

HP System Partitions Guide

Administration for nPartitions

Thirteenth Edition

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About This Document

This book describes nPartition system administration procedures, concepts, and principles for the HP servers that support nPartitions.

New and Changed Information in This Edition

This edition includes the following changes and additions:

- The third generation of cell-based servers is built around the HP sx2000 chipset.
Refer to “sx2000 Chipset for HP Servers” on page 73.
- Global shared memory (GSM) is supported on servers based on the HP sx2000 chipset.
Refer to “Global Shared Memory” on page 42.
- HP Superdome servers based on the HP sx1000 chipset can support hybrid configurations with both PA-RISC nPartitions and Intel® Itanium® 2 nPartitions in the same server complex.
Refer to “HP Superdome Hybrid Servers: Intel® Itanium® 2 and PA-RISC nPartition Mixing” on page 30.
- On cell-based HP Integrity servers, each nPartition can be configured in either of two boot modes: vPars boot mode or nPars boot mode.
Refer to “Boot Modes on HP Integrity nPartitions: nPars and vPars Modes” on page 162.

Document Organization

This book contains the following chapters and appendix.

- Chapter 1. “Getting Started with nPartitions” on page 25
This chapter introduces HP nPartition system features, server models, supported operating systems, and administration tools, and outlines the basic information needed for managing nPartitions.
- Chapter 2. “nPartition Server Hardware Overview” on page 71
This chapter describes HP nPartition server model features, model strings, and hardware paths.
- Chapter 3. “Planning nPartitions” on page 103
This chapter describes how you can plan nPartition configurations. Details include the nPartition configuration requirements and recommendations.
- Chapter 4. “Using Management Interfaces and Tools” on page 117
This chapter presents the system management interfaces and tools available on HP nPartition servers. Also described here are the nPartition boot environments, management access procedures, and detailed command references.
- Chapter 5. “Booting and Resetting nPartitions” on page 153
This chapter introduces nPartition system boot and reset concepts, configuration options, and procedures for booting and resetting nPartitions.
- Chapter 6. “Creating and Configuring nPartitions” on page 253
This chapter presents the procedures for creating, configuring, and managing nPartitions on HP servers that support them.
- Chapter 7. “Managing Hardware Resources” on page 303
This chapter explains the procedures for managing the hardware resources in nPartitions and their server complexes. It describes power and LED (attention indicator) management, hardware configuration and deconfiguration, and analysis of the current status of the server complex.
- Chapter 8. “Listing nPartition and Hardware Status” on page 333
This chapter describes procedures for listing the current status of nPartitions and server hardware components.
- Appendix A. “nPartition Commands” on page 363
This appendix contains details and command-line syntax for the HP nPartition configuration commands.

Typographic Conventions

The following notational conventions are used in this publication.

WARNING A warning lists requirements that you must meet to avoid personal injury.

CAUTION A caution provides information required to avoid losing data or system functionality.

NOTE A note highlights useful information, such as restrictions, recommendations, or important details about HP product features.

- Commands and options are represented using this font.
- **Text that you type exactly as shown** is represented using **this font**.
- *Text to be replaced with text that you supply* is represented using *this font*.
Example:
“Enter the `ls -l filename` command” means you must replace *filename* with your own text.
- **Keyboard keys and graphical interface items (such as buttons, tabs, and menu items)** are represented using **this font**.
Examples:
The **Control** key, the **OK** button, the **General** tab, the **Options** menu.
- **Menu → Submenu** represents a menu selection you can perform.
Example:
“Select the **Partition → Create Partition** action” means that you must select the **Create Partition** menu item from the **Partition** menu.
- Example screen output is represented using this font.

Related Information

For the most current nPartition administration information use this publication, the *HP System Partitions Guide*.

You can find other information on nPartition server hardware management, operating system administration, and diagnostic support tools in the following publications.

Web Site for HP Technical Documentation:

<http://docs.hp.com>

The main Web site for HP technical documentation is <http://docs.hp.com>, which has complete information available for free.

Server Hardware Information:

<http://docs.hp.com/hpux/hw/>

The <http://docs.hp.com/hpux/hw/> Web site is the systems hardware portion of the docs.hp.com. It provides HP nPartition server hardware management information, including site preparation and installation.

HP-UX 11i Information

The following Web sites and publications are available for information about the HP-UX 11i operating system:

- <http://docs.hp.com/hpux/os/11i/>
This portion of the docs.hp.com Web site has complete information about HP-UX 11i Version 1 (HP-UX B.11.11).
- <http://docs.hp.com/hpux/os/11iv2/>
This portion of the docs.hp.com Web site has complete information about HP-UX 11i Version 2 (HP-UX B.11.23).
- **HP-UX System Administration Information**
 - *Managing Systems and Workgroups: A Guide for HP-UX System Administrators*
 - *HP WBEM Services for HP-UX System Administrators Guide*
- **HP-UX 11i Release Notes and Installation Information**
 - <http://docs.hp.com/hpux/os/11i/>
This portion of the docs.hp.com Web site has release notes and installation documents for HP-UX 11i Version 1 (HP-UX B.11.11).
 - <http://docs.hp.com/hpux/os/11iv2/>
This portion of the docs.hp.com Web site has release notes and installation documents for HP-UX 11i Version 2 (HP-UX B.11.23).
- **PCI Card Online Addition/Replacement Information**
 - *Configuring HP-UX for Peripherals* (HP-UX 11i Version 1 Only)
 - *Interface Card OL* Support Guide* (HP-UX 11i Version 2 Only)
- **Virtual Partitions Information**
Installing and Managing HP-UX Virtual Partitions (vPars)

- **HP-UX 11i Workload and Resource Management Information**

- *HP-UX Workload Manager User's Guide*
- *HP Process Resource Manager User's Guide*

OpenVMS Operating System Information

You can find information about the HP OpenVMS operating system at the <http://docs.hp.com> Web site. For details about the OpenVMS release that supports nPartitions on HP Integrity servers, refer to *HP OpenVMS Version 8.2-1 for Integrity Servers New Features and Release Notes* and *HP OpenVMS Version 8.2-1 for Integrity Servers Upgrade and Installation Manual*.

Windows Operating System Information

You can find information about administration of the Microsoft® Windows® operating system at the following Web sites, among others:

- http://docs.hp.com/windows_nt/
- <http://www.microsoft.com/technet/>

Linux Operating System Information

You can find information about installation and administration of the Red Hat Enterprise Linux operating system and the SuSE Linux Enterprise Server operating system at the <http://www.docs.hp.com/linux/> Web site.

Diagnostics and Event Monitoring: Hardware Support Tools

Complete information about HP hardware support tools, including online and offline diagnostics and event monitoring tools, is at the <http://docs.hp.com/hpux/diag/> Web site. This site has manuals, tutorials, FAQs, and other reference material.

Web Site for HP Technical Support: <http://us-support2.external.hp.com>

The HP IT resource center Web site at <http://us-support2.external.hp.com/> provides comprehensive support information for IT professionals on a wide variety of topics, including software, hardware, and networking.

Books about HP-UX Published by Prentice Hall

The <http://www.hp.com/hpbooks/> Web site lists the HP books that Prentice Hall currently publishes. HP books are available worldwide through bookstores, online booksellers, and office and computer stores.

Publishing History

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1 Getting Started with nPartitions

This chapter introduces cell-based HP server features, server models, supported operating systems, and administration tools, and outlines the basic information needed for managing nPartitions.

Introduction to nPartitions

Cell-based HP servers enable you to configure a single server complex as one large system or as multiple smaller systems by configuring nPartitions.

Each nPartition defines a subset of server hardware resources to be used as an independent system environment. An nPartition includes one or more cells assigned to it (with processors and memory) and all I/O chassis connected to those cells.

All processors, memory, and I/O in an nPartition are used exclusively by software running in the nPartition. Thus, each nPartition has its own system boot interface, and each nPartition boots and reboots independently.

Each nPartition provides both hardware and software isolation, so that hardware or software faults in one nPartition do not affect other nPartitions within the same server complex.

You can reconfigure nPartition definitions for a server without physically modifying the server hardware configuration by using the HP software-based nPartition management tools.

For procedures for creating and reconfiguring nPartitions, see the chapter “Creating and Configuring nPartitions” on page 253.

Operating Systems Supported on nPartitions

As Table 1-1 lists, nPartitions can run the following operating systems: HP-UX 11i v1 (B.11.11), HP-UX 11i v2 (B.11.23), HP OpenVMS I64 8.2-1, Microsoft® Windows® Server 2003, Red Hat Enterprise Linux 3, and SuSE Linux Enterprise Server 9.

For an overview of the server models that support nPartitions, see “HP Server Support for nPartitions” on page 29.

For details on operating system boot and reset procedures, see the chapter “Booting and Resetting nPartitions” on page 153.

Table 1-1 nPartition Operating System Support

Operating System	Supported Cell-Based Servers
HP-UX 11i v1 (B.11.11)	<p>HP-UX 11i v1 (B.11.11) is supported on HP 9000 servers, including the cell-based HP 9000 servers.</p> <p>The HP-UX 11i v1 (B.11.11) December 2003 release and later also supports rp7420, rp8420, and HP 9000 Superdome (SD16A, SD32A, SD64A models).</p> <p>HP-UX 11i v1 does not support cell local memory.</p> <p>Also see “nPartition Hardware Requirements for Operating Systems” on page 104.</p>
HP-UX 11i v2 (B.11.23)	<p>HP-UX 11i v2 (B.11.23) is supported on HP Integrity servers, including the cell-based HP Integrity servers.</p> <p>The HP-UX 11i v2 (B.11.23) September 2004 release and later also supports all cell-based HP 9000 servers.</p> <p>HP-UX 11i v2 supports cell local memory.</p> <p>Also see “nPartition Hardware Requirements for Operating Systems” on page 104.</p>
HP OpenVMS I64 8.2-1	<p>OpenVMS I64 8.2-1 is supported on HP Integrity servers, including the cell-based HP Integrity servers.</p> <p>OpenVMS I64 8.2-1 does not support cell local memory.</p> <p>Also see “nPartition Hardware Requirements for Operating Systems” on page 104.</p>
Microsoft® Windows® Server 2003	<p>Windows Server 2003 is supported on HP Integrity servers, including the cell-based HP Integrity servers.</p> <p>The Windows Server 2003 Datacenter Edition is supported on four-cell HP Integrity server and HP Integrity Superdome servers.</p> <p>The Windows Server 2003 Enterprise Edition is supported on two-cell and four-cell HP Integrity servers.</p> <p>Windows Server 2003 supports cell local memory.</p> <p>Also see “nPartition Hardware Requirements for Operating Systems” on page 104.</p>

Table 1-1 nPartition Operating System Support (Continued)

Operating System	Supported Cell-Based Servers
Red Hat Enterprise Linux 3 Update 2 Red Hat Enterprise Linux 3 Update 3	Red Hat Enterprise Linux 3 Update 2 and Update 3 are supported on HP Integrity servers, including the cell-based HP Integrity servers. Red Hat Enterprise Linux 3 does not support cell local memory. Also see “nPartition Hardware Requirements for Operating Systems” on page 104.
SuSE Linux Enterprise Server 9	SuSE Linux Enterprise Server 9 is supported on HP Integrity servers, including the cell-based HP Integrity servers. SuSE Linux Enterprise Server 9 supports cell local memory. Also see “nPartition Hardware Requirements for Operating Systems” on page 104.

HP Server Support for nPartitions

HP supports nPartition capabilities on cell-based servers, listed in Table 1-2.

On HP Superdome servers based on the HP sx1000 chipset, you can mix both PA-RISC nPartitions and Intel® Itanium® 2 nPartitions in the same server complex under specific system configurations. For details, refer to “HP Superdome Hybrid Servers: Intel® Itanium® 2 and PA-RISC nPartition Mixing” on page 30.

The same basic nPartition features are supported for cell-based HP 9000 servers and cell-based HP Integrity servers, though some differences exist in the sets of supported tools and management capabilities. Where such differences exist, this document notes them.

Table 1-2 HP Servers Supporting nPartitions

<p>HP 9000 Servers HP 9000 servers have PA-RISC processors.</p>	<p>The first-generation cell-based HP 9000 servers include the following models:</p> <ul style="list-style-type: none"> • HP 9000 Superdome servers, including the SD16000, SD32000, and SD64000 models. These models support up to 16 cells in a server complex. • HP 9000 rp8400 model, which supports up to four cells in a server complex. • HP 9000 rp7405/rp7410, which supports up to two cells in a server complex. <p>For details see “Server Hardware Details: Cell-Based HP Servers” on page 75.</p> <hr/> <p>The following second-generation cell-based HP 9000 servers use the HP sx1000 chipset. For details see “sx1000 Chipset for HP Servers” on page 72.</p> <ul style="list-style-type: none"> • HP 9000 Superdome servers, including the SD16A, SD32A, and SD64A models. These models support up to 16 cells in a server complex. • HP 9000 rp8420 model, which supports up to four cells in a server complex. • HP 9000 rp7420 model, which supports up to two cells in a server complex. <p>For details see “Server Hardware Details: Cell-Based HP Servers” on page 75.</p>
<p>HP Integrity Servers HP Integrity servers have Intel® Itanium® 2 processors. The Intel® Itanium® processor family architecture was co-developed by Hewlett-Packard and Intel.</p>	<p>Cell-based HP Integrity servers use either the HP sx1000 chipset or the HP sx2000 chipset.</p> <p>The following cell-based HP Integrity servers use the HP sx1000 chipset; for details see “sx1000 Chipset for HP Servers” on page 72.</p> <ul style="list-style-type: none"> • HP Integrity Superdome servers include the SD16A, SD32A, and SD64A models. These models support up to 16 cells in a server complex. • The HP Integrity rx8620 model supports up to four cells in a server complex. • The HP Integrity rx7620 model supports up to two cells in a server complex. <p>The following cell-based HP Integrity servers use the HP sx2000 chipset; for details see “sx2000 Chipset for HP Servers” on page 73.</p> <ul style="list-style-type: none"> • HP Integrity Superdome servers include the SD16B, SD32B, and SD64B models. These models support up to 16 cells in a server complex. • The HP Integrity rx8640 model supports up to four cells in a server complex. • The HP Integrity rx7640 model supports up to two cells in a server complex. <p>For details see “Server Hardware Details: Cell-Based HP Servers” on page 75.</p>

HP Superdome Hybrid Servers: Intel® Itanium® 2 and PA-RISC nPartition Mixing

HP Superdome servers based on the HP sx1000 chipset can support hybrid configurations with both PA-RISC nPartitions and Intel® Itanium® 2 nPartitions in the same server complex.

On Superdome hybrid servers, each nPartition must have only PA-RISC processor or Intel® Itanium® 2 processors. However, both types of nPartitions can reside in the same server complex. Within each PA-RISC nPartition, all cells must have the same processor revision level. Within each Intel® Itanium® 2 nPartition, all cells must have the same cell compatibility value.

NOTE Specific firmware, operating systems, and management tools are required to supported mixing PA-RISC nPartitions and Intel® Itanium® 2 nPartitions on Superdome hybrid servers.

For details, refer to *HP Superdome Hybrid Servers*, which is available from the <http://docs.hp.com/en/hw.html> Web site under the **HP 9000 Superdome Server** and **HP Integrity Superdome Server** links.

Hardware Components of nPartition-Capable Servers

All hardware within a cell-based server—including all cells, I/O chassis, cables, cabinet hardware, fans, and power and utility components—is considered to be a server complex.

Within each cell-based server cabinet are one or more cells, each of which contains processors and memory.

Each cell-based server cabinet can have multiple I/O chassis that provide PCI slots for I/O cards. I/O resources also include any I/O devices attached to I/O cards within the I/O chassis.

Core I/O is required for each nPartition to provide console services and other boot and management abilities. On first-generation cell-based servers and HP sx1000 chipset-based servers, core I/O is provided by a PCI card residing in an I/O chassis. On HP sx2000 chipset-based servers, core I/O is provided on each cell. On all cell-based servers, each nPartition has only one core I/O active at a time.

Each I/O chassis connects to only one cell in the server. Some cell-based servers also support optional I/O expansion cabinets to provide additional I/O chassis. An HP Superdome complex can consist of one cabinet or two server cabinets, and can also include one or two I/O expansion cabinets (to provide additional I/O chassis). The two-cell HP servers consists of a single server cabinet only. The four-cell servers consists of a single server cabinet and can optionally include one I/O expansion cabinet to provide two additional I/O chassis.

For details on listing and managing nPartition hardware components, see the chapter “Managing Hardware Resources” on page 303.

Administration Tools for nPartitions

The main administration tools for nPartitions are Partition Manager, which provides a graphical interface, and the nPartition Commands, which provide a command-line interface.

Some nPartition configuration and management also can be accomplished using the service processor interface to a cell-based server or by using the boot interface available through an nPartition console.

Slightly different toolsets and capabilities are available the different server models. However, the same basic administration tasks are supported on all cell-based servers.

The following tools can perform nPartition administration tasks:

- Service Processor (MP or GSP) Menus

Service processor menus provide a service interface for the entire complex. It allows access to all hardware and nPartitions defined within the complex. The service processor is always available, regardless of whether any nPartitions are configured or booted in the complex.

The service processor includes the Command menu, nPartition consoles, nPartition Virtual Front Panels, nPartition console logs and the Chassis Log Viewer or Event Log Viewer (HP 9000 servers with HP PA-8700 processors have chassis logs, and servers based on the HP sx1000 or sx2000 chipset have event logs).

See the chapter “Using Management Interfaces and Tools” on page 117.

For service processor commands, see “Command Reference for Service Processor Commands” on page 144.

- EFI Boot Manager and EFI Shell Commands

On cell-based HP Integrity servers, the Extensible Firmware Interface (EFI) supports nPartition management. The EFI is accessible from an nPartition console when the nPartition is in an active state but has not booted an operating system.

See “Command Reference for EFI Shell Commands” on page 146 for details.

- BCH Menu Commands

On cell-based PA-RISC servers, the Boot Console Handler (BCH) interface supports management from an nPartition console when the nPartition is in an active state but has not booted an operating system. See “Command Reference for BCH Menu Commands” on page 150 for details.

- nPartition Commands

You can configure, manage, and monitor nPartitions and hardware using the nPartition commands such as `parstatus`, `parcreate`, `parmodify`, and others.

Two versions of the nPartition commands are available: the Original nPartition Commands and Enhanced nPartition Commands. The Original nPartition Commands are used only on HP-UX 11i v1 (B.11.11) releases prior to the December 2004 release. The Enhanced nPartition Commands are supported for HP-UX, Windows, and Linux.

The same base set of features is available in both nPartition commands versions. However, the Enhanced nPartition Commands include new options, such as remote administration abilities, and include the `cplxmodify` command.

See “Commands for Configuring nPartitions” on page 34 for details.

- Partition Manager (`/opt/parmgr/bin/parmgr`)

Partition Manager provides a graphical interface for configuring, modifying, and managing nPartitions

and hardware within a server complex.

Two versions of Partition Manager are available: Version 1.0 and Version 2.0. Partition Manager Version 1.0 is used only on HP-UX 11i v1 (B.11.11) releases prior to the December 2004 release and relies in part on the Original nPartition Commands. Partition Manager Version 2.0 is supported for HP-UX and Windows and relies in part on the Enhanced nPartition Commands.

Although both Partition Manager versions support a similar set of tasks, the Partition Manager Version 2.0 release provides a significantly improved graphical interface, a new Web-based management interface, and remote administration abilities.

See “Partition Manager” on page 38 for details.

Commands for Configuring nPartitions

You can use the nPartition commands to create, modify, monitor, and remove nPartitions; get detailed server hardware information; manipulate attention indicators (LEDs) and power; and modify server complex attributes such as the complex name.

Table 1-3 describes the two nPartition commands releases, the Original nPartition Commands and the Enhanced nPartition Commands.

The nPartition commands include: `parcreate`, `parmodify`, `parremove`, `parstatus`, `parunlock`, `fruled`, `frupower`, and `cplxmodify`. Table 1-4 on page 34 briefly describes each of the commands.

When using these commands, specify cells and I/O chassis using the notations in “Specifying Cells and I/O Chassis to Commands” on page 364.

Remote management using the commands is supported as described in “Specifying Remote Management Options to Commands” on page 368.

Table 1-3 nPartition Commands Releases

Original nPartition Commands	Enhanced nPartition Commands
<ul style="list-style-type: none"> Support only local management of nPartitions and complexes. Were distributed with HP-UX 11i v1 (B.11.11) releases prior to the December 2004 release. Supported by HP-UX kernels built with nPartition support enabled (the <code>hd_fabric</code> driver) and use the <code>libfab.1</code> library. Installed as part of the HP-UX 11i Version 1 operating system installation prior to the December 2004 release. 	<ul style="list-style-type: none"> Support both local management and remote management of nPartitions and complexes. Distributed with the HP-UX 11i v2 (B.11.23) release. Installed and supported for use on all systems that run HP-UX 11i Version 2. Distributed with the HP-UX 11i v1 (B.11.11) December 2004 release and later. Available for Windows (32-bit) and Windows (64-bit). Distributed with the Smart Setup CD. Available for Red Hat Enterprise Linux and SuSE Linux Enterprise Server. Distributed with the HP Enablement Kit for Linux.

Table 1-4 describes the nPartition configuration commands and lists sections where you can find each command’s syntax and details.

Table 1-4 nPartition Commands Descriptions

Command	Description
<code>parcreate</code>	Create a new nPartition; root or IPMI LAN access is required. See “parcreate Command” on page 369.
<code>parmodify</code>	Modify an existing nPartition; root or IPMI LAN access is required. See “parmodify Command” on page 372.
<code>parremove</code>	Remove an existing nPartition; root or IPMI LAN access is required. See “parremove Command” on page 376.

Table 1-4 nPartition Commands Descriptions (Continued)

Command	Description
parstatus	Display nPartition information and hardware details for a server complex. See “parstatus Command” on page 378.
parunlock	Unlock Complex Profile data (use this command with caution); root or IPMI LAN access is required. See “parunlock Command” on page 380.
fruled	Blink the attention indicators (LEDs) or turn them off. This command can control these indicators for cells, I/O chassis, and cabinet numbers. See “fruled Command” on page 383.
frupower	Display status or turn power on or off for cells and I/O chassis; root or IPMI LAN access is required. See “frupower Command” on page 385.
cplxmodify	Only distributed with the Enhanced nPartition Commands. Modify server complex attributes. Supports changing the name of a complex; root or IPMI LAN access is required See “cplxmodify Command” on page 387.

Availability of nPartition Commands

The Original nPartition Commands were distributed as part of HP-UX 11i v1 (B.11.11) releases prior to the December 2004 release.

The Enhanced nPartition Commands are distributed with current HP-UX releases, including all releases of HP-UX 11i v2 (B.11.23) and releases of HP-UX 11i v1 (B.11.11) beginning with the December 2004 release.

The Enhanced nPartition Commands also are distributed as bundles on the HP Smart Setup CD for Windows, and as bundles on the HP Enablement Kit for Linux.

You can download the nPartition Commands for Windows and the HP Enablement Kit for Linux from the <http://www.hp.com/> Web site. See “Downloading Enhanced nPartition Commands for Windows” on page 36 and “Downloading the HP Enablement Kit for Linux” on page 37.

Enhanced nPartitions Commands for Windows

The Enhanced nPartition Commands for Windows are available in both 32-bit and 64-bit versions.

- The Windows (32-bit) Enhanced nPartition Commands are designed for any 32-bit system running Windows XP, Windows 2000 with Service Pack 3, or Windows Server 2003 (32-bit).

The 32-bit nPartition Commands enable you to use a 32-bit system as a remote management station for nPartition administration.

- The Windows (64-bit) Enhanced nPartition Commands are designed for HP Integrity servers running Windows Server 2003, 64-bit, Enterprise Edition or Datacenter Edition.

The 64-bit nPartition Commands enable you to perform local and remote management of nPartitions when running on a cell-based server with Windows Server 2003, and enable you to perform remote management when running on other HP Integrity servers with Windows Server 2003.

The Smart Setup CD has both both the 32-bit and 64-bit versions of the nPartition Commands. You also can download the nPartition Commands bundles for Windows from the <http://www.hp.com/> Web site.

Downloading Enhanced nPartition Commands for Windows

You can download the Enhanced nPartition Commands for Windows from the <http://www.hp.com/> Web site.

Step 1. Go to the <http://www.hp.com/> Web site and choose **Software & Driver Downloads**.

Step 2. At the Software & Driver Downloads page, in the for product box, enter the name of a cell-based HP Integrity server, such as:

- Integrity Superdome
- Integrity rx8620
- Integrity rx7620

Step 3. At the Downloads for HP Business Support Center Web page, choose **Microsoft Windows Server 2003 64-Bit** from the **select operating system** list.

Step 4. At the next Downloads for HP Business Support Center Web page, choose **HP nPartition Commands Bundle (Windows Server 2003 64-Bit)** or choose **HP nPartition Commands Bundle (Windows Server 2003 32-Bit)** from the **Utility Partition Management** heading.

After you choose the nPartition commands bundle, the HP nPartition Commands Bundle Web page displays information about the software bundle and provides options for downloading the software and for viewing the release notes.

Step 5. To view the release notes, choose the **Release Notes** tab.

Read the *Installation instructions* section of the release notes and the features summary before downloading and installing the software.

Step 6. To download the Enhanced nPartition Commands for Windows, choose **download** from the Web page.

Enhanced nPartition Commands for Linux

The HP Enablement Kit for Linux is a CD that includes Enhanced nPartition Commands for use with Red Hat Enterprise Linux 3 or SuSE Linux Enterprise Server 9.

Downloading the HP Enablement Kit for Linux

You can download the HP Enablement Kit for Linux from the <http://www.hp.com/go/softwaredepot> Web site.

The downloadable CD image is an `.iso` file that you can use to record a usable CD.

- Step 1.** Go to the <http://www.hp.com/go/softwaredepot> Web site.
- Step 2.** At the Software Depot home page, enter **Enablement Kit** in the **Search** field to search the Software Depot.
- Step 3.** At the product catalog page that displays the search results, choose the **HP Enablement Kit for Linux on Itanium (R) 2-based Servers** entry from the list of products.
- Step 4.** At the HP Enablement Kit product details page, in the **to order** section of the page (where it states “Click here to download”), choose the word **here**.
- Step 5.** To download the HP Enablement Kit for Linux CD image file, choose **download** from the Web page.
You will use the `.iso` file that you downloaded to create a usable CD.
- Step 6.** Go to the <http://docs.hp.com/linux/> Web site to view documentation for the HP Enablement Kit for Linux.

Under the **Linux for Itanium 2-based Servers and Workstations** heading of the Linux documentation Web site, view the HP Enablement Kit for Linux documentation.

- Step 7.** Record a CD using the HP Enablement Kit for Linux CD image file.

The CD image (`.iso` file) is a complete CD image in one file. Copying the file to a CD does not create a usable CD. Instead, use a software application that supports recording a CD from a CD image.

Partition Manager

Partition Manager provides a graphical interface for managing cell-based servers.

Partition Manager Version 1.0 was distributed with HP-UX 11i v1 (B.11.11) releases prior to the December 2004 release. Starting with the HP-UX 11i v1 December 2004 release, Partition Manager Version 2.0 replaces Partition Manager Version 1.0 for HP-UX 11i v1 systems.

Partition Manager Version 2.0 is distributed and installed with all HP-UX 11i v2 (B.11.23) releases. It also is available for Windows (32-bit) and Windows (64-bit) as part of the the Smart Setup CD.

Partition Manager Version 2.0 for HP-UX provides the `/opt/parmgr/bin/parmgr` command to run, stop, and restart Partition Manager. Refer to the `parmgr -h` command or the *parmgr* (1M) manpage for command-line options.

Also see the Partition Manager Version 2.0 online help available at the following Web site:

<http://docs.hp.com/en/PARMGR2/>

To view the online help without running Partition Manager, you can open the help files using a Web browser either on a system where Partition Manager is installed, or on a system that has a downloaded copy of the help files.

- On an HP-UX 11i v2 (B.11.23) system you can view the Partition Manager online help using a Web browser to open the following file:

`/opt/hpwebadmin/webapps/mxhelp/parmgr/en/overview.html`

- On any system, you can download the Partition Manager Version 2.0 online help files from the following Web site:

<http://docs.hp.com/en/PARMGR2/features2.html>

Partition Manager Version 2.0 for Windows

The Partition Manager Version 2.0 for Windows can be installed and run on either 32-bit or 64-bit Windows systems. (A single Partition Manager bundle is provided for both 32-bit and 64-bit systems.)

- Using Partition Manager for Windows on any 32-bit system running Windows XP, Windows 2000 with Service Pack 3, or Windows 2003, 32-bit Edition enables you to use a 32-bit system as a remote management station for nPartition administration.
- Using Partition Manager for Windows on an HP Integrity servers running Windows Server 2003, 64-bit, Enterprise Edition or Datacenter Edition enables you to perform local and remote management of nPartitions when running on a cell-based server with Windows Server 2003, and enables you to perform remote management when running on other HP Integrity servers with Windows Server 2003.

NOTE Before installing the Partition Manager bundle for Windows you must download and install the nPartition Commands bundle (either the 32-bit or 64-bit version, depending on the platform where the installation occurs).

You also must download and install the Java 2 SE SDK v1.42 from <http://java.sun.com/downloads>. For details refer to the release notes.

The Smart Setup CD includes Partition Manager Version 2.0 for Windows. You also can download the Partition Manager bundles for Windows from the <http://www.hp.com/> Web site.

Downloading Partition Manager Version 2.0 for Windows

You can download Partition Manager Version 2.0 for Windows from the <http://www.hp.com/> Web site.

- Step 1.** Go to the <http://www.hp.com/> Web site and choose **Software & Driver Downloads**.
- Step 2.** At the Software & Driver Downloads page, in the for product box, enter the name of a cell-based HP Integrity server, such as:
- Integrity Superdome
 - Integrity rx8620
 - Integrity rx7620
- Step 3.** At the Downloads for HP Business Support Center Web page, choose **Microsoft Windows Server 2003 64-Bit** from the **select operating system** list.
- Step 4.** At the next Downloads for HP Business Support Center Web page, choose **HP Partition Manager Bundle** from the **Utility Partition Management** heading.
- After you choose the Partition Manager bundle, the HP Partition Manager Bundle Web page displays information about the software bundle and provides options for downloading the software and for viewing the release notes.
- Step 5.** To view the release notes, choose the **Release Notes** tab.
- Read the *Installation instructions* section of the release notes and the features summary before downloading and installing the software.
- Step 6.** To download Partition Manager for Windows, choose **download** from the Web page.

nPartition Properties

This section describes the nPartition properties you work with when performing nPartition administration tasks.

The following nPartitions details are covered here:

- “Partition Numbers” on page 41
- “Assigned and Unassigned Cells” on page 41
- “Base Cells” on page 41
- “Core Cells” on page 41
- “Active and Inactive Cells” on page 41
- “Cell Local Memory” on page 42
- “Global Shared Memory” on page 42
- “Cell Property Details” on page 42
- “Active and Inactive nPartition Boot States” on page 44

Partition Numbers

Each nPartition has its own unique partition number that the nPartition administration tools use for identifying the nPartition.

When you create an nPartition, the tool you use assigns the nPartition the lowest available partition number. For example, the first nPartition always is partition number 0, and the second nPartition to be created is partition number 1.

After you remove an nPartition, no cells are assigned to the nPartition. As a result, the nPartition tools can reuse the partition number when creating a new nPartition.

For example, after you remove partition number 2, the next time you create a new nPartition the `parcreate` command or Partition Manager will assign cells to partition number 2 when creating a new nPartition, if all lower-numbered nPartitions (partition numbers 0 and 1) already are defined.

Assigned and Unassigned Cells

Each cell in a server complex either is assigned to one of the nPartitions in the complex, or it is unassigned and thus is not used by any of the nPartitions. If an I/O chassis is attached to an unassigned cell, then the chassis likewise is not assigned to an nPartition.

Cells that are unassigned are considered to be available resources; they are free to be assigned to any of the existing nPartitions, or can be used to create new nPartitions.

Base Cells

On both HP 9000 servers and HP Integrity servers, all cells within an nPartition are base cells.

The nPartitions administration tools automatically set the cell type to base cell, if you do not specify the cell type.

Core Cells

One cell in each nPartition must serve as the active core cell. The core cell controls the nPartition until an operating system has booted, and it provides console services and other boot and management abilities for the nPartition. The monarch processor on the core cell runs the Boot Console Handler (BCH) or Extensible Firmware Interface (EFI) code while all other processors are idle until an operating system is booted.

On first-generation cell-based servers and HP sx1000 chipset-based servers, core I/O is provided by a PCI card residing in an I/O chassis. On these servers, to be eligible as a core cell, a cell must be assigned to the nPartition, it must be active, and it must be attached to an I/O chassis containing functional core I/O.

On HP sx2000 chipset-based servers, core I/O is provided on each cell, so any cell assigned to an nPartition can be a core cell.

Although an nPartition can have multiple core-capable cells, only one core I/O is actively used in an nPartition: the core I/O belonging to the active core cell.

For details about setting and using the core cell choices (or “alternates”) for an nPartition see “Setting nPartition Core Cell Choices” on page 294. When none of the core cell choices can serve as the active core cell, or if no core cell choices are specified, the nPartition attempts to select an eligible cell using a default process.

Active and Inactive Cells

Cells that are assigned to an nPartition and have booted to form an nPartition are active cells whose resources (processors, memory, and any attached I/O) can be actively used by software running in the

nPartition.

Cells that are inactive either are not assigned to an nPartition, or they have not participated in partition rendezvous to form an nPartition with any other cells assigned to the nPartition. (Partition rendezvous is the point during the nPartition boot process when all available cells in an nPartition join together to establish which cells are active for the current boot of the nPartition.)

For example, a cell is inactive when it is powered off, has booted with a “n” use-on-next-boot value, or is assigned to an nPartition that has been reset to the shutdown for reconfig state.

The resources belonging to inactive cells are not actively used by an nPartition. For a cell and its resources to be actively used the cell must boot and participate in partition rendezvous.

Cell Local Memory

On cell-based servers that are based on the HP sx1000 or sx2000 chipset, a portion of the memory in each cell can be configured as cell local memory (CLM), which is non-interleaved memory that can be quickly accessed by processors residing on the same cell as the memory.

CAUTION Memory configured as cell local memory only can be used by operating systems that support it. HP-UX 11i v2 (B.11.23), Windows Server 2003, and SuSE Linux Enterprise Server 9 support cell local memory.

Any memory configured as cell local memory is unusable when an nPartition runs an operating system that does not support it. HP-UX 11i v1 (B.11.11), Red Hat Enterprise Linux 3, and HP OpenVMS 8.2-1 do not support cell local memory.

The nPartition management tools enable you to configure CLM for each cell either as a percentage of the total memory in the cell, or as an absolute number of gigabytes of memory.

For details about configuring CLM see the chapter “Planning nPartitions” on page 103.

Global Shared Memory

Global shared memory (GSM) is a type of memory sharing that allows nPartitions in the same complex to communicate with each other. GSM is supported only on servers based on the HP sx2000 chipset and requires each nPartition to have some cell local memory (CLM) configured.

After GSM is enabled for two or more nPartitions, applications running on the nPartitions must take coordinated steps to open a shared memory window. Two GSM-enabled nPartitions can use a shared memory window to enable an application on one nPartition to read (but not write) a portion of CLM that resides in the other nPartition. Only GSM-aware applications on nPartitions running Microsoft Windows can use GSM when it is enabled.

GSM can be enabled complex-wide, disabled complex-wide, or configured on a per-nPartition basis.

From Partition Manager, the **Complex** → **Configure GSM** action enables you to configure GSM for an HP sx2000 chipset-based complex. The `cplxmodify` command enables you to configure GSM using the nPartition Commands.

After enabling or disabling GSM sharing for an nPartition, you must reboot all nPartitions that are affected by the GSM change for it to take effect.

Cell Property Details

Each cell has various properties that determine how the cell can be used and managed.

To list the properties of cells in a server complex, you can use the `parstatus -C` command, `parstatus -V -c#` command, or Partition Manager.

The `parstatus -C` command output includes cell property summaries such as the current assignments, usage, and I/O details for all cells in the complex.

```
# parstatus -C
[Cell]

          CPU      Memory      Use
Hardware  Actual    OK/      (GB)      Core    On
Location  Usage    Deconf/ OK/      Cell    Next Par
          Max    Deconf    Connected To    Capable Boot Num
=====
cab0,cell0 active core 4/0/4    8.0/ 0.0 cab 0,bay0,chassis1 yes    yes 0
cab0,cell1 active base 4/0/4    8.0/ 0.0 -      no     yes 0
cab0,cell2 active base 4/0/4    8.0/ 0.0 cab 0,bay1,chassis3 yes    yes 0
cab0,cell3 absent  -      -      -      -      -      -
cab0,cell4 active core 2/0/4    4.0/ 0.0 cab 0,bay0,chassis3 yes    yes 1
cab0,cell5 active base 2/0/4    4.0/ 0.0 -      no     yes 1
cab0,cell6 active base 2/0/4    4.0/ 0.0 cab 0,bay1,chassis1 yes    yes 1
cab0,cell7 absent  -      -      -      -      -      -
```

#

The `parstatus -V -c#` command gives detailed information about the properties and status for the cell (`-c#`) that you specify.

```
# parstatus -V -c0
[Cell]
Hardware Location      : cab0,cell0
Global Cell Number     : 0
Actual Usage           : active core
Normal Usage           : base
Connected To           : cab0,bay0,chassis0
Core Cell Capable      : yes
Firmware Revision      : 20.1
Failure Usage          : activate
Use On Next Boot       : yes
Partition Number       : 0
Partition Name         : Partition 0
```

```
[CPU Details]
Type : 8820
Speed : 900 MHz
CPU Status
=== =====
0 ok
1 ok
2 ok
3 ok
4 ok
5 ok
6 ok
7 ok
```

```
CPUs
=====
OK      : 8
Deconf  : 0
Max     : 8
```

```
[Memory Details]
DIMM Size (MB) Status
=====
0A 2048 ok
4A 2048 ok
0B 2048 ok
4B 2048 ok
1A 2048 ok
5A 2048 ok
1B 2048 ok
```

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nPartition Properties

```
5B 2048 ok
2A 2048 ok
6A 2048 ok
2B 2048 ok
6B 2048 ok
3A 2048 ok
7A 2048 ok
3B 2048 ok
7B 2048 ok
Memory
=====
DIMM OK      : 16
DIMM Deconf  : 0
Max DIMMs   : 16
Memory OK    : 32.00 GB
Memory Deconf : 0.00 GB

#
```

Active and Inactive nPartition Boot States

Each nPartition has a boot state of either active or inactive.

The boot state indicates whether the nPartition has booted so that it may be interactively accessed through its console (active nPartitions) or if it cannot be used interactively (inactive nPartitions)

You can use the `parstatus -P` command or Partition Manager to list all nPartitions and their boot states (active or inactive status).

```
# parstatus -P
[Partition]
Par          # of # of I/O
Num Status   Cells Chassis Core cell Partition Name (first 30 chars)
=== =====
0  inactive  2      1      ?      feshd5a
1  active    2      1      cab1,cell2 feshd5b

#
```

Likewise, you can view nPartition boot states using the Virtual Front Panel, which is available from the service processor Main menu for the server complex.

Active nPartition

An nPartition that is active has at least one core-capable cell that is active (not in a boot-is-blocked state). When an nPartition is active, one or more of the cells assigned to the nPartition have completed partition rendezvous and the system boot interface (the BCH or EFI environment) has loaded and been displayed through the nPartition console. An operating system can be loaded and run from the system boot interface on an active nPartition.

Inactive nPartition

An inactive nPartition is considered to be in the shutdown for reconfig state, because all cells assigned to the nPartition either remain at a boot-is-blocked state or are powered off.

To make an inactive nPartition active, use the `BO` command at the service processor (MP or GSP) Command menu. The `BO` command clears the boot-is-blocked flag for all cells assigned to the nPartition, thus allowing the cells to rendezvous and enabling the nPartition to run the system boot interface. (If all cells assigned to an nPartition are powered off, you must power on its cells to enable the nPartition to become active.)

To make an nPartition inactive perform a shutdown for reconfig. You can issue commands from the operating system, the system boot interface (BCH or EFI), or the service processor (MP or GSP) Command menu. All three methods reboot an nPartition and hold all of its cells at boot-is-blocked; as a result the nPartition is shutdown for reconfig (placed in an inactive state). For details see the chapter “Booting and Resetting

nPartitions” on page 153.

Overview of Managing nPartitions

This section provides overviews of common nPartition management tasks.

The following task overviews are given here:

- “Basics of Listing nPartition and Complex Status” on page 47
- “Basics of nPartition Creation” on page 49
- “Basics of nPartition Modification” on page 51
- “Basics of nPartition Booting and Resetting” on page 53

Basics of Listing nPartition and Complex Status

You can list server complex hardware details and nPartition configuration details using the following tools and commands.

For details see the chapter “Listing nPartition and Hardware Status” on page 333.

- Service processor (MP or GSP) methods for listing hardware and nPartition status include the following commands, which are available from the service processor Command menu.
 - CP — List nPartition configurations, including all assigned cells.
 - PS — List cabinet, power, cell, processor, memory, I/O, and other details.
 - IO — List connections from cells to I/O chassis on HP Superdome servers.
 - ID — List product and serial numbers.
- EFI Shell methods (available only on HP Integrity servers) for listing hardware and nPartition status include the following commands. Hardware and nPartition information displayed by the EFI Shell is limited to the local nPartition.
 - `info sys` — List the local nPartition number and active cell details.
 - `info io` — List the I/O configuration.
 - `info mem` — List memory details.
 - `info cpu` — List processor details.
- BCH menu methods (available only on HP 9000 servers) for listing hardware and nPartition status include the following commands. Hardware and nPartition information displayed by the BCH menu is limited to the local nPartition in most cases.
 - Information menu, PR command — List processor configuration details.
 - Information menu, ME command — List memory configuration details.
 - Information menu, IO command — List I/O configuration details.
 - Information menu, CID command — List complex product and serial numbers.
 - Configuration menu, PD command — List the local nPartition number and name.
- nPartition administration tools for listing hardware and nPartition status include the following features.
 - Partition Manager Version 1.0 — The **Complex** → **Show Complex Details** action provides complex status information; use the **Cells** tab, **CPUs/Memory** tab, **I/O Chassis** tab, and **Cabinet Info** tab to display selected details.
 - Partition Manager Version 2.0 — The following user interface features provide nPartition and complex status:
 - General** tab, **Hardware** tab, **nPartitions** tab, **Cells** tab, **I/O** tab, **CPUs/Memory** tab, **Power and Cooling** tab.
 - Also, the **Complex** → **Show Complex Details** action.
 - `parstatus -C` command — List cell configurations.
 - `parstatus -V -c#` command — List detailed cell information.
 - `parstatus -I` command, `rad -q` command on HP-UX 11i v1 (B.11.11) systems, and `olrad -q` command on HP-UX 11i v2 (B.11.23) systems — List I/O chassis and card slot details.
 - `parstatus -B` command — List server cabinet summaries for the complex.
 - `parstatus -V -b#` command — List detailed server cabinet status.

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Overview of Managing nPartitions

- `parstatus -X` command — List product and serial numbers.
- `parstatus -P` command — List a configuration summary for all nPartitions.
- `parstatus -V -p#` command — List detailed nPartition configuration information.
- `parstatus -w` command — List the local nPartition number.
- `frupower -d -C` command or `frupower -d -I` command — List power status for all cells (-C) or all I/O chassis (-I).

For further details and summaries see Table 8-1 on page 335.

Basics of nPartition Creation

Creating an nPartition involves using an nPartition administration tool to assign one or more cells in a complex to the new nPartition. At the time an nPartition is created you also can optionally specify various configuration options for the nPartition, such as its name, cell use-on-next-boot values, and other details. After an nPartition is created you can modify the nPartition, as described in “Basics of nPartition Modification” on page 51. For detailed procedures see the chapter “Creating and Configuring nPartitions” on page 253.

NOTE When creating an nPartition, follow the HP nPartition requirements and guidelines. HP recommends only specific sets of nPartition configurations. For nPartition configuration requirements and recommendations, see the chapter “Planning nPartitions” on page 103.

The method you choose for creating an nPartition can depend on whether you are creating the first nPartition in a complex, creating a “Genesis Partition” for a complex, or creating an additional nPartition in a complex that already has one or more nPartitions defined.

- **Creating the First nPartition in a Server Complex**

To create the first nPartition in a complex you can do so either by creating a Genesis Partition or by using an nPartition administration tool to remotely manage the complex using IPMI over LAN.

- All cell-based servers support creating a Genesis Partition. See “Creating a Genesis Partition for a Server Complex” on page 49.
- Only cell-based servers based on the HP sx1000 or sx2000 chipset support remote administration using IPMI over LAN.

From a system with the Enhanced nPartition Commands, use the `parcreate` command `-g... -h...` set of options. Or from Partition Manager Version 2.0 use the **Switch Complexes** dialog to connect to the complex and use the **nPartition** → **Create nPartition** action.

For remote administration details see “Remote and Local Management of nPartitions” on page 62.

- **Creating a Genesis Partition for a Server Complex**

Creating a Genesis Partition involves the service processor (MP or GSP) `CC` command to specify that an initial, one-cell nPartition be created within the server complex. To create a Genesis Partition, the complex either must have no nPartitions defined, or all nPartitions must be shutdown for reconfig (inactive). For details see “Genesis Partition” on page 50.

- **Creating Additional nPartitions in a Server Complex**

You can use either of two methods to create additional nPartitions in a complex where one or more nPartitions already are defined: either use `parcreate` or Partition Manager from an nPartition running in the complex, or use the remote administration feature of those tools running on a system outside the complex. For a detailed procedure see “Creating a New nPartition” on page 266.

- **Creating a New nPartition Locally** — To create a new nPartition in the same complex where `parcreate` or Partition Manager is running at least one nPartition must be booted with an operating system that has the nPartition tools installed.

Login to HP-UX on the nPartition and issue the `parcreate` command, or access Partition Manager running on the nPartition and use its **Create nPartition** action.

- **Creating a New nPartition Remotely** — To remotely create a new nPartition in a complex, do so either by using the Enhanced nPartition Commands version of `parcreate`, or by using Partition Manager

Version 2.0.

Only cell-based servers based on the HP sx1000 or sx2000 chipset support remote administration.

Both `parcreate` and Partition Manager support two methods of remote administration: Wbem and IPMI over LAN. For remote administration using Wbem the tool remotely accesses a booted operating system running on an nPartition in the target complex (for example, by the `-u...` `-h...` set of options). For remote administration using IPMI over LAN the tool remotely accesses the service processor of the target complex (for example, by the `-g...` `-h...` set of options).

For remote administration details see “Remote and Local Management of nPartitions” on page 62.

For detailed procedures for creating and managing nPartitions see the chapter “Creating and Configuring nPartitions” on page 253.

Genesis Partition

The Genesis Partition is the initial, one-cell nPartition created within a server complex by the service processor (MP or GSP) `CC` command. The Genesis Partition is just like any other nPartition except for how it is created and the fact that its creation wipes out any previous nPartition configuration data.

For a detailed procedure see “Creating a Genesis Partition” on page 263.

If your server complex has its nPartitions pre-configured by HP, you do not need to create a Genesis Partition.

NOTE For servers based on the HP sx1000 or sx2000 chipset, you can instead use nPartition tools running on a remote system to remotely create and configure new nPartitions (including the first nPartition in the complex).

See “Remote and Local Management of nPartitions” on page 62 for details.

You can use nPartition management tools running on the Genesis Partition as the method for configuring all nPartitions in the complex. The Genesis Partition always is partition number 0.

When it is first created, the Genesis Partition consists of one cell that is connected to an I/O chassis that has core I/O installed. The Genesis Partition also should have a bootable disk (or a disk onto which you can install an operating system).

If an operating system is not installed on any disks in the Genesis Partition, you can boot the Genesis partition to the system boot interface (either BCH or EFI) and from that point install an operating system. This installation requires either having access to an installation server, or to a CD drive (or DVD drive) attached to an I/O chassis belonging to the nPartition.

After you boot an operating system on the Genesis Partition, you can modify the nPartition to include additional cells. You also can create other, new nPartitions and can modify them from the Genesis Partition or from any other nPartition that has an operating system with the nPartition tools installed.

Basics of nPartition Modification

Modifying an nPartition involves using an nPartition administration tool to revise one or more parts of the server Complex Profile data, which determines how hardware is assigned to and used by nPartitions. The Complex Profile is discussed in “Complex Profile” on page 57.

For detailed procedures see the chapter “Creating and Configuring nPartitions” on page 253.

You can modify an nPartition either locally or remotely.

- For local administration, use nPartition Commands or Partition Manager from an nPartition in the same complex as the nPartition to be modified. Some nPartition details also can be modified locally from an nPartition console by using EFI Shell commands or BCH menu commands.
- For remote administration, use remote administration features of the Enhanced nPartition Commands or Partition Manager Version 2.0.

You can use either of two methods for remote administration: WBEM and IPMI over LAN.

- For remote administration using WBEM the tool remotely accesses an operating system running on an nPartition in the target complex.

Use the `-u... -h...` set of `parmodify` options or the Partition Manager **Switch Complexes** action and “remote nPartition” option.

- For remote administration using IPMI over LAN the tool remotely accesses the service processor of the target complex.

Use the `-g... -h...` set of `parmodify` options or the Partition Manager **Switch Complexes** action and “remote partitionable complex” option.

See “Remote and Local Management of nPartitions” on page 62 for details.

nPartition Modification Tasks

The following tasks are among the basic procedures for modifying nPartitions.

- Assigning and Unassigning Cells

To assign (add) or unassign (remove) cells from an nPartition use the `parmodify -p# -a#...` command to add a cell, or the `parmodify -p# -d#...` command to remove a cell from the specified nPartition (`-p#`, where `#` is the partition number). From Partition Manager select the nPartition, use the **nPartition → Modify nPartition** action, and select the **Add/Remove Cells** tab.

Also see “Assigning (Adding) Cells to an nPartition” on page 275 and see “Unassigning (Removing) Cells from an nPartition” on page 279.

- Removing an nPartition

To remove (delete) an nPartition use the `parremove -p#` command to remove a specified nPartition (`-p#`, where `#` is the partition number). From Partition Manager select the nPartition and use the **nPartition → Delete nPartition** action.

Also see “Removing (Deleting) an nPartition” on page 271.

- Renaming an nPartition

To rename an nPartition use the `parmodify -p# -P name` command to set the name for a specified nPartition (`-p#`, where `#` is the partition number). From Partition Manager select the nPartition, use the **nPartition → Modify nPartition** action, and select the **General** tab. On an HP 9000 server you also can use the BCH Configuration menu `PD NewName` command.

Also see “Renaming an nPartition” on page 283.

- Setting Cell Attributes

To set attributes for a cell use the `parmodify -p# -m#...` command to modify cell attributes for a specified nPartition (`-p#`, where `#` is the partition number).

From Partition Manager Version 1.0 select the nPartition, use the **Partition → Modify Partition** action, **Change Cell Attributes** tab, select the cell(s), and click **Modify Cell(s)**.

From Partition Manager Version 2.0 select the nPartition, use the **nPartition → Modify nPartition** action, and use the **Set Cell Options** tab (to set the use-on-next-boot value) and **Configure Memory** tab (to set the cell local memory value).

On an HP 9000 server you also can use the BCH Configuration menu `CELLCONFIG` command to set use-on-next-boot values. On an HP Integrity server you also can use the EFI Shell `cellconfig` command to set use-on-next-boot values.

Also see “Setting Cell Attributes” on page 287.

- Setting Core Cell Choices

To set core cell choices for an nPartition use the `parmodify -p# -r# -r#...` command to specify up to four core cell choices in priority order for a specified nPartition (`-p#`, where `#` is the partition number).

From Partition Manager Version 1.0 select the nPartition, use the **Partition → Modify Partition** action, **Core Cell Choices** tab.

From Partition Manager Version 2.0 select the nPartition, use the **nPartition → Modify nPartition** action, **Set Cell Options** tab, and use the **Core Cell Choice** column to set priorities.

On an HP 9000 server you can use the BCH Configuration menu `COC` command to set core cell choices. On an HP Integrity server you can use the EFI Shell `rootcell` command to set core cell choices.

Also see “Setting nPartition Core Cell Choices” on page 294.

- Setting nPartition Boot Paths

On HP Integrity servers boot paths can be listed and configured only from the local nPartition.

From HP-UX use the `setboot` command to configure the local nPartition boot paths, or use the `parmodify -p# -b... -s... -t...` command to set boot paths for a specified nPartition (`-p#`, where `#` is the partition number).

On an HP 9000 server you can use the BCH Main menu `PATH` command to configure boot paths. On an HP Integrity server you can use the EFI Shell `bcfg` command to configure boot paths.

Also see “Configuring Boot Paths and Options” on page 241.

For more details and summaries see Table 6-1, “nPartition Configuration Task Summaries,” on page 255.

Basics of nPartition Booting and Resetting

This section gives a brief overview of the boot process for cells and nPartitions and lists the main nPartition boot commands and tasks.

For more details see the chapter “Booting and Resetting nPartitions” on page 153.

Boot Process for Cells and nPartitions

The nPartition boot process, on both HP 9000 servers and HP Integrity servers, includes two phases: the cell boot phase and the nPartition boot phase.

1. Cell Boot Phase of the nPartition Boot Process

The cell boot phase occurs when cells are powered on or reset. The main activities that occur during the cell boot phase are power-on-self-test activities. During this phase each cell operates independently of all other cells in the complex. Cells do not necessarily proceed through this phase at the same pace, because each cell may have a different amount of hardware to test and discover, or cells might be reset or powered on at different times. The main steps that occur during the cell boot phase are:

- a. A cell is powered on or reset, and the cell boot-is-blocked (BIB) flag is set.
BIB is a hardware flag on the cell board. When BIB is set, the cell is considered to be inactive.
- b. Firmware on the cell performs self-tests and discovery operations on the cell hardware components. Operations at this point include processor self-tests, memory tests, I/O discovery, and discovery of interconnecting fabric (connections between the cell and other cells, I/O, and system crossbars).
- c. After the firmware completes cell self-tests and discovery, it reports the cell hardware configuration to the service processor (GSP or MP), informs the service processor it is “waiting at BIB”, and then waits for the cell BIB flag to be cleared.

2. nPartition Boot Phase of the nPartition Boot Process

The nPartition boot phase occurs when an nPartition is booted, after its cells have completed self tests. During this phase “nPartition rendezvous” occurs, however not all cells assigned to an nPartition are required to participate in rendezvous. A minimum of one core-capable cell that has completed its cell boot phase is required before the nPartition boot phase can begin. By default, all cells assigned to the nPartition that have a “y” use-on-next-boot value are expected to participate in rendezvous, and the service processor will wait for up to ten minutes for all such cells to reach the “waiting at BIB” state. Cells that have a “n” use-on-next-boot value do not participate in rendezvous and remain waiting at BIB. The main steps that occur during the nPartition boot phase are:

- a. The service processor provides a copy of the relevant Complex Profile data to the cells assigned to the nPartition.
This data includes a copy of the Stable Complex Configuration Data and a copy of the Partition Configuration Data for the nPartition. For details see “Complex Profile” on page 57.
- b. The service processor releases BIB for all cells assigned to the nPartition that have a “y” use-on-next-boot value and complete the cell boot phase in time.
The service processor does not release BIB for any cell with a “n” use-on-next-boot value, or for any cell that did not complete the cell boot phase within ten minutes of the first cell to do so.
Once BIB is release for a cell, the cell is considered to be active.
- c. nPartition rendezvous begins, with the system firmware on each active cell using its copy of complex profile data to contact other active cells in the nPartition.
- d. The active cells in the nPartition negotiate to select a core cell.

- e. The chosen core cell manages the rest of the nPartition boot process. A processor on the core cell runs the nPartition system boot environment (BCH on HP 9000 servers, EFI on HP Integrity servers). The core cell hands off control to an operating system loader when the OS boot process is initiated.

You can view progress during the cell and nPartition boot phases by observing the Virtual Front Panel for an nPartition, which is available from the service processor (MP or GSP) Main menu.

Common nPartition Boot Commands and Tasks

The following summary briefly describes the main nPartition boot commands and tasks. For more summaries and details see Table 5-1, “nPartition Boot and Reset Task Summaries,” on page 165.

- Service processor (MP or GSP) support for managing nPartition booting includes the following commands, which are available from the service processor Command menu.
 - RS — Reset an nPartition.
On HP Integrity servers you should reset an nPartition only after all self tests and partition rendezvous have completed.
 - RR — Reset and perform a shutdown for reconfig of an nPartition.
On HP Integrity servers you should reset an nPartition only after all self tests and partition rendezvous have completed.
 - BO — Boot the cells assigned to an nPartition past the “waiting at BIB” state and thus begin the nPartition boot phase.
 - TC — Perform a transfer of control reset of an nPartition.
 - PE — Power on or power off a cabinet, cell, or I/O chassis.
On HP Integrity rx8620 servers and HP Integrity rx7620 servers, nPartition power on and power off also is supported, to manage power of all cells and I/O chassis assigned to the nPartition using a single command.
- EFI Shell support for managing nPartition booting includes the following commands. (EFI is available only on HP Integrity servers.)
 - bcfg — List and configure the boot options list for the local nPartition.
 - autoboot — List, enable, or disable the nPartition autoboot configuration value.
 - acpiconfig — List and configure the nPartition ACPI configuration setting, which determines whether HP-UX, Windows, or Linux can boot on the nPartition.
The ACPI configuration setting must be set to `default` for HP-UX 11i v2 (B.11.23) or for HP OpenVMS I64 8.2-1 to boot. To boot Windows Server 2003, the ACPI configuration setting for the nPartition must be set to `windows`. To boot Red Hat Enterprise Linux 3 or SuSE Linux Enterprise Server 9, the ACPI configuration must be set to `single-pci-domain`.
 - `acpiconfig enable softpowerdown` — When set, causes nPartition hardware to be powered off when the operating system issues a shutdown for reconfig command. On HP rx7620, rx7640, rx8620, and rx8640 servers with a `windows` ACPI configuration setting, this is the default behavior. Available only on HP rx7620, rx7640, rx8620, and rx8640 servers.
 - `acpiconfig disable softpowerdown` — When set, causes nPartition cells to remain at BIB when the operating system issues a shutdown for reconfig command. In this case an OS shutdown for reconfig makes the nPartition inactive. On HP rx7620, rx7640, rx8620, and rx8640 servers this is the normal behavior for nPartitions with an ACPI configuration setting of `default` (to support HP-UX or HP OpenVMS I64) or `single-pci-domain` (to support Red Hat Enterprise Linux 3 or SuSE Linux

Enterprise Server 9). Available only on HP Integrity rx8620 servers and HP Integrity rx7620 servers.

- `reset` — Resets the local nPartition, resetting all cells and then proceeding with the nPartition boot phase.
- `reconfigreset` — Performs a shutdown for reconfig of the local nPartition, resetting all cells and then holding them at the “wait at BIB” state, making the nPartition inactive.
- BCH menu support for managing nPartition booting includes the following commands. (BCH is available only on HP 9000 servers.)
 - `BOOT` — Initiate an operating system boot from a specified boot device path or path variable.
 - `REBOOT` — Resets the local nPartition, resetting all cells and then proceeding with the nPartition boot phase.
 - `RECONFIGRESET` — Performs a shutdown for reconfig of the local nPartition, resetting all cells and then holding them at the “wait at BIB” state, making the nPartition inactive.
 - `PATH` — List and set boot device path variables (`PRI`, `HAA`, `ALT`).
 - Configuration menu, `PATHFLAGS` command — List and set the boot control flag for each boot path, effectively determining the nPartition autoboot behavior.
- HP-UX includes the following commands for shutting down and rebooting the nPartition.
 - `shutdown -r` — Shuts down HP-UX and resets the local nPartition, resetting cells and then proceeding with the nPartition boot phase.

On HP 9000 servers `shutdown -r` resets only the active cells.

On HP Integrity servers `shutdown -r` has the same effect as `shutdown -R`. All cells are reset and nPartition reconfiguration occurs as needed.
 - `shutdown -h` — On HP 9000 servers, shuts down HP-UX, halts all processing on the nPartition, and does not reset cells.

On HP Integrity servers, `shutdown -h` has the same effect as `shutdown -R -H` and results in a shutdown for reconfig.
 - `shutdown -R` — Shuts down HP-UX and performs a reboot for reconfig of the nPartition. All cells are reset and nPartition reconfiguration occurs as needed. The nPartition then proceeds with the nPartition boot phase.
 - `shutdown -R -H` — Shuts down HP-UX and performs a shutdown for reconfig of the nPartition. All cells are reset and nPartition reconfiguration occurs as needed. All cells then remain at a “wait at BIB” state and the nPartition is inactive.

On HP rx7620, rx7640, rx8620, and rx8640 servers with a default (to support HP-UX) ACPI configuration setting a “wait at BIB” state is the default behavior, but the `acpiconfig enable softpowerdown` EFI Shell command can be used to instead cause all nPartition hardware to power off.
- HP OpenVMS I64 8.2-1 includes the following commands for shutting down and rebooting the nPartition.
 - `@SYS$SYSTEM:SHUTDOWN.COM` — Shuts down the OpenVMS I64 operating system.

The `@SYS$SYSTEM:SHUTDOWN.COM` command provides a series of prompts that you use to establish the shutdown behavior, including the shutdown time and whether the system is rebooted after it is shut down.

 - To perform a reboot for reconfig from OpenVMS I64 running on an nPartition, issue `@SYS$SYSTEM:SHUTDOWN.COM` from OpenVMS, and then enter **yes** at the “Should an automatic

system reboot be performed” prompt

- To perform a shutdown for reconfig of an nPartition running OpenVMS I64: first issue @SYSS\$SYSTEM:SHUTDOWN.COM from OpenVMS and enter **No** at the “Should an automatic system reboot be performed” prompt, then access the MP and, from the MP Command Menu, issue the RR command and specify the nPartition that is to be shutdown for reconfig.
- RUN SYSS\$SYSTEM:OPCRASH — Causes OpenVMS to dump system memory and then halt at the P00>> prompt. To reset the nPartition following OPCRASH, access the nPartition console and press any key to reboot.
- Microsoft® Windows® includes the following commands for shutting down and rebooting the nPartition.
 - shutdown /r — Shuts down Windows and performs a reboot for reconfig of the nPartition. All cells are reset and nPartition reconfiguration occurs as needed. The nPartition then proceeds with the nPartition boot phase.
 - shutdown /s — Shuts down Windows and performs a shutdown for reconfig of the nPartition. The default behavior differs on HP Integrity Superdome servers and HP Integrity HP rx7620, rx7640, rx8620, and rx8640 servers.

On HP Integrity Superdome servers, shutdown /s causes all cells to be reset and nPartition reconfiguration to occur as needed. All cells then remain at a “wait at BIB” state and the nPartition is inactive

On HP Integrity HP rx7620, rx7640, rx8620, and rx8640 servers, the default behavior is for shutdown /s to cause nPartition hardware to be powered off. On HP rx7620, rx7640, rx8620, and rx8640 servers with a windows ACPI configuration setting, the the acpiconfig disable softpowerdown EFI Shell command can be used to instead cause all cells to instead remain at a “wait at BIB” state.
- Red Hat Enterprise Linux 3 and SuSE Linux Enterprise Server 9 include the following commands for shutting down and rebooting the nPartition.
 - shutdown -r *time* — Shuts down Linux and performs a reboot for reconfig of the nPartition. All cells are reset and nPartition reconfiguration occurs as needed. The nPartition then proceeds with the nPartition boot phase.

The required *time* argument specifies when the Linux shutdown is to occur.

You can specify *time* in the format *hh:mm*, in which *hh* is the hour (one or two digits) and *mm* is the minute of the hour (two digits); or in the format *+m*, in which *m* is the number of minutes delay until shutdown; or specify *now* to immediately shut down.
 - shutdown -h *time* — Shuts down Linux and performs a shutdown for reconfig of the nPartition. All cells are reset and nPartition reconfiguration occurs as needed. All cells then remain at a “wait at BIB” state and the nPartition is inactive.

The required *time* argument specifies when the Linux shutdown is to occur.

On HP rx7620, rx7640, rx8620, and rx8640 servers with an ACPI configuration setting of *single-pci-domain* (to support Red Hat Enterprise Linux 3 or SuSE Linux Enterprise Server 9), a “wait at BIB” state is the default OS shutdown for reconfig behavior, but the acpiconfig enable softpowerdown EFI Shell command can be used to instead cause all nPartition hardware to power off.

For details see the chapter “Booting and Resetting nPartitions” on page 153.

Complex Profile

The configurable aspects of a server complex are represented in a set of data called the “Complex Profile”, which determines how hardware is assigned to and used by nPartitions within a server.

The Complex Profile consists of three parts, or groups of data, which are described in detail in Table 1-5 on page 60:

- **Stable Complex Configuration Data** — This group contains complex-wide settings, including the complex name, serial number, the nPartition assignment for each cell, and other details that apply to the entire server complex.

The Complex Profile contains one Stable Complex Configuration Data entry.

- **Dynamic Complex Configuration Data** — Architecturally reserved data.
- **Partition Configuration Data** — This group contains individual nPartition settings, including the nPartition name, core cell choices, and other details that are specific to an nPartition.

The Complex Profile contains a Partition Configuration Data entry for each possible nPartition. (A server complex may have a maximum of sixteen nPartitions, globally numbered from 0–15.)

The master copy of all parts of the Complex Profile resides on the service processor (MP or GSP) for the complex. Each cell in the complex also has a copy of the Stable Complex Configuration Data and a copy of the Partition Configuration Data for the nPartition to which it is assigned.

The service processor (MP or GSP) in the server manages all Complex Profile data and keeps all copies of the data coherent using a locking mechanism, as described in the next sections.

Changing the Server Complex Profile

To modify the Complex Profile and thus change the server complex configuration, you use an administration tool such as Partition Manager or one of the nPartition commands. See “Administration Tools for nPartitions” on page 32 for details. You cannot directly edit the Complex Profile data for a server.

The service processor maintains a set of locks that are used to ensure that only one set of changes to the Complex Profile occurs at a time.

When you configure nPartitions, the administration tools you use revise the Complex Profile for the server in coordination with the service processor. The tools acquire and release locks as needed when modifying Complex Profile entries. You do not directly manage Complex Profile locks under normal circumstances, but you can force an entry to be unlocked if required.

How the Complex Profile is Updated

A server Complex Profile is updated when you use one of the nPartition administration tools (such as Partition Manager or commands) to create, modify, or delete an nPartition or modify complex-wide data.

The general process by which changes to the Complex Profile occur is as follows:

1. An administrator uses an nPartition administration tool to request that a specific configuration change occurs.

This is a request to create, modify, or delete an nPartition or modify complex-wide data such as the complex name.

2. The tool acquires a lock from the service processor (MP or GSP) for the Complex Profile entry that will be revised.

The lock ensures that no other changes to the Complex Profile entry will occur while the tool revises it.

If the entry already is locked, that Complex Profile entry cannot be updated and the request will fail and the tool exits with an error message.

3. The tool reads the Complex Profile entry whose lock it has acquired.
4. The tool revises the Complex Profile entry according to the administrator request.
5. The tool sends the revised Complex Profile entry back to the service processor along with the corresponding lock key.
6. The service processor then “pushes out” the new, revised Complex Profile entry by updating its copy and updating all cells that have a copy of the entry.

However, the service processor will not push out a revised Complex Profile entry that affects the nPartition assignment of an active cell. In this case the revised entry will remain pending until the cell becomes inactive, for example during a reboot for reconfig or shutdown for reconfig of the nPartition to which the cell is assigned.

7. After the service processor has pushed out the revised Complex Profile entry it clears the lock for the entry.

After the entry is unlocked then, as needed, another nPartition configuration task can lock and revise that portion of the Complex Profile.

A single administration task can revise multiple Complex Profile entries. For example, you can create a new nPartition and assign its name in a single action. In this case the tool you use must lock both the Stable Complex Configuration Data and the Partition Configuration Data entry for the new nPartition before revising the data according to the administration request.

Multiple nPartition configuration tasks can occur essentially concurrently if all tasks revise different Complex Profile entries (thus allowing each task to acquire a lock for the entry it revises).

Complex Profile Entry Locking and Unlocking

Each Complex Profile entry has its own lock which is used to restrict access to the entry. If necessary you can manually unlock Complex Profile entries, however in nearly all situations you instead should allow the administration tools to automatically acquire and release locks.

CAUTION You should generally avoid manually unlocking Complex Profile entries because doing so can result in the loss of configuration changes.

The locks for Complex Profile entries are managed as described here.

- For the Stable Complex Configuration Data entry, there are slight differences in the locking mechanisms on HP 9000 and HP Integrity servers.
 - On cell-based HP 9000 servers, the Stable Complex Configuration Data has a single lock.
 - On cell-based HP Integrity servers, the Stable Complex Configuration Data has two separate locks: a “read lock” for restricting read access to the current Stable Complex Configuration Data entry, and a “write lock” for restricting access to a modifiable copy of the Stable Complex Configuration Data.
- On both HP 9000 and HP Integrity cell-based servers there is one lock for each Partition Configuration Data entry (each nPartition has its own Partition Configuration Data entry).

The `parunlock` command and the service processor `RL` command enable you to manually unlock Complex Profile entries.

It can be necessary to manually unlock a Complex Profile entry in the situation where an nPartition configuration tool such as Partition Manager has prematurely exited. If such a tool exits before it sends revised Complex Profile entries and corresponding lock keys back to the service processor, the entries that the tool locked will remain locked indefinitely (until they are manually unlocked).

Manually Unlocking a Complex Profile Entry

You can manually unlock Complex Profile entries after an nPartition configuration tool has exited before unlocking the entries it had locked. In this situation an attempt to modify the nPartition or complex-wide setting will fail because the Complex Profile entries still are locked. If you are certain no authorized users are changing configurations, use the `parunlock` command or the service processor `RL` command to unlock the entries. After they are unlocked you can perform the modifications you had previously attempted. For details see “Unlocking Complex Profile Entries” on page 298.

Aborting a Complex Profile Change

A pending update of the Complex Profile can be canceled or prevented by clearing the lock for a Complex Profile entry before the service processor has pushed out the revised data for the entry. This occurs, for example, when you have issued a request to change the nPartition assignment of an active cell and then manually unlock the effected Complex Profile entries before performing a reboot for reconfig of the nPartition to which the cell is assigned. For details see “Canceling Pending Changes to the Complex Profile” on page 301.

Complex Profile Group Details

Table 1-5 on page 60 lists details of the three groups of data that comprise the Complex Profile.

NOTE	<p>The Complex Profiles on cell-based HP 9000 servers and cell-based HP Integrity servers contain slightly different sets of information.</p> <p>Table 1-5 on page 60 covers both types of Complex Profiles.</p> <p>The Complex Profile on cell-based HP Integrity servers includes all HP 9000 server Complex Profile data and additional components that are specific to HP Integrity servers. Some HP 9000 server Complex Profile data is unused on HP Integrity servers but is included for compatibility.</p>
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Table 1-5 **Complex Profile Group Details**

Complex Profile Group	Description and Contents
<p>Stable Complex Configuration Data</p> <p>Complex-wide information.</p>	<p>The Stable Complex Configuration Data contains complex-wide configuration details, some of which may be set by administrators.</p> <p>Although the Stable Complex Configuration Data applies to the whole complex, the cell assignments and cell local memory (CLM) per cell components are comprised of data that affect the individual cells.</p> <p>A copy of the Stable Complex Configuration Data resides on the service processor (MP or GSP) and on every cell in the complex.</p> <p>The system boot interfaces (the BCH and EFI environments) do not have methods for changing Stable Complex Configuration Data. Instead, use the service processor command menu or nPartition management tools.</p> <p>The Stable Complex Configuration Data includes these components:</p> <ul style="list-style-type: none"> • Model String — Only applies to HP 9000 servers. PA-RISC model. • Complex System Name — User-chosen name for the complex. • Original Product Number — Set by HP manufacturing. • Current Product Number — Originally set by HP manufacturing. • Creator Serial Number — Set by HP manufacturing. • Cell Assignments — User-configurable nPartition assignments for all cells in the complex; also specifies each cell type (e.g. base). • Cell Local Memory (CLM) Per Cell — Only on servers based on the HP sx1000 or sx2000 chipset. User-configurable setting for each cell that determines the amount of cell local memory. The operating system on an nPartition with CLM configured must also support CLM for the cell local memory to be accessible to the operating system. • nPartition Configuration Privilege — Only on servers based on the HP sx1000 or sx2000 chipset. Either unrestricted or restricted. A restricted privilege means complex changes are possible only through the service processor LAN interface, which prompts for the IPMI password.

Table 1-5 Complex Profile Group Details (Continued)

Complex Profile Group	Description and Contents
<p>Dynamic Complex Configuration Data</p> <p>Architecturally reserved information.</p>	<p>The Dynamic Complex Configuration Data is architecturally reserved information that applies to the entire server complex.</p> <p>A copy of the Dynamic Complex Configuration Data resides on the service processor (MP or GSP) and on every cell in the complex. A reboot is not required for Dynamic Complex Configuration Data changes to take effect.</p> <p>The system boot interfaces (the BCH and EFI environments) do not have methods for changing Dynamic Complex Configuration Data. Users and administrators do not directly configure this data.</p>
<p>Partition Configuration Data</p> <p>nPartition- specific information (each nPartition has its own data).</p>	<p>The Partition Configuration Data contains configuration details specific to each nPartition in the complex. Each nPartition has its own Partition Configuration Data entry, which may be modified by administrators.</p> <p>The service processor (MP or GSP) has a copy of the Partition Configuration Data for every nPartition. Each cell has a copy of the Partition Configuration Data entry for the nPartition to which it is assigned.</p> <p>Partition Configuration Data includes this data for each nPartition:</p> <ul style="list-style-type: none"> • HP 9000 server components (unused on HP Integrity servers) — These components apply only on HP 9000 servers, but are present on HP Integrity servers for compatibility: Primary Boot Path, HA Alternate Boot Path, Alternate Boot Path, Console Path, Keyboard Path, Boot Timer, Known Good Memory Requirement, Autostart and Restart Flags, and CPU Flags (e.g. Data Prefetch setting). • Cell use-on-next-boot values — Specifies whether the cell is to be an active or inactive member of the nPartition to which it is assigned. • Core Cell Choices — Up to four cells preferred to be the core cell. • Partition Number — The partition number; not user-configurable. • Profile Architecture — Specifies whether the current Partition Configuration Data applies to the HP 9000 server architecture or HP Integrity server architecture; not user-configurable. • nPartition Name — The nPartition name, used in various displays. • Cell Failure Usage — Specifies how each cell in the nPartition is handled when a processor or memory component fails self-tests. Only activating the cell to integrate it into the nPartition is supported (the <code>ri</code> failure usage option, as specified by the <code>parcreate</code> and <code>parmodify</code> commands). • IP Address — If set, should be consistent with the IP address assigned to the nPartition when HP-UX is booted. Not actually used for network configuration, but for information only.

Remote and Local Management of nPartitions

You can remotely manage cell-based servers using either the Enhanced nPartition Commands or Partition Manager Version 2.0.

The Enhanced nPartition Commands and Partition Manager Version 2.0 also can run on an nPartition and manage that nPartition and the complex to which it belongs.

The ability to remotely manage a server based on the HP sx1000 chipset or HP sx2000 chipset is enabled by two technologies: the Web-Based Enterprise Management infrastructure (WBEM) and the Intelligent Platform Management Interface (IPMI). A brief overview of these technologies is provided first, then explanations of how to use the tools to locally and remotely manage cell-based servers are provided.

Intelligent Platform Management Interface (IPMI)

The nPartition management tools perform their functions by sending requests to the service processor. These requests are either to get information about the server or to affect changes to the server.

On the first generation of cell-based servers (the HP 9000 Superdome SD16000, SD32000, and SD64000 models; rp7405/rp7410; and rp8400 servers) a proprietary interface to the service processor was implemented. This interface relied on system firmware to convey information between HP-UX and the service processor. This in turn required that the nPartition management tools run on an nPartition in the complex being managed.

The service processor in all sx1000-based or sx2000-based servers supports the Intelligent Platform Management Interface (IPMI) as a replacement for the proprietary interface mentioned above. IPMI is an industry-standard interface for managing hardware. IPMI also supports value-added capabilities, such as HP's nPartition and complex management features.

The service processor in all sx1000-based or sx2000-based servers supports two of the communication paths defined by the IPMI standard: the Block Transfer path and IPMI over LAN. Some background details about each of these communication paths is provided in the next sections. How and when these paths are used is covered in the explanations of the local and remote management scenarios that follow.

IPMI Block Transfer (IPMI BT)

The IPMI Block Transfer (IPMI BT) path uses a driver [`/dev/ipmi` for HP-UX 11i v2 (B.11.23)] and a hardware buffer on each cell to provide communication between the operating system and the service processor. Thus, each nPartition running HP-UX 11i v2 (B.11.23) in an sx1000-based or sx2000-based server has its own private path to the service processor; the block transfer hardware on the core cell in each nPartition is used. The service processor always reliably knows which nPartition a request comes from.

NOTE The IPMI BT path currently is supported only for nPartitions running the Enhanced nPartition Commands. To use the IPMI BT interface, you must locally or remotely access the operating system running in the target complex. For details see “Remote Management Using WBEM” on page 65.

In many respects from an administrator's perspective the IPMI BT interface behaves like the proprietary interface used in the first-generation cell-based servers. For example, a user with superuser capabilities on an nPartition can manage the entire complex, including making changes to both the local nPartition and other nPartitions in the complex.

nPartition Configuration Privilege Because it is not always desirable to allow a user on one nPartition to

make changes that affect other nPartitions, HP provides the nPartition Configuration Privilege on sx1000-based or sx2000-based servers.

You can control the nPartition Configuration Privilege by using the `PARPERM` command at the service processor Command menu.

The nPartition Configuration Privilege has two settings:

- Unrestricted — The default setting, which allows the behavior described above.
- Restricted — Restricts use of the IPMI BT interface to the following capabilities:
 - Retrieving information about the server. Everything that is normally displayed by Partition Manager and the `parstatus` command is still available.
 - Making changes to the local nPartition's Partition Configuration Data. (Details on local versus remote nPartitions is provided later.)
 - Manipulating any of the attention indicators (LEDs).
 - Powering on/off cells and I/O chassis that belong to the local nPartition.

Restricting the nPartition Configuration Privilege does not restrict deallocation of processors across nPartition boundaries.

By restricting the nPartition Configuration Privilege, you limit someone with superuser privileges on an nPartition to doing things that affect only that nPartition. However, when the nPartition Configuration Privilege is restricted certain changes can only be made by using the nPartition management tools in the mode that utilizes IPMI over LAN.

IPMI over LAN

IPMI requests can be sent to the service processor's LAN port, thus eliminating the need to involve any of the nPartitions in the server.

IPMI LAN access to a service processor may be enabled or disabled by the SA command at the service processor Command menu.

The service processor will accept IPMI requests over its LAN port only if the request is accompanied by the correct password. To set the IPMI password use the SO command at the service processor Command menu.

Communication using IPMI over LAN is authenticated using the challenge and response protocol defined by the IPMI specification. The MD5 message digest algorithm (RFC1321) is used to encrypt the IPMI password and to ensure authentication of both the server and the client. All IPMI messages are authenticated in the manner described above. In addition, appropriate methods are implemented to protect against replay attacks.

The use of IPMI over LAN is not affected by setting the nPartition Configuration Privilege to restricted. When the IPMI BT interfaces are restricted certain changes to a complex can only be made by using the nPartition management tools in the mode that utilizes IPMI over LAN.

The following list describes all the actions that can be performed using IPMI over LAN.

- Retrieving information about the server.
- Changing the Stable Complex Configuration Data, including cell local memory settings and all cell assignments (that is: creating an nPartition, assigning cells to an nPartition, unassigning cells from an nPartition, and removing an nPartition).
- Powering on/off all cells and I/O chassis in the server, including unassigned resources.
- Manipulating any of the attention indicators (LEDs).

Web-Based Enterprise Management (WBEM)

The Enhanced nPartition Commands and Partition Manager Version 2.0 are implemented as WBEM client applications.

The Enhanced nPartition Commands toolset for HP-UX and Linux also includes a WBEM agent known as the nPartition Provider.

The Windows operating system includes the Windows Management Instrumentation (WMI) software, which is the Microsoft implementation of WBEM. To support the Windows release of the Enhanced nPartition Commands, HP also provides the WMI Mapper and the WMI nPartition Provider software components for the Windows system. The WMI-based nPartition tools components for Windows provides a WBEM-compliant solution.

All communication with the service processor, whether by way of the IPMI BT path [for example, using `/dev/ipmi` on HP-UX 11i v2 (B.11.23)] or by IPMI over LAN, is done by the nPartition Provider. The nPartition Provider responds to requests sent to it by the nPartition commands and Partition Manager.

Partition Manager uses the nPartition commands to make changes to a cell-based server. Partition Manager Version 2.0 only uses WBEM directly when retrieving information about a server.

The power of WBEM is that it enables a distributed architecture. The applications (the nPartition management tools) can be running on one system and can use the WBEM infrastructure to send requests to other systems. See “Remote Management Using WBEM” on page 65 for more details.

Local Management

As previously mentioned, the Enhanced nPartition Commands and Partition Manager Version 2.0 can run on an nPartition to manage that nPartition and the complex that it belongs to. This is the default behavior of the tools when run on an nPartition.

In this scenario, the nPartition management tools send WBEM requests to the nPartition Provider running on the local nPartition (that is, the same nPartition where the tools are being run). The nPartition Provider uses `/dev/ipmi` to send requests to the service processor in the local complex.

If the nPartition Configuration Privilege is unrestricted, then the server can be managed from any nPartition and making changes to other nPartitions in the complex is supported. However, if the privilege is set to restricted then certain operations are supported only when using the tools in the mode that uses IPMI over LAN (see “Remote Management Using IPMI over LAN” on page 68).

Local management is the only form of management supported by the older nPartition tools (the Original nPartition Commands and Partition Manager Version 1.0). Also, because the nPartition Configuration Privilege is a feature of the sx1000-based and sx2000-based servers it affects the older nPartition tools when used on nPartitions in an sx1000-based or sx2000-based server, but not when used on nPartitions in the first-generation cell-based servers.

Remote Management Using WBEM

WBEM enables one form of remote management of an nPartition complex: using nPartition management tools (WBEM client applications) that are running on one system to communicate with the nPartition Provider (a WBEM agent) running on an nPartition in the complex to be managed.

When performing remote management using WBEM the following terminology is used:

- The complex being managed is referred to as a “remote complex” because it is remote with respect to the system where the tools are being run.
- The remote complex is also the “target complex” as it is the complex that will be affected by any changes

requested by the tools.

- The nPartition that the tools communicate with (using WBEM) is referred to as a “remote nPartition” because it is remote with respect to the system where the tools are being run.
- If the tools are used to retrieve information about or to make a change to a specific nPartition in the target complex, then that nPartition is the “target nPartition”. The target nPartition and the remote nPartition might be the same, but don’t have to be the same nPartition.

For example, the `parmodify` command could be used in a way where it sends requests to an nPartition in the target complex but the `-p` option identifies a different nPartition to be modified.

The following sections explain how to use the Enhanced nPartition Commands and Partition Manager Version 2.0 to remotely manage an nPartition complex using WBEM. The system where the tools are used could be an nPartition or other system, but where the tools are run is irrelevant when performing remote management of an nPartition complex.

NOTE Remote management using WBEM relies on an nPartition in the target complex being booted to multi-user mode. The remote nPartition must be configured to accept remote WBEM requests.

Remote management using WBEM also requires that the Trust Certificate Store file on the local system contains a copy of the server certificate data from the SSL Certificate file on the system being managed. See “WBEM Remote Management Files” on page 66.

WBEM Remote Management Files

WBEM systems provide secure remote management using the following files as part of the SSL authentication process. Both files reside on all WBEM-enabled systems.

- **server.pem — WBEM SSL Certificate file**

The SSL Certificate file resides on the system that is being managed and contains the local server’s PRIVATE KEY and CERTIFICATE data.

On HP-UX B.11.23 systems, the SSL Certificate file is the `/var/opt/wbem/server.pem` file.

On a Windows system, the SSL Certificate file is in the location specified by the `%PEGASUS_HOME%\cimserver_current.conf` file; in this file the `sslCertificateFilePath` entry specifies the SSL Certificate file location.

- **client.pem — WBEM Trust Certificate Store file**

The Trust Certificate Store file resides on the system from which WBEM remote management commands are issued.

On HP-UX B.11.23 systems, the Trust Certificate Store file is the `/var/opt/wbem/client.pem` file.

On a Windows system, the Trust Certificate Store file is the `%HP_SSL_SHARE%\client.pem` file, where `%HP_SSL_SHARE%` specifies the directory where the file resides.

To remotely manage a server, the Trust Certificate Store file (`client.pem`) on the local system must contain a copy of the CERTIFICATE data from the SSL Certificate file (`server.pem`) on the remote server. The CERTIFICATE data includes all text starting with the “-----BEGIN CERTIFICATE-----” line through the “-----END CERTIFICATE-----” line.

By default the Trust Certificate Store file contains a copy of the CERTIFICATE data from the SSL Certificate data for the local system.

nPartition Commands Support for Remote Management Using WBEM

Two options supported by the Enhanced nPartition Commands result in remote management using WBEM. These options are:

- `-u username:[password]`

The `-u` option specifies a valid username on the remote nPartition.

For the `parstatus` and `fruled` commands any user defined on the remote nPartition can be used, but the other commands require the username to be a user with superuser privileges on the remote nPartition.

- `-h hostname | IPaddress`

The `-h` option specifies either the hostname or IP address of the remote nPartition.

When you use the `-u . . . -h . . .` set of options, the specified command sends the appropriate WBEM requests to the remote nPartition where the requests are handled by the nPartition Provider using `/dev/ipmi` to communicate with the service processor in the target complex.

Partition Manager Support for Remote Management Using WBEM

Partition Manager Version 2.0 supports remote management using WBEM in either of two ways.

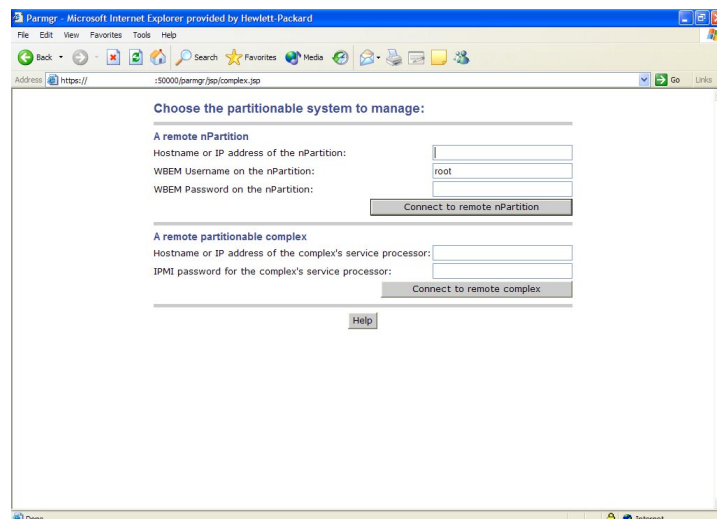
- Run Partition Manager Version 2.0 on an nPartition and then select the **Switch Complexes** task from the **Tools** menu. In the resulting dialog enter the hostname or IP address of the remote nPartition, and supply a username and that user's password.

If you will use Partition Manager only to display information about the target complex, then you can specify any user defined on the remote nPartition.

However, if you will use Partition Manager to make changes to the target complex then you must specify a user with superuser privileges on the remote nPartition.

- Run Partition Manager Version 2.0 on a system that is not an nPartition, and Partition Manager will immediately display the **Switch Complexes** dialog.

Figure 1-1 Partition Manager Version 2.0 Switch Complexes Dialog



Remote Management Using IPMI over LAN

IPMI over LAN enables the second form of remote management of an nPartition complex: using nPartition management tools that are running on a system to communicate directly (without going through an nPartition) with the service processor in the complex to be managed.

When performing remote management using IPMI over LAN the following terminology is used:

- The complex being managed is referred to as a “remote complex” because it is remote with respect to the system where the tools are being run.
- The remote complex is also the “target complex” as it is the complex that will be affected by any changes requested by the tools.
- If the tools are used to retrieve information about or to make a change to a specific nPartition in the target complex, then that nPartition is the “target nPartition”.

Note that there is no concept of a “remote nPartition” in this scenario.

The following sections explain how to use the nPartition commands and Partition Manager to remotely manage an nPartition complex using IPMI over LAN.

The system where the tools are used could be an nPartition or other system, but where the tools are run is irrelevant when performing remote management of an nPartition complex.

nPartition Commands Support for Remote Management Using IPMI over LAN

Two options of the Enhanced nPartition Commands result in remote management using IPMI over LAN. These options are:

- `-g [password]`

The *password* is the service processor’s IPMI password.

- `-h hostname | IPaddress`

The `-h` option specifies the hostname or IP address of the service processor in the target complex.

When you use the `-g . . . -h . . .` set of options, the specified command sends the appropriate WBEM requests to the local nPartition Provider, which in turn uses IPMI over LAN to communicate with the service processor in the target complex.

Partition Manager Support for Remote Management Using IPMI over LAN

Partition Manager Version 2.0 can be used in this mode in either of two ways:

- Run Partition Manager on an nPartition and then select the **Switch Complexes** task from the **Tools** menu. In the resulting dialog enter the hostname or IP address of the service processor in the target complex, and supply that service processor’s IPMI password.
- Run Partition Manager on a system that is not an nPartition. In this situation Partition Manager immediately displays the **Switch Complexes** dialog.

Licensing Information: Getting Server Product Details

When you license a software product to run on an HP system, you may need to provide machine or system details to the software vendor as part of the software registration process.

This section describes how to obtain information you may need when licensing non-HP software to run on a cell-based HP server.

For complete information about software product licensing, refer to the company that manufactures or sells the software you plan to use.

- **Unique Machine (Complex) Identifier**

```
/usr/bin/getconf _CS_MACHINE_IDENT
```

- **Unique nPartition Identifier**

```
/usr/bin/getconf _CS_PARTITION_IDENT
```

- **Unique Virtual Partition Identifier**

```
/usr/bin/getconf _CS_PARTITION_IDENT
```

- **Machine (Complex) Serial Number**

```
/usr/bin/getconf _CS_MACHINE_SERIAL  
and  
/usr/sbin/parstatus -X
```

- **Server (Complex) Product Number**

```
/usr/sbin/parstatus -X
```

- **Machine (Complex) Hardware Model**

```
/usr/bin/getconf MACHINE_MODEL  
and  
/usr/bin/model
```

- **HP-UX Version and Installed Bundles**

```
For the HP-UX version: /usr/bin/uname -r  
For all bundles installed: /usr/sbin/swlist -l bundle
```

nPartition and Virtual Partition Unique Identifiers

NOTE Use the `getconf` command or the `confstr()` call to obtain unique identifiers. Do not use the `uname -i` command, which does not report unique IDs for nPartition systems.

In order to guarantee compatibility on current and future platforms, use the interfaces to `getconf` (1) and `confstr` (3C) to retrieve unique machine identifiers.

The interfaces include the `_CS_PARTITION_IDENT` and `_CS_MACHINE_IDENT` parameters:

- For a nPartition-specific or a virtual partition-specific unique ID use this command:

```
/usr/bin/getconf _CS_PARTITION_IDENT
```

The unique partition identifier value for a virtual partition environment has virtual partition-specific data added that does not appear for an equivalent non-vPars environment. See the examples that follow.

- For a complex-specific unique ID use this command:

```
/usr/bin/getconf _CS_MACHINE_IDENT
```

On cell-based HP PA-RISC servers, the complex, nPartition, and virtual partition unique IDs are based in part on the machine serial number.

To retrieve the machine serial through these interfaces, specify the `_CS_MACHINE_SERIAL` parameter to them.

Refer to the *confstr* (3C) manpage for details on these parameters and their use.

Example 1-1 Unique IDs for an nPartition and Complex

The following examples show nPartition-unique and complex-unique IDs returned by the `getconf` command, as well as the local nPartition number and machine serial number.

```
# parstatus -w
The local partition number is 1.
# /usr/bin/getconf _CS_PARTITION_IDENT
Z3e02955673f9f7c9_P1
# /usr/bin/getconf _CS_MACHINE_IDENT
Z3e02955673f9f7c9
# /usr/bin/getconf _CS_MACHINE_SERIAL
USR2024FP1
#
```

Example 1-2 Unique IDs for Virtual Partitions (vPars)

The following example shows the virtual partition-unique ID returned by the `getconf` command, as well as the local nPartition number and the current virtual partition name.

```
# parstatus -w
The local partition number is 0.
# vparstatus -w
The current virtual partition is Shad.
# getconf _CS_PARTITION_IDENT
Z3e0ec8e078cd3c7b_P0_V00
#
```

For details on virtual partitions, refer to the book *Installing and Managing HP-UX Virtual Partitions (vPars)*.

2 nPartition Server Hardware Overview

This chapter describes the cell-based HP server models, including system capacities, model strings, and hardware paths. Differences among the cell-based server models also are covered in this chapter.

Both HP 9000 servers and HP Integrity servers are discussed here.

- The HP 9000 series of servers has HP PA-RISC processors.

The cell-based HP 9000 servers include three generations of servers: the first-generation models, models based on the HP sx1000 chipset, and models based on the HP sx2000 chipset.

- The HP Integrity series of servers has Intel® Itanium® 2 processors.

The cell-based HP Integrity servers either are based on the HP sx1000 chipset or are based on the HP sx2000 chipset.

The “Hardware, Slot, and Device Paths” on page 91 section discusses the notations used to describe hardware components within nPartitions.

sx1000 Chipset for HP Servers

The second generation of cell-based servers is built around the HP sx1000 chipset. The sx1000 chipset supports both single-core and dual-core processors, including both HP PA-RISC and Intel® Itanium® 2 processors.

The following servers use the HP sx1000 chipset:

- PA-RISC servers — HP rp7420, HP rp8420, HP 9000 Superdome (SD16A, SD32A, and SD64A models).
- Itanium® 2-based servers — HP rx7620, HP rx7620-16, HP rx8620, HP rx8620-32, HP Integrity Superdome (SD16A, SD32A, SD64A models).

The HP sx1000 chipset provides a scalable server architecture with high-bandwidth processor, memory, and I/O busses. The HP sx1000 chipset includes interconnecting components such as memory buffers, I/O bus adapters and host bridges, and cell controllers, which have built-in low-level error correction.

One notable administration feature of HP servers built around the HP sx1000 chipset is management processor (MP) support for access to the server using IPMI over LAN. For details see “Remote and Local Management of nPartitions” on page 62.

sx2000 Chipset for HP Servers

The third generation of cell-based HP servers is built around the HP sx2000 chipset.

The following servers use the HP sx2000 chipset: HP rx7640, HP rx8640, HP Integrity Superdome (SD16B, SD32B, SD64B models).

The HP sx2000 chipset provides a scalable server architecture with high-bandwidth processor, memory, and I/O busses. The HP sx2000 chipset includes new cell boards with core I/O, new system and I/O backplanes, new interconnecting components, and the addition of a redundant clock source that is hot-swappable.

The HP sx2000 chipset also supports global shared memory (GSM). For details, refer to “Global Shared Memory” on page 42.

HP servers built around the HP sx2000 chipset include management processor (MP) support for access to the server using IPMI over LAN. For details see “Remote and Local Management of nPartitions” on page 62.

Model Identifiers for Machine Hardware

The machine hardware model identifies the server hardware type.

A summary of the supported cell-based servers and their corresponding model identifiers appears in “Server Hardware Details: Cell-Based HP Servers” on page 75.

You can report the machine hardware model for the local server complex using the following methods:

- From HP-UX 11i use either the `/usr/bin/model` command or the `/usr/bin/getconf MACHINE_MODEL` command.
- From the Windows command line, use the `systeminfo` command to report system details including the system model.

Different methods are used to establish the machine hardware model on HP 9000 servers and HP Integrity servers.

- For HP 9000 servers, the reported machine hardware model is the Model String component of the Stable Complex Configuration Data.
- For HP Integrity servers, the machine hardware model is based on the Creator Manufacturer and Creator Product Name complex-wide settings.

On OEM versions of cell-based HP Integrity servers, the OEM Manufacturer and OEM Product Name are the machine hardware model, if they are set.

See “Complex Profile” on page 57 for details on the Model String and Creator complex-wide settings.

Server Hardware Details: Cell-Based HP Servers

Table 2-1 on page 76 lists the cell-based HP servers. For individual server details see the sections that follow. Figure 2-1 shows cell-based server cabinets.

Figure 2-1 Cell-Based Server Models

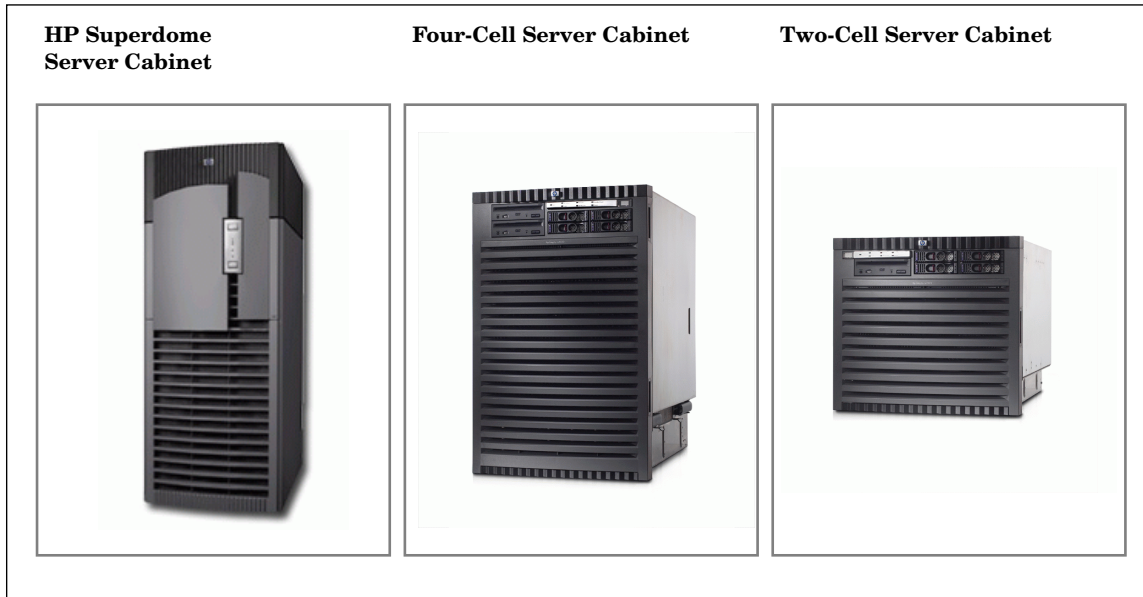


Table 2-1 **Models of Cell-Based HP Servers**

Cell Capacity	Server Model(s)	Description
Two-Cell Servers See “Two-Cell nPartition Server Model” on page 80.	HP 9000 rp7405/7410 server	Up to eight PA-RISC processors. Runs HP-UX B.11.11. Also runs the HP-UX B.11.23 September 2004 release and later. model string: 9000/800/rp7410
	HP 9000 rp7420 server	Up to eight dual-core PA-RISC processors (16 CPUs total). Uses the HP sx1000 chipset. Runs HP-UX B.11.11. Also runs the HP-UX B.11.23 September 2004 release and later. model string: 9000/800/rp7420
	HP Integrity rx7620 server	Up to eight Intel® Itanium® 2 processors. Uses the HP sx1000 chipset. Runs HP-UX B.11.23, HP OpenVMS 8.2-1, Microsoft® Windows® Server 2003, Red Hat Enterprise Linux 3, and SuSE Linux Enterprise Server 9. model command output: ia64 hp rx7620 server
	HP Integrity rx7620-8 server	Up to eight HP mx2 dual-processor modules with Intel® Itanium® 2 processors (16 CPUs total). Uses the HP sx1000 chipset. Runs HP-UX B.11.23 and Microsoft® Windows® Server 2003. model command output: ia64 hp rx7620 server
	HP Integrity rx7640	Up to eight Intel® Itanium® 2 processors. Uses the HP sx2000 chipset. Runs HP-UX B.11.23 and Microsoft® Windows® Server 2003. model command output: ia64 hp rx7640 server

Table 2-1 Models of Cell-Based HP Servers (Continued)

Cell Capacity	Server Model(s)	Description
Four-Cell Servers See “Four-Cell nPartition Server Model” on page 82.	HP 9000 rp8400 server	Up to 16 PA-RISC processors. Runs HP-UX B.11.11. Also runs the HP-UX B.11.23 September 2004 release and later. model string: 9000/800/S16K-A
	HP 9000 rp8420 server	Up to 16 dual-core PA-RISC processors (32 CPUs total). Uses the HP sx1000 chipset. Runs HP-UX B.11.11. Also runs the HP-UX B.11.23 September 2004 release and later. model string: 9000/800/rp8420
	HP Integrity rx8620 server	Up to 16 Intel® Itanium® 2 processors. Uses the HP sx1000 chipset. Runs HP-UX B.11.23, HP OpenVMS 8.2-1, Microsoft® Windows® Server 2003, Red Hat Enterprise Linux 3, and SuSE Linux Enterprise Server 9. model command output: ia64 hp rx8620 server
	HP Integrity rx8620-32 server	Up to 16 HP mx2 dual-processor modules with Intel® Itanium® 2 processors (32 CPUs total). Uses the HP sx1000 chipset. Runs HP-UX B.11.23 and Microsoft® Windows® Server 2003. model command output: ia64 hp rx8620 server
	HP Integrity rx8640	Up to 16 Intel® Itanium® 2 processors. Uses the HP sx2000 chipset. Runs HP-UX B.11.23 and Microsoft® Windows® Server 2003. model command output: ia64 hp rx8640 server

Table 2-1 Models of Cell-Based HP Servers (Continued)

Cell Capacity	Server Model(s)	Description
<p>HP 9000 Superdome Servers See “Superdome Server Models” on page 84.</p>	<p>HP 9000 Superdome SD16000, SD32000, SD64000 servers</p>	<p>Up to 64 PA-RISC processors. Runs HP-UX B.11.11. Also runs the HP-UX B.11.23 September 2004 release and later.</p> <ul style="list-style-type: none"> • HP 9000 Superdome 16-way server model string: 9000/800/SD16000 • HP 9000 Superdome 32-way server model string: 9000/800/SD32000 • HP 9000 Superdome 64-way server model string: 9000/800/SD64000
	<p>HP 9000 Superdome SD16A, SD32A, SD64A servers</p>	<p>Up to 64 dual-core PA-RISC processors (128 CPUs total). Uses the HP sx1000 chipset. Runs HP-UX B.11.11. Also runs the HP-UX B.11.23 September 2004 release and later.</p> <ul style="list-style-type: none"> • HP 9000 Superdome 16-way server model string: 9000/800/SD16A • HP 9000 Superdome 32-way server model string: 9000/800/SD32A • HP 9000 Superdome 64-way server model string: 9000/800/SD64A

Table 2-1 Models of Cell-Based HP Servers (Continued)

Cell Capacity	Server Model(s)	Description
<p>HP Integrity Superdome Servers</p> <p>See “Superdome Server Models” on page 84.</p>	<p>HP Integrity Superdome SD16A, SD32A, SD64A servers</p> <p>HP Integrity Superdome SD16B, SD32B, SD64B servers</p>	<p>Up to 64 processor sockets, four per cell, with each cell having either single Intel® Itanium® 2 processors or HP mx2 dual-processor modules with Itanium 2 processors. (Up to 128 CPUs total when using HP mx2 modules.)</p> <p>Runs HP-UX B.11.23 and Microsoft® Windows® Server 2003. nPartitions with single Itanium 2 processors also can run HP OpenVMS 8.2-1, Red Hat Enterprise Linux 3, and SuSE Linux Enterprise Server 9.</p> <p>These models use the HP sx1000 chipset:</p> <ul style="list-style-type: none"> • HP Integrity Superdome 16-way server model command output: ia64 hp superdome server SD16A • HP Integrity Superdome 32-way server model command output: ia64 hp superdome server SD32A • HP Integrity Superdome 64-way server model command output: ia64 hp superdome server SD64A <p>These models use the HP sx2000 chipset:</p> <ul style="list-style-type: none"> • HP Integrity Superdome 16-way server model command output: ia64 hp superdome server SD16B • HP Integrity Superdome 32-way server model command output: ia64 hp superdome server SD32B • HP Integrity Superdome 64-way server model command output: ia64 hp superdome server SD64B

Two-Cell *nPartition* Server Model

The following cell-based HP servers scale from one to two cells:

- The HP rp7405/rp7410 server has single-core HP PA-RISC processors.
The model string is: 9000/800/rp7410.
- The HP rp7420 server has dual-core HP PA-RISC processors: PA-8800 processors, which provide two CPUs per processor socket.
The model string is: 9000/800/rp7420.
- The HP rx7620 server has Intel® Itanium® 2 processors, either single-processor modules or HP mx2 dual-processor modules.
Both HP mx2 dual-processor modules and single Itanium 2 processors can exist in the same complex, but they cannot be mixed in the same *nPartition*.
The model command output is: ia64 hp rx7620 server.
- The HP rx7640 server has Intel® Itanium® 2 processors.
The model command output is: ia64 hp rx7640 server.

Figure 2-2 on page 81 shows an overview of the two-cell HP server hardware architecture.

On the two-cell HP servers you can configure a single *nPartition* using one or both cells, or can configure up to two separate *nPartitions* within the server complex. In a two-*nPartition* complex, you use cell 0 and its core I/O in one *nPartition*, and use cell 1 and its core I/O in the other *nPartition*.

The two-cell HP server models includes these features:

- A single server cabinet that includes all cells, I/O chassis, processors, memory, PCI cards, and core I/O.
- Either one or two cells. Each cell has up to four processor sockets and up to 16 DIMMs.
- Two PCI I/O chassis that share the same chassis hardware.
One I/O chassis is connected to cell 0, the other is connected to cell 1.
Each I/O chassis has 8 PCI card slots, numbered from 1 to 8.

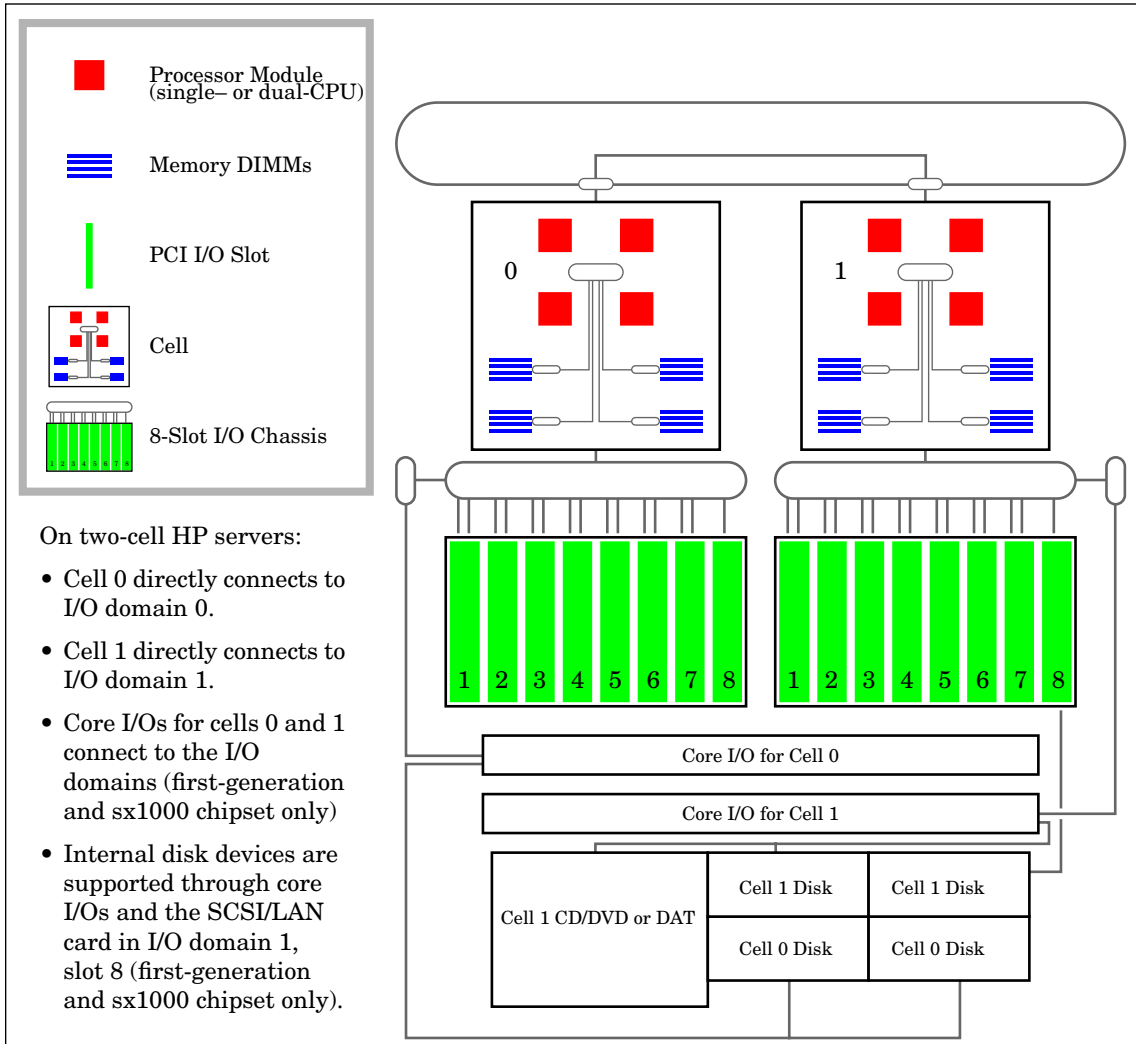
NOTE On the first-generation and HP sx1000-based two-cell servers, two PCI slots by convention are dedicated for use by a combination LAN/SCSI card: PCI domain 0 slot 1 (the first slot on the left) and PCI domain 1 slot 8 (the last slot on the right).

On two-cell servers based on the HP sx2000 chipset, core I/O is provided in each cell.

- A total server complex capacity of: 2 cells, 8 processor sockets, 32 DIMMs, and 16 PCI card slots.

Two-cell HP servers include a single server cabinet that may be rack-mounted or a stand-alone server configuration.

Figure 2-2 Two-Cell HP Server Architecture Overview



Four-Cell *nPartition* Server Model

The following cell-based HP servers scale from one to four cells:

- The HP rp8400 server has single-core HP PA-RISC processors.
The model string is: 9000/800/S16K-A.
- The HP rp8420 server has dual-core HP PA-RISC processors: PA-8800 processors, which provide two CPUs per processor socket.
The model string is: 9000/800/rp8420.
- The HP rx8620 server has Intel® Itanium® 2 processors, either single-processor modules or HP mx2 dual-processor modules.
Both HP mx2 dual-processor modules and single Itanium 2 processors can exist in the same complex, but they cannot be mixed in the same *nPartition*.
The model command output is: ia64 hp rx8620 server.
- The HP rx8640 server has Intel® Itanium® 2 processors.
The model command output is: ia64 hp rx8640 server.

Figure 2-3 on page 83 shows an overview of the four-cell HP server hardware architecture.

You can configure a single *nPartition* using some or all cells, or can configure up to four separate *nPartitions* within the server complex when using an I/O expansion cabinet.

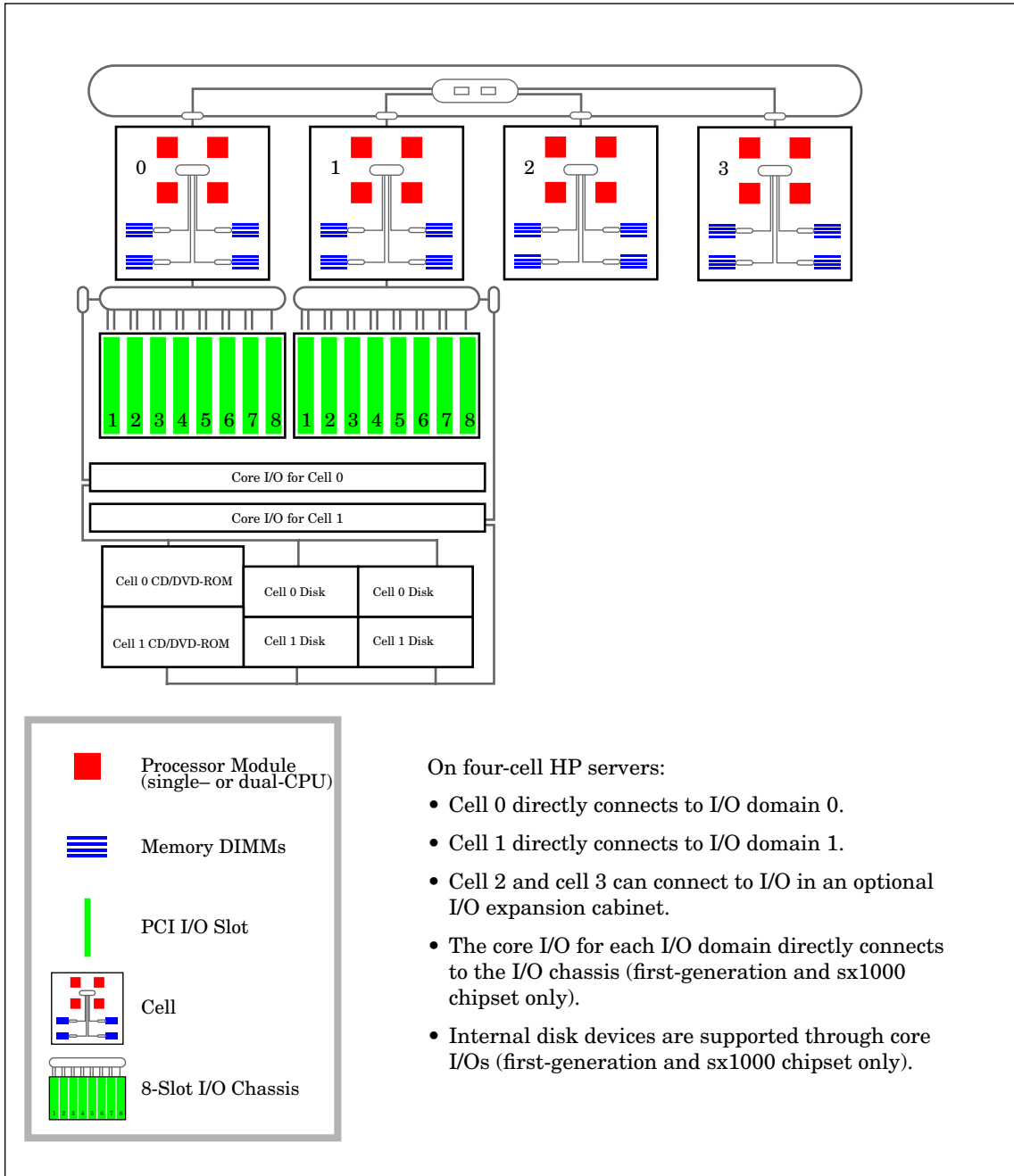
In a multiple-*nPartition* four-cell server complex, you would use cell 0 and its I/O chassis in one *nPartition*, and use cell 1 and its I/O chassis in another *nPartition*. The other cells (cells 2 and 3) can be assigned to either of the two *nPartitions*, or if connected to I/O in an expansion cabinet can be used to create additional *nPartitions*.

The four-cell HP servers include these features:

- A single server cabinet that includes cells, I/O chassis, processors, memory, PCI cards, and core I/O.
Two PCI I/O chassis in the server cabinet share the same chassis hardware. One I/O chassis is connected to cell 0, the other is connected to cell 1. Each I/O chassis has 8 PCI card slots, numbered from 1 to 8.
- An optional I/O expansion cabinet that provides an additional two core I/O cards and an additional two I/O domains each containing eight PCI card slots (for a total of 16 more PCI card slots).
Two PCI I/O chassis in the I/O expansion cabinet share the same chassis hardware. One I/O chassis is connected to cell 2, the other is connected to cell 3.
- From one to four cells. Each cell has four processor sockets and up to 16 DIMMs.
- A total server complex capacity of: 4 cells, 16 processor sockets, 64 DIMMs, and either 16 or 32 PCI card slots.

Four-cell HP servers include a single server cabinet that can be rack-mounted or stand-alone. An optional I/O expansion cabinet may also be used to provide I/O connected to cell 2 and cell 3.

Figure 2-3 Four-Cell HP Server Architecture Overview



Superdome Server Models

HP Superdome servers scale up to 16 cells. The following types of HP Superdome servers are supported:

- The first-generation HP 9000 Superdome: SD16000, SD32000, and SD64000
- The HP sx1000-chipset-based HP 9000 Superdome: SD16A, SD32A, and SD64A
- The HP sx1000-chipset-based HP Integrity Superdome server: SD16A, SD32A, and SD64A
- The HP sx2000-chipset based HP Integrity Superdome server: SD16B, SD32B, and SD64B

A Support Management Station (SMS) is connected to each HP Superdome server through the service processor private LAN port. The SMS is either an HP-UX workstation or an HP ProLiant system running Microsoft® Windows®. The SMS primarily is used for support and service purposes. The Windows SMS supports Windows versions of Partition Manager and the nPartition commands, thus enabling remote administration of nPartitions from the SMS. For details see “SMS (Support Management Station) for HP Superdome Servers” on page 118.

You can add up to two Superdome I/O expansion cabinets to the Superdome 32-way/64-way and Superdome 64-way/128-way server models. Each I/O expansion cabinet has up to six additional 12-slot I/O chassis.

The HP Superdome server models include:

- HP Superdome 16-/32-Way Servers: SD16000, SD16A, and SD16B
- HP Superdome 32-/64-Way Servers: SD32000, SD32A, and SD32B
- HP Superdome 64-/128-Way Servers: SD64000, SD64A, and SD64B

Details on these models are given in the following sections.

HP Superdome 16-/32-Way Servers: SD16000, SD16A, and SD16B

The HP Superdome 16-way/32-way server is a single-cabinet server that has from two to four cells, each with four processor sockets and up to 32 DIMMs.

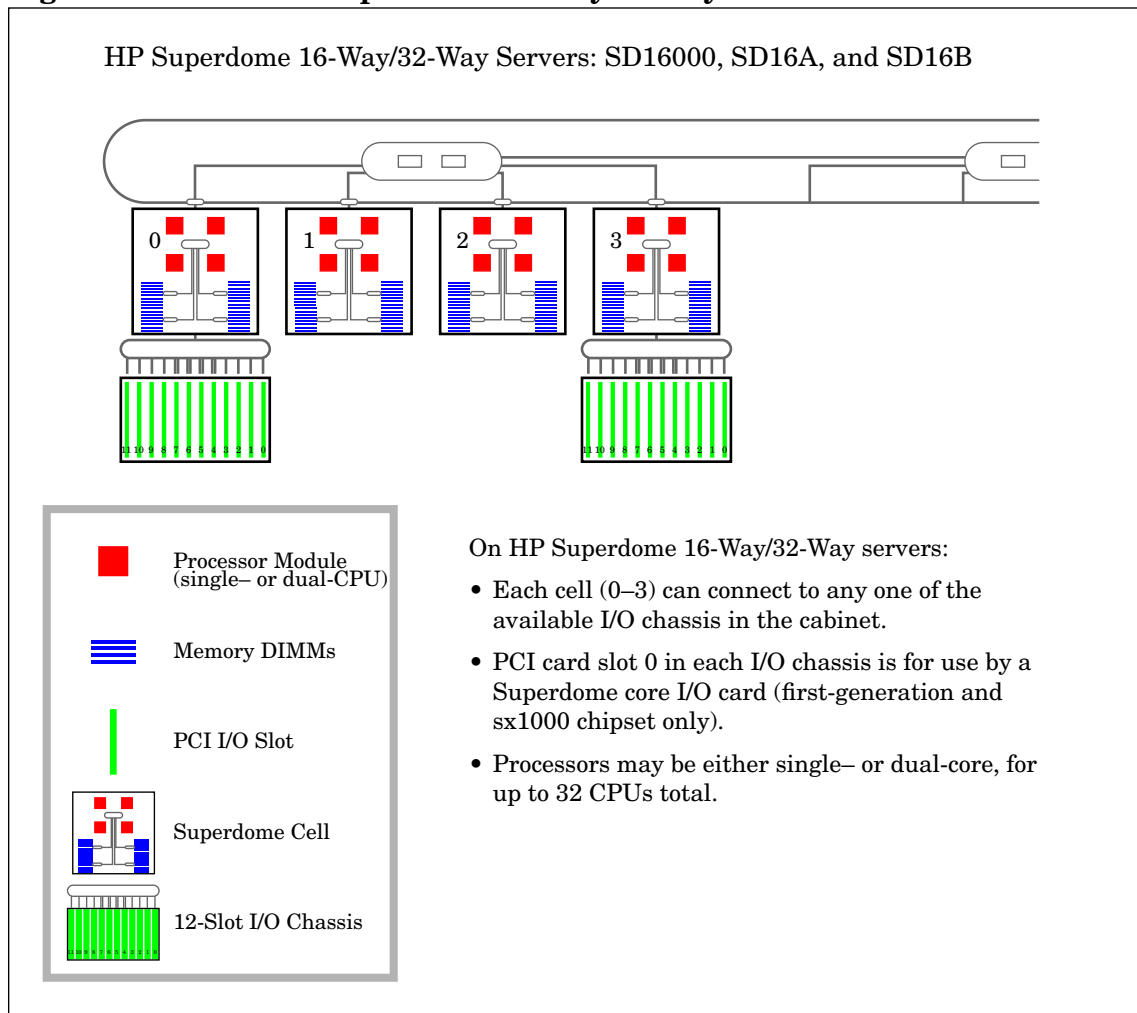
Figure 2-4 on page 86 shows an overview of the Superdome 16-way/32-way server hardware architecture.

The models of HP Superdome 16-way/32-way servers are: SD16000, SD16A, SD16B.

- The HP 9000 Superdome SD16000 server has single-core HP PA-RISC processors.
The model string for the SD16000 server is: 9000/800/SD16000
- The HP 9000 Superdome SD16A server has dual-core HP PA-RISC processors: PA-8800 processors, which provide two CPUs per processor socket.
The model string for the HP 9000 SD16A server is: 9000/800/SD16A
- The HP Integrity Superdome SD16A server has Intel® Itanium® 2 processors, either single-processor modules or HP mx2 dual-processor modules.
Both HP mx2 dual-processor modules and single Itanium 2 processors can exist in the same complex, but they cannot be mixed in the same nPartition.
The model command output for the HP Integrity SD16A server is:
ia64 hp superdome server SD16A
- The HP Integrity Superdome SD16B server has Intel® Itanium® 2 processors.
The model command output for the HP Integrity SD16B server is:
ia64 hp superdome server SD16B

The Superdome 16-way/32-way server can have up to 16 processor sockets, 128 DIMMs, and up to four 12-slot PCI I/O chassis.

Figure 2-4 HP Superdome 16-Way/32-way Architecture Overview



HP Superdome 32-/64-Way Servers: SD32000, SD32A, and SD32B

The Superdome 32-way/64-way server is a single-cabinet server that has from two to eight cells, each with four processor sockets and up to 32 DIMMs.

Figure 2-5 on page 88 shows an overview of the Superdome 32-way/64-way server hardware architecture.

The models of HP Superdome 32-way/64-way servers are: SD32000, SD32A, and SD32B.

- The HP 9000 Superdome SD32000 server has single-core HP PA-RISC processors.
The model string for the SD32000 server is: 9000/800/SD32000
- The HP 9000 Superdome SD32A server has dual-core HP PA-RISC processors: PA-8800 processors, which provide two CPUs per processor socket.

The model string for the HP 9000 SD32A server is: 9000/800/SD32A

- The HP Integrity Superdome SD32A server has Intel® Itanium® 2 processors, either single-processor modules or HP mx2 dual-processor modules.

Both HP mx2 dual-processor modules and single Itanium 2 processors can exist in the same complex, but they cannot be mixed in the same *nPartition*.

The `model` command output for the HP Integrity SD32A server is:

```
ia64 hp superdome server SD32A
```

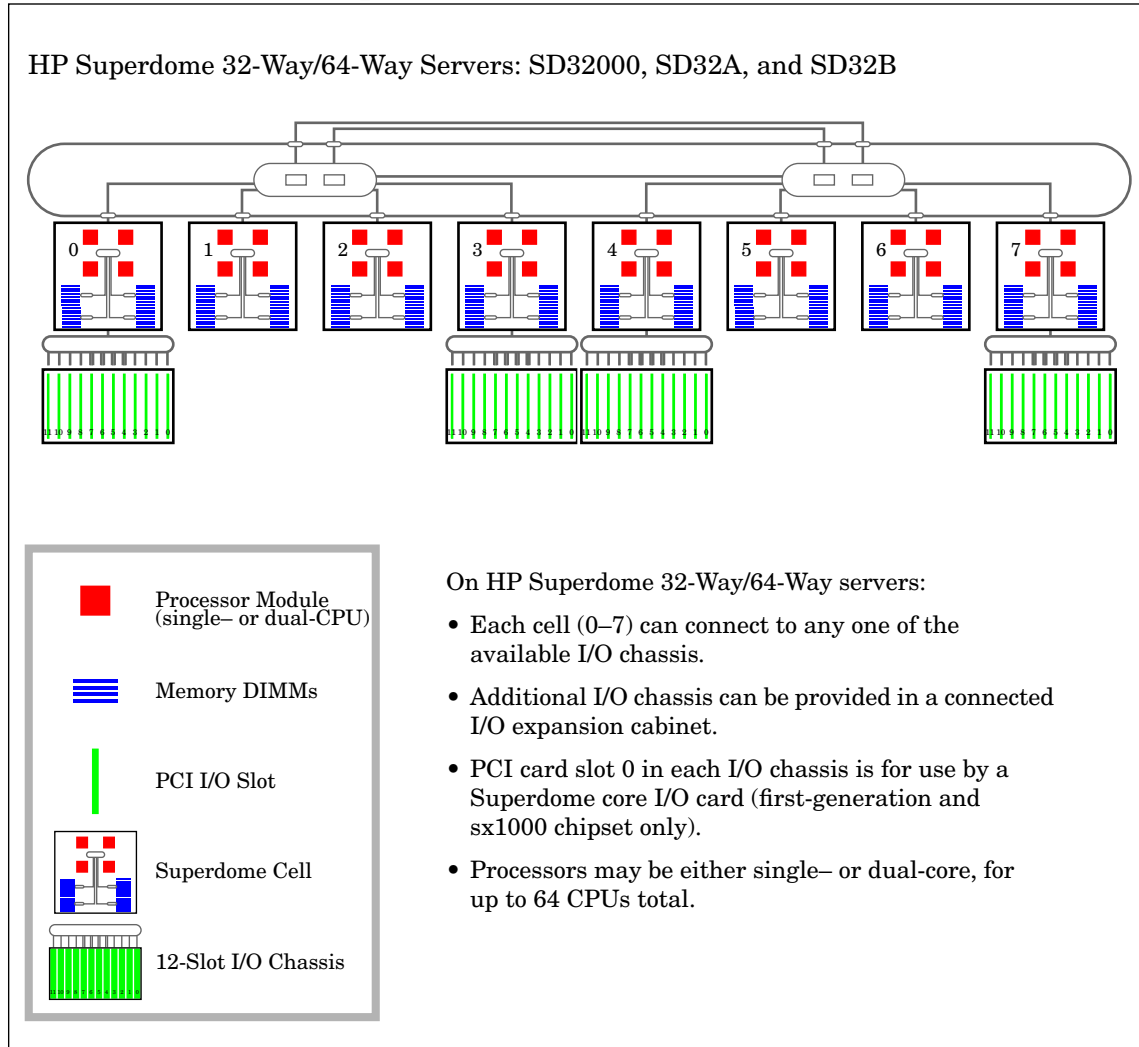
- The HP Integrity Superdome SD32B server has Intel® Itanium® 2 processors.

The `model` command output for the HP Integrity SD32B server is:

```
ia64 hp superdome server SD32B
```

The Superdome 32-way/64-way server can have up to 32 processor sockets, 256 DIMMs, up to four internal 12-slot PCI I/O chassis, plus optional I/O expansion cabinet hardware.

Figure 2-5 HP Superdome 32-Way/64-Way Architecture Overview



HP Superdome 64-/128-Way Servers: SD64000, SD64A, and SD64B

The Superdome 64-way/128-way server is a tightly interconnected dual-cabinet server that has from 4 to 16 cells, each with four processor sockets and up to 32 DIMMs.

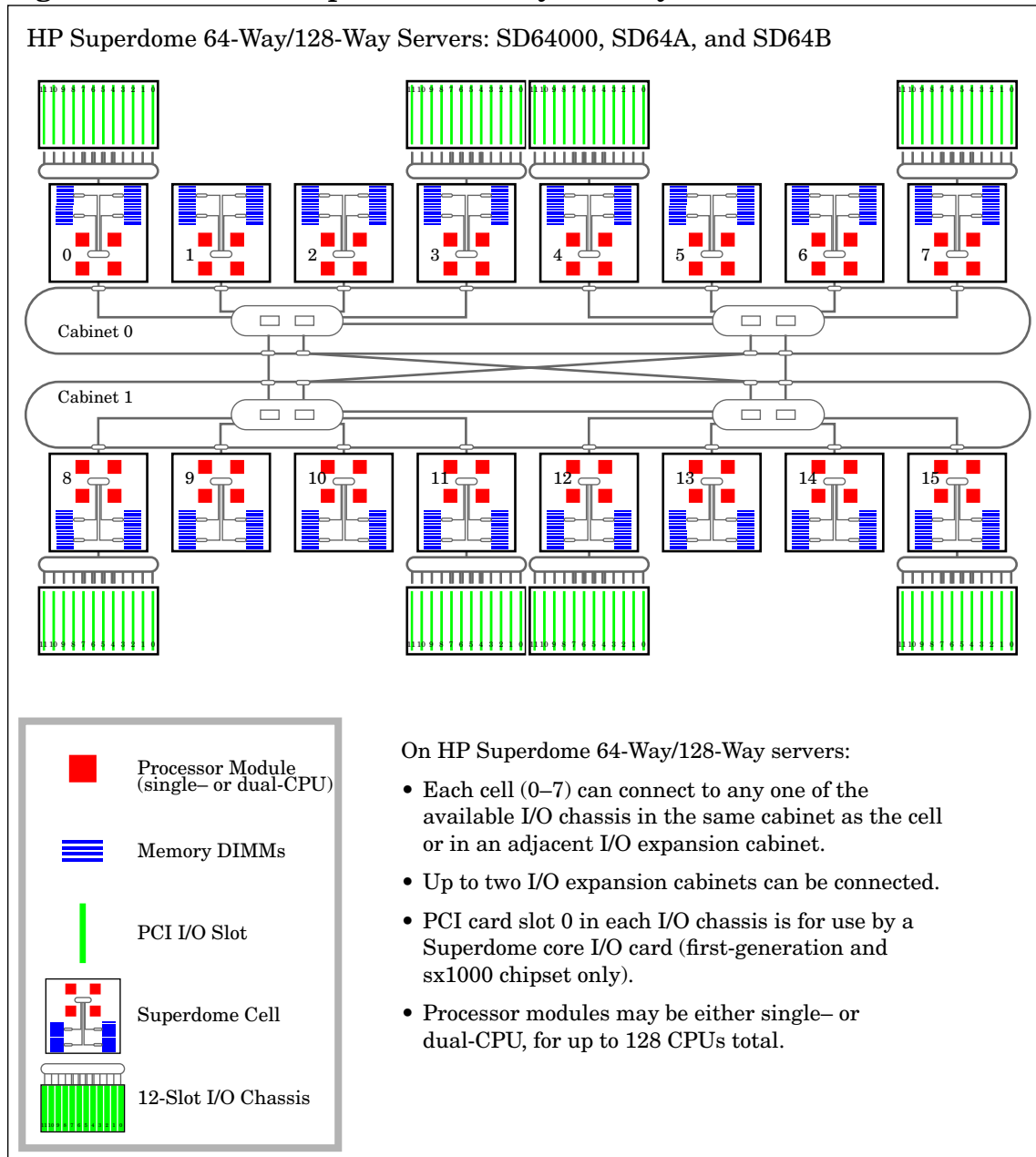
Figure 2-6 on page 90 shows an overview of the Superdome 64-way/128-way server hardware architecture.

The models of HP Superdome 64-way/128-way servers are: SD64000, SD64A, and SD64B.

- The HP 9000 Superdome SD64000 server has single-core HP PA-RISC processors.
The model string for the SD64000 server is: 9000/800/SD64000
- The HP 9000 Superdome SD64A server has dual-core HP PA-RISC processors: PA-8800 processors, which provide two CPUs per processor socket.
The model string for the HP 9000 SD64A server is: 9000/800/SD64A
- The HP Integrity Superdome SD64A server has Intel® Itanium® 2 processors, either single-processor modules or HP mx2 dual-processor modules.
Both HP mx2 dual-processor modules and single Itanium 2 processors can exist in the same complex, but they cannot be mixed in the same nPartition.
The model command output for the HP Integrity SD64A server is:
ia64 hp superdome server SD64A
- The HP Integrity Superdome SD64B server has Intel® Itanium® 2 processors.
The model command output for the HP Integrity SD64B server is:
ia64 hp superdome server SD64B

The Superdome 64-way/128-way server can have up to 64 processor sockets, 512 DIMMs, and up to eight internal 12-slot PCI I/O chassis. (Each of the two cabinets in a Superdome 64-way/128-way server provides up to 32 processor sockets, 256 DIMMs, and up to four 12-slot PCI I/O chassis.) HP Superdome 64-way/128-way servers also can have optional I/O expansion cabinet hardware.

Figure 2-6 HP Superdome 64-Way/128-Way Architecture Overview



HP Superdome I/O Expansion Cabinet

HP Superdome 32-way/64-way and Superdome 64-way/128-way servers can include I/O expansion cabinets in addition to the server cabinet(s) in the complex.

Each I/O expansion cabinet has a cabinet number of either 8 or 9.

A Superdome I/O expansion cabinet includes up to 3 I/O bays, with two 12-slot I/O chassis in each bay. This provides for up to 6 chassis with a total of 72 PCI card slots in each I/O expansion cabinet.

The Superdome I/O expansion cabinet is a standard-size cabinet that, space permitting, you can mount peripherals in as well as I/O chassis.

Also refer to the book *I/O Expansion Cabinet Guide for Superdome Servers*.

Hardware, Slot, and Device Paths

This section discusses the notations that HP-UX uses to describe hardware components within nPartitions.

The following HP-UX hardware notation formats are covered:

- “HP-UX Hardware Paths” on page 92.

The `/usr/sbin/ioscan` command lists the hardware paths for active components in an nPartition.

- “PCI Card Slot and Hardware Path Numbering” on page 96.

PCI card slot numbering differs from the hardware path numbering in many cases.

- “rad and olrad Command Output in nPartitions” on page 96.

The `rad` and `olrad` commands present detailed reports of PCI card slots.

Also see “EFI Device Path Notation” on page 98. On HP Integrity servers, the Extensible Firmware Interface (EFI) system boot environment displays I/O paths in EFI Device Path notation, which differs from other notations such as HP-UX hardware paths.

HP-UX Hardware Paths

The HP-UX hardware path for nPartition systems is provided in the formats described here.

The `/usr/sbin/ioscan` HP-UX command reports the hardware path for active components within the nPartition in which the command is issued.

You also can use the `/usr/bin/rad -q` command (with HP-UX B.11.11) or the `/usr/bin/olrad -q` command (with HP-UX B.11.23) to list details about active I/O slots and cards in the local nPartition.

NOTE The `ioscan`, `rad`, and `olrad` commands only report information about the currently active hardware components in the local nPartition.

These commands do not report details for hardware that is not assigned to the local nPartition or hardware that is inactive in the nPartition.

NOTE PCI I/O chassis and PCI-X I/O chassis have different hardware paths due to the differing PCI device numbers reported (0 for PCI, 1 for PCI-X).

Hardware Paths in nPartitions

The components of nPartition hardware paths are:

`a/b/c/d/e.f.g`

where these components are as described in the following list.

- **a**
Is the global cell number.
- **b**
On HP 9000 servers, **b** may be a processor (10–17), memory (5), or a system bus adapter (0).
On HP Integrity servers, **b** may be a processor (120–127) or a system bus adapter (0).
Each I/O chassis has a single system bus adapter.
- **c**
Is a local bus adapter (the LBA, one for each PCI card slot in the chassis). The LBA connects its corresponding PCI card slot with the system bus adapter.

NOTE The LBA number is not necessarily the same as the PCI slot number.

Use the `rad -q` command to list all active PCI slots in an nPartition along with their corresponding hardware paths. See “PCI Card Slot and Hardware Path Numbering” on page 96.

- **d**
Is the PCI device number, the address of the card on the PCI bus.
For PCI I/O chassis, the PCI device number is 0.
For PCI-X I/O chassis, the PCI device number is 1.
Note that the core I/O card has multiple devices and addresses in a single card.

- e
Is the function for the I/O card. Typically this is 0 (zero) for single-function cards.
- f
Is the target of the I/O device, or SCSI ID.
- g
Is a device-specific address such as a SCSI controller (initiator).

Refer to the *ioscan* (1M) manpage for details on using `ioscan` to list hardware path information.

Example 2-1 ioscan Output for a One-Cell HP 9000 Superdome nPartition

The following example shows ioscan output for a one-cell nPartition on an HP 9000 Superdome server.

In this example, the hardware path for the cell is 12, indicating that the cell is in slot 4 in cabinet 1. See “Specifying Cells and I/O Chassis to Commands” on page 364 for details about cell path formats.

Also note that in this example the I/O chassis is a PCI chassis.

```
# ioscan
H/W Path      Class      Description
-----
12            root
12            cell
12/0          ioa        System Bus Adapter (804)
12/0/0        ba         Local PCI Bus Adapter (782)
12/0/0/0      tty        PCI Serial (103c1048)
12/0/0/0/0    lan        HP PCI 10/100Base-TX Core
12/0/1        ba         Local PCI Bus Adapter (782)
12/0/2        ba         Local PCI Bus Adapter (782)
12/0/3        ba         Local PCI Bus Adapter (782)
12/0/4        ba         Local PCI Bus Adapter (782)
12/0/6        ba         Local PCI Bus Adapter (782)
12/0/6/0/0    ext_bus    SCSI C87x Ultra Wide Differential
12/0/6/0/0.5 target     disk       SEAGATE ST39173WC
12/0/6/0/0.5.0 target     disk       SEAGATE ST39173WC
12/0/6/0/0.6 target     disk       SEAGATE ST39173WC
12/0/6/0/0.6.0 target     disk       SEAGATE ST39173WC
12/0/6/0/0.7 target     disk       SEAGATE ST39173WC
12/0/6/0/0.7.0 target     disk       SEAGATE ST39173WC
12/0/8        ba         Local PCI Bus Adapter (782)
12/0/9        ba         Local PCI Bus Adapter (782)
12/0/10       ba         Local PCI Bus Adapter (782)
12/0/11       ba         Local PCI Bus Adapter (782)
12/0/12       ba         Local PCI Bus Adapter (782)
12/0/14       ba         Local PCI Bus Adapter (782)
12/5          memory     Memory
12/10         processor  Processor
12/11         processor  Processor
12/12         processor  Processor
12/13         processor  Processor
#
```

Example 2-2 ioscan Output for a One-Cell HP Integrity Superdome nPartition

The following example shows ioscan output for a one-cell nPartition on an HP Integrity Superdome server.

In this example, the hardware path for the cell is 4, indicating that the cell is in slot 4 in cabinet 0. See “Specifying Cells and I/O Chassis to Commands” on page 364 for details about cell path formats.

Also note that in this example, the I/O chassis is a PCI-X chassis.

```
# ioscan
H/W Path      Class      Description
-----
4             root
4             cell
4/0           ioa        System Bus Adapter (127b)
4/0/0         ba        Local PCI-X Bus Adapter (122e)
4/0/0/0/0     tty       PCI Serial (103c1048)
4/0/0/1/0     lan       HP PCI 10/100Base-TX Core
4/0/1         ba        Local PCI-X Bus Adapter (122e)
4/0/1/1/0     ext_bus   SCSI C1010 Ultra160 Wide LVD A6828-60101
4/0/1/1/0.0  target
4/0/1/1/0.0  disk     HP 18.2GST318453LC
4/0/1/1/0.1  target
4/0/1/1/0.1  disk     HP 18.2GST318453LC
4/0/1/1/0.2  target
4/0/1/1/0.2  disk     HP 18.2GST318453LC
4/0/1/1/0.7  target
4/0/1/1/0.7  ctl      Initiator
4/0/1/1/0.15 target
4/0/1/1/0.15.0 ctl      HP A6491A
4/0/2         ba        Local PCI-X Bus Adapter (122e)
4/0/2/1/0     lan       HP A6825-60101 PCI 1000Base-T Adapter
4/0/3         ba        Local PCI-X Bus Adapter (122e)
4/0/4         ba        Local PCI-X Bus Adapter (122e)
4/0/4/1/0     ba        PCItoPCI Bridge
4/0/4/1/0/4/0 usb       NEC USB Interface
4/0/4/1/0/4/0.1 usbhub    USB Root Hub
4/0/4/1/0/4/0.1.2 usbhid    USB HID Mouse(2)
4/0/4/1/0/4/1 usb       NEC USB Interface
4/0/4/1/0/4/1.1 usbhub    USB Root Hub
4/0/4/1/0/4/1.1.2 usbhid    USB HID Kbd(0) Other(1)
4/0/4/1/0/4/2 usb       NEC USB Interface
4/0/4/1/0/5/0 unknown   PCI Display (10025159)
4/0/6         ba        Local PCI-X Bus Adapter (122e)
4/0/8         ba        Local PCI-X Bus Adapter (122e)
4/0/9         ba        Local PCI-X Bus Adapter (122e)
4/0/10        ba        Local PCI-X Bus Adapter (122e)
4/0/11        ba        Local PCI-X Bus Adapter (122e)
4/0/11/1/0    ext_bus   SCSI C1010 Ultra Wide Single-Ended A6828-60101
4/0/11/1/0.4 target
4/0/11/1/0.4.0 disk     HP DVD-ROM 6x/32x
4/0/11/1/0.7 target
4/0/11/1/0.7.0 ctl      Initiator
4/0/12        ba        Local PCI-X Bus Adapter (122e)
4/0/14        ba        Local PCI-X Bus Adapter (122e)
4/120        processor Processor
4/121        processor Processor
4/122        processor Processor
4/123        processor Processor
4/250        ba        Core I/O Adapter
4/250/0       ipmi      IPMI Controller
4/250/1       acpi_node Acpi Hardware
#
```

PCI Card Slot and Hardware Path Numbering

On cell-based servers, the PCI card slot numbers (within an I/O chassis) are not necessarily the same as their local bus adapter (LBA) number, such as is reported by HP-UX commands such as `ioscan`, `rad`, or `olrad` (the `rad` command is in HP-UX B.11.11, and `olrad` in HP-UX B.11.23).

Table 2-2 shows the correlations among PCI slots and LBA numbers.

Table 2-2 I/O Numbering: PCI slots and Busses (LBAs)

PCI Card Slot	LBA Number for HP Superdome Servers	LBA Number for Two-Cell and Four-Cell Servers
0	0	0 Always connected to Core I/O.
1	1	8
2	2	10
3	3	12
4	4	14
5	6	6
6	14	4
7	12	2
8	11	1
9	10	—
10	9	—
11	8	—

The `rad -q` and `olrad -q` commands list each active PCI slot, its associated HP-UX hardware path, and other slot details.

The `ioscan -C ba` command lists the active PCI slots (“Local PCI Bus Adapter”) for your nPartition.

The order in which `ioscan` reports the PCI slots (in LBA number order) does not correspond to the order in which the slots physically are arranged (PCI card slot order, left-to-right or right-to-left).

rad and olrad Command Output in nPartitions

This section covers the `rad` command’s output on nPartitions. For complete details, refer to the `rad` (1M) or `olrad` (1M) manpage. The `rad` command is available with HP-UX B.11.11, and `olrad` with B.11.23.

NOTE In HP-UX B.11.11, when adding or replacing I/O cards, use the SAM (`/usr/sbin/sam`) procedures when possible rather than equivalent `rad` command procedures. Refer to the `sam` (1M) and `rad` (1M) manpages.

On cell-based servers, the `rad` and `olrad` commands report PCI card slot details for active I/O chassis that are assigned to the local nPartition. These commands report each available PCI slot

(*cabinet-bay-chassis-slot*), the corresponding HP-UX hardware path (*cell/sba/lba/device*), and more details.

```
# rad -q
```

Slot	Path	Bus	Speed	Power	Occupied	Suspended	Driver(s) Capable
0-0-1-0	0/0/0	0	33	On	Yes	No	No
0-0-1-1	0/0/1/0	8	33	On	Yes	No	Yes
0-0-1-2	0/0/2/0	16	33	On	Yes	No	Yes
0-0-1-3	0/0/3/0	24	33	On	Yes	No	Yes
0-0-1-4	0/0/4/0	32	33	On	Yes	No	Yes
0-0-1-5	0/0/6/0	48	66	On	Yes	No	Yes
0-0-1-6	0/0/14/0	112	33	On	No	No	Yes
0-0-1-7	0/0/12/0	96	33	On	No	N/A	N/A
0-0-1-8	0/0/11/0	88	33	On	Yes	No	Yes
0-0-1-9	0/0/10/0	80	33	On	No	N/A	N/A
0-0-1-10	0/0/9/0	72	33	On	No	N/A	N/A
0-0-1-11	0/0/8/0	64	33	On	Yes	No	Yes
0-1-3-0	2/0/0	0	33	On	Yes	No	No
0-1-3-1	2/0/1/0	8	33	On	Yes	No	Yes
0-1-3-2	2/0/2/0	16	33	On	Yes	No	Yes
0-1-3-3	2/0/3/0	24	33	On	Yes	No	Yes
0-1-3-4	2/0/4/0	32	33	On	No	No	Yes
0-1-3-5	2/0/6/0	48	66	On	No	No	Yes
0-1-3-6	2/0/14/0	112	66	On	Yes	No	Yes
0-1-3-7	2/0/12/0	96	33	On	No	No	Yes
0-1-3-8	2/0/11/0	88	33	On	Yes	No	Yes
0-1-3-9	2/0/10/0	80	33	On	No	N/A	N/A
0-1-3-10	2/0/9/0	72	33	On	No	N/A	N/A
0-1-3-11	2/0/8/0	64	33	On	Yes	No	Yes

Cabinet 0, Bay 0, Chassis 1, Slot 3
(rad and olrad slot notation: 0-0-1-3)

Cell 2, SBA 0, LBA 6, Device 0
(HP-UX hardware path: 2/0/6/0)

EFI Device Path Notation

On HP Integrity servers, the Extensible Firmware Interface (EFI) system boot environment displays I/O paths in EFI Device Path notation. EFI Device Path notation uses a combination of text and hexadecimal numbers to present I/O paths. The `map` EFI Shell command lists EFI Device Paths.

The EFI presentation of I/O paths differs from HP-UX Hardware Paths, which are composed of decimal numbers as described in “HP-UX Hardware Paths” on page 92. The `ioscan` HP-UX command lists HP-UX Hardware Paths.

NOTE This section describes EFI Device Paths for HP Integrity servers booted with the default ACPI configuration value only.

Other HP Integrity server models may present EFI Device Paths differently. Likewise, EFI booted with the windows ACPI configuration value presents device paths using a slightly different notation.

Example 2-3 EFI Device Path and Corresponding HP-UX Hardware Path

On an HP Integrity Superdome nPartition, a disk device that has the following EFI Device Path:

```
Acpi(000222F0,E15)/Pci(0|0)/Scsi(Pun0,Lun0)/HD(Part1,Sig843B0000)
```

is displayed in HP-UX B.11.23 using the following HP-UX Hardware Path notation:

```
14/0/1/0/0.0.0
```

NOTE To list the EFI Device Path for a device from HP-UX B.11.23, use the `ioscan -e...` command. For details refer to the *ioscan* (1M) manpage.

See “EFI Device Path Translation to HP-UX Hardware Path” on page 100 for details on converting an EFI Device Path to its equivalent HP-UX Hardware Path.

Description of EFI Device Path Notation

The EFI Device Path notation for cell-based HP Integrity servers is as follows:

```
Acpi( ... , XY) / Pci(A|B) [ / Pci(C|D) ] / Scsi(PunM, LunN) / ...
```

where `/Pci(C|D)` is displayed only if required to list a multi-function device.

To list EFI Device Paths from the EFI Shell use the `map` command.

NOTE The EFI Device Path notation shown here is used for cell-based HP Integrity servers booted with the default ACPI configuration value only.

The notable components of EFI Device Paths (*X*, *YY*, *A*, *B*, *C*, *D*, *M*, *N*) are described in the following list along with notes for translating the EFI Device Path components to their HP-UX hardware path equivalents.

XY) indicates the cell and PCI bus.

Note that *X* and *YY* are specific to cell-based HP Integrity servers.

For devices on cell 0, the EFI Device Path only shows *YY* and *X* is not displayed.

- *X* = cell number in hex.

Convert *X* to decimal to get the cell number as per HP-UX Hardware Path. (Hex A = decimal 10, B=11, C=12... F=15.)

The cell number is not listed in the EFI Device Path for devices on cell 0.

- *YY* = PCI bus in hex.

Use the EFI Shell `info io` command output to translate the PCI bus to its corresponding LBA.

First translate *YY* to its corresponding PCI slot number, then translate the slot number to its corresponding rope number (use the first rope, for two-rope slots).

The decimal rope number is the LBA component of the HP-UX Hardware Path.

Pci(*A|B*) indicates the device and function.

A = PCI device, in hex.

B = PCI function, in hex.

Pci(*C|D*) indicates the device and function and only is displayed for multi-function cards.

C = PCI device, in hex.

D = PCI function, in hex.

Scsi(*PunM*, *LunN*) indicates the target and LUN (logical unit number).

M = The target or PUN (physical unit number) in hex.

N = The LUN (logical unit number) in hex.

For details on converting an EFI Device Path to its HP-UX Hardware Path equivalent see “EFI Device Path Translation to HP-UX Hardware Path” on page 100.

EFI Device Path Translation to HP-UX Hardware Path

From the EFI Shell on an nPartition you can use the following procedure to translate an EFI Device Paths to its equivalent HP-UX Hardware Path.

From HP-UX B.11.23 on HP Integrity servers you can list the EFI Device Path for a device by using the `ioscan -e...` command. For example, `ioscan -e -C disk` lists all disk devices with both the HP-UX Hardware Path and EFI Device Path for each.

Device Path Translation from an EFI Device Path to an HP-UX Hardware Path

This procedure describes how to translate an EFI Device Path to an equivalent HP-UX Hardware Path.

NOTE This procedure only applies to cell-based HP Integrity servers booted with the default ACPI configuration value.

Step 1. Access the EFI Shell and issue the `map` command.

Login to the service processor (GSP or MP) then enter the `CO` command and select the console for the nPartition whose devices you will list.

At the nPartition console access the EFI Shell and use the `map` command to list device mappings and the corresponding EFI Device Path for each.

Step 2. Note the EFI Device Path components for the device you will translate to HP-UX Hardware Path notation.

In the `map` command output the EFI Device Path notation is as follows:

```
Acpi( ... , XYZ)/Pci(A|B[/Pci(C|D)]/Scsi(PunM,LunN)/ ...
```

where all numerical components (*X*, *Y*, *A*, etc.) are given in hex form, and `/Pci(C|D)` is displayed only for a multi-function PCI card.

See “Description of EFI Device Path Notation” on page 99 for details.

Step 3. Issue the `info io` EFI Shell command to list nPartition I/O details.

You will use the output from `info io` to determine the local bus adapter (LBA) component for the HP-UX Hardware Path.

Step 4. Convert the EFI Device Path cell number (*x*) from hex to decimal if the device is on cell 1 or higher.

NOTE For devices on cell 0, the cell number (*x*) component of the EFI Device Path is not shown as part of the `map` command output.

Use Table 2-3 to convert the EFI Device Path cell number to decimal form.

Table 2-3 Hexadecimal to Decimal Conversion Table

Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Decimal Cell Number: _____

- Step 5.** Translate the EFI Device Path PCI bus number (*YY*) to its equivalent LBA number by using the output from the `info io` EFI Shell command.

This translation from PCI bus to LBA number involves the following steps.

- A. First translate the PCI bus number to PCI slot number by using the “PCI DEVICE INFORMATION” part of the `info io` output.

For example, the following excerpt shows that PCI bus 15 corresponds to PCI slot 01.

```
...
PCI DEVICE INFORMATION

          Cell/
Seg/   Dev/  Vendor Device  PCI
Bus  Func   ID    ID    Slot
(hex) (hex) (hex) (hex) (dec) Description
-----
08/00 00/00 0x103C 0x1048  8/00 Simple Communications Controllers - Serial co
08/00 01/00 0x1011 0x0019  8/00 Network Controller - Ethernet controller
08/15 00/00 0x1000 0x0021  8/01 Mass Storage Controller - SCSI controller
...
```

- B. Then translate the PCI slot number to a corresponding rope number by using the “IO MODULE INFORMATION” part of the `info io` output. For two-rope slots, use the first (lower) rope number.

The rope number is decimal and is the LBA component of the HP-UX Hardware Path.

LBA Number: _____

- Step 6.** For each occurrence of “/Pci(A|B)” in the EFI Device Path, convert the PCI device (*A*) and PCI function (*B*) from hex to decimal.

Use Table 2-3 on page 100 to convert each PCI device and function to decimal.

Multiple PCI device and function entries are present only for multi-function cards. For single-function cards only the first PCI device and function entries below are used.

Decimal PCI Device 1: _____

Decimal PCI Function 1: _____

Decimal PCI Device 2: _____

Decimal PCI Function 2: _____

- Step 7.** Convert the SCSI target (*M*) and LUN (*N*) from hex to decimal.

Use Table 2-3 on page 100 to convert from hex to decimal.

Decimal Target: _____

Decimal LUN: _____

- Step 8.** Determine the full HP-UX Hardware Path by filling out the Table 2-4 on page 102 using the

translated, decimal values gathered from this procedure.

The SBA always is 0. The second device and function are used for multi-function cards only.

Table 2-4 HP-UX Hardware Path Components

Cell	SBA	LBA	Device	Func.	Device	Func.	Target	LUN
	/ 0	/	/	/	/	/	/	.

3 Planning nPartitions

This chapter describes how you can plan nPartition configurations. Details include the nPartition configuration requirements and Hewlett-Packard's recommendations.

For procedures to create and configure nPartitions, see the chapter "Creating and Configuring nPartitions" on page 253.

nPartition Hardware Requirements for Operating Systems

Table 3-1 lists the hardware requirements for operating systems running on nPartitions.

Table 3-1 Operating System Hardware Requirements

Operating System	nPartition Hardware Requirements
HP-UX B.11.11	Supports up to 64 PA-RISC processors.
HP-UX B.11.23, March 2004 and earlier	Supports up to 64 Intel® Itanium® 2 processors.
HP-UX B.11.23, September 2004 and later	Supports up to 128 PA-RISC processors. Supports up to 128 Intel® Itanium® 2 processors.
HP OpenVMS I64 8.2-1	Supports up to 4 cells (16 processors). Requires single Itanium 2 processors, and does not support HP mx2 dual-processor modules.
Microsoft® Windows® Server 2003	Supports up to 64 Intel® Itanium® 2 processors.
Red Hat Enterprise Linux 3 Update 2	Supports up to eight Intel® Itanium® 2 processors. Requires single Itanium 2 processors, and does not support HP mx2 dual-processor modules. Supports a maximum of two cells in an nPartition. Supports a maximum of one I/O chassis in an nPartition. Requires a PCI-X I/O chassis, and does not support PCI I/O chassis. Supports a maximum of 96 GBytes memory.
Red Hat Enterprise Linux 3 Update 3	Supports up to eight Intel® Itanium® 2 processors. Requires single Itanium 2 processors, and does not support HP mx2 dual-processor modules. Supports a maximum of two cells in an nPartition. Supports a maximum of 128 GBytes memory. Supports a maximum of two I/O chassis in an nPartition. Requires a PCI-X I/O chassis, and does not support PCI I/O chassis.
SuSE Linux Enterprise Server 9	Supports up to 16 Intel® Itanium® 2 processors. Requires single Itanium 2 processors, and does not support HP mx2 dual-processor modules. Supports a maximum of four cells in an nPartition. Supports a maximum of 256 GBytes memory. Supports a maximum of two I/O chassis in an nPartition. Requires a PCI-X I/O chassis, and does not support PCI I/O chassis.

Configuration Requirements for nPartitions

The hardware requirements determine which cells are eligible to be assigned to an nPartition.

For configuration requirements and restrictions for Superdome hybrid servers, refer to “HP Superdome Hybrid Servers: Intel® Itanium® 2 and PA-RISC nPartition Mixing” on page 30. HP Superdome servers based on the HP sx1000 chipset can support hybrid configurations with both PA-RISC nPartitions and Intel® Itanium® 2 nPartitions in the same server complex.

Every nPartition you configure must meet the following hardware requirements:

- On HP 9000 systems, all cells in an nPartition must have the same processor revision level and clock speed. That is, the `IODC_HVERSION` must be identical for all PA-RISC processors.

You can view processor details, including the CPU type (revision level) and speed, by using the `parstatus -v -c#` command or by using Partition Manager (select the **Cell** → **Show Cell Details** action, **CPUs/Memory** tab).

- On HP Integrity servers, all cells in an nPartition must have the same compatibility value.

The cell compatibility value is reported by the `parstatus -v -c#` command as “CPU Compatibility” for the cell.

Partition Manager Version 2.0 reports the value as “Cell Compatibility” in the General Cell Properties view for the cell, which you can display by clicking the cell location when viewing other details about the server complex.

- On HP Integrity servers, all cells assigned to an nPartition must have either mx2 dual-processor modules or single Itanium 2 processors.

Both HP mx2 dual-processor modules and single Itanium 2 processors can exist in the same complex, but they cannot be mixed in the same nPartition.

- The same firmware revision must be present on all cells within an nPartition.
- At least one cell in every nPartition must be connected to an I/O chassis that has core I/O.

Only one core I/O is active per nPartition. If an nPartition has multiple cells that are connected to I/O chassis with core I/O, only the core I/O connected to the active core cell is active.

Recommended nPartition Configurations

For best performance and availability, configure nPartitions to meet the following guidelines.

- On servers based on the HP sx1000 chipset or HP sx2000 chipset, the nPartition memory configuration should meet the following guidelines:
 - The number of cells participating in memory interleave should be a power of two, and each cell participating in interleave should contribute the same amount of memory.
 - The total amount of memory being interleaved should be a power of two number of GBytes.
- When configuring cell local memory, ensure that the amount of interleaved memory meets the guidelines given here. (All memory not specified as being cell local will be interleaved.)

Also ensure that any nPartition that has cell local memory configured runs only operating systems that support cell local memory.

Cell local memory can be configured on servers based on the HP sx1000 chipset or HP sx2000 chipset.

CAUTION Memory configured as cell local memory only can be used by operating systems that support it. HP-UX 11i v2 (B.11.23), Windows Server 2003, and SuSE Linux Enterprise Server 9 support cell local memory.

Any memory configured as cell local memory is unusable when an nPartition runs an operating system that does not support it. HP-UX 11i v1 (B.11.11), Red Hat Enterprise Linux 3, and HP OpenVMS 8.2-1 do not support cell local memory.

- The I/O chassis containing the active core I/O also should have an operating system (OS) boot disk and method of installing or recovering the OS (such as a CD-ROM/DVD-ROM drive, network connection to an install server, or tape drive). This applies to first-generation cell-based servers and HP sx1000-based servers; it allows the nPartition to boot or recover the OS, even if only the core cell for the nPartition is functioning. On HP sx2000-based servers, every cell has core I/O.
- Assign multiple core-capable cells to each nPartition.

This allows the nPartition to boot at least to the system boot environment (either BCH or EFI) if a core-capable cell fails to boot. On HP sx2000-based servers, every cell has core I/O.

(Disregard this recommendation if you are configuring multiple nPartitions in a cell-based server that has only two core-capable cells.)
- The memory configuration of all cells in an nPartition should be identical to achieve best performance. Each cell in an nPartition should have:
 - the same number of DIMMs
 - the same capacity (size) and the same locations (population) of DIMMs

This avoids cell interconnect (crossbar) “hot spots” by distributing memory evenly across all of the cells in the nPartition.
- The memory configuration of each cell should include a multiple of two memory ranks (first-generation cell-based HP 9000 servers) or a multiple of two memory echelons (servers based on the HP sx1000 chipset or HP sx2000 chipset) per cell.

On the first generation of cell-based HP 9000 servers, each memory rank is 4 DIMMs. If possible, install

memory in sets of 8 DIMMs: 8 DIMMs or 16 DIMMs on HP rp7405/rp7410, rp8400, and Superdome (SD16000, SD32000, SD64000) cells. On Superdome cells, you also can install 24 DIMMs or 32 DIMMs per cell.

On servers based on the HP sx1000 chipset or HP sx2000 chipset, each memory echelon is 2 DIMMs. If possible, install memory in sets of 4 DIMMs: 4, 8, 12, or 16 DIMMs. On Superdome servers, you also can install 20, 24, 28, or 32 DIMMs per cell.

This provides a performance improvement by doubling the memory bandwidth of the cell, as compared to having one memory rank or memory echelon installed.

This also can provide an availability improvement, in that if one memory rank or echelon fails the cell still has at least one functional rank of memory.

(Memory rank 0, or echelon 0, must be functional for a cell to boot.)

- Each nPartition should have PRI (primary), HAA (high-availability alternate), and ALT (alternate) boot paths defined and configured, and their path flags appropriately configured for your purposes.

NOTE Note that on HP Integrity servers, the PRI path corresponds to the first item in the EFI boot options list, the HAA path is the second item in the boot options list, and ALT is the third boot option.

The PRI and HAA paths should be configured to reference disks that are connected to different cells, if possible, with HAA being a mirror of the root volume and PRI being the root volume. ALT should be the path of a recovery or install device.

Under this configuration, if the cell to which the PRI disk is connected fails or is otherwise inactive and the cell to which the HAA disk is available, then the nPartition still can boot an operating system.

Even if the PRI and HAA devices connect to the same cell (such as on a two-cell server with two nPartitions configured), the HAA device can be used to boot an operating system should the PRI device fail.

Recommended HP Superdome nPartition Configurations

On HP Superdome servers, the locations of the cells you assign to each nPartition and the resulting loads on server interconnections can affect nPartition system performance within the server.

HP offers specific guidelines for configuring nPartitions on HP Superdome servers in order to ensure good system performance.

NOTE The guidelines in this section apply to HP Superdome servers only.

These guidelines follow two basic configuration principles:

1. Avoid sharing interconnecting hardware (crossbars and crossbar links) among multiple nPartitions.
2. Minimize the number of crossbar links used by each nPartition, but do not overload crossbar links by creating nPartitions that can generate more cell communications traffic across the links than the links can support. Overloading crossbar links degrades performance.

The above principles are incorporated into the guidelines below, and are accounted for in the charts of recommended HP Superdome nPartitions.

Configuration Guidelines for HP Superdome nPartitions

Use these guidelines to help determine which cells to assign to the nPartitions you create on HP Superdome servers.

- Define nPartitions in order of size.

Assign cells to the nPartition that has the largest cell count first. Then select cells for the next largest nPartition, and so on, and finally choose cells for the nPartition with the fewest cells last.

This provides more appropriate cell assignments for larger nPartitions (those with more cells). Any smaller nPartitions with fewer cells are more easily accommodated in the remaining, available cells.

- Place each nPartition within an empty cabinet, if possible.

This applies to nPartitions in HP Superdome 64-way servers only.

If possible, assign each nPartition cells from a cabinet whose cells have no nPartition assignments. Do this before assigning cells from a cabinet that already has cells assigned to an nPartition.

To select cells for nPartitions that are larger than six cells, on HP Superdome 64-way servers, refer “Supported nPartitions for Superdome 64-way/128-way” on page 113. For such larger nPartitions, assigning some cells from both cabinet 0 and cabinet 1 provides better performance by better distributing cell communications across crossbar links.

These guidelines can help minimize contentions for using the interconnecting server hardware (crossbars and crossbar links).

- Assign each nPartition cells from an unused “cell quad”, if possible.

Each “cell quad” is a set of four cells that share the same cabinet backplane connections (crossbar chips). Within each HP Superdome cabinet, cell slots 0–3 comprise one cell quad, and cell slots 4–7 comprise the second cell quad.

Because cells in a quad share the same crossbar chips, they have the best cross-cell memory performance.

Partitions with cells on different crossbar chips have higher memory latency (worse memory performance) than nPartitions whose cells all share the same crossbar chip.

Chart of Supported Two-Cell Server nPartition Configurations

Figure 3-1 shows the nPartition configurations that HP supports for two-cell servers.

Figure 3-1 Supported nPartition Configurations for Two-Cell Servers

	Two-Cell Server	
Cell Slots	0	1
One-Cell Partitions	1B	1A
Two-Cell Partition	2A	2A

Chart of Supported Four-Cell Server nPartition Configurations

Figure 3-2 shows the nPartition configurations that HP supports for four-cell servers.

Figure 3-2 Supported nPartition Configurations for Four-Cell Servers

		Four-Cell Server			
Cell Slots		0	1	2	3
One-Cell Partitions		1A	1B		
Two-Cell Partitions		2A		2A	
		2B			2B
		2C	2C		
			2D	2D	
			2E		2E
Three-Cell Partitions		3A	3A	3A	
		3B		3B	3B
			3C	3C	3C
Four-Cell Partition		4A	4A	4A	4A

On these servers, each nPartition must include either cell 0 or cell 1 — unless an I/O Expansion cabinet is connected.

Charts of Supported HP Superdome nPartition Configurations

Figure 3-3 shows the nPartition cell configurations that HP supports for Superdome 16-way/32-way and Superdome 32-way/64-way servers.

Figure 3-4 shows the nPartition cell configurations that HP supports for Superdome 64-way/128-way servers.

Example nPartition configurations that use these charts to determine which cells to assign to nPartitions appear in “Example nPartition Configurations for an HP Superdome Server” on page 114.

NOTE nPartition configurations with more than 64 processors are supported only by the HP-UX B.11.23 September 2004 release or later.

For details see “nPartition Hardware Requirements for Operating Systems” on page 104.

Figure 3-3 Supported nPartition Configurations for Superdome 16-way/32-way and Superdome 32-way/64-way

		Superdome 16/32-way			
Cell Slots		0	1	2	3
One-Cell Partitions	1	1A	1C	1B	1D
Two-Cell Partitions	2	2A	2B	2A	2B
Three-Cell Partition	3	3A	3A	3A	
Four-Cell Partition	4	4A	4A	4A	4A

		Superdome 32/64-way							
Cell Slots		0	1	2	3	4	5	6	7
One-Cell Partitions	5	1A	1E	1C	1G	1B	1F	1D	1H
Two-Cell Partitions	6	2A	2C	2A	2C	2B	2D	2B	2D
	7				2E				2E
Three-Cell Partitions	8	3A	3A	3A		3B	3B	3B	
Four-Cell Partitions	9	4A	4A	4A	4A	4B	4B	4B	4B
Five-Cell Partition	10	5A	5A	5A	5A				5A
Six-Cell Partition	11	6A	6A	6A	6A		6A		6A
Seven-Cell Partition	12	7A	7A	7A	7A		7A	7A	7A
Eight-Cell Partition	13	8A	8A	8A	8A	8A	8A	8A	8A

Figure 3-4 Supported nPartitions for Superdome 64-way/128-way

Cell Slots	Config Set	Superdome 64/128-way Cabinet 0								Superdome 64/128-way Cabinet 1							
		0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
One-Cell Partitions	14	1A	1I	1E	1M	1C	1K	1G	1O	1B	1J	1F	1N	1D	1L	1H	1P
Two-Cell Partitions	15	2A	2E	2A	2E	2C	2G	2C	2G	2B	2F	2B	2F	2D	2H	2D	2H
	16														2I	2I	
	17					2J										2J	
	18				2K				2K				2L				2L
Three-Cell Partitions	19	3A	3A	3A		3C	3C	3C		3B	3B	3B		3D	3D	3D	
	20														3E	3E	3E
Four-Cell Partitions	21	4A	4A	4A	4A	4C	4C	4C	4C	4B	4B	4B	4B	4D	4D	4D	4D
	22					4E		4E							4E		4E
Five-Cell Partitions	23	5A	5A	5A	5A				5A	5B	5B	5B	5B				5B
Six-Cell Partitions	24	6A	6A	6A	6A		6A		6A	6B	6B	6B	6B		6B		6B
Seven-Cell Partitions	25	7A	7A	7A	7A		7A	7B	7A	7B	7B	7B	7B		7B	7A	7B
Eight-Cell Partitions	26	8A	8A	8A	8A	8B	8A	8B	8A	8B	8B	8B	8B	8A	8B	8A	8B
Nine-Cell Partition*	27	9A	9A	9A	9A	9A	9A		9A					9A		9A	
Ten-Cell Partition*	28	10A	10A	10A	10A	10A	10A	10A	10A					10A		10A	
Eleven-Cell Partition*	29	11A	11A	11A	11A	11A	11A	11A	11A					11A	11A	11A	
Twelve-Cell Partition*	30	12A	12A	12A	12A	12A	12A	12A	12A					12A	12A	12A	12A
Thirteen-Cell Partition*	31	13A	13A	13A	13A	13A	13A	13A	13A				13A	13A	13A	13A	13A
Fourteen-Cell Partition*	32	14A	14A	14A	14A	14A	14A	14A	14A		14A		14A	14A	14A	14A	14A
Fifteen-Cell Partition*	33	15A	15A	15A	15A	15A	15A	15A	15A		15A	15A	15A	15A	15A	15A	15A
Sixteen-Cell Partition*	34	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A	16A

* NOTE: nPartitions with more than 64 processors are supported only by the HP-UX B.11.23 September 2004 release or later.

Example nPartition Configurations for an HP Superdome Server

This section shows example cell assignments to demonstrate the procedure for selecting cells for two sample server complex configurations.

For reference in the following examples, Figure 3-3 on page 112 and Figure 3-4 on page 113 show a unique number for each nPartition configuration set. (For example, config set 6 shows the four two-cell nPartition configurations that HP recommends for Superdome 32-way servers.)

The following two examples are given here:

- “Example nPartition Configuration for a Superdome 32-way Server” on page 115
- “Example nPartition Configuration for a Superdome 64-way Server” on page 116

Example 3-1 Example nPartition Configuration for a Superdome 32-way Server

This example configures an HP Superdome 32-way server with one six-cell nPartition and one two-cell nPartition.

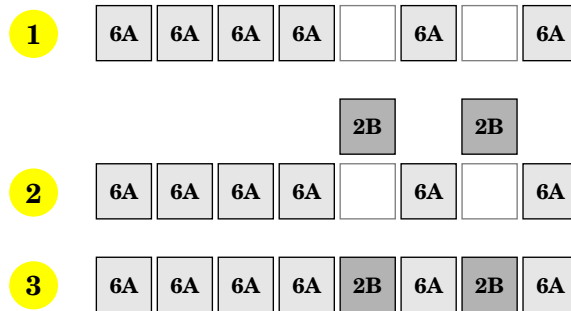
A Superdome 32-way server with a six-cell and two-cell nPartition would be configured with nPartitions 6A and 2B, as shown in Figure 3-3 on page 112.

In Figure 3-3, configuration sets 5–13 are eligible to be assigned on Superdome 32-way servers. The nPartition cell assignments are:

1. 6A (config set 11), the recommended six-cell nPartition.
2. 2B (config set 6), because cells 0 and 2 (2A) are assigned to 6A.
3. nPartitions 6A and 2B use all cells in the complex.

Example

Superdome 32-way complex nPartition configuration:
one six-cell nPartition and one two-cell nPartition.



Example 3-2 Example nPartition Configuration for a Superdome 64-way Server

This example configures an HP Superdome 64-way server with one seven-cell nPartition and two four-cell nPartitions.

A Superdome 64-way server with a seven-cell nPartition and two four-cell nPartitions would be configured with nPartitions 7A, 4B, and 4E, as shown in Figure 3-4 on page 113.

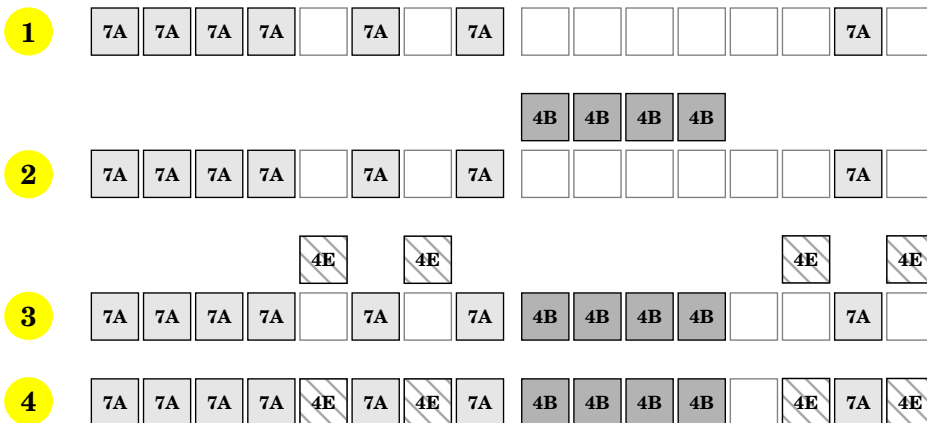
In Figure 3-4, configuration sets 14–34 are eligible to be assigned on Superdome 64-way servers. The nPartition cell assignments are:

1. 7A (config set 25), the first recommended seven-cell nPartition.
2. 4B (config set 21), because cells in 4A are used by 7A.
3. 4E (config set 22), because some or all cells in 4A–D are assigned.
4. Partitions 7A, 4B, and 4E use all cells except one (cabinet 1, cell 4).

The following illustrations shows how the Superdome 64-way nPartition configurations would be selected, using Figure 3-4 to determine which recommended nPartitions to use.

Example

Superdome 64-way complex nPartition configuration:
one seven-cell nPartition and two four-cell nPartitions.



4 Using Management Interfaces and Tools

This chapter presents the system management interfaces and tools available on Hewlett-Packard's cell-based servers. Also covered here are the nPartition boot environments, management access procedures, and detailed command references.

Management differences on HP 9000 systems and HP Integrity systems are addressed in this chapter. For a discussion of the supported cell-based server models, see the chapter "nPartition Server Hardware Overview" on page 71.

SMS (Support Management Station) for HP Superdome Servers

The Support Management Station (SMS) is a workstation or PC that is connected to an HP Superdome server through the service processor private LAN. The SMS may either be an HP-UX workstation or an HP ProLiant system running Microsoft® Windows® 2000 with Service Pack 3 or later.

The SMS primarily is used by HP-certified service and support personnel for system scan, upgrade, and hardware verification purposes.

The Windows SMS is an HP ProLiant system running the Windows operating system that has an enhanced system support toolset, including Partition Manager and the HP nPartition commands (such as `parcreate` and `parstatus`, among others).

Use of the nPartition commands from a Windows SMS requires specifying the remote management command-line options (either the `-u...` `-h...` set of options or the `-g...` `-h...` options). For details see “Specifying Remote Management Options to Commands” on page 368.

You can use the Windows versions of the nPartition commands to remotely manage servers based on the HP sx1000 chipset or HP sx2000 chipset. Remote management using IPMI over LAN is supported for all servers based on the HP sx1000 chipset or HP sx2000 chipset. Remote nPartition management using WBEM is supported for nPartitions running an operating system with the HP nPartition Provider (such as HP-UX B.11.23).

Details on the Windows SMS release of nPartition commands are given in “Commands for Configuring nPartitions” on page 34.

For more details about the SMS for Superdome servers, refer to the *Service Guide* for your model of Superdome server.

Overview of nPartition Service Processor (MP or GSP) Interfaces

The service processor (MP or GSP) utility hardware is an independent support system for cell-based servers. It provides a way for you to connect to a server complex and perform administration or monitoring tasks for the server hardware and its nPartitions.

The main features of the service processor include:

- Command Menu
- nPartition Consoles
- Console Logs
- Chassis Code Viewer (on HP 9000 servers with HP PA-8700 processors) or Event Log Viewer (on servers based on the HP sx1000 chipset or HP sx2000 chipset)
- Virtual Front Panels (live displays of nPartition and cell states)

These features are described in more detail in “Service Processor (MP or GSP) Features” on page 120.

The service processor is available when its cabinet has standby power, even if the main (48-volt) cabinet power switch is turned off.

Access to the service processor is restricted by user accounts. Each user account is password protected and provides a specific level of access to the server complex and service processor commands.

Multiple users can independently interact with the service processor because each service processor login session is private. However, some output is mirrored: the Command menu and each nPartition console permit one interactive user at a time and mirror output to all users accessing those features. Likewise, the service processor mirrors live chassis codes to all users accessing the Live Chassis Logs feature (or the Live Events feature).

Up to 32 users can simultaneously login to the service processor through its network (customer LAN) interface and they can independently manage nPartitions or view the server complex hardware states.

Two additional service processor login sessions can be supported by the local and remote serial ports. These allow for serial port terminal access (through the local RS-232 port) and external modem access (through the remote RS-232 port).

In general, the service processor (MP or GSP) on cell-based servers is similar to the service processor on other HP servers, while providing enhanced features necessary for managing a multiple nPartitions.

For example, the service processor manages the complex profile, which defines nPartition configurations as well as complex-wide settings for the server.

The service processor also controls power, reset, and TOC capabilities, displays and records system events (or chassis codes), and can display detailed information about the various internal subsystems.

Service Processor (MP or GSP) Features

The following list describes the primary features available through the service processor on cell-based HP servers.

- **Command Menu**

The Command menu provides commands for system service, status, and access configuration tasks.

To enter the Command menu, enter **CM** at the service processor Main menu. To exit the service processor Command menu, enter **MA** or type **^b (Control-b)** to return to the service processor Main menu.

See “Command Reference for Service Processor Commands” on page 144 for details.

Service processor commands are restricted based on the three levels of access: Administrator, Operator, and Single Partition User. See “Service Processor Accounts and Access Levels” on page 121 for details.

- **Consoles**

Each nPartition in a server complex has its own console.

Enter **CO** at the service processor Main menu to access the nPartition consoles. To exit the console, type **^b (Control-b)**.

See “nPartition Console Features” on page 123 for details.

Console output for each nPartition is reflected to all users currently accessing the nPartition console.

One console user can have interactive access to each nPartition console, and all other users of the console have read-only access. To gain write access for a console, type **^e cf (Control-e c f)**.

Each nPartition console provides access to:

- The nPartition system boot environment: either BCH or EFI.

The BCH or EFI system boot environment is available when the nPartition is active but has not yet loaded or booted an operating system.

- The Boot Console Handler (BCH) environment is provided on HP 9000 servers only (PA-RISC servers).

- The Extensible Firmware Interface (EFI) is provided on HP Integrity servers only (Intel® Itanium®-based servers).

- HP-UX console for the nPartition.

The nPartition console provides console login access to HP-UX and serves as `/dev/console` for the nPartition.

- **Console Logs**

Enter **CL** from the service processor Main menu to access the console logs menu. To exit the console log, type **^b (Control-b)**.

Each nPartition has its own console log, which stores a history of console output for the nPartition, including boot output, system boot environment (BCH or EFI) activity, and any HP-UX console login activity.

See “Viewing Console Logs” on page 140 for details.

The console log provides a limited history; it is a circular log file that overwrites the oldest information

with the most recent.

All console activity is recorded in the console log, regardless of whether any service processor users are connected to the console.

- **Chassis Logs and Event Logs**

On both HP 9000 systems and HP Integrity systems, you can view real-time (live) system events and can view prior events that have been stored in a log history. Use the `SL` (“show logs”) option from the service processor Main Menu to view events/chassis codes.

- On cell-based HP 9000 servers with HP PA-8700 processors, `SL` provides the Chassis Log Viewer. The chassis log viewer includes options for viewing: activity (level 1 and greater) logs, error (level 2 and greater) logs, and live logs (which optionally may be filtered by cell, nPartition, or alert level).
- On cell-based servers based on the HP sx1000 chipset or HP sx2000 chipset, `SL` provides the Event Log Viewer. The event log viewer includes options for viewing: forward progress (level 1 and greater) logs, system event (level 2 and greater) logs, and live logs (which optionally may be filtered by cell, nPartition, or alert level).

See “Viewing Chassis Codes or Event Logs” on page 141 for details.

- **Virtual Front Panel (VFP) for an nPartition**

The Virtual Front Panel (VFP) for each nPartition displays real-time boot activity and details about all cells assigned to the nPartition. The VFP display automatically updates as cell and nPartition status changes. A system-wide VFP also is provided.

Enter `VFP` at the Main menu to access the Virtual Front Panel menu. To exit a Virtual Front Panel, type `^b` (**Control-b**).

See “Virtual Front Panel (VFP) nPartition Views” on page 143 for details.

Service Processor Accounts and Access Levels

To access the service processor interface for a server complex, you must have a user account that enables you to login to the service processor.

Each server complex has its own set of service processor user accounts, which are defined for the server complex and may differ from accounts on other complexes.

Service processor user accounts have a specific login name, password, and access level.

The three user account access levels are:

- **Administrator Account**

Provides access to all commands, and access to all nPartition consoles and Virtual Front Panels.

Can manage user accounts (using the Command menu `SO` command) and can reconfigure various service processor settings.

- **Operator Account**

Provides access to a subset of commands, and access to all nPartition consoles and Virtual Front Panels.

- **Single Partition User Account**

Provides access to a restricted subset of commands and provides access to the nPartition console for a single nPartition. However, allows the user to view the Virtual Front Panel for any nPartition.

Chapter 4 Using Management Interfaces and Tools

Service Processor (MP or GSP) Features

Can only execute commands that affect the assigned nPartition.

Cannot execute commands that could potentially affect multiple nPartitions or affect the service processor configuration.

Each user account can either permit repeated login sessions (if it is a “multiple use” account), or restrict the account to only login once (for “single use” accounts).

nPartition Console Features

The service processor Console menu provides access to all nPartition consoles within the server complex.

Enter **CO** from the service processor Main menu to access an nPartition console. To exit the nPartition console, type **^b (Control-b)** to return to the Main menu.

Each nPartition in a complex has a single console. However, multiple connections to the console are supported, allowing multiple users to simultaneously view the console output. Only one connection per console permits write-access.

To force (gain) console write access for an nPartition console, type **^ecf (Control-e c f)**.

Each nPartition console can display a variety of information about the nPartition, including:

- Partition startup, shutdown, and reset output.
- The system boot environment: either Boot Console Handler (BCH, on HP 9000 servers) or Extensible Firmware Interface (EFI, on HP Integrity servers).

The system boot environment is available when the nPartition has not yet booted an operating system and has completed Power-On Self Tests (POST) and completed nPartition rendezvous to become active.

- The HP-UX login prompt and “console shell access”.

CAUTION When you use an nPartition console connection to login to an operating system running on the nPartition, logout from the operating system when you have finished using it before you type **^B (Control-b)** to disconnect from the nPartition console.

If you fail to logout from the operating system console session, then any other service processor user who has permission to access the nPartition could connect to the nPartition console and use the open login session.

Disconnecting from an nPartition console does not close any open operating system login sessions.

nPartition Console Access versus Direct OS Login

You may need to consider the following factors when deciding whether to interact with an nPartition through the service processor console interface or a direct operating system (OS) login session.

- Whether you want to log your activity to the console log for the nPartition (all console activity is stored at least temporarily).
- Whether the OS is installed, booted, and properly configured on the nPartition.

If the OS is not installed on an nPartition, you should access the nPartition console (through the service processor) in order to install and configure the OS.

You should use the network to login to the OS running on an nPartition when you do not need to use service processor features and do not want to record a log of your activity.

Before an OS has booted, the service processor nPartition consoles are the primary method of interacting with an nPartition.

After an nPartition has booted the OS, you should be able to connect to and login to the nPartition by using telnet or rlogin or ssh to remotely login to HP-UX or Linux, or by using remote desktop for a remote

Chapter 4 *Using Management Interfaces and Tools*

nPartition Console Features

Windows session.

Boot Console Handler System Boot Environment

Each nPartition in a server complex has its own Boot Console Handler (BCH) interface.

The BCH interface is available through an nPartition console interface before an operating system has booted and after the cells have booted and performed nPartition rendezvous (to make the nPartition active).

The nPartition BCH interface enables you to manage and configure the HP-UX boot process for an nPartition. You also can configure some settings for the local nPartition, get some information about the nPartition and its server complex, and perform other tasks such as reboot.

Figure 4-1 on page 127 shows details on accessing and using the BCH interface for an nPartition, including the following points:

- To access an nPartition console type **CO** from the service processor (MP or GSP) Main menu.
- To force console write access, type **^ecf** (**Control-e c f**).
- To exit the console, type **^b** (**Control-b**) to return to the Main Menu.

The BCH interface is available after one or more core-capable cells assigned to the nPartition has been powered on; its hardware has completed all Power-On Self Tests (POST); and the cells have booted past boot-is-blocked, rendezvoused, and BCH has started executing.

Once you begin the HP-UX boot process and load ISL, the BCH interface is no longer available.

The BCH menus and commands for nPartitions differ slightly from the commands menus for BCH on other HP 9000 server systems.

To display the current BCH menu and commands, type **DI**.

The BCH interface **HELP** command lists BCH command or menu details.

Chapter 4 Using Management Interfaces and Tools

Boot Console Handler System Boot Environment

Main Menu: Enter command or menu > **HELP MA**

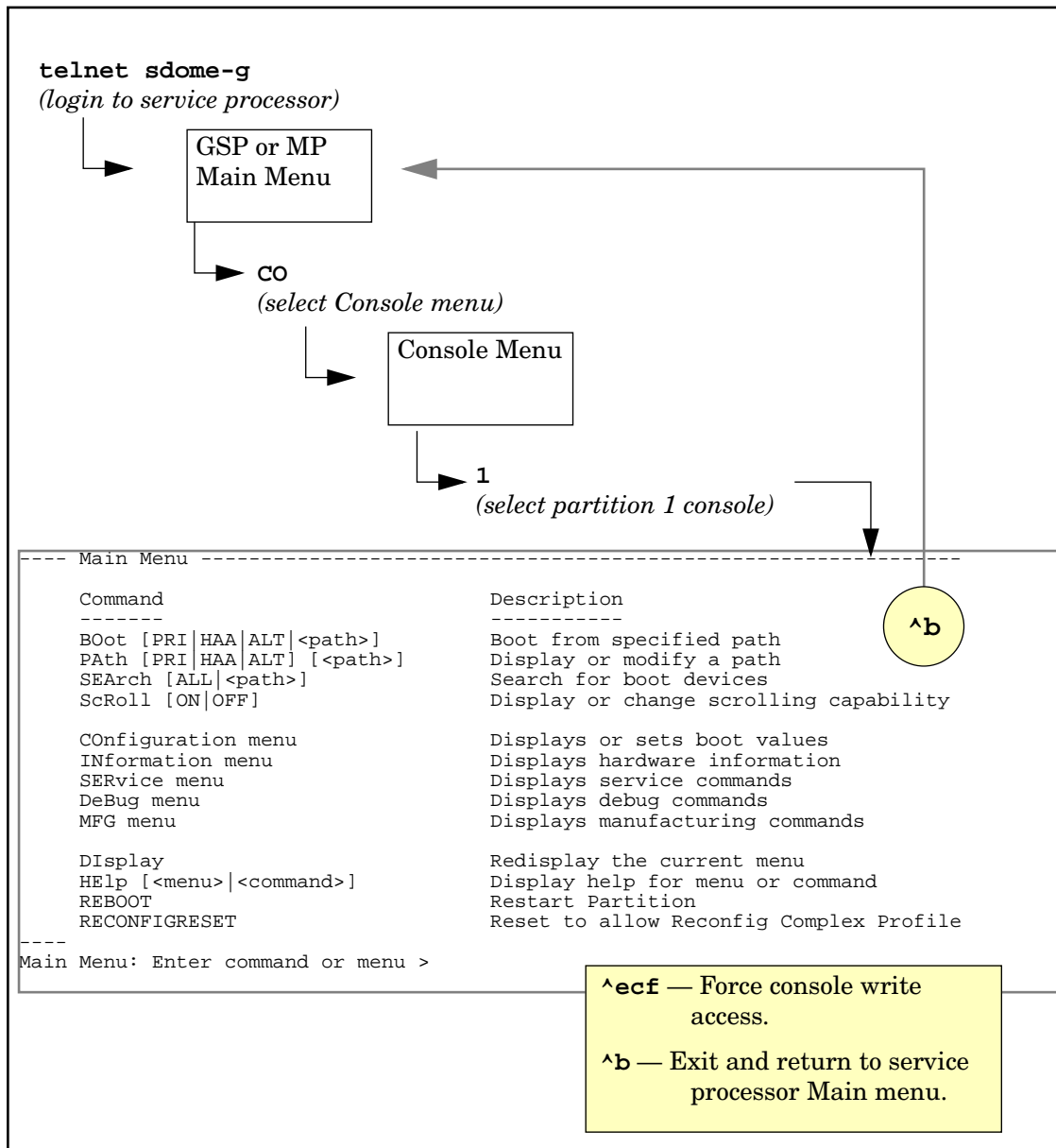
---- Main Menu Help -----

The following submenus are available from the main menu:

COntfiguration-----			BooTID
INformation-----		ALL	BooTImer
SERvice-----	BAttery	BooTINfo	CEllConfig
	CLEARPIM	CAche	COreCell
	MemRead	ChIPRevisions	CPUConfig
	PDT	COmplexID	DatAPrefetch
	PIM	FABricInfo	DEfault
	SCSI	FRU	FAstBooT
		FwrVersion	KGMemory
		IO	PAthFlag
		LanAddress	PD
		MEmory	REsTart
		PROcessor	TIme

...

Figure 4-1 Accessing the BCH Interface for an nPartition



Extensible Firmware Interface System Boot Environment

On HP Integrity servers the system boot environment is provided by the Extensible Firmware Interface (EFI).

EFI is available through an nPartition console interface before an operating system has booted and after the cells have booted and performed nPartition rendezvous (to make the nPartition active).

The EFI environment enables you to manage and configure the operating system boot process for an nPartition. You also can configure some settings for the local nPartition, get information about the nPartition and its server complex, and perform other tasks such as reboot.

The EFI boot environment has two main components:

- **EFI Boot Manager** — A menu-driven interface that enables you to configure and select boot options. From the EFI Boot Manager you can load an operating system, reset the nPartition, and configure various system boot and console options.
- **EFI Shell** — A command-line system boot interface that you can enter by selecting the **EFI Shell** option from the EFI Boot Manager Menu.

Type `exit` to leave the EFI Shell interface and return to the EFI Boot Manager Menu.

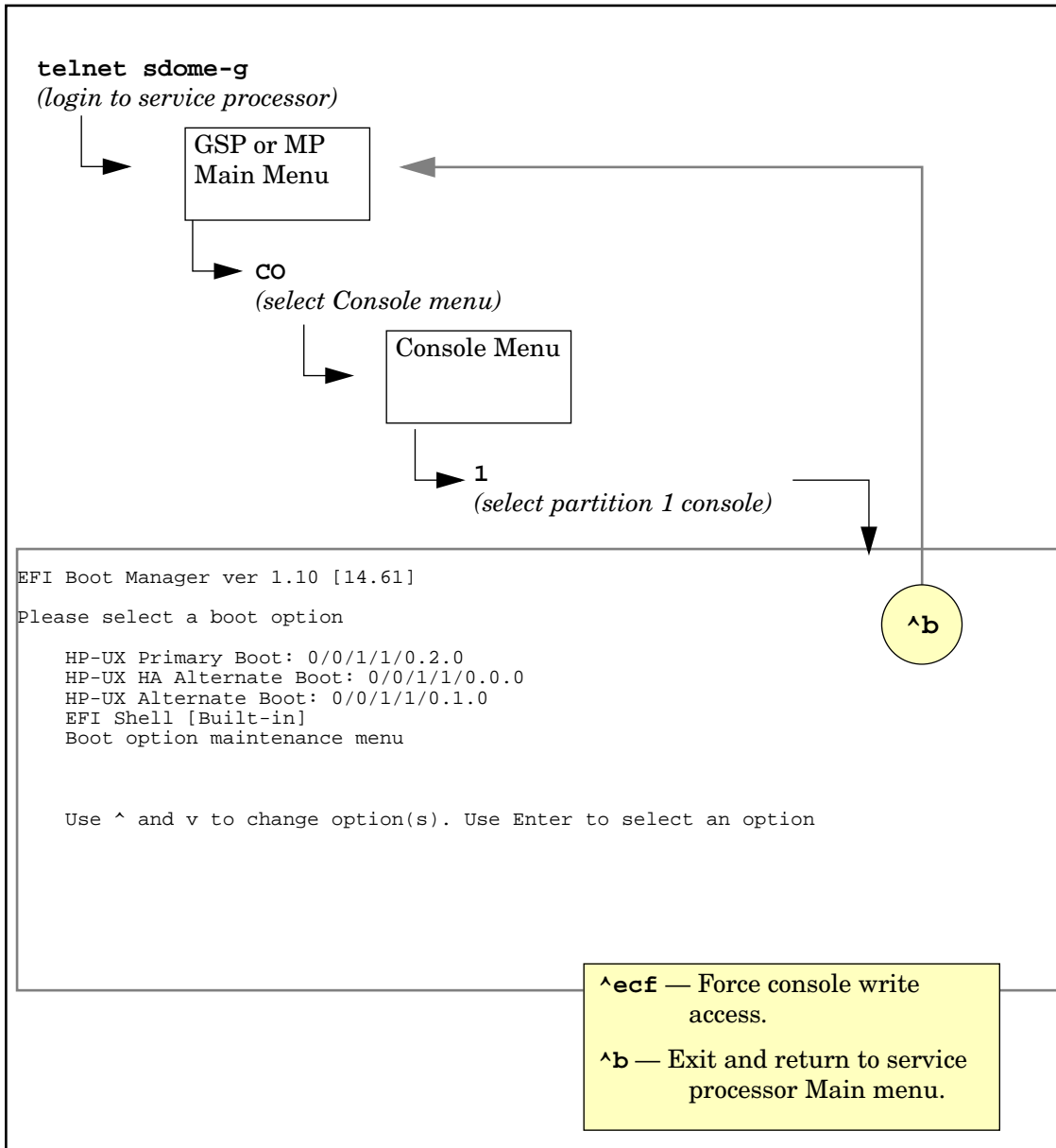
The EFI Shell provides much of the same functionality as the Boot Console Handler (BCH) interface on HP 9000 systems (PA-RISC systems).

For details on using the EFI Shell use the `help` command.

Figure 4-2 on page 129 shows details on accessing and using the EFI system boot environment for the nPartition, including the following points:

- To access an nPartition console type `CO` from the service processor (MP or GSP) Main menu.
- To force console write access, type `^ecf` (**Control-e c f**).
- To exit the console, type `^b` (**Control-b**) to return to the Main Menu.

Figure 4-2 Accessing the EFI Environment for an nPartition



Windows Special Administration Console (SAC)

After an nPartition has successfully loaded Microsoft® Windows® Server 2003, you can access a text-based Windows administration interface at the nPartition console.

The Special Administration Console (SAC) interface lets you interact with the Windows operating system running on an nPartition by using the `SAC>` command prompt that is provided at the nPartition console interface. The SAC commands listed in Table 4-1 on page 131 are provided for managing Windows.

The SAC interface enables you to have administrative access to Windows on an nPartition even if Windows networking is not functional.

Tips for using the SAC interface and a table of SAC commands follow.

SAC Interface:

Tips for Interacting with Windows Special Administration Console

When using the Windows SAC interface through an nPartition console, you can use the commands in Table 4-1 on page 131. You also can use the following tips to help complete tasks with the SAC.

- To list all commands available from the SAC, issue the `?` or `help` command at the `SAC>` prompt.
- To list basic identification and boot information about the instance of Windows running on the nPartition whose console you are using, issue the `id` command.
- To switch among the “channels” provided by the SAC interface, use the channel management command.

SAC Channel Management Commands

Esc Tab — Change channels: if multiple channels exist, typing **Esc Tab** switches to the next channel and typing **Space** selects a channel.

`ch` — List all channels.

`ch -?` — Display the channel-management command help.

`ch -si #` — Switch to a channel by its number.

`ch -sn name` — Switch to a channel by its name.

`ch -ci #` — Close a channel by its number.

`ch -cn name` — Close a channel by its name.

- To create a new Windows command prompt that you can interact with through the nPartition console, issue the `cmd` command.

The `cmd` SAC command creates a new channel for the command prompt, which you can then switch to (using **Esc Tab**, or other commands) in order to login to Windows running on the nPartition.

- When you need to type function keys and are using the SAC, type the following key sequence: **Esc #**

For example, for the **F3** key type **Esc** then **3** in quick sequence.

Table 4-1 lists the commands you can issue at the Windows `SAC>` prompt, which is provided through an nPartition console after Windows has booted.

Table 4-1 Windows SAC Commands

SAC Command	Description
ch	Channel management commands. Use <code>ch -?</code> for more help.
cmd	Create a Command Prompt channel.
d	Dump the current kernel log.
f	Toggle detailed or abbreviated <code>tlist</code> (Windows process) info.
? or help	Display command help.
i	List all IP network numbers and their IP addresses.
i # ip sub gate	Set IP address, subnet, and gateway for an IP network number.
id	Display the Windows nPartition identification information.
k pid	Kill the given process.
l pid	Lower the priority of a process to the lowest possible.
lock	Lock access to Command Prompt channels.
m pid MB-allow	Limit the memory usage of a process to <i>MB-allow</i> .
p	Toggle paging the display.
r pid	Raise the priority of a process by one.
s	Display the current time and date (24 hour clock used).
s mm/dd/yyyy hh:mm	Set the current time and date (24 hour clock used).
t	Display <code>tlist</code> info (a list of Windows processes running on the nPartition).
restart	Restart the system immediately.
shutdown	Shutdown the system immediately. This puts the nPartition in a shutdown for reconfig (inactive) state. To boot the nPartition (make it active), use the <code>BO</code> command at the service processor Command menu.
crashdump	Crash the Windows system running on the nPartition. You must have crash dump enabled.

Accessing and Using the Service Processor

This section describes how to login to the service processor (MP or GSP) for a server complex.

You can connect to the service processor for a server complex by using the following methods:

- Connecting through the customer LAN port by using `telnet`, if login access through the customer LAN is enabled for the service processor.

On HP Superdome servers, the customer LAN hardware is labeled “Customer LAN”. On HP rp8400 servers it is “GSP LAN”. On HP rp7405/rp7410 servers it is the only LAN port on the core I/O.

Use `telnet` to open a connection with the service processor, then login by entering the account name and corresponding password.

- Connecting through the local RS-232 port using a direct serial cable connection.

On HP Superdome server hardware, the local RS-232 port is labeled “Local RS-232”. On HP rp8400 servers it is the “Local Console” port. On HP rp7405/rp7410 servers it is the 9-pin D-shaped connector (DB9) labeled “Console”.

- Connecting through the remote RS-232 port using external modem (dial-up) access, if remote modem access is configured.

On HP Superdome server hardware, the remote RS-232 port is labeled “Remote RS-232”. On HP rp8400 servers it is the “Remote Console” port. On HP rp7405/rp7410 servers it is the DB9 connector labeled “Remote”.

Example 4-1 Overview of a Service Processor Login Session

The following output shows a sample login session for a server whose service processor hostname is “hpsys-s”.

```
> telnet hpsys-s
Trying...
Connected to hpsys-s.rsn.hp.com.
Escape character is '^]'.
Local flow control off

MP login: Username
MP password:

                Welcome to the

                S Class 16K-A

                Management Processor

(c) Copyright 1995-2001 Hewlett-Packard Co., All Rights Reserved.

                Version 0.23

MP MAIN MENU:

    CO: Consoles
    VFP: Virtual Front Panel
    CM: Command Menu
    CL: Console Logs
    SL: Show chassis Logs
    HE: Help
    X: Exit Connection

MP>
```

Logging in to a Service Processor

This procedure connects to and logs in to the service processor (MP or GSP) for a server complex by using telnet to access the customer LAN.

If connecting through the local RS-232 port, skip Step 1 (instead establish a direct-cable connection) and begin with Step 2.

- Step 1.** Use the telnet command on a remote system to connect to the service processor for the server complex.

You can connect directly from the command line, for example:

```
telnet sdome-g
```

or run telnet first, and then issue the open command (for example, open sdome-g) at the telnet> prompt.

All telnet commands and escape options are supported while you are connected to the service processor.

- Step 2.** Login using your service processor user account name and password.

```
GSP login: Username
```

```
GSP password: Password
```

- Step 3.** Use the service processor menus and commands as needed and log out when done.

To log out, select the Exit Connection menu item from the Main menu (enter **x** at the GSP> prompt or MP> prompt).

You also can terminate a login session by issuing the telnet escape key sequence **^]** (type: **Control-right bracket**) and entering **close** at the telnet> prompt.

NOTE

If possible, you should log out of any consoles and menus before terminating your telnet session.

If accessing an OS on an nPartition, log out of the OS before exiting the console and service processor sessions. (Otherwise an open OS login session will remain available to any other service processor users.)

Using Service Processor Menus

The service processor (MP or GSP) has a set of menus that give you access to various commands, consoles, log files, and other features.

See “Navigating through Service Processor Menus” on page 136 for details on using these menus.

The following menus are available from the service processor Main menu (which is the menu you first access when logging in):

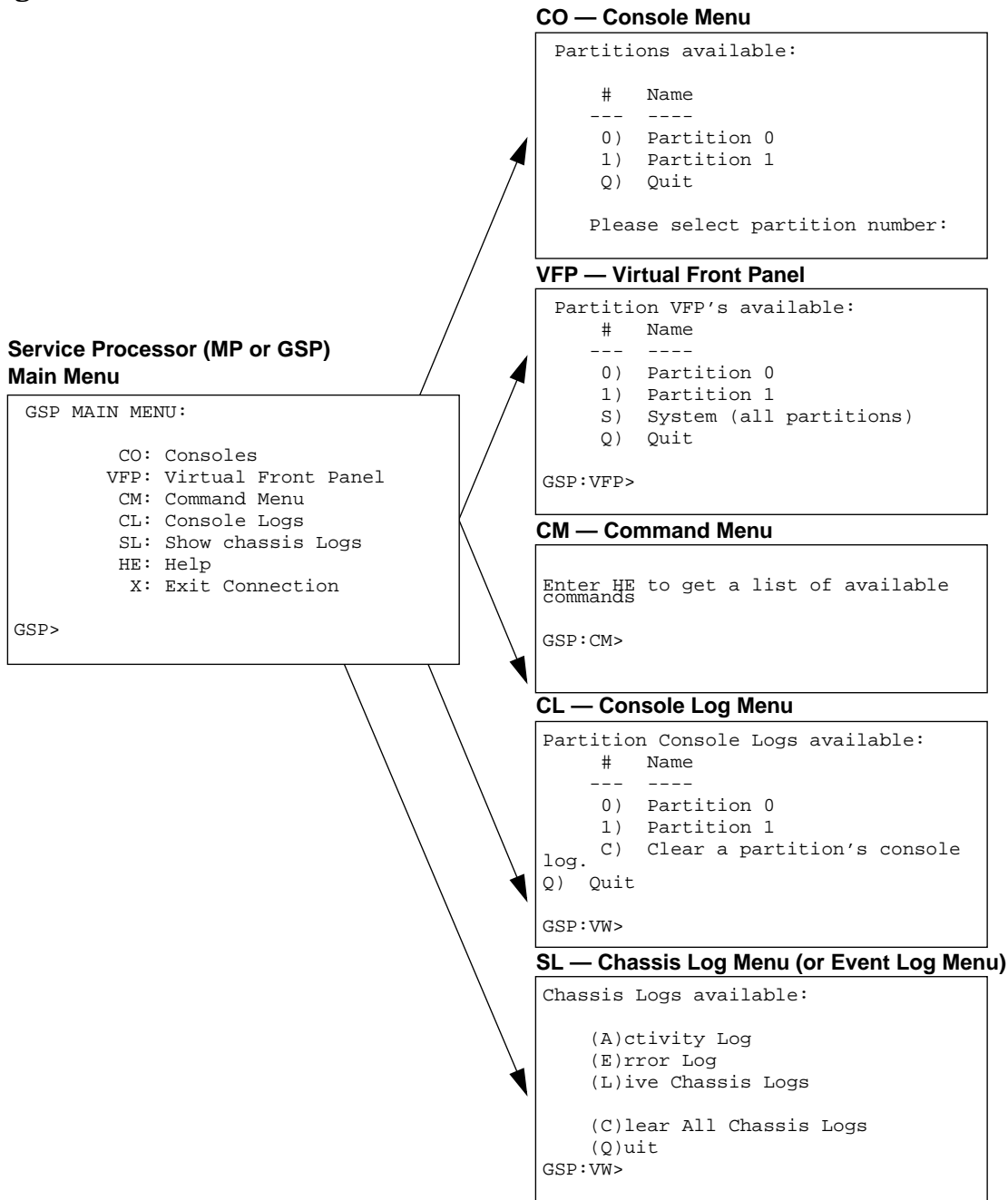
- Console Menu—Provides access to nPartition consoles for the server.
- Virtual Front Panel Menu—Provides a Virtual Front Panel for each nPartition (or for the entire server complex).
- Command Menu—Includes service, status, system access, and other commands.

- Console Log Viewer Menu—Allows access to the console logs for nPartitions.
- Chassis Log Viewer Menu or Event Log Viewer Menu—Allows access to the server chassis code logs (on HP 9000 servers with HP PA-8700 processors) or event logs (on servers based on the HP sx1000 chipset or HP sx2000 chipset). Chassis logs and event logs are functionally equivalent: they record system activities. However, event logs are more descriptive.
- Help Menu—Provides online help on a variety of service processor topics and on all service processor Command menu commands.

These menus provide a central point for managing a server complex outside of an operating system.

The service processor menus provide many tools and details not available elsewhere. More administration features also are available from the nPartition system boot environments (BCH or EFI), the nPartition tools, and various operating system commands.

Figure 4-3 Overview of Service Processor (MP or GSP) Menus



Navigating through Service Processor Menus

Figure 4-4 on page 138 shows the commands and options for returning to the service processor Main menu and for ending a service processor login session.

The following list also includes tips for navigating through service processor menus and using various menu features:

- **Control-b**
Exit current console, console log, chassis log, or Virtual Front Panel.

When accessing the Command menu, an nPartition console, any log files, or any Virtual Front Panel (VFP), you can exit and return to the Main menu by typing **^b (Control-b)**.

- **Q** (or lower-case **q**)

Exit or cancel current menu prompt.

Enter **Q** (or lower-case **q**) as response to any menu prompt to exit the prompt and return to the previous sub-menu.

You can do this throughout the service processor menus, including the console menus, various command menu prompts, and the log and VFP menus.

Note that, from the Command menu prompt (**GSP:CM>** or **MP:CM>**) you must enter **MA** (not **Q**) to return to the Main menu. However, you can enter **Q** or **q** to cancel any command.

- **Control-]**

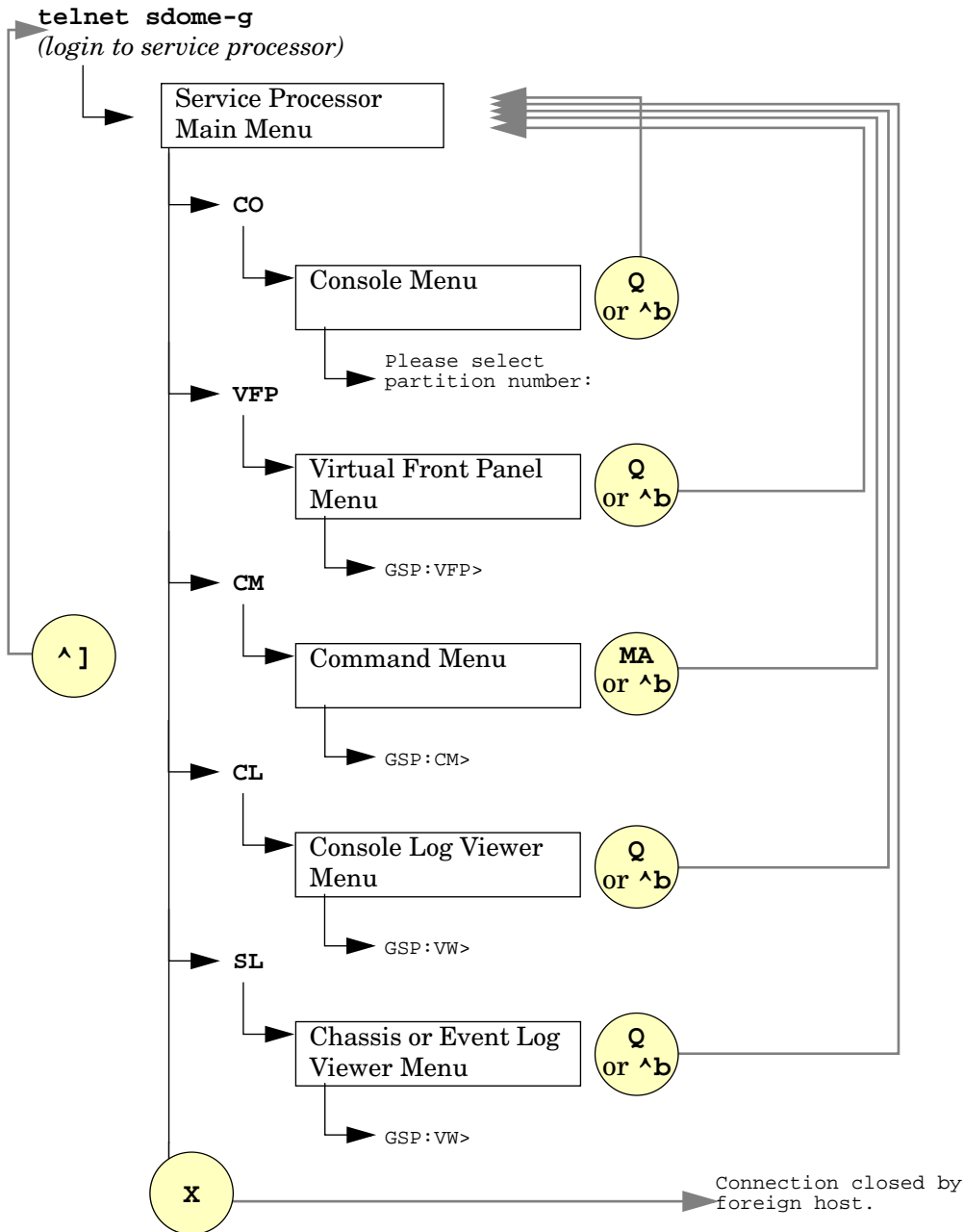
Escape the service processor connection and return to the telnet prompt.

At any time during your telnet connection to a service processor, you can type the **^]** (**Control-right bracket**) escape sequence.

This key sequence escapes back to the telnet prompt. When at the **telnet>** prompt you can use the following commands, among others: **?** (print telnet command help information), **close** (close the current connection), and **quit** (exit telnet).

To return to the service processor connection, type enter (or return) one or more times.

Figure 4-4 Navigating through Service Processor (MP or GSP) Menus



Network Configuration for a Service Processor

This gives an overview of the network settings for service processor (MP or GSP) hardware. These settings are used for connections to the service processor and are not used for HP-UX networking.

Details on configuring service processor networking are given in the service guide for each server.

The service processor utility hardware on HP Superdome servers has two network connections: the customer LAN and private LAN.

The service processor on other (non-Superdome) cell-based servers does not have a private LAN; only a

customer LAN connection is provided.

Features of service processor LANs are given in the following list.

- **Customer LAN for Service Processor**

The customer LAN is the connection for login access to the service processor menus, consoles, commands, and other features.

All cell-based servers have a customer LAN.

On HP Superdome servers, the customer LAN port is labeled “Customer LAN”. On HP rp8400 servers it is “GSP LAN”. On HP rp7405/rp7410 servers it is the only LAN connection on each board.

- **Private LAN for Service Processor (Superdome Only)**

The private LAN is the connection to the Superdome service support processor (SSP) workstation, also called the service management station (SMS).

Only Superdome servers have a private LAN. It typically is not used on the Superdome server models based on the HP sx1000 chipset or HP sx2000 chipset.

To list the current service processor network configuration, use the `LS` command. To configure service processor network settings, use the `LC` command from the Command menu. For a procedures, refer to the service guide for your server.

Viewing Console Logs

Each nPartition in a server complex has its own console log that stores a record of the most recent nPartition console activity.

To access the console log for an nPartition, enter **CL** from the service processor Main menu and select which nPartition console log you want to view. To exit the console log viewer, type **^b (Control-b)** to return to the Main menu.

When viewing an nPartition console log, type **P** to view the previous page of the console log, or type **N** (or **Enter**) to view the next page.

When you enter a console log viewer it displays the oldest data in the log first and allows you to page through the log to view the more recently recorded activity.

Each console log is a circular log file that records approximately 30 to 40 pages of data. All nPartition console activity is written to this log file, regardless of whether a user is connected to the nPartition console.

As a console log is written the oldest data in the log is overwritten by current data, as needed, so that the last 30 to 40 pages of console output always is available from the console log viewer.

Viewing Chassis Codes or Event Logs

The event log and chassis code viewers enables you to view chassis codes or event logs that are emitted throughout the entire server complex.

NOTE On HP 9000 servers with HP PA-8700 processors, the equivalent of event logs is chassis codes.

To enter the event log viewer enter **SL** at the service processor Main menu. To exit the viewer type **^b** (**Control-b**) to return to the Main menu.

Event logs are data that communicate information about system events from the source of the event to other parts of the server complex. Event log data indicates what event has occurred, when and where it happened, and its severity (the alert level).

All event logs pass from the event source through the service processor. The service processor takes any appropriate action and then reflects the event logs to all running nPartitions. If an nPartition is running event monitoring software, it may also take action based on the event logs (for example, sending notification e-mail).

System administrators, of course, may have interest in viewing various event logs—especially event logs that indicate failures or errors.

Hardware, software, and firmware events may emit event logs as a result of a failure or error, a major change in system state, or basic forward progress. For example: a fan failure, a machine check abort (MCA), the start of a boot process, hardware power on or off, and test completion all result in event logs being emitted.

NOTE The front panel attention LED for a cell-based server cabinet is automatically turned on when one or more event logs of alert level 2 or higher have not yet been viewed by the administrator. When this attention LED is on, entering the chassis log viewer turns the LED off.

You can remotely check the on/off status of this attention LED by using the **PS** command, **G** option, from the service processor Command menu.

On cell-based servers, event logs are recorded in the server complex activity log (for events of alert level 0 or alert level 1) or the error log (for events alert level 2 or higher).

```
GSP> SL
```

```
Chassis Logs available:
```

```
(A)ctivity Log
(E)rror Log
(L)ive Chassis Logs

(C)lear All Chassis Logs
(Q)uit
```

```
GSP:VW> L
```

```
Entering Live Log display
```

```
A)lert filter
C)ell filter
P)artition filter
U)nfiltered
V)iew format selection
^B to Quit
```

Current filter: ALERTS only

Log Viewing Options: Activity, Error, and Live Chassis Logs

When you enter the chassis log viewer by entering **SL** at the service processor (MP or GSP) Main menu, you can select from these viewers:

- **Activity Log Viewer**

Allows you to browse recorded event logs of alert level 0 or 1.

- **Error Log Viewer**

Allows you to browse recorded event logs of alert level 2 or higher.

- **Live Chassis Logs Viewer**

Displays event logs in real time as they are emitted.

By default, the live event log viewer has the Alert filter enabled, which causes it to display only the events of alert level 3 or higher.

To view all event logs in real-time, type **U** for the Unfiltered option.

You also can filter the live codes by cell (**C**) or nPartition (**P**). Cell filter: only display event logs emitted by a specific cell in the server complex. Partition filter: only display event logs emitted by hardware assigned to a specific nPartition.

When viewing event log logs, type **v** to change the display format. The viewers can show event logs in text format (**T**), keyword format (**K**), or raw hex format (**R**).

Virtual Front Panel (VFP) nPartition Views

The Virtual Front Panel (VFP) provides ways to monitor the boot or run status of each cell in an nPartition and of the nPartition itself. The VFP provides the sort of information typically displayed on the LCD of a non-partitionable server.

The VFP presents a real-time display of activity on the selected nPartition(s) and it automatically updates when cell and nPartition status change.

To access the VFP feature, enter **vfp** from the service processor Main menu. To exit the VFP, type **^b** (**Control-b**) to return to the Main menu.

When you access a Virtual Front Panel, you can either select the nPartition whose VFP you want to view or select the system VFP to view summary information for all nPartitions in the server complex.

```
E indicates error since last boot
  Partition 0 state      Activity
  -----
  Cell(s) Booting:    710 Logs

# Cell state           Activity
- -----
0 Early CPU selftest   Cell firmware test    232 Logs
1 Early CPU selftest   Processor test         230 Logs
2 Memory discovery     Physical memory test   242 Logs
```

```
GSP:VFP (^B to Quit) >
```

Command Reference for Service Processor Commands

Table 4-2 lists the commands available from the service processor command menu (the MP:CM> or GSP:CM> prompt).

The following categories of commands are available:

- “Service Commands — Service Processor (MP or GSP)” on page 144.
- “Status Commands — Service Processor (MP or GSP)” on page 144.
- “System and Access Configuration Commands — Service Processor (MP or GSP)” on page 145.

Some commands are restricted to users with Operator or Administrator authority. Also note that the available set of commands may differ depending on the utility revision level and server hardware model.

For details on these commands, use the help (HE: HeLp) feature at the service processor Main Menu. Enter the command name at the MP:HELP or GSP:HELP prompt for syntax, restrictions, and other information.

Table 4-2 Service Processor (MP or GSP) Command Reference

Command	Description
Service Commands — Service Processor (MP or GSP)	
Commands for general server complex administration and nPartition management.	
BO	Boot an nPartition past Boot is Blocked (BIB).
DF	Display FRU information of an entity.
MA	Return to the Main menu.
MR	Modem reset.
PCIOLOAD	Activate/deactivate a PCI card.
PE	Power entities on or off.
RE	Reset entity.
RR	Reset an nPartition for reconfiguration; the nPartition remain inactive, in the shutdown for reconfig state.
RS	Reset an nPartition.
TC	Send a TOC signal to an nPartition.
TE	Broadcast a message to all users of the MP Command Handler.
VM	Margin the voltage in a cabinet.
WHO	Display a list of MP connected users.
Status Commands — Service Processor (MP or GSP)	
Commands for displaying hardware and nPartition information.	
CP	Display nPartition cell assignments.

Table 4-2 Service Processor (MP or GSP) Command Reference (Continued)

Command	Description
HE	Display the list of available commands.
IO	Display IO chassis/cell connectivity.
LS	Display LAN connected console status.
MS	Display the status of the modem.
PS	Display detailed power and hardware configuration status.
SYSREV	Display revisions of all firmware entities in the complex.
System and Access Configuration Commands — Service Processor (MP or GSP)	
Commands for managing server complex accounts, security, and nPartition configuration.	
PARPERM	Restrict/unrestrict nPartition Reconfiguration Privilege.
PD	Modify default nPartition for this login session.
RL	Rekey Complex Profile locks (unlock Complex Profile).
SA	Display and set (enable/disable) MP remote access methods.
SO	Configure security options and access control (user accounts and passwords).
XD	MP diagnostics and reset.

Command Reference for EFI Shell Commands

Table 4-3 lists the commands supported by the EFI Shell interface on HP Integrity Superdome servers.

The EFI Shell is accessible from an nPartition console when the nPartition is in an active state but has not booted an operating system.

The following categories of commands are available:

- “Boot Commands — EFI Shell” on page 146.
- “Configuration Commands — EFI Shell” on page 146.
- “Device, Driver, and Handle Commands — EFI Shell” on page 147.
- “Filesystem Commands — EFI Shell” on page 148.
- “Memory Commands — EFI Shell” on page 148.
- “Shell Navigation and Other Commands — EFI Shell” on page 149.
- “Shell Script Commands / Programming Constructs — EFI Shell” on page 149.

For details on these commands, enter `help command` at the EFI shell prompt.

Table 4-3 EFI Shell Command Reference

Command	Description
Boot Commands — EFI Shell	
Commands related to nPartition booting.	
autoboot	Set/view autoboot timeout variable.
bcfg	Display/modify the driver/boot configuration.
boottest	Set/view BootTest bits.
dbprofile	Display/modify direct boot profiles for use by lanboot.
lanboot	Boot over the LAN.
reconfigreset	Reset the system (nPartition) for reconfiguration; the nPartition remains inactive, in the shutdown for reconfig state.
reset	Reset the system (nPartition).
search	Connect drivers for bootables devices.
Configuration Commands — EFI Shell	
Commands for changing and retrieving system (nPartition) information.	
acpiconfig	Set/view ACPI configuration mode.
cellconfig	Deconfigure/reconfigure cells. (Set cell use-on-next-boot values.)
cpuconfig	Deconfigure/reconfigure CPUs.
date	Display the current date or set the date of the system (nPartition).

Table 4-3 EFI Shell Command Reference (Continued)

Command	Description
dimconfig	Deconfigure/reconfigure memory (DIMMs).
err	Display/change the error level.
errdump	View/clear logs.
fru	View FRU data.
info	Display hardware information.
monarch	Set/view a monarch processor.
palproc	Make a PAL call.
romdrivers	Enable/disable PCI expansion ROM drivers.
rootcell	Set/view preferred root cells. (Set nPartition core cell choices.)
salproc	Make a SAL call.
tftp	Performs TFTP operation to a bootp/DHCP enabled Unix boot server.
time	Display the current time or set the time of the system (nPartition). EFI time is set and presented in GMT (Greenwich mean time).
variable	Save/restore specific EFI variables.
ver	Display the version information.
Device, Driver, and Handle Commands — EFI Shell	
Commands for managing devices, drivers, and handles.	
baud	View serial port com settings.
connect	Bind a driver to a device.
dblk	Hex dump of BlkIo devices.
devices	Display devices managed by EFI drivers.
devtree	Display tree of devices.
dh	Dump handle info.
disconnect	Disconnect driver(s) from device(s).
drivers	Display list of drivers.
drvcfg	Invoke the Driver Config Protocol.
drvdiag	Invoke the Driver Diagnostics Protocol.
guid	Dump known GUID IDs.
lanaddress	Display MAC address.
load	Load EFI drivers.

Table 4-3 EFI Shell Command Reference (Continued)

Command	Description
map	Map shortname to device path.
openinfo	Display the open protocols for given handle.
pci	Display PCI devices or PCI function configuration space.
reconnect	Reconnect driver(s) from a device.
unload	Unload a protocol image.
Filesystem Commands — EFI Shell	
Commands for managing files, directories, and attributes.	
attrib	Display/change the attributes of files/directories.
cd	Update/view the current directory.
comp	Compare the contents of two files.
cp	Copy one or more files/directories to another location.
edit	Edit an ASCII or UNICODE file in full screen.
eficompress	Compress infile and write to outfile.
efidecompress	Decompress infile and write to outfile.
hexedit	Edit a file, block device, or memory region using hex.
ls	Display a list of files and subdirectories in a directory.
mkdir	Create one or more directories.
mount	Mount a filesystem on a block device.
rm	Delete one or more files/directories.
setsize	Set the size of a file.
touch	Update time of file/directory with current time.
type	Display the contents of a file.
vol	Display volume information of the file system.
Memory Commands — EFI Shell	
Commands for listing and managing memory, EFI variables, and NVRAM details.	
default	Set the default NVRAM values.
dmem	Dump memory or memory mapped IO.
dmpstore	Display all EFI variables.
memmap	Display the memory map.
mm	Display/modify MEM/IO/PCI.

Table 4-3 EFI Shell Command Reference (Continued)

Command	Description
pdt	View/clear nPartition or cell memory page deallocation table (PDT).
Shell Navigation and Other Commands — EFI Shell	
Commands for basic EFI Shell navigation and customization.	
alias	Set/get alias settings.
cls	Clear the standard output with an optional background color.
exit	Exit EFI Shell environment.
getmtc	Display current monotonic counter value.
help or ?	Display help.
mode	Display the mode of the console output device.
set	Set/Get environment variable.
xchar	Turn on/off extended character features.
Shell Script Commands / Programming Constructs — EFI Shell	
EFI shell-script commands.	
echo	Echo message to stdout or toggle script echo.
else	Script-only: Use with IF THEN.
endfor	Script-only: Delimiter for FOR loop construct.
endif	Script-only: Delimiter for IF THEN construct.
for	Script-only: Loop construct.
goto	Script-only: Jump to label location in script.
if	Script-only: IF THEN construct.
input	Take user input and place in EFI variable.
pause	Script-only: Prompt to quit or continue.
stall	Stall the processor for some microseconds.

Command Reference for BCH Menu Commands

Table 4-4 lists the commands available from the Boot Console Handler (BCH) menus for an nPartition.

The BCH Menu is accessible from an nPartition console when the nPartition is in an active state but has not booted an operating system.

The following categories of commands are available:

- “General Commands — Boot Console Handler (BCH)” on page 150.
- “Main Menu Commands — Boot Console Handler (BCH)” on page 150.
- “Configuration Menu Commands — Boot Console Handler (BCH)” on page 151.
- “Information Menu Commands — Boot Console Handler (BCH)” on page 151.
- “Service Menu Commands — Boot Console Handler (BCH)” on page 152.

For details on these commands, use the help (HE) command. At any BCH menu enter **HE** *command* for details about the specified *command*, or enter **HE** for general help.

Table 4-4 Boot Console Handler (BCH) Command Reference

Command	Description
General Commands — Boot Console Handler (BCH)	
These BCH commands are available from all BCH menus.	
BOot [PRI HAA ALT <i>path</i>]	Boot from the specified path.
REBOOT	Restart nPartition.
RECONFIGRESET	Reset the nPartition to allow Complex Profile reconfiguration; the nPartition remains inactive, in the shutdown for reconfig state.
DISplay	Redisplay the current menu.
HElp [<i>menu</i> <i>command</i>]	Display help for the current menu or the specified <i>menu</i> or <i>command</i> .
Main Menu Commands — Boot Console Handler (BCH)	
Commands to find devices, set boot paths (PRI,HAA, ALT), and access other BCH menus.	
BOot [PRI HAA ALT <i>path</i>]	Boot from the specified path.
PAth [PRI HAA ALT] [<i>path</i>]	Display or modify a device boot path.
SEArch [ALL <i>cell</i> <i>path</i>]	Search for boot devices.
ScRoll [ON OFF]	Display or change scrolling capability.
COntfiguration	Access the Configuration Menu, which displays or sets boot values.

Table 4-4 Boot Console Handler (BCH) Command Reference (Continued)

Command	Description
INformation	Access the information menu, which displays hardware information.
SERvice	Access the Service Menu, which displays service commands.
Configuration Menu Commands — Boot Console Handler (BCH)	
Commands to display or set boot values.	
MAin	Return to the BCH Main Menu.
BootID [<i>cell</i> [<i>proc</i> [<i>bootid</i>]]]	Display or set Boot Identifier.
BootTimer [0-200]	Seconds allowed for boot attempt.
CELLConfig [<i>cell</i>] [ON OFF]	Configure or deconfigure the specified <i>cell</i> .
COreCell [<i>choice cell</i>]	Display or set core cell choices for the nPartition.
CPUconfig [<i>cell</i> [<i>cpu</i> [ON OFF]]]	Configure or deconfigure the processor (<i>cpu</i>) on the specified <i>cell</i> .
DataPrefetch [ENABLE DISABLE]	Display or set data prefetch behavior.
DEfault	Set the nPartition to predefined (default) values.
FastBoot [test][RUN SKIP]	Display or set boot tests execution (self tests).
KGMemory [<i>value</i>]	Display or set KGMemory requirement.
PathFlags [PRI HAA ALT] [<i>value</i>]	Display or set boot path flags (boot actions).
PD [<i>name</i>]	Display or set the nPartition name.
ResTart [ON OFF]	Set nPartition restart policy.
TIme [<i>cn:yr:mo:dy:hr:mn</i> : <i>ss</i>]	Read or set the real time clock, the local nPartition date/time setting. The BCH time is set and presented in GMT (Greenwich mean time).
Information Menu Commands — Boot Console Handler (BCH)	
Commands to display hardware information.	
MAin	Return to the BCH Main Menu.
ALL [<i>cell</i>]	Display all of the information available for the nPartition.
BootINfo	Display boot-related information.
CAche [<i>cell</i>]	Display cache information.

Table 4-4 Boot Console Handler (BCH) Command Reference (Continued)

Command	Description
ChipRevisions [<i>cell</i>]	Display revisions of major integrated circuits.
ComplexID	Display Complex information.
FabricInfo	Display Fabric information.
FRU [<i>cell</i>] [CPU MEM]	Display FRU information
FwrVersion [<i>cell</i>]	Display versions for PDC, ICM, and complex.
IO [<i>cell</i>]	Display I/O interface information.
MEemory [<i>cell</i>]	Display memory information.
PRocessor [<i>cell</i>]	Display processor information
Service Menu Commands — Boot Console Handler (BCH) Commands related to nPartition system service tasks.	
MAin	Return to the BCH Main Menu.
BATtery [<i>cell</i>]	Display cell battery status.
CLEARPIM [<i>cell</i>]	Clear the non-volatile processor internal memory (NVM PIM) data for the nPartition.
DimmDealloc [<i>cell</i>] [<i>dim</i>] [ON OFF]	Display, deallocate, or re-allocate the DIMM identified by <i>dim</i> in cell number specified by <i>cell</i> .
ErrorLog [<i>cell</i>][MEMORY IO FABRIC CELL]	Display error log information.
LanAddress	Display Core I/O LAN station address.
MemRead <i>address</i> [<i>len</i>]	Read memory locations scope of nPartition.
PDT [<i>cell</i>] [CLEAR]	Display or clear the memory page deallocation table (PDT).
PIM [<i>cell</i> [<i>proc</i>]] [HPMC LPMC TOC]	Display the processor internal memory (PIM) data for the nPartition.
SCSI [<i>path</i> [INIT RATE TERM WIDTH DEFAULT [<i>id</i>]]]	Display or set SCSI device parameters.

5 Booting and Resetting nPartitions

This chapter introduces nPartition system boot and reset concepts, configuration options, and procedures for booting and resetting nPartitions.

This chapter covers boot details for HP-UX, HP OpenVMS I64, Microsoft® Windows® Server 2003, Red Hat Enterprise Linux 3, and the SuSE Linux Enterprise Server 9 operating system.

Differences in the nPartition boot process on PA-RISC systems and Intel® Itanium®-based systems also are addressed in this chapter.

CAUTION An nPartition on an HP Integrity server cannot boot HP-UX virtual partitions when in nPars boot mode. Likewise, an nPartition on an HP Integrity server cannot boot an operating system outside of a virtual partition when in vPars boot mode.

For details, refer to “Boot Modes on HP Integrity nPartitions: nPars and vPars Modes” on page 162.

NOTE For details on boot and reset of nPartitions running vPars software, refer to *Installing and Managing HP-UX Virtual Partitions (vPars)*.

Overview of nPartition System Booting

This section provides an overview of the nPartition system boot process for HP 9000 servers and HP Integrity servers.

On cell-based HP servers, system resources are configured into one or more nPartitions. Each nPartition includes the cells (with processors and memory) assigned to it and the I/O that is connected to those cells.

An nPartition can boot and reboot independently of any other nPartitions in the same server complex. Each nPartition runs its own firmware and has its own system boot environment. nPartitions provide hardware and software fault isolation: a reset, TOC, or MCA in one nPartition does not affect any other nPartition in most cases.

Figure 5-1 shows an overview of the boot process on HP 9000 servers (PA-RISC systems). Figure 5-2 shows an overview of the boot process on HP Integrity servers (Itanium® 2-based systems). Each nPartition is effectively an independent system that follows the boot processes outlined in Figure 5-1 and Figure 5-2.

Also refer to “Boot Process for Cells and nPartitions” on page 53 for details.

Figure 5-1 Boot Overview for HP 9000 Servers

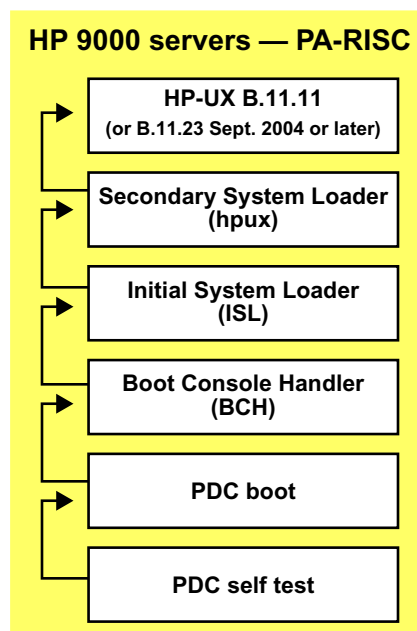
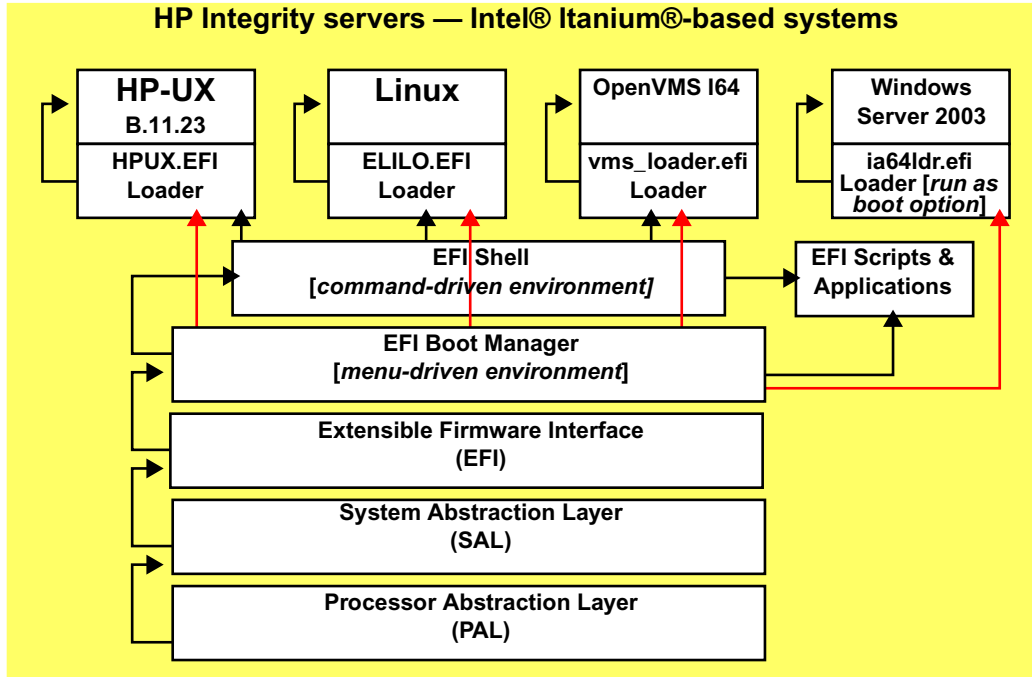


Figure 5-2 Boot Overview for HP Integrity Servers



Boot Process Differences for nPartitions on HP 9000 servers and HP Integrity servers

The following lists, HP Integrity Server Booting and HP 9000 Server Booting, describe system boot features and differences on HP Integrity and HP 9000 servers.

HP Integrity Server Booting

This list describes system boot features on cell-based HP Integrity servers.

- The nPartition system boot environment is the Extensible Firmware Interface (EFI): the EFI Boot Manager menu and the EFI Shell.
- The autoboot process is configured by the EFI autoboot setting and the order of items in the boot options list.

The boot options list can include:

- First boot option: configured using the `setboot -p...` or `parmodify -b...` command.
- Second boot option: configured using the `setboot -h...` or `parmodify -s...` command
- Third boot option: configured using the `setboot -a...` or `parmodify -t...` command.
- Each operating system has its own OS loader.
 - The HP-UX B.11.23 OS loader is `HPUX.EFI`, which supports `hpux (1M)` loader options. You can issue `hpux` loader commands from the `HPUX>` prompt.
 - The HP OpenVMS I64 loader is `vms_loader.efi`.
 - The Microsoft® Windows® loader is `ia64ldr.efi` and it is invoked only from the EFI Boot Manager.

Chapter 5 Booting and Resetting nPartitions

Overview of nPartition System Booting

— The loader for Red Hat Enterprise Linux 3 and SuSE Linux Enterprise Server 9 is `ELILO.EFI`.

You can issue ELILO loader commands from the “`ELILO boot`” prompt.

- The EFI system boot environment includes an ACPI configuration setting that must be set properly for the OS being booted: either HP-UX B.11.23, OpenVMS I64, Windows, or Linux. For details see “ACPI Configuration Value—HP Integrity Server OS Boot” on page 160.

HP 9000 Server Booting

This list describes system boot features on cell-based HP 9000 servers.

- The nPartition system boot environment is the Boot Console Handler (BCH).
- The autoboot process is configured using boot device paths (PRI, HAA, ALT) and path flags.
 - PRI boot path: configured using the `setboot -p...` or `parmodify -b...` command.
 - HAA boot path: configured using the `setboot -h...` or `parmodify -s...` command
 - ALT boot path: configured using the `setboot -a...` or `parmodify -t...` command.
- The HP-UX B.11.11 OS loaders are `ISL` and `hpux`. Issue commands from the `ISL>` prompt.

Types of Booting and Resetting for nPartitions

HP cell-based servers provide two special types of reboot and reset for managing nPartitions: performing a reboot for reconfig, and performing a shutdown for reconfig.

The following list summarizes all types of booting, rebooting, and resetting that are supported for HP nPartition systems. See the Reboot for Reconfig and Shutdown for Reconfig State items for a discussion of these nPartition-specific boot processes.

NOTE You can perform the Windows shutdown tasks either by using the shutdown command or by using the **Start** → **Shut Down** action.

- **Reboot**

A reboot shuts down the operating system and reboots the nPartition. On HP 9000 systems, only the active cells in the nPartition are reset. On HP Integrity systems, all cells are reset.

To perform a standard reboot of an nPartition use the HP-UX `shutdown -r` command, the Windows `shutdown /r` command, the Linux `shutdown -r time` command, or the OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot.

- **Halt**

A halt shuts down the operating system, halts all processing on the nPartition, and does not reboot.

To halt the operating system use the HP-UX `shutdown -h` command.

To reboot an nPartition that was halted from HP-UX use the `RS` command from the service processor Command menu.

Halting the system is supported only on HP 9000 servers. On HP Integrity servers the effect of the `shutdown -h` command or its Windows and Linux equivalents is to perform a shutdown for reconfig (see Shutdown for Reconfig State in this list). On HP OpenVMS servers, shutting down without rebooting halts OpenVMS but does not perform a shutdown for reconfig.

- **Reset**

A reset resets the nPartition immediately. On HP 9000 systems, only the active cells in the nPartition are reset. On HP Integrity systems all cells are reset.

You can reset an nPartition using the `REBOOT` command from the BCH interface, the `reset` command from the EFI Shell, or the `RS` command from the service processor Command menu.

The `RS` command does not check whether the specified nPartition is in use or running an operating system—be certain to correctly specify the nPartition.

NOTE On HP Integrity servers you should reset an nPartition only after all self tests and partition rendezvous have completed. For example, when the nPartition is inactive (all cells are at BIB) or is at EFI.

- **Boot an nPartition from the Service Processor (GSP or MP)**

A boot initiated from the service processor boots an inactive nPartition past the shutdown for reconfig state to allow it to become active.

To boot an inactive nPartition, use the `BO` command from the service processor Command menu.

The cells assigned to the nPartition proceed past boot-is-blocked (BIB), rendezvous, and the nPartition boots to the system boot environment (BCH or EFI).

- **Reboot for Reconfig**

A reboot for reconfig shuts down the operating system, resets all cells assigned to the nPartition, performs any nPartition reconfigurations, and boots the nPartition back to the system boot environment (BCH or EFI).

To perform a reboot for reconfig of the local nPartition, use the HP-UX `shutdown -R` command, Windows `shutdown /r` command, or the Linux `shutdown -r time` command. To perform a reboot for reconfig from OpenVMS 8.2-1 running on an nPartition, issue `@SYS$SYSTEM:SHUTDOWN.COM` from OpenVMS, and then enter **Yes** at the “Should an automatic system reboot be performed” prompt.

All cells—including any inactive cells and all newly added or deleted cells—reset and the nPartition is reconfigured as needed. All cells with a “y” use-on-next-boot setting participate in partition rendezvous and synchronize to boot as a single nPartition.

After you assign a cell to an nPartition, or remove an active cell from an nPartition, you can perform a reboot for reconfig of the nPartition to complete the cell addition or removal.

If an nPartition is configured to boot an operating system automatically, it can do so immediately following a reboot for reconfig.

- **Shutdown for Reconfig State**

Putting an nPartition into the shutdown for reconfig state involves shutting down the operating system (as required), resetting all cells assigned to the nPartition, performing any nPartition reconfigurations, and keeping all cells at a boot-is-blocked (BIB) state, thus making the nPartition and all of its cells inactive.

On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the OS shutdown for reconfig behavior for each nPartition to either power off hardware or keep cells at BIB. See “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161 for details.

To put an nPartition into the shutdown for reconfig state use the `shutdown -R -H` HP-UX command, the `shutdown /s` Windows command, or the Linux `shutdown -h time` command. To perform a shutdown for reconfig of an nPartition running OpenVMS I64: first issue `@SYS$SYSTEM:SHUTDOWN.COM` from OpenVMS and enter **No** at the “Should an automatic system reboot be performed” prompt, then access the MP and, from the MP Command Menu, issue the `RR` command and specify the nPartition that is to be shutdown for reconfig.

From system firmware, to put an nPartition into the shutdown for reconfig state use the `RECONFIGRESET` command from the BCH interface, the `reconfigreset` command from the EFI Shell, or the `RR` command from the service processor Command menu.

To make an nPartition boot past shutdown for reconfig, use either the `BO` command or the `PE` command from the service processor Command menu.

- For an inactive nPartition whose cells are at BIB, use the `BO` command from the service processor Command menu. The `BO` command makes the nPartition active by allowing its cells to boot past BIB, rendezvous, and boot to the system boot environment (BCH or EFI) and, if configured, automatically boot an operating system.
- For an nPartition whose cells have been powered off, use the `PE` command to power on the nPartition hardware.

- **TOC: Transfer-of-Control Reset**

When you initiate a transfer-of-control reset, the service processor immediately performs a TOC reset of the specified nPartition, which resets the nPartition and allows a crash dump to be saved.

If crash dump is configured for an OS on an nPartition, then when you TOC the nPartition while it is running the OS, the nPartition performs a crash dump and lets you select the type of dump.

To perform a TOC reset, use the TC command from the service processor Command menu. HP nPartition systems do not have TOC buttons on the server cabinet hardware.

From the Windows SAC, you can initiate a crash dump by issuing the `crashdump` command at the `SAC>` prompt

From HP OpenVMS I64, you can cause OpenVMS to dump system memory and then halt at the `P00>>` prompt by issuing the `RUN SYSSYSTEM:OPCRASH` command. To reset the nPartition following `OPCRASH`, access the nPartition console and press any key to reboot.

System Boot Configuration Options

This section briefly discusses the system boot options you can configure on cell-based servers. You can configure boot options that are specific to each nPartition in the server complex.

HP 9000 Boot Configuration Options

On cell-based HP 9000 servers the configurable system boot options include boot device paths (PRI, HAA, and ALT) and the autoboot setting for the nPartition. To set these options from HP-UX, use the `setboot` command. From the BCH system boot environment, use the `PATH` command at the BCH Main menu to set boot device paths, and use the `PATHFLAGS` command at the BCH Configuration menu to set autoboot options. For details issue `HELP command` at the appropriate BCH menu, where *command* is the command for which you want help.

HP Integrity Boot Configuration Options

On cell-based HP Integrity servers you must properly specify the ACPI configuration value, which affects the OS startup process and on some servers can affect the shutdown behavior. You also can configure boot device paths and the autoboot setting for the nPartition. Details are given in the following list.

- **Boot Options List**

The boot options list is a list of loadable items available for you to select from the EFI Boot Manager menu. Ordinarily the boot options list includes the EFI Shell and one or more operating system loaders.

The following example includes boot options for HP OpenVMS, Microsoft Windows, HP-UX, and the EFI Shell. The final item in the EFI Boot Manager menu, the Boot Configuration menu, is not a boot option. The Boot Configuration menu allows system configuration through a maintenance menu.

```
EFI Boot Manager ver 1.10 [14.61] Please select a boot option
```

```
HP OpenVMS 8.2-1
EFI Shell [Built-in]
Windows Server 2003, Enterprise
HP-UX Primary Boot: 4/0/1/1/0.2.0
Boot Option Maintenance Menu
```

```
Use ^ and v to change option(s). Use Enter to select an option
```

NOTE In some versions of EFI, the **Boot Configuration** menu is listed as the **Boot Option Maintenance** menu.

To manage the boot options list for each system use the EFI Shell, the **EFI Boot Configuration** menu, or operating system utilities.

At the EFI Shell, the `bcfg` command supports listing and managing the boot options list for all operating systems except Microsoft Windows. On HP Integrity systems with Windows installed the `\MSUtil\nvrboot.efi` utility is provided for managing Windows boot options from the EFI Shell. Likewise on HP Integrity systems with OpenVMS installed the `\efi\vms\vms_bcfg.efi` and `\efi\vms\vms_show` utilities are provided for managing OpenVMS boot options.

The **EFI Boot Configuration** menu provides the **Add a Boot Option**, **Delete Boot Option(s)**, and **Change Boot Order** menu items. (If you must add an EFI Shell entry to the boot options list, use this method.)

Operating system utilities for managing the boot options list include the HP-UX `setboot` command and the HP OpenVMS `@SYS$MANAGER:BOOT_OPTIONS.COM` command.

The OpenVMS I64 installation and upgrade procedures assist you in setting up and validating a boot option for your system disk. HP recommends that you allow the procedure to do this. Alternatively, you can use the `@SYS$MANAGER:BOOT_OPTIONS.COM` command (also referred to as the OpenVMS I64 Boot Manager utility) to manage boot options for your system disk. The OpenVMS I64 Boot Manager (`BOOT_OPTIONS.COM`) utility is a menu-based utility and is easier to use than EFI. To configure OpenVMS I64 booting on Fibre Channel devices, you must use the OpenVMS I64 Boot Manager utility (`BOOT_OPTIONS.COM`). For more information on this utility and other restrictions, refer to the *HP OpenVMS for Integrity Servers Upgrade and Installation Manual*.

For details refer to the following sections.

- To set HP-UX boot options refer to “Adding HP-UX to the Boot Options List” on page 182.
- To set OpenVMS boot options refer to “Adding HP OpenVMS to the Boot Options List” on page 194.
- To set Windows boot options refer to “Adding Microsoft Windows to the Boot Options List” on page 199.
- To set Linux boot options refer to “Adding Linux to the Boot Options List” on page 204.

• **Autoboot Setting**

You can configure the autoboot setting for each nPartition either by using the `autoboot` command at the EFI Shell, or by using the **Set Auto Boot TimeOut** menu item at the **EFI Boot Option Maintenance** menu.

To set autoboot from HP-UX, use the `setboot` command.

• **ACPI Configuration Value—HP Integrity Server OS Boot**

On cell-based HP Integrity servers you must set the proper ACPI configuration for the OS that will be booted on the nPartition.

To check the ACPI configuration value, issue the `acpiconfig` command with no arguments at the EFI Shell.

To set the ACPI configuration value, issue the `acpiconfig value` command at the EFI Shell, where `value` is either `default`, `windows`, or `single-pci-domain`. Then reset the nPartition by issuing the `reset` EFI Shell command for the setting to take effect.

The ACPI configuration settings for the supported OSes are in the following list.

— **HP-UX ACPI Configuration: default**

On cell-based HP Integrity servers, to boot or install the HP-UX OS, you must set the ACPI configuration value for the nPartition to `default`.

For details refer to “ACPI Configuration for HP-UX Must Be default” on page 184.

— **HP OpenVMS I64 ACPI Configuration: default**

On cell-based HP Integrity servers, to boot or install the HP OpenVMS I64 OS, you must set the ACPI configuration value for the nPartition to `default`.

For details refer to “ACPI Configuration for HP OpenVMS I64 Must Be default” on page 196.

— **Windows ACPI Configuration: windows**

On cell-based HP Integrity servers, to boot or install the Windows OS, you must set the ACPI configuration value for the nPartition to `windows`.

For details refer to “ACPI Configuration for Windows Must Be windows” on page 201.

— **Red Hat Enterprise Linux ACPI Configuration: single-pci-domain**

On cell-based HP Integrity servers, to boot or install the Red Hat Enterprise Linux OS, you must set the ACPI configuration value for the nPartition to `single-pci-domain`.

For details refer to “ACPI Configuration for Red Hat Enterprise Linux Must Be single-pci-domain” on page 206.

— **SuSE Linux Enterprise Server ACPI Configuration: single-pci-domain**

On cell-based HP Integrity servers, to boot or install the SuSE Linux Enterprise Server OS, you must set the ACPI configuration value for the nPartition to `single-pci-domain`.

For details refer to “ACPI Configuration for SuSE Linux Enterprise Server Must Be single-pci-domain” on page 207.

• **ACPI Softpowerdown Configuration—OS Shutdown Behavior**

On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the nPartition behavior when an OS is shut down and halted. The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state). The normal OS shutdown behavior on these servers depends on the ACPI configuration for the nPartition.

You can run the `acpiconfig` command with no arguments to check the current ACPI configuration setting; however, softpowerdown information is displayed only when different from normal behavior.

To change the nPartition behavior when an OS is shut down and halted, use either the `acpiconfig enable softpowerdown` EFI Shell command or the `acpiconfig disable softpowerdown` command, and then reset the nPartition to make the ACPI configuration change take effect.

— **acpiconfig enable softpowerdown**

When set on HP rx7620, rx7640, rx8620, and rx8640 servers, `acpiconfig enable softpowerdown` causes nPartition hardware to be powered off when the OS issues a shutdown for reconfig command (for example, `shutdown -h` or `shutdown /s`).

This is the normal behavior on HP rx7620, rx7640, rx8620, and rx8640 servers with a windows ACPI configuration setting.

When softpowerdown is enabled on HP rx7620, rx7640, rx8620, and rx8640 servers, if one nPartition is defined in the server, then halting the OS powers off the server cabinet including all cells and I/O chassis. On HP rx7620, rx7640, rx8620, and rx8640 servers with multiple nPartitions, halting the OS from an nPartition with softpowerdown enabled causes only the resources on the local nPartition to be powered off.

To power on hardware that has been powered off, use the `PE` command at the management processor Command menu.

- **acpiconfig disable softpowerdown**

When set on HP rx7620, rx7640, rx8620, and rx8640 servers, `acpiconfig disable softpowerdown` causes nPartition cells to remain at a boot-is-blocked state when the OS issues a shutdown for reconfig command (for example, `shutdown -h` or `shutdown /s`). In this case an OS shutdown for reconfig makes the nPartition inactive.

This is the normal behavior on HP rx7620, rx7640, rx8620, and rx8640 servers with an ACPI configuration setting of `default` or `single-pci-domain`.

To make an inactive nPartition active, use the management processor `BO` command to boot the nPartition past the boot-is-blocked state.

- **Boot Modes on HP Integrity nPartitions: nPars and vPars Modes**

On cell-based HP Integrity servers, each nPartition can be configured in either of two boot modes:

- **nPars Boot Mode**

In nPars boot mode, an nPartition is configured to boot any single operating system in the standard environment. When an nPartition is in nPars boot mode, it cannot boot the vPars monitor and therefore does not support HP-UX virtual partitions.

- **vPars Boot Mode**

In vPars boot mode, an nPartition is configured to boot into the vPars environment. When an nPartition is in vPars boot mode, it can only boot the vPars monitor and therefore it only supports HP-UX virtual partitions and it does not support booting HP OpenVMS I64, Microsoft Windows, or other operating systems. On an nPartition in vPars boot mode, HP-UX can boot only within a virtual partition (from the vPars monitor) and cannot boot as a standalone, single operating system in the nPartition.

CAUTION An nPartition on an HP Integrity server cannot boot HP-UX virtual partitions when in nPars boot mode. Likewise, an nPartition on an HP Integrity server cannot boot an operating system outside of a virtual partition when in vPars boot mode.

To check or set the boot mode for an nPartition on a cell-based HP Integrity server, use any of the following tools as appropriate. Refer to *Installing and Managing HP-UX Virtual Partitions (vPars)*, Sixth Edition, for details, examples, and restrictions.

- `parconfig` EFI shell command

The `parconfig` command is a built-in EFI shell command. Refer to the `help parconfig` command for details.

- `\EFI\HPUX\vpconfig` EFI shell command

The `vpconfig` command is delivered in the `\EFI\HPUX` directory on the EFI system partition of the disk where HP-UX virtual partitions has been installed on a cell-based HP Integrity server. For usage details, enter the `vpconfig` command with no options.

- `vpasenv` HP-UX command

On cell-based HP Integrity servers only, the `vpasenv` HP-UX command is installed on HP-UX 11iv2 (B.11.23) systems that have the HP-UX virtual partitions software. Refer to *vpasenv* (1m) for details.

NOTE On HP Integrity servers, nPartitions that do not have the `parconfig` EFI shell command do not support virtual partitions and are effectively in nPars boot mode.

HP recommends that you do not use the `parconfig` EFI shell command and instead use the `\EFI\HPUX\vpconfig` EFI shell command to manage the boot mode for nPartitions on cell-based HP Integrity servers.

Refer to *Installing and Managing HP-UX Virtual Partitions (vPars)*, Sixth Edition, for details.

Tools for Booting nPartitions

The tools for booting nPartitions and configuring related settings are:

- **Service Processor (MP or GSP) Menus**
Service processor menus provide a complex-wide service interface that can allow access to all hardware and nPartitions.
See “Command Reference for Service Processor Commands” on page 144.
- **EFI Boot Manager and EFI Shell**
On HP Integrity servers only, the EFI (Extensible Firmware Interface) Boot Manager and Shell are the methods for interacting with an nPartition before it has booted an operating system.
See “Command Reference for EFI Shell Commands” on page 146.
- **Boot Console Handler (BCH) Menu Commands**
On PA-RISC servers, the BCH interface is the method for interacting with an nPartition before it has booted HP-UX.
See “Command Reference for BCH Menu Commands” on page 150.
- **nPartition Commands**
HP nPartition commands allow you to configure, manage, and monitor nPartitions and hardware within a server complex.
The Enhanced nPartition Commands also can remotely manage complexes based on the HP sx1000 chipset or HP sx2000 chipset.
See “Commands for Configuring nPartitions” on page 34 for details.
- **Partition Manager (/opt/parmgr/bin/parmgr)**
Partition Manager provides a graphical interface for managing and monitoring nPartitions and hardware within a server complex.
See “Partition Manager” on page 38.

Task Summaries for nPartition Boot and Reset

Table 5-1 describes the main nPartition boot and reset tasks and provides brief summaries and references for detailed procedures.

You can perform the nPartition boot tasks in Table 5-1 using various tools, including the service processor (MP or GSP), Boot Console Handler (BCH, available only on PA-RISC servers), Extensible Firmware Interface (EFI, available only on HP Integrity servers), HP-UX commands, or Partition Manager (/opt/parmgr/bin/parmgr).

See “Tools for Booting nPartitions” on page 164 for details.

Table 5-1 nPartition Boot and Reset Task Summaries

Task	Summary
Troubleshooting Boot Problems	This section has tips for resolving common nPartition boot issues. See “Troubleshooting Boot Problems” on page 171.
Accessing nPartition Console and System Boot Interfaces	Use the service processor Console Menu (CO) to access the BCH or EFI system boot environment for an nPartition. See “Accessing nPartition Console and System Boot Interfaces” on page 173.
Monitoring nPartition Boot Activity	Use the vFP option from the service processor Main Menu to access a Virtual Front Panel for monitoring the boot status of an nPartition. See “Monitoring nPartition Boot Activity” on page 176.
Finding Bootable Devices	<ul style="list-style-type: none"> BCH Menu: <code>SEARCH</code> command. EFI Shell: <code>map</code> command. See “Finding Bootable Devices” on page 178.
Performing a Transfer of Control Reset	CAUTION: Under normal operation you shut down the operating system before issuing a TOC reset. <ul style="list-style-type: none"> Service Processor (MP or GSP): <code>TC</code> command. See “Performing a Transfer of Control Reset” on page 180.
Booting HP-UX	<ul style="list-style-type: none"> BCH Menu: <code>BOOT</code> command. EFI Boot Manager: select an item from the boot options list. EFI Shell: access the EFI System Partition (for example <code>fs0:</code>) for a root device and enter <code>HPUX</code> to invoke the loader. See “Booting HP-UX” on page 183. This section also covers booting HP-UX in single-user mode and LVM-maintenance mode.

Table 5-1 nPartition Boot and Reset Task Summaries (Continued)

Task	Summary
Shutting Down HP-UX	<ul style="list-style-type: none"> Issue the <code>/sbin/shutdown</code> command with the desired options, such as <code>-r</code> to shut down and reboot automatically, or <code>-h</code> to shut down and halt the system. The <code>-R</code> and <code>-H</code> options to <code>shutdown</code> and <code>reboot</code> are used when performing nPartition reconfigurations; see the Reboot for Reconfig and Shutdown for Reconfig details in this table. <p>See “Shutting Down HP-UX” on page 192.</p>
Booting HP OpenVMS	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> EFI Boot Manager: select an item from the boot options list. EFI Shell: access the EFI System Partition (for example <code>fs0:</code>) for a root device and enter <code>vms_loader</code> to invoke the loader. <p>See “Booting HP OpenVMS” on page 196.</p>
Shutting Down HP OpenVMS	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> At the OpenVMS command line issue the <code>@SYS\$SYSTEM:SHUTDOWN</code> command and specify the shutdown options in response to the prompts given. <p>See “Shutting Down HP OpenVMS” on page 197.</p>
Booting Microsoft Windows	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> EFI Boot Manager: select an item from the boot options list. (Windows does not support being invoked from the EFI Shell.) <p>See “Booting Microsoft Windows” on page 201.</p>
Shutting Down Microsoft Windows	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> Issue the <code>shutdown</code> command with the desired options, such as <code>/r</code> to shut down and reboot automatically, <code>/s</code> to shut down and halt (make the nPartition inactive), or <code>/a</code> to abort a system shutdown. <p>You also can select the Start → Shut Down action and either choose Restart or choose Shut down from the pull-down menu.</p> <ul style="list-style-type: none"> The <code>/r</code> and <code>/s</code> options to <code>shutdown</code> also are used when performing nPartition reconfigurations; see the Reboot for Reconfig and Shutdown for Reconfig details in this table. <p>See “Shutting Down Microsoft Windows” on page 202.</p>
Booting Red Hat Enterprise Linux	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> EFI Boot Manager: select an item from the boot options list. EFI Shell: access the EFI System Partition (for example <code>fs0:</code>) for a root device and enter <code>ELILO</code> to invoke the loader. <p>See “Booting Red Hat Enterprise Linux” on page 206.</p>

Table 5-1 nPartition Boot and Reset Task Summaries (Continued)

Task	Summary
Booting SuSE Linux Enterprise Server	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> • EFI Boot Manager: select an item from the boot options list. • EFI Shell: access the EFI System Partition (for example <code>fs0:</code>) for a root device and enter ELILO to invoke the loader. <p>See “Booting SuSE Linux Enterprise Server” on page 207.</p>
Shutting Down Linux	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> • Issue the <code>/sbin/shutdown</code> command with the desired options, such as <code>-r</code> to shut down and reboot automatically, or <code>-h</code> to shut down and halt the system. <p>You must include the required <i>time</i> argument to specify when the operating system shutdown is to occur.</p> <p>See “Shutting Down Linux” on page 208.</p>
Rebooting and Resetting nPartitions	<ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>RS</code> command; under normal operation you first shut down the operating system. <p>On HP Integrity servers you should reset an nPartition only after all self tests and partition rendezvous have completed.</p> <ul style="list-style-type: none"> • BCH Menu: <code>REBOOT</code> command. • EFI Boot Manager: Boot Option Maintenance —> Cold Reset. • EFI Shell: <code>reset</code> command. • HP-UX: <code>/sbin/shutdown</code> or <code>/usr/sbin/reboot</code> command. • OpenVMS: <code>@SYS\$SYSTEM:SHUTDOWN</code> command and enter Yes at the “Should an automatic system reboot be performed” prompt. • Windows: <code>shutdown /r</code> command or the Start —> Shut Down action and Restart pull-down menu option. • Linux: <code>/sbin/shutdown</code> command. You must include the required <i>time</i> argument to specify when the shutdown is to occur. <p>See “Rebooting and Resetting nPartitions” on page 210.</p>
Performing a Reboot for Reconfig	<p>NOTE: Only supported for cell-based HP servers.</p> <ul style="list-style-type: none"> • HP-UX: <code>/sbin/shutdown -R</code> command. • OpenVMS: <code>@SYS\$SYSTEM:SHUTDOWN</code> command and enter Yes at the “Should an automatic system reboot be performed” prompt. • Windows: <code>shutdown /r</code> command or the Start —> Shut Down action and Restart pull-down menu option. • Linux: <code>/sbin/shutdown -r time</code> command. You must include the <i>time</i> argument to specify when the shutdown is to occur. <p>See “Performing a Reboot for Reconfig” on page 215.</p>

Table 5-1 nPartition Boot and Reset Task Summaries (Continued)

Task	Summary
Shutting Down to a Shutdown for Reconfig (Inactive) State	<p>NOTE: Only supported for cell-based HP servers.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): RR command; under normal operation you first shut down the operating system. • BCH Menu: RECONFIGRESET command. • EFI Shell: reconfigreset command. • HP-UX: /sbin/shutdown -R -H command. • OpenVMS: @SYSS\$SYSTEM: SHUTDOWN command and enter No at the “Should an automatic system reboot be performed” prompt, then at the service processor (MP or GSP) Command menu enter the RR command and specify the nPartition. • Windows: shutdown /s command or the Start → Shut Down action and Shut down pull-down menu option. • Linux: /sbin/shutdown -h <i>time</i> command. You must include the <i>time</i> argument to specify when the shutdown is to occur. <p>See “Shutting Down to a Shutdown for Reconfig (Inactive) State” on page 218.</p>
Booting an Inactive nPartition	<p>NOTE: Only supported for cell-based HP servers.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): BO command. • HP-UX: specify the -B option when using the /usr/sbin/parmodify command to reconfigure an inactive nPartition. <p>See “Booting an Inactive nPartition” on page 224.</p>
Booting over a Network	<ul style="list-style-type: none"> • BCH Menu: BOOT LAN . . . command. • EFI Boot Manager: select Boot Option Maintenance → Boot from a File and select the “Load File” option for the LAN card that has the desired MAC address. • EFI Shell: lanboot select command. <p>See “Booting over a Network” on page 226.</p>
Booting to the HP-UX Initial System Loader (ISL)	<p>NOTE: Only supported on PA-RISC systems.</p> <ul style="list-style-type: none"> • BCH Menu: issue the BOOT command and reply y (for “yes”) to the Do you wish to stop at the ISL prompt question. <p>See “Booting to the HP-UX Initial System Loader (ISL)” on page 229.</p>
Booting to the HP-UX Loader (HPUX.EFI)	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> • EFI Shell or EFI Boot Manager: start booting HP-UX and type any key to interrupt the boot process, stopping it at the HP-UX Boot Loader prompt (HPUX>). <p>See “Booting to the HP-UX Loader (HPUX.EFI)” on page 231.</p>

Table 5-1 nPartition Boot and Reset Task Summaries (Continued)

Task	Summary
Using HP-UX Loader Commands	<ul style="list-style-type: none"> • BCH Menu: boot to the Initial System Loader prompt (<code>ISL></code>), and from ISL issue HP-UX loader commands in the following form: <code>hpux command</code> For example: enter <code>hpux ls</code> to issue the <code>ls</code> command. • EFI Shell or EFI Boot Manager: boot to the HP-UX Boot Loader prompt (<code>HPUX></code>), and issue HP-UX loader commands directly. For example: enter <code>ls</code> to issue the <code>ls</code> command. <p>See “Using HP-UX Loader Commands” on page 233.</p>
Booting to the Linux Loader (ELILO.EFI)	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> • EFI Shell or EFI Boot Manager: start booting Linux and type any key to interrupt the boot process, stopping it at the ELILO Linux Loader prompt (“ELILO boot”). <p>See “Booting to the Linux Loader (ELILO.EFI)” on page 235.</p>
Using Linux Loader (ELILO) Commands	<p>NOTE: Only supported on HP Integrity servers.</p> <ul style="list-style-type: none"> • EFI Shell or EFI Boot Manager: boot to the ELILO Linux Loader prompt (“ELILO boot”) and issue loader commands directly. <p>See “Using Linux Loader (ELILO) Commands” on page 239.</p>
Configuring Boot Paths and Options	<ul style="list-style-type: none"> • BCH Menu: <code>PATH</code> command. • EFI Boot Manager: use Boot Option Maintenance operations to add or delete boot options, or to change the order of items in the boot options list. • EFI Shell: <code>bcfg</code> command for HP-UX options. For example: <code>bcfg boot dump</code> to list all boot options, or <code>help bcfg</code> for details setting and reordering boot options list items. For Windows boot options, use the <code>MSUtil\nvrboot.efi</code> utility. • HP-UX: <code>/usr/sbin/setboot</code> or <code>/usr/sbin/parmodify</code> command. On HP-UX B.11.23 systems, only the boot options list for the local nPartition may be displayed and modified. <p>See “Configuring Boot Paths and Options” on page 241.</p>

Table 5-1 nPartition Boot and Reset Task Summaries (Continued)

Task	Summary
Configuring Autoboot Options	<ul style="list-style-type: none"> • BCH Menu: the <code>PATHFLAGS</code> command from the BCH Configuration menu sets boot-time actions for an nPartition. To set the boot actions for an nPartition boot paths, enter: <code>PATHFLAGS VAR action</code> where <code>VAR</code> is the boot path variable (PRI, HAA, or ALT) and <code>action</code> is the boot action (0 for “go to BCH”, 1 for “boot, if fail go to BCH”, 2 for “boot, if fail try next path”, or 3 for “skip this path, try next path”). • EFI Boot Manager: Boot Option Maintenance → Set Auto Boot TimeOut operation. • EFI Shell: <code>autoboot</code> command. For example: <code>autoboot off</code> to disable autoboot, or <code>autoboot 60</code> to enable autoboot with a 60-second timeout period. • HP-UX: <code>setboot -b on</code> or <code>setboot -b off</code> command, to turn on (enable) or turn off (disable) autoboot. <p>See “Configuring Autoboot Options” on page 245.</p>
Configuring Boot-Time System Tests	<p>NOTE: HP recommends that all self tests be performed.</p> <ul style="list-style-type: none"> • BCH Menu: Configuration menu FASTBOOT command: enter <code>FASTBOOT</code> to list settings; enter <code>FASTBOOT RUN</code> to enable all tests; enter <code>FASTBOOT TEST RUN</code> or <code>FASTBOOT TEST SKIP</code> to enable or disable an individual test. • EFI Shell: <code>boottest</code> command to list settings; <code>boottest on</code> to enable all tests; <code>boottest off</code> to disable all tests. To configure a specific test, use the <code>boottest test on</code> or <code>boottest test off</code> command. • HP-UX B.11.11: <code>setboot -t testname=value</code> to configure the test for all following boots, or <code>setboot -T testname=value</code> to configure the test for the next boot only. <code>setboot -v</code> to list settings. • HP-UX B.11.23: <code>setboot -t testname=value</code> to configure the test for the next boot only. <code>setboot -v</code> to list settings. <p>See “Configuring Boot-Time System Tests” on page 249.</p>

Troubleshooting Boot Problems

On HP cell-based servers, you might encounter different boot issues than on other HP servers.

The following boot issues are possible on cell-based servers.

- **Problem:** On an HP Integrity server, HP-UX B.11.23 begins booting but is interrupted with a panic when launching the HP-UX kernel (`/stand/vmunix`).

Causes: The nPartition ACPI configuration might not be properly set for booting HP-UX. In order to boot the HP-UX operating system an nPartition must have its `acpiconfig` value set to default.

Actions: At the EFI Shell interface, enter the `acpiconfig` command with no arguments to list the current ACPI configuration for an nPartition. If the `acpiconfig` value is set to `windows`, then HP-UX cannot boot; in this situation you must reconfigure `acpiconfig`.

To set the ACPI configuration for HP-UX: at the EFI Shell interface enter the `acpiconfig default` command, and then enter the `reset` command for the nPartition to reboot with the proper (default) configuration for HP-UX.

Use the `help acpiconfig` command for more details.

- **Problem:** Not all cells boot to join (rendezvous) an nPartition.

Causes: Some cells may have the `use-on-next-boot` value set to “n” (do not use), or the cells may have been powered off, or the cells may have booted too late to participate in partition rendezvous, or the cells have failed self-tests and cannot be used, or the cells are incompatible.

Actions: Check the cell `use-on-next-boot` values and change them to “y” as needed then reboot for reconfig (HP-UX `shutdown -R`, or Windows `shutdown /r`). Check cell power (`frupower -d -C`) and power on any cells as needed, then reboot for reconfig. Check the cell processor and firmware revisions using (`parstatus -v -c#` where # is the cell number).

As the cells assigned to the nPartition reboot, observe the boot progress from the Virtual Front Panel (VFP) for the nPartition and note any problems the cells have proceeding from one boot state to the next; as needed review chassis logs or event logs using the service processor **Show Chassis Logs** or **Show Event Logs** (SL) menu.

- **Problem:** An nPartition takes a long time to boot (over ten minutes).

Causes: One or more cells assigned to the nPartition that have a “y” `use-on-next-boot` value has not booted to participate in partition rendezvous, thus causing the rest of the cells assigned to the nPartition to wait for ten minutes for the cell to report.

For example, the cell might not be installed, might be powered off, or might have been powered on or reset too late to rendezvous with the other cells.

Actions: You can avoid the delay by performing any of the following actions, as needed. Perform a reboot for reconfig following any changes you make.

- Set the cell `use-on-next-boot` value to “n” (do not use).
- Power on the cell.
- Unassign (remove) the cell from the nPartition.

- **Problem:** An nPartition does not boot to its system boot environment (BCH or EFI) and instead all cells remain at a boot-is-blocked (BIB) state.

Causes: The nPartition has been reset to the shutdown for reconfig state, or no valid core cell is available

to the nPartition.

Actions: If the nPartition was reset to the shutdown for reconfig state, use the `BO` command from the service processor Command menu to boot the nPartition past boot-is-blocked (to allow it to boot to its system boot environment).

If no valid core cell was available to the nPartition when it booted, check the power for all core cell choices (a cell might be powered off) and power it on if needed.

Also review the chassis logs for the nPartition to search for any core cell problems and failures.

Accessing nPartition Console and System Boot Interfaces

You can access an nPartition console and its BCH or EFI system boot environment through the service processor (GSP or MP).

On HP 9000 servers, the system boot environment is the Boot Console Handler (BCH) interface.

On HP Integrity servers, the system boot environment is the Extensible Firmware Interface (EFI).

Each nPartition has its own system boot environment that provides you a method for interacting with the nPartition before an operating system has booted on it. The system boot environment is accessible through the nPartition console during the time after the cells assigned to the nPartition have booted and completed nPartition rendezvous and before the nPartition begins loading an operating system.

NOTE Always login to the service processor from a tty (not console) login session. You can check your current login terminal using the `who -m` command.

Do not login to a service processor from an nPartition console connection. Any use of the `^b` (**Control-b**) console exit sequence would exit the original console login—not the subsequent console-based login to the service processor—thus potentially stranding the console-based login (for example, if it too were accessing a console).

Accessing nPartition Console and System Boot Interfaces (Service Processor)

Use the service processor Console Menu (CO) to access the BCH or EFI system boot environment for an nPartition through its console.

Step 1. Login to the service processor (MP or GSP) for the server complex where the nPartition resides.

You can connect to the service processor using a direct physical connection, or using `telnet` for a remote connection.

In most situations, you can `telnet` to the service processor.

Step 2. Select the Console Menu (CO) from the service processor Main Menu.

The Console Menu is the method for accessing nPartition consoles.

```
GSP MAIN MENU:

Utility Subsystem FW Revision Level: SR_XXXX_D

CO: Consoles
VFP: Virtual Front Panel
CM: Command Menu
CL: Console Logs
SL: Show chassis Logs
HE: Help
X: Exit Connection
```

```
GSP> CO
```

If you are accessing the service processor using a single-partition-user account, selecting the CO (console) option takes you directly to the nPartition console.

If using an operator or administrator account, you can access the console for any of the nPartitions within the server complex.

- Step 3.** At the Console Menu, enter the nPartition number for the nPartition whose console (and BCH or EFI system boot environment) you wish to access.

Skip this step if you are accessing the service processor using a single-partition-user account.

If using an operator or administrator account, select the nPartition whose console you wish to access.

```
GSP> CO
```

```
Partitions available:
```

```
#   Name
---  ----
0)  jules00
1)  jules01
Q)  Quit
```

```
Please select partition number: 1
```

```
Connecting to Console: jules01
```

```
(Use ^B to return to main menu.)
```

```
[A few lines of context from the console log:]
```

```
-----
SERVICE menu                                Displays service commands
Display                                       Redisplay the current menu
HELP [<menu>|<command>]                    Display help for menu or command
REBOOT                                       Restart Partition
RECONFIGRESET                               Reset to allow Reconfig Complex Profile
-----
Main Menu: Enter command or menu >
```

The console displays the last 10 lines of console output when you connect to it. This provides you a view of the most recent console activity.

- Step 4.** Gain interactive access to the nPartition console.

Press **Enter** to access the prompt currently available from the nPartition console, if any. You will have either interactive or non-interactive access, as described in the sections Interactive Console Access and Non-Interactive Console Access in this step.

To exit the nPartition console and return to the service processor Main Menu, type **^b (Control-b)** at any time.

Interactive Console Access

In most situations a prompt for the BCH or EFI system boot environment, or the operating system login or command prompt, is available from the nPartition console.

- When an nPartition is at the BCH or EFI system boot environment you can access the BCH Menu, the EFI Boot Manager menu, or the EFI Shell from the nPartition console.
- When an nPartition has booted to ISL you can use the **EXIT** command to exit ISL and return to the BCH interface for the nPartition.
- When an nPartition has booted HP-UX, in order to access the BCH or EFI system boot environment you must reboot HP-UX and if necessary interrupt the automatic boot process. (To

reboot the nPartition, use the `shutdown -r` command, or use `shutdown -R` if you also are changing the cell configuration of the nPartition.)

- When an nPartition has booted Windows, in order to access the EFI system boot environment you must reboot Windows and if necessary interrupt the automatic boot process. (To reboot the nPartition, use the `shutdown /r Windows` command.)

Non-Interactive Console Access

In the following situations, you cannot interact with the nPartition console. In these cases you can wait until the console is interactive or can force interactive access.

- When the nPartition is resetting or is booting an operating system you cannot interact with software running on the nPartition.

Once the nPartition has completed resetting, or has completed booting the operating system, you can interact with the BCH or EFI system boot environment or with an operating system running on the nPartition.

To determine the boot state of an nPartition use the Virtual Front Panel, which is available from the service processor Main menu.

- When another user already is attached to the console you can access the nPartition console in spy (read-only) mode or can force write access by typing `^ecf` (**Control-e c f**).

Spy mode allows you to view console information but does not enable you to enter commands. If you type when accessing an nPartition console in spy mode, the console prints the following message.

```
[Read-only - use ^Ecf to attach to console.]
```

When in spy mode, you can force access to the nPartition console by typing `^ecf` (**Control-e c f**). Doing this provides you interactive console access and forces (“bumps”) the user who was using the console into spy mode.

```
[Bumped user - Admin.]
```

Monitoring nPartition Boot Activity

On HP cell-based servers you can monitor the nPartition boot process—from power-on or reset to operating system start-up—using the Virtual Front Panel (VFP) view of the nPartition.

Each nPartition has its own VFP that displays details about the cells assigned to the nPartition and the current boot state and activity.

Monitoring Boot Activity (Service Processor)

Use the **VFP** option from the service processor Main Menu to access an nPartition Virtual Front Panel for monitoring the nPartition boot status.

Step 1. Login to the service processor (MP or GSP).

Step 2. From the Main Menu, enter **VFP** to select the Virtual Front Panel option.

```
GSP MAIN MENU:

Utility Subsystem FW Revision Level: SR_XXXX_D

      CO: Consoles
      VFP: Virtual Front Panel
      CM: Command Menu
      CL: Console Logs
      SL: Show chassis Logs
      HE: Help
      X: Exit Connection
```

```
GSP> VFP
```

If you are accessing the service processor using a single-partition-user account, selecting the VFP option takes you directly to the nPartition Virtual Front Panel.

If accessing the GSP using an operator or administrator account, you can select the VFP for any single nPartition, or can select a system VFP that displays the nPartition state and activity for all nPartitions within the server complex.

Step 3. Select the nPartition you wish to monitor.

Skip this step if you are accessing the service processor using a single-partition-user account.

```
Partition VFP's available:

#   Name
---  ----
0)  jules00
1)  jules01
S)  System (all chassis codes)
Q)  Quit

GSP:VFP> 1
```

Step 4. View the VFP details for information about the nPartition and its current boot state.

To exit the VFP and return to the service processor main menu, type **^b (Control-b)**.

The VFP provides details including the nPartition state, nPartition activity, and the state and activity for each cell assigned to the nPartition. The VFP display updates as the cell or nPartition state and activities change.

```
E indicates error since last boot
  Partition 1 state          Activity
  -----
  Cell(s) Booting:         57 Logs

# Cell state                Activity
- -----
4 Booting                   Cell firmware test          28 Logs
6 Booting                   Cell firmware test          28 Logs
```

```
GSP:VFP (^B to Quit) >
```

Step 5. At the service processor (MP or GSP) Main Menu, enter x to exit the service processor interface.

Finding Bootable Devices

You can find bootable devices by using any one of the following procedures:

- “Finding Bootable Devices (BCH Menu)” on page 178
- “Finding Bootable Devices (EFI Shell)” on page 179

Finding Bootable Devices (BCH Menu)

From the BCH Main Menu, issue the `SEARCH` command to find bootable devices. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose bootable devices you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. From the BCH Main Menu, issue the `SEARCH` command to find and list bootable devices in the nPartition.

The `SEARCH` command reports all potential boot devices it locates.

```

---- Main Menu -----
Command                Description
-----                -
BBoot [PRI|HAA|ALT|<path>]  Boot from specified path
PArch [PRI|HAA|ALT] [<path>]  Display or modify a path
SEArch [ALL|<path>]         Search for boot devices
ScRoll [ON|OFF]           Display or change scrolling capability

Configuration menu       Displays or sets boot values
INformation menu        Displays hardware information
SERvice menu            Displays service commands

Display                 Redisplay the current menu
HElp [<menu>|<command>]    Display help for menu or command
REBOOT                 Restart Partition
RECONFIGRESET          Reset to allow Reconfig Complex Profile
----

```

Main Menu: Enter command or menu > **SEARCH**

Searching for potential boot device(s)
This may take several minutes.

To discontinue search, press any key (termination may not be immediate).

Path#	Device Path (dec)	Device Type
P0	0/0/1/0/0.15	Random access media
P1	0/0/1/0/0.12	Random access media
P2	0/0/1/0/0.11	Random access media
P3	0/0/1/0/0.9	Random access media
P4	0/0/1/0/0.8	Random access media
P5	0/0/1/0/0.6	Random access media

Main Menu: Enter command or menu >

The `SEARCH` command lists up to the first 20 potential boot devices that it locates, and lists each with a path number (P0 through P19).

To boot a device that was reported by the `SEARCH` command, specify the path number or the full device path. For example, `BOOT P0` would boot the path listed as path number P0.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Finding Bootable Devices (EFI Shell)

From the EFI Shell environment, issue the `map` command to list bootable devices. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose bootable devices you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** At the EFI Shell, issue the `map` command to list all disk devices with a potentially bootable EFI System Partition.

For details see the `help map` command. Also see the `help search` command for details on using the `search` command to load drivers for bootable devices.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Performing a Transfer of Control Reset

You can perform a transfer of control (TOC) reset by using the Service Processor (MP or GSP) TC command, as described in the following procedure.

If crash dump is configured for the operating system on the nPartition, when you TOC the nPartition while it is running the operating system then the nPartition performs a crash dump.

Performing a Transfer of Control Reset (Service Processor)

Use the Command menu TC command to perform a transfer-of-control (TOC) reset of an nPartition.

- Step 1.** Login to the service processor (MP or GSP) and enter CM to access the Command Menu.
- Step 2.** At the Command menu, enter the TC command, specify which nPartition is to be reset, and confirm whether to TOC the nPartition.

The TC command performs a transfer-of-control reset on the specified nPartition.

If you are accessing the service processor using a single-partition-user account, the TC command selects which nPartition is to be reset: the nPartition that your account allows you to access.

If using an operator or administrator account, you can select which nPartitions in the server complex you want to TOC.

Be certain to select the correct nPartition to be reset.

```
GSP:CM> TC
```

This command TOCs the selected partition.

```
WARNING: Execution of this command irrecoverably halts all system
         processing and I/O activity and restarts the selected
         partition.
```

```

#   Name
---  ---
0)  jules00
1)  jules01
```

```
Select a partition number: 0
```

```
Do you want to TOC partition number 0? (Y/[N]) y
```

```
-> The selected partition will be TOCed.
```

```
GSP:CM>
```

- Step 3.** After you initiate the TOC, you can observe its progress and select the type of crash dump through the nPartition console.

Once the nPartition completes the dump, or once you cancel it, the nPartition reboots.

```

***** Unexpected TOC. Processor HPA FFFFFFFF'FC07C000 *****
                    GENERAL REGISTERS:
r00/03 00000000'00000000 00000000'0099CA2C 00000000'00000000 00000000'010BB790
r04/07 00000000'00000002 00000000'010BC140 00000000'0080F000 00000000'00AA2490
r08/11 00000000'00000001 00000000'0099A800 00000000'0099A800 00000000'0099C800
```

....

```
Processor 8 TOC:  pcsq.pcoq = 0'0.0'12675c  
                  isr.ior   = 0'10340004.0'2f8bfd30
```

Boot device reset done.

*** The dump will be a SELECTIVE dump: 457 of 4080 megabytes.

*** To change this dump type, press any key within 10 seconds.

*** Proceeding with selective dump.

*** The dump may be aborted at any time by pressing ESC.

*** Dumping: 7% complete (32 of 457 MB) (device 64:0x2)

Booting and Shutting Down HP-UX

This section has procedures for booting and shutting down HP-UX on cell-based HP servers and a procedure for adding HP-UX to the boot options list on HP Integrity servers.

- To check whether the cell local memory (CLM) configuration is appropriate for HP-UX, refer to “HP-UX Support for Cell Local Memory” on page 182.
- To add an HP-UX entry to the nPartition boot options list on an HP Integrity server refer to “Adding HP-UX to the Boot Options List” on page 182.
- To boot HP-UX refer to “Booting HP-UX” on page 183.
- To shut down HP-UX refer to “Shutting Down HP-UX” on page 192.

HP-UX Support for Cell Local Memory

On servers based on the HP sx1000 chipset or HP sx2000 chipset, each cell has a cell local memory (CLM) parameter, which determines how firmware interleaves memory residing on the cell.

NOTE HP-UX 11i Version 1 (B.11.11) does not support using CLM. Before booting HP-UX 11i Version 1 on an nPartition, you must ensure that the CLM parameter for each cell in the nPartition is set to zero (0). Although you might be able to boot HP-UX 11i Version 1 on an nPartition with CLM configured, any memory configured as cell local is unusable, and such a configuration is untested and unsupported.

HP-UX 11i Version 2 (B.11.23) supports using CLM. The optimal CLM settings for HP-UX B.11.23 depend on the applications and workload the OS is running.

To check CLM configuration details from an OS, use Partition Manager or the `parstatus` command. For example, the `parstatus -v -c#` command and `parstatus -v -p#` command report the CLM amount requested and CLM amount allocated for the specified cell (`-c#`, where `#` is the cell number) or the specified nPartition (`-p#`, where `#` is the nPartition number).

To check CLM configuration details from the EFI Shell on a cell-based HP Integrity server, use the `info mem` command. If the amount of “NonInterleaved Memory” reported is less than 512 MB then no CLM is configured for any cells in the nPartition (and the indicated amount of noninterleaved memory is used by system firmware). If the `info mem` command reports more than 512 MB of noninterleaved memory then use Partition Manager or the `parstatus` command to confirm the CLM configuration details.

To set the CLM configuration, use Partition Manager or the `parmodify` command.

Adding HP-UX to the Boot Options List

This section describes how to add an HP-UX entry to the system boot options list.

You can add the `\EFI\HPUX\HPUX.EFI` loader to the boot options list from the EFI Shell or **EFI Boot Configuration** menu (or in some versions of EFI, the **Boot Option Maintenance** menu).

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Adding an HP-UX Boot Option

This procedure adds an HP-UX item to the boot options list from the EFI Shell.

To add an HP-UX boot option when logged in to HP-UX use the `setboot` command. For details refer to the `setboot` (1M) manpage.

Step 1. Access the EFI Shell environment.

Log in to the management processor and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX`: where *X* is the file system number) for the device from which you want to boot HP-UX.

For example, enter `fs2`: to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the HP-UX loader is `\EFI\HPUX\HPUX.EFI` and it should be on the device you are accessing.

Step 3. At the EFI Shell environment, use the `bcfg` command to manage the boot options list.

The `bcfg` command includes the following options for managing the boot options list:

- `bcfg boot dump` — Display all items in the boot options list for the system.
- `bcfg boot rm #` — Remove the item number specified by `#` from the boot options list.
- `bcfg boot mv #a #b` — Move the item number specified by `#a` to the position specified by `#b` in the boot options list.
- `bcfg boot add # file.efi "Description"` — Add a new boot option to the position in the boot options list specified by `#`. The new boot option references `file.efi` and is listed with the title specified by `Description`.

For example, `bcfg boot add 1 \EFI\HPUX\HPUX.EFI "HP-UX 11i"` adds an HP-UX 11i item as the first entry in the boot options list.

See the `help bcfg` command for details.

Step 4. Exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment press **^B (Control-B)**; this exits the system console and returns to the management processor Main Menu. To exit the management processor, type `x` at the Main Menu.

Booting HP-UX

This section covers the following methods of booting HP-UX:

- “HP-UX Booting” on page 184 — The standard ways to boot HP-UX. Typically this results in booting HP-UX in multiuser mode.
- “Single-User Mode HP-UX Booting” on page 187 — How to boot HP-UX in single-user mode.

- “LVM-Maintenance Mode HP-UX Booting” on page 190 — How to boot HP-UX in LVM-maintenance mode.

Refer to “Shutting Down HP-UX” on page 192 for details on shutting down the HP-UX OS.

CAUTION ACPI Configuration for HP-UX Must Be default

On cell-based HP Integrity servers, to boot the HP-UX OS an nPartition must have its ACPI configuration value set to default.

At the EFI Shell interface, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to default, then HP-UX cannot boot; in this situation you must reconfigure `acpiconfig` or booting will be interrupted with a panic when launching the HP-UX kernel.

To set the ACPI configuration for HP-UX: At the EFI Shell interface enter the `acpiconfig default` command, and then enter the `reset` command for the nPartition to reboot with the proper (default) configuration for HP-UX.

HP-UX Booting

This section describes how to boot HP-UX on cell-based HP 9000 servers and cell-based HP Integrity servers.

- On HP 9000 servers, to boot HP-UX refer to “HP-UX Booting (BCH Menu)” on page 184.
- On HP Integrity servers, to boot HP-UX use either of the following procedures:
 - “HP-UX Booting (EFI Boot Manager)” on page 186
 - “HP-UX Booting (EFI Shell)” on page 186

HP-UX Booting (BCH Menu)

From the BCH Menu, use the `BOOT` command to boot the HP-UX OS. The BCH Menu is available only on HP 9000 servers.

Step 1. Access the BCH Main Menu for the nPartition on which you want to boot HP-UX.

Log in to the management processor (MP) and enter `CO` to access the Console list. Choose the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If you are at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Choose which device you want to boot.

From the BCH Main Menu, use the `PATH` command to list any boot path variable settings. The primary (PRI) boot path normally is set to the main boot device for the nPartition. You also can use the `SEARCH` command to find and list potentially bootable devices for the nPartition.

```
Main Menu: Enter command or menu > PATH

    Primary Boot Path:  0/0/2/0/0.13
                       0/0/2/0/0.d    (hex)

    HA Alternate Boot Path: 0/0/2/0/0.14
                           0/0/2/0/0.e    (hex)

    Alternate Boot Path:  0/0/2/0/0.0
                           0/0/2/0/0.0    (hex)
```


Main Menu: Enter command or menu >

Step 3. Boot the device using the **BOOT** command from the BCH interface.

You can issue the **BOOT** command in any of the following ways:

- **BOOT**

Issuing the **BOOT** command with no arguments boots the device at the primary (PRI) boot path.

- **BOOT *bootvariable***

This command boots the device indicated by the specified boot path, where *bootvariable* is the PRI, HAA, or ALT boot path.

For example, **BOOT PRI** boots the primary boot path.

- **BOOT LAN INSTALL** or **BOOT LAN.*ip-address* INSTALL**

The **BOOT . . . INSTALL** commands boot HP-UX from the default HP-UX install server or from the server specified by *ip-address*.

- **BOOT *path***

This command boots the device at the specified *path*. You can specify the *path* in HP-UX hardware path notation (for example, 0/0/2/0/0.13) or in path label format (for example, P0 or P1).

If you specify the *path* in path label format, then *path* refers to a device path reported by the last **SEARCH** command.

After you issue the **BOOT** command, the BCH interface prompts you to specify whether you want to stop at the ISL prompt.

To boot the `/stand/vmunix` HP-UX kernel from the device without stopping at the ISL prompt, enter **n** to automatically proceed past ISL and execute the contents of the `AUTO` file on the chosen device. (By default the `AUTO` file is configured to load `/stand/vmunix`.)

Main Menu: Enter command or menu > **BOOT PRI**

Primary Boot Path: 0/0/1/0/0.15

Do you wish to stop at the ISL prompt prior to booting? (y/n) >> **n**

ISL booting hpux

Boot
: disk(0/0/1/0/0.15.0.0.0.0;0)/stand/vmunix

To boot an HP-UX kernel other than `/stand/vmunix`, or to boot HP-UX in single-user or LVM-maintenance mode, stop at the ISL prompt and specify the appropriate arguments to the `hpux` loader.

Step 4. Exit the console and management processor interfaces if you are finished using them.

To exit the BCH environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type **x** at the Main Menu.

HP-UX Booting (EFI Boot Manager)

From the EFI Boot Manager menu, choose an item from the boot options list to boot HP-UX using that boot option. The EFI Boot Manager is available only on HP Integrity servers.

Refer to “ACPI Configuration for HP-UX Must Be default” on page 184 for required configuration details.

- Step 1.** Access the EFI Boot Manager menu for the nPartition on which you want to boot HP-UX.

Log in to the management processor (MP) and enter `CO` to access the Console list. Choose the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the `EFI Boot Manager` heading.

- Step 2.** At the EFI Boot Manager menu, choose an item from the boot options list.

Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments to be used when booting the device.

- Step 3.** Press **Enter** to initiate booting using the chosen boot option.

- Step 4.** Exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type `x` at the Main Menu.

HP-UX Booting (EFI Shell)

From the EFI Shell environment, to boot HP-UX on a device first access the EFI System Partition (for example `fs0:`) for the root device and then enter `HPUX` to initiate the loader. The EFI Shell is available only on HP Integrity servers.

Refer to “ACPI Configuration for HP-UX Must Be default” on page 184 for required configuration details.

- Step 1.** Access the EFI Shell environment for the nPartition on which you want to boot HP-UX.

Log in to the management processor (MP) and enter `CO` to access the Console list. Choose the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** At the EFI Shell environment, issue the `acpiconfig` command to list the current ACPI configuration for the local nPartition.

On cell-based HP Integrity servers, to boot the HP-UX OS an nPartition must have its ACPI configuration value set to default. If the `acpiconfig` value is not set to default, then HP-UX cannot boot; in this situation you must reconfigure `acpiconfig` or booting will be interrupted with a panic when launching the HP-UX kernel.

To set the ACPI configuration for HP-UX: At the EFI Shell interface enter the `acpiconfig`

default command, and then enter the `reset` command for the nPartition to reboot with the proper (default) configuration for HP-UX.

- Step 3.** At the EFI Shell environment, issue the `map` command to list all currently mapped bootable devices.

The bootable file systems of interest typically are listed as `fs0:`, `fs1:`, and so on.

- Step 4.** Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP-UX.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The file system number can change each time it is mapped (for example, when the nPartition boots, or when the `map -r` command is issued).

- Step 5.** When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to initiate the HP-UX EFI loader on the device you are accessing.

The full path for the loader is `\EFI\HPUX\HPUX.EFI` and when initiated it references the `\EFI\HPUX\AUTO` file and proceeds to boot HP-UX using the default boot behavior specified in the `AUTO` file.

You are given 10 seconds to interrupt the automatic booting of the default boot behavior. Pressing any key during this 10-second period stops the HP-UX boot process and enables you to interact with the HP-UX EFI loader. To exit the loader (the `HPUX>` prompt), enter `exit` (this return you to the EFI Shell).

To boot the HP-UX OS, do not type anything during the 10-second period given for stopping at the HP-UX EFI loader.

```
Shell> map
Device mapping table
  fs0  : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part1,Sig72550000)
  blk0 : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)
  blk1 : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part1,Sig72550000)
  blk2 : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part2,Sig72550000)
  blk3 : Acpi(000222F0,2A8)/Pci(0|0)/Scsi(Pun8,Lun0)
  blk4 : Acpi(000222F0,2A8)/Pci(0|1)/Scsi(Pun2,Lun0)
```

```
Shell> fs0:
```

```
fs0:\> hpux
```

```
(c) Copyright 1990-2002, Hewlett Packard Company.
All rights reserved
```

```
HP-UX Boot Loader for IA64 Revision 1.723
```

```
Press Any Key to interrupt Autoboot
\efi\hpux\AUTO ==> boot vmunix
Seconds left till autoboot - 9
```

- Step 6.** Exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type `x` at the Main Menu.

Single-User Mode HP-UX Booting

This section describes how to boot HP-UX in single-user mode on cell-based HP 9000 servers and cell-based HP Integrity servers.

- On HP 9000 servers, to boot HP-UX in single-user mode refer to “Single-User Mode HP-UX Booting (BCH Menu)” on page 188.
- On HP Integrity servers, to boot HP-UX in single-user mode refer to “Single-User Mode HP-UX Booting (EFI Shell)” on page 189.

Single-User Mode HP-UX Booting (BCH Menu)

From the BCH Menu, you can boot HP-UX in single-user mode by issuing the **BOOT** command, stopping at the ISL interface, and issuing **hpux** loader options. The BCH Menu is available only on HP 9000 servers.

- Step 1.** Access the BCH Main Menu for the nPartition on which you want to boot HP-UX in single-user mode.

Log in to the management processor (MP) and enter **CO** to access the Console list. Choose the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If you are at a BCH menu other than the Main Menu, then enter **MA** to return to the BCH Main Menu.

- Step 2.** Boot the desired device using the **BOOT** command at the BCH interface, and specify that the nPartition stop at the ISL prompt prior to booting (reply **y** to the “stop at the ISL prompt” question).

```
Main Menu: Enter command or menu > BOOT 0/0/2/0/0.13
```

```
BCH Directed Boot Path: 0/0/2/0/0.13
```

```
Do you wish to stop at the ISL prompt prior to booting? (y/n) >> y
```

```
Initializing boot Device.
```

```
....
```

```
ISL Revision A.00.42 JUN 19, 1999
```

```
ISL>
```

- Step 3.** From the ISL prompt, issue the appropriate Secondary System Loader (**hpux**) command to boot the HP-UX kernel in the desired mode.

Use the **hpux** loader to specify the boot mode options and to specify which kernel (such as: **/stand/vmunix**) to boot on the nPartition.

- To boot HP-UX in single-user mode:

```
ISL> hpux -is boot /stand/vmunix
```

- To boot HP-UX at the default run level:

```
ISL> hpux boot /stand/vmunix
```

To exit the ISL prompt and return to the BCH interface, issue the **EXIT** command instead of specifying one of the **hpux** loader commands.

Refer to the *hpux* (1M) manpage for a detailed list of **hpux** loader options.

Example 5-1 Single-User HP-UX Boot

```
ISL Revision A.00.42 JUN 19, 1999
```

```

ISL> hpux -is /stand/vmunix

Boot
: disk(0/0/2/0/0.13.0.0.0.0.0;0)/stand/vmunix
8241152 + 1736704 + 1402336 start 0x21a0e8

....

INIT: Overriding default level with level 's'

INIT: SINGLE USER MODE

INIT: Running /sbin/sh
#

```

- Step 4.** Exit the console and management processor interfaces if you are finished using them.

To exit the BCH environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type **x** at the Main Menu.

Single-User Mode HP-UX Booting (EFI Shell)

From the EFI Shell environment, boot in single-user mode by stopping the boot process at the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) entering the `boot -is vmunix` command. The EFI Shell is available only on HP Integrity servers.

Refer to “ACPI Configuration for HP-UX Must Be default” on page 184 for required configuration details.

- Step 1.** Access the EFI Shell environment for the nPartition on which you want to boot HP-UX in single-user mode.

Log in to the management processor (MP) and enter `CO` to access the Console list. Choose the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP-UX.

- Step 3.** When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to initiate the `\EFI\HPUX\HPUX.EFI` loader on the device you are accessing.

- Step 4.** Boot to the HP-UX Boot Loader prompt (`HPUX>`) by pressing any key within the 10 seconds given for interrupting the HP-UX boot process. You will use the `HPUX.EFI` loader to boot HP-UX in single-user mode in the next step.

After you press any key, the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) is provided. For help using the `HPUX.EFI` loader, enter the `help` command. To return to the EFI Shell, enter `exit`.

```
fs0:\> hpux
```

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Chapter 5 Booting and Resetting nPartitions

Booting and Shutting Down HP-UX

```
All rights reserved

HP-UX Boot Loader for IA64  Revision 1.723
```

```
Press Any Key to interrupt Autoboot
\efi\hpux\AUTO ==> boot vmunix
Seconds left till autoboot - 9
```

[User Types A Key to Stop the HP-UX Boot Process and Access the HPUX.EFI Loader]

```
Type 'help' for help

HPUX>
```

Step 5. At the HPUX.EFI interface (the HP-UX Boot Loader prompt, HPUX>) enter the `boot -is vmunix` command to boot HP-UX (the `/stand/vmunix` kernel) in single-user (`-is`) mode.

```
HPUX> boot -is vmunix
> System Memory = 4063 MB
loading section 0
..... (complete)
loading section 1
..... (complete)
loading symbol table
loading System Directory(boot.sys) to MFS
....
loading MFSFILES Directory(bootfs) to MFS
.....
Launching /stand/vmunix
SIZE: Text:25953K + Data:3715K + BSS:3637K = Total:33306K

Console is on a Serial Device
Booting kernel...
```

Step 6. Exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type `x` at the Main Menu.

LVM-Maintenance Mode HP-UX Booting

This section describes how to boot HP-UX in LVM-maintenance mode on cell-based HP 9000 servers and cell-based HP Integrity servers.

- On HP 9000 servers, to boot HP-UX in LVM-maintenance mode refer to “LVM-Maintenance Mode HP-UX Booting (BCH Menu)” on page 190.
- On HP Integrity servers, to boot HP-UX in LVM-maintenance mode refer to “LVM-Maintenance Mode HP-UX Booting (EFI Shell)” on page 191.

LVM-Maintenance Mode HP-UX Booting (BCH Menu)

From the BCH Menu, you can boot HP-UX in LVM-maintenance mode by issuing the `BOOT` command, stopping at the ISL interface, and issuing `hpux` loader options. The BCH Menu is available only on HP 9000 servers.

Step 1. Access the BCH Main Menu for the nPartition on which you want to boot HP-UX in LVM-maintenance mode.

Log in to the management processor (MP) and enter `CO` to access the Console list. Choose the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If you are at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

- Step 2.** Boot the desired device using the **BOOT** command at the BCH interface, and specify that the nPartition stop at the ISL prompt prior to booting (reply **y** to the “stop at the ISL prompt” question).
- Step 3.** From the ISL prompt, issue the appropriate Secondary System Loader (**hpux**) command to boot the HP-UX kernel in the desired mode.

To boot HP-UX in LVM-maintenance mode:

```
ISL> hpux -lm boot /stand/vmunix
```

- Step 4.** Exit the console and management processor interfaces if you are finished using them.

To exit the BCH environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type **x** at the Main Menu.

LVM-Maintenance Mode HP-UX Booting (EFI Shell)

From the EFI Shell environment, boot in LVM-maintenance mode by stopping the boot process at the **HPUX.EFI** interface (the HP-UX Boot Loader prompt, **HPUX>**) entering the **boot -lm vmunix** command. The EFI Shell is available only on HP Integrity servers.

Refer to “ACPI Configuration for HP-UX Must Be default” on page 184 for required configuration details.

- Step 1.** Access the EFI Shell environment for the nPartition on which you want to boot HP-UX in LVM-maintenance mode.

Log in to the management processor (MP) and enter **CO** to access the Console list. Choose the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the **EFI Boot Manager** heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Access the EFI System Partition (**fsX:** where **X** is the file system number) for the device from which you want to boot HP-UX.
- Step 3.** When accessing the EFI System Partition for the desired boot device, issue the **HPUX** command to initiate the **\EFI\HPUX\HPUX.EFI** loader on the device you are accessing.
- Step 4.** Type any key within the 10 seconds given for interrupting the HP-UX boot process. This stops the boot process at the **HPUX.EFI** interface (the HP-UX Boot Loader prompt, **HPUX>**).
- Step 5.** At the **HPUX.EFI** interface, enter the **boot -lm vmunix** command to boot HP-UX (the **/stand/vmunix** kernel) in LVM-maintenance (**-lm**) mode.
- Step 6.** Exit the console and management processor interfaces if you are finished using them.
- To exit the EFI environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type **x** at the Main Menu.

Shutting Down HP-UX

When HP-UX is running on an nPartition, you can shut down HP-UX using the `shutdown` command.

On nPartitions you have the following options when shutting down HP-UX:

- To shut down HP-UX and reboot an nPartition: `shutdown -r`
On cell-based HP Integrity servers, the `shutdown -r` command is equivalent to the `shutdown -R` command.
- To shut down HP-UX and halt an nPartition: `shutdown -h`
On cell-based HP Integrity servers, the `shutdown -h` command is equivalent to the `shutdown -R -H` command.
- To perform a reboot for reconfig of an nPartition: `shutdown -R`
- To hold an nPartition at a shutdown for reconfig state: `shutdown -R -H`

For details refer to the *shutdown* (1M) manpage.

NOTE On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the nPartition behavior when an OS is shutdown and halted (`shutdown -h` or `shutdown -R -H`). The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

The normal behavior for HP-UX shutdown and halt is for the nPartition to be made inactive.

For details refer to “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

Shutting Down HP-UX

From the HP-UX command line, issue the `shutdown` command to shut down the HP-UX OS.

Step 1. Log in to HP-UX running on the nPartition that you want to shut down.

You should log in to the MP for the server and use the Console menu to access the system console. Accessing the console through the MP enables you to maintain console access to the system after HP-UX has shut down.

Step 2. Issue the `shutdown` command with the appropriate command-line options.

The command-line options you specify dictate the way in which HP-UX is shut down, whether the nPartition is rebooted, and whether any nPartition configuration changes (adding or removing cells) take place.

Use the following list to choose an HP-UX shutdown option for your nPartition:

- Shut down HP-UX and halt the nPartition.

On HP 9000 servers only, issue the `shutdown -h` command to shut down and halt the nPartition. This leaves the nPartition and all its cells in an active state after HP-UX shuts down and halts.

To reboot a halted nPartition, you must reset the nPartition using the `RS` command at the `GSP` command menu.

On cell-based HP Integrity servers, the `shutdown -h` command puts an nPartition into the

shutdown for reconfig state; for details refer to the discussion of `shutdown -R -H` in this list.

- Shut down HP-UX and reboot the nPartition.

Issue the `shutdown -r` command to shut down and reboot the nPartition.

On cell-based HP Integrity servers, the `shutdown -r` command is equivalent to the `shutdown -R` command.

- Perform a reboot for reconfig of the nPartition.

Issue the HP-UX `shutdown -R` command to perform a reboot for reconfig.

This shuts down HP-UX, reconfigures the nPartition if needed, and reboots the nPartition.

- Reboot the nPartition and put it into the shutdown for reconfig state.

Use the HP-UX `shutdown -R -H` command to hold the nPartition in the shutdown for reconfig state.

This leaves the nPartition and all its cells in an inactive state (the nPartition can be reconfigured remotely), unless the normal behavior has been modified. For details on changing OS halt behavior on rx8620 and rx7620 servers, refer to “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

To reboot the nPartition, you must do so manually by using the `BO` command at the management processor Command menu.

If HP-UX is halted on the nPartition, thus not allowing you to use the `shutdown` command, you can reboot or reset the nPartition by issuing commands from the management processor Command menu.

Booting and Shutting Down HP OpenVMS I64

This section has procedures for booting and shutting down HP OpenVMS I64 on cell-based HP Integrity servers and procedures for adding HP OpenVMS to the boot options list.

- To check whether the cell local memory (CLM) configuration is appropriate for HP OpenVMS, refer to “HP OpenVMS I64 Support for Cell Local Memory” on page 194.
- To add an HP OpenVMS entry to the boot options list refer to “Adding HP OpenVMS to the Boot Options List” on page 194.
- To boot HP OpenVMS on a cell-based HP Integrity server refer to “Booting HP OpenVMS” on page 196.
- To shut down HP OpenVMS refer to “Shutting Down HP OpenVMS” on page 197.

HP OpenVMS I64 Support for Cell Local Memory

On servers based on the HP sx1000 chipset or HP sx2000 chipset, each cell has a cell local memory (CLM) parameter, which determines how firmware interleaves memory residing on the cell.

NOTE HP OpenVMS I64 does not support using CLM. Before booting OpenVMS on an nPartition, you must ensure that the CLM parameter for each cell in the nPartition is set to zero (0). Although you might be able to boot OpenVMS on an nPartition with CLM configured, any memory configured as cell local is unusable, and such a configuration is untested and unsupported.

To check CLM configuration details from an OS, use Partition Manager or the `parstatus` command. For example, the `parstatus -v -c#` command and `parstatus -v -p#` command report the CLM amount requested and CLM amount allocated for the specified cell (`-c#`, where `#` is the cell number) or the specified nPartition (`-p#`, where `#` is the nPartition number).

To check CLM configuration details from the EFI Shell on a cell-based HP Integrity server, use the `info mem` command. If the amount of “NonInterleaved Memory” reported is less than 512 MB then no CLM is configured for any cells in the nPartition (and the indicated amount of noninterleaved memory is used by system firmware). If the `info mem` command reports more than 512 MB of noninterleaved memory then use Partition Manager or the `parstatus` command to confirm the CLM configuration details.

To set the CLM configuration, use Partition Manager or the `parmodify` command.

Adding HP OpenVMS to the Boot Options List

On HP Integrity servers, you can use the following procedures to manage boot options list entries for HP OpenVMS.

You can add the `\efi\vms\vms_loader.efi` loader to the boot options list from the EFI Shell or EFI **Boot Configuration** menu (or in some versions of EFI, the **Boot Option Maintenance** menu).

NOTE OpenVMS I64 installation and upgrade procedures assist you in setting up and validating a boot option for your system disk. HP recommends that you allow the procedure to do this.

To configure booting on Fibre Channel devices, you must use the OpenVMS I64 Boot Manager utility (`BOOT_OPTIONS.COM`). For more information on this utility and other restrictions, refer to the *HP OpenVMS for Integrity Servers Upgrade and Installation Manual*.

Adding an HP OpenVMS Boot Option

This procedure adds an HP OpenVMS item to the boot options list from the EFI Shell.

To add an HP OpenVMS boot option when logged in to OpenVMS use the `@SYS$MANAGER:BOOT_OPTIONS.COM` command.

Step 1. Access the EFI Shell environment.

Log in to the management processor and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP OpenVMS.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the HP OpenVMS loader is `\efi\vms\vms_loader.efi` and it should be on the device you are accessing.

Step 3. At the EFI Shell environment, use the `bcfg` command to manage the boot options list.

You can also accomplish this step by using the `\efi\vms\vms_bcfg.efi` and `\efi\vms\vms_show.efi` utilities, which are available on the EFI System Partition for HP OpenVMS. Both `vms_bcfg` and `vms_show` are unique utilities for OpenVMS I64. The `vms_bcfg` utility differs from the `bcfg` EFI command in that `vms_bcfg` enables you to specify boot devices using VMS-style device names.

The `bcfg` command includes the following options for managing the boot options list:

- `bcfg boot dump` — Display all items in the boot options list for the system.
- `bcfg boot rm #` — Remove the item number specified by `#` from the boot options list.
- `bcfg boot mv #a #b` — Move the item number specified by `#a` to the position specified by `#b` in the boot options list.
- `bcfg boot add # file.efi "Description"` — Add a new boot option to the position in the boot options list specified by `#`. The new boot option references `file.efi` and is listed with the title specified by `Description`.

For example, `bcfg boot add 1 \efi\vms\vms_loader.efi "HP OpenVMS"` adds an HP OpenVMS item as the first entry in the boot options list.

See the `help bcfg` command for details.

Step 4. Exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment, press **^B (Control-B)**; this exits the nPartition console and returns to the management processor Main Menu. To exit the management processor, type `X` at the Main Menu.

Booting HP OpenVMS

To boot HP OpenVMS I64 on a cell-based HP Integrity server use either of the following procedures.

- “Booting HP OpenVMS (EFI Boot Manager)” on page 196
- “Booting HP OpenVMS (EFI Shell)” on page 196

CAUTION ACPI Configuration for HP OpenVMS I64 Must Be default

On cell-based HP Integrity servers, to boot the HP OpenVMS OS an nPartition must have its ACPI configuration value set to default.

At the EFI Shell interface, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to default, then OpenVMS cannot boot; in this situation you must reconfigure `acpiconfig` or booting will fail and report the `INCONSTATE` code when launching OpenVMS.

To set the ACPI configuration for HP OpenVMS I64: At the EFI Shell interface enter the `acpiconfig default` command, and then enter the `reset` command for the nPartition to reboot with the proper (default) configuration for OpenVMS.

Booting HP OpenVMS (EFI Boot Manager)

From the EFI Boot Manager menu, select an item from the boot options list to boot HP OpenVMS using the selected boot option.

- Step 1.** Access the EFI Boot Manager menu for the system on which you want to boot HP OpenVMS.

Log in to the management processor (MP) and enter `CO` to select the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

- Step 2.** At the EFI Boot Manager menu, select an item from the boot options list.

Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments to use when booting the device.

- Step 3.** Press **Enter** to initiate booting using the selected boot option.

- Step 4.** Exit the console and management processor interfaces when finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the system console and returns to the management processor Main Menu. To exit the management processor, type `x` at the Main Menu.

Booting HP OpenVMS (EFI Shell)

From the EFI Shell environment, to boot HP OpenVMS on a device first access the EFI System Partition (for example `fs0:`) for the root device and enter `\efi\vms\vms_loader` to initiate the OpenVMS loader.

- Step 1.** Access the EFI Shell environment for the system on which you want to boot HP OpenVMS.

Log in to the management processor (MP) and enter `CO` to select the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI

menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. At the EFI Shell environment, issue the **map** command to list all currently mapped bootable devices.

The bootable file systems of interest typically are listed as `fs0:`, `fs1:`, and so on.

Step 3. Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP OpenVMS.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

Also, the file system number might change each time it is mapped (for example, when the system boots, or when the `map -r` command is issued).

Step 4. When accessing the EFI System Partition for the desired boot device, issue the `\efi\vms\vms_loader` command to initiate the `vms_loader.efi` loader on the device you are accessing.

```
fs5:> \efi\vms\vms_loader.efi
```

```
HP OpenVMS Industry Standard 64 Operating System, Version V8.2-1
Copyright 1976-2005 Hewlett-Packard Development Company, L.P.
```

```
%PKA0, Copyright (c) 1998 LSI Logic PKW V3.2.20 ROM 4.19
%PKA0, SCSI Chip is SYM53C1010/66, Operating mode is LVD Ultra3 SCSI
%SMP-I-CPUTRN, CPU #01 has joined the active set.
%SMP-I-CPUTRN, CPU #02 has joined the active set.
...
```

Step 5. Exit the console and management processor interfaces when finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the system console and returns to the management processor Main Menu. To exit the management processor, type **X** at the Main Menu.

Shutting Down HP OpenVMS

This section describes how to shut down the HP OpenVMS OS on cell-based HP Integrity servers.

Shutting Down HP OpenVMS

From the HP OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command to shut down the OpenVMS OS.

Step 1. Log in to HP OpenVMS running on the system that you want to shut down.

You should log in to the MP for the server and use the Console menu to access the system console. Accessing the console through the MP enables you to maintain console access to the system after HP OpenVMS has shut down.

Step 2. At the OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command and specify the shutdown options in response to the prompts given.

```
>@SYS$SYSTEM:SHUTDOWN
```

Chapter 5 Booting and Resetting nPartitions

Booting and Shutting Down HP OpenVMS I64

```
SHUTDOWN -- Perform an Orderly System Shutdown
           on node RSNVMS

How many minutes until final shutdown [0]:
Reason for shutdown [Standalone]:
Do you want to spin down the disk volumes [NO]?
Do you want to invoke the site-specific shutdown procedure [YES]?
Should an automatic system reboot be performed [NO]? yes
When will the system be rebooted [shortly via automatic reboot]:
Shutdown options (enter as a comma-separated list):
  REBOOT_CHECK           Check existence of basic system files
  SAVE_FEEDBACK          Save AUTOGEN feedback information from this boot
  DISABLE_AUTOSTART      Disable autostart queues
  POWER_OFF              Request console to power-off the system

Shutdown options [NONE]:

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
...
```

NOTE HP OpenVMS I64 currently does not support the `POWER_OFF` shutdown option.

The `@SYSS$SYSTEM:SHUTDOWN.COM` command prompts establish the shutdown behavior, including the shutdown time and whether the system is rebooted after it is shut down.

- To perform a reboot for reconfig from OpenVMS I64 running on an nPartition, issue `@SYSS$SYSTEM:SHUTDOWN.COM` from OpenVMS, and then enter **yes** at the “Should an automatic system reboot be performed” prompt
- To perform a shutdown for reconfig of an nPartition running OpenVMS I64: first issue `@SYSS$SYSTEM:SHUTDOWN.COM` from OpenVMS and enter **no** at the “Should an automatic system reboot be performed” prompt, then access the MP and, from the MP Command Menu, issue the `RR` command and specify the nPartition that is to be shutdown for reconfig.

Booting and Shutting Down Microsoft Windows

This section has procedures for booting and shutting down Microsoft Windows on cell-based HP Integrity servers and a procedure for adding Windows to the boot options list.

- To check whether the cell local memory (CLM) configuration is appropriate for Windows, refer to “Microsoft Windows Support for Cell Local Memory” on page 199.
- To add a Windows entry to the boot options list refer to “Adding Microsoft Windows to the Boot Options List” on page 199.
- To boot Windows refer to “Booting Microsoft Windows” on page 201.
- To shut down Windows refer to “Shutting Down Microsoft Windows” on page 202.

Microsoft Windows Support for Cell Local Memory

On servers based on the HP sx1000 chipset or HP sx2000 chipset, each cell has a cell local memory (CLM) parameter, which determines how firmware interleaves memory residing on the cell.

NOTE Microsoft Windows supports using CLM on cell-based HP Integrity servers. For best performance in an nPartition running Windows, HP recommends that you configure the CLM parameter to 100% for each cell in the nPartition.

To check CLM configuration details from an OS, use Partition Manager or the `parstatus` command. For example, the `parstatus -v -c#` command and `parstatus -v -p#` command report the CLM amount requested and CLM amount allocated for the specified cell (`-c#`, where `#` is the cell number) or the specified nPartition (`-p#`, where `#` is the nPartition number).

To check CLM configuration details from the EFI Shell on a cell-based HP Integrity server, use the `info mem` command. If the amount of “NonInterleaved Memory” reported is less than 512 MB then no CLM is configured for any cells in the nPartition (and the indicated amount of noninterleaved memory is used by system firmware). If the `info mem` command reports more than 512 MB of noninterleaved memory then use Partition Manager or the `parstatus` command to confirm the CLM configuration details.

To set the CLM configuration, use Partition Manager or the `parmodify` command.

Adding Microsoft Windows to the Boot Options List

To add a Microsoft Windows entry to the system boot options list you must do so from EFI by using the `\MSUtil\nvrboot.efi` utility to import boot options from the `EFI\Microsoft\WINNT50\Boot0...` file on the device from which Windows is loaded.

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Adding a Microsoft Windows Boot Option

This procedure adds the Microsoft Windows item to the boot options list.

Step 1. Access the EFI Shell environment.

Login to the management processor and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot Microsoft Windows.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the Microsoft Windows loader is `\efi\microsoft\winnt50\ia64ldr.efi` and it should be on the device you are accessing. (However, you must only initiate this loader from the EFI Boot Menu and not from the EFI Shell.)

- Step 3.** List the contents of the `\EFI\Microsoft\WINNT50` directory to identify the name of the Windows boot option file (`Boot00nn`) that you want to import into the system boot options list.

```
fs0:\> ls EFI\Microsoft\WINNT50
Directory of: fs0:\EFI\Microsoft\WINNT50

    09/18/03  11:58a <DIR>          1,024  .
    09/18/03  11:58a <DIR>          1,024  ..
    12/18/03  08:16a                354   Boot0001
           1 File(s)                354 bytes
           2 Dir(s)
```

```
fs0:\>
```

- Step 4.** At the EFI Shell environment, issue the `\MSUtil\nvrboot.efi` command to launch the Microsoft Windows boot options utility.

```
fs0:\> msutil\nvrboot

NVRBOOT: OS Boot Options Maintenance Tool [Version 5.2.3683]

    1. SUSE SLES 9
    2. HP-UX Primary Boot: 0/0/1/0/0.2.0
    * 3. Windows Server 2003, Datacenter
    4. EFI Shell [Built-in]

    * = Windows OS boot option

(D)isplay (M)odify (C)opy E(x)port (I)mport (E)rase (P)ush (H)elp (Q)uit

Select>
```

- Step 5.** Use the **Import** command to import the Windows boot option file.

```
Select> i
Enter IMPORT file path: \EFI\Microsoft\WINNT50\Boot0001
Imported Boot Options from file: \EFI\Microsoft\WINNT50\Boot0001

Press enter to continue
```

- Step 6.** Type **Q** to quit the NVRBOOT utility, and exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment press **^B (Control-B)**; this exits the system console and returns to the management processor Main Menu. To exit the management processor, type **X** at the Main Menu.

Booting Microsoft Windows

You can boot the Windows Server 2003 OS on an HP Integrity server by using the EFI Boot Manager to choose the appropriate Windows item from the boot options list.

Refer to “Shutting Down Microsoft Windows” on page 202 for details on shutting down the Windows OS.

CAUTION ACPI Configuration for Windows Must Be windows

On cell-based HP Integrity servers, to boot the Windows OS an nPartition must have its ACPI configuration value set to windows.

At the EFI Shell, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to windows, then Windows cannot boot; in this situation you must reconfigure `acpiconfig` or booting will be interrupted with a panic when launching Windows.

To set the ACPI configuration for Windows: At the EFI Shell enter the `acpiconfig windows` command, and then enter the `reset` command for the nPartition to reboot with the proper (windows) configuration for Windows.

NOTE Microsoft Windows Booting on HP Integrity Servers

The recommended method for booting Windows is to use the EFI Boot Manager menu to choose a Windows entry from the boot options list. Using the `ia64ldr.efi` Windows loader from the EFI Shell is not recommended.

Windows Booting

From the EFI Boot Manager menu, choose an item from the boot options list to boot Windows using that boot option. The EFI Boot Manager is available only on HP Integrity servers.

Refer to “ACPI Configuration for Windows Must Be windows” on page 201 for required configuration details.

Step 1. Access the EFI Boot Manager menu for the system on which you want to boot Windows.

Log in to the management processor and enter `CO` to access the Console list. Choose the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

Step 2. At the EFI Boot Manager menu, choose an item from the boot options list.

Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments to be used when booting the device.

Step 3. Press **Enter** to initiate booting using the chosen boot option.

Step 4. When Windows begins loading, wait for the Special Administration Console (SAC) to become available.

The SAC interface provides a text-based administration tool that is available from the nPartition console. For details refer to the SAC online help (type `?` at the `SAC>` prompt).

Chapter 5 Booting and Resetting nPartitions

Booting and Shutting Down Microsoft Windows

```
Loading.: Windows Server 2003, Datacenter
Starting: Windows Server 2003, Datacenter
```

```
Starting Windows...
*****
Computer is booting, SAC started and initialized.

Use the "ch -?" command for information about using channels.
Use the "?" command for general help.

SAC>
```

Step 5. Exit the console and management processor interfaces if you are finished using them.

To exit the console environment, press **^B (Control-B)**; this exits the console and returns to the management processor Main menu. To exit the management processor, type X at the Main menu.

Shutting Down Microsoft Windows

You can shut down the Windows OS on HP Integrity servers using the **Start** menu or the shutdown command.

CAUTION Do not shut down Windows using Special Administration Console (SAC) restart or shutdown commands under normal circumstances.

Issuing restart or shutdown at the SAC> prompt causes the system to restart or shut down immediately and can result in the loss of data.

Instead use the Windows **Start** menu or the shutdown command to shut down gracefully.

To shut down Windows use either of the following methods.

- Choose **Shut Down** from the **Start** menu and choose either **Restart** or **Shut down** from the pull-down menu.

The **Restart** menu item shuts down and restarts the system. The **Shut down** menu item shuts down the system.

You can use this method when using a graphical interface to the system.

- Issue the shutdown command from the Windows command line.

Refer to the procedure “Windows Shutdown from the Command Line” on page 203 for details.

You can issue this command from a command prompt through the Special Administration Console (SAC) or from any other command line.

The Windows shutdown command includes the following options:

/s	Shut down the system. This is the equivalent of Start—>Shut Down, Shut down .
/r	Shut down and restart the system. This is the equivalent of Start—>Shut Down, Restart .
/a	Abort a system shutdown.
/t xxx	Set the timeout period before shutdown to xxx seconds. The timeout period can range from 0–600, with a default of 30.

Refer to the help shutdown Windows command for details.

NOTE On HP rx7620, rx7640, rx8620, and rx8640 servers, performing a shutdown using shutdown /s

(or the equivalent **Start**—>**Shut Down, Shut down**) powers off the server cabinet or powers off the cells and I/O chassis assigned to the nPartition. On these servers you can customize this behavior. For details refer to “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

On HP Integrity Superdome servers, the Windows `shutdown /s` command shuts down the system and keeps all cells at BIB (the boot-is-blocked, inactive state).

Windows Shutdown from the Command Line

From the Windows command line, issue the **shutdown** command to shut down the OS.

Step 1. Log in to Windows running on the system that you want to shut down.

For example, access the system console and use the Windows SAC interface to start a command prompt, from which you can issue Windows commands to shut down the the system.

Step 2. Check whether any users are logged in.

Use the `query user` or `query session` command.

Step 3. Issue the `shutdown` command and the appropriate options to shut down the Windows Server 2003 on the system.

You have the following options when shutting down Windows:

- To shut down Windows and reboot:

`shutdown /r`

Alternatively, you can choose the **Start** —> **Shut Down** action and choose **Restart** from the pull-down menu.

- To shut down Windows and not reboot (either power down server hardware or put an nPartition into a shutdown for reconfig state):

`shutdown /s`

Alternatively, you can choose the **Start** —> **Shut Down** action and choose **Shut down** from the pull-down menu.

- To abort a shutdown (stop a shutdown that has been initiated): `shutdown /a`

For example:

```
shutdown /r /t 60 /c "Shut down in one minute."
```

This command initiates a Windows system shutdown-and-reboot after a timeout period of 60 seconds. The `/c` option specifies a message that is broadcast to any other users of the system.

Booting and Shutting Down Linux

This section has procedures for booting and shutting down Linux on cell-based HP Integrity servers and a procedure for adding Linux to the boot options list.

- To check whether the cell local memory (CLM) configuration is appropriate for Red Hat Enterprise Linux or SuSE Linux Enterprise Server, refer to “Linux Support for Cell Local Memory” on page 204.
- To add a Linux entry to the nPartition boot options list refer to “Adding Linux to the Boot Options List” on page 204.
- To boot Red Hat Enterprise Linux refer to “Booting Red Hat Enterprise Linux” on page 206.
- To boot SuSE Linux Enterprise Server refer to “Booting SuSE Linux Enterprise Server” on page 207.
- To shut down Linux refer to “Shutting Down Linux” on page 208.

Linux Support for Cell Local Memory

On servers based on the HP sx1000 chipset or HP sx2000 chipset, each cell has a cell local memory (CLM) parameter, which determines how firmware interleaves memory residing on the cell.

NOTE Red Hat Enterprise Linux does not support using CLM. Before booting Red Hat Enterprise Linux on an nPartition, you must ensure that the CLM parameter for each cell in the nPartition is set to zero (0). Although you might be able to boot Red Hat Enterprise Linux on an nPartition with CLM configured, any memory configured as cell local is unusable, and such a configuration is untested and unsupported.

SuSE Linux Enterprise Server supports using CLM. The optimal CLM settings for SuSE Linux Enterprise Server depend on the applications and workload the OS is running.

To check CLM configuration details from an OS, use Partition Manager or the `parstatus` command. For example, the `parstatus -v -c#` command and `parstatus -v -p#` command report the CLM amount requested and CLM amount allocated for the specified cell (`-c#`, where `#` is the cell number) or the specified nPartition (`-p#`, where `#` is the nPartition number).

To check CLM configuration details from the EFI Shell on a cell-based HP Integrity server, use the `info mem` command. If the amount of “NonInterleaved Memory” reported is less than 512 MB then no CLM is configured for any cells in the nPartition (and the indicated amount of noninterleaved memory is used by system firmware). If the `info mem` command reports more than 512 MB of noninterleaved memory then use Partition Manager or the `parstatus` command to confirm the CLM configuration details.

To set the CLM configuration, use Partition Manager or the `parmodify` command.

Adding Linux to the Boot Options List

This section describes how to add a Linux entry to the system boot options list. The processes for adding both Red Hat Enterprise Linux and SuSE Linux Enterprise Servers are given here.

You can add the `\EFI\redhat\elilo.efi` loader or the `\efi\SuSE\elilo.efi` loader to the boot options list from the EFI Shell or EFI **Boot Configuration** menu (or in some versions of EFI, the **Boot Option Maintenance** menu).

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Adding a Linux Boot Option

This procedure adds a Linux item to the boot options list.

Step 1. Access the EFI Shell environment.

Log in to the management processor and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot Linux.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the Red Hat Enterprise Linux loader is `\EFI\redhat\elilo.efi` and it should be on the device you are accessing.

The full path for the SuSE Linux Enterprise Server loader is `\efi\SuSE\elilo.efi` and it should be on the device you are accessing.

Step 3. At the EFI Shell environment, use the `bcfg` command to manage the boot options list.

The `bcfg` command includes the following options for managing the boot options list:

- `bcfg boot dump` — Display all items in the boot options list for the system.
- `bcfg boot rm #` — Remove the item number specified by `#` from the boot options list.
- `bcfg boot mv #a #b` — Move the item number specified by `#a` to the position specified by `#b` in the boot options list.
- `bcfg boot add # file.efi "Description"` — Add a new boot option to the position in the boot options list specified by `#`. The new boot option references `file.efi` and is listed with the title specified by `Description`.

For example, `bcfg boot add 1 \EFI\redhat\elilo.efi "Red Hat Enterprise Linux"` adds a Red Hat Enterprise Linux item as the first entry in the boot options list.

Likewise, `bcfg boot add 1 \efi\SuSE\elilo.efi "SLES 9"` adds a SuSE Linux item as the first entry in the boot options list.

See the `help bcfg` command for details.

Step 4. Exit the console and management processor interfaces if you are finished using them.

To exit the EFI environment press **^B (Control-B)**; this exits the system console and returns to the management processor Main Menu. To exit the management processor, type `x` at the Main Menu.

Booting Red Hat Enterprise Linux

You can boot the Red Hat Enterprise Linux OS on HP Integrity servers using either of the methods described in this section.

Refer to “Shutting Down Linux” on page 208 for details on shutting down the Red Hat Enterprise Linux OS.

CAUTION ACPI Configuration for Red Hat Enterprise Linux Must Be single-pci-domain

On cell-based HP Integrity servers, to boot the Red Hat Enterprise Linux OS an nPartition must have its ACPI configuration value set to `single-pci-domain`.

At the EFI Shell, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to `single-pci-domain`, then Red Hat Enterprise Linux could panic; in this situation you must reconfigure `acpiconfig` to eliminate any bus address conflicts and ensure all I/O slots have unique addresses.

To set the ACPI configuration for Red Hat Enterprise Linux: At the EFI Shell enter the `acpiconfig single-pci-domain` command, and then enter the `reset` command for the nPartition to reboot with the proper (`single-pci-domain`) configuration for Red Hat Enterprise Linux.

Use either of these methods to boot Red Hat Enterprise Linux:

- Choose a Red Hat Enterprise Linux entry from the EFI Boot Manager menu.
To load the Red Hat Enterprise Linux OS at the EFI Boot Manager menu, choose its entry from the list of boot options.
Choosing a Linux entry from the boot options list boots the OS using `ELILO.EFI` loader and the `elilo.conf` file.
- Initiate the `ELILO.EFI` Linux loader from the EFI Shell.

Refer to the procedure “Booting Red Hat Enterprise Linux (EFI Shell)” on page 206 for details.

On a Red Hat Enterprise Linux boot device EFI System Partition, the full paths to the loader and configuration files are:

```
\EFI\redhat\elilo.efi  
\EFI\redhat\elilo.conf
```

After choosing the file system for the boot device (for example, `fs0:`) you can initiate the Linux loader from the EFI Shell prompt by entering the full path for the `ELILO.EFI` loader.

By default the `ELILO.EFI` loader boots Linux using the kernel image and parameters specified by the default entry in the `elilo.conf` file on the EFI System Partition for the boot device.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, type a space) at the `ELILO` boot prompt. To exit the `ELILO.EFI` loader, use the `exit` command.

Booting Red Hat Enterprise Linux (EFI Shell)

Use this procedure to boot Red Hat Enterprise Linux from the EFI Shell.

Refer to “ACPI Configuration for Red Hat Enterprise Linux Must Be single-pci-domain” on page 206 for required configuration details.

Step 1. Access the EFI Shell.

From the system console, choose the **EFI Shell** entry from the EFI Boot Manager menu to access the

shell.

Step 2. Access the EFI System Partition for the Red Hat Enterprise Linux boot device.

Use the `map EFI Shell` command to list the file systems (`fs0`, `fs1`, and so on) that are known and have been mapped.

To choose a file system to use, enter its mapped name followed by a colon (`:`). For example, to operate with the boot device that is mapped as `fs3`, enter `fs3:` at the EFI Shell prompt.

Step 3. Enter `ELILO` at the EFI Shell command prompt to launch the `ELILO.EFI` loader.

If needed, you can specify the loader's full path by entering `\EFI\redhat\elilo` at the EFI Shell command prompt.

Step 4. Allow the `ELILO.EFI` loader to proceed with booting the Red Hat Enterprise Linux kernel.

By default, the `ELILO.EFI` loader boots the kernel image and options specified by the default item in the `elilo.conf` file.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, type a space) at the `ELILO` boot prompt. To exit the loader, use the `exit` command.

Booting SuSE Linux Enterprise Server

You can boot the SuSE Linux Enterprise Server 9 OS on HP Integrity servers using either of the methods described in this section.

Refer to “Shutting Down Linux” on page 208 for details on shutting down the SuSE Linux Enterprise Server OS.

CAUTION ACPI Configuration for SuSE Linux Enterprise Server Must Be single-pci-domain

On cell-based HP Integrity servers, to boot the SuSE Linux Enterprise Server OS an nPartition must have its ACPI configuration value set to `single-pci-domain`.

At the EFI Shell, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to `single-pci-domain`, then SuSE Linux Enterprise Server could panic.

To set the ACPI configuration for SuSE Linux Enterprise Server: at the EFI Shell enter the `acpiconfig single-pci-domain` command, and then enter the `reset` command for the nPartition to reboot with the proper (`single-pci-domain`) configuration for SuSE Linux Enterprise Server.

Use either of these methods to boot SuSE Linux Enterprise Server:

- Choose a SuSE Linux Enterprise Server entry from the EFI Boot Manager menu.

To load the SuSE Linux Enterprise Server OS at the EFI Boot Manager menu, choose its entry from the list of boot options.

Choosing a Linux entry from the boot options list boots the OS using `ELILO.EFI` loader and the `elilo.conf` file.

- Initiate the `ELILO.EFI` Linux loader from the EFI Shell.

Refer to the procedure “Booting SuSE Linux Enterprise Server (EFI Shell)” on page 208 for details.

On a SuSE Linux Enterprise Server boot device EFI System Partition, the full paths to the loader and configuration files are:

```
\efi\SuSE\elilo.efi  
\efi\SuSE\elilo.conf
```

After choosing the file system for the boot device (for example, `fs0:`) you can initiate the Linux loader from the EFI Shell prompt by entering the full path for the `ELILO.EFI` loader.

By default the `ELILO.EFI` loader boots Linux using the kernel image and parameters specified by the default entry in the `elilo.conf` file on the EFI System Partition for the boot device.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, type a space) at the `ELILO` boot prompt. To exit the `ELILO.EFI` loader, use the `exit` command.

Booting SuSE Linux Enterprise Server (EFI Shell)

Use this procedure to boot SuSE Linux Enterprise Server 9 from the EFI Shell.

Refer to “ACPI Configuration for SuSE Linux Enterprise Server Must Be single-pci-domain” on page 207 for required configuration details.

Step 1. Access the EFI Shell.

From the system console, choose the **EFI Shell** entry from the EFI Boot Manager menu to access the shell.

Step 2. Access the EFI System Partition for the SuSE Linux Enterprise Server boot device.

Use the `map` EFI Shell command to list the file systems (`fs0`, `fs1`, and so on) that are known and have been mapped.

To choose a file system to use, enter its mapped name followed by a colon (:). For example, to operate with the boot device that is mapped as `fs3`, enter `fs3:` at the EFI Shell prompt.

Step 3. Enter **ELILO** at the EFI Shell command prompt to launch the `ELILO.EFI` loader.

If needed, you can specify the loader’s full path by entering `\efi\SuSE\elilo` at the EFI Shell command prompt.

Step 4. Allow the `ELILO.EFI` loader to proceed with booting the SuSE Linux kernel.

By default, the `ELILO.EFI` loader boots the kernel image and options specified by the default item in the `elilo.conf` file.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, type a space) at the `ELILO` boot prompt. To exit the loader, use the `exit` command.

Shutting Down Linux

Use the `shutdown` command to shut down Red Hat Enterprise Linux or SuSE Linux Enterprise Server.

The Red Hat Enterprise Linux and SuSE Linux Enterprise Server `shutdown` command includes the following options:

`-h` Halt after shutdown.

On cell-based HP Integrity servers, this will either power down server hardware or put the nPartition into a shutdown for reconfig state.

Use the `PE` command at the management processor Command menu to manually power on or power off server hardware, as needed.

- `-r` Reboot after shutdown.
- `-c` Cancel an already running shutdown.
- `time` When to shut down. (Required.) You can specify the `time` option in any of the following ways:
- Absolute time in the format `hh:mm`, in which `hh` is the hour (one or two digits) and `mm` is the minute of the hour (two digits).
 - Number of minutes to wait in the format `+m`, in which `m` is the number of minutes.
 - `now` to immediately shut down; this is equivalent to using `+0` to wait zero minutes.

Refer to the `shutdown(8)` Linux manpage for details. Also refer to the Linux manpage for the `poweroff` command.

NOTE

On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the nPartition behavior when an OS is shut down and halted (`shutdown -h` or `poweroff`). The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

The normal behavior for Red Hat Enterprise Linux or SuSE Linux Enterprise Server shutdown and halt is for the nPartition to be made inactive.

For details refer to “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

Shutting Down Linux

From the command line for Red Hat Enterprise Linux or SuSE Linux Enterprise Server, issue the `shutdown` command to shut down the OS.

Step 1. Log in to Linux running on the system you want to shut down.

You should log in to the MP for the server and use the Console menu to access the system console. Accessing the console through the MP enables you to maintain console access to the system after Linux has shut down.

Step 2. Issue the `shutdown` command with the desired command-line options, and include the required `time` argument to specify when the operating shutdown is to occur.

For example, `shutdown -r +20` will shut down and reboot the system starting in 20 minutes.

Rebooting and Resetting nPartitions

You can reboot and reset nPartitions by using any one of the following procedures:

- “Rebooting and Resetting nPartitions (Service Processor)” on page 210
- “Rebooting and Resetting nPartitions (BCH Menu)” on page 211
- “Rebooting and Resetting nPartitions (EFI Boot Manager)” on page 211
- “Rebooting and Resetting nPartitions (EFI Shell)” on page 212
- “Rebooting and Resetting nPartitions (HP-UX)” on page 212
- “Rebooting and Resetting nPartitions (OpenVMS)” on page 213
- “Rebooting and Resetting nPartitions (Windows)” on page 213
- “Rebooting and Resetting nPartitions (Linux)” on page 214

When you perform a reboot or reset of an nPartition, all active cells in the nPartition reboot and the nPartition returns to the system boot environment (BCH or EFI). On PA-RISC systems, any inactive cells in the nPartition are not rebooted in this procedure.

NOTE If possible shut down the operating system before resetting an nPartition.

Rebooting and Resetting nPartitions (Service Processor)

From the service processor issue the **RS** command to reset an nPartition. Under normal operation you first shut down the operating system.

Step 1. Login to the service processor (MP or GSP) and enter **CM** to access the Command Menu.

Step 2. At the Command menu, enter the **RS** command, specify which nPartition is to be reset, and confirm whether to reset it.

The **RS** command resets all active cells in the nPartition and reboots them past partition rendezvous to the system boot environment (BCH or EFI) or an operating system.

NOTE On HP Integrity servers you should reset an nPartition only after all self tests and partition rendezvous have completed. For example, when the nPartition is inactive (all cells are at BIB) or is at EFI.

Be certain to correctly select which nPartition to be reset.

```
GSP:CM> RS
```

This command resets the selected partition.

WARNING: Execution of this command irrecoverably halts all system processing and I/O activity and restarts the selected partition.

```

#   Name
---  ----
0)  jules00
1)  jules01

Select a partition number: 1

Do you want to reset partition number 1? (Y/[N]) y

-> The selected partition will be reset.
GSP:CM>

```

If you are accessing the service processor using a single-partition-user account, the `RS` command selects which nPartition is to be reset: the nPartition that your account allows you to access.

If using an operator or administrator service processor account, you can select which of the nPartitions in the server complex you want to reset.

- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Rebooting and Resetting nPartitions (BCH Menu)

From the BCH Menu, issue the `REBOOT` command to reset the local nPartition. The BCH Menu is available only on HP 9000 systems.

- Step 1.** Access the BCH Main Menu for the nPartition that you want to reboot.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

- Step 2.** From the BCH main menu for the nPartition, enter the `REBOOT` command to reboot the nPartition.

The BCH `REBOOT` command resets all active cells in the nPartition and reboots them past partition rendezvous to BCH or HP-UX.

```

Main Menu: Enter command or menu > REBOOT
Rebooting the partition ...

```

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Rebooting and Resetting nPartitions (EFI Boot Manager)

From the EFI Boot Manager menu, select the **Boot Option Maintenance** —> **Cold Reset** menu to reset the local nPartition.

The EFI Boot Manager is available only on HP Integrity systems.

- Step 1.** Access the EFI Boot Manager menu for the nPartition that you want to reboot.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

- Step 2.** From the EFI Boot Manager menu, select the **Boot Option Maintenance** menu. Then from the **Boot Option Maintenance** menu select the **Cold Reset** menu to reset the local nPartition.

The **Cold Reset** menu item resets all active cells in the nPartition and reboots them.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Rebooting and Resetting nPartitions (EFI Shell)

From the EFI Shell environment, issue the `reset` command to reset the local nPartition. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition that you want to reboot.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** From the EFI Shell environment, issue the `reset` command to reset the local nPartition.

The `reset` command resets all active cells in the nPartition and reboots them.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Rebooting and Resetting nPartitions (HP-UX)

From the HP-UX command line, issue the `/sbin/shutdown` or `/usr/sbin/reboot` command to reset the local nPartition.

- Step 1.** Login to HP-UX running on the nPartition that you want to reboot.

- Step 2.** Issue the `shutdown -r` command to reset the nPartition.

The `shutdown -r` command shuts down HP-UX and reboots the nPartition. All active cells in the nPartition are reset.

Rebooting and Resetting nPartitions (OpenVMS)

To reset the local nPartition from the HP OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command to shut down OpenVMS, then enter **yes** at the “Should an automatic system reboot be performed” prompt.

Step 1. Log in to HP OpenVMS running on the system that you want to shut down.

You should log in to the MP for the server and use the Console menu to access the system console. Accessing the console through the MP enables you to maintain console access to the system after HP OpenVMS has shut down.

Step 2. At the OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command and enter **Yes** at the “Should an automatic system reboot be performed” prompt.

```
>@SYS$SYSTEM:SHUTDOWN

          SHUTDOWN -- Perform an Orderly System Shutdown
                   on node RSNVMS

How many minutes until final shutdown [0]:
Reason for shutdown [Standalone]:
Do you want to spin down the disk volumes [NO]?
Do you want to invoke the site-specific shutdown procedure [YES]?
Should an automatic system reboot be performed [NO]? yes
When will the system be rebooted [shortly via automatic reboot]:
Shutdown options (enter as a comma-separated list):
  REBOOT_CHECK           Check existence of basic system files
  SAVE_FEEDBACK         Save AUTOGEN feedback information from this boot
  DISABLE_AUTOSTART     Disable autostart queues
  POWER_OFF             Request console to power-off the system

Shutdown options [NONE]:

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
...
```

NOTE HP OpenVMS I64 currently does not support the `POWER_OFF` shutdown option.

Rebooting and Resetting nPartitions (Windows)

To reset the local nPartition from Windows issue the `shutdown /r` command (or select the **Start** → **Shut Down** action and choose **Restart** from the pull-down menu).

CAUTION Do not shut down Windows using Special Administration Console (SAC) `restart` or `shutdown` commands under normal circumstances.

Issuing `restart` or `shutdown` at the `SAC>` prompt causes the system to restart or shutdown immediately and can result in the loss of data.

Instead use the Windows **Start** menu or the `shutdown` command to shut down gracefully.

Step 1. Login to Windows running on the nPartition that you want to shut down.

For example, access the nPartition console and use the Windows SAC interface to start a command prompt, from which you can issue Windows commands to shut down the nPartition.

- Step 2.** Issue the `shutdown /r` command to shut down the Windows Server 2003 operating system on the nPartition and reboot. You also can perform this procedure by selecting the **Start → Shut Down** action and choosing **Restart** from the pull-down menu

For example:

```
shutdown /r /t 60 /c "Shut down and reboot."
```

This command initiates a Windows system shutdown-and-reboot after a timeout period of 60 seconds. The `/c` option specifies a message that is broadcast to any other users of the system.

For more details use the `help shutdown` command.

Rebooting and Resetting nPartitions (Linux)

To reset the local nPartition from Linux, issue the `shutdown -r time` command, where *time* is the time when the system will be shut down and rebooted.

- Step 1.** Login to Linux running on the system you want to shut down.
- Step 2.** Issue the `shutdown -r time` command with the required *time* argument to specify when the shutdown is to occur.

You can specify *time* in the format *hh:mm*, in which *hh* is the hour (one or two digits) and *mm* is the minute of the hour (two digits); or in the format *+m*, in which *m* is the number of minutes delay until shutdown; or specify `now` to immediately shut down.

Performing a Reboot for Reconfig

You can perform a reboot for reconfig by using the following procedures:

- “Reboot for Reconfig from HP-UX (/sbin/shutdown -R command)” on page 215
- “Reboot for Reconfig from OpenVMS” on page 215
- “Reboot for Reconfig from Windows (shutdown /r command)” on page 216
- “Reboot for Reconfig from Linux (shutdown -r time command)” on page 217

During a reboot for reconfig of an nPartition, the command that you issue performs the following tasks:

1. Shuts down the operating system and resets all cells that are assigned to the nPartition, including any inactive cells.
2. Reconfigures the nPartition if necessary (if there is a pending change to the Stable Complex Configuration Data, it occurs during the reboot for reconfig).
3. Boots all cells in the nPartition. Any cells with a “n” use-on-next-boot value remain inactive at BIB, and all other cells can rendezvous to form the nPartition.

Perform a reboot for reconfig of an nPartition whenever you add cells or remove active cells from the nPartition, and whenever you need to allow an inactive cell to join the nPartition (such as after changing a cell use-on-next-boot value from “n” to “y”).

Reboot for Reconfig from HP-UX (/sbin/shutdown -R command)

From the HP-UX command line use the `shutdown -R` command to perform a reboot for reconfig for an nPartition.

Step 1. Login to HP-UX running on the nPartition where you want to perform the reboot for reconfig.

Step 2. Issue the `shutdown -R` command to perform a reboot for reconfig of the nPartition.

The `shutdown -R` command shuts down HP-UX, reboots all cells assigned to the nPartition, performs any nPartition reconfigurations, and boots all cells that have “y” use-on-next-boot values.

Reboot for Reconfig from OpenVMS

To perform a reboot for reconfig of the local nPartition from the HP OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command to shut down OpenVMS, then enter **Yes** at the “Should an automatic system reboot be performed” prompt.

Step 1. Log in to HP OpenVMS running on the system that you want to shut down.

You should log in to the MP for the server and use the Console menu to access the system console. Accessing the console through the MP enables you to maintain console access to the system after HP OpenVMS has shut down.

Step 2. At the OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command and enter **Yes** at the “Should an automatic system reboot be performed” prompt.

```
>@SYS$SYSTEM:SHUTDOWN
```

```
SHUTDOWN -- Perform an Orderly System Shutdown
           on node RSNVMS
```

```
How many minutes until final shutdown [0]:
Reason for shutdown [Standalone]:
Do you want to spin down the disk volumes [NO]?
Do you want to invoke the site-specific shutdown procedure [YES]?
Should an automatic system reboot be performed [NO]? yes
When will the system be rebooted [shortly via automatic reboot]:
Shutdown options (enter as a comma-separated list):
REBOOT_CHECK      Check existence of basic system files
SAVE_FEEDBACK     Save AUTOGEN feedback information from this boot
DISABLE_AUTOSTART Disable autostart queues
POWER_OFF         Request console to power-off the system

Shutdown options [NONE]:

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
...
```

NOTE HP OpenVMS I64 currently does not support the `POWER_OFF` shutdown option.

Reboot for Reconfig from Windows (shutdown /r command)

From the Windows command line use the `shutdown /r` command (or select the **Start** → **Shut Down** action and choose **Restart** from the pull-down menu) to perform a reboot for reconfig for an nPartition.

CAUTION Do not shut down Windows using Special Administration Console (SAC) `restart` or `shutdown` commands under normal circumstances.

Issuing `restart` or `shutdown` at the `SAC>` prompt causes the system to restart or shutdown immediately and can result in the loss of data.

Instead use the Windows **Start** menu or the `shutdown` command to shut down gracefully.

Step 1. Login to Windows running on the nPartition that you want to shut down.

For example, access the nPartition console and use the Windows SAC interface to start a command prompt, from which you can issue Windows commands to shut down the nPartition.

Step 2. Issue the `shutdown /r` command to shut down the Windows Server 2003 operating system on the nPartition and reboot. You also can perform this task by selecting the **Start** → **Shut Down** action and choosing **Restart** from the pull-down menu.

For example:

```
shutdown /r /t 60 /c "Reboot for reconfig."
```

This command initiates a Windows system shutdown-and-reboot after a timeout period of 60 seconds. The `/c` option specifies a message that is broadcast to any other users of the system.

For more details use the `help shutdown` command.

Reboot for Reconfig from Linux (shutdown -r time command)

To perform a reboot for reconfig of an nPartition from Linux, issue the `shutdown -r time` command, where *time* is the time when the system will be shut down and rebooted.

- Step 1.** Login to Linux running on the nPartition you want to shut down.
- Step 2.** Issue the `shutdown -r time` command with the required *time* argument to specify when the shutdown is to occur.

You can specify *time* in the format *hh:mm*, in which *hh* is the hour (one or two digits) and *mm* is the minute of the hour (two digits); or in the format *+m*, in which *m* is the number of minutes delay until shutdown; or specify `now` to immediately shut down.

Shutting Down to a Shutdown for Reconfig (Inactive) State

You can shut down to a shutdown for reconfig (inactive) state by using any one of the following procedures:

- “Shutting Down to Shutdown for Reconfig (Service Processor)” on page 219
- “Shutting Down to Shutdown for Reconfig (BCH Menu)” on page 219
- “Shutting Down to Shutdown for Reconfig (EFI Shell)” on page 220
- “Shutting Down to Shutdown for Reconfig (HP-UX)” on page 220
- “Shutting Down to Shutdown for Reconfig (OpenVMS)” on page 221
- “Shutting Down to Shutdown for Reconfig (Windows)” on page 222
- “Shutting Down to Shutdown for Reconfig (Linux)” on page 223

On all HP 9000 servers and on all HP Superdome servers, performing a shutdown for reconfig always keep all cells assigned to the nPartition at a boot-is-blocked state.

NOTE

On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the nPartition behavior when an OS shuts down to the shutdown for reconfig state. The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

On these servers, the normal behavior for HP-UX B.11.23 and Linux shutdown for reconfig is for the nPartition be made inactive, and the normal Windows shutdown for reconfig (shutdown /s) behavior is for the nPartition hardware to be powered off.

For details see “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

When you use any of the methods to hold an nPartition at the shutdown for reconfig state, the command you issue performs the following tasks:

1. Shut down the operating system (if using the shutdown command) and reset all cells that are assigned to the nPartition, including any inactive cells.
2. Reconfigure the nPartition if necessary (if there is a pending change to the Stable Complex Configuration Data, it occurs during the reboot for reconfig).
3. Either keep all cells at a boot-is-blocked state (the nPartition and all cells assigned to it are inactive) or power off all cells and I/O chassis assigned to the nPartition.

HP rx7620, rx7640, rx8620, and rx8640 servers can be configured to power off hardware upon shutdown for reconfig. For details see “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

You can reset an nPartition to shutdown for reconfig whenever you need for the nPartition and its cells to be inactive.

Shutting Down to Shutdown for Reconfig (Service Processor)

From the service processor Command Menu, issue the **RR** command to shut an nPartition down to a shutdown for reconfig (inactive) state. Under normal operation you first shut down the operating system.

- Step 1.** Login to the service processor (MP or GSP) and enter **CM** to access the Command Menu.
- Step 2.** At the service processor Command menu, enter the **RR** command, specify which nPartition is to be reset, and confirm whether to reset it to the shutdown for reconfig state.

The service processor **RR** command resets all cells in the nPartition, performs any nPartition reconfigurations, and halts all cells at a boot-is-blocked state, thus making the nPartition and all its cells inactive.

Be certain to select the correct nPartition to be reset.

```
GSP:CM> RR
```

```
This command resets for reconfiguration the selected partition.
```

```
WARNING: Execution of this command irrecoverably halts all system  
processing and I/O activity and restarts the selected  
partition in a way that it can be reconfigured.
```

```
#   Name  
---  ---  
0)  jules00  
1)  jules01
```

```
Select a partition number: 1
```

```
Do you want to reset for reconfiguration partition number 1? (Y/[N]) y
```

```
-> The selected partition will be reset for reconfiguration.
```

```
GSP:CM>
```

If you are accessing the service processor using a single-partition-user account, the **RR** command selects which nPartition is to be reset: the nPartition that your account allows you to access.

If using an operator or administrator account, you can select which nPartition in the server complex you want to reset.

- Step 3.** To exit the service processor Command Menu, enter **MA** to return to the service processor Main Menu.

At the Main Menu, enter **X** to exit the service processor interface.

Shutting Down to Shutdown for Reconfig (BCH Menu)

From the BCH Menu issue the **RECONFIGRESET** command to shut an nPartition down to a shutdown for reconfig (inactive) state. The BCH Menu is available only on HP 9000 systems.

- Step 1.** Access the BCH Main Menu for the nPartition that you want to shut down to a shutdown for reconfig (inactive) state.

Login to the service processor (MP or GSP) and enter **CO** to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu,

then enter MA to return to the BCH Main Menu.

- Step 2.** From the BCH interface for the nPartition, enter the **RECONFIGRESET** command to reset the nPartition to the shutdown for reconfig state.

The **RECONFIGRESET** command resets all cells in the nPartition, performs any nPartition reconfigurations, and halts all cells at a boot-is-blocked state, thus making the nPartition and all its cells inactive.

```
Main Menu: Enter command or menu > RECONFIGRESET  
Reset the partition for reconfiguration of Complex Profile ...
```

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type X at the Main Menu.

Shutting Down to Shutdown for Reconfig (EFI Shell)

From the EFI Shell environment issue the **reconfigreset** command to shut an nPartition down to a shutdown for reconfig (inactive) state. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition that you want to shut down to a shutdown for reconfig (inactive) state.

Login to the service processor (MP or GSP) and enter CO to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** At the EFI Shell environment, issue the **reconfigreset** command to reset the local nPartition to a shutdown for reconfig state.

The **reconfigreset** command resets all cells in the nPartition, performs any nPartition reconfigurations, and halts all cells at a boot-is-blocked state, thus making the nPartition and all its cells inactive.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type X at the Main Menu.

Shutting Down to Shutdown for Reconfig (HP-UX)

From the HP-UX command line issue the **/sbin/shutdown -R -H** command to shut an nPartition down to a shutdown for reconfig (inactive) state.

NOTE On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the nPartition behavior when HP-UX B.11.23 initiates a shutdown for reconfig (**shutdown -h** or

`shutdown -R -H`). The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

The normal behavior for HP-UX B.11.23 shutdown for reconfig is for the nPartition be made inactive.

For details see “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

Step 1. Login to HP-UX running on the nPartition that you want to shut down to a shutdown for reconfig (inactive) state.

Step 2. Issue the `shutdown -R -H` command to reset the nPartition to the shutdown for reconfig state.

The `shutdown -R -H` command shuts down HP-UX, reset all cells in the nPartition, perform any nPartition reconfigurations, and halt all cells at a boot-is-blocked state, thus making the nPartition and all its cells inactive.

Shutting Down to Shutdown for Reconfig (OpenVMS)

To perform a shutdown for reconfig of an nPartition running OpenVMS I64: first issue `@SYS$SYSTEM:SHUTDOWN.COM` from OpenVMS and enter **No** at the “Should an automatic system reboot be performed” prompt, then access the MP and, from the MP Command Menu, issue the `RR` command and specify the nPartition that is to be shutdown for reconfig.

Step 1. Log in to HP OpenVMS running on the system that you want to shut down.

You should log in to the MP for the server and use the Console menu to access the system console. Accessing the console through the MP enables you to maintain console access to the system after HP OpenVMS has shut down.

Step 2. At the OpenVMS command line, issue the `@SYS$SYSTEM:SHUTDOWN` command and enter **No** at the “Should an automatic system reboot be performed” prompt.

```
>@SYS$SYSTEM:SHUTDOWN

SHUTDOWN -- Perform an Orderly System Shutdown
           on node RSNVMS

How many minutes until final shutdown [0]:
Reason for shutdown [Standalone]:
Do you want to spin down the disk volumes [NO]?
Do you want to invoke the site-specific shutdown procedure [YES]?
Should an automatic system reboot be performed [NO]? no
When will the system be rebooted [shortly via automatic reboot]:
Shutdown options (enter as a comma-separated list):
  REBOOT_CHECK          Check existence of basic system files
  SAVE_FEEDBACK         Save AUTOGEN feedback information from this boot
  DISABLE_AUTOSTART     Disable autostart queues
  POWER_OFF             Request console to power-off the system

Shutdown options [NONE]:

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
...
```

NOTE HP OpenVMS I64 currently does not support the `POWER_OFF` shutdown option.

- Step 3.** Login to the service processor (MP or GSP) and enter **CM** to access the Command Menu.
- Step 4.** At the service processor Command menu, enter the **RR** command, specify which nPartition is to be reset, and confirm whether to reset it to the shutdown for reconfig state.

The service processor **RR** command resets all cells in the nPartition, performs any nPartition reconfigurations, and halts all cells at a boot-is-blocked state, thus making the nPartition and all its cells inactive.

Be certain to select the correct nPartition to be reset. If you are accessing the service processor using a single-partition-user account, the **RR** command selects which nPartition is to be reset: the nPartition that your account allows you to access. If using an operator or administrator account, you can select which nPartition in the server complex you want to reset.

- Step 5.** To exit the service processor Command Menu, enter **MA** to return to the service processor Main Menu.

At the Main Menu, enter **X** to exit the service processor interface.

Shutting Down to Shutdown for Reconfig (Windows)

From the Windows command line issue the `shutdown /s` command (or select the **Start —> Shut Down** action and choose **Shut down** from the pull-down menu) to shut an nPartition down to a shutdown for reconfig (inactive) state or power off the nPartition hardware.

CAUTION Do not shut down Windows using Special Administration Console (SAC) `restart` or `shutdown` commands under normal circumstances.

Issuing `restart` or `shutdown` at the `SAC>` prompt causes the system to restart or shutdown immediately and can result in the loss of data.

Instead use the Windows **Start** menu or the `shutdown` command to shut down gracefully.

NOTE On HP rx7620, rx7640, rx8620, and rx8640 servers, performing a shutdown using `shutdown /s` (or the equivalent **Start—>Shut Down, Shut down**) powers off the server cabinet or powers off the cells and I/O chassis assigned to the nPartition. On these servers this behavior can be customized. For details see “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

On HP Integrity Superdome servers, the Windows `shutdown /s` command shuts down the system and keeps all cells at BIB (the boot is blocked, inactive state).

- Step 1.** Login to Windows running on the nPartition that you want to shut down.
- For example, access the nPartition console and use the Windows SAC interface to start a command prompt, from which you can issue Windows commands to shut down the nPartition.

- Step 2.** Issue the `shutdown /s` command to shut down the Windows Server 2003 operating system on the nPartition and reset the nPartition to the shutdown for reconfig state. You also can perform this task by selecting the **Start —> Shut Down** action and choosing **Shut down** from the pull-down menu.

For example:

```
shutdown /s /c "Shut down for reconfig (inactive)."
```

This command initiates a Windows system shutdown-and-stop after a timeout period of 60 seconds. The /c option specifies a message that is broadcast to any other users of the system.

The `shutdown /s` command and option shuts down Windows, reset all cells in the nPartition, perform any nPartition reconfigurations, and halt all cells at a boot-is-blocked state, thus making the nPartition and all its cells inactive.

For more details use the `help shutdown` command.

Shutting Down to Shutdown for Reconfig (Linux)

To perform a shutdown for reconfig of an nPartition from Linux, issue the `shutdown -h time` command, where *time* is the time when the system will be shutdown for reconfig.

NOTE On HP rx7620, rx7640, rx8620, and rx8640 servers, you can configure the nPartition behavior when Linux initiates a shutdown for reconfig (`shutdown -h time`). The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

The normal behavior for Linux shutdown for reconfig is for the nPartition be made inactive.

For details see “ACPI Softpowerdown Configuration—OS Shutdown Behavior” on page 161.

Step 1. Login to Linux running on the system you want to shut down.

Step 2. Issue the `shutdown -h time` command with the required *time* argument to specify when the shutdown is to occur.

You can specify *time* in the format *hh:mm*, in which *hh* is the hour (one or two digits) and *mm* is the minute of the hour (two digits); or in the format *+m*, in which *m* is the number of minutes delay until shutdown; or specify `now` to immediately shut down.

Booting an Inactive nPartition

You can boot an inactive nPartition by using any one of the following procedures:

- “Booting an Inactive nPartition (Service Processor)” on page 224
- “Booting an Inactive nPartition (nPartition Commands)” on page 225

When all cells in an nPartition are at boot-is-blocked, the nPartition is inactive. This is the case, for example, when an nPartition is held at the shutdown for reconfig state.

You can boot an nPartition past the shutdown for reconfig state to make it active by using the **BO** (boot) command at the service processor Command menu.

To determine whether an nPartition is in a boot-is-blocked (shutdown for reconfig) state, use the Virtual Front Panel for the nPartition to check the nPartition boot status. If all cells assigned to the nPartition are at boot-is-blocked, the nPartition is halted at the shutdown for reconfig state.

Booting an Inactive nPartition (Service Processor)

Use the service processor Command menu **BO** command to boot an nPartition past the shutdown for reconfig state to make the nPartition active.

If you use the **BO** command to attempt to boot an nPartition that already is active, the command has no effect.

Step 1. Login to the service processor (MP or GSP) and enter **CM** to access the Command Menu.

Step 2. From the Command menu, enter the **BO** command and specify which nPartition is to be booted (released from boot-is-blocked).

As a result of the **BO** command, the service processor for the complex releases the cells assigned to the selected nPartition from boot-is-blocked: the cells proceed to rendezvous to form an active nPartition, which no longer is in the shutdown for reconfig state.

```
GSP:CM> BO
```

This command boots the selected partition.

```
#   Name
---  ---
0)  jules00
1)  jules01
```

```
Select a partition number: 0
```

```
Do you want to boot partition number 0? (Y/[N]) y
```

```
-> The selected partition will be booted.
```

```
GSP:CM>
```

Any of the cells assigned to the nPartition that are not configured (those with a “n” use-on-next-boot value) remain inactive at boot-is-blocked.

When the nPartition becomes active it proceeds through the normal boot process.

- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `x` to exit the service processor interface.

Booting an Inactive nPartition (nPartition Commands)

You can cause an inactive nPartition to be booted (made active) by using the `parmodify` command with the `-B` option when changing the configuration of an inactive nPartition.

- Step 1.** Login to HP-UX running on any nPartition in the server complex, or login to any HP-UX B.11.23 system or a Windows system with the nPartition commands (ParCLI) installed.

When using the nPartition commands from HP-UX B.11.23 or Windows, you can specify the `-g . . . -h . . .` set of options to configure a remote complex.

- Step 2.** When modifying an inactive nPartition, specify the `-B` option when using the `/usr/sbin/parmodify` command to reconfigure the inactive nPartition.

For example, when adding or removing cells from an inactive nPartition, specifying the `-B` option causes the nPartition to boot (become active) immediately following the nPartition modification.

For details refer to the `parmodify` (1M) manpage.

Booting over a Network

You can boot over a network by using any one of the following procedures:

- “Booting over a Network (BCH Menu)” on page 226
- “Booting over a Network (EFI Boot Manager)” on page 226
- “Booting over a Network (EFI Shell)” on page 227

Booting over a Network (BCH Menu)

From the BCH Menu, use the `BOOT LAN . . .` command to boot HP-UX over a network. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition that you want to boot over a network.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Issue the `BOOT LAN INSTALL` command or the `BOOT LAN.ip-address INSTALL` command to boot over a network and perform an HP-UX installation.

The `BOOT . . . INSTALL` commands boot HP-UX from the default HP-UX install server or from the server specified by `ip-address`.

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Booting over a Network (EFI Boot Manager)

From the EFI Boot Manager, to boot from a network device select the **Boot Option Maintenance** → **Boot from a File** menu option and then select the “Load File” option for the LAN card that has the desired MAC address. The EFI Boot Manager is available only on HP Integrity systems.

Step 1. Access the EFI Boot Manager menu for the nPartition that you want to boot over a network.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

Step 2. At the EFI Boot Manager menu, select the **Boot Option Maintenance** option.

Step 3. At the **Boot Option Maintenance** menu, select the **Boot from a File** menu option and then select the network card whose MAC address you want to use when booting.

Highlight the desired network card, then press **Return** or **Enter** to initiate booting using the selected

card.

```
EFI Boot Maintenance Manager ver 1.10 [14.60]
```

```
Boot From a File.  Select a Volume
```

```
IA64_EFI [Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part1,S
Removable Media Boot [Acpi(000222F0,2A8)/Pci(0|1)/Scsi(Pun2,Lun0
Load File [Acpi(000222F0,200)/Pci(1|0)/Mac(001083FD5D9B)]
Load File [EFI Shell [Built-in]]
Exit
```

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **X** at the Main Menu.

Booting over a Network (EFI Shell)

From the EFI Shell environment, use the `lanboot select` command to boot over a network. The EFI Shell is available only on HP Integrity systems.

NOTE To perform a directed lanboot on HP Integrity servers, use the EFI Shell `dbprofile` command and the `lanboot` command `-dn` option.

First use the `dbprofile` EFI Shell command to list or create direct boot profiles. Then use the `lanboot select -dn profile` command to perform a directed lanboot using the specified direct boot profile (*profile*).

For details use the `help dbprofile` command and the `help lanboot` command from the EFI Shell.

Step 1. Access the EFI Shell environment for the nPartition that you want to boot over a network.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. At the EFI Shell, issue the `lanboot select` command to boot from the selected networking card.

For details see the `help lanboot` command.

```
Shell> lanboot select
  01 Acpi(000222F0,0)/Pci(1|0)/Mac(00306E0E5268)
  02 Acpi(000222F0,800)/Pci(1|0)/Mac(00108327549F)
Select Desired LAN: 1
Selected Acpi(000222F0,0)/Pci(1|0)/Mac(00306E0E5268)

Running LoadFile()

CLIENT MAC ADDR: 00 30 6e 0e 52 68
```

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **x** at the Main Menu.

Booting to the HP-UX Initial System Loader (ISL)

On HP 9000 servers, you can boot to the HP-UX Initial System Loader (ISL) by using the following procedure.

NOTE The Initial System Loader (ISL) interface is available only from HP-UX boot devices on HP 9000 servers (PA-RISC systems).

See “Using HP-UX Loader Commands” on page 233 for details in issuing commands to the HP-UX Boot Loader (hpux) from the Initial System Loader (the ISL> prompt).

Initial System Loader (ISL) Booting of HP-UX

From the BCH Menu, to access the ISL prompt issue the **BOOT** command and and reply **y** (for “yes”) to the Do you wish to stop at the ISL prompt question. The BCH Menu is available only on HP 9000 systems.

- Step 1.** Access the BCH Main Menu for the nPartition from which you will be running and accessing the ISL interface.

Login to the service processor (MP or GSP) and enter **CO** to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter **MA** to return to the BCH Main Menu.

- Step 2.** Boot the desired device using the **BOOT** command at the BCH interface, and specify that the nPartition stop at the ISL prompt prior to booting (reply **y** to the “stop at the ISL prompt” question).

```
Main Menu: Enter command or menu > BOOT 0/0/2/0/0.13
```

```
BCH Directed Boot Path: 0/0/2/0/0.13
```

```
Do you wish to stop at the ISL prompt prior to booting? (y/n) >> y
```

```
Initializing boot Device.
```

```
....
```

```
ISL Revision A.00.42 JUN 19, 1999
```

```
ISL>
```

Replying “n” (no, do not stop at ISL) skips the ISL prompt and proceeds to execute the **AUTO** file, which by default will boot HP-UX (/stand/vmunix) on the nPartition.

ISL: Initial System Loader

Replying “y” (yes, do stop at ISL) allows you to interact directly with the Initial System Loader (ISL) and the Secondary System Loader (hpux) for the boot device. Enter all ISL commands from the ISL> prompt.

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Booting to the HP-UX Initial System Loader (ISL)

hpux: Secondary System Loader

From the ISL prompt you also can enter commands that are executed by the Secondary System Loader (hpux). Preface your Secondary System Loader command with **hpux**. For example: `hpux ls /stand` to list the contents of the `/stand` directory on the booted device.

Refer to the *isl* (1M) and *hpux* (1M) manpages for details.

Step 3. Issue commands from the ISL prompt (`ISL>`), or enter the `EXIT` command to leave the ISL interface and return to the BCH Menu.

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Booting to the HP-UX Loader (HPUX.EFI)

On HP Integrity servers, you can boot to the HP-UX Loader (HPUX.EFI) by using the following procedure.

NOTE The HP-UX Loader (HPUX.EFI) is available only on HP Integrity servers.

See “Using HP-UX Loader Commands” on page 233 for details on issuing commands from the HP-UX Boot Loader (HPUX.EFI, the HPUX> prompt).

HPUX.EFI Access: Booting to the HP-UX Loader (EFI Boot Manager or EFI Shell)

The EFI system boot environment is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition from which you will be running and accessing the HP-UX Loader (HPUX.EFI) interface.

Login to the service processor (MP or GSP) and enter CO to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Access the EFI System Partition (fsX: where X is the filesystem number) for the device from which you want to boot HP-UX.

- Step 3.** When accessing the EFI System Partition for the desired boot device, issue the HPUX command to invoke the \EFI\HPUX\HPUX.EFI loader on the selected device.

- Step 4.** Boot to the HP-UX Boot Loader prompt (HPUX>) by typing any key within the ten seconds given for interrupting the HP-UX boot process. You will use the HPUX.EFI loader to boot HP-UX in single-user mode in the next step.

After you type a key, the HPUX.EFI interface (the HP-UX Boot Loader prompt, HPUX>) is provided.

```
fs0:\> hpux
```

```
(c) Copyright 1990-2002, Hewlett Packard Company.
All rights reserved
```

```
HP-UX Boot Loader for IA64 Revision 1.723
```

```
Press Any Key to interrupt Autoboot
\efi\hpux\AUTO ==> boot vmunix
Seconds left till autoboot - 9
```

[User Types A Key to Stop the HP-UX Boot Process and Access the HPUX.EFI Loader]

```
Type 'help' for help
```

```
HPUX>
```

- Step 5.** Issue HP-UX Boot Loader commands at the HPUX> prompt, or enter the EXIT command to return to the EFI Shell interface.

Chapter 5 Booting and Resetting nPartitions

Booting to the HP-UX Loader (HPUX.EFI)

Refer to the `help` command or the `hpux (1M)` manpage for details.

Step 6. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Using HP-UX Loader Commands

This section gives details on issuing HP-UX Boot Loader commands using the following two methods:

- “HPUX.EFI Boot Loader Commands” on page 233 — On HP Integrity servers (Intel® Itanium®-based systems), you can issue HP-UX Boot Loader commands using HPUX.EFI (the `HPUX>` prompt).
- “HPUX Boot Loader Commands Issued from ISL” on page 233 — On HP 9000 servers (PA-RISC systems), you can issue HP-UX Boot Loader commands from the HP-UX Initial System Loader (the `ISL>` prompt).

HPUX.EFI Boot Loader Commands

On HP Integrity servers, you can issue HP-UX Boot Loader commands using HPUX.EFI (the `HPUX>` prompt), as described in the following procedure.

Issuing HP-UX Boot Loader Commands (HP Integrity Servers)

Issue HP-UX Loader commands directly from the `HPUX>` prompt. The EFI system boot environment and `HPUX.EFI` boot loader are available only on HP Integrity systems.

- Step 1.** Access the nPartition console, EFI Shell, and desired boot device, then boot to the HP-UX Loader (`HPUX.EFI`) interface.

See “HPUX.EFI Access: Booting to the HP-UX Loader (EFI Boot Manager or EFI Shell)” on page 231 for details.

- Step 2.** Issue HP-UX Loader commands directly from the `HPUX>` prompt.

For example, to list files in `/stand` enter: `ls`

To exit the HP-UX Loader interface, enter the `EXIT` command to return to the EFI Shell environment.

Refer to the `help` command or the `hpux` (1M) manpage for command details.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type `^B` (**Control-B**); this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

HPUX Boot Loader Commands Issued from ISL

On HP 9000 servers, you can issue HP-UX Boot Loader commands from the HP-UX Initial System Loader (the `ISL>` prompt), as described in the following procedure.

Issuing HP-UX Boot Loader Commands (HP 9000 Servers)

Issue HP-UX Loader commands from the ISL prompt by prefacing them with “`hpux`”. The BCH Menu and ISL interface are available only on HP 9000 systems.

- Step 1.** Access the nPartition console, use the `BOOT` command to boot the desired device, then interrupt the boot process at the ISL interface.

See “Initial System Loader (ISL) Booting of HP-UX” on page 229 for details.

Chapter 5 Booting and Resetting nPartitions

Using HP-UX Loader Commands

- Step 2.** Issue HP-UX Loader commands by prefacing them with “hpux” so that ISL invokes the hpux secondary system loader to execute the commands you specify.

From ISL issue HP-UX loader commands in the following form:

`hpux command`

where *command* is one of the the hpux secondary system loader commands.

For example: enter `hpux ls` to issue the `ls` command.

Refer to the *isl* (1M) and *hpux* (1M) manpages for details.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **x** at the Main Menu.

Booting to the Linux Loader (ELILO.EFI)

On HP Integrity servers you can access the Linux loader (ELILO.EFI) by using the following procedure to boot ELILO.EFI and type any key to stop the boot process at the “ELILO boot” prompt.

From ELILO you can boot Linux, list devices and configuration entries, or exit ELILO by typing **Esc** (the escape key) then **Enter**.

The ELILO loader and configuration files are at the following locations on the EFI System Partition for the Linux boot device.

- **ELILO Loader Files for Red Hat Enterprise Linux**

On a Red Hat Enterprise Linux boot device EFI System Partition, the full paths to the loader and configuration files are:

```
\EFI\redhat\elilo.efi
\EFI\redhat\elilo.conf
```

- **ELILO Loader Files for SuSE Linux Enterprise Server**

On a SuSE Linux Enterprise Server boot device EFI System Partition, the full paths to the loader and configuration files are:

```
\efi\SuSE\elilo.efi
\efi\SuSE\elilo.conf
```

NOTE The Linux loader (ELILO.EFI) is available only on HP Integrity servers (Intel® Itanium®-based systems).

See “Using Linux Loader (ELILO) Commands” on page 239 for details on issuing Linux loader commands. Also see “Linux Boot Option Management” on page 236 for information about ELILO and `elilo.conf`.

Linux Loader (ELILO.EFI) Booting and Access

Use this procedure to access the ELILO Linux loader.

Step 1. Load the ELILO.EFI Linux loader.

Either select a Linux entry from the EFI Boot Manager menu (the boot options list for the nPartition), or invoke the ELILO.EFI Linux loader from the EFI Shell.

Step 2. Type any key when the “ELILO boot” prompt is displayed to stop the boot process at ELILO.

After you type a key (for example, **space**) the ELILO loader remains at the “ELILO boot” prompt, rather than loading the default Linux kernel entry in the `elilo.conf` file.

Step 3. Issue ELILO loader commands or enter the kernel path or label (from the `elilo.conf` file) that you wish to boot.

To exit the ELILO loader, type **Esc** then **Enter** at the “ELILO boot” prompt. To list labels in the current `elilo.conf` file, type **Tab**. For details see “Using Linux Loader (ELILO) Commands” on page 239.

Linux Boot Option Management

You can manage Linux boot options by interacting with the Linux loader interface (`elilo.efi`, the “ELILO boot” prompt) and by editing the Linux loader configuration file (`elilo.conf`).

- The `elilo.efi` Linux loader boots a Linux kernel and can apply boot options that are specified in an `elilo.conf` file entry or are manually specified.
 - You can select any of the Linux kernel boot configuration entries in the boot device’s `elilo.conf` file. To select a boot entry, enter its label at the “ELILO boot” prompt along with any additional boot options to be passed to the kernel.
 - You also can directly specify a kernel file to be loaded at the “ELILO boot” prompt along with any kernel boot options.

See “Using Linux Loader (ELILO) Commands” on page 239 for details.

- The `elilo.conf` Linux loader configuration file defines the kernel boot configurations that are available to be selected from a Linux boot device.

Each boot configuration has a multiple-line entry in the `elilo.conf` file that included the label used to identify the entry, the kernel image to be booted, and other details such as kernel boot options.

This file also can specify the default boot entry to be loaded from the boot device and the amount of time given before automatically loading the default.

See “Linux Loader Configuration File (`elilo.conf`)” on page 237 for details.

Refer to the following Linux manpages for more details, but note that specific details may differ on your particular system:

bootparam(7) — Introduction to Linux boot time kernel parameters.

grubby(8) — Information about boot loader configuration files.

init(8) — Introduction to process initialization and runlevel details.

Linux Loader Configuration File (elilo.conf)

Boot configuration entries in the `elilo.conf` file enable you to establish a collection of bootable Linux configuration, any one of which can be selected at the “ELILO boot” prompt.

CAUTION Save a backup copy of the `elilo.conf` file before making changes to customize the file.

Sample elilo.conf File

The following sample `elilo.conf` file has two boot entries, labeled “linux” and “linux-up”.

```
prompt
timeout=50
default=linux

image=vmlinuz-2.4.18-e.12smp
    label=linux
    initrd=initrd-2.4.18-e.12smp.img
    read-only
    root=/dev/sda2
    append="console=ttyS0"

image=vmlinuz-2.4.18-e.12
    label=linux-up
    initrd=initrd-2.4.18-e.12.img
    read-only
    root=/dev/sda2
    append="console=ttyS0"
```

elilo.conf File Boot Options

You can specify the following options, among others, in an `elilo.conf` file to configure a Linux device’s boot behavior. For more details refer to the documentation for the Linux distribution you are using.

- `prompt` — Specifies to make the “ELILO boot” prompt available without requiring anything to be typed.
- `timeout=tsecs` — Sets the timeout duration in *tenths of seconds*. Following the timeout period, either the default boot entry is selected, or if no default is specified the first boot entry is selected.
- `default=name` — Sets the boot option entry that is selected by default. The *name* listed must match the *name* specified by a `label` option in the same `elilo.conf` file. When no default is specified, then the first boot entry is chosen if no other boot entry is requested.
- `image=kernel` — Specifies the Linux kernel to boot. Typically, the *kernel* specified is a `vmlinuz` file. For example, the file `vmlinuz-2.4.18-e.12smp` is a kernel that resides on the EFI partition as `\efi\redhat\vmlinuz-2.4.18-e.12smp`.
- `label=name` — The *name* defined by the `label` option is the identifier you can reference to invoke the boot entry for loading.

You can use the specified *name* at the “ELILO boot” prompt, or in a default option line in the same `elilo.conf` file, to cause the boot entry to be used for loading Linux.

- `initrd=image` — Specifies the initial RAM disk image used to initialize and start services for booting the Linux kernel. The *image* file typically resides on the EFI partition in the same directory as the corresponding Linux kernel file specified by the `image` option.
- `read-only` — Specifies that the root disk partition (specified by the `root` option) cannot be modified during the Linux boot process.

Chapter 5 Booting and Resetting nPartitions

Booting to the Linux Loader (ELILO.EFI)

- `root=diskptn` — Indicates which device (*diskptn*) to mount as the root disk partition.
- `append="options"` — Specifies boot-time kernel options that are passed to the Linux kernel when it is loaded.

Using Linux Loader (ELILO) Commands

You can control the Linux boot process by using the ELILO Linux loader commands to select a non-default Linux boot configuration, specify additional boot options, or load a Linux kernel whose path you explicitly specify.

See “Booting to the Linux Loader (ELILO.EFI)” on page 235 for details on accessing ELILO, using ELILO and `elilo.conf`, and managing the `elilo.conf` file.

ELILO Linux Loader Commands

The following commands are available for use when interacting with the ELILO Linux loader (the “ELILO boot” prompt).

- Esc Enter** Exit the ELILO Linux loader.
- Tab** List all entries (labels) in the current `elilo.conf` file.
- ?** (question mark) List all disk devices available to the ELILO Linux loader.

Linux Booting Using ELILO Commands and Options

The following list describes uses of ELILO to load Linux.

- Select a non-default Linux boot configuration to be loaded.
 1. Access the “ELILO boot” prompt.
 2. Type the **Tab** key to list all boot configuration entries in the `elilo.conf` file.
 3. Enter the name of the boot entry you want to load.

```
ELILO boot: Tab
linux linux-up   (or any kernel file name: [dev_name:]/path/file)

ELILO boot: linux-up
Uncompressing Linux... done
Loading initrd initrd-2.4.18-e.12.img...done
```
- Specify additional boot options when loading a Linux boot configuration.
 1. Access the “ELILO boot” prompt.
 2. Type the **Tab** key to list all boot configuration entries in the `elilo.conf` file.
 3. Enter the name of the boot entry you want to load, followed by any additional boot options to apply. See *bootparam(7)* or other Linux manpages for details on kernel boot options.

```
ELILO boot: linux S
Uncompressing Linux... done
Loading initrd initrd-2.4.18-e.12smp.img...done
```
- Load a kernel by explicitly specifying the kernel path and any boot options to be used.
 1. Access the “ELILO boot” prompt.
 2. Type **?** (question mark) to list all boot devices.
 3. Enter the full path to the Linux kernel you wish to load, and specify any kernel boot options to apply.

```
ELILO boot: scsi0:/efi/redhat/vmlinuz-2.4.18-e.12 root=/dev/sda2 console=ttyS0
Uncompressing Linux... done
Linux version 2.4.18-e.12 (bhcompile@rocky.devel.redhat.com) (gcc version 2.96 2
```

Chapter 5 *Booting and Resetting nPartitions*

Using Linux Loader (ELILO) Commands

```
0000731 (Red Hat Linux 7.2 2.96-112.7.2) #1 Thu Oct 17 15:22:28 EDT 2002
```

Configuring Boot Paths and Options

You can configure boot paths and boot options by using any one of the following procedures:

- “Configuring Boot Paths and Options (BCH Menu)” on page 241
- “Configuring Boot Paths and Options (EFI Boot Manager)” on page 242
- “Configuring Boot Paths and Options (EFI Shell)” on page 242
- “Configuring Boot Paths and Options (HP-UX)” on page 243
- “Adding an HP-UX Boot Option” on page 183
- “Adding an HP OpenVMS Boot Option” on page 195
- “Adding a Microsoft Windows Boot Option” on page 199
- “Adding a Linux Boot Option” on page 205

CAUTION The nPartition ACPI configuration must be set to the proper value for the operating system when configuring boot options on HP Integrity servers. This must be done for the device paths to be properly established in the boot options list. Use the `acpiconfig` command to check and set this value. For details refer to “ACPI Configuration Value—HP Integrity Server OS Boot” on page 160.

Configuring Boot Paths and Options (BCH Menu)

Use the `PATH` command from the BCH Main Menu to configure boot paths for an nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose boot paths and options you want to configure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. At the BCH Main menu, set the boot path values using the `PATH` command.

To list the current boot path settings, enter `PATH` with no arguments.

To set a boot path, enter `PATH VAR hwpath`, where `VAR` is the boot path variable (PRI, HAA, or ALT) and `hwpath` is a boot device hardware path.

For example, to set the PRI boot path to a new value (4/0/2/0/0.10, in this case) enter `PATH PRI 4/0/2/0/0.10`, as shown below.

```
Main Menu: Enter command or menu > PATH PRI 4/0/2/0/0.10.0
```

```
Primary Boot Path: 4/0/2/0/0.10
                   4/0/2/0/0.a    (hex)
```

```
Main Menu: Enter command or menu >
```

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **X** at the Main Menu.

Configuring Boot Paths and Options (EFI Boot Manager)

From the EFI Boot Manager environment, use the use **Boot Option Maintenance** operations to add or delete boot options, or to change the order of items in the boot options list. The EFI Boot Manager is available only on HP Integrity systems.

Step 1. Access the EFI Boot Manager menu for the nPartition whose boot paths (the EFI boot options list items) and options you want to configure.

Login to the service processor (MP or GSP) and enter **CO** to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

Step 2. Select the **Boot Option Maintenance** option from the main EFI Boot Manager menu.

Step 3. At the **Boot Option Maintenance** menu use the **Add a Boot Option**, **Delete Boot Option(s)**, and **Change Boot Order** menu items to add or delete boot options or change the order of items in the boot options list.

```
EFI Boot Maintenance Manager ver 1.10 [14.60]
```

```
Main Menu. Select an Operation
```

```
    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
```

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **X** at the Main Menu.

Configuring Boot Paths and Options (EFI Shell)

From the EFI Shell environment, use the **bcfg** command to add or delete boot options, or to change the order of items in the boot options list. The EFI Shell is available only on HP Integrity systems.

Step 1. Access the EFI Shell environment for the nPartition whose boot paths (the EFI boot options list

items) and options you want to configure.

Login to the service processor (MP or GSP) and enter CO to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** At the EFI Shell environment, use the `bcfg` command to manage the boot options list for the local nPartition.

The `bcfg` command include the following options for managing the boot options list:

- `bcfg boot dump` — Display all items in the boot options list for the local nPartition.
- `bcfg boot rm #` — Remove the item number specified by # from the boot options list.
- `bcfg boot mv #a #b` — Move the item number specified by #a to the position specified by #b in the boot options list.
- `bcfg boot add # file.efi "Description"` — Add a new boot option to the position in the boot options list specified by #. The new boot option references `file.efi` and is listed with the title specified by `Description`.

See the `help bcfg` command for details.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring Boot Paths and Options (HP-UX)

From the HP-UX command line you can configure boot options for an nPartition by using the `/usr/sbin/setboot` or `/usr/sbin/parmodify` command.

NOTE On HP-UX B.11.23 systems, the boot options list for only the local nPartition may be displayed and modified.

- Step 1.** Login to HP-UX running on the nPartition whose boot paths and options you want to configure.

On HP-UX B.11.11 nPartition systems, you can configure boot paths for any nPartition in the complex, including remote nPartitions.

On HP-UX B.11.23 nPartition systems—the cell-based HP Integrity servers—you can configure boot paths (the EFI boot options list items) for only the local nPartition.

- Step 2.** Configure boot path settings using the `parmodify -p#...` command.

Use the following commands to set the boot path variables for a specified partition number (`-p#`):

- `PRI path`— `parmodify -p# -b PRI` where `PRI` is the hardware path.

- HAA path—`parmodify -p# -s HAA` where *HAA* is the hardware path.
- ALT path—`parmodify -p# -t ALT` where *ALT* is the hardware path.

If using the `setboot` command to set boot paths for the local nPartition, you can specify `setboot -p PRI` or the `setboot -a ALT` command. On HP-UX B.11.23 systems you also can set the HAA boot path using the `setboot -h HAA` command.

You can list the current boot path settings for an nPartition by issuing the `parstatus -v -p# | grep Path` command and specifying the partition number (*-p#*). The `setboot` command with no arguments lists the PRI and ALT settings for the local nPartition as well as the PRI path flags (boot actions) for the local nPartition.

For example, to set the PRI boot path to `0/0/4/0/0.8.0` and the HAA boot path to `0/0/4/0/0.9.0` for partition number 0, issue the `parmodify -p0 -b 0/0/4/0/0.8.0 -s 0/0/4/0/0.9.0` command, as shown below.

```
# parmodify -p0 -b 0/0/4/0/0.8.0 -s 0/0/4/0/0.9.0
Command succeeded.
#
```

Boot Path Notes for HP Integrity servers

On HP Integrity servers, `parmodify` and `setboot` considers the first item in the boot options list to be the PRI boot path, the second item to be the HAA boot path, and the third boot option list item to be the ALT boot path.

Also, when you use `parmodify` or `setboot` to configure the first (PRI) or second (HAA) or third (ALT) item in the boot options list, the new device path that you specify either replaces the original boot option, or it is inserted in the original item's place (with the original item being shifted toward the end of the boot options list):

- If the boot option currently is not set to an HP-UX device, the new boot device path is inserted as a new item in the boot options list.

In this case the original list item, if any, moves toward the end of the boot options list and the new boot device path becomes the first (PRI) or second (HAA) or third (ALT) item in the list, as specified by `parmodify` or `setboot`.

- If the boot option currently is set to an HP-UX device and the list item has the standard description (such as “HP-UX Primary Boot” for PRI, or “HP-UX Alternate Boot” for ALT) then the new boot device path replaces the original item in the boot options list.
- If the boot option currently is set to an HP-UX device and the list item's description is not standard for its place in the boot options list, then the new boot device setting is inserted as a new item in the boot options list.

In this case the original list item is moved toward the end of the boot options list.

Configuring Autoboot Options

You can configure autoboot options by using any one of the following procedures:

- “Configuring Autoboot Options (BCH Menu)” on page 245
- “Configuring Autoboot Options (EFI Boot Manager)” on page 246
- “Configuring Autoboot Options (EFI Shell)” on page 246
- “Configuring Autoboot Options (HP-UX)” on page 247

Configuring Autoboot Options (BCH Menu)

From the BCH Menu, use the `PATHFLAGS` command at the BCH Configuration menu to set the boot-time actions for an nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose autoboot options you want to configure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Access the BCH Configuration menu by entering `CO` at the Main menu, and set the boot action for each boot path, as desired, by using the `PATHFLAGS` command.

At the BCH Configuration menu, you can list the path flags (boot actions) for all boot path variables by entering `PATHFLAGS` with no arguments.

To set the boot action for each of the boot paths, enter `PATHFLAGS VAR action`, where `VAR` is the boot path variable (`PRI`, `HAA`, or `ALT`) and `action` is the boot action (0 for “go to BCH”, 1 for “boot, if fail go to BCH”, 2 for “boot, if fail try next path”, or 3 for “skip this path, try next path”).

For example, to configure an nPartition to boot from the `PRI` device or (if `PRI` fails to boot) the `HAA` device, use the following two BCH Configuration commands: `PATHFLAGS PRI 2` and `PATHFLAGS HAA 1`, as shown below.

```
Configuration Menu: Enter command > PATHFLAGS PRI 2
```

```
Primary Boot Path Action
  Boot Actions:  Boot from this path.
                 If unsuccessful, go to next path.
```

```
Configuration Menu: Enter command > PATHFLAGS HAA 1
```

```
HA Alternate Boot Path Action
  Boot Actions:  Boot from this path.
                 If unsuccessful, go to BCH.
```

```
Configuration Menu: Enter command >
```

For other help in setting path flags, enter `HELP PATHFLAGS` at the BCH Configuration menu prompt.

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **x** at the Main Menu.

Configuring Autoboot Options (EFI Boot Manager)

From the EFI Boot Manager environment use the **Boot Option Maintenance** —> **Set Auto Boot TimeOut** menu operation to configure an nPartitions autoboot setting. The EFI Boot Manager is available only on HP Integrity systems.

- Step 1.** Access the EFI Boot Manager menu for the nPartition whose autoboot options you want to configure.

Login to the service processor (MP or GSP) and enter **CO** to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

- Step 2.** Select the **Boot Option Maintenance** option from the main EFI Boot Manager menu.

- Step 3.** Select the **Set Auto Boot TimeOut** menu operation from the **Boot Option Maintenance** menu.

- Step 4.** At the Set Auto Boot TimeOut menu, either disable autoboot by selecting the **Delete/Disable Timeout** menu item, or enable autoboot by setting the autoboot timeout through the **Set Timeout Value** menu item.

When autoboot is enabled on an HP Integrity server, the local nPartition boot options are attempted to be loaded automatically at boot time, starting with the first item in the boot options list.

See the **Help** menu for details.

```
EFI Boot Maintenance Manager ver 1.10 [14.60]
```

```
Set Auto Boot Timeout. Select an Option
```

```
Set Timeout Value
Delete/Disable Timeout
Help
Exit
```

- Step 5.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **x** at the Main Menu.

Configuring Autoboot Options (EFI Shell)

From the EFI Shell environment configure the autoboot setting for the local nPartition by using the **autoboot** command. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose autoboot options you want to configure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** At the EFI Shell environment, use the `autoboot` command to enable or disable autoboot for the nPartition.

When autoboot is enabled for an nPartition in an HP Integrity server, items in the boot options list are attempted to be loaded automatically at boot time, starting with the first item in the boot options list.

Enter the `autoboot` command with no arguments to list the current autoboot configuration for the local nPartition.

You also can specify `off` to disable autoboot, or specify a timeout duration to enable autoboot with a specific number of seconds during which automatic booting from the boot options list can be canceled.

For example: `autoboot off` to disable autoboot, or `autoboot 60` to enable autoboot with a 60-second timeout period.

See the `help autoboot` command for details.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Configuring Autoboot Options (HP-UX)

From the HP-UX command line use the `setboot -b on` or `setboot -b off` command, to turn on (enable) or turn off (disable) autoboot.

- Step 1.** Login to HP-UX running on the nPartition whose autoboot options you want to configure.
- Step 2.** On HP Integrity servers only, the `setboot -b on` command enables autoboot, and the `setboot -b off` command disables autoboot.

When autoboot is enabled for an nPartition in an HP Integrity server, items in the boot options list are attempted to be loaded automatically at boot time, starting with the first item in the boot options list.

- Step 3.** On HP 9000 servers only, the `setboot` command configures the boot action for the PRI boot path.

Configure the PRI boot action for the local nPartition by using the `setboot -b Autoboot -s Autosearch` command.

The `setboot` command supports the following options for setting local nPartition boot actions:

- b Autoboot setting for the local nPartition:
- b on to automatically boot the PRI path.

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Configuring Autoboot Options

- b off to not boot PRI.
- s Autosearch setting for the local nPartition:
 - s on to attempt to perform the HAA path boot action when PRI is not booted (either when -b is off, or when PRI fails to boot when -b is on).
 - s off to never attempt to perform the HAA action.

For example, to always stop the local nPartition at BCH when booting, issue the `setboot -b off -s off` command.

Configuring Boot-Time System Tests

You can configure boot-time system tests (self tests) for an nPartition by using any one of the following procedures:

- “Configuring Boot-Time System Tests (BCH Menu)” on page 249
- “Configuring Boot-Time System Tests (EFI Shell)” on page 249
- “Configuring Boot-Time System Tests (HP-UX B.11.11)” on page 251
- “Configuring Boot-Time System Tests (HP-UX B.11.23)” on page 252

Configuring Boot-Time System Tests (BCH Menu)

From the BCH Configuration Menu use the `FASTBOOT` command to configure fast boot settings for an nPartition. The BCH interface is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose boot-time tests you want to configure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. At the BCH Configuration menu use the `FASTBOOT` command to list or configure the nPartition fast boot settings.

Enter `FASTBOOT` with no arguments to display the current fast boot settings. This lists which self tests are set to be performed or skipped.

NOTE HP recommends that all self tests be performed for all nPartitions.

To enable all tests for an nPartition, use the `FASTBOOT RUN` command at the BCH Configuration menu.

To disable an individual test, enter `FASTBOOT test SKIP`, where `test` is the name of the self test (“PDH”, “EARLY”, or “LATE”).

To enable an individual test, enter `FASTBOOT test RUN`.

For details on setting self tests, enter `HELP FASTBOOT` at the Configuration menu.

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring Boot-Time System Tests (EFI Shell)

From the EFI Shell environment use the `boottest` command to manage the self test configuration

for the local nPartition. The EFI Shell is available only on HP Integrity systems.

Step 1. Access the EFI Shell environment for the nPartition whose boot-time tests you want to configure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. At the EFI Shell environment use the `boottest` command to list, enable, or disable boot-time system tests for the local nPartition.

To display the list of supported boot-time system tests, enter the `boottest -h` command at the EFI Shell prompt.

```
Shell> boottest -h

Usage: BOOTTEST [on|off] | [[test] [on|off]]
test : early_cpu, late_cpu, platform, chipset
       io_hw, mem_init, mem_test
```

```
Shell>
```

You can enable or disable any of the boot-time tests by specifying the name of the test to `boottest`. The test names include: `early_cpu`, `late_cpu`, `platform`, `chipset`, `io_hw`, `mem_init`, and `mem_test`.

System Tests:

Configuring and Deconfiguring Tests from the EFI Shell

- `boottest` — Display the current boot-time system test configuration.
- `boottest testname` — Display the current setting for the specified test (*testname*).
For example: `boottest mem_test` displays the memory selftest settings.
- `boottest on` — Enable all boot-time system tests.
Enabling all tests is recommended.
- `boottest off` — Disable all boot-time system tests.
Disabling all selftests is usually not recommended; ordinarily all tests are enabled.
- `boottest testname on` — Enable the specified test (*testname*).
For example: `boottest io_hw on` enables I/O hardware selftests.
- `boottest testname off` — Disable the specified test (*testname*).
For example: `boottest io_hw off` disables I/O hardware selftests.

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the

service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring Boot-Time System Tests (HP-UX B.11.11)

From the HP-UX B.11.11 command line use the `setboot` command to configure the self test configuration for an nPartition.

Step 1. Login to HP-UX running on the nPartition whose boot-time tests you want to configure.

Step 2. Enter the `setboot -v` command to list the current self test configuration for the local nPartition.

The self test details listed by `setboot -v` include:

TEST—The keyword names of self tests that you can enable or disable.

CURRENT—The test setting in stable storage for the nPartition: `on` means the test is normally executed on each boot, `off` means the test is normally omitted on each boot, `partial` means some subtests normally are executed on each boot. This may differ from the NEXT BOOT settings.

SUPPORTED—Whether the server supports the test completely (`yes`), partially (`partial`), or not at all (`no`).

DEFAULT—The default setting for the test, either `on`, `off`, or `partial`.

NEXT BOOT—The self test behavior for the next boot of the nPartition only. If these settings differ from **CURRENT**, then the **CURRENT** settings are reestablished after the next boot.

The following example shows `setboot -v` output for an nPartition in an HP 9000 server.

```
# setboot -v
Primary bootpath : 0/0/6/0/0.6.0
Alternate bootpath : 0/0/1/0/0.8.0

Autoboot is OFF (disabled)
Autosearch is OFF (disabled)

Note: The interpretation of Autoboot and Autosearch has changed for
systems that support hardware partitions. Please refer to the manpage.
TEST          CURRENT      SUPPORTED   DEFAULT     NEXT BOOT
-----
all           partial      partial     partial     partial
  SELFTESTS   on           yes         on          on
  early_cpu   on           yes         on          on
  late_cpu    on           yes         on          on
  FASTBOOT    partial      partial     partial     partial
  full_memory off          no          off         off
  PDH         on           yes         on          on
  CEC         off          no          off         off
#
```

Step 3. Use the `setboot...` command to enable or disable boot-time self tests for the local nPartition.

You can use the following commands to configure tests:

```
setboot -t test_name=[on|off|default]
```

```
setboot -T test_name=[on|off|default]
```

`test_name` is the name of the self test (“PDH”, “early_cpu”, “late_cpu”) or is “all” (for all tests).

The `setboot` command’s `-t` option changes the test setting in stable storage and affects all following boots. The `-T` option changes the test setting for the next boot only.

NOTE HP recommends that all self tests be performed for all nPartitions.

To enable all tests for an nPartition, use the following command:

```
setboot -t all=on
```

For example, to enable the early CPU tests and PDH tests but disable the late CPU tests issue the following command:

```
setboot -t early_cpu=on -t PDH=on -t late_cpu=off
```

This changes the settings for these tests in stable storage for the nPartition and uses these test configurations for all following boots.

After modifying the self test configuration for an nPartition, you can list the new settings with the `setboot -v` command.

For more details refer to the *setboot* (1M) manpage.

Configuring Boot-Time System Tests (HP-UX B.11.23)

From the HP-UX B.11.23 command line use the `setboot` command to configure the self test configuration for an nPartition.

- Step 1.** Login to HP-UX running on the nPartition whose boot-time tests you want to configure.
- Step 2.** Enter the `setboot -v` command to list the current self test configuration for the local nPartition.

The self test details listed by `setboot -v` include:

TEST—The keyword names of self tests that you can enable or disable.

CURRENT—The setting for the test in stable storage for the nPartition: `on` means the test is normally executed on each boot, `off` means the test is normally omitted on each boot, `partial` means some subtests normally are executed on each boot.

DEFAULT—The default setting for the test, either `on`, `off`, or `partial`.

- Step 3.** Use the `setboot . . .` command to enable or disable boot-time self tests for the local nPartition.

You can use the following command to configure tests on HP Integrity systems:

```
setboot -T test_name=[on|off|default]
```

`test_name` is the name of the self test or is “all” (for all tests).

The `-T` option changes the test setting for the next boot only.

NOTE The `setboot` command’s `-t` option is not supported for HP Integrity systems.

After modifying the self test configuration for an nPartition, you can list the new settings with the `setboot -v` command.

For more details refer to the *setboot* (1M) manpage.

6 Creating and Configuring nPartitions

This chapter has procedures for creating, configuring, and managing nPartitions on Hewlett-Packard servers that support them.

For an introduction to nPartition features, see the chapter “Getting Started with nPartitions” on page 25.

For nPartition configuration requirements and recommendations, see the chapter “Planning nPartitions” on page 103.

Tools for Configuring nPartitions

You can configure and manage nPartitions using the tools listed here.

- Service Processor (MP or GSP) Menus

Service processor menus provide a complex-wide service interface that can allow access to all hardware and nPartitions.

See “Command Reference for Service Processor Commands” on page 144.

- EFI Boot Manager and EFI Shell

On HP Integrity servers only, the EFI (Extensible Firmware Interface) Boot Manager and Shell are the methods for interacting with an nPartition before it has booted an operating system.

See “Command Reference for EFI Shell Commands” on page 146.

- Boot Console Handler (BCH) Menu Commands

On PA-RISC servers, the BCH interface is the method for interacting with an nPartition before it has booted an operating system.

See “Command Reference for BCH Menu Commands” on page 150.

- nPartition Commands

HP nPartition commands allow you to configure, manage, and monitor nPartitions and hardware within a server complex.

The Enhanced nPartition Commands also can remotely manage complexes based on the HP sx1000 chipset or HP sx2000 chipset.

See “Commands for Configuring nPartitions” on page 34 for details.

- Partition Manager (`/opt/parmgr/bin/parmgr`)

Partition Manager provides a graphical interface for managing and monitoring nPartitions and hardware within a server complex.

See “Partition Manager” on page 38.

Task Summaries for Creating and Configuring nPartitions

Table 6-1 describes the main nPartition configuration tasks and provides brief summaries and references for detailed procedures.

You can perform the tasks in Table 6-1 using various tools, including the service processor (MP or GSP), Boot Console Handler (BCH, available only on PA-RISC servers), Extensible Firmware Interface (EFI, available only on HP Integrity servers), nPartition commands, or Partition Manager (/opt/parmgr/bin/parmgr).

See “Tools for Configuring nPartitions” on page 254 for details.

Table 6-1 nPartition Configuration Task Summaries

Task	Summary
Creating a Genesis Partition	<ul style="list-style-type: none"> • Creating a Genesis Partition overwrites all nPartition-related complex profile data for the server and establishes one single-cell nPartition. • Service Processor (MP or GSP): CC command. See “Creating a Genesis Partition” on page 263.
Creating a New nPartition	<ul style="list-style-type: none"> • nPartition Commands: parcreate command. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Partition → Create Partition action. — Version 2.0 — nPartition → Create nPartition action. See “Creating a New nPartition” on page 266.
Removing (Deleting) an nPartition	<p>NOTE: When an inactive nPartition is specified to be removed, its removal occurs immediately. When an active nPartition is specified to be removed, for the nPartition removal (deletion) to occur, the nPartition must be put into a shutdown for reconfig state (HP-UX: shutdown -R -H; Windows: shutdown /s; Linux: shutdown -h time; OpenVMS: @SYS\$SYSTEM:SHUTDOWN with no automatic system reboot then MP Command menu RR command).</p> <ul style="list-style-type: none"> • nPartition Commands: parremove -p# command removes the specified nPartition (-p#, where # is the nPartition number). When removing an active nPartition you must specify the -F option. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select an nPartition, then select the Partition → Delete Partition action. — Version 2.0 — Select an nPartition, then select the nPartition → Delete nPartition action. See “Removing (Deleting) an nPartition” on page 271.

Table 6-1 nPartition Configuration Task Summaries (Continued)

Task	Summary
Assigning (Adding) Cells to an nPartition	<p>NOTE: When a cell is assigned to an inactive nPartition the assignment completes immediately. To complete new cell assignments to an active nPartition, you must perform a reboot for reconfig (HP-UX: shutdown -R; Windows: shutdown /r; Linux: shutdown -r <i>time</i>; OpenVMS: @SYS\$SYSTEM:SHUTDOWN with an automatic system reboot).</p> <ul style="list-style-type: none"> • nPartition Commands: <code>parmodify -p# -a#...</code> command, which adds a cell (-a#, where # is the cell number) to the specified nPartition (-p#, where # is the nPartition number). • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select an nPartition, and use the Partition → Modify Partition action, Add/Remove Cells tab. — Version 2.0 — Select an nPartition, and use the nPartition → Modify nPartition action, Add/Remove Cells tab. <p>See “Assigning (Adding) Cells to an nPartition” on page 275.</p>
Unassigning (Removing) Cells from an nPartition	<p>NOTE: When an inactive cell is specified to be removed from an nPartition the removal occurs immediately. When an active cell is specified to be removed from an nPartition, to complete the cell removal the nPartition must perform a reboot for reconfig (HP-UX: shutdown -R; Windows: shutdown /r; Linux: shutdown -r <i>time</i>; OpenVMS: @SYS\$SYSTEM:SHUTDOWN with an automatic system reboot).</p> <ul style="list-style-type: none"> • nPartition Commands: <code>parmodify -p# -d#</code> command, which unassigns the cell (-d#, where # is the cell number) from the specified nPartition (-p#, where # is the nPartition number). <p>When removing an active cell, you must specify the -B option if you want the nPartition to be active after the reboot for reconfig.</p> <ul style="list-style-type: none"> • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select an nPartition, and use the Partition → Modify Partition action, Add/Remove Cells tab. — Version 2.0 — Select an nPartition, and use the nPartition → Modify nPartition action, Add/Remove Cells tab. <p>See “Unassigning (Removing) Cells from an nPartition” on page 279.</p>

Table 6-1 nPartition Configuration Task Summaries (Continued)

Task	Summary
Renaming an nPartition	<ul style="list-style-type: none"> • BCH Menu: Configuration menu, PD <i>NewName</i> command, where <i>NewName</i> specifies the new name for the nPartition. Quotation marks are not needed, even if the name includes spaces. • nPartition Commands: <code>parmodify -p# -P name</code> command, where <code>-P name</code> specifies the new name for the nPartition (<code>-p#</code>, where # is the nPartition number). <p>If the nPartition name includes spaces you must specify it in quotation mark (for example: “nPar Name 1”).</p> <ul style="list-style-type: none"> • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Partition → Modify Partition, General tab. — Version 2.0 — nPartition → Modify nPartition, General tab. <p>See “Renaming an nPartition” on page 283.</p>
Renaming a Server Complex	<ul style="list-style-type: none"> • nPartition Commands: <code>cplxmodify -N name</code> command. <p>Only the Enhanced nPartition Commands support the <code>cplxmodify</code> command.</p> <p>If the complex name includes spaces you must specify it in quotation mark (for example: “Cplx Name 1”).</p> <ul style="list-style-type: none"> • Partition Manager: Complex → Set Complex Name action. <p>See “Renaming a Server Complex” on page 285.</p>

Table 6-1 nPartition Configuration Task Summaries (Continued)

Task	Summary
Setting Cell Attributes	<ul style="list-style-type: none"> • BCH Menu: Configuration menu, <code>CELLCONFIG</code> command to list or set cell use-on-next-boot values. • EFI Shell: <code>cellconfig</code> command to list or set cell use-on-next-boot values. • nPartition Commands: <code>parmodify -p# -m#...</code> command to modify cell attributes (<code>-m#...</code>, where <code>#</code> is the cell number) for the specified nPartition (<code>-p#</code>, where <code>#</code> is the nPartition number). <ul style="list-style-type: none"> — Original nPartition Commands — For the cell modify (<code>-m</code>) option, specify: <pre style="margin: 0;">-m#:base:[y n]:ri</pre> <p>where: <code>#</code> is the cell number, <code>base</code> always is the cell type, the cell use-on-next-boot value is either <code>y</code> (the default, make active) or <code>n</code> (inactive), and <code>ri</code> always is the cell failure usage.</p> <p>For the Original nPartition Commands, all attributes are optional and if not specified the default values (<code>base:y:ri</code>) are assigned.</p> — Enhanced nPartition Commands — For the <code>-m</code> option: <pre style="margin: 0;">-m#:base:[y n]:ri[:c1m]</pre> <p>where all Original nPartition Commands attributes are supported, and <code>c1m</code> is the cell local memory value: the amount of memory on the cell that is not interleaved.</p> <p>The <code>c1m</code> attribute may be an absolute number of GBytes in 0.5 GByte increments, or a percentage (in 12.5% increments, or in 25% increments for cells with less than 4 GBytes).</p> • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select the nPartition to which the cell belongs, select the Partition → Modify Partition action, Change Cell Attributes tab, select the cell(s), and click Modify Cell(s). — Version 2.0 — Select the nPartition to which the cell belongs, select the nPartition → Modify nPartition action, and then configure attributes using the Set Cell Options tab and the Configure Memory tab. <p>See “Setting Cell Attributes” on page 287.</p>

Table 6-1 nPartition Configuration Task Summaries (Continued)

Task	Summary
Setting nPartition Core Cell Choices	<ul style="list-style-type: none"> • BCH Menu: Configuration menu, COC command. COC <i>choice cell</i>, where <i>choice</i> is 0-3 (with 0 being the highest-priority choice) and where <i>cell</i> is the cell number. • EFI Shell: rootcell command. rootcell clear to clear the list of preferred core cells. rootcell <i>c0 c1...</i> to specify up to four choices, with <i>c0</i> being the highest-priority choice and <i>c0-c3</i> being the cell numbers. • nPartition Commands: parmodify -p# -r# -r#... command to specify up to four core cell choices (-r#, where # is the cell number) in priority order for the specified nPartition (-p#, where # is the nPartition number) • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select the nPartition to configure, select the Partition → Modify Partition action, Core Cell Choices tab. — Version 2.0 — Select the nPartition to configure, select the nPartition → Modify nPartition action, Set Cell Options tab, and use the Core Cell Choice column to set priorities. <p>See “Setting nPartition Core Cell Choices” on page 294.</p>
Setting nPartition Boot Paths	<p>NOTE: On HP Integrity servers, nPartition boot paths can be listed and configured only from the local nPartition.</p> <p>See the chapter “Booting and Resetting nPartitions” on page 153 for detailed nPartition boot configuration tasks and related information.</p> <ul style="list-style-type: none"> • BCH Menu: BCH Main menu, PATH command. • EFI Boot Manager: Boot Option Maintenance menu. • EFI Shell: bcfg command. • HP-UX: setboot command, or parmodify -p# -b... -s... -t... command.

Table 6-1 nPartition Configuration Task Summaries (Continued)

Task	Summary
Setting the Date and Time	<p>NOTE: The Service Processor (MP or GSP) date and time is stored and managed separately from nPartition times, and each nPartition has independently stored and managed date and time settings. Changes to the date and time for an nPartition do not affect other nPartitions or the MP.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>DATE</code> command configures the MP date and time. • BCH Menu: Configuration menu, <code>TIME</code> command configures the local nPartitions date and time. The BCH time is set and presented in GMT (Greenwich mean time). • EFI Shell: <code>date</code> command and <code>time</code> command configure the local nPartition date and time. The EFI time is set and presented in GMT (Greenwich mean time). • HP-UX: <code>date</code> command configures the local nPartition date and time. Use <code>set_parms timezone</code> to set the HP-UX system time zone.
Restricting nPartition Configuration Privilege	<p>NOTE: nPartition Configuration Privilege is supported on servers based on the HP sx1000 chipset or HP sx2000 chipset.</p> <p>When the nPartition Configuration Privilege for a complex is restricted the following nPartition configuration actions are prohibited (except when using the MP IMPI LAN access):</p> <ul style="list-style-type: none"> — Changes to the complex name, cell assignments, and cell local memory parameters. — Powering on/off non-local cells. — Changes to Partition Configuration Data for non-local nPartitions. <p>When nPartition Configuration Privilege is unrestricted the above actions are permitted.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): the <code>PARPERM</code> command restricts and unrestricts nPartition Configuration Privilege.

Table 6-1 nPartition Configuration Task Summaries (Continued)

Task	Summary
Configuring Remote Administration	<p>NOTE: This coverage of remote nPartition administration addresses features of HP Integrity Superdome, rx8620, and rx7620 servers.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): Remote security features. <ul style="list-style-type: none"> — <code>SO</code> command — Set MP security, including IPMI password. — <code>SA</code> command — Set MP network access, including IMPI LAN. — <code>PARPERM</code> command — Set nPartition Configuration Privilege. • HP-UX B.11.23: Features affecting remote administration. <ul style="list-style-type: none"> — The <code>/opt/wbem/sbin/cimconfig</code> command lists and sets CIM Server configuration properties, which determine the types of users and connections permitted. To list the current properties: <code>cimconfig -l -c</code> command. — The <code>/opt/wbem/sbin/cimserver</code> command starts and stops the CIM Server. To stop the CIM Server: <code>cimserver -s</code> command; to start the CIM Server: <code>cimserver</code> command. — The <code>/opt/wbem/bin/cimprovider</code> command lists, enables, disables, or removes CIM provider modules, such as <code>HP_NParProviderModule</code>. To list CIM provider modules: <code>cimprovider -l -s</code> command. — The WBM Services SSL certificates files (<code>client.pem</code>, <code>server.pem</code>) determine whether a client is trusted to connect to a server. <ul style="list-style-type: none"> — <code>/var/opt/wbem/client.pem</code> file — The Trust Store file on the local system, which contains a <code>CERTIFICATE</code> entry from every server to which it is trusted to connect. — <code>/var/opt/wbem/server.pem</code> file — Contains the <code>PRIVATE KEY</code> and <code>CERTIFICATE</code> entry for the local system. — The <code>/opt/parmgr/bin/parmgr</code> command starts or stops the HP-UX Tomcat-based Servlet Engine, in which Partition Manager runs. To start: <code>parmgr -s start</code>; to stop: <code>parmgr -s stop</code>; to check status: <code>parmgr -s status</code>; to restart: <code>parmgr -s restart</code>.
Unlocking Complex Profile Entries	<p>CAUTION: These commands should only be used when recovering from a hung complex reconfiguration.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>RL</code> command. • HP-UX: <code>parunlock</code> command. <p>See “Unlocking Complex Profile Entries” on page 298.</p>
Canceling Pending Changes to the Complex Profile	<p>Only changes involving the unassignment (deletion) of an active cell from an nPartition can practically be canceled.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>RL</code> command. • HP-UX: <code>parunlock</code> command. <p>See “Canceling Pending Changes to the Complex Profile” on page 301.</p>

Table 6-1 **nPartition Configuration Task Summaries (Continued)**

Task	Summary
Restoring the Prior Complex Profile	NOTE: All nPartitions in the complex must be inactive (put in a shutdown for reconfig state) before restoring a prior complex profile. <ul style="list-style-type: none">• Service Processor (MP or GSP): CC command, L option.

Creating a Genesis Partition

Creating a Genesis Partition overwrites all nPartition-related complex profile data for the server and establishes one single-cell nPartition.

Genesis Partition Creation (Service Processor)

Use the **CC** command and **G** option at the service processor Command menu to create a Genesis Partition on a cell-based server.

As a result of this procedure, all existing nPartition configurations are deleted and are replaced with a single, one-cell nPartition (the Genesis Partition).

You can revert to the previous nPartition configuration—if any existed before you created the Genesis Partition—by using the **CC** command and **L** option to restore the last configuration.

Step 1. Save all current nPartition configuration details, if any nPartitions are configured in the complex.

Saving the current nPartition information provides you the details you would need to re-create all nPartitions as they currently exist.

Use the `parstatus -v -p#` command (or an equivalent Partition Manager procedure) to save configuration details about each nPartition.

For each nPartition, enter the `parstatus -v -p#` command to display detailed information about the partition number (`-p#`) specified.

Step 2. Determine which cell will be configured as the Genesis Partition.

The cell must be connected to an I/O chassis. The I/O chassis must have a core I/O card installed, and it should have a bootable disk (or a method for installing an operating system and a disk onto which it can be installed).

Step 3. Ensure that all nPartitions within the complex are in the shutdown for reconfig (inactive) state.

If an nPartition is running HP-UX, you can shut down the nPartition to the shutdown for reconfig state by using the `shutdown -R -H` command.

If an nPartition is running Windows you can put it in a shutdown for reconfig state by using the `shutdown /s` command.

Or, you can put an nPartition into the shutdown for reconfig state by using the `RECONFIGRESET` command at the BCH interface, the `reconfigreset` command at the EFI Shell, or using the `RR` command at the service processor Command menu.

Step 4. Login to the service processor (GSP or MP) for the server complex.

Login as a user with administrator privileges, which are required for creating a Genesis Partition.

Step 5. Enter **CM** to access the service processor Command menu.

Step 6. Issue the **CC** command, select **G** for Genesis Complex Profile, and specify the cabinet and cell slot for the cell that will comprise the Genesis Partition.

```
GSP:CM> CC
```

Chapter 6 Creating and Configuring nPartitions

Creating a Genesis Partition

This command allows you to change the complex profile.

WARNING: You must shut down all Protection Domains before executing this command.

```
G - Genesis Complex Profile
L - Last Complex Profile
Select Profile: g

Enter Cabinet number: 0

Enter Slot number: 0

Do you want to modify the complex profile? (Y/[N]) y

-> The complex profile will be modified.
GSP:CM>
```

You can confirm that the Genesis Partition was successfully created if the CC command reports that the “complex profile will be modified”.

If the CC command reports “Sorry, command failed”, then the Genesis Partition was not created, possibly because one or more nPartitions are not at the shutdown for reconfig state. If this is the case, go back to Step 3 and ensure all nPartitions are inactive at the shutdown for reconfig state.

- Step 7.** Issue the **BO** command to boot the Genesis Partition past its shutdown for reconfig state and make it an active nPartition.

When a Genesis Partition is created, it remains at boot-is-blocked (in an inactive, shutdown for reconfig state), so you must boot it manually.

The Genesis Partition always is assigned partition number 0, because when it is created it is the first and only nPartition in the server complex.

Using the **BO** command to boot partition 0 will boot the Genesis Partition to its system boot environment: either Boot Console Handler (BCH, on HP 9000 servers) or Extensible Firmware Interface (EFI, on HP Integrity servers).

```
GSP:CM> BO

This command boots the selected partition.

#   Name
---  ----
0)  Partition 0

Select a partition number : 0

Do you want to boot partition number 0,
named Partition 0 ? (Y/[N]) y

-> The selected partition will be booted.
GSP:CM>
```

- Step 8.** Access the console for the Genesis Partition and configure the nPartition as appropriate and necessary.

From the service processor Command menu, enter **MA** to return to the Main menu, then enter **CO** to access the Console menu. The Genesis Partition is partition 0 and by default is named “Partition 0”.

You will need to set the boot paths or options, any core cell choices, the nPartition name, and other settings as appropriate. You also may need to add cells to the Genesis Partition if you want it to have more than one cell.

Creating a New nPartition

You can create a new nPartition by using any one of the following procedures:

- “Creating a New nPartition (nPartition Commands)” on page 266
- “Creating a New nPartition (Partition Manager)” on page 269

Creating a new nPartition involves specifying one or more cells in a server complex, setting various attributes for the cells, and optionally specifying other nPartition settings. The settings you specify then are used to create a new nPartition, which has assigned to it the cells you selected.

At least one cell in each nPartition must be connected to an I/O chassis that has core I/O attached. To boot an operating system from disk, the nPartition also must have a boot device and associated PCI card.

When creating an nPartition, follow the HP nPartition requirements and guidelines. HP recommends only specific sets of nPartition configurations.

Creating a New nPartition (nPartition Commands)

From the command line, use the `parcreate` command to create a new nPartition. You also can use the `parstatus` and `parmodify` commands to list nPartition and complex details and modify nPartition settings.

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u... -h...` options or `-g... -h...` options.

For details see “Tools for Configuring nPartitions” on page 254.

Step 1. Login to a system that enables you to list the current cell assignments and details. For example, login to HP-UX running on an existing nPartition in the server complex, or login to a system with the Enhanced nPartition Commands or Partition Manager Version 2.0.

Plan your nPartition configuration by selecting which cells will comprise the new nPartition.

Use the `parstatus -AC` command to list all unassigned (available) cells in the server complex.

```
# parstatus -AC
[Cell]

```

Hardware Location	Actual Usage	CPU OK/Failed/Max	Memory (GB) OK/Failed	Connected To	Core cell Capable	Use On Next Boot	Par Num
cab0,cell11	absent	-	-	-	-	-	-
cab0,cell13	absent	-	-	-	-	-	-
cab0,cell14	power on	4/0/4	2.0/0.0	cab 0,bay0,chassis3	yes	-	-
cab0,cell15	absent	-	-	-	-	-	-
cab0,cell16	power on	4/0/4	2.0/0.0	cab 0,bay1,chassis1	yes	-	-
cab0,cell17	absent	-	-	-	-	-	-

```
#
```

You can select any of the cells listed to create the new nPartition; only the cells that are not “absent” are present within the server complex.

All cells that you choose must meet the hardware requirements for nPartitions (for example, they all must have the same firmware revision). The cells also must form an HP-recommended nPartition configuration. At least one cell must have an I/O chassis with core I/O.

- Step 2.** After confirming that cells you have chosen would establish a valid nPartition configuration, use the `parcreate -c...` command to create a new nPartition with the cells. The `-c...` option differs slightly for the nPartition command releases.

When using the `parcreate` command, only specify the `-B` option if you want the nPartition to be booted and become active. The `-B` option causes `parcreate` to immediately boot the newly-created nPartition past the default shutdown for reconfig state.

By not specifying `-B`, the new nPartition can be further modified because it will remain inactive at the shutdown for reconfig state (until you boot it using the `BO` command at the service processor Command Menu).

If creating a single-cell nPartition, use just one `-c` option.

To create a multiple-cell nPartition, specify the `-c` option multiple times (once for each cell) issuing a single command line.

For example, with the Original nPartition Commands, the following command creates a one-cell nPartition:

```
# parcreate -c4:base:y:ri -c6:base:y:ri
Partition Created. The partition number is : 1
#
```

When `parcreate` successfully creates a new nPartition, it reports “Partition Created” and reports the nPartition number (“partition number is...”).

If `parcreate` detects any problems or issues when creating an nPartition, it lists them in its output. If it cannot create the nPartition, `parcreate` reports “Command failed” along with more details.

parcreate Command:

Cell Attributes Differences for nPartition Command Releases

The `parcreate` command’s `-c...` option specifies the cell number(s) and attributes to be used when creating the new nPartition. For the Enhanced nPartition Commands, an additional cell local memory attribute is optional. Both the syntaxes are given in the following list.

- For the Original nPartition Commands, the `parcreate` command’s `-c` option is as follows:

```
-c cell:[cell_type]:[use_on_next_boot]:[failure_usage]
```

This option specifies the cell ID (*cell*) to be assigned to the nPartition.

— The only valid *cell_type* value is: `base` (base cell, the default).

— The valid *use_on_next_boot* values for cells are:

 y Participate in reboot (the default).

 n Do not participate in reboot.

— The only valid *failure_usage* value is: `ri` (reactivate with interleave, the default).

For details, refer to the *parcreate* (1M) manpage.

- For the Enhanced nPartition Commands, the *parcreate* command's *-c* option is as follows:

```
-c cell:[cell_type]:[use_on_next_boot]:[failure_usage][:clm]
```

This option specifies the cell ID (*cell*) to be assigned to the nPartition.

— The *cell_type*, *use_on_next_boot*, and *failure_usage* attributes are the same as supported with the Original nPartition Commands.

— You can specify the *clm* value in either of two forms: percentage or absolute amount of memory.

— Percentage cell-local memory (CLM).

The percent number can be any number in the range 0–100 with a suffix of %.

This number is rounded to 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5% or 100%. If the cell contains less than 4 GBytes of memory, then the percentage is rounded to 25%, 50%, 75% or 100%. Percentages are rounded up or down to the nearest value, but are not rounded up to 100%.

— Absolute CLM specification. (The default.)

The absolute number is interpreted as an absolute number of gigabytes of memory and can optionally have a suffix of GB.

As needed, an absolute CLM specification is rounded up to the nearest 0.5 GBytes.

If the *clm* value is rounded, the command reports the final value used.

For details, refer to the *parcreate* (1M) manpage.

- Step 3.** Use the *parmodify* command to modify the configuration of the new nPartition and set the nPartition name (*-P*), boot paths (*-b*, *-s*, and *-t*), and any core cell choices (*-r*). On HP Integrity servers, nPartition boot paths must be set from the local nPartition.

When using the *parmodify* command, you must use the *-p#* option to specify the partition number for the nPartition. Use the partition number that the *parcreate* command reported in the previous step.

```
# parmodify -p1 -P "hostname05"  
Command succeeded.  
# parmodify -p1 -r0/4 -r0/6  
Command succeeded.  
# parmodify -p1 -b 4/0/1/0/0.9  
Command succeeded.  
#
```

When each modification takes place, *parmodify* reports “Command succeeded”. Otherwise it reports any problems.

You can specify each configuration option on a separate command line or can combine all options into a single, longer command line.

For details on the various options for modifying nPartition settings, refer to the *parmodify* (1M) manpage.

- Step 4.** Use the *parstatus -v -p#* command to list all details about your newly created and configured nPartition.

If any configuration details need to be modified, use the `parmodify` command before you boot the nPartition in the next step.

```
# parstatus -V -p1
[Partition]
Partition Number      : 1
Partition Name        : hostname05
Status                : inactive
IP address            :
Primary Boot Path     : 4/0/1/0/0.9
Alternate Boot Path   : 0/0/0/0/0/0/0/0.0
HA Alternate Boot Path : 0/0/0/0/0/0/0/0.0
PDC Revision         : 104.1
IODCH Version        : 23664
CPU Speed             : 552 MHz
Core Cell            : ?
Core Cell Alternate   :
                    0. cab0,cell4
                    1. cab0,cell6

[Cell]

                CPU      Memory              Use
                OK/      (GB)              Core   On
Hardware      Actual    Failed/ OK/      cell   Next Par
Location      Usage     Max    Failed    Connected To    Capable Boot Num
-----
cab0,cell4    inactive  4/0/4    2.0/ 0.0  cab 0,bay0,chassis3  yes   yes 1
cab0,cell6    inactive  4/0/4    2.0/ 0.0  cab 0,bay1,chassis1  yes   yes 1
....
```

- Step 5.** Boot your newly-created nPartition past boot-is-blocked to make it active and make its system boot environment available.

(The BCH environment is provided on HP 9000 servers; the EFI environment is provided on HP Integrity servers.)

Use the **BO** command at the service processor Command menu to boot the nPartition.

Once the nPartition is booted, you can access its system boot environment through its console. Use the service processor Console menu (enter **CO** at the service processor Main Menu).

Creating a New nPartition (Partition Manager)

You can create a new nPartition by using Partition Manager.

When using Partition Manager Version 1.0, use the **Partition** → **Create Partition** action.

When using Partition Manager Version 2.0, use the **nPartition** → **Create nPartition** action.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

- Step 2.** Run the Partition Manager task wizard for creating a new nPartition.

From Partition Manager Version 1.0, select the **Partition** → **Create Partition** action.

From Partition Manager Version 2.0, select the **nPartition** → **Create nPartition** action.

Partition Manager guides you through the steps it requires for creating a new nPartition.

- Step 3.** Exit Partition Manager.

Chapter 6 *Creating and Configuring nPartitions*

Creating a New nPartition

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Removing (Deleting) an nPartition

You can remove an nPartition by using any one of the following procedures:

- “Deleting an nPartition (nPartition Commands)” on page 271
- “Deleting an nPartition (Partition Manager)” on page 273

Deleting an nPartition causes all cells (and any I/O resources connected to the cells) that were assigned to the nPartition to be unassigned. As a result, all of these cells become available resources which can be assigned to any nPartition in the server complex.

When removing an active nPartition, you must complete the procedure by performing a shutdown for reconfig (the HP-UX `shutdown -R -H` command or Windows `shutdown /s` command) as soon as possible after initiating the nPartition removal.

When using the Original nPartition Commands or Partition Manager Version 1.0, you can delete only the local nPartition and inactive remote nPartitions.

Deleting an nPartition (nPartition Commands)

From the command line, use the `parremove` command to delete (remove) an nPartition.

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u... -h... options` or `-g... -h... options`. For details see “Tools for Configuring nPartitions” on page 254.

Step 1. Use the `parstatus -P` command to list all nPartitions, and check the status (active or inactive) for the nPartition you plan to remove.

To check the local partition number, use the `parstatus -w` command. The local nPartition always is active when it is running HP-UX.

If you are planning to remove a remote nPartition, check to see whether the remote nPartition is inactive.

- If using Original nPartition Commands to remove a remote nPartition, the remote nPartition must be inactive.

To make a remote nPartition inactive, put the nPartition into a shutdown for reconfig state by performing any of the following tasks:

- Login to HP-UX running on the remote nPartition and issue the `shutdown -R -H` command
- Login to Windows running on the remote nPartition and issue the `shutdown /s` command.
- Login to Linux running on the remote nPartition and issue the `shutdown -h time` command.
- Login to OpenVMS running on the remote nPartition, first issue `@SYS$SYSTEM:SHUTDOWN` from OpenVMS and enter **No** at the “Should an automatic system reboot be performed” prompt, then access the MP and, from the MP Command Menu, issue the `RR` command and

specify the nPartition that is to be shutdown for reconfig.

- Access the console for the remote nPartition and use the RECONFIGRESET command at the BCH Menu (on HP 9000 systems) or the reconfigreset command at the EFI Shell (on HP Integrity systems).
- Use the RR command at the service processor Command Menu to reset the nPartition to a shutdown for reconfig state.
- To remove an active remote nPartition, you must use the Enhanced nPartition Commands remote administration options and the remote nPartition must be in a complex based on the HP sx1000 chipset or HP sx2000 chipset.

Step 2. Save all current configuration details about the nPartition you plan to remove.

Use the `parstatus -v -p#` command to display all current configuration information related to the nPartition you plan to remove.

Save this information, as you can use it to manually recreate the nPartition if necessary at a later time.

Step 3. Remove the nPartition.

Use one of the following procedures to remove the nPartition: Removing an Inactive Remote nPartition, Removing a Local nPartition, or Removing an Active Remote nPartition.

- **Removing an Inactive Remote nPartition**

1. Issue the `parremove -p#` command to remove the inactive remote nPartition (`-p#` where `#` is the nPartition number). For example:

```
# parremove -p1
```

2. Issue the `parstatus -P` command to confirm that the nPartition was removed.

If the nPartition was removed, it no longer is listed in the `parstatus` command output.

- **Removing a Local nPartition**

To remove the local nPartition (the nPartition on which you currently are issuing commands), perform the following steps.

1. Shut down all applications and warn users. Follow the same procedures you would use if you were to reboot the nPartition.
2. Issue the `parremove -F -p#` command to force-remove (`-F`) the local nPartition (`-p#` where `#` is the number of the local nPartition).

Note that the local nPartition remains active following the `parremove -F -p#` command, until you perform a shutdown for reconfig to complete the removal.

As soon as possible proceed with the shutdown for reconfig because the server Complex Profile will remain locked—and no other changes can occur—until the pending nPartition removal is completed.

3. Perform a shutdown for reconfig of the local nPartition (HP-UX: `shutdown -R -H`; Windows: `shutdown /s`; Linux: `shutdown -h time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with no automatic system reboot then MP Command menu RR command).

The shutdown for reconfig command shuts down the nPartition and all cells so that the

configuration changes occur and the nPartition is deleted.

- **Removing an Active Remote nPartition**

To remove an active remote nPartition, you must use the Enhanced nPartition Commands or Partition Manager Version 2.0 and the remote nPartition must be in a complex based on the HP sx1000 chipset or HP sx2000 chipset.

1. Shut down all applications and warn users. Follow the same procedures you would use if you were to reboot the nPartition.
2. Issue the `parremove -F -p#` command and specify either the `-u . . . -h . . .` options or `-g . . . -h . . .` options. For details see “Tools for Configuring nPartitions” on page 254.

You must specify both the force-remove option (`-F`) and the nPartition number (`-p#` where `#` is the number for the nPartition being removed).

3. Perform a shutdown for reconfig of the nPartition that is being removed.

Use any of the following methods, as appropriate, to perform the shutdown for reconfig.

- From the operating system, put the nPartition into a shutdown for reconfig state (HP-UX: `shutdown -R -H`; Windows: `shutdown /s`; Linux: `shutdown -h time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with no automatic system reboot then MP Command menu `RR` command).
- From the EFI Shell for the nPartition, use `reconfigreset` to put the nPartition into a shutdown for reconfig state.
- From the BCH menu for the nPartition, use `RECONFIGRESET` to put the nPartition into a shutdown for reconfig state.
- From the service processor Command Menu for the server complex where the nPartition resides, use the Command menu `RR` command to put the nPartition into a shutdown for reconfig state.

After you complete the nPartition removal, the nPartition no longer exists. All cells (and associated I/O chassis) that used to be assigned to the deleted nPartition now are unassigned and can be assigned for other uses.

Deleting an nPartition (Partition Manager)

You can delete an nPartition by using Partition Manager.

When using Partition Manager Version 1.0, select an nPartition, then select the **Partition → Delete Partition** action.

When using Partition Manager Version 2.0, select an nPartition, then select the **nPartition → Delete nPartition** action.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

Step 2. In Partition Manager, select the nPartition you want to remove.

If using Partition Manager Version 1.0, you must select either the local nPartition or a inactive

remote nPartition (where all hardware assigned to the nPartition must be listed as having an Actual Usage of “inactive”).

If using Partition Manager Version 2.0, you also can remove an active remote nPartition either when managing the complex where nPartition resides, or when managing the remote nPartition. Both remote management features involve using the **Tools** → **Switch Complexes** action.

Step 3. Select the Partition Manager action to request that the nPartition be removed (deleted).

From Partition Manager Version 1.0, select the **Partition** → **Delete Partition** action.

From Partition Manager Version 2.0, select the **nPartition** → **Delete nPartition** action.

Step 4. Proceed with the nPartition deletion by clicking the **OK** button when Partition Manager requests confirmation for deleting the nPartition.

Step 5. If removing an active nPartition, perform a shutdown for reconfig of the nPartition. (You do not need to perform a shutdown for reconfig if removing an inactive nPartition.)

Login to the nPartition being removed, and issue the HP-UX `shutdown -R -H` command or Windows `shutdown /s` command to perform the shutdown for reconfig. Following the shutdown, the nPartition no longer exists—its configuration information is deleted.

Step 6. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Assigning (Adding) Cells to an nPartition

You can add cells to an nPartition by using any one of the following procedures:

- “Adding Cells to an nPartition (nPartition Commands)” on page 275
- “Adding Cells to an nPartition (Partition Manager)” on page 277

Adding cells to an nPartition involves selecting available cells (those not currently assigned to an nPartition) and assigning them to an existing nPartition. Both the selected cells and any I/O chassis connected to the cells are assigned to the designated nPartition.

NOTE Adding or removing cells from an nPartition will change the amount of memory available to the nPartition, possibly significantly. You should consider how the memory change may affect the amount of swap space necessary for the nPartition and if needed adjust the swap space size.

You can add cells to the local nPartition or to any remote nPartitions in the same server complex.

Reboot for Reconfig Guidelines for Adding Cells

In some situations, you must immediately perform a reboot for reconfig of a modified nPartition after adding cells to it.

- You must perform a reboot for reconfig of an active nPartition after you have added a cell to it (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot). The reboot for reconfig enables the newly assigned cell to rendezvous and be actively used when the nPartition reboots.
- Perform a reboot for reconfig of an nPartition as soon as possible after you have added a cell to an active nPartition and have specified a “y” use-on-next-boot value for the new cell.
- You need not perform a reboot for reconfig of an nPartition in these situations:
 - When you have added a cell to an inactive nPartition.
 - When you have added a cell with a “n” use-on-next-boot value and you did not specify the `-B` option to the `parmodify` command.

Adding Cells to an nPartition (nPartition Commands)

From the command line, use the `parmodify` command to add cells to an nPartition. You also can use the `parstatus` command to list nPartition and complex details, such as available cells.

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u... -h... options` or `-g... -h... options`.

For details see “Tools for Configuring nPartitions” on page 254.

Step 1. Use the `parstatus -A -C` command to list all available cells (the unassigned cells) in the server

complex.

Step 2. Choose one or more eligible cells from the list to add to the nPartition.

Adding the cell(s) to the nPartition must create a configuration that meets the hardware requirements and performance guidelines.

Step 3. Modify the nPartition by issuing the `parmodify -p# -a#...` command to add the cell (`-a#...` where # is the cell number) to the specified nPartition (`-p#` where # is the nPartition number). The `-a...` option differs slightly for the nPartition command releases.

To add multiple cells, you can specify the `-a` option multiple times in the same command.

parmodify Command:

-a Option Differences for nPartition Command Releases

The `parmodify` command's `-a...` option specifies a cell number and attributes, which are used when adding the cell to an existing nPartition. For the Enhanced nPartition Commands, an additional cell local memory attribute is optional. Both syntaxes are given in the following list.

- For the Original nPartition Commands, the `parmodify` command's `-a...` option is as follows:

```
-a cell:[type]:[use]:[fail]
```

where:

<i>cell</i>	The cell to be added to the nPartition. You can specify the cell in global (<i>cell</i>) format or in hardware location (<i>cabinet/slot</i>) format.
<i>type</i>	The cell type: <code>base</code> is the only supported cell type and it is the default.
<i>use</i>	The cell use-on-next-boot value: <code>y</code> or <code>n</code> . Use <code>y</code> (the default) if the cell is to be an active member of the nPartition, or use <code>n</code> if the cell is to remain an inactive member.
<i>fail</i>	The cell failure usage: <code>ri</code> (reactivate with interleave) is the only supported failure usage policy and it is the default.

For details, refer to the `parmodify` (1M) manpage.

- For the Enhanced nPartition Commands, the `parmodify` command's `-a...` option is as follows:

```
-a cell:[type]:[use]:[fail][:clm]
```

where the *cell*, *type*, *use*, and *fail* attributes are the same as supported by the Original nPartition Commands.

The *clm* value specifies the amount of memory that will be configured as cell local memory for the cell.

You can specify the *clm* value in either of two forms: percentage or absolute amount of memory.

— Percentage cell-local memory (CLM).

The percent number can be any number in the range 0–100 with a suffix of %.

This number is rounded to 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5% or 100%. If the cell contains less than 4 GBytes of memory, then the percentage is rounded to 25%, 50%, 75% or 100%. Percentages are rounded up or down to the nearest value, but are not rounded up to 100%.

— Absolute CLM specification. (The default.)

The absolute number is interpreted as an absolute number of gigabytes of memory and can optionally have a suffix of GB.

As needed, an absolute CLM specification is rounded up to the nearest 0.5 GBytes.

If the *clm* value is rounded, the command reports the final value used. For details, refer to the *parmodify* (1M) manpage.

parmodify Command:

-B Option for nPartition Booting

You can optionally specify the *parmodify* command's `-B` option to require that the modified nPartition be rebooted.

- When you specify `-B` to modify an inactive nPartition, the changes to the inactive nPartition are completed immediately and the nPartition then boots and becomes active.
- When you specify `-B` to modify an active nPartition, you must perform a reboot for reconfig for the changes to be completed. After the reboot for reconfig occurs the nPartition boots and becomes active (because the *parmodify* command `-B` option was specified).

Refer to the *parmodify* (1M) manpage for details on all options.

- Step 4.** As needed, perform a reboot for reconfig on the modified nPartition (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

See “Reboot for Reconfig Guidelines for Adding Cells” on page 275 for details on when to perform a reboot for reconfig.

Adding Cells to an nPartition (Partition Manager)

You can add cells to an nPartition by using Partition Manager.

When using Partition Manager Version 1.0, select an nPartition, and use the **Partition → Modify Partition** action, **Add/Remove Cells** tab.

When using Partition Manager Version 2.0, select an nPartition, and use the **nPartition → Modify nPartition** action, **Add/Remove Cells** tab.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

- Step 2.** Select the nPartition to which you want to add cells.

- Step 3.** Specify for Partition Manager to add one or more cells to the nPartition.

From Partition Manager Version 1.0, use the **Partition → Modify Partition** action and select the **Add/Remove Cells** tab. To add cells to the nPartition, select the cells from the Available Cells list and click the **Add** button.

From Partition Manager Version 2.0, use the **nPartition → Modify nPartition** action and select the **Add/Remove Cells** tab. To add cells to the nPartition, click on the checkbox for the new cells so that a checkmark appears.

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Assigning (Adding) Cells to an nPartition

Step 4. After selecting the new cells to add to the nPartition, click the **OK** button.

Step 5. Review all information presented in the **Notes and Warnings**, the **Summary of Changes**, and the **HA Checks** tabs and either cancel or proceed with the changes.

Click the **Cancel** button to cancel the changes.

To proceed with adding the cells, click the **Finish** button or click the **OK** button.

Step 6. As needed, perform a reboot for reconfig on the modified nPartition (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot) .

See “Reboot for Reconfig Guidelines for Adding Cells” on page 275 for details on when to perform a reboot for reconfig.

Unassigning (Removing) Cells from an nPartition

You can remove cells from an nPartition by using any one of the following procedures:

- “Removing Cells from an nPartition (nPartition Commands)” on page 279
- “Removing Cells from an nPartition (Partition Manager)” on page 281

Removing a cell from an nPartition involves unassigning the cell from the nPartition to which it is assigned and, if necessary, performing a reboot for reconfig of the nPartition.

NOTE Adding or removing cells from an nPartition will change the amount of memory available to the nPartition, possibly significantly. You should consider how the memory change may affect the amount of swap space necessary for the nPartition and if needed adjust the swap space size.

When not using remote administration features, you can remove any cell from the local nPartition and can remove inactive cells from remote nPartitions in the same server complex. However, at least one core-capable cell must remain in each nPartition.

The remote administration features supported by the Enhanced nPartition Commands or Partition Manager Version 2.0 also enable you to remove any cell from any nPartition in an HP Integrity server complex. Still, at least one core-capable cell must remain in each nPartition.

Reboot for Reconfig Guidelines for Removing Cells

In some situations, after removing cells from a modified nPartition you must immediately perform a reboot for reconfig (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYSS$SYSTEM:SHUTDOWN` with an automatic system reboot). Performing a required reboot for reconfig completes cell assignment changes and unlocks the Complex Profile for the server.

- You must immediately perform a reboot for reconfig of an nPartition when you have removed an active cell from the nPartition.
- You must immediately perform a reboot for reconfig of an nPartition when you have removed a cell from an active nPartition and specified the `-B` option to the `parmodify` command.
- You do not need to perform a reboot for reconfig of an nPartition when you have removed an inactive cell from an nPartition and did not specify the `-B` option to the `parmodify` command.

In the cases where you must immediately perform a reboot for reconfig after removing a cell, not doing so will leave the Complex Profile locked and thus will prevent any other changes to the server complex configuration. In these cases, the reboot for reconfig is required to complete the cell assignment changes and permit other changes to occur.

Removing Cells from an nPartition (nPartition Commands)

From the command line, use the `parmodify` command to remove cells from an nPartition. You also can use the `parstatus` command to list current nPartition details such as cell assignments.

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote

administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u...` `-h...` options or `-g...` `-h...` options.

For details see “Tools for Configuring nPartitions” on page 254.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features to modify an nPartition, you can login to any system with Enhanced nPartition Commands installed.

If removing an inactive cell from an nPartition, you can use local management from any nPartition in the complex. For example, you can login to HP-UX running on any nPartition in the same server complex.

If removing an active cell from an nPartition and not using remote administration features, you must login to the nPartition from which the cell is to be removed.

Step 2. Issue the `parstatus -c#...` command to list the current nPartition assignments and status for each cell (`-c#` where `#` is the cell number) that you plan to remove from its assigned nPartition.

Specify each cell you plan to remove with a separate `-c` option. For example, to list details on cells 0, 1, and 2, issue the `parstatus -c0 -c1 -c2` command.

The cells must all be assigned to the same nPartition in order to remove them using a single procedure. Otherwise, if the cells are assigned to different nPartitions, you must perform this procedure separately for each nPartition.

Step 3. Remove the cell from the nPartition to which it is assigned by using the `parmodify -p# -d#...` command.

Specify the nPartition (`-p#` where `#` is the nPartition number) and each cell (`-d#` where `#` is the cell number) that you want to remove from the nPartition.

If you are performing this task using the Enhanced nPartition Commands to remotely administer a server, also specify the `-u...` `-h...` options or the `-g...` `-h...` options as appropriate.

If removing multiple cells from an nPartition, specify each cell with a separate `-d#` option on the same command line (such as: `parmodify -p1 -d0 -d2...` to remove cells 0 and 2 from partition number 1).

Slightly different procedures are required for removing active cells and inactive cells. See the following information for details (Guidelines for Removing an Active Cell and Guidelines for Removing an Inactive Cell).

If at least one of the cells you plan to remove is currently active, then follow the guidelines for removing active cells.

- **Guidelines for Removing an Active Cell**

Specify the `-B` option to `parmodify` when removing an active cell from an nPartition if you want the nPartition to become active following its reboot for reconfig.

For example, the following command removes cell 4 from partition 0 and the `-B` option ensures that the nPartition will be active following its reboot for reconfig.

```
# parmodify -p0 -d4 -B
Cell 4 is active.
Use shutdown -R to shutdown the system to ready for reconfig state.
Command succeeded.
#
```


You must perform a reboot for reconfig after you issue the `parmodify` command to remove active cell(s) from the nPartition. (This is covered in the step that follows.)

- **Guidelines for Removing an Inactive Cell**

When removing an inactive cell from an nPartition you do not need to specify the `-B` option to `parmodify` and do not need to perform a reboot for reconfig of the nPartition to which the cell is assigned.

When you use `parmodify` to remove an inactive cell, the cell is immediately unassigned from its nPartition.

If you specify the `-B` option when removing an inactive cell from an inactive nPartition, then the cell is immediately removed and the modified nPartition is booted past its inactive shutdown for reconfig state and becomes an active nPartition.

For example, the following command removes cell 2 from partition 0. Because cell 2 is inactive, it is immediately unassigned.

```
# parmodify -p0 -d2
Command succeeded.
#
```

- Step 4.** As needed, perform a reboot for reconfig of the nPartition being modified (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

You must perform a reboot for reconfig if you have removed an active cell or have specified the `-B` option when modifying an active nPartition.

See the “Reboot for Reconfig Guidelines for Removing Cells” on page 279 for details on when to perform a reboot for reconfig.

This reboot for reconfig enables the cell removal to complete and the Complex Profile to be unlocked.

If you have removed an active cell and you did not specify the `-B` option to `parmodify`, then the nPartition will remain inactive in the shutdown for reconfig state after you perform the reboot for reconfig. To make the inactive nPartition active, use the `BO` (boot) command at the service processor Command menu.

Removing Cells from an nPartition (Partition Manager)

You can remove cells from an nPartition by using Partition Manager.

When using Partition Manager Version 1.0, select an nPartition, and use the **Partition → Modify Partition** action, **Add/Remove Cells** tab.

When using Partition Manager Version 2.0, select an nPartition, and use the **nPartition → Modify nPartition** action, **Add/Remove Cells** tab.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

Chapter 6 Creating and Configuring nPartitions

Unassigning (Removing) Cells from an nPartition

Step 2. Select the nPartition from which you want to remove cells.

Step 3. Specify for Partition Manager to remove one or more cells from the nPartition.

From Partition Manager Version 1.0, use the **Partition** → **Modify Partition** action and select the **Add/Remove Cells** tab. To remove cells from the nPartition, select the cells from the “Cells in the Partition” list and click the **Remove** button.

From Partition Manager Version 2.0, use the **nPartition** → **Modify nPartition** action and select the **Add/Remove Cells** tab. To remove cells from the nPartition, click on the checkbox for the cells so that no checkmark appears (the checkbox is empty).

Step 4. After specifying that the cells be removed from the nPartition, click the **OK** button.

Step 5. Review all information presented in the **Notes and Warnings**, the **Summary of Changes**, and the **HA Checks** tabs.

Step 6. Either check or leave unchecked the option for booting the nPartition after the reconfiguration occurs.

For Partition Manager Version 1.0, this option is the **Automatically boot partition...** checkbox. For Partition Manager Version 2.0, this option is the **Boot nPartition to system firmware...** checkbox.

If removing an active cell, leaving this option unchecked (not selected) results in the nPartition being inactive after its reboot for reconfig occurs.

If removing a cell from an inactive nPartition, selecting this option results in the nPartition becoming active after its reconfiguration occurs.

Step 7. Either cancel or proceed with the changes (the removal of cell).

Click the **Cancel** button to cancel the changes.

To proceed with removing the cells, click the **Finish** button or click the **OK** button.

Step 8. As needed, perform a reboot for reconfig on the modified nPartition (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

- If you have removed only inactive cells from an nPartition, then you do not need to perform a reboot for reconfig of the nPartition.
- If you have removed any active cells from the nPartition, then you must perform a reboot for reconfig and will have seen a detailed message about rebooting from Partition Manager.

Issue the reboot for reconfig command.

If you did not select the option for automatically booting the nPartition to system firmware, then the nPartition is inactive (at the shutdown for reconfig state) after the reboot for reconfig occurs. In this situation, you can make the nPartition active by using the `BO` command at the service processor Command Menu.

Renaming an nPartition

You can change the name of an nPartition by using any one of the following procedures:

- “Renaming an nPartition (BCH Menu)” on page 283
- “Renaming an nPartition (nPartition Commands)” on page 283
- “Renaming an nPartition (Partition Manager)” on page 284

Each nPartition has both an nPartition name and an nPartition number. The nPartition name is a short description useful for identifying the nPartition. You can customize nPartition names to help you distinguish among the nPartition in a server complex. (You cannot change the nPartition number, which is a permanent unique identifier that is automatically assigned for each nPartition in a server complex.)

Each nPartition name can have from 1 to 64 characters, including upper- and lowercase letters; numbers; and dashes, underscores, and spaces (“-” “_” and “ ”).

nPartition names are displayed (along with nPartition numbers) in various reports and menus provided by the service processor, Boot Console Handler (BCH), and other nPartition tools. Note that some tools display only the first 30 characters of nPartition names.

Renaming an nPartition (BCH Menu)

From the BCH Configuration Menu, use the PD command to display and change the name of the local nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose name you want to change.

Login to the service processor (MP or GSP) and enter CO to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter MA to return to the BCH Main Menu.

Step 2. Enter CO to access the BCH Configuration Menu.

Step 3. At the BCH Configuration Menu, enter the PD *NewName* command to change the nPartition name to *NewName*. No quotation marks are needed when specifying the name, even if it includes spaces.

To display the nPartition number and its current name, enter the PD command (PD not followed by any text).

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type X at the Main Menu.

Renaming an nPartition (nPartition Commands)

From the command line, rename an nPartition by using the parmodify -p# -P *name* command, where -P *name* specifies the new name for the nPartition (-p#, where # is the nPartition number).

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u... -h...` options or `-g... -h...` options.

For details see “Tools for Configuring nPartitions” on page 254.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features to rename an nPartition in a complex, you can login to any system with Enhanced nPartition Commands installed.

Step 2. Use the `parmodify -p# -P name` command to set the nPartition name for any of the nPartitions in the server complex.

Specify both the nPartition number (`-p#`, where `#` is the nPartition number) and the new name for the nPartition (`-P name`).

If the nPartition name contains spaces then quotation marks must surround the name.

```
# parmodify -p1 -P "New Name"  
Command succeeded.  
#
```

You can list the new name of the nPartition by using the `parstatus -p#` command (where `#` is the nPartition number) or `parstatus -P`.

Renaming an nPartition (Partition Manager)

You can change an nPartition name by using Partition Manager. Select an nPartition, then select either the **Partition** → **Modify Partition** action (Partition Manager Version 1.0) or the **nPartition** → **Modify nPartition** action (Partition Manager Version 2.0). Then use the **General** tab to rename the nPartition.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

Step 2. Select the nPartition you want to rename, then perform the actions to rename it.

From Partition Manager Version 1.0, select the **Partition** → **Modify Partition** action and use the **General** tab to rename the nPartition.

From Partition Manager Version 2.0, select the **nPartition** → **Modify nPartition** action and use the **General** tab to rename the nPartition.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Renaming a Server Complex

You can rename a server complex by using any one of the following procedures:

- “Renaming a Server Complex (Service Processor)” on page 285
- “Renaming a Server Complex (nPartition Commands)” on page 286
- “Renaming a Server Complex (Partition Manager)” on page 286

You can assign a name for each server complex in order to better identify the complex as you work with it. The server complex name serves as a helpful identifier; changing the name does not affect the way in which commands and utilities interact with the complex.

Several commands and utilities display the server complex name as part of their output and interfaces. For example, some nPartition commands and Partition Manager list the complex name.

Each server complex name has up to 20 characters, which can include upper- and lowercase letters; numbers; and dashes, underscores, periods, and spaces (“-” “_” “.” and “ ”).

The server complex name is stored as part of the Complex Profile for the server (part of its Stable Complex Configuration Data).

Renaming a Server Complex (Service Processor)

From the service processor Command Menu, use the `ID` command to list and modify the server complex name.

Step 1. Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.

Step 2. At the Command Menu, issue the `ID` command to list the complex name.

The `ID` command lists some of the Stable Complex Configuration Data for the current server, including the complex name.

```
GSP:CM> ID
```

```
This command allows you to change certain fields in the Stable complex configuration portion of the complex profile.
```

```
Retrieving the stable complex configuration portion of the complex profile.
```

```
GSP modifiable stable complex configuration data fields.  
Model String      : 9000/800/SD64000  
Complex System Name : feshd5  
Complex Serial Number : USR2024FP1  
Original Product Number: A5201A  
Current Product Number : A5201A  
Enterprise Id      :
```

```
Do you want to modify any of this information? (Y/[N])
```

Step 3. Specify whether you want to modify the complex profile, including its name.

Only modify the “Complex System Name”. Do not change the model string, serial number, or other details used by commands, utilities, and licensing tools.

To cancel the changes at any time enter `q` to quit the `ID` command without modifying the complex profile.

- Step 4.** To exit the service processor Command Menu, enter MA to return to the service processor Main Menu.

At the Main Menu, enter X to exit the service processor interface.

Renaming a Server Complex (nPartition Commands)

From the command line, use the `cplxmodify -N name` command to rename a server complex. The `cplxmodify` command currently only is supported by the Enhanced nPartition Commands.

NOTE

You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u... -h...` options or `-g... -h...` options.

For details see “Tools for Configuring nPartitions” on page 254.

- Step 1.** Login to a system with the nPartition commands installed.

If using remote administration features to rename a complex, you can login to any system with Enhanced nPartition Commands installed.

- Step 2.** Issue the `cplxmodify -N name` command to rename the local server complex.

To list the current complex name, issue the `parstatus -X` command.

Renaming a Server Complex (Partition Manager)

You can rename a server complex from Partition Manager by selecting the **Complex** → **Set Complex Name** action.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

- Step 2.** Select the **Complex** → **Set Complex Name** action.

Enter the new name for the complex in the text box provided, which shows the current complex name. If no name was previously assigned, the default name is “MyComplex”.

- Step 3.** Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Setting Cell Attributes

You can set the attributes for a cell by using any one of the following procedures:

- “Setting Cell Attributes (BCH Menu)” on page 287
- “Setting Cell Attributes (EFI Shell)” on page 288
- “Setting Cell Attributes (nPartition Commands)” on page 290
- “Setting Cell Attributes (Partition Manager)” on page 292

Each cell assigned to an nPartition has attributes including use-on-next-boot that determine how the cell is used within the nPartition. On servers based on the HP sx1000 chipset or HP sx2000 chipset, each cell also has a cell local memory attribute that determines the amount of memory on the cell that is not interleaved.

CAUTION Memory configured as cell local memory only can be used by operating systems that support it. HP-UX 11i v2 (B.11.23), Windows Server 2003, and SuSE Linux Enterprise Server 9 support cell local memory.

Any memory configured as cell local memory is unusable when an nPartition runs an operating system that does not support it. HP-UX 11i v1 (B.11.11), Red Hat Enterprise Linux 3, and HP OpenVMS 8.2-1 do not support cell local memory.

NOTE Changing a cell use-on-next-boot attribute may be restricted on any server complex that is under an Instant Capacity contract.

NOTE After changing cell attributes, in order to use the new settings you must reboot the nPartition to which the cell is assigned (HP-UX: `shutdown -r`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If modifying an inactive cell to be active, perform a reboot for reconfig (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

Setting Cell Attributes (BCH Menu)

From the BCH Configuration Menu, use the `CELLCONFIG` command to list or set the use-on-next-boot value for each cell in the local nPartition. The BCH Menu is available only on HP 9000 systems.

- Step 1.** Access the BCH Main Menu for the nPartition whose cell use-on-next-boot attributes you want to list or set.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter CO to access the BCH Configuration Menu.

Step 3. From the BCH Configuration menu, use the CELLCONFIG command to list or set the use-on-next-boot value for each cell.

- To list the use-on-next-boot values for all cells in the nPartition, issue the CELLCONFIG command with no arguments.
- To change the use-on-next-boot value for a cell, issue the following command:

```
CELLCONFIG cell [ON|OFF]
```

where *cell* is the cell number, ON sets the cell use-on-next-boot value to “y” (yes, do use the cell), or OFF sets the cell use-on-next-boot value to “n” (no, do not use the cell).

A cell that boots with a “y” (ON) use-on-next-boot value is permitted to rendezvous and join its nPartition, thus becoming an active cell whose resources are used.

A cell that boots with a “n” (OFF) use-on-next-boot value does not rendezvous and thus becomes an inactive cell whose resources are not used by its nPartition, although the cell still is assigned to its nPartition.

Step 4. Reboot the nPartition to use the cells’ new use-on-next-boot settings.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Use the REBOOT command at the BCH interface to perform a reboot.

If you have only changed cell configurations from ON to OFF, then perform a reboot using the REBOOT command. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Use the RECONFIGRESET command at the BCH interface to put the nPartition in the shutdown for reconfig state, then use the BO command at the service processor Command menu to boot the nPartition.

If you have changed any cell from OFF (“n”, do not use on next boot) to ON (“y”, use the cell on next boot), then you must perform these two tasks; this resets and reconfigures the nPartition and boots it.

Step 5. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type X at the Main Menu.

Setting Cell Attributes (EFI Shell)

From the EFI Shell environment, use the `cellconfig` command to list or set the use-on-next-boot value for each cell in the local nPartition. The EFI Shell is available only on HP Integrity systems.

NOTE Use of the `cellconfig` command at the EFI Shell is restricted. See the help

`cellconfig` command for details.

- Step 1.** Access the EFI Shell environment for the nPartition whose cell use-on-next-boot attributes you want to list or set.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Use the `cellconfig` command to list or set the use-on-next-boot value for each cell.

- To list the use-on-next-boot values for all cells in the nPartition, issue the `cellconfig` command with no arguments.
- To change the use-on-next-boot value for a cell, issue the following command:

```
cellconfig cell [on|off]
```

where `cell` is the cell number, `on` sets the cell use-on-next-boot value to “y” (yes, do use the cell), or `off` sets the cell use-on-next-boot value to “n” (no, do not use the cell).

A cell that boots with a “y” (`on`) use-on-next-boot value is permitted to rendezvous and join its nPartition, thus becoming an active cell whose resources are used.

A cell that boots with a “n” (`off`) use-on-next-boot value does not rendezvous and thus becomes an inactive cell whose resources are not used by its nPartition, although the cell still is assigned to its nPartition.

- Step 3.** Reboot the nPartition to use the cells’ new use-on-next-boot settings.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Use the `reset` command at the EFI Shell to perform a reboot.

If you have only changed cell configurations from `on` to `off`, then perform a reboot using the `reset` command. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Use the `reconfigreset` command at the EFI Shell to put the nPartition in the shutdown for reconfig state, then use the `BO` command at the service processor Command Menu to boot the nPartition.

If you have changed any cell from `off` (“n”, do not use on next boot) to `on` (“y”, use the cell on next boot), then you must perform these two tasks; this resets and reconfigures the nPartition and boots it.

- Step 4.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Setting Cell Attributes (nPartition Commands)

From the command line, use the `parmodify -p# -m#...` command to configure cell attributes. You also can use the `parstatus -V -c#` command to list attribute details for a specific cell (`-c#` where `#` is the cell number).

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u...` `-h...` options or `-g...` `-h...` options. For details see “Tools for Configuring nPartitions” on page 254.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features to set cell attributes, you can login to any system with Enhanced nPartition Commands installed.

Step 2. To list current cell attribute settings, use the `parstatus -C` command to list the use-on-next-boot values for all cells, or use the `parstatus -V -c#` command to list all attribute values for a specific cell (`-c#` where `#` is the cell number)

Step 3. To modify cell attribute values, use the `parmodify -p# -m#...` command and specify the new attributes for a cell as part of the `-m` option. The `-m...` option differs slightly for the nPartition command releases.

You must specify both the nPartition (`-p#` where `#` is the nPartition number) and the cell (`-m#...` where `#` is the cell number).

To modify multiple cells, you can specify the `-m` option multiple times in the same command.

parmodify Command:

-m Option Differences for nPartition Command Releases

The `parmodify` command's `-m...` option specifies a cell number and attributes, which are used to modify the configuration of the specified cell. Both syntaxes are given in the following list.

- For the Original nPartition Commands, the `parmodify` command's `-m...` option is as follows:

```
-m cell:[type]:[use]:[fail]
```

where:

cell The cell to be added to the nPartition. You can specify the cell in global (*cell*) format or in hardware location (*cabinet/slot*) format.

type The cell type: `base` is the only supported cell type and it is the default.

use The cell use-on-next-boot value: `y` or `n`. Use `y` (the default) if the cell is to be an active member of the nPartition, or use `n` if the cell is to remain an inactive member.

fail The cell failure usage: `ri` (reactivate with interleave) is the only supported failure usage policy and it is the default.

For details, refer to the `parmodify` (1M) manpage.

- For the Enhanced nPartition Commands, the `parmodify` command's `-m . . .` option is as follows:

```
-m cell:[type]:[use]:[fail][:clm]
```

where the *cell*, *type*, *use*, and *fail* attributes are the same as supported by the Original nPartition Commands.

The *clm* value specifies the amount of memory that will be configured as cell local memory for the cell.

CAUTION Memory configured as cell local memory only can be used by operating systems that support it. HP-UX 11i v2 (B.11.23), Windows Server 2003, and SuSE Linux Enterprise Server 9 support cell local memory.

Any memory configured as cell local memory is unusable when an nPartition runs an operating system that does not support it. HP-UX 11i v1 (B.11.11), Red Hat Enterprise Linux 3, and HP OpenVMS 8.2-1 do not support cell local memory.

Cell Local Memory Specification

You can specify the *clm* value in either of two forms: percentage or absolute amount of memory.

- Percentage cell-local memory (CLM).

The percent number can be any number in the range 0–100 with a suffix of %.

This number is rounded to 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5% or 100%. If the cell contains less than 4 GBytes of memory, then the percentage is rounded to 25%, 50%, 75% or 100%. Percentages are rounded up or down to the nearest value, but are not rounded up to 100%.

- Absolute CLM specification. (The default.)

The absolute number is interpreted as an absolute number of gigabytes of memory and can optionally have a suffix of GB.

As needed, an absolute CLM specification is rounded up to the nearest 0.5 GBytes.

If the *clm* value is rounded, the command reports the final value used. For details, refer to the *parmodify* (1M) manpage.

Step 4. Reboot the nPartition to use the cells' new attribute values.

On cell-based servers based on the HP sx1000 chipset or HP sx2000 chipset, if you have changed cell local memory (CLM) values then you must reboot the nPartition whose CLM values have changed (HP-UX: `shutdown -r`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot). If you also are changing use-on-next-boot values then also use the following guidelines.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Perform a standard reboot (HP-UX: `shutdown -r`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have only changed use-on-next-boot values from *y* to *n*, then perform a reboot. Any cells

set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Perform a reboot for reconfig (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have changed any use-on-next-boot values from `n` (do not use on next boot) to `y` (use the cell on next boot), then you must perform a reboot for reconfig to allow the currently inactive cells to reboot and rendezvous when the nPartition reboots.

Setting Cell Attributes (Partition Manager)

You can set cell attributes by using Partition Manager.

When using Partition Manager Version 1.0, select the nPartition to which the cell belongs, select the **Partition** → **Modify Partition** action, **Change Cell Attributes** tab, select the cell(s), and click **Modify Cell(s)**.

When using Partition Manager Version 2.0, select the nPartition to which the cell belongs, select the **nPartition** → **Modify nPartition** action, and then configure attributes using the **Set Cell Options** tab and the **Configure Memory** tab.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

Step 2. Select the nPartition whose cell attribute values you want to modify.

Step 3. Initiate the nPartition modify action.

If using Partition Manager Version 1.0, the **Partition** → **Modify Partition** action.

If using Partition Manager Version 2.0, select the **nPartition** → **Modify nPartition** action.

Step 4. Access the Partition Manager section(s) for configuring cell attributes.

From Partition Manager Version 1.0, select the **Change Cell Attributes** tab, then select the cell and click the **Modify Cell** button. This enables you to configure the use-on-next-boot value for the selected cell.

From Partition Manager Version 2.0, use the **Set Cell Options** tab to configure cell use-on-next-boot values, and use the **Configure Memory** tab to configure cell local memory values.

CAUTION Memory configured as cell local memory only can be used by operating systems that support it. HP-UX 11i v2 (B.11.23), Windows Server 2003, and SuSE Linux Enterprise Server 9 support cell local memory.

Any memory configured as cell local memory is unusable when an nPartition runs an operating system that does not support it. HP-UX 11i v1 (B.11.11), Red Hat Enterprise Linux 3, and HP OpenVMS 8.2-1 do not support cell local memory.

Step 5. After changing attribute values for all the cells you plan to modify, click the **OK** button.

Step 6. Review all information presented in the **Notes and Warnings**, the **Summary of Changes**, and the **HA Checks** tabs.

Step 7. Either cancel or proceed with the cell attribute changes.

Click the **Cancel** button to cancel the changes.

To proceed with the cell attribute changes, click the **Finish** button or click the **OK** button.

Step 8. Reboot the nPartition to use the cells' new attribute values.

On cell-based servers based on the HP sx1000 chipset or HP sx2000 chipset, if you have changed cell local memory (CLM) values then you must reboot the nPartition whose CLM values have changed. If you also are changing use-on-next-boot values then also use the following guidelines.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Perform a standard reboot (HP-UX: `shutdown -r`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have only changed use-on-next-boot values from *y* to *n*, then perform a reboot. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Perform a reboot for reconfig (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have changed any use-on-next-boot values from *n* (do not use on next boot) to *y* (use the cell on next boot), then you must perform a reboot for reconfig to allow the currently inactive cells to reboot and rendezvous when the nPartition reboots.

Setting nPartition Core Cell Choices

You can set the core cell choices for an nPartition by using any one of the following procedures:

- “Setting Core Cell Choices (BCH Menu)” on page 294
- “Setting Core Cell Choices (EFI Shell)” on page 295
- “Setting Core Cell Choices (nPartition Commands)” on page 295
- “Setting Core Cell Choices (Partition Manager)” on page 296

The core cell choice settings for an nPartition are optional preferences that establish which cells in the nPartition are preferred to be selected as the core cell for the nPartition.

NOTE You do not need to specify core cell choices for a valid core cell to be chosen.

By default on four-cell and HP Superdome servers, system firmware selects the lowest numbered eligible cell to be the active core cell for the nPartition.

By default on two-cell servers, cell 1 is selected as the core cell.

Setting Core Cell Choices (BCH Menu)

From the BCH Menu, use the Configuration menu, COC command to configure core cell choices for the nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose core cell choices you want to configure.

Login to the service processor (MP or GSP) and enter CO to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter MA to return to the BCH Main Menu.

Step 2. Enter CO to access the BCH Configuration Menu.

Step 3. Enter the COC command to list or set the core cell choices for the local nPartition.

Entering COC with no arguments lists all core cell choice preferences.

The COC command syntax is:

```
COC choice cell
```

where *choice* is 0–3 (with 0 being the highest-priority choice) and where *cell* is the cell ID.

For example, COC 0 2 sets the most preferred core cell choice to be cell ID 2. Likewise, COC 1 4 sets the next (second-highest priority) core preference to be cell ID 4.

Use the HELP COC command for other details about the COC command.

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type X at the Main Menu.

Setting Core Cell Choices (EFI Shell)

From the EFI Shell environment, use the `rootcell` command to set core cell choices for the local nPartition. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose core cell choices you want to configure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** At the EFI Shell interface enter the `rootcell` command to list or set the core cell choices for the local nPartition.

Enter the `rootcell` command with no arguments to display the current core cell choice list.

Enter the `rootcell clear` command to clear the list of preferred core cells.

Enter `rootcell c0 c1...` to specify up to four choices, with `c0` being the highest-priority choice and `c0-c3` being the cell numbers.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Setting Core Cell Choices (nPartition Commands)

From the command line, use the `parmodify` command to configure the core cell choices for an nPartition. You also can use the `parstatus -V -p#` command to list the core cell choices for an nPartition (`-p#` where `#` is the nPartition number).

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u...` `-h...` options or `-g...` `-h...` options. For details see “Tools for Configuring nPartitions” on page 254.

- Step 1.** Login to a system with the nPartition commands installed.

If using remote administration features to set core cell choices, you can login to any system with Enhanced nPartition Commands installed.

- Step 2.** Issue the `parstatus -V -p#` command to list the current core cell choices and core cell use for an nPartition.

The `parstatus -V -p#` command list detailed status for the specified nPartition (`-p#` where `#` is

the nPartition number).

The nPartition status includes the current active core cell (“Core Cell”), and any core cell choice settings.

The core cell choice preferences are listed by `parstatus` as the “Core Cell Alternate” settings with “1” being the highest priority and “2” through “4” as the lower priority core cell choices.

```
# parstatus -v -p0
[Partition]
Partition Number      : 0
Partition Name       : jules00
Status                : active
IP address            : 0.0.0.0
Primary Boot Path    : 0/0/2/0/0.13.0
Alternate Boot Path  : 0/0/2/0/0.0.0
HA Alternate Boot Path : 0/0/2/0/0.14.0
PDC Revision         : 6.0
IODCH Version        : 23664
CPU Speed             : 552 MHz
Core Cell             : cab0,cell0
Core Cell Alternate [1]: cab0,cell0
Core Cell Alternate [2]: cab0,cell2
....

Hardware Location    Usage          Core Connected  Par
=====
cab0,bay0,chassis1  active        yes  cab0,cell0  0
cab0,bay1,chassis3  active        yes  cab0,cell2  0

#
```

Step 3. Modify the nPartition core cell choices using the `parmodify -p# -r#...` command.

You can modify the core cell choices for the local nPartition or any remote nPartition in the server complex.

Use the following command: `parmodify -p# -r# -r#...`

Specify the nPartition number (-p#) and the cell ID (-r#) for all cells you wish to designate as core cell choices.

```
# parmodify -p0 -r2 -r0
Command succeeded.
#
```

The order in which you list the cells is the order in which the nPartition core cell choices are established; the first cell listed is the first preferred core cell (choice 1), and the subsequent cells are lower-priority core cell choices (choices 2 through 4, if specified).

Setting Core Cell Choices (Partition Manager)

You can set core cell choices by using Partition Manager.

When using Partition Manager Version 1.0, select the nPartition to configure, select the **Partition** → **Modify Partition** action, and use the **Core Cell Choices** tab.

When using Partition Manager Version 2.0, select the nPartition to configure, select the **nPartition** → **Modify nPartition** action, select the **Set Cell Options** tab, and use the **Core Cell Choice** column to set priorities.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Configuring nPartitions” on page 254.

Step 2. Select the nPartition whose core cell choices you want to configure.**Step 3.** Initiate the nPartition modify action.

If using Partition Manager Version 1.0, the **Partition** → **Modify Partition** action.

If using Partition Manager Version 2.0, select the **nPartition** → **Modify nPartition** action.

Step 4. Access the Partition Manager area for setting core cell choices and then make any changes to the core choices for the nPartition.

From Partition Manager Version 1.0, select the **Core Cell Choices** tab. Highlight the cell whose core cell choice you want to configure, select the desired choice priority (1st, 2nd, none, etc.) from the Core Cell Choice pop-up list, and click the **Modify** button to modify the priority.

From Partition Manager Version 2.0, select **Set Cell Options** tab, and use the **Core Cell Choice** column to set priorities.

Step 5. After changing attribute values for all the cells you plan to modify, click the **OK** button.**Step 6.** Review all information presented in the **Notes and Warnings**, the **Summary of Changes**, and the **HA Checks** tabs.**Step 7.** Either cancel or proceed with changing the core cell choices.

Click the **Cancel** button to cancel the changes.

To proceed with the core cell changes, click the **Finish** button or click the **OK** button.

Step 8. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Unlocking Complex Profile Entries

You can manually unlock a Complex Profile entry by using either of the following procedures:

- “Complex Profile Unlocking (Service Processor)” on page 299
- “Complex Profile Unlocking (nPartition Commands)” on page 299

The Complex Profile is a set of data that determines how hardware is assigned to and used by nPartitions in an server complex. Each Complex Profile entry has its own lock which is used to restrict access to the entry.

In certain situations you might need to manually unlock a Complex Profile entry, for example when an nPartition configuration tool such as Partition Manager has prematurely exited before it sends revised Complex Profile entries and corresponding lock keys back to the service processor.

For details see “Complex Profile” on page 57.

CAUTION You should generally avoid manually unlocking Complex Profile entries because doing so can result in the loss of configuration changes.

Complex Profile Unlocking (Service Processor)

This procedure unlocks a Complex Profile entry by using the **RL** command at the service processor Command menu.

- Step 1.** Login to the service processor (MP or GSP) and enter **CM** to access the Command menu.
- Step 2.** At the service processor Command menu, issue the **RL** command.
- Step 3.** Select the Complex Profile entry you want to unlock.

```
[feshd4-u] MP:CM> rl
WARNING: This command should only be used to recover from a hung
        complex reconfiguration.

        Random breaking of locks will cause unpredictable results
        and could cause your system to crash.

A - Stable complex configuration data
B - Dynamic complex configuration data
C - Partition configuration data
  Select configuration data: A

Do you want to break stable complex configuration data lock? (Y/[N]) y

-> The selected lock will be broken.
```

Complex Profile Unlocking (nPartition Commands)

This procedure unlocks a Complex Profile entry by using the **parunlock** nPartition configuration command.

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command **-u...** **-h...** options or **-g...** **-h...** options. For details see “Tools for Configuring nPartitions” on page 254.

- Step 1.** Login to HP-UX running on an existing nPartition in the server complex, or login to a system with the Enhanced nPartition Commands.
- Step 2.** Issue the **parunlock** command with the command-line option appropriate for the Complex Profile entry or entries you want to unlock.

parunlock Options for Original nPartition Commands

The Original nPartition Commands **parunlock** command supports the following options:

-s	Unlock the Stable Complex Configuration Data.
-p#	Unlock the Partition Configuration Data for the nPartition whose number (#) is specified.
-A	Unlock the Stable Complex Configuration Data and the Partition Configuration Data for all nPartitions in the complex.

parunlock Options for Enhanced nPartition Commands

The Enhanced nPartition Commands `parunlock` command supports the following options:

- s Unlock the Stable Complex Configuration Data. On HP Integrity servers the `-s` option unlocks the “read lock” that controls read access to the current Stable Complex Configuration Data. See also the `-P` option.
- d Unlock the Dynamic Complex Configuration Data.
- p# Unlock the Partition Configuration Data for the nPartition whose number (#) is specified.
- P Cancel any pending changes to the Stable Complex Configuration Data. On HP Integrity servers the `-P` option unlocks the “write lock” that controls write access to a modifiable copy of the Stable Complex Configuration Data. See also the `-s` option.
- A Unlock the Stable Complex Configuration Data, Dynamic Complex Configuration Data, and the Partition Configuration Data for all nPartitions in the complex. On HP Integrity servers the `-A` option unlocks both the “read lock” and “write lock” for the Stable Complex Configuration Data.

Canceling Pending Changes to the Complex Profile

You can cancel a pending change to the Stable Complex Configuration Data for a cell-based server by unlocking the the Stable Complex Configuration Data before the service processor has pushed out the revised data for the entry.

For example, you can abort a cell assignment change when you have issued a request to unassign an active cell but manually unlock the effected Complex Profile entries before performing a reboot for reconfig of the nPartition to which the cell originally is assigned.

For background details see “Complex Profile” on page 57.

CAUTION You should generally avoid manually unlocking Complex Profile entries because doing so can result in the loss of configuration changes.

Aborting Cell Assignment Changes

You can cancel a pending change to an active cell by using this procedure. Only changes involving the unassignment (deletion) of an active cell from an nPartition can practically be canceled.

Step 1. After issuing a request to unassign an active cell from its nPartition, do not perform a shutdown or reset of the nPartition.

When the cell assignment of an active cell is pending, the Stable Complex Configuration Data is not pushed out until the cell is at the boot is blocked (BIB) state, which occurs during a reboot for reconfig or shutdown for reconfig of its nPartition.

Step 2. Issue a request to unlock the Stable Complex Configuration Data for the server where the cell assignment change is pending.

Use one of the the procedures given in “Unlocking Complex Profile Entries” on page 298.

7 Managing Hardware Resources

This chapter covers the procedures for managing the hardware resources in nPartitions and their server complexes.

The topics covered include power and LED (attention indicator) management, hardware configuration and deconfiguration, and analysis of the current complex status.

Tools for Managing Hardware

You can list and manage server hardware using the following tools.

- **Service Processor (MP or GSP) Menus**
Service processor menus provide a complex-wide service interface that can allow access to all hardware and nPartitions.
See “Command Reference for Service Processor Commands” on page 144.
- **EFI Boot Manager and EFI Shell**
On HP Integrity servers only, the EFI (Extensible Firmware Interface) Boot Manager and Shell are the methods for interacting with an nPartition before it has booted an operating system.
See “Command Reference for EFI Shell Commands” on page 146.
- **Boot Console Handler (BCH) Menu Commands**
On PA-RISC servers, the BCH interface is the method for interacting with an nPartition before it has booted an operating system.
See “Command Reference for BCH Menu Commands” on page 150.
- **nPartition Commands**
HP nPartition commands allow you to configure, manage, and monitor nPartitions and hardware within a server complex.
The Enhanced nPartition Commands also can remotely manage complexes based on the HP sx1000 chipset or HP sx2000 chipset.
See “Commands for Configuring nPartitions” on page 34 for details.
- **Partition Manager (/opt/parmgr/bin/parmgr)**
Partition Manager provides a graphical interface for managing and monitoring nPartitions and hardware within a server complex.
See “Partition Manager” on page 38.

Task Summaries for Hardware Resource Management

Table 7-1 describes the main hardware management tasks and provides brief summaries and references for detailed procedures.

You can perform the hardware tasks in Table 7-1 using various tools, including the service processor (MP or GSP), Boot Console Handler (BCH, available only on PA-RISC servers), Extensible Firmware Interface (EFI, available only on HP Integrity servers), nPartition commands, or Partition Manager (/opt/parmgr/bin/parmgr).

See “Tools for Managing Hardware” on page 304 for details.

Table 7-1 Hardware Management Task Summaries

Task	Summary
Powering Server Cabinets On and Off	<p>CAUTION: Before powering off system hardware, you first must check whether it is being used and also inspect the hardware.</p> <ul style="list-style-type: none"> • Cabinet Power Switch: use the 48-volt power switch on the front of the cabinet. • Service Processor (MP or GSP): PE command. <p>See “Powering Server Cabinets On and Off” on page 310.</p>
Powering Cells and I/O Chassis On and Off	<p>NOTE: Powering on a cell also powers on any I/O chassis attached to the cell, and powering off a cell also powers off any I/O chassis attached to the cell. Powering on or off an I/O chassis connected to a powered-on cell causes the cell to reset if the cell located and mapped the I/O chassis during its cell boot process.</p> <ul style="list-style-type: none"> • Service Processor (MP or GSP): PE command. • nPartition Commands: frupower command, and specify -o or -f and a cell or I/O chassis: -o option to turn power on, -f option to turn power off, -c# for a cell (where # is the cell number), -i #/#/# for an I/O chassis (where #/#/# is the cabinet/bay/chassis). • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select an inactive cell or I/O chassis, and use the Cell → Power Off Cell or I/O → Power Off I/O Chassis action (or a similar “Power On...” action). — Version 2.0 — Select an inactive cell or I/O chassis, and use the Cell → Power Off Cell or I/O → Power Off Chassis action (or a similar “Power On...” action). <p>See “Powering Cells and I/O Chassis On and Off” on page 312.</p>

Table 7-1 Hardware Management Task Summaries (Continued)

Task	Summary
Turning Attention Indicators (LEDs) On and Off	<ul style="list-style-type: none"> • nPartition Commands: <code>fruled</code> command and specify <code>-o</code> or <code>-f</code> and a cabinet, cell, or I/O chassis: <code>-o</code> option to blink the LED, <code>-f</code> option to turn off the LED, <code>-b#</code> for a cabinet (where # is the cabinet number), <code>-c#</code> for a cell (where # is the cell number), <code>-i #/#/#</code> for an I/O chassis (where #/#/# is the cabinet/bay/chassis) <ul style="list-style-type: none"> HP-UX B.11.11 supports the <code>rad</code> command for controlling PCI card slot attention indicators and other tasks. HP-UX B.11.23 supports the <code>olrad</code> command for controlling PCI card slot attention indicators and other tasks. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select a cell or I/O chassis, and use the Cell → Light Cell LED or I/O → Light I/O Chassis LED action. To turn off all LEDs use the Complex → Clear All LEDs action. — Version 2.0 — Select a cell or I/O chassis, and use the Cell → Turn On Cell LED or I/O → Turn On Chassis LED action (or a similar “Turn Off...” action). To turn off all LEDs use the Complex → Clear All LEDs action. <p>See “Turning Attention Indicators (LEDs) On and Off” on page 316.</p>

Table 7-1 Hardware Management Task Summaries (Continued)

Task	Summary
Configuring and Deconfiguring Cells	<p>NOTE: Configuring and deconfiguring cells may be restricted based on any Instant Capacity contract for the server complex.</p> <p>To make an inactive cell active (configured), its use-on-next-boot value must be “y” and its nPartition must perform a reboot for reconfig (shutdown -R). To make an active cell inactive (deconfigured) its use-on-next-boot value must be “n” and its nPartition must perform a normal reboot (shutdown -r).</p> <ul style="list-style-type: none"> • BCH Menu: Configuration Menu, CELLCONFIG command. • EFI Shell: cellconfig command; use of this command is restricted. • nPartition Commands: parmodify -p# -m#... command to modify attributes of the specified cell (-m#... , where # is the cell number) for the specified nPartition (-p#, where # is the nPartition number). <ul style="list-style-type: none"> — Original nPartition Commands — For the cell modify (-m) option, specify: <ul style="list-style-type: none"> -m#: :y: to configure the cell to be used the next time the nPartition boots, or -m#: :n: to deconfigure the cell. — Enhanced nPartition Commands — For the cell modify (-m) option, specify: <ul style="list-style-type: none"> -m#: :y: :clm to configure the cell to be used the next time the nPartition boots, or -m#: :n: :clm to deconfigure the cell. The clm parameter specifies the amount of cell local memory. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Select the nPartition to which the cell belongs, select the Partition → Modify Partition action, Change Cell Attributes tab, select the cell(s), and click Modify Cell(s). — Version 2.0 — Select the nPartition to which the cell belongs, select the nPartition → Modify nPartition action, Set Cell Options tab, and configure the use-on-next-boot value. <p>See “Configuring and Deconfiguring Cells” on page 321.</p>

Table 7-1 Hardware Management Task Summaries (Continued)

Task	Summary
Configuring and Deconfiguring Processors (CPUs)	<p>NOTE: Configuring and deconfiguring processors may be restricted based on any Instant Capacity contract for the server complex.</p> <p>After a processor configuration is changed the nPartition in which the processor resides must be rebooted to use the new configuration.</p> <ul style="list-style-type: none"> • BCH Menu: Configuration Menu, CPUCONFIG command. CPUCONFIG <i>cell cpu</i> OFF deconfigures the specified processor (<i>cpu</i>) on the specified cell (<i>cell</i>). CPUCONFIG <i>cell cpu</i> ON configures the processor on the cell. • EFI Shell: cpuconfig command. cpuconfig <i>cell cpu</i> off deconfigures the specified processor (<i>cpu</i>) on the specified cell (<i>cell</i>). cpuconfig <i>cell cpu</i> on configures the processor on the cell. <p>See “Configuring and Deconfiguring Processors (CPUs)” on page 326.</p>
Configuring and Deconfiguring Memory (DIMMs)	<p>NOTE: DIMMs operate either in ranks of four or echelons of two, depending on the memory architecture of the server. When you deallocate a DIMM, all other DIMMs in the rank or echelon also will not be used the next time the nPartition boots.</p> <p>Each rank or echelon is numbered (0, 1, 2, and so on up to hexadecimal number F as needed). The DIMMs in the rank or echelon are lettered (A to D). For example, rank 0 includes DIMMs 0A, 0B, 0C, and 0D; echelon 1 has DIMMs 1A and 1B.</p> <p>After the DIMM configuration is changed the nPartition in which it resides must be rebooted to use the new configuration.</p> <ul style="list-style-type: none"> • BCH Menu: Service Menu, DIMMDEALLOC command. DIMMDEALLOC <i>cell dimm</i> OFF deconfigures the specified DIMM (<i>dimm</i>) on the cell (<i>cell</i>) indicated. DIMMDEALLOC <i>cell dimm</i> ON configures the DIMM on the cell. Use DIMMDEALLOC <i>cell</i> to display the DIMM configuration for the specified cell. • EFI Shell: dimmconfig command. dimmconfig <i>cell dimm</i> OFF deconfigures the specified DIMM (<i>dimm</i>) on the cell (<i>cell</i>) indicated. dimmconfig <i>cell dimm</i> ON configures the DIMM on the cell. Use dimmconfig <i>cell</i> to display the DIMM configuration for the specified cell. <p>See “Configuring and Deconfiguring Memory (DIMMs)” on page 328.</p>

Table 7-1 **Hardware Management Task Summaries (Continued)**

Task	Summary
Complex Health Analysis of a Server	<ul style="list-style-type: none">• Complex health analysis provides both an evaluation of the complex hardware and an evaluation its nPartition configurations.• Partition Manager: Use the Complex → Analyze Complex Health action. See “Complex Health Analysis of a Server” on page 331.

Powering Server Cabinets On and Off

You can power on or power off server cabinets by using any one of the following procedures:

- “Powering Server Cabinets On and Off (Cabinet Power Switch)” on page 310
- “Powering Server Cabinets On and Off (Service Processor)” on page 311

When powering off a cabinet, you turn off 48-volt power to the cabinet thus causing all cells and all I/O chassis to power off, and causing most fans to turn off.

Changes in cabinet power status do not affect the standby power that supplies system utilities such as the service processor (GSP or MP) and keeps some fans running. These utilities and fans can receive power as long as standby power is enabled.

CAUTION When you power on or off HP Superdome 64-way compute cabinets, you must power off and power on cabinet 0 and cabinet 1 in such a way that both cabinets are off for an overlapping interval.

If either Superdome 64-way cabinet is powered off then powered on while the other cabinet remains on, then communications between the two cabinets is lost.

CAUTION Before powering off system hardware, you first must check whether it is being used.

The cabinet power switch and the PE command at the service processor Command menu do not check whether system hardware is in use before powering it off.

Powering Server Cabinets On and Off (Cabinet Power Switch)

Use the Virtual Front Panel to check status, and then use the cabinet power switch to manage 48-volt power for a cabinet with the cabinet hardware.

Step 1. Login to the service processor for the server complex and access the Virtual Front Panel for the system.

From the service processor Main menu, enter **VFP** to access the Virtual Front Panel menu, then enter **s** to access the “system VFP” that displays the current status for all nPartitions.

Step 2. Check the VFP status to see whether any cabinet hardware is running an operating system (OS).

Any nPartition whose state is “OS heartbeat” is running an OS and thus should not have its hardware powered off until after the OS is shut down.

Type **^b (Control-b)** to exit the VFP.

Step 3. Shut down the OS running on any cabinet hardware that you plan to power off.

Step 4. Confirm that nobody else is using or servicing the cabinet hardware you plan to power on or off.

Both physically inspect the hardware and check whether others are remotely accessing the service processor (using the **WHO** command at the Command menu).

- Step 5.** Access the cabinet hardware and flip the power switch (located on the front of the cabinet) to the on or off position in order to power the cabinet on or off.

Powering Server Cabinets On and Off (Service Processor)

Use the Virtual Front Panel, and then use the Command menu **PE** command to turn 48-volt cabinet power on or off from the service processor (GSP or MP).

- Step 1.** Login to the service processor for the server and access the Virtual Front Panel for the system.

From the service processor Main menu, enter **VFP** to access the Virtual Front Panel menu, then enter **S** to access the “system VFP” that displays the current status for all nPartitions.

- Step 2.** Check the VFP status to see whether any cabinet hardware is running an operating system (OS).

Any nPartition whose state is “OS heartbeat” is running an OS and thus should not have its hardware powered off until after the OS is shut down.

Type **^b (Control-b)** to exit the VFP.

- Step 3.** Shut down the OS running on any cabinet hardware that you plan to power off.

- Step 4.** Confirm that nobody else is using or servicing the cabinet hardware you plan to power on or off.

Both physically inspect the hardware and check whether others are remotely accessing the service processor (using the **WHO** command at the Command menu).

- Step 5.** Access the service processor Command menu, issue the **PE** command, then select the cabinet to power on or power off.

From the service processor Main menu, enter **CM** to access the Command menu. To exit the Command menu enter **MA**.

When using the **PE** command enter **B** to power on or off a cabinet; specify the cabinet number; and then enter **ON** (power on), **OFF** (power off), or **Q** (quit without changing the power status).

```
GSP:CM> PE
```

```
This command controls power enable to a hardware device.
```

```
B - Cabinet
C - Cell
I - IO Chassis
  Select Device: b
```

```
Enter cabinet number: 1
```

```
The power state is ON for Cabinet 1.
In what state do you want the power? (ON/OFF)
```

Powering Cells and I/O Chassis On and Off

You can power on or power off cells and I/O chassis by using any one of the following procedures:

- “Powering Cells and I/O Chassis On and Off (Service Processor)” on page 312
- “Powering Cells and I/O Chassis On and Off (nPartition Commands)” on page 313
- “Powering Cells and I/O Chassis On and Off (Partition Manager)” on page 314

You can control power for cells and I/O chassis from remote locations, without physically accessing the system hardware.

NOTE On HP nPartition systems, powering on a cell also powers on any I/O chassis attached to the cell, and powering off a cell also powers off any I/O chassis attached to the cell.

Powering on or off an I/O chassis connected to a powered-on cell causes the cell to reset if the cell located and mapped the I/O chassis during its cell boot process.

The `frupower` command and Partition Manager permit you to power on or off inactive cells and I/O chassis that are assigned to the current nPartition or are not assigned to any nPartition.

The `PE` command at the service processor Command menu permits you to power on or off any hardware in the complex, including active cells and I/O chassis. The `PE` command does not check the current usage of components.

Powering Cells and I/O Chassis On and Off (Service Processor)

Use the Command menu `PE` command to power on and power off cells, I/O chassis, and cabinets from the service processor interface (GSP or MP).

CAUTION When using the `PE` command at the service processor Command menu to power on or off hardware, be certain to specify the correct component to power on or off.

The `PE` command does not check whether the hardware is actively being used.

You can manage the power for all components within the server complex by using the `PE` command at the service processor Command menu, regardless of any nPartition assignment or the status (active or inactive) for the hardware components.

Step 1. Login to the service processor for the server and access the Command menu.

From the service processor Main menu, enter `CM` to access the Command menu. To exit the Command menu enter `MA`.

Step 2. Issue the `PE` command and specify the type of hardware whose power you want to turn on or turn off.

You can manage power to cells, I/O chassis, and cabinets.

Step 3. Specify the hardware device to power on or power off.

The service processor does not check whether the specified component is currently being used.

- **Cabinets**—When you power on or off a cabinet, the firmware also powers on or off all cells and I/O chassis in the cabinet.
- **Cells**—When you power on or off a cell, the firmware also powers on or off any I/O chassis attached to the cell.

When specifying a cell, you indicate both the cabinet number and the slot in which the cell resides.

- **I/O Chassis**—When you power off an I/O chassis from the service processor Command menu, the system firmware resets the cell attached to the I/O chassis (if the cell located and mapped the I/O chassis during its cell boot process).

When specifying an I/O chassis, you indicate the cabinet, bay, and chassis numbers to identify it.

In the following example, the service processor powers off cell 2 in cabinet 0.

```
GSP:CM> PE
```

This command controls power enable to a hardware device.

```
B - Cabinet
C - Cell
I - IO Chassis
  Select Device: c
```

```
Enter cabinet number: 0
Enter slot number: 2
```

```
The power is ON for the Cell in Cabinet 0, Slot 2.
In what state do you want the power for the
Cell in Cabinet 0, Slot 2? (ON/OFF) OFF
```

```
GSP:CM>
```

Powering Cells and I/O Chassis On and Off (nPartition Commands)

From the command line, use the **frupower -o -c#** and **frupower -f -c#** commands to power on and power off cells (and their associated I/O chassis).

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command **-u...** **-h...** options or **-g...** **-h...** options.

For details see “Tools for Managing Hardware” on page 304.

Step 1. Login to a system with the nPartition commands installed.

To manage power for a cell, you must login to the nPartition to which the cell is assigned or use the Enhanced nPartition Commands remote administration features.

If the cell is not assigned to an nPartition, you can manage its power from any nPartition or from a remote system.

Step 2. Use the `frupower` command to turn on or turn off the cell power.

Specify the `frupower -f -c#` command to power off a cell. (-c#). This also powers off any I/O chassis connected to the cell.

Specify the `frupower -o -c#` command to power on a cell (-c#). This also powers on any I/O chassis connected to the cell.

The following example shows several sample `frupower` commands and their results.

```
# frupower -f -c0
Error: Can not power off active cell 0.
# frupower -f -c2
# frupower -o -c2
# frupower -f -c6
Error: Cell 6 belongs to partition 1. Can not power off cell.
#
# frupower -f -i0/1/1
Error: I/O chassis 0/1/1 is attached to a powered-on free
cell 4. Please power off the free cell.
#
```

In the above example, cell 0 is active and thus cannot be powered off using `frupower`. Cell 2 is inactive and is powered off (`frupower -f -c2`) and then powered back on (`frupower -o -c2`). Cell 6 is assigned to a remote nPartition (partition number 1) and thus cannot be powered off. I/O chassis 0/1/1 is attached to cell 4, so to power it off cell 4 must be powered off.

Powering Cells and I/O Chassis On and Off (Partition Manager)

You can power cells and I/O chassis on and off by using Partition Manager.

When using Partition Manager Version 1.0, select an inactive cell or I/O chassis, and use the **Cell** → **Power Off Cell** or **I/O** → **Power Off I/O Chassis** action (or a similar “Power On...” action)

When using Partition Manager Version 2.0, select an inactive cell or I/O chassis, and use the **Cell** → **Power Off Cell** or **I/O** → **Power Off Chassis** action (or a similar “Power On...” action).

NOTE You can use Partition Manager to power on or off inactive cells. You cannot power off active cells. To power on or off cells assigned to a remote nPartition when using Partition Manager, you must use Partition Manager Version 2.0 remote administration features.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Managing Hardware” on page 304.

Step 2. Select the cell or I/O chassis you want to power on or off.

In Partition Manager Version 1.0, select the nPartition containing the item you want to power on or off, then select the item.

In Partition Manager Version 2.0, select the cell (or I/O chassis) that you want to power on or off.

Step 3. Select the Partition Manager action to power on or off the selected item.

Select the **Cell → Power On Cell** action, or select the **Cell → Power Off Cell** action. If powering on or off an I/O chassis, instead use the **I/O → Power On...** or **I/O → Power Off...** actions.

Step 4. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File → Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Turning Attention Indicators (LEDs) On and Off

You can turn hardware attention indicators (LEDs) on or off by using any one of the following procedures:

- “Turning Attention Indicators On and Off (nPartition Commands)” on page 317
- “Turning Attention Indicators On and Off (Partition Manager)” on page 319

HP’s nPartition systems provide attention indicators (LEDs) to help you to visually select and confirm which hardware you want to perform operations on. Attention indicators are amber (orange) lights.

Table 7-2 lists the meanings for the various attention indicator states. When all components of a system are functioning and no service operations are occurring, every attention indicator should be turned off. (HP Superdome cabinet number LCDs remain lit or blinking when cabinet power is on.)

Table 7-2 Attention Indicator (LED) States and Meanings

Attention Indicator State	Meaning
OFF	Not selected.
BLINKING	Selected to be used in a service operation.
ON	Supported for PCI card slot LEDs only. Service required, problems have been identified with the component.

LEDs for Hardware Components

You can control (turn off, blink, and/or turn on) attention indicators for the following hardware components.

- **Cell LEDs**

Each cell or cell slot has its own attention indicators.

- On HP Superdome servers, each cell attention indicator is located on the server cabinet hardware below the cell slot, just to the right of the power LED for the cell slot.
- On other Partition-capable servers, each cell attention indicator is located on the cell hardware, to the outside of the power LEDs for the cell.

- **I/O Chassis LEDs**

On HP Superdome servers only, each I/O chassis has a attention indicator, which is located on the cabinet above the I/O chassis.

- **PCI Card Slot LEDs**

On all HP nPartition systems, each PCI card slot has an attention indicator that you can use to select the card slot. You can view the attention indicator for a PCI card slot when accessing the card cage.

On HP rp7405/rp7410, rp7420, rx7620, rp8400, rp8420, and rx8620 servers only, you also can view the attention indicator for each PCI slot beneath the corresponding slot, on the external chassis at the rear of the server cabinet.

- **Cabinet Number LCDs**

On HP Superdome servers only, each cabinet has a cabinet number LCD that serves as the attention indicator for the cabinet.

NOTE The cabinet “attention” light on HP’s nPartition capable servers is not user-controllable. The cabinet attention light automatically turns on when one or more alert level 6 (or higher) chassis codes has been recorded in the error logs and has not yet been read. This light automatically turns off when a user enters the service processor (GSP or MP) chassis logs or event logs viewer.

Turning Attention Indicators On and Off (nPartition Commands)

From the command line, you can turn attention indicators on or off by using the `fruled` command, the `rad` command (HP-UX B.11.11 only), and the `olrad` command (HP-UX B.11.23 only).

You can use the `fruled` command and specify `-o` or `-f` and a cabinet, cell, or I/O chassis: `-o` option to blink the LED, `-f` option to turn off the LED, `-b#` for a cabinet (where # is the cabinet number), `-c#` for a cell (where # is the cell number), `-i #/#/#` for an I/O chassis (where #/#/# is the cabinet/bay/chassis).

HP-UX B.11.11 supports the `rad` command for controlling PCI card slot attention indicators and other tasks.

HP-UX B.11.23 supports the `olrad` command for controlling PCI card slot attention indicators and other tasks.

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u... -h... options` or `-g... -h... options`. For details see “Tools for Managing Hardware” on page 304.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features to turn attention indicators on or off, you can login to any system with Enhanced nPartition Commands installed.

To manage PCI slot attention indicators, you must access HP-UX in the local nPartition where the PCI slot resides (the nPartition to which the cell attached to the I/O chassis containing the PCI slot is assigned).

Step 2. Use the `fruled` command and either the `rad` command (HP-UX B.11.11) or the `olrad` command (HP-UX B.11.23) to manage (turn on, off, or blink) the attention indicator for a system hardware component.

From the command line you can manage LEDs for the following hardware components:

- Cells—Use `fruled` to blink or turn off a cell attention indicator.
 - Turn Off: The `fruled -f -c#` command turns off the attention indicator for the specified cell (`-c#`). To turn off all cell attention indicators use the `fruled -f -C` command.

- Blink: The **fruled -o -c#** command blinks the attention indicator for the specified cell (-c#).
- I/O Chassis—Use **fruled** to blink or turn off HP Superdome I/O chassis attention indicators. Specify the I/O chassis using *cabinet/bay/chassis* notation (##/#).
 - Turn Off: The **fruled -f -i##/#** command turns off the attention indicator for the specified I/O chassis (-i##/#). To turn off all I/O chassis attention indicators use the **fruled -f -I** command.
 - Blink: The **fruled -o -i##/#** command blinks the attention indicator for the specified I/O chassis (-i##/#).
- Cabinet Numbers—Use **fruled** to blink or not-blink (keep lit) the cabinet number LCD for an HP Superdome cabinet.
 - Not-Blink: The **fruled -f -b#** command stops blinking (keeps it lit) the cabinet number LCD for the specified cabinet (-b#).
 - Blink: The **fruled -o -b#** command blinks the cabinet number LCD for the specified cabinet (-b#).
- PCI Card Slots—Managing the attention indicator for a PCI card slot is supported from HP-UX only.

Use the **rad** command (HP-UX B.11.11 only) or **olrad** command (HP-UX B.11.23 only) to turn on, off, or blink the attention indicator for a PCI card slot.

Specify the PCI slot using *cabinet-bay-chassis-slot* (#-#-#-#) notation.

- Turn Off PCI Card Slot Attention Indicator

The HP-UX B.11.11 **rad -f off slot** command turns off the attention indicator for the specified PCI card slot (*slot*).

The HP-UX B.11.23 **olrad -I OFF slot** command turns off the attention indicator for the specified PCI card slot (*slot*).

- Blink PCI Card Slot Attention Indicator

The HP-UX B.11.11 **rad -f attention slot** command blinks the attention indicator for the specified PCI card slot (*slot*).

The HP-UX B.11.23 **olrad -f ATTN slot** command blinks the attention indicator for the specified PCI card slot (*slot*).

- Turn On PCI Card Slot Attention Indicator

The HP-UX B.11.11 **rad -f on slot** command turns on the attention indicator for the specified PCI card slot (*slot*).

The HP-UX B.11.23 **olrad** command does not support turning on a PCI card slot's attention indicator to a steady-on state.

For details refer to the *fruled* (1), *rad* (1M), or *olrad* (1M) manpage.

The following HP-UX B.11.11 example turns off and blinks various attention indicators on an HP Superdome system, including cell, I/O chassis, PCI slot, and cabinet LEDs.

<pre># fruled -f -C # fruled -f -I</pre>	<i>Turn off</i> all cell and I/O chassis attention indicators.
<pre># fruled -o -c0 -c2 -c4 # fruled -o -i0/0/1 -i0/0/3 # fruled -o -b0</pre>	<i>Blink</i> attention indicators for cells 0, 2, and 4 and I/O chassis 0/0/1 and 0/0/3. <i>Blink</i> the cabinet number LCD for cabinet 0.
<pre># fruled -f -C # fruled -f -I # fruled -f -b0</pre>	<i>Turn off</i> all cell and I/O chassis attention indicators and <i>stop blinking</i> the cabinet number LCD.
<pre># rad -f attention 0-0-1-2 # rad -f off 0-0-1-2 #</pre>	<i>Blink</i> the attention indicator for PCI slot 2 in cabinet 0, bay 0, chassis 1. Then <i>turn off</i> the same PCI slot attention indicator.

Turning Attention Indicators On and Off (Partition Manager)

You can turn attention indicators (LEDs) on and off by using Partition Manager.

When using Partition Manager Version 1.0, select a cell or I/O chassis, and use the **Cell → Light Cell LED** or **I/O → Light I/O Chassis LED** action. To turn off all LEDs use the **Complex → Clear All LEDs** action.

When using Partition Manager Version 2.0, select a cell or I/O chassis, and use the **Cell → Turn On Cell LED** or **I/O → Turn On Chassis LED** action (or a similar “Turn Off...” action). To turn off all LEDs use the **Complex → Clear All LEDs** action.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Managing Hardware” on page 304.

Step 2. Select the cell or I/O chassis whose attention indicator you want to control.

In Partition Manager Version 1.0, select the nPartition that contains the cell or I/O chassis, and then select the cell or I/O chassis.

In Partition Manager Version 2.0, select the cell (or I/O chassis) whose attention indicator you want to control.

Step 3. Select the Partition Manager action to turn on (blink) or turn off (stop blinking) the attention indicator (LED) for the selected cell or I/O chassis.

From Partition Manager Version 1.0, use the **Cell → Light Cell LED** or **I/O → Light I/O Chassis LED** action. To turn off all LEDs use the **Complex → Clear All LEDs** action.

From Partition Manager Version 2.0, use the **Cell → Turn On Cell LED** or **I/O → Turn On Chassis LED** action (or a similar “Turn Off...” action). To turn off all LEDs use the **Complex → Clear All LEDs** action.

Step 4. Exit Partition Manager.

Chapter 7 *Managing Hardware Resources*

Turning Attention Indicators (LEDs) On and Off

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Configuring and Deconfiguring Cells

You can configure and deconfigure cells by using any one of the following procedures:

- “Configuring and Deconfiguring Cells (BCH Menu)” on page 321
- “Configuring and Deconfiguring Cells (EFI Shell)” on page 322
- “Configuring and Deconfiguring Cells (nPartition Commands)” on page 323
- “Configuring and Deconfiguring Cells (Partition Manager)” on page 324

You can deconfigure (make inactive) a cell that is assigned to an nPartition by setting its use-on-next-boot value to “n” (do not use). This causes the cell to remain assigned to the nPartition, but the cell will be inactive the next time its nPartition boots, meaning the cell hardware resources will not be used.

Whenever you configure or deconfigure cells, you must reboot the corresponding nPartition for the configuration change to take effect.

NOTE Configuring and deconfiguring cells may be restricted based on any Instant Capacity contract for the server complex.

Configuring and Deconfiguring Cells (BCH Menu)

From the BCH Configuration Menu use the `CELLCONFIG` command to configure and deconfigure cells assigned to the local nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose cells you want to configure or deconfigure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter `CO` to access the Configuration Menu.

Step 3. From the BCH Configuration menu, use the `CELLCONFIG` command to list or set the use-on-next-boot value for each cell.

- To list the use-on-next-boot values for all cells in the nPartition, issue the `CELLCONFIG` command with no arguments.
- To change a cell use-on-next-boot value, issue the following command:

```
CELLCONFIG cell [ON|OFF]
```

where *cell* is the cell number, `ON` sets the cell use-on-next-boot value to “y” (yes, do use the cell), or `OFF` sets the cell use-on-next-boot value to “n” (no, do not use the cell).

A cell that boots with a “y” (`ON`) use-on-next-boot value is permitted to rendezvous and join its nPartition, thus becoming an active cell whose resources are used.

A cell that boots with a “n” (`OFF`) use-on-next-boot value does not rendezvous and thus becomes

an inactive cell whose resources are not used by its nPartition, although the cell still is assigned to its nPartition.

Step 4. Reboot the nPartition to use the cells' new use-on-next-boot settings.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Use the `REBOOT` command at the BCH interface to perform a reboot.

If you have only changed cell configurations from `ON` to `OFF`, then perform a reboot using the `REBOOT` command. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.
- Use the `RECONFIGRESET` command at the BCH interface to put the nPartition in the shutdown for reconfig state, then use the `BO` command at the service processor Command menu to boot the nPartition.

If you have changed any cell from `OFF` (“n”, do not use on next boot) to `ON` (“y”, use the cell on next boot), then you must perform these two tasks; this resets and reconfigures the nPartition and boots it.

Step 5. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring and Deconfiguring Cells (EFI Shell)

From the EFI Shell environment, use the `cellconfig` command to configure or deconfigure cells in the local nPartition. The EFI Shell is available only on HP Integrity systems.

NOTE Use of the `cellconfig` command at the EFI Shell is restricted. See the `help cellconfig` command for details.

Step 1. Access the EFI Shell environment for the nPartition whose cells you want to configure or deconfigure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Use the `cellconfig` command to list or set the configuration setting (the use-on-next-boot value) for each cell.

- To list the use-on-next-boot values for all cells in the nPartition, issue the `cellconfig`

command with no arguments.

- To change a cell use-on-next-boot value, issue the following command:

```
cellconfig cell [on|off]
```

where *cell* is the cell number, *on* sets the cell use-on-next-boot value to “y” (yes, do use the cell), or *off* sets the cell use-on-next-boot value to “n” (no, do not use the cell).

A cell that boots with a “y” (*on*) use-on-next-boot value is permitted to rendezvous and join its nPartition, thus becoming an active cell whose resources are used.

A cell that boots with a “n” (*off*) use-on-next-boot value does not rendezvous and thus becomes an inactive cell whose resources are not used by its nPartition, although the cell still is assigned to its nPartition.

Step 3. Reboot the nPartition to use the cells’ new configuration settings.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Use the `reset` command at the EFI Shell to perform a reboot.

If you have only changed cell configurations from *on* to *off*, then perform a reboot using the `reset` command. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Use the `reconfigreset` command at the EFI Shell to put the nPartition in the shutdown for reconfig state, then use the `BO` command at the service processor Command Menu to boot the nPartition.

If you have changed any cell from *off* (“n”, do not use on next boot) to *on* (“y”, use the cell on next boot), then you must perform these two tasks; this resets and reconfigures the nPartition and boots it.

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring and Deconfiguring Cells (nPartition Commands)

From the command line, use the `parmodify -p# -m#...` command to configure or deconfigure a cell by setting its use-on-next-boot attribute value. You also can use the `parstatus -V -c#` command to list attribute details for a specific cell (`-c#` where `#` is the cell number).

NOTE You can remotely perform this task using remote administration options supported by the Enhanced nPartition Commands or Partition Manager Version 2.0. Remote administration is supported by the Partition Manager **Tools** → **Switch Complexes** action and by the nPartition command `-u...` `-h...` options or `-g...` `-h...` options.

For details see “Tools for Managing Hardware” on page 304.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features to configure and deconfigure cells, you can login to any system with Enhanced nPartition Commands installed.

Step 2. To list current cell attribute settings, use the `parstatus -C` command to list the use-on-next-boot values for all cells, or use the `parstatus -V -c#` command to list all attribute values for a specific cell (`-c#` where `#` is the cell number)

Step 3. To modify cell attribute values, use the `parmodify -p# -m#...` command and specify the new cell attributes as part of the `-m` option. The `-m...` option differs slightly for the nPartition command releases.

You must specify both the nPartition (`-p#` where `#` is the nPartition number) and the cell (`-m#...` where `#` is the cell number).

See “Setting Cell Attributes” on page 287 for details on modifying cell attributes, including the use-on-next-boot value that determines whether a cell is configured or deconfigured during the nPartition boot process.

Step 4. Reboot the nPartition to use the cells’ new configuration (the new use-on-next-boot values).

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Perform a standard reboot (HP-UX: `shutdown -r`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have only changed use-on-next-boot values from `y` to `n`, then perform a reboot. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Perform a reboot for reconfig (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have changed any use-on-next-boot values from `n` (do not use on next boot) to `y` (use the cell on next boot), then you must perform a reboot for reconfig to allow the currently inactive cells to reboot and rendezvous when the nPartition reboots.

Configuring and Deconfiguring Cells (Partition Manager)

You can set configure and deconfigure cell by using Partition Manager to set each cell use-on-next-boot value.

When using Partition Manager Version 1.0, select the nPartition to which the cell belongs, select the **Partition** → **Modify Partition** action, **Change Cell Attributes** tab, select the cell(s), and click **Modify Cell(s)**.

When using Partition Manager Version 2.0, select the nPartition to which the cell belongs, select the **nPartition** → **Modify nPartition** action, and then configure attributes using the **Set Cell Options** tab.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Managing Hardware” on page 304.

Step 2. Select the nPartition whose cells you want to configure or deconfigure.

Step 3. Initiate the nPartition modify action.

If using Partition Manager Version 1.0, the **Partition** → **Modify Partition** action.

If using Partition Manager Version 2.0, select the **nPartition** → **Modify nPartition** action.

Step 4. Access the Partition Manager section(s) for configuring cell attributes.

From Partition Manager Version 1.0, select the **Change Cell Attributes** tab, then select the cell and click the **Modify Cell** button. This enables you to configure the use-on-next-boot value for the selected cell.

From Partition Manager Version 2.0, use the **Set Cell Options** tab to configure cell use-on-next-boot values.

Step 5. After changing attribute values for all the cells you plan to modify, click the **OK** button.

Step 6. Review all information presented in the **Notes and Warnings**, the **Summary of Changes**, and the **HA Checks** tabs.

Step 7. Either cancel or proceed with the cell attribute changes.

Click the **Cancel** button to cancel the changes.

To proceed with the cell use-on-next-boot changes, click the **Finish** button or click the **OK** button.

Step 8. Reboot the nPartition to use the cells' new attribute values.

If you have changed any cell use-on-next-boot settings for the nPartition then reboot the nPartition in either of two ways:

- Perform a standard reboot (HP-UX: `shutdown -r`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have only changed use-on-next-boot values from *y* to *n*, then perform a reboot. Any cells set to not be used will still be assigned to the nPartition but will not be used (will not rendezvous) in the nPartition.

- Perform a reboot for reconfig (HP-UX: `shutdown -R`; Windows: `shutdown /r`; Linux: `shutdown -r time`; OpenVMS: `@SYS$SYSTEM:SHUTDOWN` with an automatic system reboot).

If you have changed any use-on-next-boot values from *n* (do not use on next boot) to *y* (use the cell on next boot), then you must perform a reboot for reconfig to allow the currently inactive cells to reboot and rendezvous when the nPartition reboots.

Configuring and Deconfiguring Processors (CPUs)

You can configure and deconfigure processors by using any one of the following procedures:

- “Configuring and Deconfiguring Processors (BCH Menu)” on page 326
- “Configuring and Deconfiguring Processors (EFI Shell)” on page 327

You can configure and deconfigure processors from any cell that is assigned to an nPartition. Deconfiguring a processor causes it to not be available for use by the cell or its nPartition.

Whenever you configure or deconfigure processors, you must reboot the corresponding nPartition for the configuration change to take effect.

NOTE Configuring and deconfiguring processors may be restricted based on any Instant Capacity contract for the server complex.

Configuring and Deconfiguring Processors (BCH Menu)

From the BCH Configuration Menu, use the `CPUCONFIG` command to configure or deconfigure processors in the local nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose processors you want to configure or deconfigure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter `CO` to access the BCH Configuration Menu.

Step 3. From the Configuration Menu, use the `CPUCONFIG` command to configure or deconfigure a processor on a cell in the nPartition.

Enter `CPUCONFIG` with no arguments to list the current processor configurations for all cells assigned to the local nPartition.

`CPUCONFIG cell cpu OFF` deconfigures the specified processor (*cpu*) on the specified cell (*cell*).

`CPUCONFIG cell cpu ON` configures the specified processor on the cell

Enter `HELP CPUCONFIG` for details.

Step 4. Reboot the nPartition using the `REBOOT` command.

Whenever changing processor configurations you must reboot the corresponding nPartition to allow the configuration changes to take place.

Step 5. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring and Deconfiguring Processors (EFI Shell)

From the EFI Shell environment, use the `cpuconfig` command to configure or deconfigure processors in the local nPartition. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose processors you want to configure or deconfigure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Enter the `cpuconfig` command with no arguments to list the current processor configurations for all cells assigned to the local nPartition.
- Step 3.** Use the `cpuconfig` command to change processor configurations for any of the cells assigned to the local nPartition.

`cpuconfig cell cpu off` deconfigures the specified processor (`cpu`) on the specified cell (`cell`).

`cpuconfig cell cpu on` configures the processor on the cell.

Enter `help cpuconfig` for more details on configuring and deconfiguring processors from the EFI Shell.

- Step 4.** Reboot the nPartition using the `reset` command.

Whenever changing processor configurations you must reboot the corresponding nPartition to allow the configuration changes to take place.

- Step 5.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Configuring and Deconfiguring Memory (DIMMs)

You can configure and deconfigure memory by using any one of the following procedures:

- “Configuring and Deconfiguring Memory (BCH Menu)” on page 328
- “Configuring and Deconfiguring Memory (EFI Shell)” on page 329

You can configure and deconfigure memory modules (DIMMs) from any cell that is assigned to an nPartition. Deconfiguring memory causes it to not be available for use by the cell or its nPartition.

Whenever you configure or deconfigure memory, you must reboot the corresponding nPartition for the configuration change to take effect.

NOTE DIMMs operate either in ranks of four or echelons of two, depending on memory architecture of the server. When you deallocate a DIMM, all other DIMMs in the rank or echelon also will not be used the next time the nPartition boots.

Each rank or echelon is numbered (0, 1, 2, and so on up to hexadecimal number F as needed). The DIMMs in the rank or echelon are lettered (A to D). For example, rank 0 includes DIMMs 0A, 0B, 0C, and 0D; echelon 1 has DIMMs 1A and 1B.

Configuring and Deconfiguring Memory (BCH Menu)

From the BCH Service Menu, use the `DIMMDEALLOC` command to configure or deconfigure memory modules (DIMMs) in cells assigned to the local nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose memory you want to configure or deconfigure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter `SER` to access the BCH Service Menu.

Step 3. From the Service Menu, use the `DIMMDEALLOC` command to list the current configurations of memory modules (DIMMs) in the cells assigned to the local nPartition. Also use the `DIMMDEALLOC` command to configure and deconfigure DIMMs for cells in the local nPartition.

NOTE When you deallocate a DIMM, all other DIMMs in the rank or echelon also will not be used the next time the nPartition boots.

Enter `DIMMDEALLOC` with no arguments to list the current DIMM configurations for all cells in the local nPartition.

`DIMMDEALLOC cell dimm OFF` deconfigures the specified DIMM (*dim*) on the cell (*cell*) indicated.

`DIMMDEALLOC cell dimm ON` configures the DIMM on the cell.

Use `DIMMDEALLOC cell` to display the DIMM configuration for a cell.

Enter `HELP DIMMDEALLOC` for details.

- Step 4.** Reboot the nPartition using the `REBOOT` command.

Whenever changing memory configurations you must reboot the corresponding nPartition to allow the configuration changes to take place.

- Step 5.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Configuring and Deconfiguring Memory (EFI Shell)

From the EFI Shell environment, use the `dimmconfig` command to configure or deconfigure memory modules (DIMMs) in cells assigned to the local nPartition. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose memory you want to configure or deconfigure.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Enter the `dimmconfig` command with no arguments to list a current summary of the memory configuration for the local nPartition.

- Step 3.** Use the `dimmconfig` command to change memory configurations for any of the cells assigned to the local nPartition.

NOTE When you deallocate a DIMM, all other DIMMs in the echelon also will not be used the next time the nPartition boots.

`dimmconfig cell dimm OFF` deconfigures the specified DIMM (*dim*) on the cell (*cell*) indicated.

`dimmconfig cell dimm ON` configures the DIMM on the cell.

Use `dimmconfig cell` to display the DIMM configuration for a cell.

Enter the `help dimmconfig` command for more details.

- Step 4.** Reboot the nPartition using the `reset` command.

Whenever changing memory configurations you must reboot the corresponding nPartition to allow the configuration changes to take place.

- Step 5.** Exit the console and service processor interfaces if finished using them.

Chapter 7 *Managing Hardware Resources*

Configuring and Deconfiguring Memory (DIMMs)

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type **x** at the Main Menu.

Complex Health Analysis of a Server

You can analyze the general hardware and configuration status of a cell-based server by using the Partition Manager **Complex** → **Analyze Complex Health** action, as described in the following procedure.

This feature scans the server complex and uses problem detectors to check the operating status of cells, I/O chassis, fans and blowers, and power supplies.

Complex Health Analysis of a Server (Partition Manager)

Use the **Complex** → **Analyze Complex Health** action to quickly check the operating status of a server complex from Partition Manager.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Managing Hardware” on page 304.

Step 2. Use the **Complex** → **Analyze Complex Health** action to have Partition Manager analyze the general hardware and configuration status for the server complex.

Partition Manager displays a report of the hardware analysis results. To re-analyze the server health click the **Refresh** button.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Chapter 7 Managing Hardware Resources

Complex Health Analysis of a Server

8 Listing nPartition and Hardware Status

This chapter covers procedures for listing the current status of nPartitions and server hardware components. For an introduction to nPartition system hardware features, see the chapter “Getting Started with nPartitions” on page 25.

Tools for Listing Status

You list hardware and nPartition status using the following tools.

- **Service Processor (MP or GSP) Menus**

Service processor menus provide a complex-wide service interface that can allow access to all hardware and nPartitions.

See “Command Reference for Service Processor Commands” on page 144.
- **EFI Boot Manager and EFI Shell**

On HP Integrity servers only, the EFI (Extensible Firmware Interface) Boot Manager and Shell are the methods for interacting with an nPartition before it has booted an operating system.

See “Command Reference for EFI Shell Commands” on page 146.
- **Boot Console Handler (BCH) Menu Commands**

On PA-RISC servers, the BCH interface is the method for interacting with an nPartition before it has booted an operating system.

See “Command Reference for BCH Menu Commands” on page 150.
- **nPartition Commands**

HP nPartition commands allow you to configure, manage, and monitor nPartitions and hardware within a server complex.

The Enhanced nPartition Commands also can remotely manage complexes based on the HP sx1000 chipset or HP sx2000 chipset.

See “Commands for Configuring nPartitions” on page 34 for details.
- **Partition Manager (/opt/parmgr/bin/parmgr)**

Partition Manager provides a graphical interface for managing and monitoring nPartitions and hardware within a server complex.

See “Partition Manager” on page 38.

Task Summaries for nPartition and Hardware Status

Table 8-1 describes the main hardware and nPartition status tasks and provides brief summaries and references for detailed procedures.

You can perform the status tasks in Table 8-1 using various tools, including the service processor (MP or GSP), Boot Console Handler (BCH, available only on PA-RISC servers), Extensible Firmware Interface (EFI, available only on HP Integrity servers), nPartition commands, or Partition Manager (/opt/parmgr/bin/parmgr).

See “Tools for Listing Status” on page 334 for details.

Table 8-1 Hardware and nPartition Status Task Summaries

Task	Summary
Listing Cell Configurations	<ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>CP</code> command for cell nPartition assignments. <code>PS</code> command and select a cell for detailed information about any cell in the complex. • nPartition Commands: <code>parstatus -C</code> command. • Partition Manager: <ul style="list-style-type: none"> Version 1.0 — Details —> Show Complex Details action, Cells tab. Version 2.0 — Select the Cells tab. <p>See “Listing Cell Configurations” on page 339.</p>
Listing Processor Configurations	<ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>PS</code> command, and select the cell whose processor configuration you wish to view. • BCH Menu: Information menu, <code>PR</code> command. • EFI Shell: <code>info cpu</code> command. • nPartition Commands: <ul style="list-style-type: none"> — <code>parstatus -C</code> for processor summaries for all cells. — <code>parstatus -V -c#</code> for detailed processor information for the specified cell (<code>-c#</code> where <code>#</code> is the cell number). — Processor information about the local nPartition: <ul style="list-style-type: none"> <code>ioscan -C processor</code> (HP-UX only) or <code>mpsched -s</code> (HP-UX B.11.23 only). • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Details —> Show Complex Details action, CPUs/Memory tab. — Version 2.0 — Select the Cells tab. <p>See “Listing Processor Configurations” on page 341.</p>

Table 8-1 Hardware and nPartition Status Task Summaries (Continued)

Task	Summary
Listing Memory Configurations	<ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>PS</code> command, and select the cell whose memory configuration you wish to view. • BCH Menu: Information menu, <code>ME</code> command. • EFI Shell: <code>info mem</code> command, and the <code>dimmconfig #</code> command (where # is the cell number) for memory module (DIMM) details for a specific cell. • nPartition Commands: <ul style="list-style-type: none"> — <code>parstatus -C</code> for memory summaries for all cells. — <code>parstatus -V -c#</code> for detailed memory information for the specified cell (-c# where # is the cell number). Includes cell local memory (CLM) details. — <code>parstatus -V -p#</code> for detailed memory information for the specified nPartition (-p# where # is the nPartition number). Includes cell local memory (CLM) details. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Details → Show Complex Details action, CPUs/Memory tab. — Version 2.0 — Select the Cells tab. <p>See “Listing Memory Configurations” on page 344.</p>
Listing Input/Output (I/O) Configurations	<ul style="list-style-type: none"> • Service Processor (MP or GSP): <code>IO</code> command to list connections from cells to I/O chassis. <code>PS</code> command and the cabinet option to list I/O details for an entire cabinet. • BCH Menu: Information menu, <code>IO</code> command. • EFI Shell: <code>info io</code> command. • nPartition Commands: <code>parstatus -I</code> command, for complex-wide details. <ul style="list-style-type: none"> — HP-UX B.11.11 — <code>rad -q</code> command. — HP-UX B.11.23 — <code>olrad -q</code> command. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Details → Show Complex Details action, I/O Chassis tab. — Version 2.0 — Select the I/O tab. <p>See “Listing Input/Output (I/O) Configurations” on page 347.</p>

Table 8-1 Hardware and nPartition Status Task Summaries (Continued)

Task	Summary
Listing Cabinets in a Server Complex	<ul style="list-style-type: none"> • Service Processor (MP or GSP): PS command and B option to list cabinet details for the desired cabinet. • nPartition Commands: parstatus -B command for summaries about all cabinets, or the parstatus -V -b# command for detailed status for the specified cabinet (-b# where # is the cabinet number). • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Details → Show Complex Details action, Cabinet Info tab. — Version 2.0 — Hardware tab for an overview of cabinets in the complex. Complex → Show Complex Details for complete details about all hardware in the complex. <p>See “Listing Cabinets in a Server Complex” on page 350.</p>
Listing Product and Serial Numbers	<ul style="list-style-type: none"> • Service Processor (MP or GSP): ID command. • BCH Menu: Information menu, CID command. • nPartition Commands: parstatus -X command. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Complex → Show Complex Details, General tab. — Version 2.0 — General tab. <p>See “Listing Product and Serial Numbers” on page 352.</p>
Listing nPartition Configurations	<ul style="list-style-type: none"> • Service Processor (MP or GSP): CP command. • nPartition Commands: parstatus -P command, or the parstatus -V -p# command for details about specific nPartition (-p# where # is the nPartition number) • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — View the left side of the primary window to see a display of all nPartitions in the server; for details select an nPartition and the Details → Show Partition Details action. — Version 2.0 — nPartitions tab. <p>See “Listing nPartition Configurations” on page 354.</p>
Listing the Local nPartition Number	<ul style="list-style-type: none"> • BCH Menu: Configuration menu, PD command. • EFI Shell: info sys command. • nPartition Commands: parstatus -w command. <p>See “Listing the Local nPartition Number” on page 356.</p>

Table 8-1 Hardware and nPartition Status Task Summaries (Continued)

Task	Summary
<p>Listing Power Status and Power Supplies</p>	<ul style="list-style-type: none"> • Service Processor (MP or GSP): PS command and the cabinet option for detailed power status for the specified cabinet. • nPartition Commands: parstatus -B command for a power status summary for all cabinets, or parstatus -V -b# for detailed power status for the specified cabinet (-b#, where # is the cabinet number). frupower -d -C command for cell power status. frupower -d -I command for I/O chassis power status. • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Details → Show Complex Details action, Power/Cooling tab. — Version 2.0 — Power and Cooling tab. <p>See “Listing Power Status and Power Supplies” on page 358.</p>
<p>Listing Fan and Blower Status</p>	<ul style="list-style-type: none"> • Service Processor (MP or GSP): PS command, B option for detailed fan and blower status for the specified cabinet. • nPartition Commands: parstatus -B command for a summary of fans and blowers for all cabinets, or parstatus -V -b# for detailed fan and blower status for the specified cabinet (-b#, where # is the cabinet number). • Partition Manager: <ul style="list-style-type: none"> — Version 1.0 — Details → Show Complex Details action, Power/Cooling tab. — Version 2.0 — Power and Cooling tab. <p>See “Listing Fan and Blower Status” on page 360.</p>

Listing Cell Configurations

You can list the cell configurations in a cell-based server by using any one of the following procedures:

- “Listing Cell Configurations (Service Processor)” on page 339
- “Listing Cell Configurations (nPartition Commands)” on page 339
- “Listing Cell Configurations (Partition Manager)” on page 339

Cell configuration details include the list of the cells installed in the server, and cell assignments to nPartitions.

Listing Cell Configurations (Service Processor)

From the service processor Command Menu, use the `CP` and `PS` commands to list cell configuration details.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** At the Command Menu, enter the `CP` command to list cell nPartition assignments, or use the `PS` command to list details about the individual cells in the server complex. The `PS` command's `C` option displays detailed information about a specified cell.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Cell Configurations (nPartition Commands)

From the command line, use the `parstatus -C` command to list cell configuration details.

- Step 1.** Login to a system with the nPartition commands installed.
- If using remote administration features to list cell configurations, you can login to any system with Enhanced nPartition Commands installed.
- Step 2.** Issue the `parstatus -C` command to list details about the cells installed in the server complex and their nPartition assignments.

Listing Cell Configurations (Partition Manager)

From Partition Manager, select the **Cells** tab to list cell configuration details.

When using Partition Manager Version 1.0, first select the **Details** → **Show Complex Details** action, then select the **Cells** tab.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Chapter 8 Listing nPartition and Hardware Status

Listing Cell Configurations

- Step 2.** Use the **Cells** tab to list cell configurations, including details about which cell are installed in the server and any cell nPartition assignments.

From Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **Cells** tab.

From Partition Manager Version 2.0, select the **Cells** tab to list these details.

- Step 3.** Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing Processor Configurations

You can list processor configurations by using any one of the following procedures:

- “Listing Processor Configurations (Service Processor)” on page 341
- “Listing Processor Configurations (BCH Menu)” on page 341
- “Listing Processor Configurations (EFI Shell)” on page 342
- “Listing Processor Configurations (nPartition Commands)” on page 342
- “Listing Processor Configurations (Partition Manager)” on page 342

Processor (CPU) configuration details include the CPU population, CPU type, and the clock speed.

Listing Processor Configurations (Service Processor)

From the service processor Command Menu, use the `PS` command to list details about the cell whose processor configuration you want to view.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** At the Command Menu, enter the `PS` command, select the `C` option, and specify the cell whose processor configuration you want to view.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Processor Configurations (BCH Menu)

From the BCH Information Menu use the `PR` command to list processor details for the local nPartition. The BCH Menu is available only on HP 9000 systems.

- Step 1.** Access the BCH Main Menu for the nPartition whose processor configuration you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

- Step 2.** Enter `IN` to access the BCH Information Menu.
- Step 3.** Enter the `PR` command to list processor information for all active cells in the local nPartition.
- Step 4.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Listing Processor Configurations (EFI Shell)

From the EFI Shell environment, use the `info cpu` command to list processor details for the local nPartition. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose processor configuration you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Enter the `info cpu` command to list processor details for all active cells in the local nPartition.

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Listing Processor Configurations (nPartition Commands)

From the command line, use `parstatus -C` for processor summaries for all cells in the server complex; or use `parstatus -V -c#` for detailed processor information for the specified cell (`-c#` where `#` is the cell number). Use the HP-UX `ioscan -C processor` command or the HP-UX B.11.23 `mpsched -s` command for processor information about the local nPartition.

- Step 1.** Login to a system with the nPartition commands installed.

If using remote administration features to list processor configurations, you can login to any system with Enhanced nPartition Commands installed.

- Step 2.** Issue the command to list processor details.

- `parstatus -C` — Cell and processor summaries for all cells in the server complex.
- `parstatus -V -c#` — Detailed processor information for the specified cell (`-c#` where `#` is the cell number).
- `ioscan -C processor` — HP-UX only. Processor HP-UX Hardware Paths for all configured processors in all active cells in the local nPartition.
- `mpsched -s` — HP-UX B.11.23 only. Processor and “locality domain” summary for all configured processors in all active cells in the local nPartition.

Listing Processor Configurations (Partition Manager)

You can list the processor configuration for any of the cells or nPartitions in a server complex by using Partition Manager.

When using Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **CPUs/Memory** tab.

When using Partition Manager Version 2.0, select the **Cells** tab.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. List processor configuration details for any cell in the complex you currently are accessing.

From the Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **CPUs/Memory** tab to view processor details about all cells in the complex. For additional details on any cell, use the **Show Details** button.

From Partition Manager Version 2.0, select the **Cells** tab to view details about all cells in the complex, including processor details.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing Memory Configurations

You can list memory configurations by using any one of the following procedures:

- “Listing Memory Configurations (Service Processor)” on page 344
- “Listing Memory Configurations (BCH Menu)” on page 344
- “Listing Memory Configurations (EFI Shell)” on page 345
- “Listing Memory Configurations (nPartition Commands)” on page 345
- “Listing Memory Configurations (Partition Manager)” on page 346

Memory configuration details include summaries of the total memory in a cell or nPartition, the amounts of interleaved memory and cell local memory (where supported) per cell or nPartition, and the number and locations of memory modules (DIMMs) within the cells in a server complex.

Listing Memory Configurations (Service Processor)

From the service processor Command Menu, use the `PS` command to list details about the cell whose memory configuration you want to view.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** At the Command Menu, enter the `PS` command, select the `C` option, and specify the cell whose memory configuration you want to view.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Memory Configurations (BCH Menu)

From the BCH Information Menu, use the `ME` command to list memory details for the local nPartition. The BCH Menu is available only on HP 9000 systems.

- Step 1.** Access the BCH Main Menu for the nPartition whose memory configuration you want to list.
- Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.
- Step 2.** Enter `IN` to access the BCH Information Menu.
- Step 3.** Enter the `ME` command to list memory details for all active cells in the local nPartition.
- Step 4.** Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `X` at the Main Menu.

Listing Memory Configurations (EFI Shell)

From the EFI Shell environment, use the `info mem` command to list memory details for the local nPartition. Also use the `dimconfig #` command (where # is the cell number) for memory module (DIMM) details for a specific cell. The EFI Shell is available only on HP Integrity systems.

- Step 1.** Access the EFI Shell environment for the nPartition whose memory configuration you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Enter the `info mem` command to list memory details for all active cells in the local nPartition. For additional details about memory modules (DIMMs) in an individual cell use the `dimconfig #` command (where # is the cell number).

The `info mem` command lists memory totals for each active cell in the local nPartition, and includes a summary of the current interleaved memory and non-interleaved (cell local) memory.

The `dimconfig #` command shows DIMM locations, sizes, and current status for all memory in the specified cell (where # is the cell number).

- Step 3.** Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Listing Memory Configurations (nPartition Commands)

From the command line, issue the `parstatus -C` command for memory summaries for all cells; use `parstatus -V -c#` for detailed memory information for the specified cell (`-c#` where # is the cell number); or use `parstatus -V -p#` for detailed memory information for the specified nPartition (`-p#` where # is the nPartition number).

- Step 1.** Login to a system with the nPartition commands installed.

If using remote administration features to list memory configurations, you can login to any system with Enhanced nPartition Commands installed.

- Step 2.** Issue the command to list memory details.

- `parstatus -C` — Cell and memory summaries for all cells in the server complex.
- `parstatus -V -c#` — Detailed memory information for the specified cell (`-c#` where # is the cell number), including memory module (DIMM) locations and sizes. For HP Integrity servers, this includes details about the interleaved memory in the cell as well as the requested and allocated cell local memory (CLM) amounts.
- `parstatus -V -p#` — Detailed information about the specified nPartition (`-p#` where # is the

nPartition number), including summaries for all assigned cells including their amounts of memory. For HP Integrity servers, the nPartition details include the total good memory size, total interleaved memory, and the total requested and allocated cell local memory (CLM) amounts.

Listing Memory Configurations (Partition Manager)

You can list the memory configuration for any of the cells or nPartitions in a server complex by using Partition Manager.

When using Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **CPUs/Memory** tab.

When using Partition Manager Version 2.0, select the **Cells** tab.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. List memory configuration details for any cell in the complex you currently are accessing.

From Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **CPUs/Memory** tab to view memory details about all cells in the complex. For additional details on any cell, use the **Show Details** button.

From Partition Manager Version 2.0, select the **Cells** tab to view details about all cells in the complex, including memory details.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing Input/Output (I/O) Configurations

You can list I/O configurations by using any one of the following procedures:

- “Listing Input/Output (I/O) Configurations (Service Processor)” on page 347
- “Listing Input/Output Configurations (BCH Menu)” on page 347
- “Listing Input/Output Configurations (EFI Shell)” on page 348
- “Listing Input/Output (I/O) Configurations (nPartition Commands)” on page 348
- “Listing Input/Output (I/O) Configurations (Partition Manager)” on page 349

nPartition input/output (I/O) configuration details include the I/O chassis population, cell-to-chassis connections, PCI card slot capabilities, and PCI card details.

Listing Input/Output (I/O) Configurations (Service Processor)

From the service processor Command Menu, use the `IO` command to list connections from cells to I/O chassis, or use the `PS` command and the `cabinet` option to list I/O chassis population and power status for an entire cabinet.

Step 1. Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.

Step 2. At the Command Menu, enter the `IO` command to list the connections from I/O chassis to cells; the `IO` command is supported for HP Superdome servers only.

To list the power status for I/O chassis, and the locations of installed I/O chassis, issue the `PS` command, and select the `cabinet` option for the server cabinet whose I/O configuration you want to view:

- On HP Superdome servers, select the `B` (cabinet) option, and specify the cabinet whose information you want to view.
- On all other systems, select the `T` (cabinet) option.

Step 3. To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Input/Output Configurations (BCH Menu)

From the BCH Information Menu use the `IO` command to list I/O details for the local nPartition. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose I/O configuration you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter `IN` to access the BCH Information Menu.

Step 3. Enter the `IO` command to list I/O details for all active cells in the local nPartition.

The `IO` command provides details that include I/O chassis information, I/O module (PCI card slot) details, and information about PCI devices (installed PCI cards).

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Listing Input/Output Configurations (EFI Shell)

From the EFI Shell environment, use the `info io` command to list I/O details for the local nPartition. The EFI Shell is available only on HP Integrity systems.

Step 1. Access the EFI Shell environment for the nPartition whose I/O configuration you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Enter the `info io` command to list I/O details for all active cells in the local nPartition.

The `info io` command reports details that include I/O chassis information, I/O module (PCI card slot) details, and information about PCI devices (installed PCI cards).

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Listing Input/Output (I/O) Configurations (nPartition Commands)

From the command line, use the `parstatus -I` command to list details about all I/O chassis in the server complex.

From HP-UX B.11.11 use the `rad -q` command, or from HP-UX B.11.23 use the `olrad -q` command, to list details about PCI cards and slots in the local nPartition.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features, you can login to any system with Enhanced nPartition Commands installed.

If listing I/O chassis status (using `parstatus -I`) you can login to any nPartition in the complex or remotely list details. To list details about the cards and slots in an I/O chassis you must login to the nPartition to which the cell connected to the I/O chassis is assigned.

Step 2. Issue the commands to list details about I/O chassis and PCI slots.

- `parstatus -I` — List details about all I/O chassis in the server complex, including the usage (absent, active, inactive), whether the chassis has Core I/O, and which cell the I/O chassis is connected to.
- `rad -q` — HP-UX B.11.11 only. Displays the status of all PCI card slots in the system. Includes details about each PCI card slot, HP-UX Hardware Paths, and power and driver status.
- `olrad -q` — HP-UX B.11.23 only. Displays the status of all PCI card slots in the system. Includes details about each PCI card slot, HP-UX Hardware Paths, and power and driver status.

Listing Input/Output (I/O) Configurations (Partition Manager)

You can list the I/O configuration for a server complex or any nPartition in the complex by using Partition Manager.

When using Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **I/O Chassis** tab.

When using Partition Manager Version 2.0, select the **I/O** tab.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. List I/O configuration details for the server complex.

From Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **I/O Chassis** tab to view I/O chassis details for the complex. For additional details on any I/O chassis, use the **Show Details** button to display a list of PCI slots and cards.

From Partition Manager Version 2.0, select the **I/O** tab to view details about the I/O chassis in the complex. You can view further details about individual cards by clicking on the card or by selecting the card(s) and using actions available from the **I/O** menu. Viewing these additional details requires running `pdweb` (the HP-UX Peripheral Device tool) on the local nPartition to which the cell connected to the I/O chassis is assigned.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing Cabinets in a Server Complex

You can list the cabinets in a server complex by using any one of the following procedures:

- “Listing Cabinets in a Server Complex (Service Processor)” on page 350
- “Listing Cabinets in a Server Complex (nPartition Commands)” on page 350
- “Listing Cabinets in a Server Complex (Partition Manager)” on page 351

Cabinet details include the cabinet type, a list of cells, I/O chassis, power supplies, utilities, fans, firmware components, interconnecting hardware. Other information such as the power status, faults, and LED states also are given.

Listing Cabinets in a Server Complex (Service Processor)

From the service processor Command Menu, use the `PS` command and the cabinet option to list the current status for the desired cabinet.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** To list the current status for a cabinet in the server complex, issue the `PS` command and select the cabinet option for the server cabinet whose configuration and details you want to view:
- On HP Superdome servers, select the `B` (cabinet) option, and specify the cabinet whose information you want to view.
 - On all other systems, select the `T` (cabinet) option.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Cabinets in a Server Complex (nPartition Commands)

From the command line, use the `parstatus -B` command to list all cabinets in the server complex, or use the `parstatus -V -b#` command to view a detailed status for the specified cabinet (`-b#` where `#` is the cabinet number).

- Step 1.** Login to a system with the nPartition commands installed.
- If using remote administration features to list cabinet details, you can login to any system with Enhanced nPartition Commands installed.
- Step 2.** Issue commands to list details about cabinets in the target complex.
- `parstatus -B` — List all cabinets in the server complex.
 - `parstatus -V -b#` — View a detailed status for the specified cabinet (`-b#` where `#` is the cabinet number).

Listing Cabinets in a Server Complex (Partition Manager)

You can list details about the cabinets in a server complex by using Partition Manager.

When using Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action; the **General** tab and the **Cabinet Info** tab provide cabinet-related information.

When using Partition Manager Version 2.0, select the **Hardware** tab for an overview of cabinets in the complex. For complete details about all hardware in the complex, select the **Complex** → **Show Complex Details** action.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. List cabinet details for the server complex.

From Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action, then select the **Cabinet Info** tab. The **General** tab also provides cabinet-related information.

From Partition Manager Version 2.0, select the **Hardware** tab for an overview of cabinets in the complex. For complete details about all hardware in the complex, select the **Complex** → **Show Complex Details** action.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing Product and Serial Numbers

You can list product and serial numbers by using any one of the following procedures:

- “Listing Product and Serial Numbers (Service Processor)” on page 352
- “Listing Product and Serial Numbers (BCH Menu)” on page 352
- “Listing Product and Serial Numbers (nPartition Commands)” on page 353
- “Listing Product and Serial Numbers (Partition Manager)” on page 353

Product and serial number information is stored in the Stable Complex Configuration Data portion of the Complex Profile for a cell-based server.

Listing Product and Serial Numbers (Service Processor)

From the service processor Command Menu, use the `ID` command to list product and serial number information for the server complex.

Step 1. Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.

Step 2. At the Command Menu, enter the `ID` command to list product and serial number information for the server complex.

In response to the `Do you want to modify any of this information?` prompt, type `n` (or type `q`) to not modify the server complex information that was displayed.

Step 3. To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `x` to exit the service processor interface.

Listing Product and Serial Numbers (BCH Menu)

From the BCH Information Menu, use the `CID` command to list the product number and serial number for the server complex. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for any nPartition in the complex.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the `Main Menu: Enter command or menu>` prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter `IN` to access the BCH Information Menu.

Step 3. Enter the `CID` command to list the product number and serial number for the server complex.

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Listing Product and Serial Numbers (nPartition Commands)

From the command line, issue the `parstatus -x` command to display the product number and serial number for the server complex.

- Step 1.** Login to a system with the nPartition commands installed.

If using remote administration features, you can login to any system with Enhanced nPartition Commands installed.

- Step 2.** Issue the `parstatus -x` command to display the product number and serial number.

Listing Product and Serial Numbers (Partition Manager)

You can list the product number and serial number for a complex by using Partition Manager.

When using Partition Manager Version 1.0, select the **Complex** → **Show Complex Details** action and **General** tab.

When using Partition Manager Version 2.0, select the **General** tab.

- Step 1.** Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

- Step 2.** From Partition Manager Version 1.0, select the **Complex** → **Show Complex Details** action and **General** tab to list the product number and serial number for the server complex.

From Partition Manager Version 2.0, select the **General** tab to list the product number and serial number.

- Step 3.** Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing nPartition Configurations

You can list nPartition configurations by using any one of the following procedures:

- “Listing nPartition Configurations (Service Processor)” on page 354
- “Listing nPartition Configurations (nPartition Commands)” on page 354
- “Listing nPartition Configurations (Partition Manager)” on page 354

nPartition configuration information includes a list of which cells are assigned to which nPartitions, and additional details such as the core cell choices, boot device paths, and nPartition names.

Listing nPartition Configurations (Service Processor)

From the service processor Command Menu, use the `CP` command to list the nPartition configurations for the server complex. The `CP` command reports information including the nPartition numbers and corresponding cells assignments.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** At the Command Menu, enter the `CP` command to list the nPartition configurations: the nPartition numbers and corresponding cells assignments for the server complex.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing nPartition Configurations (nPartition Commands)

From the command line, issue the `parstatus -P` command to list a summary of all nPartitions in the server complex. For detailed information issue the `parstatus -V -p#` command for more information about a specific nPartition (`-p#` where `#` is the nPartition number).

- Step 1.** Login to a system with the nPartition commands installed.

If using remote administration features to list nPartition configurations, you can login to any system with Enhanced nPartition Commands installed.
- Step 2.** Issue the `parstatus -P` command to list a summary of all nPartitions in the server complex.

For detailed information issue the `parstatus -V -p#` command for more information about a specific nPartition (`-p#` where `#` is the nPartition number).

Listing nPartition Configurations (Partition Manager)

You can list nPartition configurations for a server complex by using Partition Manager.

When using Partition Manager Version 1.0, view the left side of the primary window to see a display of all nPartitions in the server, and for details select an nPartition and select the **Details** →

Show Partition Details action.

When using Partition Manager Version 2.0, use the **nPartitions** tab to view details about all nPartitions in the complex.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. From Partition Manager Version 1.0, view the left side of the primary window to see a display of all nPartitions in the server. For further details about a specific nPartition, select the nPartition and select the **Details** → **Show Partition Details** action.

From Partition Manager Version 2.0, use the **nPartitions** tab to view details about all nPartitions in the complex.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing the Local nPartition Number

You can list the local nPartition number by using any one of the following procedures:

- “Listing the Local nPartition Number (BCH Menu)” on page 356
- “Listing the Local nPartition Number (EFI Shell)” on page 356
- “Listing the Local nPartition Number (nPartition Commands)” on page 357

The local nPartition number is the numerical identifier for the nPartition currently being accessed (where the command executes).

Listing the Local nPartition Number (BCH Menu)

From the BCH Configuration Menu, use the `PD` command to list the local nPartition number and its name. The BCH Menu is available only on HP 9000 systems.

Step 1. Access the BCH Main Menu for the nPartition whose name and number you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console. When accessing the console, confirm that you are at the BCH Main Menu (the Main Menu: Enter command or menu> prompt). If at a BCH menu other than the Main Menu, then enter `MA` to return to the BCH Main Menu.

Step 2. Enter `CO` to access the BCH Configuration Menu.

Step 3. Enter the `PD` command to list the local nPartition number and its name.

Step 4. Exit the console and service processor interfaces if finished using them.

To exit the BCH environment type `^B (Control-B)`; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Listing the Local nPartition Number (EFI Shell)

From the EFI Shell, use the `info sys` command to list the local nPartition number; this command also displays a list of active cells, CPUs, and the current memory configuration. The EFI Shell is available only on HP Integrity systems.

Step 1. Access the EFI Shell environment for the nPartition whose nPartition number you want to list.

Login to the service processor (MP or GSP) and enter `CO` to access the Console list. Select the nPartition console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If at another EFI menu, select the **Exit** option from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, select the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Enter the `info sys` command to list the nPartition number for the local nPartition.

The `info sys` command also displays a list of active cells, CPUs, and the current memory configuration.

Step 3. Exit the console and service processor interfaces if finished using them.

To exit the EFI environment type **^B (Control-B)**; this exits the nPartition console and returns to the service processor Main Menu. To exit the service processor, type `x` at the Main Menu.

Listing the Local nPartition Number (nPartition Commands)

From the command line, issue the `parstatus -w` command to list the local nPartition number.

Step 1. Login to a system with the nPartition commands installed.

If using remote administration features to list a local nPartition number, you can login to any system with Enhanced nPartition Commands installed.

Only remote management using WBEM involves remote management on a local nPartition. Remote management using IPMI over LAN does not support listing a local nPartition number, because the remote access point is the service processor (MP or GSP) of a remote complex.

Step 2. Issue the `parstatus -w` command to list the local nPartition number.

Listing Power Status and Power Supplies

You can list power status and power supply details by using any one of the following procedures:

- “Listing Power Status and Power Supplies (Service Processor)” on page 358
- “Listing Power Status and Power Supplies (nPartition Commands)” on page 358
- “Listing Power Status and Power Supplies (Partition Manager)” on page 359

Power status and power supply information includes the power status (on or off) for cabinets, cells, and I/O chassis; the status (ok or failed) for power supplies; and related details.

Listing Power Status and Power Supplies (Service Processor)

From the service processor Command Menu, use the `PS` command and the cabinet option to list power status and power supply details for the specified cabinet.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** At the Command Menu, enter the `PS` command and select the cabinet option for the cabinet whose power status and related details you want to view:
- On HP Superdome servers, select the `B` (cabinet) option, and specify the cabinet whose information you want to view.
 - On all other systems, select the `T` (cabinet) option.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Power Status and Power Supplies (nPartition Commands)

From the command line, issue the `parstatus -B` command for a power status summary for all cabinets, or `parstatus -V -b#` for detailed power status for the specified cabinet (`-b#`, where `#` is the cabinet number). You also can issue the `frupower -d -C` command for cell power status, or the `frupower -d -I` command for I/O chassis power status.

- Step 1.** Login to a system with the nPartition commands installed.
- If using remote administration features to list power status, you can login to any system with Enhanced nPartition Commands installed.
- Step 2.** Issue commands to list details about system power status.
- `parstatus -B` — Power status summary for all cabinets.
 - `parstatus -V -b#` — Detailed power status for the specified cabinet (`-b#`, where `#` is the cabinet number).
 - `frupower -d -C` — Cell power status.

- `frupower -d -I` — I/O chassis power status.

Listing Power Status and Power Supplies (Partition Manager)

You can list power status and power supply details by using Partition Manager.

When using Partition Manager Version 1.0, use the **Details** → **Show Complex Details** action, **Power/Cooling** tab to list power details.

When using Partition Manager Version 2.0, use the **Power and Cooling** tab to list power details.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. List power status and power supply details for the server complex.

From Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action and the **Power/Cooling** tab to view power status. For specific details, select the `backplane power boards` or `bulk power supplies` entries in the Power/Cooling summary list.

From Partition Manager Version 2.0, select the **Power and Cooling** tab to view power status details.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Listing Fan and Blower Status

You can list fan and blower status by using any one of the following procedures:

- “Listing Fan and Blower Status (Service Processor)” on page 360
- “Listing Fan and Blower Status (nPartition Commands)” on page 360
- “Listing Fan and Blower Status (Partition Manager)” on page 361

Fan and blower status includes lists of cabinet blowers and I/O fans, and their status (whether ok or failed).

Listing Fan and Blower Status (Service Processor)

From the service processor Command Menu, use the `PS` command and the cabinet option to list fan and blower status for the specified cabinet.

- Step 1.** Login to the service processor (MP or GSP) and enter `CM` to access the Command Menu.
- Step 2.** At the Command Menu, enter the `PS` command and select the cabinet option for the cabinet whose fan and blower status you want to view:
- On HP Superdome servers, select the `B` (cabinet) option, and specify the cabinet whose information you want to view.
 - On all other systems, select the `T` (cabinet) option.
- Step 3.** To exit the service processor Command Menu, enter `MA` to return to the service processor Main Menu.

At the Main Menu, enter `X` to exit the service processor interface.

Listing Fan and Blower Status (nPartition Commands)

From the command line, issue the `parstatus -B` command for a fan and blower status summary for all cabinets, or `parstatus -V -b#` for detailed fan and blower status for the specified cabinet (`-b#`, where `#` is the cabinet number).

- Step 1.** Login to a system with the nPartition commands installed.
- If using remote administration features to list fan and blower status, you can login to any system with Enhanced nPartition Commands installed.
- Step 2.** Issue commands to list details about fan and blower status.
- `parstatus -B` — Fan and blower status summary for all cabinets.
 - `parstatus -V -b#` — Detailed fan and blower status for the specified cabinet (`-b#`, where `#` is the cabinet number).

Listing Fan and Blower Status (Partition Manager)

You can list fan and blower status by using Partition Manager.

When using Partition Manager Version 1.0, use the **Details** → **Show Complex Details** action, **Power/Cooling** tab to list fan and blower details.

When using Partition Manager Version 2.0, use the **Power and Cooling** tab to list fan and blower details.

Step 1. Access Partition Manager.

For details on accessing Partition Manager or other tools, see “Tools for Listing Status” on page 334.

Step 2. List fan and blower details for the server complex.

From Partition Manager Version 1.0, select the **Details** → **Show Complex Details** action and the **Power/Cooling** tab to view fan and blower status. For specific details, select the cabinet blowers or I/O fans entries in the Power/Cooling summary list.

From Partition Manager Version 2.0, select the **Power and Cooling** tab to view fan and blower status details.

Step 3. Exit Partition Manager.

From Partition Manager Version 1.0, select the **File** → **Exit** action.

From Partition Manager Version 2.0, select **Log off parmgr** or exit the Web browser when finished.

Chapter 8 *Listing nPartition and Hardware Status*

Listing Fan and Blower Status

A nPartition Commands

This appendix has details and command-line syntax for the HP nPartition Commands, including both the Original nPartition Commands and the Enhanced nPartition Commands.

- The Original nPartition Commands were distributed as part of HP-UX 11i v1 (B.11.11) releases prior to the December 2004 release.
- The Enhanced nPartition Commands are distributed with current HP-UX releases, including all releases of HP-UX 11i v2 (B.11.23) and releases of HP-UX 11i v1 (B.11.11) beginning with the December 2004 release.

The Enhanced nPartition Commands also are distributed as bundles on the HP Smart Setup CD for Windows, and as bundles on the HP Enablement Kit for Linux.

For an introduction to the nPartition Commands, see “Commands for Configuring nPartitions” on page 34. This appendix provides the following reference information for using HP nPartition Commands:

- “parcreate Command” on page 369
- “parmodify Command” on page 372
- “parremove Command” on page 376
- “parstatus Command” on page 378
- “parunlock Command” on page 380
- “fruled Command” on page 383
- “frupower Command” on page 385
- “cplxmodify Command” on page 387 — Only supported by the Enhanced nPartition Commands.

NOTE For the most current information for these commands, refer to the online manpages: *parcreate* (1M), *parmodify* (1M), *parremove* (1M), *parstatus* (1), *parunlock* (1M), *fruled* (1M), *frupower* (1M), and *cplxmodify* (1M).

On a Windows system, refer to **Start** → **Programs** → **Hewlett-Packard** → **nPar Management** → **nPar Commands Manual**.

Specifying Cells and I/O Chassis to Commands

Use the cell and I/O chassis notation described in this section when you manage, configure, and inquire about cells and I/O chassis using the *nPartition* configuration commands.

Details are in the Cell Specification Formats and I/O Specification Format sections that follow.

Cell Specification Formats

Use either of the following two formats to specify cells when using the *nPartition* configuration commands: Global Cell Number Format or Cell Hardware Location Format.

- **Global Cell Number Format**

The global cell number format is identical to the cells' HP-UX hardware path, as reported by the HP-UX `ioscan` command. In global format, each cell is given a single unique number that indicates the relative location of the cell in the entire server complex.

Table A-1 Cell IDs in Global Cell Number Format

Cell Slot	0	1	2	3	4	5	6	7
rp7405/rp7410, rp7420, and rx7620 Global Format	0	1	—	—	—	—	—	—
rp8400, rp8420, and rx8620 Global Format	0	1	2	3	—	—	—	—
Superdome Cabinet 0 Global Format	0	1	2	3	4	5	6	7
Superdome Cabinet 1 Global Format	8	9	10	11	12	13	14	15

- **Cell Hardware Location Format**

In cell hardware location format, each cell is identified using two numbers that specify the cabinet and the cell slot with the cabinet where the cell resides: *cabinet/slot*.

Table A-2 Cell IDs in Hardware Location Format

Cell Slot	0	1	2	3	4	5	6	7
rp7405/rp7410, rp7420, and rx7620 HW Loc Format	0/0	0/1	—	—	—	—	—	—
rp8400, rp8420, and rx8620 HW Loc Format	0/0	0/1	0/2	0/3	—	—	—	—
Superdome Cabinet 0 HW Loc Format	0/0	0/1	0/2	0/3	0/4	0/5	0/6	0/7
Superdome Cabinet 1 HW Loc Format	1/0	1/1	1/2	1/3	1/4	1/5	1/6	1/7

Both cell ID formats specify the location of a cell in a complex. For example, `parstatus -c9` and `parstatus -c1/1` specify the same cell.

```
# parstatus -c9
[Cell]
          CPU      Memory
          OK/      (GB)
Hardware  Actual  Deconf/ OK/      Core   Use
Location  Usage   Max    Deconf  Connected To  Cell  Next Par
=====  =====  =====  =====  =====  =====  =====  =====
cab1,cell1 active base 4/0/4   8.2/ 0.0 -          no    yes  1
```

```
# parstatus -c1/1
[Cell]
          CPU      Memory
          OK/      (GB)
Hardware  Actual  Deconf/ OK/      Core   Use
Location  Usage   Max    Deconf  Connected To  Cell  Next Par
=====  =====  =====  =====  =====  =====  =====  =====
cab1,cell1 active base 4/0/4   8.2/ 0.0 -          no    yes  1
```

#

I/O Specification Format

Use the following I/O hardware location format when specifying an I/O chassis to the nPartition configuration commands:

cabinet/bay/chassis

The *cabinet*, *bay*, and *chassis* fields specify the physical location of the I/O chassis. The values of these fields are as follows.

- *cabinet*

Appendix A nPartition Commands

Specifying Cells and I/O Chassis to Commands

specifies the cabinet number where the I/O chassis resides.

On HP rp7405/rp7410, rp7420, rx7620, rp8400, rp8420, and rx8620 servers, the server cabinet number always is 0.

In HP rp8400, rp8420, and rx8620 complexes the I/O Expansion cabinet, if present, is 8.

On HP Superdome servers, the cabinet number can be:

- 0 — the left Compute cabinet.
- 1 — the right Compute cabinet, if present.
- 8 — an I/O Expansion cabinet, if present.
- 9 — an I/O Expansion cabinet, if present.

- *bay*

specifies the I/O bay (within a cabinet) where the I/O chassis resides.

On HP rp7405/rp7410, rp7420, rx7620, rp8400, rp8420, and rx8620 servers, the bay number always is 0.

On HP Superdome servers, the bay number can be:

- 0 — the front bay of a Compute cabinet, or the bottom bay of an I/O Expansion cabinet.
- 1 — the rear bay of a Compute cabinet, or the middle bay of an I/O Expansion cabinet.
- 2 — the top bay in an I/O Expansion cabinet.

- *chassis*

specifies the I/O chassis (within a bay).

On HP rp7405/rp7410, rp7420, rx7620, rp8400, rp8420, and rx8620 servers, the chassis number is:

- 0 — Chassis 0, which connects to cell 0 and is the left chassis as viewed from the cabinet rear: the left eight PCI card slots.
- 1 — Chassis 1, which connects to cell 1 and is the right chassis as viewed from the cabinet rear: the right eight PCI card slots.

On HP Superdome servers, the chassis number is:

- 1 — Chassis 1, the left chassis in the bay, as viewed when facing the bay/chassis.
- 3 — Chassis 3, the right chassis in the bay, as viewed when facing the bay/chassis.

In HP Superdome servers all chassis are 12-slot I/O chassis, both in Compute cabinets and in I/O Expansion cabinets.

The example below shows the `parstatus` command listing details about two different I/O chassis (cabinet 0/bay 0/chassis 1, and cabinet 0/bay 1/chassis 3).

```
# parstatus -i0/0/1
[Chassis]
Hardware Location  Usage          Core Connected  Par
=====
cab0,bay0,chassis1  absent        -      -      -

# parstatus -i0/1/3
[Chassis]
Core Connected  Par
```

```
Hardware Location Usage IO To Num
=====
cab0,bay1,chassis3 active yes cab0,cell0 0

#
```

Use the `parstatus -I` command to list all I/O chassis within a server complex, regardless of the chassis cell connections and nPartition assignments.

Use the HP-UX `rad -q` command or `olrad -q` command to list the currently available PCI I/O slots in the local nPartition and their status. The `rad` command is available with HP-UX B.11.11, and `olrad` is available with HP-UX B.11.23.

In the following example, both the `parstatus` and `rad` commands show details for various chassis and slots, including chassis 0/1/3.

```
# parstatus -I
[Chassis]
Hardware Location Usage Core Connected Par
IO To Num
=====
cab0,bay0,chassis0 absent - - -
cab0,bay0,chassis1 absent - - -
cab0,bay0,chassis2 absent - - -
cab0,bay0,chassis3 inactive yes cab0,cell4 -
cab0,bay1,chassis0 absent - - -
cab0,bay1,chassis1 absent - - -
cab0,bay1,chassis2 absent - - -
cab0,bay1,chassis3 active yes cab0,cell0 0
cab1,bay0,chassis0 absent - - -
cab1,bay0,chassis1 inactive - - -
cab1,bay0,chassis2 absent - - -
cab1,bay0,chassis3 absent - - -
cab1,bay1,chassis0 absent - - -
cab1,bay1,chassis1 absent - - -
cab1,bay1,chassis2 absent - - -
cab1,bay1,chassis3 active yes cab1,cell2 1
cab8,bay0,chassis1 inactive - - -
cab8,bay0,chassis3 active yes cab0,cell2 0
cab8,bay1,chassis1 inactive yes cab1,cell0 -
cab8,bay1,chassis3 inactive - - -
cab8,bay2,chassis1 absent - - -
cab8,bay2,chassis3 absent - - -
cab8,bay3,chassis1 absent - - -
cab8,bay3,chassis3 absent - - -

# rad -q
Slot Path Bus Speed Power Occupied Suspended Driver Capab
( ) e
0-1-3-0 0/0/0 0 33 On Yes No No
0-1-3-1 0/0/1/0 0 33 On Yes No No
0-1-3-2 0/0/2/0 16 33 On No N/A N/A
0-1-3-3 0/0/3/0 24 33 On No N/A N/A
0-1-3-4 0/0/4/0 32 33 On No N/A N/A
0-1-3-5 0/0/6/0 48 33 On Yes No Yes
0-1-3-6 0/0/14/0 112 33 On No N/A N/A
0-1-3-7 0/0/12/0 96 33 On No N/A N/A
0-1-3-8 0/0/11/0 88 33 On Yes No Yes
0-1-3-9 0/0/10/0 80 33 On No N/A N/A
0-1-3-10 0/0/9/0 72 33 On No N/A N/A
0-1-3-11 0/0/8/0 64 33 On No N/A N/A
0-0-3-0 2/0/0 0 33 On Yes No No
0-0-3-1 2/0/1/0 8 33 On No N/A N/A
0-0-3-2 2/0/2/0 16 33 On No N/A N/A
0-0-3-3 2/0/3/0 24 33 On No N/A N/A
0-0-3-4 2/0/4/0 32 33 On No N/A N/A
0-0-3-5 2/0/6/0 48 33 On No N/A N/A
0-0-3-6 2/0/14/0 112 33 On Yes No Yes
0-0-3-7 2/0/12/0 96 33 On No N/A N/A
0-0-3-8 2/0/11/0 88 33 On No N/A N/A
0-0-3-9 2/0/10/0 80 33 On No N/A N/A
0-0-3-10 2/0/9/0 72 33 On No N/A N/A
0-0-3-11 2/0/8/0 64 33 On No N/A N/A

#
```

Cabinet 0/Bay 1/Chassis 3
(0/1/3)

Specifying Remote Management Options to Commands

Two sets of remote management options are supported by the Enhanced *nPartition* Commands:

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an *nPartition* other than the local *nPartition* (but can also be used as a “loopback access” to the local *nPartition*).

NOTE When specifying the `-u...` `-h...` options, the host specified by `-h` must have the Enhanced *nPartition* Commands installed and have WBEM configured. Also, the `client.pem` file on the system from which the command is issued must have a copy of the SSL certificate entry (including the `BEGIN` and `END` lines) from specified host’s `server.pem` file.

See “Remote Management Using WBEM” on page 65 for details.

- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

NOTE When specifying the `-g...` `-h...` options, the host specified by `-h` must have IPMI LAN access enabled. Also, the user who issues the command must correctly specify the host’s IPMI password in order for the command to be able to successfully complete.

See “Remote Management Using IPMI over LAN” on page 68 for details.

The `-u` and `-g` options are mutually exclusive.

For more details about remote management, see “Remote and Local Management of *nPartitions*” on page 62.

parcreate Command

The `parcreate` command creates a new *nPartition*.

This command assigns the specified cells (and any attached I/O chassis) to an *nPartition*, assigns a number to the new *nPartition*, and returns the partition number of the newly created *nPartition*.

Root permission or IPMI LAN access is required to use `parcreate`.

NOTE On servers based on the HP *sx1000* chipset, when the *nPartition* Configuration Privilege is restricted the `parcreate` command cannot create a new *nPartition*. This restriction does not apply when using the `-g...` `-h...` options.

Refer to the *parcreate* (1M) manpage for complete details.

Synopsis

The `parcreate` command supports slightly different options for the HP-UX B.11.11 and other releases.

Original *nPartition* Commands

```
parcreate [-P PartitionName] [-I IPaddress]
-c cell:[type]:[use_on_next_boot]:[failure_usage] [-c...]
[-b path] [-t path] [-s path] [-r cell] [-r...] [-B]
```

Enhanced *nPartition* Commands

```
parcreate [-P PartitionName] [-I IPaddress] [-L clm_value]
-c cell:[type]:[use_on_next_boot]:[failure_usage][:clm]
[-c...] [-b path] [-t path] [-s path] [-r cell] [-r...]
[-B] [-u username:[passwd]
-h IPaddress|hostname | -g [passwd] -h IPaddress|hostname ]
```

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an *nPartition* other than the local *nPartition* (but can also be used as a “loopback access” to the local *nPartition*).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Appendix A nPartition Commands

parcreate Command

Options

-P *PartitionName*

Specifies the name of the new nPartition.

-I *IPaddress*

Specifies the IP address that can be used by management tools to address this nPartition. This value should be consistent with the IP address used for the nPartition when an operating system is booted.

-L *clm_value*

Specifies the amount of the memory that will be used as cell local memory per cell. The *clm_value* specified using the -c option takes precedence over the *clm_value* specified using the -L option. See the -c option for a description of the *clm_value* formats.

Original nPartition Commands:

-c *cell:[type]:[use_on_next_boot]:[failure_usage]*

Enhanced nPartition Commands:

-c *cell:[type]:[use_on_next_boot]:[failure_usage][:clm]* Specifies the cell(s) to be added to the nPartition.

- The only valid *type* value is:
 - base Base cell. (The default.)
- The valid *use_on_next_boot* values for cells are:
 - y Participate in reboot. (The default.)
 - n Do not participate in reboot.
- The only valid *failure_usage* value is:
 - ri Reactivate with memory interleave (the default). Specifies to integrate the cell into the nPartition as normally occurs.
- Enhanced nPartition Commands only.
 - The *clm* value specifies the amount of memory that will be configured as cell local memory for the cell.

The *clm* value specified using the -c option takes precedence over the *clm* value specified using the -L option.

You can specify the *clm* value in either of two forms: percentage or absolute amount of memory. The default is 0 (no cell local memory).

— Percentage cell-local memory (CLM).

The percent number can be any number in the range 0–100 with a suffix of %.

This number is rounded to 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5% or 100%. If the cell contains less than 4 GBytes of memory, then the percentage is rounded to 25%, 50%, 75% or 100%. Percentages are rounded up or down to the nearest value, but are not rounded up to 100%.

— Absolute CLM specification. (The default.)

The absolute number is interpreted as an absolute number of gigabytes of memory and can optionally have a suffix of GB.

As needed, an absolute CLM specification is rounded up to the nearest 0.5 GBytes.

If the *c1m* value is rounded, the command reports the final value used.

-b *path*

Specifies the primary boot path.

For HP 9000 servers, this is the PRI boot path.

For HP Integrity servers, only boot options for the local nPartition can be modified—therefore, boot paths for a newly created nPartition cannot be set using parcreate. Instead use the EFI system boot interface, available through the nPartition console.

-t *path*

Specifies the alternate boot path.

For HP 9000 servers, this is the ALT boot path.

For HP Integrity servers, only boot options for the local nPartition can be modified—therefore, boot paths for a newly created nPartition cannot be set using parcreate. Instead use the EFI system boot interface, available through the nPartition console.

-s *path*

Specifies the secondary boot path.

For HP 9000 servers, this is the HAA boot path.

For HP Integrity servers, only boot options for the local nPartition can be modified—therefore, boot paths for a newly created nPartition cannot be set using parcreate. Instead use the EFI system boot interface, available through the nPartition console.

-r *cell*

Specifies the core cell choices. One to four cells can be specified.

-B

Specifies to boot the nPartition. The default is not to boot the nPartition and leave it in the shutdown for reconfig state.

-u *username*: [*passwd*] Enhanced nPartition Commands only. Specifies the account and authorization to access an nPartition other than the local nPartition.

The **-h** option is required if this option is used.

- *username* specifies a configured user name on the target nPartition.
- *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.

-g [*passwd*]

Enhanced nPartition Commands only. Allows access to the complex specified by the **-h** option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.

The **-h** option is required if this option is used.

passwd specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.

-h *IPaddress*|*hostname* Enhanced nPartition Commands only. This option is only used in combination with either the **-u** or **-g** option. *IPaddress*|*hostname* specifies the IP address or hostname of the target nPartition (**-u**) or service processor (**-g**).

parmodify Command

You can use the `parmodify` command to modify the following attributes of an existing *nPartition*:

- Partition name
- Cell assignments (add cells or remove cells)
- Attributes of existing cells:
 - Cell type
 - Use-on-next-boot value
 - Failure usage
 - Enhanced *nPartition* Commands only:
 - Cell local memory (CLM) value
- Core cell choices
- Boot paths (the primary, alternate, and HA alternate paths)
- IP address (if set, this value should be consistent with the IP address assigned to the *nPartition* when HP-UX is booted)

Root permission or IPMI LAN access is required to use this command.

NOTE On servers based on the HP `sx1000` chipset, when the *nPartition* Configuration Privilege is restricted the `parmodify` command cannot add or remove cells from an *nPartition* and cannot modify the CLM value of any cell. These restrictions do not apply when using the `-g...` `-h...` options.

Refer to the *parmodify* (1M) manpage for complete details.

Synopsis

The `parmodify` command supports slightly different options for the Original nPartition Commands and Enhanced nPartition Commands.

Original nPartition Commands

```
parmodify -p PartitionNumber
-a cell:[type]:[use_on_next_boot]:[failure_usage] [-a...] |
-m cell:[type]:[use_on_next_boot]:[failure_usage] [-m...] |
-I IPaddress | -r cell [-r...] | -d cell [-d...] | -b path |
-t path | -s path | -P PartitionName | -B
```

Enhanced nPartition Commands

```
parmodify -p PartitionNumber
-a cell:[type]:[use_on_next_boot]:[failure_usage][:clm]
[-a...] |
-m cell:[type]:[use_on_next_boot]:[failure_usage][:clm]
[-m...] |
-I IPaddress | -r cell [-r...] | -d cell [-d...] |
-b path | -t path | -s path | -P PartitionName | -B |
[-u username: [passwd] -h IPaddress|hostname |
-g [passwd] -h IPaddress|hostname ]
```

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an nPartition other than the local nPartition (but can also be used as a “loopback access” to the local nPartition).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

The `-p` option is required.

Options

The `parmodify` command supports the following command-line options.

```
-p PartitionNumber
    Specifies the nPartition to be modified. PartitionNumber specifies the unique number (integer) assigned to the nPartition.
```

The `-p` option is required.

Note that you must also specify any one or more of the following options.

Original nPartition Commands

```
-a cell:[type]:[use_on_next_boot]:[failure_usage]
```

Enhanced nPartition Commands

```
-a cell:[type]:[use_on_next_boot]:[failure_usage][:clm]
    Specifies the cell(s) to be added to the nPartition.
```

- The only valid *type* value is:
 - base Base cell. (The default.)
- The valid *use_on_next_boot* values for cells are:

Appendix A nPartition Commands

parmodify Command

- | | |
|---|---------------------------------------|
| y | Participate in reboot. (The default.) |
| n | Do not participate in reboot. |
- The only valid *failure_usage* value is:

ri	Reactivate with memory interleave (the default). Specifies to integrate the cell into the nPartition as normally occurs.
----	--
 - Enhanced nPartition Commands only.
The *clm* value specifies the amount of memory that will be configured as cell local memory for the cell.

You can specify the *clm* value in either of two forms: percentage or absolute amount of memory. The default is 0 (no cell local memory).
 - Percentage cell-local memory (CLM).
The percent number can be any number in the range 0–100 with a suffix of %.
This number is rounded to 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5% or 100%. If the cell contains less than 4 GBytes of memory, then the percentage is rounded to 25%, 50%, 75% or 100%. Percentages are rounded up or down to the nearest value, but are not rounded up to 100%.
 - Absolute CLM specification. (The default.)
The absolute number is interpreted as an absolute number of gigabytes of memory and can optionally have a suffix of GB.
As needed, an absolute CLM specification is rounded up to the nearest 0.5 GBytes.
If the *clm* value is rounded, the command reports the final value used.

Original nPartition Commands

`-m cell:[type]:[use_on_next_boot]:[failure_usage]`

Enhanced nPartition Commands

`-m cell:[type]:[use_on_next_boot]:[failure_usage][:clm]`

Modifies attributes of a cell already assigned to the nPartition.

See the `-a` option descriptions for details on the *type*, *use_on_next_boot*, *failure_usage*, and *clm* cell attributes.

`-I IPaddress`

Specifies the IP address that can be used by management tools to address this nPartition. This value should be consistent with the IP address used by the nPartition when an operating system is booted.

`-r cell`

Specifies the core cell choices. One to four core cell choices can be specified.

`-d cell`

Remove the specified cell from the nPartition.

`-b path`

Specifies the primary boot path.

For HP 9000 servers, this is the PRI boot path.

For HP Integrity servers `-b` sets the first item in the boot options list displayed by the EFI

Boot Manager, and only boot options for the local *nPartition* can be modified.

-t *path*

Specifies the alternate boot path.

For HP 9000 servers, this is the ALT boot path.

For HP Integrity servers **-t** sets the third item in the boot options list displayed by the EFI Boot Manager, and only boot options for the local *nPartition* can be modified.

-s *path*

Specifies the secondary boot path.

For HP 9000 servers, this is the HAA boot path.

For HP Integrity servers **-s** sets the second item in the boot options list displayed by the EFI Boot Manager, and only boot options for the local *nPartition* can be modified.

-P *PartitionName*

Specifies the name of the *nPartition*.

-B

Specifies whether to boot the *nPartition*. The default is not to boot.

When you modify an inactive *nPartition* and specify the **-B** option, the *nPartition* is booted (and becomes active) immediately after it is modified.

When you modify an active *nPartition* and specify the **-B** option, you must perform a reboot for reconfig of the modified *nPartition*. You must perform this reboot for reconfig before any other cell assignments can take place in the server complex.

-u *username*: [*passwd*] Enhanced *nPartition* Commands only. Specifies the account and authorization to access an *nPartition* other than the local *nPartition*.

The **-h** option is required if this option is used.

- *username* specifies a configured user name on the target *nPartition*.
- *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.

-g [*passwd*]

Enhanced *nPartition* Commands only. Allows access to the complex specified by the **-h** option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.

The **-h** option is required if this option is used.

passwd specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.

-h *IPaddress*|*hostname* Enhanced *nPartition* Commands only. This option is only used in combination with either the **-u** or **-g** option. *IPaddress*|*hostname* specifies the IP address or hostname of the target *nPartition* (**-u**) or service processor (**-g**).

parremove Command

The `parremove` command removes an existing *nPartition*. This removes all cells from the *nPartition* and destroys the *nPartition* definition. Root permission or IPMI LAN access is required to run this command.

- To remove the local *nPartition*, you must specify the `-F` option.
For the Original *nPartition* Commands, the local *nPartition* is the one from which you issue the `parremove` command.
For the Enhanced *nPartition* Commands, the local *nPartition* either is the one where the command is issued, or if the `-u...` `-h...` options are specified it is the *nPartition* whose host is specified by `-h`.
- To remove a remote *nPartition* using the Original *nPartition* Commands, the remote *nPartition* must be inactive: it must be shutdown for reconfig or the `parremove` command will not be able to remove the *nPartition*.
When using the Enhanced *nPartition* Commands, `parremove` can remove an active, remote *nPartition* when both the `-F` option and the `-g...` `-h...` set of options are specified.

NOTE On servers based on the HP *sx1000* chipset, when the *nPartition* Configuration Privilege is restricted the `parremove` command cannot remove an *nPartition* unless the command is issued with the `-g...` `-h...` options.

Refer to the *parremove* (1M) manpage for complete details.

Synopsis

```
parremove -p PartitionNumber [-F]
```

Enhanced *nPartition* Commands Notes

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an *nPartition* other than the local *nPartition* (but can also be used as a “loopback access” to the local *nPartition*).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Options

- `-p PartitionNumber` Specifies the *nPartition* number to be removed.
- `-F` Forcibly remove the *nPartition*. If the *nPartition* is inactive, the *nPartition* is removed. If the *nPartition* is active and if it is the local *nPartition*, the *nPartition* is removed. If the *nPartition* is active but is not the local *nPartition*, then the *nPartition* will not be removed.
- `-u username:[passwd]` Enhanced *nPartition* Commands only. Specifies the account and authorization to access an *nPartition* other than the local *nPartition*. The `-h` option is required if this option is used.
- `username` specifies a configured user name on the target *nPartition*.
 - `passwd` specifies the password associated with the `username`. If this field is empty, the command prompts for the password.
- `-g [passwd]` Enhanced *nPartition* Commands only. Allows access to the complex specified by the `-h` option. The accessed complex is then considered the target complex. Access is through the service processor LAN port. The `-h` option is required if this option is used. `passwd` specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.
- `-h IPaddress|hostname` Enhanced *nPartition* Commands only. This option is only used in combination with either the `-u` or `-g` option. `IPaddress|hostname` specifies the IP address or hostname of the target *nPartition* (`-u`) or service processor (`-g`).

parstatus Command

The `parstatus` command displays information about the nPartitions or hardware within a server complex. If you specify no arguments, `parstatus` lists information about several of the major components of the server complex.

You can specify an individual entity (cell, I/O chassis, cabinet, or nPartition) to restrict the output to information about that component.

All users can issue this command.

Refer to the *parstatus* (1) manpage for complete details.

Synopsis

```
parstatus -s
parstatus -w
parstatus [-X]
parstatus [-A] [-M] -C|-I
parstatus [-M] -B|-P
parstatus [-M] -i IOchassis [-i...]
parstatus [-V|-M] -c cell [-c...]
parstatus [-V|-M] -b cabinet [-b...]
parstatus [-V|-M] -p PartitionNumber [-p...]
```

Enhanced nPartition Commands Notes

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an nPartition other than the local nPartition (but can also be used as a “loopback access” to the local nPartition).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Options

<code>-s</code>	Indicate (through <code>parstatus</code> exit status) whether the system is an HP server that supports nPartitions. Not supported with the <code>-g...</code> <code>-h...</code> options.
<code>-w</code>	Display the nPartition number for the local nPartition. Not supported with the <code>-g...</code> <code>-h...</code> options.
<code>-X</code>	Display the server complex attributes.
<code>-A</code>	Only display the available resources in the complex.
<code>-V</code>	Increase the amount of information displayed. For Enhanced nPartition Commands, this option includes interleaved and cell local memory

- settings when cell (*-c cell*) or nPartition (*-p partition*) details are displayed.
- M* Produce output suitable for machine parsing.
 - C* Show information for all the cells in the complex.
 - I* Show information for all I/O chassis in the complex.
 - B* Show information for all cabinets in the complex.
 - P* Show information for all nPartitions in the complex.
 - c cell*
Show information about the specified cell.
 - i IOchassis*
Show information about the specified I/O chassis.
 - b cabinet*
Show information about the specified cabinet.
 - p partition*
Show information about the specified nPartition.
 - u username:[passwd]* Enhanced nPartition Commands only. Specifies the account and authorization to access an nPartition other than the local nPartition.
The *-h* option is required if this option is used.
 - *username* specifies a configured user name on the target nPartition.
 - *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.
 - g [passwd]* Enhanced nPartition Commands only. Allows access to the complex specified by the *-h* option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.
The *-h* option is required if this option is used.
passwd specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.
 - h IPaddress|hostname* Enhanced nPartition Commands only. This option is only used in combination with either the *-u* or *-g* option. *IPaddress|hostname* specifies the IP address or hostname of the target nPartition (*-u*) or service processor (*-g*).

parunlock Command

The `parunlock` command unlocks the Stable Complex Configuration Data or Partition Configuration Data.

The Enhanced *nPartition Commands* version of `parunlock` also can unlock Dynamic Complex Configuration Data and cell data and can cancel pending changes to the Stable Complex Configuration Data.

Use this command with caution.

Root permission is required to run this command.

NOTE

On servers based on the HP *sx1000* chipset, when the *nPartition Configuration Privilege* is restricted the `parunlock` command

- cannot unlock the Partition Configuration Data of non-local *nPartitions*,
- cannot unlock the Dynamic Complex Configuration Data or Stable Complex Configuration Data for the local complex,
- cannot cancel pending changes to the Stable Complex Configuration Data, and
- cannot unlock the cell data of cells not assigned to the local *nPartition*.

These restrictions do not apply when using the `-g . . . -h . . .` options.

Refer to the *parunlock* (1M) manpage for details.

Synopsis

```
parunlock [-p PartitionNumber] [-s]
```

```
parunlock -A
```

Enhanced *nPartition* Commands only:

```
parunlock [-b] [-c cell] [-P]
```

Enhanced *nPartition* Commands Notes

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an *nPartition* other than the local *nPartition* (but can also be used as a “loopback access” to the local *nPartition*).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Options

```
-p PartitionNumber
```

Unlock the Partition Configuration Data of the specified *nPartition*.

```
-s
```

Unlocks the Stable Complex Configuration Data of the target complex.

```
-b
```

Enhanced *nPartition* Commands only. Unlocks the Dynamic Complex Configuration Data of the target complex.

```
-c cell
```

Enhanced *nPartition* Commands only. Unlocks the cell data of the specified *cell*.

```
-P
```

Enhanced *nPartition* Commands only. Cancels any pending changes to the Stable Complex Configuration Data of the target complex.

```
-A
```

This option differs slightly for the Original *nPartition* Commands and Enhanced *nPartition* Commands releases.

- For the Original *nPartition* Commands release, `-A` unlocks the Stable Complex Configuration Data and the Partition Configuration Data of all the *nPartitions* in the complex.
- For the Enhanced *nPartition* Commands release, `-A` unlocks the Complex Configuration Data, the Dynamic Complex Configuration Data, and the Partition Configuration Data of all the *nPartitions* in the target complex.

```
-u username: [passwd]
```

Enhanced *nPartition* Commands only. Specifies the account and authorization to access an *nPartition* other than the local *nPartition*.

The `-h` option is required if this option is used.

- *username* specifies a configured user name on the target *nPartition*.
- *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.

```
-g [passwd]
```

Enhanced *nPartition* Commands only. Allows access to the complex specified by the `-h` option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.

The `-h` option is required if this option is used.

Appendix A nPartition Commands

parunlock Command

passwd specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.

-h *IPaddress|hostname* Enhanced nPartition Commands only. This option is only used in combination with either the **-u** or **-g** option. *IPaddress|hostname* specifies the IP address or hostname of the target nPartition (**-u**) or service processor (**-g**).

fruled Command

The `fruled` command blinks hardware attention indicators (LEDs) or turns them off.

This command can control the cell attention LEDs in all cell-based servers, as well as the I/O chassis LEDs on Superdome servers. The `fruled` command also can start and stop blinking the cabinet number LCDs on HP Superdome compute cabinets and I/O expansion cabinets.

Refer to the `fruled` (1) manpage for details.

Synopsis

```
fruled [-f|-o] [-B] -c cell [-c...]
fruled [-f|-o] [-B] -i IOchassis [-i...]
fruled [-f|-o] -b cabinet [-b...]
fruled [-f] -C [-l cabinet] [-l...]
fruled [-f] -I [-l cabinet] [-l...]
```

Enhanced nPartition Commands Notes

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an nPartition other than the local nPartition (but can also be used as a “loopback access” to the local nPartition).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Options

`-f` Turn off specified attention LED(s). This is the default.
The `-f` and `-o` options are mutually exclusive.

`-o` Start blinking the specified attention LED(s). The `-o` option is unavailable with `-C` or `-I`.

`-B` Start or stop blinking the cabinet number LCD of the cabinet that contains the cell or I/O chassis.
The `-B` option is only available with `-c` and `-i`.

`-c cell`
Blink or turn off the specified *cell* attention LED.
cell can be specified either in the local (*cabinet/slot*) or global (*cell_ID*) format.

`-i IOchassis`
Blink or turn off the specified *IOchassis* attention LED.

`-b cabinet`
Start or stop blinking the cabinet number LCD of the specified *cabinet*.

Appendix A nPartition Commands

fruled Command

- C Turn off all cell attention LEDs.
- l *cabinet* Limit the scope of the -C or -I option to a given *cabinet*.
- u *username*: [*passwd*] Enhanced nPartition Commands only. Specifies the account and authorization to access an nPartition other than the local nPartition.
- The -h option is required if this option is used.
- *username* specifies a configured user name on the target nPartition.
 - *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.
- g [*passwd*] Enhanced nPartition Commands only. Allows access to the complex specified by the -h option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.
- The -h option is required if this option is used.
- passwd* specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.
- h *IPaddress*|*hostname* Enhanced nPartition Commands only. This option is only used in combination with either the -u or -g option. *IPaddress*|*hostname* specifies the IP address or hostname of the target nPartition (-u) or service processor (-g).

frupower Command

The `frupower` command turns on, turns off, or displays the current status of power for cells and I/O chassis in cell-based servers.

Root permission is required to run this command.

- By default, the `frupower` command permits you to power on or off inactive cells and I/O chassis that either are assigned to the target nPartition or are not assigned to any nPartition.
- I/O chassis power is turned on or off when the cell to which it is connected is powered on or off. However, you also can control I/O chassis power separately from cell power in certain situations.
 - You can turn on I/O chassis power when a powered-off I/O chassis is attached to an active cell assigned to the target nPartition. The nPartition must be rebooted for the power on to become effective.
 - You can turn off I/O chassis power when the I/O chassis is not assigned to an nPartition and (on HP Integrity Superdome servers) when nPartition Configuration Privilege is unrestricted.
- When using the Original nPartition Commands, the target and local nPartition are the same.

When using the Enhanced nPartition Commands, the target nPartition may be different from the local nPartition when the `-u...` `-h...` options are specified.

CAUTION When using the Enhanced nPartition Commands, the `frupower -g... -h...` command and options allow all power operations on all cells and I/O chassis in the target complex, even if this results in turning power off for a component of an active nPartition.

NOTE On servers based on the HP sx1000 chipset, you cannot turn cell or I/O chassis power on or off for free cells or I/O chassis when nPartition Configuration Privilege is restricted and when not using the `-g...` `-h...` options.

The nPartition Configuration Privilege setting does not affect the ability to control power using the `frupower -g... -h...` command and option.

Command syntax and options for `frupower` follow. Refer to the *frupower* (1M) manpage for details.

Syntax

```
frupower [ -d | -o | -f ] -c cell [-c...]
frupower [ -d | -o | -f ] -i IOchassis [-i...]
frupower [-d] -C [-l cabinet] [-l...]
frupower [-d] -I [-l cabinet] [-l...]
```

Enhanced nPartition Commands Notes

- The `-u...` `-h...` set of options may be specified to cause the command to send its management request using WBEM to an nPartition other than the local nPartition (but can also be used as a “loopback access” to the local nPartition).
- The `-g...` `-h...` options may be specified to cause the command to send its management request using

Appendix A nPartition Commands

frupower Command

IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Options

- `-d` Display power status of the specified cells or I/O chassis. This is the default.
- `-o` Power on the specified cells or I/O chassis.
The `-o` and `-f` options are mutually exclusive. The `-o` and `-f` options are unavailable with `-C` and `-I`.
- `-f` Power off the specified cells or I/O chassis.
- `-c cell`
The specified *cell* is powered on/off or the power status is displayed.
A *cell* can be specified either in the local (*cabinet/slot*) or global (*cell_ID*) format.
- `-i IOchassis`
The specified *IOchassis* is powered on/off or the power status is displayed.
- `-C` Display power status of all cells. By default the scope is the entire complex if the `-l` option is not specified.
- `-I` Display power status of all I/O chassis. The scope is the entire complex if the `-l` option is not specified.
- `-l cabinet`
Limit the scope of the `-C` or `-I` option to the specified *cabinet*.
- `-u username:[passwd]` Enhanced nPartition Commands only. Specifies the account and authorization to access an nPartition other than the local nPartition.
The `-h` option is required if this option is used.
 - *username* specifies a configured user name on the target nPartition.
 - *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.
- `-g [passwd]` Enhanced nPartition Commands only. Allows access to the complex specified by the `-h` option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.
The `-h` option is required if this option is used.
passwd specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.
- `-h IPaddress|hostname` Enhanced nPartition Commands only. This option is only used in combination with either the `-u` or `-g` option. *IPaddress|hostname* specifies the IP address or hostname of the target nPartition (`-u`) or service processor (`-g`).

cplxmodify Command

The `cplxmodify` command modifies attributes of a cell-based server complex, such as the complex name.

NOTE The `cplxmodify` command is only supported by the Enhanced nPartition Commands.

Root permission is required to run this command.

Refer to the `cplxmodify` (1M) manpage for details.

Synopsis

```
cplxmodify -N ComplexName [-u username:[passwd] -h IPaddress|hostname | -g [passwd] -h
IPaddress|hostname ]
```

- The `-u... -h...` set of options may be specified to cause the command to send its management request using WBEM to an nPartition other than the local nPartition (but can also be used as a “loopback access” to the local nPartition).
- The `-g... -h...` options may be specified to cause the command to send its management request using IPMI over LAN to a service processor in another server complex (but can also be used as a “loopback access” to the service processor in the local complex).

The `-u` and `-g` options are mutually exclusive.

Options

`-N ComplexName` Changes the name of the target complex to *ComplexName*.

`-u username:[passwd]` Specifies the account and authorization to access an nPartition other than the local nPartition.

The `-h` option is required if this option is used.

- *username* specifies a configured user name on the target nPartition.
- *passwd* specifies the password associated with the *username*. If this field is empty, the command prompts for the password.

`-g [passwd]` Allows access to the complex specified by the `-h` option. The accessed complex is then considered the target complex. Access is through the service processor LAN port.

The `-h` option is required if this option is used.

passwd specifies the IPMI password of the service processor. If this field is omitted, the command prompts for the password.

`-h IPaddress|hostname` This option is only used in combination with either the `-u` or `-g` option. *IPaddress*|*hostname* specifies the IP address or hostname of the target nPartition (`-u`) or service processor (`-g`).

Appendix A *nPartition* Commands

`cplxmodify` Command

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