

Ordering and Configuration Guide HP-UX Virtual Partitions (vPars)

T1335CC
T1335BC
T1335AC

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1 introduction to this document

This document describes the configuration and version requirements for HP-UX Virtual Partitions (vPars) and vPars-related products. The information provided in this document is supplemental to other vPars documents:

HP-UX Virtual Partitions Administrator's Guide (formerly Installing and Managing HP-UX Virtual Partitions)
HP-UX Virtual Partitions Release Notes

All of these documents can be found on the web at:

<http://docs.hp.com/hpux/11i/index.html#Virtual%20Partitions>

The vPars documents at <http://docs.hp.com> are intended to cover only user information on existing vPars products that are officially released. For information on future plans for vPars products, see the appropriate marketing materials.

Note that this document is cumulative, meaning that it includes information on all supported releases up to and including the latest vPars release; a specific version of vPars is stated when needed. For a list of features for a specific release of vPars, see Section 2.3; for detailed information on a specific release, see the HP-UX Virtual Partitions Release Notes document for that release.

2 overview of virtual partitions

HP-UX Virtual Partitions (vPars) is a powerful tool that runs multiple instances of the HP-UX 11i Operating Environment (OE) simultaneously on one server or nPartition, where each virtual partition:

- has its own assigned set of CPU (processing core), memory, and I/O resources (resource isolation)
- runs its own separate instance of HP-UX with different patch levels (O/S kernel isolation)
- hosts its own set of applications in a fully isolated environment (application isolation)

2.1 key benefits and features

The key benefits that vPars provides to customers are:

- Better system resource utilization (from typical 20-50% up to 80-90%)
- Flexible and dynamic resource adjustment
- Application isolation
- Server consolidation

via the following features:

- Flexible "carving up" of existing server or nPartition resources into multiple, independent OS instances per node.
- Increased isolation (and uptime) of applications, their OSs and assigned resources (processing cores, memory and I/O), with individual reconfiguration and reboot of the individual partitions (not affecting other partitions).
- Dynamic movement of processor resources between virtual partitions (for variable workload requirements).
- Single processing core granularity per virtual partition

2.2 advantages of HP-UX vPars offering

vPars offers:

Flexibility:

- Compatibility with nPartitions (hard partitions)
- Integration with iCAP (Instant Capacity on Demand)
- Dynamic creation of virtual partitions while other virtual partitions are running

Automated and Intelligent Management:

- Goal-based workload management across virtual partitions (cross-virtual partition integration with HP-UX Workload Manager)
- Easy, automated deployment through Ignite-UX

Integration with the rest of the HP VSE (Virtual Server Environment) for HP-UX:

- HP Partitioning Continuum, Workload Manager, iCAP and PPU, Rapid Deployment

2.3 features vPars software by software release

This section outlines the features in brief for each of the supported vPars releases. For detailed information, see the HP-UX Virtual Partitions Release Notes for a specific release.

For customers that are using previous versions of vPars, HP strongly recommends that you update to the latest supported vPars version to take advantage of new features and product improvements.

2.3.1 vPars A.05.xx releases

vPars A.05.01 adds support for the following:

Dynamic Memory Migration

You can add memory to or delete memory from a virtual partition while it is UP (online). When memory is assigned to a virtual partition, it can be categorized as float (i.e., can be added or deleted while the virtual partition is UP), or base (i.e., cannot be deleted while the virtual partition is UP). By default, all memory assigned to a virtual partition during vPar creation or memory addition, is considered base memory. For more information, see the A.05.01 Resources chapter in the HP-UX Virtual Partitions Administrator's Guide.

Hyperthreading

Hyperthreading can be enabled in a vPars environment if the processor hardware supports it. Each vPar OS and applications will be able to take advantage of CPU-threading, just as in an nPartitions environment. Processor assignments and migration will continue to be supported at the CPU-core level though. For more information, see the A.05.01 Resources chapter in the HP-UX Virtual Partitions Administrator's Guide.

Mixed HP-UX 11i v2/v3 vPars Environments

You can now have a vPars A.05.01 monitor and database that simultaneously supports virtual partitions running vPars A.05.01 on HP-UX 11i v3 (11.31) and virtual partitions running vPars A.04.02 or above on HP-UX 11i v2 (11.23). For detailed information, see the Mixed HP-UX 11i v2/v3 vPars section in the Planning chapter of the HP-UX Virtual Partitions Administrator's Guide.

Obsolescence Notes:

vPars A.03.02 is no longer supported. See Section 3.5 obsolescence.

Servers that are not nPartitionable are not supported under A.05.01. These servers are the rp5470/L3000, rp5405, and rp7400/N4000. See Section 4.2.1 servers. These servers remain supported for A.03.xx and A.04.xx.

vPars A.04.04 adds support for the following:

Support for PA-RISC Servers Using the HP sx2000 Chipset

Support for the following PA-RISC servers using the HP sx2000 chipset: rp7440, rp8440, and HP 9000 Superdome.

Pre-enablement of SCSI Tape Boot and Recovery for Integrity Servers

On Integrity servers running vPars A.04.04, you are pre-enabled to use tape devices from within the vPars environment - this includes recovery using tape devices. Note that you are pre-enabled to use only the tape devices that are already supported with Integrity servers in stand alone mode. vPars does not support devices beyond those that are supported by the server itself.

vPars A.04.03 adds support for the following:

Tape Devices on PA-RISC Servers

On PA-RISC servers, you can use tape as boot devices from within the vPars environment; this includes recovery using tape devices. For more information, see the recovery chapter in the HP-UX Virtual Partitions Administrator's Guide.

Note that you can use only the tape devices that are already supported for PA-RISC servers in standalone mode; vPars does not support devices beyond what is supported by the server itself.

Obsolescence Note:

vPars A.03.01 is no longer supported. See Section 3.5 obsolescence.

vPars A.04.02 adds support for the following:

Integrity servers using the sx2000 chipset (firmware update may be required):

- HP Integrity Superdomes
- rx8640
- rx7640

Note that PHKL_34088 (bootloader patch) is required before performing the hardware upgrade.

Flexible Administrative Capability

This allows administrators to designate which virtual partitions allow superusers to run virtual partition commands that affect other virtual partitions. It has been renamed from a security feature to this as it is not intended to replace current HP-UX security applications. For more information, see the Flexible Administrative Capability chapter in HP-UX Virtual Partitions Administrator's Guide.

Customer-requested Defect Fixes

For more information, see the HP-UX Virtual Partition Release Notes for this release.

Obsolescence Note:

vPars A.02.03 is no longer supported. See Section 3.5 obsolescence.

vPars A.04.01 adds support for the following:

OS:

Support for HP-UX 11i v2 (11.23) on both the PA and Integrity platforms:

- vPars A.04.xx requires HP-UX 11i v2 May 2005 Update or later
- vPars A.03.xx continues to support HP-UX 11i v1

Note that vPars A.04.xx and vPars A.03.xx have different product numbers:

- T1335BC vPars A.04.xx and later for HP-UX 11i v2
- T1335AC vPars A.03.xx and vPars A.02.xx for HP-UX 11i v1

For more information, see Section 4.1 of this document.

Servers (firmware update may be required):

Support for these Integrity servers:

- HP Integrity Superdomes
- rx8620
- rx7620

As well as these previously supported PA servers:

- HP 9000 Superdomes (PA)
- rp8420 and rp8400
- rp7420, rp7410, and rp7405
- rp7400/N4000
- rp5470/L3000

For information, see Section 4.2 of this document.

Cards, Interconnects, and Mass Storage Devices:

Additional IO and Networking cards are supported in vPars A.04.01.

See Section 4.3 of this document.

Obsolescence Note:

vPars A.02.01 and A.02.02 are no longer supported as of this A.04.01 release.

See Section 3.5 obsolescence.

2.3.3 vPars A.03.xx releases

vPars A.03.04 adds support for:

HP 9000 servers based on the sx2000 chipset, including:

- HP 9000 Superdome
- rp8440
- rp744-0

vPars A.03.03 adds support for:

- Flexible Administrative Capability (formerly called Primary-Admin vPars Security)
This allows administrators to designate which virtual partitions allow superusers to run virtual partition commands that affect other virtual partitions. It has been renamed from a security feature to this as it is not intended to replace current HP-UX security applications. For more information, see the Flexible Administrative Capability chapter in HP-UX Virtual Partitions Administrator's Guide.
- Support for Tape Devices
For more information, see the recovery chapter in HP-UX Virtual Partitions Administrator's Guide.
- Customer-requested Defect Fixes.
For more information, see the HP-UX Virtual Partition Release Notes for this release.

vPars A.03.02 adds support for:

- Specifying only the SBA on the vPars command-line
- New autosearch attributes using `vparcreate` and `vparmodify` commands to enable automatic fallback to an alternate bootpath
- New `-m` option that displays vPars monitor information for the `vparstatus` command
- Logging of vPars commands that are executed into syslog
- Customer-viewable defect fixes as documented in the HP-UX Virtual Partitions Release Notes

vPars A.03.01 adds support for:

- rp8400/rp8420 SEU (Server Expansion Unit)
- PA-8800 processors (dual-core)
- rp7420 and rp8420 servers
- vPars, WLM & iCAP on the same system or nPartition
- IPMI functionality

No new cards are being added for this release. For a list of all the cards that are supported, please see Section 4.3 "supported cards".

Note that vPars A.01.01 is no longer supported as of the A.03.01 release. For information on the expected end of support dates for existing vPars releases, see Section 3.2 "obsolescence".

2.4 what's changed in this document

This section describes what has changed since the previous version of this document.

This document has begun versioning. Instead of simply showing the month and year of publication, this document will have a version number. This allows multiple updates of this document within a given month as well as being able to specify what has changed in this document versus what has changed in the vPars software. Note that this versioning format applies only to the versioning of this document and does not apply to the versioning of the software, which has its own version numbers, or any other documents.

For an estimated date of publication, the version number relates to a YY.MM.DD format. For example, if the version of this document is 6.01.01, the estimated date of publication is 2006, January 1st.

Version 6.01.01 is the first "versioned" release of this document and "what's changed" refers to the last "month and year" designated release of this document, which is October 2005. The October 2005 version of this document has been archived at <http://docs.hp.com>.

2.4.1 version history of this document

v07.06.05 includes:

- Finalized for vPars A.04.04 release
- Added vPars A.04.04 specific support information for systems and peripherals, as required, throughout this document.
- Updated vPars A.05.01 minimum system firmware requirements in section 4.2.3.

V07.03.15 includes:

- Finalized for vPars A.03.04 release
- Added AB379A (2-Port 4Gb Fibre Channel) to card firmware tables for A.04.xx in section 4.3.3 "required card firmware (Integrity)" and corrected part number to "AB287A" in A.04.01 table
- Updated download instructions in section 4.3.5 "obtaining and installing card firmware (Integrity)"
- Corrected section numbering in section 4.3 "supported cards"

v7.03.06 includes:

- Corrected PA card product numbers typos in section 4.3.1 "supported mass storage and networking cards (PA)": change from A6826A3 to A6826A (the appended character "3" should be a footnote) and changes from AB290A4 and AB465A4 to AB290A and AB465A, respectively (the appended character "4" should be a footnote)

v7.02.20 includes:

- Finalized for vPars A.05.01 release
- Re-organized End of Support Date section
- Removed the ODE CD information for IO card driver updates. The updates should use drivers, instructions, and information from the web (see Section 4.3.5 "obtaining and installing card firmware (Integrity)")
- Replaced Superdome System Firmware SD Recipe 4.3d with SD Recipe 5.5b since 4.3.d was recalled
- Added Warning regarding Ignite-UX and A.04.01 on PA systems. Requires an Ignite-UX version earlier than C.6.8 or vPars A.04.02 or later.
- Added iCAP v8.x requirement (not a vPars requirement) for Dual-core Intel® Itanium® 2 (Montecito) processors

v6.12.15 includes:

- Highlighted the existing statement regarding the maximum number of cells per nPartition (8) as well as the maximum number of virtual partitions per nPartition (8)
- Added specific Dual-core Intel® Itanium® 2 (Montecito) processor information

v6.10.01 includes:

- Highlighted the statement regarding the maximum number of virtual partitions per nPartition

v6.09.01 includes:

- Finalized for vPars A.04.03 release

v6.06.01 includes:

- Added rx8640 SEU/IOX support to SEU/IOX list
- Simplified WLM and iCAP version requirements
- Added information on vPars A.04.03 release (tape device support)

v6.03.16 includes:

- rx7640/8640 required system firmware for the sx2000 chipset added
- Corrected End of Support Date for vPars A.04.02 to the year 2008

v6.03.07 includes:

- Additions for vPars A.04.02

v6.01.15 includes:

- PHKL_31227 is required for cards that have a PCI-to-PCI bridge. This includes the cards AB290A, A9782A, A9784A, and AB465A. See section 4.3.1 under supported mass storage and networking cards (PA).

v6.01.01 includes:

- Secure Path Installation Sequence for vPars A.04.01
- Updated End of Support Date for vPars A.04.01
(now based on the required firmware release rather than only the software release)
- Added Web Download instructions for all HBAs on Integrity servers
- Updated feature name to Flexible Administrative Capability
(previously named Primary-Admin vPars Security)
- Removal of information for unsupported vPars releases
(the information for vPars A.02.xx remains in the archived October 2005 version of this document at <http://docs.hp.com/hpux/11i/index.html#Virtual%20Partitions>)
- New versioning and formatting of this document

3 purchasing and licensing

NOTE: For information on future plans for vPars products, see the appropriate marketing materials.

3.1 vPars licensing

Virtual partitioning products are sold on a Per Core Licensing basis. Therefore, you purchase the same quantity of this product as the number of active processing cores in your nPartitions or non-nPartitioned system that will be running vPars. If you later purchase additional processing cores, you must also purchase the corresponding number of per-processor licenses of T1335AC, T1335BC, or T1335CC.

Note: Dual-core processors (for example, the PA-8800 processor) have two cores per processor and are seen by HP-UX and associated applications as two processing cores; hence, two vPars software licenses are required for each dual-core processor. In other words, each core requires its own vPars license.

3.2 related software licensing

Systems running vPars have two options for purchasing software licenses: Per nPartition Licensing or Virtualization Licensing.

- Per nPartition Licensing allows licensing of HP-UX 11i software based upon the number of active processing cores in the server or nPartition.
- Virtualization Licensing allows customers to purchase software licenses for less than the full processor core capacity of a server or nPartition when the software will be run in virtual partitions (vPars).

For more details on software licensing for vPars refer to the Virtualization Licensing for HP-UX 11i website at: <http://www.hp.com/go/virtualizationlicensing/>

3.3 product numbers

Please be sure you order the correct product number based on your needs. Note that the table below is general information regarding the virtual partition software products. There may be further hardware, operating system, or application constraints. Please check the applicable hardware, OE, and application documentation for any further constraints.

Product Information Table (read horizontally from left to right):

Product Number	vPars version	HP-UX 11i Version Supported	HP-UX Releases Supported	Server Platforms Supported
T1335CC	vPars A.05.xx and later	11i v3 (11.31)	February 2007 or later	PA-RISC and Integrity
T1335BC	vPars A.04.xx and later	11i v2 (11.23)	May 2005 or later	PA-RISC and Integrity
T1335AC	vPars A.03.xx and earlier	11i v1 (11.11)	December 2000 or later	PA-RISC

3.4 software depot

HP-UX Virtual Partition software products can be ordered from the HP Software Depot at:

vPars A.05.xx:

<http://h20293.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=T1335CC>

vPars A.04.xx:

<http://h20293.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=T1335BC>

vPars A.03.xx:

<http://h20293.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=T1335AC>

Please note that the URL for the HP Software Depot has changed:

From - <http://software.hp.com>

To - <http://www.hp.com/go/softwaredepot>

3.5
obsolescence of
vPars releases

Below are the minimum end of support dates for the vPars releases in order of release date:

vPars A.05.xx on 11i v3*

vPars Version	Release Date	Minimum End of Support Date	Status
A.05.01	Feb-2007	Mar-2010	Supported

vPars A.04.xx on 11i v2*

vPars Version	Release Date	Minimum End of Support Date	Status
A.04.01	Sep-2005	Sep-2007	Supported
A.04.02	Mar-2006	Mar-2008	Supported
A.04.03	Sep-2006	Sep-2008	Supported
A.04.04	Jun-2007	Jun-2010	Supported

vPars A.03.xx on 11i v1*

vPars Version	Release Date	Minimum End of Support Date	Status
A.03.01	Apr-2004	May-2006	Unsupported
A.03.02	Dec-2004	Dec-2006	Unsupported
A.03.03	Oct-2005	Oct-2007	Supported
A.03.04	Mar-2007	Mar-2010	Supported

vPars A.02.xx on 11i v1*

vPars Version	Release Date	Minimum End of Support Date	Status
A.02.01	-	Jul-2004	Unsupported
A.02.02	-	Jan-2005	Unsupported
A.02.03	-	Dec-2005	Unsupported

*The final vPars releases within a given OS will be supported through the end of the support life of the OS.

4 supported configurations

This section contains the following information:

- Supported operating systems (operating environments (OEs) and patches)
- Supported servers and server firmware
- Maximum number of virtual partitions per system
- Minimum requirements for each virtual partition

4.1 operating systems

4.1.1 os version

vPars requires the following OS version (see [4.2.2 processors and chipsets](#) for further OS requirements based upon your specific processor and chipset):

vPars A.05.xx:

11i v3 (11.31) February 2007 or later.

vPars A.04.xx:

vPars A.04.04 11i v2 (11.23) June 2007 or later.

vPars A.04.03 11i v2 (11.23) September 2006 or later.

vPars A.04.02 11i v2 (11.23) March 2006 Update or later.

vPars A.04.01 11i v2 (11.23) May 2005 Update or later.

vPars A.03.xx:

vPars A.03.04 11i v1 (11.11) December 2006 Update or later.

vPars A.03.01, 11i v1 (11.11) December 2000 Update or later.

A.03.02, and

A.03.03

4.1.2 patch bundles

vPars A.05.xx:

There are no patch bundles required for vPars. However, the OS or other applications may have their own patch requirements.

vPars A.04.xx:

From the HP-UX 11i v2 (11.23) Update Release, verify the following bundles are installed on your system:

- B.11.23.0706 FEATURE11i (required patches for vPars install)
- HWEnable11i (with required patches for new hardware)
- QPKAPPS & QPKBASE (with recommended patches)
- OnlineDiag, NPar, iCAP, WBEM, and other bundles (with changes for vPars support)

See the version specific HP-UX Virtual Partitions Release Notes for further required patches.

vPars A.03.xx:

After installing HP-UX 11i v1 (11.11), you should install the latest Quality Pack (QPK) bundles, available from the HP-UX 11i v1 Support Plus CD or online at <http://itrc.hp.com>:

1. Select maintenance and support for hp products
2. Then click on the `standard patch bundles` link under `patching`.
3. The `HP-UX patch bundles` link will present a web page with links to releases with the `Support Plus 11.11 bundles`.
4. Select `GOLDAPPS11i` and `GOLDBASE11i`. Also, review additional recommended patches and select `add to selected patch list` for download.

These QPK bundles provide recommended patches for 11.11 OE software and 11.11 vPars software.

4.2 hardware

4.2.1 servers

vPars supports the following low to high-end HP-UX servers:

Servers	A.03.01	A.03.02 A.03.03	A.03.04	A.04.01	A.04.02 A.04.03	A.04.04	A.05.01
rp5470 ⁰ /L3000, rp5405	yes	yes	yes	yes	yes	yes	No
rp7400/N4000	yes	yes	yes	yes	yes	yes	No
rp7405, rp7410	yes	yes	yes	yes	yes	yes	Yes
rp8400	yes	yes	yes	yes	yes	yes	Yes
rp7420	yes	yes	yes	yes	yes	yes	Yes
rp8420	yes	yes	yes	yes	yes	yes	Yes
rp7440, rp8440	no	no	yes	no	no	yes	No
Superdome (PA)	yes	yes	yes	yes	yes	yes	Yes
Superdome (PA) on sx2000 chipset	no	no	yes	no	no	yes	No
rx7620	no	no	no	yes	yes	yes	Yes
rx8620	no	no	no	yes	yes	yes	Yes
rx7640	no	no	no	no	yes	yes	Yes
rx8640	no	no	no	no	yes	yes	Yes
Superdome (Integrity)	no	no	no	yes	yes	yes	Yes

⁰ The carrier grade version of rp5470 is not supported

4.2.2 processors and chipsets

Unless otherwise noted, all vPars versions support any processors that are supported by the HP-UX OS instance for use on the servers. This includes but is not limited to the following processors:

- PA-8500
- PA-8600
- PA-8700
- PA-8800
- PA-8900
- all Intel® Itanium® 2

Notes:

vPars A.03.01 or later is required when using PA-8800 and above processors.

vPars A.03.04 or later – OR – vPars A.04.04 or later are required when using HP 9000 servers based on the sx2000 chipset (rp7440, rp8440, and HP 9000 Superdome with sx2000 chipset). Also, PHNE_36225 (Cumulative mux and pty patch) must be installed.

vPars A.04.02 or later is required when using Integrity servers based on the sx2000 chipset. Further, the sx2000 chipset requires the PHKL_34088 bootloader patch.

vPars A.04.02 or later is required when using the Dual-core Intel® Itanium® 2 (Montecito) processor (HT (Hyperthreading) OFF only). HP-UX 11i v2 requires the September 2006 HP-UX 11i v2 release or later when using the Dual-core Intel® Itanium® 2 (Montecito) processor.

vPars A.05.01 or later is required when using the Dual-core Intel® Itanium® 2 (Montecito) processor (HT ON/OFF). HP-UX 11i v3 requires the February 2007 HP-UX 11i v3 release or later as well as a firmware upgrade when using the Dual-core Intel® Itanium® 2 (Montecito) processor (HT ON/OFF).

Dual-Core Processors:

vPars support single-core granularity, including being able to split dual-core processors (assigning sibling processing cores to different virtual partitions). For vPars licensing information on dual-core systems, see Section 3.1 vPars licensing. For information on using dual-cores with vPars, see the resources chapters of HP-UX Virtual Partitions Administrator's Guide.

4.2.3 server firmware

Be sure you have the required firmware before installing or upgrading vPars. Firmware upgrades are not supported from within a vPars environment. To perform a firmware upgrade, you must be in either standalone mode (for PA systems) or nPars mode (for Integrity systems).

Minimum system firmware revisions for A.03.xx vPars support are:

	A.03.01 to A.03.03 ⁶	A.03.04
rp5470/L3000 rp5405 ¹	43.43	44.12
rp7400/N4000 ¹	43.43	43.43
rp7405 rp7410 ² rp8400 ²	6.3	KIOX 8.2 PDC 17.9
rp7420 ² rp8420 ²	PDC 20.008	PDC 24.1
rp7440 rp8440	N/A	Firmware Version 1.0
Superdome ^{3,8} (PA-8600,PA-8700)	PDC 36.7	PDC 36.8
Superdome ³ on sx1000 chipset (PA-8800, PA-8900)	PDC 20.8	PDC 24.1
rx7620 rx8620	N/A	N/A
rx7640 rx8640	N/A	N/A
Superdome ³ on sx1000 chipset (Integrity)	N/A	N/A
Superdome ³ on sx2000 chipset (Integrity)	N/A	N/A
Superdome ³ on sx2000 chipset (PA-8900)	N/A	SD Recipe 6.20b

¹ When installing firmware on these systems, please refer to "Installing Firmware Patches on the rp5470/L3000 and rp7400/N4000" in the HP-UX Virtual Partitions Administrator's Guide.

² This firmware is added to the system on a special scree board (1253-5394). Customers should either download the latest version firmware on their system before installing vPars, or contact their HP Service Representative for help. For more information, please go to the HP IT Resource Center at: <http://itrc.hp.com>. The firmware is available at: ftp://ftp.itrc.hp.com/firmware_patches/hp/cpu/

³ If you are upgrading the Superdome firmware, the upgrade must be performed by Hewlett-Packard qualified service personnel only. Please contact your local HP Support Representative to schedule a convenient time for this firmware upgrade service. Please note that all cells within the Superdome should be upgraded to the same level.

⁶ Although no firmware upgrade is required to go from A.03.01 to A.03.02, you may want to upgrade to the latest firmware version for the latest firmware fixes, specifically in the Dec 2004 HWE. For more information on the firmware releases, see the firmware release notes for your specific server, available within the firmware patches from the ITRC at <http://www2.itrc.hp.com/service/patch/mainPage.do>

⁸ A firmware update is not required to move from A.03.xx to A.04.xx for PA-8600/8700s Superdomes.

4.2.3 server
firmware
(continued)

Be sure you have the required firmware before installing or upgrading vPars. Firmware upgrades are not supported from within a vPars environment. To perform a firmware upgrade, you must be in either standalone mode (for PA systems) or nPars mode (for Integrity systems).

Minimum system firmware revisions for A.04xx vPars support are:

	A.04.01	A.04.02, A.04.03	A.04.04* (minimum)
rp5470/L3000 rp5405 ¹	44.12	44.12	44.12
rp7400/N4000 ¹	43.43	43.43	43.43
rp7405 rp7410 ² rp8400 ²	KIOX 8.2 PDC 17.9	KIOX 8.2 PDC 17.9	KIOX 8.2 PDC 17.9
rp7420 ² rp8420 ²	PDC 22.2	PDC 22.2	PDC 22.2
rp7440 rp8440	N/A	N/A	Firmware Version 1.0
Superdome ^{3,8} (PA-8600,PA-8700)	PDC 36.7	PDC 36.7	PDC 36.7
Superdome ³ on sx1000 chipset (PA-8800, PA-8900)	PDC 22.1	PDC 22.1	PDC 22.1
rx7620 rx8620	Field Release v4.0	Field Release v4.0	Field Release v4.0
rx7640 rx8640	N/A	Firmware Version 1.0	Firmware Version 1.0
Superdome ³ on sx1000 chipset (Integrity)	SMS Release v6.0	SMS Release v6.0	SMS Release v6.0
Superdome ³ on sx2000 chipset (Integrity)	N/A	SD Recipe 5.5b ⁹	SD Recipe 5.5b ⁹
Superdome ³ on sx2000 chipset (PA-8900)	N/A	N/A	SD Recipe 6.20b

¹ When installing firmware on these systems, please refer to "Installing Firmware Patches on the rp5470/L3000 and rp7400/N4000" in the HP-UX Virtual Partitions Administrator's Guide.

² This firmware is added to the system on a special scree board (1253-5394). Customers should either download the latest version firmware on their system before installing vPars, or contact their HP Service Representative for help. For more information, please go to the HP IT Resource Center at: <http://itrc.hp.com>. The firmware is available at: ftp://ftp.itrc.hp.com/firmware_patches/hp/cpu/

³ If you are upgrading the Superdome firmware, the upgrade must be performed by Hewlett-Packard qualified service personnel only. Please contact your local HP Support Representative to schedule a convenient time for this firmware upgrade service. Please note that all cells within the Superdome should be upgraded to the same level.

⁶ Although no firmware upgrade is required to go from A.03.01 to A.03.02, you may want to upgrade to the latest firmware version for the latest firmware fixes, specifically in the Dec 2004 HWE. For more information on the firmware releases, see the firmware release notes for your specific server, available within the firmware patches from the ITRC at <http://www2.itrc.hp.com/service/patch/mainPage.do>

⁸ A firmware update is not required to move from A.03.xx to A.04.xx for PA-8600/8700s Superdomes.

⁹ SD Recipe 4.3d was recalled and has been replaced by Recipe 5.5b.

*NOTE: A firmware upgrade greater than the minimum firmware is only required for vPars A.04.04, if you need support for the TapeBoot feature on Integrity servers. This feature is pre-enabled in vPars A.04.04 but is not yet supported by system firmware.

4.2.3 server
firmware
(continued)

Be sure you have the required firmware before installing or upgrading vPars. Firmware upgrades are not supported from within a vPars environment. To perform a firmware upgrade, you must be in either standalone mode (for PA systems) or nPars mode (for Integrity systems).

Minimum system firmware revisions for A.05.xx vPars support are:

	A.05.01* (minimum)	A.05.01* (HT and/or memory migration)
rp5470/L3000 rp5405 ¹	N/A	N/A
rp7400/N4000 ¹	N/A	N/A
rp7405 rp7410 ² rp8400 ²	KIOX 8.2 PDC 17.9	KIOX 8.2 PDC 17.9
rp7420 ² rp8420 ²	PDC 22.2	PDC 22.2
rp7440 rp8440	N/A	N/A
Superdome ^{3,8} (PA-8600,PA-8700)	PDC 36.7	PDC 36.7
Superdome ³ on sx1000 chipset (PA-8800, PA-8900)	PDC 22.1	PDC 22.1
rx7620 rx8620	Field Release v4.0	Firmware Version 5.0
rx7640 rx8640	Firmware Version 1.0	Firmware Version 3.0
Superdome ³ on sx1000 chipset (Integrity)	SMS Release v6.0	SMS Release v7.0 ¹⁰
Superdome ³ on sx2000 chipset (Integrity)	SD Recipe 5.5b ⁹	SD Recipe 6.11b
Superdome ³ on sx2000 chipset (PA-8900)	N/A	N/A

¹ When installing firmware on these systems, please refer to "Installing Firmware Patches on the rp5470/L3000 and rp7400/N4000" in the HP-UX Virtual Partitions Administrator's Guide.

² This firmware is added to the system on a special scree board (1253-5394). Customers should either download the latest version firmware on their system before installing vPars, or contact their HP Service Representative for help. For more information, please go to the HP IT Resource Center at: <http://itrc.hp.com>. The firmware is available at: http://ftp.itrc.hp.com/firmware_patches/hp/cpu/.

³ If you are upgrading the Superdome firmware, the upgrade must be performed by Hewlett-Packard qualified service personnel only. Please contact your local HP Support Representative to schedule a convenient time for this firmware upgrade service. Please note that all cells within the Superdome should be upgraded to the same level.

⁹ SD Recipe 4.3d was recalled and has been replaced by Recipe 5.5b.

¹⁰ Patch PHKL_35426 is required prior to upgrading an Integrity Superdome to SMS Release 7.0. If this patch is not installed the virtual partitions will not boot in vPars mode. All boot disks must have this patch installed.

*NOTE: A firmware upgrade is only required for vPars A.05.01 if you wish to have the dynamic memory migration feature of vPars, or use vPars on a system with Hyperthreading enabled (HT ON). Please note that hardware, operating system, or other applications may have other requirements.

4.2.4 number of virtual partitions per nPartition

The recommended number of virtual partitions per nPartition is equal up to one-half the installed CPUs (processing cores) in the nPartition in order to meet I/O and memory requirements and to allow for cores that can be used for dynamic processing core migration.

The maximum number of virtual partitions per system is the number of processing cores given the following limits:

rp5470/L3000, rp5405	4 virtual partitions per system
rp7400/N4000	8 virtual partitions per system using the combination card A5838A (PCI 2-Port 100Base-T 2-Port Ultra2 SCSI) for boot. 7 virtual partitions when not using the combo cards.
rp7405, rp7410	8 virtual partitions per system. This is a 2-cell system.
rp7420, rp7440, rx7640	8 virtual partitions per nPartition. This is a 2-cell system.
rp8400	8 virtual partitions per nPartition, 16 total per system with no SEU and 32 total per system with SEU. This is a 4-cell system.
rp8420, rp8440, rx8640	8 virtual partitions per nPartition, 16 total per system with no SEU and 32 total per system with SEU. This is a 4-cell system.
Superdome (PA), Superdome (Integrity)	8 virtual partitions per nPartition, where the nPartition is a maximum of 8 cells; 128 total per Superdome system for the 128-way Superdome systems, where the nPartition is a maximum of 8 cells. Note that vPars can now span multiple cabinets.

Notes:

- The above assumes single path to I/O; if dual path is used, as in many mission critical environments, then the recommended and maximum numbers may be half of that stated.
- The number of virtual partitions can be limited by the number of available IO slots.
- For PA-RISC systems, the number of virtual partitions can be limited by the size of the kernels. In short, the sum of the kernel sizes must be less than 2GBs. For more information, see Memory Allocation in the HP-UX Virtual Partitions Administrator's Guide.

4.2.5 minimum virtual partition requirements

Each virtual partition requires a minimum of:

- 1 processing core
- Enough memory to run HP-UX 11i and applications. See the applicable HP-UX Install and Update Guide for your OS for the minimum amount of memory.
- 1 unique boot device connected through SCSI or Fiber Channel card on a PCI bus or a Local Bus Adapter (LBA) that is uniquely owned by that virtual partition)
- 1 unique LAN card on a PCI-bus/LBA that is uniquely owned by that virtual partition. On Integrity systems, the LAN card must be bootable if you are installing the OE onto a virtual partition using Ignite-UX. See the Chapter 4 of the HP-UX Virtual Partitions Administrator's Guide for more information on how vPars uses Ignite-UX.

Notes:

- Each PCI bus/LBA is uniquely owned by 1 virtual partition. Therefore, the internal LAN card and storage connections (associated with each core I/O card) can only be owned by a single virtual partition. All other virtual partitions require a separate LAN card for network connection, and external storage (and associated SCSI/FC connections to that storage for boot).
- An LBA is typically equivalent to one I/O slot.
- LBAs cannot be daisy chained.
- The LAN and boot device, unique to a virtual partition, can be combined into 1 LBA though a supported combination card.

4.3 supported cards

Boot recommendations.

After the boot of the initial virtual partition, it is recommended that the deployment tool Ignite-UX be used to boot the other virtual partitions.

Boot constraints.

Beyond the recommendation above, tape, CD/DVD, and lan/bootp booting (except through Ignite-UX) of virtual partitions within a vPars environment are not supported. For more information on booting and boot devices, see the paper titled Booting, Installing, Recovery, and Sharing in a vPars Environment from CD/DVDROM/TAPE/Network available at <http://docs.hp.com/hpux/11i/index.html#Virtual%20Partitions>.

I/O Expander (IOX).

vPars supports a virtual partition to be booted off a vPars-supported I/O card configured in the I/O expander:

The Superdome IOX (I/O Expander) is supported for data and boot as of vPars A.02.01.

- The rp8400 and rp8420 SEU/IOX are supported for data and boot as of vPars A.03.01
- The rx8420 and rx8640 SEU/IOX is supported for data and boot as of vPars A.04.01

Audio and graphic cards.

Audio and graphic cards are not supported with vPars.

RAID 4Si Controller.

The RAID 4Si Controller (A5856A) is not supported with vPars. This is a very low-volume card, supported on the rp54xx/L-class, rp7400/N4000, and rp8400 servers. For similar functionality, customers can also use VERITAS Volume Manager's software RAID5 functionality, which has been certified with vPars. You can also use the replacement for this card: the A7143A 4-channel RAID 160.

4.3.1 supported mass storage and networking cards (PA)

Mass Storage Cards.

For vPars on PA servers, the following mass storage cards are supported with the latest release of vPars:

PA-RISC IO Card List	
Card	Description
A4800A	PCI FWD SCSI-2 Card for HP 9000 Servers
A5149A	Single Port Ultra2 SCSI HBA (PCI Bus)
A5150A	Dual Port Ultra2 SCSI (PCI Bus) Adapter
A5158A	Single Port PCI 2x Fibre Channel Adapter
A5159[AB]	Dual Port FWD SCSI (PCI Bus) Adapter
A5838A	PCI 2-Port 100Base-T 2-Port Ultra2 SCSI
A6795A	PCI 2Gb Fibre Channel Adapter
A6828A	PCI Ultra160 SCSI Adapter
A6829A	PCI Dual Channel Ultra160 SCSI Adapter
A6826A ³	PCI Dual-Port 2Gb/1Gb Fibre-Channel
A7143A	PCI 4-Port RAID160 SA SCSI Adapter
A7173A	PCI-X 2-Port Ultra320 SCSI Adapter
A9782A	PCI-X 2Gb Fibre-Channel and GigEthernet Combo Card Adapter
A9784A	PCI-X 2Gb Fibre-Channel and GigEthernet Combo Card Adapter
A9890A	Smart Array 6402 Ultra320 SCSI RAID Controller
A9891A	Ultra320 SCSI PCI-X RAID Smart Array Controller
AB290A ⁴	U320 SCSI/GigE Combo
AB378[AB]	PCI-X 2.0 1-Port 4Gb Fibre Channel HBA
AB379[AB]	PCI-X 2.0 2-Port 4Gb Fibre Channel HBA
AB465A ⁴	2-Port 2-Gb Fibre Channel / 2-Port Gigabit Combo
AD193A	PCI-X 1-Port 4Gb FC and 1-Port 1000BT Adapter
AD194A	PCI-X 2-Port 4Gb FC and 2-Port 1000BT Adapter

³if using the A6826A card with a virtual array, please upgrade the firmware on the A6826A to version 3.02.170 or later. This eliminates the crash dump problem that occurs with earlier firmware versions. You can check the firmware version by using the command: /opt/Scms/bin/fcdutil /dev/fcd<#>.

⁴support for boot as of vPars A.03.02

Cards with a PCI-to-PCI bridge.

On systems running HP-UX 11i v1, please install the PCI OL* patch PHKL_31227 or its successor for cards that have a PCI-to-PCI bridge. This includes the cards AB290A, A9782A, A9784A, and AB465A. You can check if any of your cards uses a PCI-to-PCI bridge by performing an `ioscan -fkC ba`:

```
# ioscan -fkC ba
```

If a line similar to the following is shown in the `ioscan` output:

```
ba          2  1/0/6/1/0  PCItoPCI CLAIMED      BUS_NEXUS      PCItoPCI Bridge
```

then the cards below the hardware path use a PCI-to-PCI bridge, and you should install the patch.

Networking Cards.

For vPars on PA, all networking cards that are supported for the server are supported for the server in a vPars environment.

4.3.2 supported mass storage and networking cards (Integrity)

Updating Firmware.

All firmware steps described below require the system to be booted into nPars mode. For information on the modes for Integrity servers, see the HP-UX Virtual Partitions Administrator's Guide.

Using the network card

Note that when using vparboot -I on an Integrity system, the network card used to obtain the bootable kernel is the network card of the target virtual partition, whereas on a PA system the network card used is the card of the source virtual partition. Please check whether your card is supported for boot.

For information on setting up a boot helper, see the Ignite-UX Administration Guide (Appendix C). Table of Supported Bootable Cards for Integrity Servers.

Transitioning from cards on PA to Integrity

Not all cards supported for boot on PA are supported for boot on Integrity. You can check this web link for transitional information: http://h18000.www1.hp.com/products/quickspecs/11729_div/11729_div.HTML

Bootable Cards Supported for vPars on Integrity

Product Number	Description	Type	rx7620 rx8620	rx7640 rx8640	Integrity Superdome	Integrity Superdome on sx2000
A6795A	2G FC Tachlite	Mass Storage	B	B	B	B
A6825A	Next Gen 1000B-T (5701 chip)	Networking	b	b	D	b
A6826A	2-port 2Gb FC	Mass Storage	B	B	B	B
A6828A	1 port U160 SCSI	Mass Storage	B	B	B	B
A6829A	2 port U160 SCSI	Mass Storage	B	B	B	B
A6847A	Next Gen 1000B-SX (5701 chip)	Networking	b	b	D	b
A7011A	1000BaseSX Dual Port (Intel® chip)	Networking	b	b	b	b
A7012A	1000BaseT Dual Port (Intel® chip)	Networking	b	b	b	b
A7173A	2 port U320 SCSI	Mass Storage	B	B	B	B
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	Combo	Bb	Bb	Bb	Bb
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	Combo	Bb	Bb	Bb	Bb
A9890A	SmartArray 6402 2-channel RAID	Mass Storage	B	B,N1	N	N
A9891A	SmartArray 6404 4-channel RAID	Mass Storage	B	B,N1	N	N
AB287A	10G Ethernet	Networking	b	b	b	b
AB290A	U320 SCSI/GigE Combo Card	Combo	Bb	Bb	Bb	Bb
AB378A	1-port 4Gb FC card PCI-X	Mass Storage	B	B	B	B
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	Combo	Bb	Bb	Bb	Bb
AB545A	4-port 1000B-T Ethernet	Networking	b	b	B	B
AB378A/B AB379A/B	4 GB Fibre Channel (FC)	Mass Storage	B	B	B	B
AD193A/ AD194A	PCI-X 4Gb FC & 1000Base-T	Combo	Bb	Bb	Bb	Bb
AD331A/ AD332A	PCI-X Single-Port 1000Base/- 1000Base-SX	Networking	b,N1	b,N1	b,N1	b,N1

Legend	
B - Bootable Mass Storage HBA	D - Data only (Not Bootable)
b - Bootable Networking HBA	N - Not supported
Bb - Bootable Combo HBA	N1 - Not supported with IOX

4.3.3 required card firmware (Integrity)

vPars A.04.01 Required Card-related Firmware (EFI, ROM, and Boot Code)

Product Number	Description	FC/SCSI/RAID EFI Driver Version	FC/SCSI/RAID HBA Firmware Version	Network (NIC) EFI Firmware Version	Boot Code File	Flash Utility	Flash Utility Version
A6795A	Tachlite	1.17	N/A	N/A	N/A	FCFUPDATE	B.00.12
A6825A	Next Gen 1000B-T (5701 chip)	N/A	N/A	N/A ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.47	3.03.154	N/A	N/A	efiutil.efi	2.02 ³
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	N/A	N/A	N/A	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	N/A	N/A	N/A ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	N/A	N/A	2.16	N/A	ibautil64.efi	3.03.07.01
A7012A	1000BaseT Dual Port (Intel® chip)	N/A	N/A	2.16	N/A	ibautil64.efi	3.03.07.01
A7173A	2-Port U320 SCSI	1.04.02.00	1.03.35.65	N/A	N/A	p SCSI.efi	1.02.01
A9782A	2G Fibre Channel + GIGE Combo Copper	1.47	3.03.154	7.0.b (7.0.11) ²	2.30 ²	efiutil.efi FCFUPDATE	2.02 ³ B.00.12
A9784A	2G Fibre Channel + GIGE Combo Fibre	1.47	3.03.154	7.0.b (7.0.11) ²	2.33	efiutil.efi FCFUPDATE	2.02 ³ B.00.12
A9890A A9891A	RAID U320	Is a part of the package version 2.34	2.34	N/A	N/A	saupdate.efi	1.04.12.00
AB287A	10G Ethernet	N/A	N/A	1.1.3.0	N/A	FCFUPDATE	B.00.12
AB290A	2-Port U320 SCSI+ Combo	1.04.02.00	1.03.35.65	2.16	N/A	p SCSI.efi ibautil64.efi	1.02.01 3.03.07.01
AB378A	1-Port 4Gb Fibre Channel	1.01	4.00.70	N/A	N/A	efiutil.efi	2.09
AB379A	2-Port 4Gb Fibre Channel	1.05	4.00.70	N/A	N/A	efiutil.efi	2.17
AB465A	2G Fibre Channel + GIGE Combo Fibre	1.47	3.03.154	7.0.a (7.0.10)	3.27	efiutil.efi FCFUPDATE	2.02 ³ B.00.12
AB545A	4-Port GIGE	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.12

¹ The card utilizes the EFI driver that is in the platform's system firmware.

² Some revisions of these cards may not have the versions listed above and will need to be updated. See the following sections of this document for further information.

³ This flash utility version, previously 1.37, has been updated to 2.02. The 2.02 version of the 2p2g flash utility is required to update the 1.47 2p2g EFI driver on the HBA. Older versions of the flash utility, including 1.37, will not work with the new EFI driver. This applies to vPars A.04.xx.

required card
firmware (Integrity)
(continued)

vPars A.04.02, A.04.03 Required Card-related Firmware (EFI, ROM, and Boot Code)

Product Number	Description	FC/SCSI/RAID EFI Driver Version	FC/SCSI/RAID HBA Firmware Version	Network (NIC) EFI Firmware Version	Boot Code File	Flash Utility	Flash Utility Version
A6795A	Tachlite	1.17	N/A	N/A	N/A	FCFUPDATE	B.00.18
A6825A	Next Gen 1000B-T (5701 chip)	N/A	N/A	N/A ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.47	3.03.154	N/A	N/A	efiutil.efi	2.09
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	N/A	N/A	N/A	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	N/A	N/A	N/A ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	N/A	N/A	2.16	N/A	ibautil64.efi	3.03.07.01
A7012A	1000BaseT Dual Port (Intel® chip)	N/A	N/A	2.16	N/A	ibautil64.efi	3.03.07.01
A7173A	2-Port U320 SCSI	1.05.01.00	1.03.35.69	N/A	N/A	p SCSI.efi	1.02.01
A9782A	2G Fibre Channel + GIGE Combo Copper	1.47	3.03.154	7.0.b (7.0.11) ²	2.30 (2)	efiutil.efi FCFUPDATE	2.09 B.00.18
A9784A	2G Fibre Channel + GIGE Combo Fibre	1.47	3.03.154	7.0.b (7.0.11) ²	2.33	efiutil.efi FCFUPDATE	2.09 B.00.18
AB287A	10G Ethernet	N/A	N/A	2.0.3.1	N/A	FCFUPDATE	B.00.18
AB290A	2-Port U320 SCSI + Combo	1.05.01.00	1.03.35.69	2.16	N/A	p SCSI.efi ibautil64.efi	1.02.01 3.03.07.01
AB378A	1-Port 4Gb Fibre Channel	1.01	4.00.70	N/A	N/A	efiutil.efi	2.09
AB379A	2-Port 4Gb Fibre Channel	1.05	4.00.70	N/A	N/A	efiutil.efi	2.17
AB465A	2G Fibre Channel + GIGE Combo Fibre	1.47	3.03.154	7.0.a (7.0.10)	3.27	efiutil.efi FCFUPDATE	2.09 B.00.18
AB545A	4-Port GIGE	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.18

¹ The card utilizes the EFI driver that is in the platform's system firmware.

² Some revisions of these cards may not have the versions listed above and will need to be updated. See the following sections of this document for further information.

required card
firmware (Integrity)
(continued)

vPars A.04.04 Required Card-related Firmware (EFI, ROM, and Boot Code)

Product Number	Description	FC/SCSI/RAID EFI Driver Version	FC/SCSI/RAID HBA Firmware Version	Network (NIC) EFI Firmware Version	Boot Code File	Flash Utility	Flash Utility Version
A6795A	2G FC Tachlite	1.24	N/A	N/A	N/A	FCFUPDATE	B.00.29
A6825A	Next Gen 1000B-T (5701 chip)	N/A	N/A	N/A ¹	2.4		
A6826A	2-port 2Gb FC	1.49	3.03.154	N/A	N/A	efiutil.efi	2.17
A6828A/ A6829A	U160 SCSI	1.04.01.00	N/A	N/A	N/A	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	N/A	N/A	N/A ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.29
A7012A	1000BaseT Dual Port (Intel® chip)	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.29
A7173A	2 port U320 SCSI	1.05.02.00	1.03.35.69	N/A	N/A	pscsi.efi	1.02.03
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	1.49	3.03.154	7.0.b (7.0.11) ²	2.30	efiutil.efi FCFUPDATE	2.17 B.00.29
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	1.49	3.03.154	7.0.b (7.0.11) ²	2.33	efiutil.efi FCFUPDATE	2.17 B.00.29
A9890A/ A9891A	SmartArray 6402 SmartArray 6404 RAID	2.68	2.68	N/A	N/A	saupdate.efi	2.06.08
AB287A	10G Ethernet	N/A	N/A	2.0.4.2	N/A	FCFUPDATE	B.00.29
AB290	U320 SCSI/GigE Combo Card	1.05.02.00	1.03.35.69	3.0.03	N/A	pscsi.efi FCFUPDATE	1.02.03 B.00.29
AB465A	PCI-X 2-port 1000B-T/2- port 2Gb FC Combo	1.49	3.03.154	7.0.a (7.0.10)	3.27	efiutil.efi FCFUPDATE	2.17 B.00.29
AB545A	4-port 1000B-T Ethernet	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.29
AB378A/B AB379A/B	4 GB Fibre Channel (FC)	1.05	4.00.70	N/A	N/A	efiutil.efi	2.17
AD193A/ AD194A	PCI-X 4Gb FC & 1000Base-T	1.05	4.00.70	3.0.13	N/A	FCFUPDATE	B.00.29
AD331A/ AD332A	PCI-X Single- Port 1000Base-T 1000Base-SX	N/A	N/A	3.0.13	N/A	FCFUPDATE	B.00.29

¹ The card utilizes the EFI driver that is in the platform's system firmware.

² Some revisions of these cards may not have the versions listed above and will need to be updated. See the following sections of this document for further information.

required card
firmware (Integrity)
(continued)

vPars A.05.01 Required Card-related Firmware (EFI, ROM, and Boot Code)

Product Number	Description	FC/SCSI/RAID EFI Driver Version	FC/SCSI/RAID HBA Firmware Version	Network (NIC) EFI Firmware Version	Boot Code File	Flash Utility	Flash Utility Version
A6795A	2G FC Tachlite	1.24	N/A	N/A	N/A	FCFUPDATE	B.00.29
A6825A	Next Gen 1000B-T (5701 chip)	N/A	N/A	N/A ¹	2.4		
A6826A	2-port 2Gb FC	1.49	3.03.154	N/A	N/A	efiutil.efi	2.17
A6828A/ A6829A	U160 SCSI	1.04.01.00	N/A	N/A	N/A	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	N/A	N/A	N/A ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.29
A7012A	1000BaseT Dual Port (Intel® chip)	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.29
A7173A	2 port U320 SCSI	1.05.02.00	1.03.35.69	N/A	N/A	pscsi.efi	1.02.03
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	1.49	3.03.154	7.0.b (7.0.11) ²	2.30	efiutil.efi FCFUPDATE	2.17 B.00.29
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	1.49	3.03.154	7.0.b (7.0.11) ²	2.33	efiutil.efi FCFUPDATE	2.17 B.00.29
A9890A/ A9891A	SmartArray 6402 SmartArray 6404 RAID	2.68	2.68	N/A	N/A	saupdate.efi	2.06.08
AB287A	10G Ethernet	N/A	N/A	2.0.4.2	N/A	FCFUPDATE	B.00.29
AB290	U320 SCSI/GigE Combo Card	1.05.02.00	1.03.35.69	3.0.03	N/A	pscsi.efi FCFUPDATE	1.02.03 B.00.29
AB465A	PCI-X 2-port 1000B-T/2- port 2Gb FC Combo	1.49	3.03.154	7.0.a (7.0.10)	3.27	efiutil.efi FCFUPDATE	2.17 B.00.29
AB545A	4-port 1000B-T Ethernet	N/A	N/A	3.0.03	N/A	FCFUPDATE	B.00.29
AB378A/B AB379A/B	4 GB Fibre Channel (FC)	1.05	4.00.70	N/A	N/A	efiutil.efi	2.17
AD193A/ AD194A	PCI-X 4Gb FC & 1000Base-T	1.05	4.00.70	3.0.13	N/A	FCFUPDATE	B.00.29
AD331A/ AD332A	PCI-X Single- Port 1000Base-T 1000Base-SX	N/A	N/A	3.0.13	N/A	FCFUPDATE	B.00.29

¹ The card utilizes the EFI driver that is in the platform's system firmware.

² Some revisions of these cards may not have the versions listed above and will need to be updated. See the following sections of this document for further information.

4.3.4 checking card firmware versions (Integrity)

Checking the Current Firmware Versions on Your System.

- EFI drivers:

In nPars mode from the EFI Shell, type `drivers` to determine the version. The `version` column lists the version. For example:

```
Shell> search all
Shell> drivers
          T   D
D         Y C I E
R         P F A B
V VERSION  E G G C #D #C DRIVER NAME                IMAGE NAME  Comments
== ===== = = = = == == =====
41 0007000A ? X X - - - Broadcom Gigabit Ethernet Driv BRM5701_LAN-----
47 B0000145 ? X X X - - QLogic Fibre Channel Driver      S=0E B=16 D=4 F=0 I=0
48 0007000B B X X - 4 4 Broadcom Gigabit Ethernet Driv S=0E B=16 D=6 F=0 I=0
49 01040200 B X X - 4 22 LSI Logic Fusion MPT Driver      S=0E B=2A D=1 F=0 I=0
4A B0000145 ? X X X - - QLogic Fibre Channel Driver      S=0E B=40 D=4 F=0 I=0
4B 0007000B B X X - 1 1 Broadcom Gigabit Ethernet Driv S=0E B=40 D=6 F=0 I=0
4C 01030200 B X X - 2 12 LSI Logic Ultra160 SCSI Driver      S=0E B=69 D=1 F=0 I=0
4D 0000FF33 D X X - 2 - HP XL2 Fibre Channel Mass Stor S=0E B=93 D=1 F=0 I=0
4E B0000147 B X X X 2 10 HP 2 Gb Fibre Channel Driver      S=0E B=D4 D=1 F=0 I=0
4F 01030000 ? X X - - - LSI Logic Ultra320 SCSI Driver      S=0A B=2B D=4 F=0 I=0
50 00002160 ? - - - - - Intel(R) PRO/1000 v2.16 EFI-64 S=0A B=2B D=6 F=0 I=0
```

In the example above, the bold line shows the current version for the 2 GB Fibre Channel Driver as 1.47.

- Boot code for the A9782A/A9784A/AB465 cards:

In nPars mode from the EFI device prompt, execute `ode fcfupdate`. For example:

```
Shell>fs0: ode fcfupdate
*****
*                List of Supported IO Cards                *
*****
Index  Card Name                H/W Path                FW Revision
-----
0      HP A9782A/LAN Card  Acpi(000222F0,0)/Pci(1|0)/Pci(6|0) 7000a
*****
*                List of Firmware Files found                *
*****
File Name                Ver.    Size    Vendor ID & Device ID Supported
-----
brcm_efi.frm             7000b  79872  0x14e4    0x16c7
a9782a_bc.frm            230    11288  0x14e4    0x16c7
```

Then, to display the boot code version, execute `dispbpc`. For example:

```
FCFUPDATE> dispbpc
Card                Boot Code Rev
-----
HP A9782A/LAN Card  225
```

4.3.5 obtaining and installing card firmware (Integrity)

Obtaining and Installing the Firmware.

- Web Download:

For vPars A.04.xx and A.05.xx, you can download the required HBA EFI utilities, firmware, and EFI drivers for the cards from the web:

1. Go to the <http://www.hp.com> website.
2. Click the `Software & Driver Downloads` link.
3. Enter `vPars` in the search box and click the `>>` search button.
4. Under `Select operating system`, click `HP-UX 11.x` (it is the only one listed).
5. In the table, click the applicable version:

<code>vPars A.04.01</code>	Select the download for vPars A.04.0x.
<code>vPars A.04.02</code>	Select the download for vPars A.04.0x.
<code>vPars A.04.03</code>	Select the download for vPars A.04.0x.
<code>vPars A.04.04</code>	Select the download for vPars A.04.0x.
<code>vPars A.05.01</code>	Select the download for vPars A.05.01.
6. Click the `Release Notes` tab to view instructions on how to install the firmware. The instructions for installing firmware differ for each type of card.

Note: The offline I/O card and diagnostic utilities such as `FCFUPDATE` and `IODIAG.efi` do not work in `vPars` mode. You should remain in `nPars` mode to run these utilities.

4.3.6 mass storage devices

Storage devices supported for boot and dump within HP-UX on servers without vPars are also supported for boot and dump within a vPars environment with exceptions noted below:

vPars A.05.xx, vPars A.04.xx:
No exceptions.

NOTE: Secure Path Installation on vPars-enabled Integrity-based Servers.

You cannot install Secure Path within an nPartition and subsequently install and configure the vPars product. When installing Secure Path for an Integrity-based vPars system, you must first install vPars, create and boot the virtual partitions, and then install Secure Path within each partition. Specifically, you should follow the sequence below:

1. Install HP-UX
2. Install PHKL_33581 or later
3. Install the vPars product
4. Create (vparcreate), install the OS and boot all the virtual partitions
5. Make sure PHKL_33851 is installed on each virtual partition
6. Install Secure Path in each virtual partition

For more information on Secure Path, see the home for Secure Path at <http://h18006.www1.hp.com/products/sanworks/secure-path/index.html>

vPars A.03.xx:
EVA (Enterprise Virtual Array).

EVA without Secure Path:

EVA GLs are supported w/o Secure Path only under the single path configuration. Single path is defined as 1 HBA directly connected to 1 EVA controller. (Connection from the HBA to a switch or SAN where both controllers can be seen is not considered single path.) Note that the single path configuration is not a high availability configuration; there is no access to the EVA if any points fail or if there is switchover for any reason. Note that when moving to HP-UX 11i v2, EVAs without Secure Path is not enabled.

EVAs with SP (Secure Path):

EVAs with Secure Path is supported as follows:

	prior to SP 3.0c	SP 3.0c	SP 3.0d and later
vPars boot/dump	no	no	yes
vPars data	no	yes	yes

Note: EVA GL 5000/3000 with SP is supported with vPars. However, the EVA GL with SP is not supported with Ignite-UX.

4.3.7 interconnects

vPars supports the HP Hyperfabric products and protocols (HMP, TCP, UDP, IP).

All interconnects, including hubs, switches, and fibre channel storage arrays, that are supported for HP-UX without vPars are supported for HP-UX with vPars, with exceptions noted below:

vPars A.05.xx, vPars A.04.xx:

J3525A (X.25) cards cannot be used with vPars on Integrity systems at this time (see JAGag33474).

You must use the firmware version that is noted in the A.03.xx section below (or a later firmware version).

vPars A.03.xx:

The following interconnect hubs and switches are supported with vPars as follows:

Switch or hub	Firmware version (if applicable or required)
FC S10 hub	N/A
Brocade 2400/2800 1Gb	2.6.1c
Brocade 3800 1Gb/2Gb	3.1.1c
Brocade 12000	4.0.2b, 4.1.2b
StorageWorks Edge 2/24, McData 2/24	04.01.02 or 05.01.00-24
StorageWorks Director 2/64, EMC ED-64M, McData FC64, McData Director 2/64	05.02.00-13
McData 2/32, McData 2/16	05.02.00-13

The following interconnect storage device firmware versions are supported with vPars as follows:

Device	Firmware version (if applicable or required)
VA7110	HP18
XP1024	21-03-03
SC10	HP05
Icicle	HP62
EMC 6.0	5669, 5670
DS2100	N/A

Brocade Switches.

When configuring boot devices via a Brocade switch, if using EMC disk array boot devices, the HBA connection to the Brocade switch must be configured as a G-port. (The "portcfggport" command does exist on 2400/2800 switches even though it is not listed in the 'help' output.)

Improved time-to-boot has been observed with the Brocade firmware revision v3.0.2.c.

When using an rp5405, L3000/rp5470, or N4000/rp7400 that is booting a fiber channel mass storage device via a Brocade 3800 switch:

- Using PDC 43.22 firmware and Brocade switch firmware v3.0.2.f, configure the HBA port in the switch as G-port.
- Using PDC 43.22 firmware and Brocade switch firmware v3.1.1, you must boot the virtual partitions documently using `vparload` from the vPars monitor prompt or `vparboot` from the HP-UX shell prompt. Autobooting the virtual partitions will not work.
- Using PDC 43.36 firmware and Brocade switch firmware v3.1.1, you may experience a very slow boot. This is not experienced with firmware v3.0.2.f.

4.4 software applications

For a complete list of software requirements and product support and interactions, refer to the HP-UX Virtual Partitions Administrator's Guide.

4.4.1 application certification

Applications running on top of HP-UX using vPars run the same as when run on HP-UX native-mode (standalone). No changes, recompilation, or re-certification are required for applications running in the virtual partitions unless otherwise noted.

4.4.2 Ignite-UX version

vPars A.05.xx

See the Ignite-UX product documentation for the Ignite-UX version required for HP-UX 11i v3; vPars itself has no special requirements. At this time, HP-UX 11i v3 requires Ignite-UX version C.7.1.x or later.

vPars A.04.xx:

Ignite-UX version C.6.2.241 or later is required.

NOTE: Please do not use Ignite-UX version C.6.3.xx. For the latest version of Ignite-UX, see Ignite-UX at the Software Depot web page at <http://www.hp.com/go/softwaredepot>

WARNING: Ignite-UX C.6.8 or later will not work with vPars A.04.01 on PA systems. Please either use an Ignite-UX version earlier than C.6.8 and later than C.6.2.241 or upgrade to vPars A.04.02.

vPars A.03.xx:

Ignite-UX version B.3.7 or later is required.

4.4.3 WLM version

For detailed information on WLM compatibilities including required versions, see the WLM Product Release Notes available at <http://www.hp.com/go/wlm>.

Note: when using vPars, WLM, and iCAP on the same system, you will need the following minimum versions:

vPars	A.03.01 or later
WLM	A.03.00 or later
iCAP	B.06.01 or later for nPartition-able servers B.05.01 or later for non-nPartition-able servers

Note: when using Psets, vPars, WLM, and iCAP on the same system, you will need the following minimum versions:

vPars	A.04.01 or later
WLM	A.03.01 or later
iCAP	B.07.00 or later

A virtual partition can be resized automatically based on application performance using WLM. The white paper Sizing vPars Automatically with HP-UX Workload Manager provides details on how to use WLM to accomplish this. The white paper can be found at <http://docs.hp.com/hpux/11i/index.html#Virtual%20Partitions> as well as in the information library section of the WLM web page at <http://www.hp.com/go/wlm>.

4.4.4 iCAP version (formerly known as iCOD)

Note: When using dual-core Intel® Itanium® 2 (Montecito) systems, iCAP requires iCAP version 8.x or higher. For more information, please see the iCAP v8.x product release notes available at <http://docs.hp.com>.

vPars A.05.xx:

HP-UX 11i v3 systems require iCAP version 8.01.x or higher; vPars itself has no special requirements.

vPars A.04.xx:

For vPars A.04.01 and iCAP B.07.xx, see the A.04.xx resources chapter of the HP-UX Virtual Partitions Administrator's Guide for information on using iCAP B.07.xx with vPars A.04.01.

vPars A.03.xx:

The hang during shutdown documented on page 25 of the vPars A.03.01 RBI is fixed with iCAP B.06.02.

4.4.5 PPU version (Pay-Per-Use)

vPars A.05.xx and vPars A.04.xx:
vPars supports both PPU Percent Utilization and PPU Active CPU.

vPars A.03.xx:
vPars supports PPU Percent Utilization.

4.4.6 parmgr and vparmgr

vPars A.05.xx and vPars A.04.xx:

parmgr	Partition Manager is no longer required for installation of vPars.
vparmgr	The vparmgr graphical user interface (GUI) is not available.

vPars A.03.xx:

parmgr	Partition Manager (parmgr) version B.11.11.01.05 or later is required for installation of the vPars product. This is true on both nPartition-able servers, as well as non-nPartition-able servers (rp7400/N4000 and rp5470/L3000). (It is normal to have this product installed but not used on non-nPartition-able servers.) A compatible version is available from the HP Software Depot. The HP Software Depot home is at http://www.hp.com/go/softwaredepot
vparmgr	Virtual Partition Manager (vparmgr) GUI is available, as an alternative to the command-line interface, to simplify configuration and management of vPars. This is included on the HP-UX Virtual Partition DVD and is available from the HP Software Depot.

4.4.7 online diagnostics versions

To run the Support Tools package on a vPars server, you need the following STM versions:

vPars A.05.xx:
See the Support Tools product documentation for the Support Tools version required for HP-UX 11i v3; vPars itself has no special requirements.

vPars A.04.xx:
STM C.48.00 or later (available from the HP-UX 11i v2 May 2005 Update or later)

vPars A.03.xx:
STM A.43.00 or later (along with patch PHSS_28252 or its successor)

4.4.8 high availability and ServiceGuard

Both ServiceGuard and hardware failover capabilities are supported in HP-UX Virtual Partitions.

Note: The individual server usage and mission criticality should be considered in the failover design. (i.e., since HP-UX Virtual Partitions does not include hardware isolation, it does not provide the same level of isolation as failovers between either two separate machines or nPartitions). Please see the HA vPars design white paper ServiceGuard Cluster Configuration for Partitioned Systems, available at <http://www.docs.hp.com/hpux/ha/index.html>.

vPars A.05.xx:
See the ServiceGuard product documentation for the ServiceGuard version required for HP-UX 11i v3; vPars itself has no special requirements.

vPars A.04.xx:
ServiceGuard A.11.16 and later.

vPars A.03.xx:
ServiceGuard A.11.13 and later.

5 related information

The following list of references provides useful background information on related products and topics:

Partitioning, nPartitions, vPars, WLM Information
<http://www.hp.com/go/partitions>

Server Virtualization
<http://www.hp.com/go/virtualization>

HP-UX 11i
<http://www.hp.com/go/HP-UX>

For more information, contact any of our worldwide sales offices or HP Channel.

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