



HP Integrity Server nPartition Administration



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Topics covered

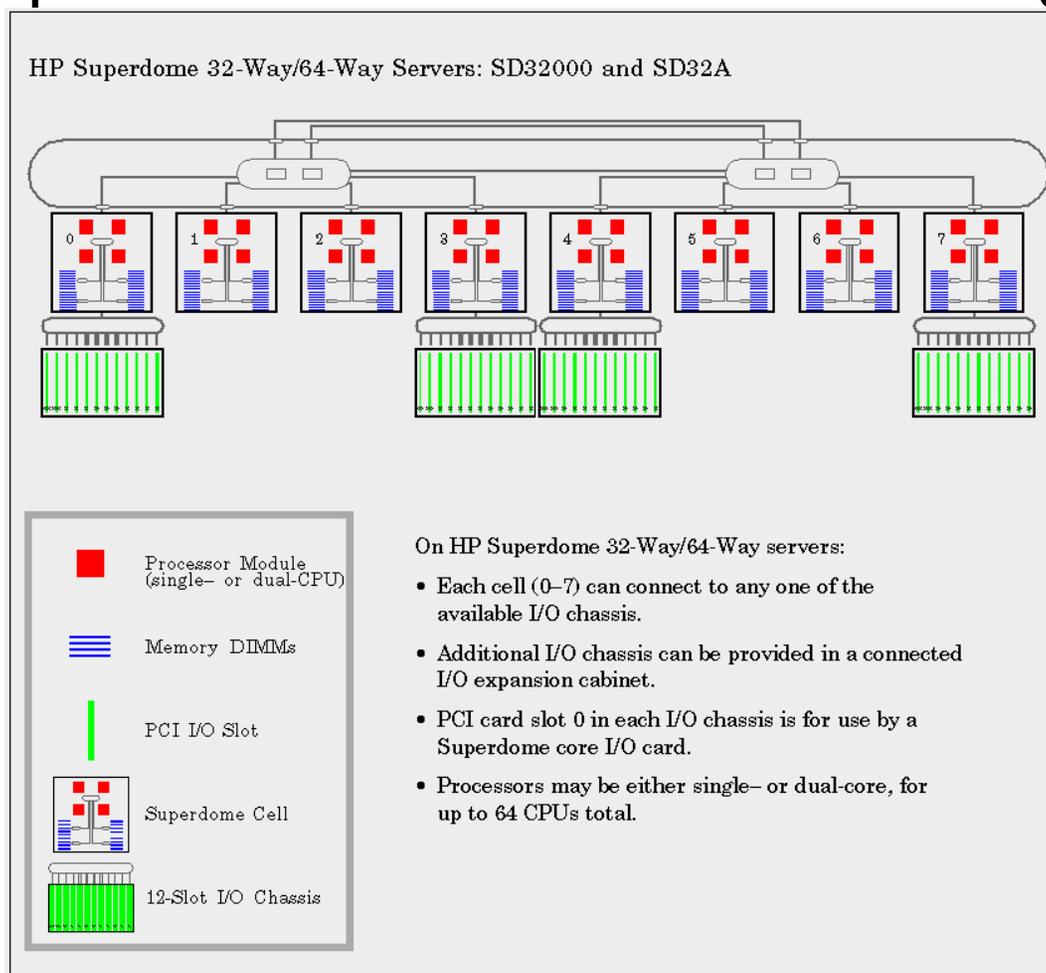
- This session will cover the following nPartition administration topics:
 - **nPartition overview**, servers, OSes, supported configurations, requirements, recommendations
 - **Tools, local/remote management**, Complex Profiles, access restriction, commands, Partition Manager
 - **Configuring nPartitions**, properties, cell local memory
 - **OS boot**, shutdown, options, autoboot
 - Listing status, EFI Shell commands, MP commands
 - Related information
- For details, refer to the *HP System Partitions Guide* at <http://www.docs.hp.com/>

nPartition overview

- nPartition -- A subset of server (**complex**) hardware that is used as an independent system environment
 - Includes: one or more **cells** (containing processors and memory) and **I/O chassis** connected to those cells
 - All hardware in an nPartition is used exclusively by software running in the nPartition
 - An nPartition has its own system boot interface and boots and reboots independently
- Hardware and software isolation
 - Faults in one nPartition do not affect other nPartitions
- Reconfigurable using software
 - Configure nPartitions using HP nPartition management tools

Server hardware overview

- HP Superdome SD32A server with eight cells



nPartition-capable hp Integrity servers



- hp Integrity servers have Intel® Itanium® 2 processors
 - HP mx2 dual-processor modules and single Itanium 2 processors can co-exist in the same complex, but not in the same nPartition
- hp Integrity servers include the following nPartition-capable models:
 - hp Integrity rx7620: 2 cells (8 processor sockets)
 - hp Integrity rx8620: up to 4 cells (16 sockets)
 - hp Integrity Superdome: up to 16 cells (64 sockets)
- Operating systems supported:
 - HP-UX 11i Version 2 (B.11.23)
 - Microsoft® Windows® Server 2003
 - Red Hat Enterprise Linux 3 Update 2



Supported nPartition configurations

- HP-UX 11i Version 2 (B.11.23)
 - March 2004 and earlier: up to 64 processors
 - September 2004 and later: up to 128 processors
 - HP-UX B.11.23 supports cell local memory
- Microsoft® Windows® Server 2003
 - Up to 64 processors
 - Windows Server 2003 supports cell local memory
- Red Hat Enterprise Linux 3 Update 2
 - Up to eight processors; requires single Itanium 2 processors, and does not support HP mx2 dual-processor modules
 - Maximum of two cells in an nPartition; one PCI-X I/O chassis
 - Maximum of 96 GBytes memory
 - Does not support cell local memory



HP Integrity nPartition requirements

- On HP Integrity servers, all cells in an nPartition must have:
 - The same firmware revision
 - Either mx2 dual-processor modules or single Itanium 2 processors
 - The same compatibility value
 - The cell compatibility value is reported by the parstatus -V -c# command as "CPU Compatibility" for the cell.
 - Partition Manager for HP-UX B.11.23 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
- At least one cell in every nPartition must be connected to an I/O chassis that has core I/O

Recommended cell assignments

- HP recommends and supports nPartition configurations that are tested and that provide good performance

		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

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



Online information and tools

- Technical documentation
 - <http://docs.hp.com>
 - Hardware, HP-UX, Linux, Windows, and other documentation
- HP Linux Enablement Kit CD
 - <http://software.hp.com>
 - Select Linux for the CD (ISO image) with tools for storage controller configuration, disk partitioning, and Linux installation
- Server Support and Software
 - <http://www.hp.com/support/itaniumservers>
 - Technical support resources, including documentation and software
 - **For Windows (32-bit) version of nPartition commands:**
 1. Select rx7620, rx8620, or Integrity Superdome
 2. Select download drivers and software
 3. Select Microsoft Windows Server 2003 64-bit
 4. See the Utility Tools heading for:
 - Partition Command Line Interface (ParCLI)
 - Graphics interface for the partition management command line utilities



Administration tools for nPartitions

- Management processor (MP)
 - Complex-wide service interface
 - Access to all hardware and nPartitions in the complex
 - Command menu, nPartition consoles, nPartition Virtual Front Panels, nPartition Console Logs, and Event Log
- EFI Boot Manager and EFI Shell commands
 - System boot interface for an HP Integrity nPartition
 - Accessible from the nPartition console when nPartition has not booted an OS
- nPartition Commands
 - For HP-UX and Windows: parstatus, parcreate, parmodify, others
- Partition Manager (/opt/parmgr/bin/parmgr)
 - Only HP-UX B.11.23 systems; provides a Web-based interface

Complex Profile overview

- Configurable aspects of a complex are represented in a set of data called the Complex Profile
- The Complex Profile consists of three parts:
 - Stable Complex Configuration Data
 - Complex-wide settings, including the complex name, serial number, the nPartition assignment for each cell, cell local memory values
 - Dynamic Complex Configuration Data
 - Architecturally reserved data
 - Partition Configuration Data
 - Individual nPartition settings, including the nPartition name, core cell choices, and other nPartition-specific details

Complex Profile changes

- The MP manages all Complex Profile data
 - It keeps all copies of the data coherent using a locking mechanism
 - The master copy of all parts of the Complex Profile resides on the MP
 - Each cell in the complex 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 MP does not “push out” a Complex Profile change that affects the assignment of an active cell
 - Instead, it waits for the cell to be inactive, as occurs during a reboot for reconfig or shutdown for reconfig

Types of reboot and reset

- Two special types of reboot and reset for managing nPartitions:
 - Performing a **reboot for reconfig**
 - Shuts down the OS, resets all assigned cells, performs any reconfigurations, cells rendezvous, and boots the nPartition back to EFI
 - HP-UX **shutdown -R** command, Windows **shutdown /r** command, or the Linux **shutdown -r time** command
 - Performing a **shutdown for reconfig**
 - Makes the nPartition and all of its cells inactive
 - Shuts down the OS (**shutdown** command), resets all assigned cells, performs reconfigurations, and keeps all cells at boot-is-blocked (BIB)
 - HP-UX **shutdown -R -H** command, Windows **shutdown /s** command, or the Linux **shutdown -h time** command
 - On HP rx8620 and rx7620 servers you can configure OS shutdown for reconfig to either power off hardware or keep cells at BIB
 - EFI Shell **reconfigreset** command, MP Command menu **RR**

nPartition management methods

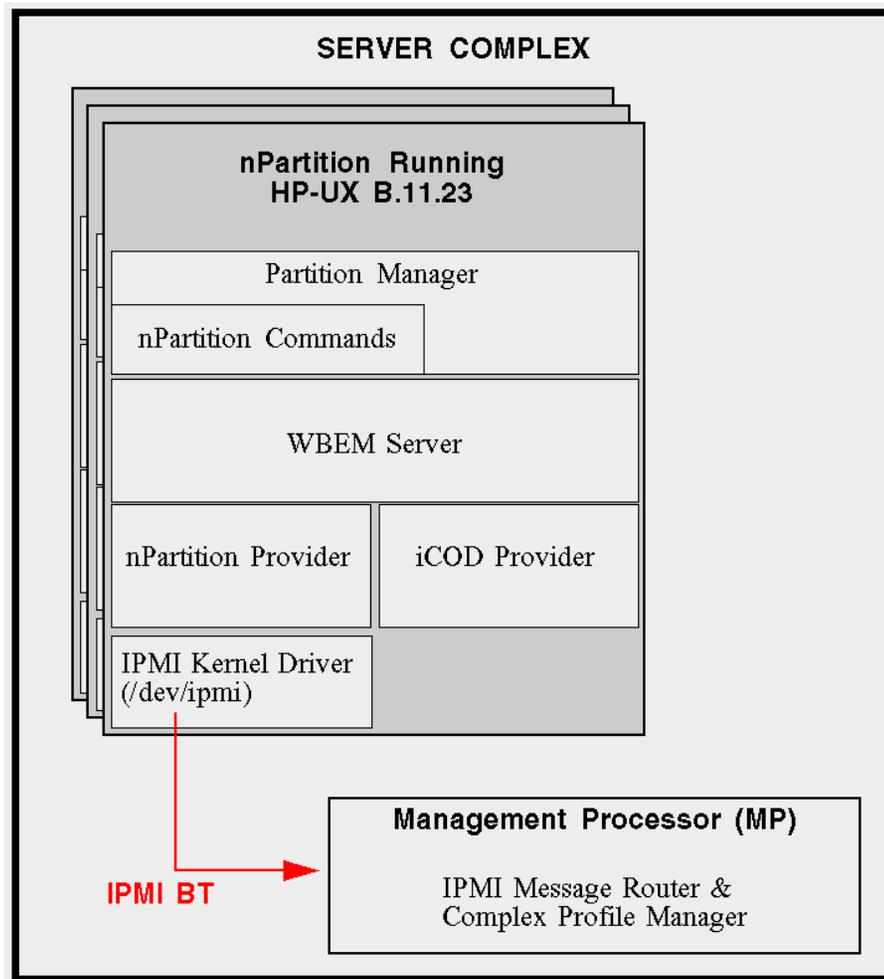
- You can perform most nPartition management with the nPartition commands and Partition Manager
- **Local management** involves using HP-UX B.11.23 commands or Partition Manager on an nPartition
 - Requires HP-UX B.11.23 be booted and WBEM configured
- **Remote management** involves using either WBEM or the MP IPMI LAN interface
 - Remote administration using IPMI over LAN
 - Commands or Partition Manager interact with the MP
 - IPMI LAN must be enabled; must specify IPMI password
 - Remote administration using WBEM
 - Commands or Partition Manager interact with WBEM
 - WBEM must be running on an nPartition (HP-UX B.11.23)
 - Must specify a user (privileged/superuser) and password

Choosing a management method

- MP always available
- EFI available via nPartition console before OS booted on the nPartition
- If no OS is running on an nPartition
 - Must use remote management via IPMI LAN
- If Windows or Linux is running on an nPartition
 - Must use remote management via IPMI LAN
- If HP-UX B.11.23 is running on an nPartition
 - Can use commands running on the nPartition
 - Can use Partition Manager running on the nPartition
 - Can use remote management via WBEM
 - Can use remote management via IPMI LAN

Local management of nPartitions

- Command or parmgr → WBEM → /dev/ipmi → BT (MP)



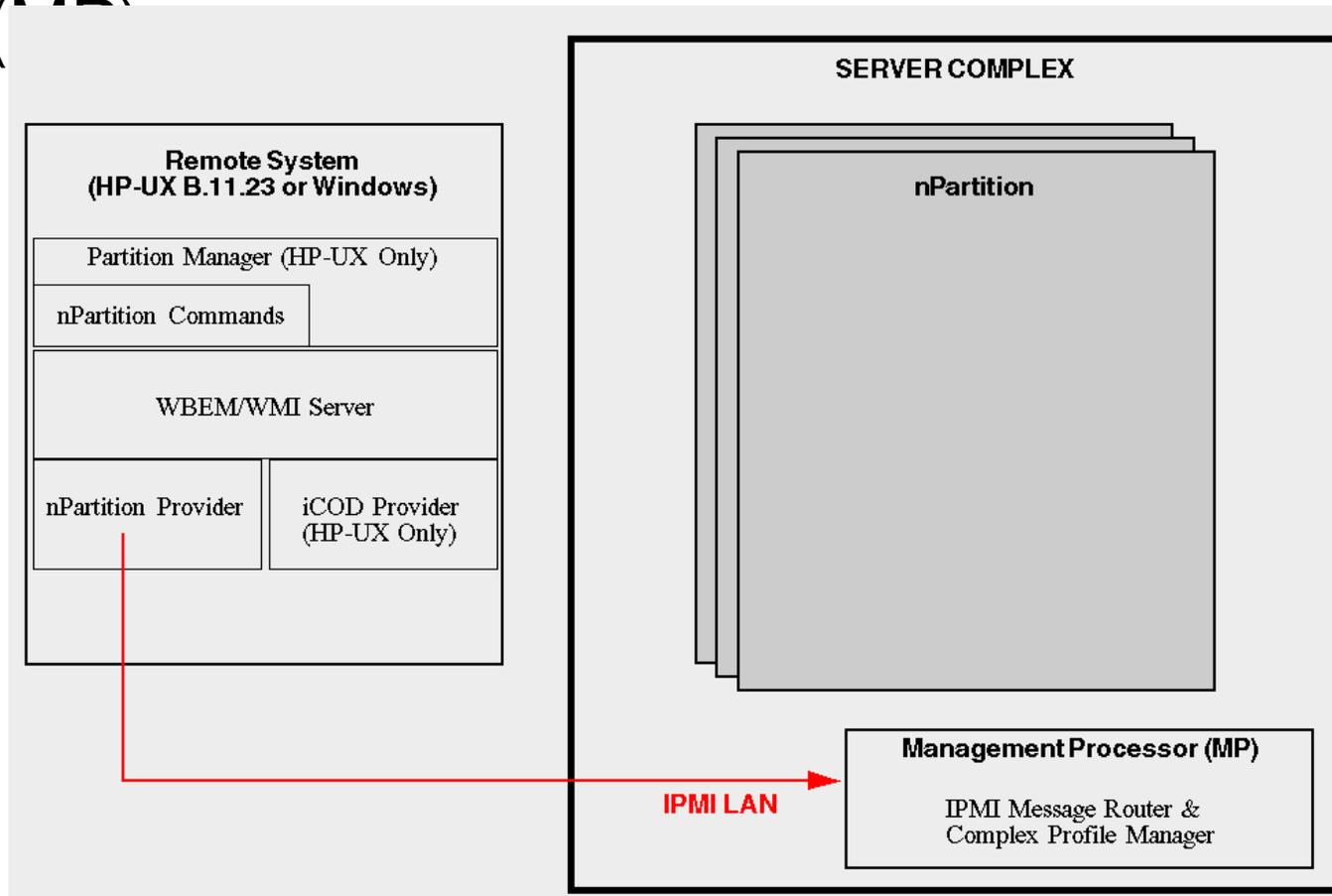
Remote management via IPMI LAN

- Intelligent Platform Management Interface (IPMI) is an industry-standard interface for managing hardware
 - Supports value-added capabilities, such as HP nPartition and complex management
 - Supported by the MP
- MP configuration affects IPMI LAN management
 - MP customer LAN IP address, subnet mask, gateway
 - **LC** command configures MP customer LAN settings
 - IPMI password
 - **SO** command sets the IPMI password for the MP
 - IPMI LAN enabled/disabled
 - **SA** command enables/disables MP's IPMI LAN access

Remote management: IPMI over LAN



- Command or parmgr → WBEM → IPMI LAN

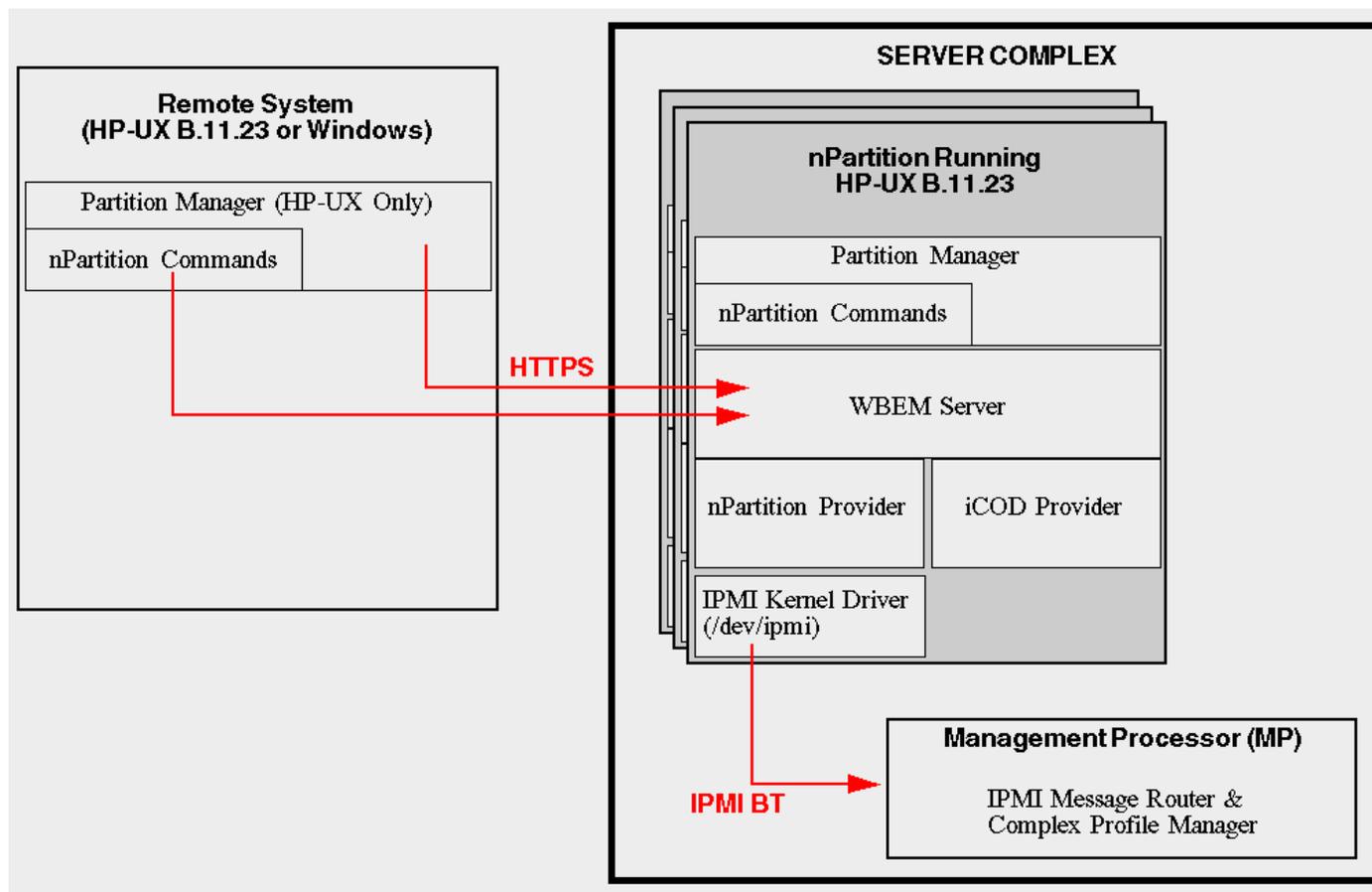


Remote management via WBEM

- Web-Based Enterprise Management (WBEM) acts as an information broker
 - A **provider** offers access to a resource
 - **Clients** send requests to WBEM to get information about and access to the resource
 - Data is sent using the Common Information Model (CIM) data model standard
- WBEM configuration affects local and remote management
 - HP-UX B.11.23 versions of Partition Manager and the nPartition commands are WBEM client applications
 - HP-UX B.11.23 nPartition Provider is a WBEM agent
- Windows provides WMI
 - WBEM-to-WMI mapper and WMI nPartition Provider supported

Remote management: WBEM

- Command or parmgr → HTTPS → WBEM → /dev/ipmi → BT (MP)



Configuring WBEM

- WBEM systems provide secure remote management using these files as part of the SSL authentication process
 - **server.pem** -- WBEM SSL Certificate file, on the system that is being managed and contains the local server's PRIVATE KEY and CERTIFICATE data
 - HP-UX path: /var/opt/wbem/server.pem
 - Windows path: the %PEGASUS_HOME%\cimserver_current.conf file; the sslCertificateFilePath entry specifies the SSL Certificate file location
 - **client.pem** -- WBEM Trust Certificate Store file, on the system from which WBEM remote management commands are issued
 - HP-UX path: /var/opt/wbem/client.pem
 - Windows path: the %HP_SSL_SHARE%\client.pem file
- To remotely manage a server using WBEM:
 - The Trust Certificate Store file (client.pem) 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

Managing WBEM components

- HP-UX B.11.23 WBEM (Pegasus CIM server)
 - `cimprovider -l -s` to list WBEM module status;
`cimprovider -d -m module` to disable a module, and
`cimprovider -e -m module` to enable a module
 - `cimserver -s` to stop the WBEM server, and
`cimserver` to start
 - `cimconfig -l -c` to list the current WBEM configuration,
or `cimconfig -l -p` to list the pending configuration
 - `enableRemotePrivilegedUserAccess=True` — Enables remote management of the local nPartition
 - `enableHttpsConnection=True` — Allows HTTPS/SSL access; also
`enableHttpConnection=False` to prevent insecure access
 - To change settings use `cimconfig -s... -p` and then stop and restart WBEM
- For Windows WMI/WBEM details, refer to the Windows documentation Web site

nPartition Configuration Privilege

- The MP Command menu **PARPERM** command configures the **nPartition Configuration Privilege** for a complex
- In effect, a restricted nPartition Configuration Privilege limits local and remote WBEM administration abilities
- The nPartition Configuration Privilege has two settings:
 - **Unrestricted** -- The default setting, which gives the IPMI BT interface the same capabilities as the IPMI LAN interface
 - **Restricted** -- Restricts use of the IPMI BT interface to these capabilities:
 - Retrieving information about the server: everything normally displayed by Partition Manager and the parstatus command is still available
 - Making changes to the local nPartition's Partition Configuration Data
 - Manipulating any of the attention indicators (LEDs)
 - Powering on/off cells and I/O chassis that belong to the local nPartition
- This privilege does not affect the nPartition management tools use of IPMI over LAN

nPartition commands

- **parcreate** to create a new nPartition
- **parmodify** to modify an existing nPartition
- **parremove** to remove an existing nPartition
- **parstatus** to display nPartition information and hardware details for a server complex
- **parunlock** to unlock Complex Profile data
- **fruled** to blink attention indicators (LEDs) or turn them off
- **frupower** to display status or turn power on or off for cells and I/O chassis
- **cplxmodify** to change the name of a complex
- Remote via WBEM: use the **-u -h** set of options
 - u **username:[password]** specifies a valid username on the remote nPartition and optionally specifies the password
 - h specifies either the hostname or IP address of the remote nPartition
- Remote via IPMI LAN: use the **-g -h** set of options
 - g **[password]** optionally specifies the IPMI password for the MP
 - h specifies either the hostname or IP address of the MP

nPartition command examples

- **parstatus -w**
 - Report the nPartition number for the local nPartition
- **parstatus -w -u root: -h 12.34.56.789**
 - Report the nPartition number for IP 12.34.56.789; this prompts for the root password for the host
- **parcreate -c0/4::: -g -h feshd4u.corp.com**
 - Create a new nPartition using cell 0/4 on the complex whose MP is the host feshd4u.corp.com; this prompts for the IPMI password

Partition Manager

- Partition Manager provides a graphical interface for managing nPartitions and complex hardware
 - Start the Partition Manager Tomcat-based Servlet Engine
 - `/opt/parmgr/bin/parmgr -s start`
 - Stop Partition Manager
 - `/opt/parmgr/bin/parmgr -s stop`
 - Restart using the `parmgr -s restart` command
 - Display status using the `parmgr -s status` command
- Partition Manager access is through the following secure (https) URL:
`https://host.corp.com:50000/parmgr`
where *host.corp.com* is the local hostname and domain

Partition Manager remote options

- To change the system access method, select the **Switch Complexes** task from the **Tools** menu

Choose the partitionable system to manage:

A remote nPartition

Hostname or IP address of the nPartition:

WBEM Username on the nPartition:

WBEM Password on the nPartition:

A remote partitionable complex

Hostname or IP address of the complex's service processor:

IPMI password for the complex's service processor:

- Remote via WBEM: use the **remote nPartition** option
- Remote via IPMI LAN: use the **remote partitionable complex** option

Creating the first nPartition

- Either create a Genesis Partition or use IPMI over LAN to remotely create the first nPartition
 - A Genesis Partition is created from MP Command menu
 - **CC** command, **G** option -- specifies that a one-cell nPartition be created within the server complex
 - Any existing nPartition configurations are deleted and are replaced with a single, one-cell nPartition (the Genesis Partition)
 - **CAUTION:** Creating a Genesis Partition clears Complex Profile details, including iCOD/PPU configuration data
 - Using IPMI over LAN to modify the Complex Profile
 - Partition Manager **nPartition** --> **Create nPartition** action
 - **parcreate** command, with the **-g -h** options specified
- The first nPartition in a complex is “Partition 0”

Creating additional nPartitions

- Either use parcreate or Partition Manager from an nPartition running HP-UX in the complex, or use the remote administration feature of those tools
- If creating nPartitions using remote administration:
 - IPMI over LAN uses the Partition Manager **remote partitionable complex** option or the **parcreate** command **-g -h** options
 - Remote WBEM administration requires HP-UX B.11.23 be running in the complex, so local management might be simpler
- Can manually boot a newly created nPartition
 - Must manually boot if you did not specify to boot (**-B** option) when the nPartition was created
 - Use the **BO** command from MP Command menu to boot an nPartition

Adding/removing cells

- Assign (add) cells
 - **parmodify -p# -a#...** command
 - Partition Manager **nPartition --> Modify nPartition** action and select the **Add/Remove Cells** tab
 - After adding a cell to an active nPartition, must reboot for reconfig for the cell to be active/rendezvous
- Unassign (remove) cells
 - **parmodify -p# -d#...** command
 - Also specify **-B** option if removing an active cell and want the nPartition to be active after it is reboot for reconfig
 - Partition Manager **nPartition --> Modify nPartition** action and select the **Add/Remove Cells** tab
 - After removing an active cell, you must reboot for reconfig its nPartition for the cell to be removed

Deleting an nPartition

- **parremove -p#** command
 - If removing the local nPartition or a remote, active nPartition, also specify the force-remove option (**-F**)
- Partition Manager -- Select the nPartition and use the **nPartition --> Delete nPartition** action
- Perform a shutdown for reconfig of the nPartition that is being removed
 - **shutdown -R -H** from HP-UX
 - **shutdown /s** from Windows
 - **shutdown -h time** from Linux
 - **reconfigreset** from the EFI Shell
 - **RR** from the MP Command menu

Setting cell attributes

- Configurable cell attributes include:
 - use-on-next-boot value
 - All cells assigned to an nPartition that have a “y” use-on-next-boot value are expected to participate in rendezvous and thus be a active hardware used by the nPartition; “n” means cell will be inactive
 - cell local memory value
 - Amount or percentage of memory that is local to the cell and is not interleaved across cells; details in slides that follow
- Must reboot the nPartition for new attributes to take effect
- **parmodify -p# -m#...** command to modify cell attributes
- Partition Manager
 - **nPartition --> Modify nPartition** action
 - Use the **Set Cell Options** tab to set use-on-next-boot
 - Use the **Configure Memory** tab to set the cell local memory value

Cell local memory overview

- Memory region that is not interleaved across all cells in the nPartition
 - Potentially better performance due to lower latency
- Memory configured as cell local memory can only be used by operating systems that support it
 - HP-UX B.11.23 and Windows Server 2003 support cell local memory
 - Red Hat Enterprise Linux 3 does not support cell local memory
 - **CAUTION:** Any memory configured as cell local memory is unusable when an nPartition runs an operating system that does not support it

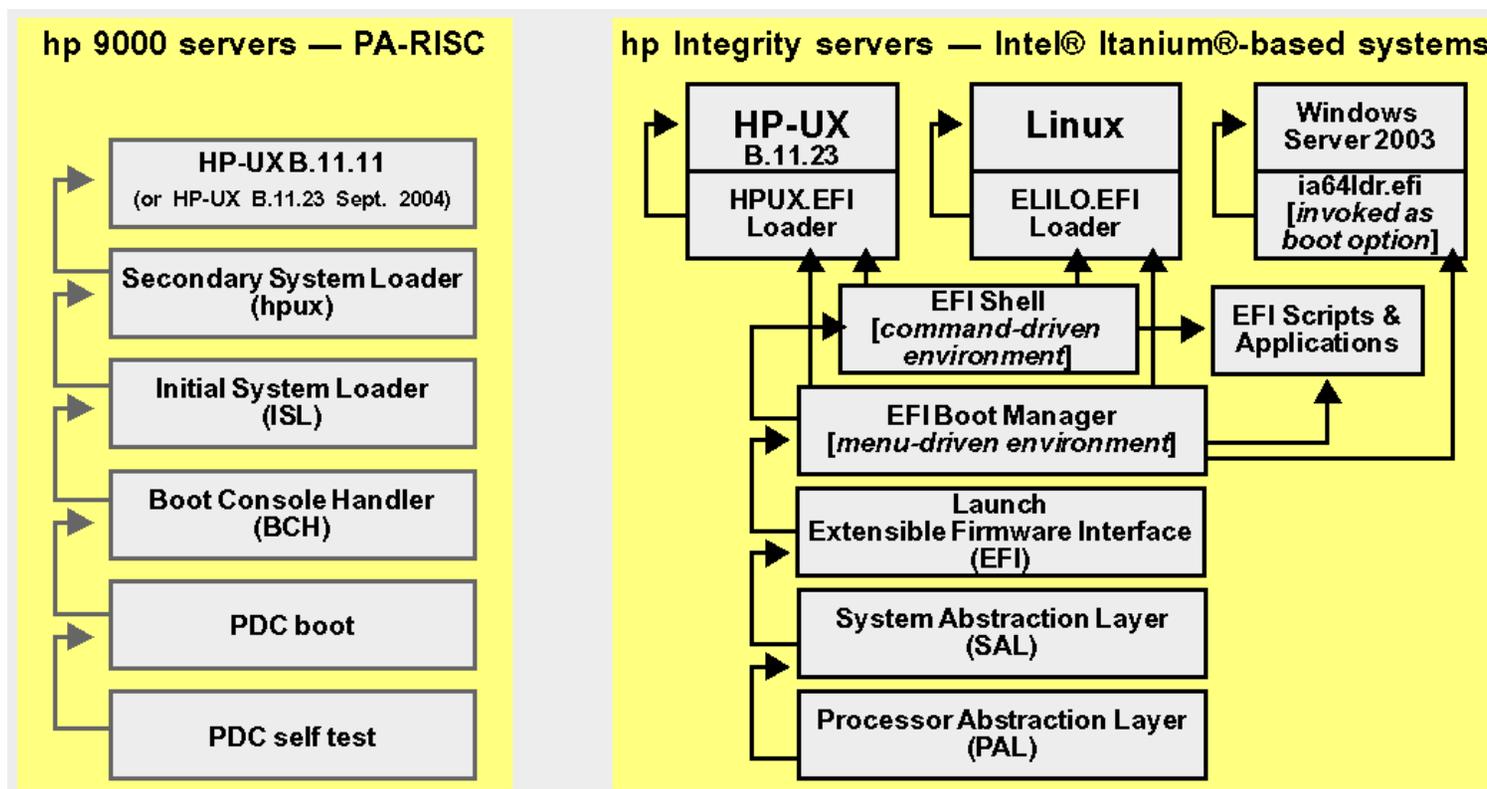
Cell local memory guidelines

- Configure cell local memory only for nPartitions booting HP-UX B.11.23 or Windows Server 2003
- For best performance, HP recommends the amount of interleaved memory meet these guidelines:
 - The number of cells participating in memory interleave should be a power of two
 - 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
- All memory not specified as being cell local will be interleaved

Cell local memory specification

- You can specify the cell local memory value in either of two forms: percentage or absolute amount of memory
- Percentage cell local memory
 - This number is rounded to 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5%, or 100% (nearest eighth) for cells with ≥ 4 GBytes
 - 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 cell local memory
 - The absolute number is interpreted as the absolute number of gigabytes and is rounded up to the nearest 0.5 GBytes

HP Integrity server OS boot process



- HP Integrity nPartition boot environment is the Extensible Firmware Interface (EFI): **EFI Boot Manager** menu and the **EFI Shell**
- EFI provides a **boot options list**: paths to bootable files

Boot process for cells and nPartitions



- nPartition boot process includes two phases: the **cell boot phase** and the **nPartition boot phase**
- Cell boot phase: Occurs when cells are powered on or reset; involves power-on-self-test activities
 - 1) Cell is powered on or reset, and the cell boot-is-blocked (BIB) flag is set
 - 2) Firmware on the cell performs self-tests and discovery operations
 - 3) Cell reports the cell hardware configuration to the MP and informs MP it is "waiting at BIB"; waits for BIB flag to be cleared
- nPartition boot phase: Occurs after a quorum of cells complete self tests; "nPartition rendezvous" occurs
 - 1) MP provides a copy of relevant Complex Profile data to the cells
 - 2) MP releases BIB for all cells assigned to the nPartition with a "y" use-on-next-boot value and complete the cell boot phase in time (10 minutes)
 - 3) nPartition rendezvous begins: each active cell uses its copy of Complex Profile data to contact other active cells
 - 4) Active cells negotiate to select a core cell
 - 5) The chosen core cell manages the rest of the nPartition boot process
 - A processor on the core cell runs the EFI boot environment

nPartition boot configuration

- **Autoboot** is configured by the EFI autoboot setting and the order of items in the boot options list
 - EFI Boot Manager: Boot option maintenance menu --> Set Auto Boot TimeOut
 - EFI Shell: autoboot command
 - HP-UX: setboot -b on or setboot -b off command
 - When autoboot is enabled, EFI attempts to automatically load/boot after rendezvous, starting with the first item in the boot options list
- nPartition **ACPI configuration** setting must be set properly for the OS being booted
 - Use the EFI Shell acpiconfig command; details on the following slide
- Boot-time system tests (**self tests**) are configured by EFI Shell **boottest** command or HP-UX **setboot** command
- **Boot options list** is configurable
 - EFI Boot Manager: Boot option maintenance menu
 - EFI Shell: bcfg boot command to set; variable command to save/restore
 - HP-UX: /usr/sbin/setboot or /usr/sbin/parmodify command

ACPI configuration value

- Each nPartition requires the proper ACPI configuration for the OS to be booted
 - **To check** the ACPI configuration value, issue the **acpicongig** command with no arguments at the EFI Shell
 - **To set** the ACPI configuration value, issue the following EFI Shell command: **acpicongig value**
 - **value** is either **default**, **windows**, or **single-pci-domain**
 - **HP-UX** ACPI value: **default**
 - **Windows** ACPI value: **windows**
 - **Red Hat Enterprise Linux 3** ACPI value: **single-pci-domain**
 - Reset (**reset** EFI Shell command) for the setting to take effect
- **NOTE:** When configuring HP-UX or Linux boot options, the ACPI value must be set as above for device paths to be properly established
 - For Windows boot options use MSUtil\nvrboot.efi to import the EFI\Microsoft\WINNT50\Boot00... file

Active and inactive cells

- A cell that is assigned to an nPartition, has booted, and has participated in nPartition rendezvous is an **active cell**
 - For cell resources to be used, the cell must be active
- An **inactive cell** either is not assigned to an nPartition, or if assigned did not rendezvous
 - For example: a cell is inactive when powered off, booted with a “n” use-on-next-boot value, or assigned to an nPartition that is in the shutdown for reconfig state
 - Resources belonging to inactive cells are not used

ACPI "Softpowerdown": rx7620 and rx8620 shutdown for reconfig



- You can configure the nPartition behavior when an OS is shutdown and halted **on rx7620 and rx8620 servers**
- The normal OS shutdown behavior depends on the ACPI configuration; the options are:
 - **nPartition hardware power off**
 - This is the normal behavior for the “windows” ACPI setting
 - If only one nPartition is defined then powers off the server cabinet (including all cells and I/O chassis) else powers off assigned hardware
 - Can manually set from EFI shell using:
acpiconfig enable softpowerdown
 - **nPartition remains inactive** (all cells at BIB)
 - This is the normal behavior for the “default” and “single-pci-domain” ACPI settings
 - Can manually set from EFI shell using:
acpiconfig disable softpowerdown



Booting an OS

- You can boot an OS either by **selecting its entry** from the EFI Boot Manager (boot options list) or by **invoking the OS loader** from the EFI Shell
 - HP-UX B.11.23 OS loader is HPUX.EFI
 - You can issue hpux(1M) loader commands at the HPUX> prompt
 - Windows loader is ia64ldr.efi and it is invoked only from the EFI Boot Manager
 - Special Administration Console (SAC) interface is available via the console after an nPartition has loaded Windows
 - Use the SAC> command prompt; issue the ? or help command
 - Red Hat Enterprise Linux loader is ELILO.EFI
 - You can issue ELILO commands at the "ELILO boot" prompt
- **CAUTION:** An nPartition must have its ACPI configuration value properly set to boot an OS

Invoking OS loader from EFI Shell

- Can directly load HP-UX and Red Hat Linux
 - 1) Access the EFI Shell
 - 2) Use the **map** EFI Shell command to list the EFI System Partitions (filesystems) available, and as needed use the **search** command to search for filesystems on non-core cells
 - 3) Access the EFI System Partition (for example fs0:) for the root device and then invoke the loader
 - Enter **HPUX** to invoke the HP-UX loader (HPUX.EFI)
 - The full path is \EFI\HPUX\HPUX.EFI
 - When invoked, HPUX.EFI references \EFI\HPUX\AUTO and boots HP-UX using the default boot behavior specified in the AUTO file
 - Enter **\EFI\redhat\elilo.efi** to invoke the Linux loader (ELILO.EFI)
 - The \efi\redhat\elilo.conf file defines the kernel boot configurations available to be selected
 - 4) As needed, interact with the OS loader
- Windows is loaded from EFI Boot Manager only

OS Shutdown

- **HP-UX** has these commands for shutting down:
 - `shutdown -R` shuts down HP-UX and performs a reboot for reconfig
 - `shutdown -R -H` shuts down HP-UX and performs a shutdown for reconfig
 - `shutdown -r` same effect as `shutdown -R` on HP Integrity servers
 - `shutdown -h` same effect as `shutdown -R -H` on HP Integrity servers
- **Windows** has these commands for shutting down:
 - `shutdown /r` shuts down Windows and performs a reboot for reconfig
 - Equivalent to: **Start**→**Shut Down, Restart**
 - `shutdown /s` shuts down Windows and performs a shutdown for reconfig
 - Equivalent to: **Start**→**Shut Down, Shut down**
 - Refer to the `help shutdown` Windows command for details
 - From GUI select Shut Down from the Start menu and choose Restart or Shut down
 - **CAUTION:** Issuing restart or shutdown at the `SAC>` prompt causes the system to restart or shutdown immediately and can result in the loss of data
- **Red Hat Enterprise Linux 3** has these commands for shutting down:
 - `shutdown -r time` shuts down Linux and performs a reboot for reconfig
 - `shutdown -h time` shuts down Linux and performs a shutdown for reconfig
 - `time` is required and can be specified as follows:
 - 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; equivalent to using `+0` to wait zero minutes

Listing system status

- Commands for status
 - **parstatus -C** command -- Cell configurations
 - **parstatus -V -c#** command -- Detailed cell information
 - **parstatus -B** command -- Server cabinet summaries
 - **parstatus -V -b#** command -- Detailed cabinet status
 - **parstatus -X** command – Complex and product details
 - **parstatus -P** command – Summaries of all nPartitions
 - **parstatus -V -p#** command -- Detailed nPartition info
- Partition Manager features for status
 - **General** tab, **Hardware** tab, **nPartitions** tab, **Cells** tab, **I/O** tab, **CPUs/Memory** tab, **Power and Cooling** tab, and the **Complex --> Show Complex Details** action

EFI Shell commands for nPartitions

- These EFI Shell commands are provided for nPartition-capable HP Integrity servers
See the **help** command for details
 - **autoboot** — Enables and disables automatic boot, and sets the boot delay (timeout)
 - **bcfg** — Displays and modifies the boot options list
 - **lanboot** — Boots over LAN; also use the **lanboot select** command to choose which LAN/MAC
 - **reset, reconfigreset** — Normal reset, or perform a reset to a “shutdown for reconfig” state
 - **acpiconfig** — Sets the ACPI mode: “default” for HP-UX B.11.23, “single-pci-domain” for Red Hat Linux, “windows” for Windows
 - **cellconfig, cpuconfig, dimmconfig** — Configures or deconfigures cells, processors, memory
 - **rootcell** — Sets and views core cell choices
 - **info** — Displays hardware information (for example: **info sys, info cell, info boot**, and more)

MP commands for nPartitions

- These commands are available from the MP Command menu of nPartition-capable HP Integrity servers
 - **BO** — Boots an nPartition past the boot-is-blocked (BIB) “shutdown for reconfig” state (make it active)
 - **CP** — Displays the nPartition cell assignments
 - **PARPERM** — Restricts or unrestrict the nPartition Configuration Privilege
 - **LC** — Sets the MP LAN configuration
 - **PD** — Sets the default nPartition for the current login session
 - **RS** — Resets an nPartition
 - **RR** — Resets an nPartition to the “shutdown for reconfig” state (make it inactive)
 - **SA** — Sets network access parameters (including IPMI LAN access)
 - **SO** — Configures security and access control options (including the IPMI password)
- Enter **HE** (the help command) for details



Summary

- **HP Integrity supports multiple OSES:**
HP-UX B.11.23, Windows, Linux
- **Remote management:**
WBEM or IPMI LAN
- **Special types of nPartition reboot:**
“reboot for reconfig” and “shutdown for reconfig”
- **ACPI configuration:**
default, windows, single-pci-domain
- **ACPI “Softpowerdown” option:**
OS shutdown behavior for rx7620 and rx8620 servers
- **Cell local memory:**
Guidelines; HP-UX B.11.23 and Windows support CLM



Related information

- Send your feedback to: adam.schwartz@hp.com
- For details, refer to the HP technical documentation Web site:
<http://www.docs.hp.com/index.html>
- See the *HP System Partitions Guide: Administration for nPartitions* book for complete details on managing nPartitions on HP Integrity servers and HP 9000 servers
- For Windows tools and documentation, also see the <http://www.hp.com/support/itaniumservers> Web site
- For WBEM details, see the *HP WBEM Services for HP-UX and Linux System Administrator's Guide* at the docs.hp.com Web site



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