

HP-UX Virtual Partitions Ordering and Configuration Guide

T1335DC, 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 Guide* (formerly *Installing and Managing HP-UX Virtual Partitions*)
- *HP-UX Virtual Partitions Release Notes*

All vPars documents can be found on the web at:

<http://docs.hp.com/hpux/os/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.

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 “Features of vPars Software by Release” (page 11); for detailed information on a specific release, see the *HP-UX Virtual Partitions Release Notes* document for that release.

What's Changed in This Document

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

This document lists a version number as its edition on the title page. This allows multiple updates of this document within a given month and allows specifying what has changed in this document versus what has changed in the vPars software. Note that this version format applies only to the version of this document and does not apply to the version 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 06.01.01, the estimated date of publication is 2006, January 1st.

Version 06.01.01 is the first “versioned” release of this document and prior to that was the October 2005 version. The October 2005 version of this document has been archived at <http://docs.hp.com/hpux/os/11i/index.html#Virtual%20Partitions>.

Revision History

Version 10.09.19

- Updated for the vPars A.05.07 September 2010 release.

Version 10.03.18

- Updated for the vPars A.05.06 March 2010 release.
- Updated for the vPars A.04.07 release.

Version 09.06.16

- Updated the EFI Boot Services Driver version information for resolving issues with SAS HBA AH303A.

Version 09.03.23

- Updated for the vPars A.05.05 release.

Version 08.09.23

- Updated Table 4-10 (page 34) and Table 4-19 (page 51) with vPars A.05.04 support details for cards AD221A, AD222A, and AD393A.

Version 08.09.02

- Updated for the vPars A.04.06 release.
- Updated for the vPars A.05.04 release.

Version 08.08.22

- Updated Table 4-10 (page 34) and Table 4-18 (page 49) with vPars A.05.03 support details for cards AD221A, AD222A, and AD393A.

Version 08.04.09

- Updated for the vPars A.05.03 release.
- Added “Oracle with Dynamic Virtual Partitions” (page 60).

Version 08.02.29

- Updated Section (page 25) details about support for Dual-core Intel® Itanium® processor 9100 series (Montvale).
- Revised Section (page 59) to clarify vPars A.03.05 requirement for iCAP version 8.03.

Version 08.02.22

- Updated electronic download details for the vPars releases.

Version 08.01.15

- Updated Table 4-10 (page 34) and Table 4-17 (page 48) with vPars A.05.02 support for AD332A and AB379B.

Version 07.12.21

- Updated the vPars A.04.05 HP-UX version requirements in Table 4-2 (page 23).
- Updated Table 4-10 (page 34) and Table 4-14 (page 43) with support for AD299A and AD300A.

Version 07.12.12

- Updated for the vPars A.03.05 release.
- Updated for the vPars A.04.05 release.
- Updated boot support for AD337A, AD338A in Table 4-10 (page 34).

Version 07.11.30

- Updates to “Server Firmware” (page 26) for tape boot support on HP Integrity servers (see Table 4-6 and Table 4-7).
- Corrections to minimum firmware requirements for sx2000 Superdome servers in Table 4-5 (page 27), Table 4-6 (page 28), and Table 4-7 (page 29) to reflect current stable, released firmware revisions.

Version 07.10.19

- Updated “Obtaining and Installing Card Firmware (Integrity)” (page 55) download instructions.

Version 07.09.17

- Updated for the vPars A.05.02 release.
- Added rx7620, rx8620 servers to Table 4-8 (page 31).
- Updated Table 4-10 (page 34) and added a “Supported vPars Releases” column.

Version 07.07.31

- Updated the vPars A.03.03 minimum end of support date to March 2008; see Table 3-4 (page 21).

Version 07.07.20

- Added vPars A.05.01 patch requirement (PHSS_36739) when using the vPars A.05.01 dynamic memory migration feature; see “Patch Bundle” (page 24).
- Corrected vPars A.03.04 minimum HP-UX level; see Table 4-3 (page 23).
- Updated document format, headings, and organization.

Version 07.06.05

- 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 “Server Firmware” (page 26).

Version 07.03.15

- Finalized for vPars A.03.04 release.
- Added AB379A (2-Port 4Gb Fibre Channel) to card firmware tables for A.04.xx in “Required Card Firmware (Integrity)” (page 39) and corrected part number to “AB287A” in Table 4-11 (page 40).
- Updated download instructions in “Obtaining and Installing Card Firmware (Integrity)” (page 55).
- Corrected section numbering in “Supported Cards” (page 32).

Version 07.03.06

- Corrected PA-RISC card product numbers typos in Table 4-9 (page 33): 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)

Version 07.02.20

- Finalized for vPars A.05.01 release.
- Reorganized 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 “Obtaining and Installing Card Firmware (Integrity)” (page 55)).
- 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-RISC 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® (Montecito) processors.

Version 06.12.15

- 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® (Montecito) processor information.

Version 06.10.01

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

Version 06.09.01

- Finalized for vPars A.04.03 release.

Version 06.06.01

- 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).

Version 06.03.16

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

Version 06.03.07

- Additions for vPars A.04.02.

Version 06.01.15

- PHKL_31227 is required for cards that have a PCI-to-PCI bridge. This includes the cards AB290A, A9782A, A9784A, and AB465A. See "Supported Mass Storage and Networking Cards (PA-RISC)" (page 32).

Version 06.01.01

- 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/os/11i/index.html#Virtual%20Partitions>).
- New versioning and formatting of this document.

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 (HP-UX kernel isolation)
- hosts its own set of applications in a fully isolated environment (application isolation)

“Well-behaved” applications built on HP-UX 11i are binary compatible to run within HP-UX Virtual Partitions (vPars) on the same architecture family. No changes, recompilation or re-certification is necessary. For more information see the following document (*HP-UX 11i Compatibility for HP Integrity and HP 9000 Servers*) at: http://h20338.www2.hp.com/hpux11i/downloads/HP-UX_Binary_Compatibility.pdf

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

vPars provides these benefits 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

Advantages of HP-UX vPars

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

Features of vPars Software by 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.

vPars A.05.xx Releases

vPars A.05.07

- Extends support to HP Superdome2 Integrity servers and also fixes customer reported problems and internally found defects.

For more details about partitioning information on HP Superdome2, see the *HP Superdome 2 Partitioning Release Notes* and *HP Superdome2 Administrator Guide*.

vPars A.05.06

- An enhancement in the `mon_bootpath` command at Monitor prompt to put the monitor boot path at the beginning in the EFI boot manager menu, and to view the default bootpath.
- Product bundling changes. Starting this release, HP-UX Virtual Partitions will not be delivered as part of the bundle T1335CC. Henceforth, only the bundle T1335DC, which was introduced since the HP-UX March 2009 release, will include vPars.
- Fixes to some of the customer-encountered defects.

vPars A.05.05

- vPars A.05.05 adds support for vPars configuration based on Locally Optimized Reference Architecture (LORA) on Multi cell Integrity systems.

LORA is a framework for increasing system performance by exploiting the locality domains in HP servers with Non-Uniform Memory Architecture. LORA consists of configuration rules, tuning recommendations, HP-UX 11i v3 enhancements and tools to support them.

For more information on using LORA, see <http://docs.hp.com/en/14655/ENW-LORA-TW.pdf> and *HP-UX Virtual Partitions Administrator Guide*.

vPars A.05.04 vPars A.05.04 adds support for the following:

- Support for Directed LAN Boot feature on HP Integrity systems based on the sx1000 and sx2000 chipset

Directed Lan Boot (Direct Boot) capability allows a system administrator or a user to specify boot server information in `vparboot` command, which is typically obtained through the BootP or DHCP protocols. With this feature, you can install to a virtual partition from an Ignite Server which can be in a different subnet. For more information, see the `vparboot(1M)` and `vpardbprofile(1M)` manpages.

- Support for Tunable Base Page Size on HP Integrity systems

With this enhancement, a system administrator can set the size of a base page of system memory. The size of a base page was previously fixed at 4 KB and now the additional sizes of 8 KB, 16 KB, and 64 KB are available. This enhancement is available in Update 3 (the September 2008 Update Release) of HP-UX 11i v3 and with vPars A.05.04. The name of the new tunable is `base_pagesize`. For information on this tunable, see the `base_pagesize(5)` manpage.

For information about the new tunable that controls the size of a system base page, see "Tunable Base Page Size" in the *HP-UX 11i Version 3 September 2008 Release Notes* at the website:

<http://www.docs.hp.com/en/oshpux11iv3.html#Release%20Notes>.

vPars A.05.03 vPars A.05.03 adds support for the following:

- Starting with vPars A.05.03, the HP-UX 11i v3 vPars software is distributed on the HP-UX 11i v3 Operating Environment media. vPars A.05.03 is distributed via the new Virtual Server OE (VSE-OE) and the new Data Center OE (DC-OE).

There is no longer a separate HP-UX 11i v3 Virtual Partitions DVD.

- Support for mixed HP-UX 11i v1/v2/v3 vPars environments on PA-RISC systems only.
A mixed HP-UX 11i v1/v2/v3 vPars environment allows you to have a vPars A.05.03 Monitor and database that simultaneously supports virtual partitions running HP-UX 11i v1 (B.11.11), HP-UX 11i v2 (B.11.23), and HP-UX 11i v3 (B.11.31) in the same nPartition.
Only the following vPars releases are supported in a mixed HP-UX 11i v1/v2/v3 vPars environment:
 - virtual partitions running vPars A.05.03 on HP-UX 11i v3 (11.31)
 - virtual partitions running vPars A.04.02 or later on HP-UX 11i v2 (11.23), and
 - virtual partitions running vPars A.03.05 on HP-UX 11i v1 (11.11)
- Support for the next-generation mass storage subsystem in HP-UX 11i v3 (including agile addressing) has been extended to include vPars configurations and operations starting with vPars A.05.03. Agile addressing support is only provided for lunpath hardware paths, not for LUN hardware paths. Use of LUN hardware paths will result in an error.
- HP-UX now supports read-only use of optical media via an iLO 2 MP on HP Integrity servers based on the sx2000 chipset, including rx7640, rx8640, and HP Integrity Superdome servers.
vPars A.05.03 supports all the standard iLO 2 MP features that are supported by HP-UX, including the Lights Out Advanced features of vMedia. However, vPars does not support virtual keyboard, video, and mouse features.
- On nPartitions with more than eight cells, the vPars software issues the following warning before booting vPars.
WARNING Unsupported configuration: booting vPars on nPar with >8 cells
vPars supports nPartition configurations with eight or fewer cells.
- **Obsolescence Notes**
The vPars A.04.02 and vPars A.03.03 releases are no longer supported. See “Obsolescence of vPars Releases” (page 20).

vPars A.05.02 vPars A.05.02 adds support for the following:

- Support for HP 9000 rp7440, rp8440, and Superdome sx2000 Servers
For vPars A.05.02 server firmware and other configuration requirements, see the *HP-UX Virtual Partitions Ordering and Configuration Guide*.
- Pre-enablement of SCSI tape boot and recovery for Integrity servers
This feature is pre-enabled in vPars A.05.02 but is not yet supported by system firmware.
- Support for booting virtual partitions from DVD on Integrity servers
On Integrity servers, the vPars A.05.02 vPars Monitor can boot an install kernel from DVD media. The vPars Monitor (vpmon) supports DVD boot through the new `vparload -D` option. For details see the *HP-UX Virtual Partitions Administrator Guide*.
- **Obsolescence Notes**
vPars A.04.01 is no longer supported. See “Obsolescence of vPars Releases” (page 20).

vPars A.05.01 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 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 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 Guide*.

- **Obsolescence Notes**

vPars A.03.02 is no longer supported. See “Obsolescence of vPars Releases” (page 20).

Servers that are not nPartitionable are not supported under A.05.01. These servers are the rp5470/L3000, rp5405, and rp7400/N4000. See “Servers” (page 25). These servers remain supported for A.03.xx and A.04.xx.

vPars A.04.xx Releases

vPars A.04.07 There are no new or changed features in the vPars A.04.07 release.

vPars A.04.06 The following features are new with the vPars A.04.06 release:

- Enhanced dynamic vPars support with Oracle Real Application Clusters (RAC) on HP 9000 PA-RISC servers



NOTE: This functionality is already available on vPars A.04.04 for Integrity servers.

- PCIe SAS support and tape recovery feature on Integrity servers

vPars A.04.06 on HP Integrity platforms enables you to use SAS disks as boot devices in vPars environment.



IMPORTANT: In certain situations while using vPars with SAS disks as boot disk on HP Integrity platforms, the `vparstatus -v` and `setboot` commands may show different boot disk paths in vPars mode. This behavior is normal, and is due to the disks being scanned in a different sequence at boot time. This behavior also occurs when you boot into nPars mode and then boot back in vPars mode.

For example:

1. A virtual partition is ignited from a SAS disk and booted in vPars mode, and the `vparstatus -v` command displays the boot disk path as *A*.
 2. If the system is booted back to nPars mode, the boot path may change to *B*, which is different from *A* due to a different scan order. This would also change the boot path to *B* in the vPars database (`/stand/vpdb`).
 3. After booting back to vPars mode, the `vparstatus -v` command for this virtual partition shows *B* as the boot path and the `setboot` command still shows *A*. Both boot paths (*A* and *B*) refer to the same SAS disk path.
-

vPars A.04.05 vPars A.04.05 adds support for the following:

- Support for mixed HP-UX 11i v1/v2 vPars environments.
Beginning with vPars A.04.05, you can have a mixed HP-UX 11i v1/v2 vPars environment. A mixed HP-UX 11i v1/v2 vPars environment enables you to have a vPars A.04.05 Monitor and database that supports both virtual partitions running vPars A.04.05 on HP-UX 11i v2 (11.23) and virtual partitions running vPars A.03.05 on HP-UX 11i v1 (11.11). For detailed information, see the “Mixed HP-UX 11i v1/v2 vPars Environments in vPars A.04.05” section in the “Planning” chapter of the *HP-UX Virtual Partitions Administrator Guide*.
- Support for boot and recovery from DVD (HP Integrity servers only).
vPars A.04.05 supports booting from CD/DVD media on HP Integrity servers.

vPars A.04.04 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 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 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 “Obsolescence of vPars Releases” (page 20).

vPars A.04.02 vPars A.04.02 adds support for the following:

- Integrity servers using the sx2000 chipset (firmware update may be required):
 - HP Integrity Superdome servers
 - 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 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 “Obsolescence of vPars Releases” (page 20).

vPars A.04.01 vPars A.04.01 adds support for the following:

- Support for HP-UX 11i v2 (11.23) on both the PA-RISC 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 for HP-UX 11i v2

T1335AC vPars A.03.xx and vPars A.02.xx for HP-UX 11i v1

For more information, see “Operating Systems” (page 23).

- Support for both HP Integrity and PA-RISC servers (firmware update may be required).

These Integrity servers are supported:

- HP Integrity Superdome servers
- rx8620
- rx7620

These PA-RISC servers are supported:

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

For information, see “Hardware” (page 24).

- Cards, Interconnects, and Mass Storage Devices

Additional IO and Networking cards are supported in vPars A.04.01. See “Supported Cards” (page 32).

- Obsolescence Note

vPars A.02.01 and A.02.02 are no longer supported as of this A.04.01 release. See “Obsolescence of vPars Releases” (page 20).

vPars A.03.xx Releases

vPars A.03.05 vPars A.03.05 adds support for:

- Support for mixed HP-UX 11i v1/v2 vPars environments.

Beginning with vPars A.04.05, you can have a mixed HP-UX 11i v1/v2 vPars environment. A mixed HP-UX 11i v1/v2 vPars environment enables you to have a vPars A.04.05 Monitor and database that supports both virtual partitions running vPars A.04.05 on HP-UX 11i v2 (11.23) and virtual partitions running vPars A.03.05 on HP-UX 11i v1 (11.11). For detailed information, see the “Mixed HP-UX 11i v1/v2 vPars Environments in vPars A.04.05” section in the “Planning” chapter of the *HP-UX Virtual Partitions Administrator Guide*.

- Full integration with HP Instant Capacity (iCAP) and iCAP enforcement.
iCAP version 8.03 supports HP-UX 11i v1 vPars (support for vPars A.03.05 has been added).
- vPars A.03.05 supports HP Global Workload Manager (gWLM) with the restrictions listed in the *HP-UX Virtual Partitions Release Notes A.03.05*.

vPars A.03.04 vPars A.03.04 adds support for HP 9000 servers based on the sx2000 chipset, including:

- HP 9000 Superdome
- rp8440
- rp7440

vPars A.03.03 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 Guide*.
- Support for Tape Devices
For more information, see the recovery chapter in *HP-UX Virtual Partitions Administrator Guide*.
- Customer-requested Defect Fixes
For more information, see the *HP-UX Virtual Partition Release Notes* for this release.

vPars A.03.02 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 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
- Obsolescence Note

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 “Obsolescence of vPars Releases” (page 20).

No new cards are being added for the A.03.01 release. For a list of all the cards that are supported, see “Supported Cards” (page 32).

3 Purchasing and Licensing

This section describes the licensing and the vPars releases that are currently supported.

vPars Licensing

The HP-UX Virtual Partitions (vPars) product is 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 T1335DC. To purchase the vPars product, contact your local HP representative or reseller.



IMPORTANT: Starting March 2010 release (vPars A.05.06), HP-UX Virtual Partitions will not be delivered as part of the bundle T1335CC. The product number for vPars bundle T1335CC is now changed to T1335DC. Henceforth, both the Virtual Server Environment Operating Environment (VSE OE) media and the Application Release (AR) media will contain the vParsT1335DC bundle. The T1335DC bundle was originally introduced in the HP-UX March 2009 release.



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.

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/>

Product Numbers

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

Table 3-1 vPars Product Support for HP-UX and Servers

Product Number	vPars Version	HP-UX 11i Version Supported	HP-UX Releases Supported	HP Server Platforms Supported
T1335DC	vPars A.05.05 and later	HP-UX 11i v3 (11.31)	March 2009 or later	PA-RISC and Integrity
T1335BC	vPars A.04.xx and later	HP-UX 11i v2 (11.23)	May 2005 or later	PA-RISC and Integrity
T1335AC	vPars A.03.xx and earlier	HP-UX 11i v1 (11.11)	December 2000 or later	PA-RISC

vPars Media

Starting with vPars A.05.03, the HP-UX 11i v3 vPars software is distributed on the HP-UX 11i v3 Operating Environment media. There is no longer a separate HP-UX 11i v3 Virtual Partitions DVD.

HP-UX 11i v3 vPars software is distributed via the Virtual Server OE (VSE-OE) and the Data Center OE (DC-OE). To install vPars, select the optional software bundle for HP-UX 11i v3 vPars (T1335DC) prior to installing or updating HP-UX.

The vPars software for HP-UX 11i v3 is delivered in the following ways:

- As a stand-alone product on the HP-UX 11i v3 Application Software DVD.
- As a product included in the HP-UX 11i v3 Virtual Server OE.
- As a product included in the HP-UX 11i v3 Data Center OE.

Obsolescence of vPars Releases

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



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

Table 3-2 Support Dates for vPars A.05.xx on 11i v3

vPars Version	Release Date	Minimum End of Support Date	Status
A.05.01	February 2007	March 2010	Unsupported
A.05.02	September 2007	September 2010	Unsupported
A.05.03	March 2008	March 2011	Supported
A.05.04	September 2008	September 2011	Supported
A.05.05	March 2009	March 2012	Supported
A.05.06	March 2010	March 2013	Supported
A.05.07	September 2010	September 2013	Supported

Table 3-3 Support Dates for vPars A.04.xx on 11i v2

vPars Version	Release Date	Minimum End of Support Date	Status
A.04.01	September 2005	September 2007	Unsupported
A.04.02	March 2006	March 2008	Unsupported
A.04.03	September 2006	September 2008	Unsupported

Table 3-3 Support Dates for vPars A.04.xx on 11i v2 (continued)

vPars Version	Release Date	Minimum End of Support Date	Status
A.04.04	June 2007	June 2010	Supported
A.04.05	December 2007	December 2010	Supported
A.04.06	September 2008	September 2011	Supported
A.04.07	March 2010	March 2013	Supported

Table 3-4 Support Dates for vPars A.03.xx on 11i v1

vPars Version	Release Date	Minimum End of Support Date	Status
A.03.01	April 2004	May 2006	Unsupported
A.03.02	December 2004	December 2006	Unsupported
A.03.03	October 2005	March 2008	Unsupported
A.03.04	March 2007	March 2010	Unsupported
A.03.05	December 2007	December 2013	Supported

Table 3-5 Support Dates for vPars A.02.xx on 11i v1

vPars Version	Release Date	Minimum End of Support Date	Status
A.02.01	—	July 2004	Unsupported
A.02.02	—	January 2005	Unsupported
A.02.03	—	December 2005	Unsupported

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

Operating Systems

vPars releases require the HP-UX versions and patch bundles listed in this section.

HP-UX Version

vPars requires the following HP-UX versions. For further HP-UX requirements based upon your specific processor and chipset, see “Processors and Chipsets” (page 25).

Table 4-1 HP-UX Versions Required for vPars A.05.xx

vPars Release	HP-UX Requirement
vPars A.05.07	HP-UX 11i v3 (11.31) September 2010 Update or later
vPars A.05.06	HP-UX 11i v3 (11.31) March 2010 Update or later
vPars A.05.05	HP-UX 11i v3 (11.31) March 2009 Update or later
vPars A.05.04	HP-UX 11i v3 (11.31) September 2008 Update or later
vPars A.05.03	HP-UX 11i v3 (11.31) March 2008 Update or later
vPars A.05.02	HP-UX 11i v3 (11.31) September 2007 Update or later
vPars A.05.01	HP-UX 11i v3 (11.31) February 2007 or later

Table 4-2 HP-UX Versions Required for vPars A.04.xx

vPars Release	HP-UX Requirement
vPars A.04.07	HP-UX 11i v2 (11.23) June 2008 or later
vPars A.04.06	HP-UX 11i v2 (11.23) June 2007 or later
vPars A.04.05	HP-UX 11i v2 (11.23) June 2007 or later
vPars A.04.04	HP-UX 11i v2 (11.23) June 2007 or later
vPars A.04.03	HP-UX 11i v2 (11.23) September 2006 or later
vPars A.04.02	HP-UX 11i v2 (11.23) March 2006 Update or later
vPars A.04.01	HP-UX 11i v2 (11.23) May 2005 Update or later

Table 4-3 HP-UX Versions Required for vPars A.03.xx

vPars Release	HP-UX Requirement
vPars A.03.04 and A.03.05	HP-UX 11i v1 (11.11) December 2000 Update or later PA-RISC servers based on the HP sx2000 chipset (rp7440, rp8440, HP 9000 Superdome) require HP-UX 11i v1 (11.11) December 2006 Update or later
vPars A.03.01, A.03.02, and A.03.03	HP-UX 11i v1 (11.11) December 2000 Update or later

Patch Bundle

vPars A.05.07 vPars A.05.07 requires the following patch bundles from the HP-UX 11i v3 (B.11.31) September 2010 update release:

- B.11.31.1009 FEATURE11i (required patches for vPars install)

vPars A.05.06 vPars A.05.06 requires the following patch bundles from the HP-UX 11i v3 (B.11.31) March 2010 update release:

- B.11.31.1003 FEATURE11i (required patches for vPars install)

vPars A.05.05 vPars A.05.05 requires the following patch bundles from the HP-UX 11i v3 (B.11.31) March 2009 update release:

- B.11.31.0903 FEATURE11i (required patches for vPars install)

vPars A.05.04 vPars A.05.04 requires the following patch bundles from the HP-UX 11i v3 (B.11.31) September 2008 update release:

- B.11.31.0809 FEATURE11i (required patches for vPars install)

vPars A.05.03 vPars A.05.03 requires the following patch bundles from the HP-UX 11i v3 (B.11.31) March 2008 update release:

- B.11.31.0803 FEATURE11i (required patches for vPars install)

vPars A.05.02 vPars A.05.02 requires the following patch bundles from the HP-UX 11i v3 (B.11.31) September 2007 update release:

- B.11.31.0709 FEATURE11i (required patches for vPars install)
- C.02.00.03 SFM-CORE (required bundle for optimal CPU migration performance)

vPars A.05.01 The vPars A.05.01 release requires patch PHSS_36739 to resolve issues with the vPars dynamic memory migration feature. This patch fixes JAGag43006 (“Memory got removed from an active partition during memory OLA”). The patch is available at the HP IT Resource Center (at <http://itrc.hp.com> select **maintenance and support for hp products**). For details see *HP-UX Virtual Partitions Release Notes (A.05.01)*.

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 and 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>. To get Quality Pack (QPK) bundles from <http://itrc.hp.com>:

1. Select **maintenance and support for hp products**.
2. Click 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 HP-UX 11.11 OE software and HP-UX 11.11 vPars software.

Hardware

This section lists the supported hardware configurations.

Servers

vPars releases support the following HP-UX servers as indicated in Table 4-4. “Yes” indicates the vPars release is supported on the server model, and “No” indicates the vPars release is unsupported on the server model.

Table 4-4 Server Support for vPars Releases

Server Model	A.03.01	A.03.02 and A.03.03	A.03.04 and A.03.05	A.04.01	A.04.02 and A.04.03	A.04.04, A.04.05, and A.04.06	A.05.01	A.05.02, A.05.03, A.05.04, and A.05.05
rp5470 ¹ /L3000, rp5405	Yes	Yes	Yes	Yes	Yes	Yes	No	No
rp7400/N4000	Yes	Yes	Yes	Yes	Yes	Yes	No	No
rp7405, rp7410	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rp8400	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rp7420	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rp8420	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rp7440, rp8440	No	No	Yes	No	No	Yes	No	Yes
Superdome (PA-8600, PA-8700)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Superdome on sx1000 chipset (PA-8800, PA-8900)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Superdome on sx2000 chipset (PA-8900)	No	No	Yes	No	No	Yes	No	Yes
rx7620	No	No	No	Yes	Yes	Yes	Yes	Yes
rx8620	No	No	No	Yes	Yes	Yes	Yes	Yes
rx7640	No	No	No	No	Yes	Yes	Yes	Yes
rx8640	No	No	No	No	Yes	Yes	Yes	Yes
Superdome on sx1000 chipset (Integrity)	No	No	No	Yes	Yes	Yes	Yes	Yes
Superdome on sx2000 chipset (Integrity)	No	No	No	No	Yes	Yes	Yes	Yes

¹ The carrier-grade version of rp5470 is not supported by vPars.

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®

Notes about vPars Support for Processors The following are additional details about vPars support for processors.

- 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—is 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® (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® (Montecito) processor.
- vPars A.05.01 or later is required when using the Dual-core Intel® Itanium® (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® (Montecito) processor (HT ON/OFF).
- vPars A.04.04 or later, or vPars A.05.02 or later, is required when using the Dual-core Intel® Itanium® processor 9100 series (Montvale).

Dual-Core Processors vPars supports single-core granularity, including the ability to split dual-core processors (assigning sibling processing cores to different virtual partitions). For vPars licensing information on dual-core systems, see “vPars Licensing” (page 19). For information on using dual-cores with vPars, see the resources chapters of *HP-UX Virtual Partitions Administrator Guide*.

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-RISC systems) or nPars mode (for Integrity systems).

The tables that follow list the system firmware requirements for vPars A.03.xx, A.04.xx, and A.05.xx.

- Table 4-5 (page 27) lists the vPars A.03.xx system firmware requirements.
- Table 4-6 (page 28) lists the vPars A.04.xx system firmware requirements.
- Table 4-7 (page 29) lists the vPars A.05.xx system firmware requirements.

Downloading Server Firmware To download server firmware, use the following procedure.

1. Go to <http://hp.com>.
2. Click **Software & Driver Downloads**.
3. Enter the server model in the search field.

For example: **rx7620**, **rx8640**, or **Superdome**.

If multiple products are listed in the search results, select one from the list.

4. Click **Cross operating system** under the **Select operating system** label.
5. Select a firmware release from the **Firmware – System** category.

Table 4-5 Minimum System Firmware¹ for vPars A.03.xx

Server Model	A.03.01, A.03.02 ² , and A.03.03	A.03.04 and A.03.05
rp5470/L3000, rp5405 ³	43.43	44.12
rp7400/N4000 ³	43.43	43.43
rp7405, rp7410 ⁴ , rp8400 ⁴	6.3	KIOX 8.2, PDC 17.9
rp7420 ⁴ , rp8420 ⁴	PDC 20.008	PDC 24.1
rp7440, rp8440	—	Firmware Version 1.0
Superdome ⁵ (PA-8600,PA-8700) ⁶	PDC 36.7	PDC 36.8
Superdome ⁵ on sx1000 chipset (PA-8800, PA-8900)	PDC 20.8	PDC 24.1
rx7620, rx8620	—	—
rx7640, rx8640	—	—
Superdome ⁵ on sx1000 chipset (Integrity)	—	—
Superdome ⁵ on sx2000 chipset (Integrity)	—	—
Superdome ⁵ on sx2000 chipset (PA-8900)	—	SD Recipe 6.20c

- ¹ **IMPORTANT:** HP recommends using the latest released version of system firmware. This table lists the minimum firmware requirements: on each server indicated, vPars supports the system firmware version listed here and greater.
- ² 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 December 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>.
- ³ 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 Guide*.
- ⁴ 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/.
- ⁵ 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 A firmware update is not required to move from A.03.xx to A.04.xx for Superdome servers with PA-8600 or PA-8700 processors.

Table 4-6 Minimum System Firmware¹ for vPars A.04.xx

Server Model	A.04.01	A.04.02, A.04.03	A.04.04, A.04.05, and A.04.06 ² (minimum)	A.04.04, A.04.05, and A.04.06 ² (Integrity tape boot)
rp5470/L3000, rp5405 ³	44.12	44.12	44.12	—
rp7400/N4000 ³	43.43	43.43	43.43	—
rp7405, rp7410 ⁴ , rp8400 ⁴	KIOX 8.2, PDC 17.9	KIOX 8.2, PDC 17.9	KIOX 8.2, PDC 17.9	—
rp7420 ⁴ , rp8420 ⁴	PDC 22.2	PDC 22.2	PDC 22.2	—
rp7440, rp8440	—	—	Firmware Version 1.0	—
Superdome ⁵ (PA-8600, PA-8700) ⁶	PDC 36.7	PDC 36.7	PDC 36.7	—
Superdome ⁵ 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	Firmware Release v5.1 ⁷
rx7640, rx8640	—	Firmware Version 3.0	Firmware Version 3.0	Firmware Version 4.0 ⁷
Superdome ⁵ on sx1000 chipset (Integrity)	SMS Release v6.0	SMS Release v6.0	SMS Release v6.0	Firmware Version 7.2 ⁷
Superdome ⁵ on sx2000 chipset (Integrity)	—	SD Recipe 6.11b	SD Recipe 6.11b	Firmware Recipe 8.6d ⁷
Superdome ⁵ on sx2000 chipset (PA-8900)	—	—	SD Recipe 7.3d	—

- 1 **IMPORTANT:** HP recommends using the latest released version of system firmware. This table lists the minimum firmware requirements: on each server indicated, vPars supports the system firmware version listed here and greater.
- 2 A firmware upgrade greater than the minimum firmware is only required for vPars A.04.04 and later if you need support for the vPars tape boot feature on Integrity servers.
- 3 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 Guide*.
- 4 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/.
- 5 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 A firmware update is not required to move from A.03.xx to A.04.xx for Superdome servers with PA-8600 or PA-8700 processors.
- 7 This firmware is available for download from the <http://hp.com> website. For details, see *Downloading Server Firmware* (page 26).

Table 4-7 Minimum System Firmware¹ for vPars A.05.xx

Server Model	A.05.01 ² (minimum)	A.05.02 ³ (minimum)	A.05.02 ⁴ (Integrity tape boot)	A.05.03 to A.05.07
rp5470/L3000, rp5405	—	—	—	—
rp7400/N4000	—	—	—	—
rp7405, rp7410 ⁵ , rp8400 ⁵	KIOX 8.2, PDC 17.9	KIOX 8.2, PDC 17.9	—	KIOX 8.2, PDC 17.9
rp7420 ⁵ , rp8420 ⁵	PDC 22.2	PDC 22.2	—	PDC 22.2
rp7440, rp8440	—	Firmware Version 1.0	—	Firmware Version 1.0
Superdome ⁶ (PA-8600,PA-8700)	PDC 36.7	PDC 36.7	—	PDC 36.7
Superdome ⁶ on sx1000 chipset (PA-8800, PA-8900)	PDC 22.1	PDC 22.1	—	PDC 22.1
rx7620, rx8620	Firmware Version 5.0	Firmware Version 5.0	Firmware Release v5.1 ⁷	Firmware Release v5.1 ⁷
rx7640, rx8640	Firmware Version 3.0	Firmware Version 3.0	Firmware Version 4.0 ⁷	Firmware Version 4.0 ⁷
Superdome ⁶ on sx1000 chipset (Integrity)	SMS Release v7.0	SMS Release v7.0	Firmware Version 7.2 ⁷	Firmware Version 7.2 ⁷
Superdome ⁶ on sx2000 chipset (Integrity)	SD Recipe 6.11b	SD Recipe 6.11b	Firmware Recipe 8.6d ⁷	Firmware Recipe 8.6d ⁷
Superdome ⁶ on sx2000 chipset (PA-8900)	—	SD Recipe 8.6d	—	SD Recipe 8.6d

- ¹ **IMPORTANT:** HP recommends using the latest released version of system firmware. This table lists the minimum firmware requirements: on each server indicated, vPars supports the system firmware version listed here and greater.
- ² The minimum firmware required for vPars A.05.01 supports the dynamic memory migration feature of vPars, as well as use of vPars on a system with Hyperthreading enabled (HT ON). Please note that hardware, operating system, or other applications may have other requirements.
- ³ The minimum firmware required for vPars A.05.02 supports the dynamic memory migration feature of vPars, as well as use of vPars on a system with Hyperthreading enabled (HT ON). Please note that hardware, operating system, or other applications may have other requirements.
- ⁴ A firmware upgrade beyond the minimum firmware for vPars A.05.02 is necessary only if you need support for the vPars tape boot feature on Integrity servers.
- ⁵ 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/.
- ⁶ 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.
- ⁷ This firmware is available for download from the <http://hp.com> website. For details, see [Downloading Server Firmware](#) (page 26).

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 limits specified in Table 4-8.

Table 4-8 Maximum Number of Virtual Partitions Per Server

Server Model	Maximum Number of Virtual Partitions
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, rx7620, 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, rx8620, 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-RISC), 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 about Maximum Number of Virtual Partitions

- Table 4-8 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. See “Memory Allocation” in the *HP-UX Virtual Partitions Administrator Guide* for more information.

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 Guide* for more information on how vPars uses Ignite-UX.

Notes about Minimum Virtual Partition Requirements

- 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.

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.

Supported Mass Storage and Networking Cards (PA-RISC)

Mass Storage Cards For vPars on PA-RISC servers, the mass storage cards listed in Table 4-9 (page 33) are supported with the latest release of vPars.

Table 4-9 Mass Storage Cards Supported by vPars on PA-RISC Servers

Card Product Number	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
A5159A, A5159B	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 ¹	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 ²	U320 SCSI/GigE Combo
AB378A, AB378B	PCI-X 2.0 1-Port 4Gb Fibre Channel HBA
AB379A, AB379B	PCI-X 2.0 2-Port 4Gb Fibre Channel HBA
AB465A ²	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

1 If 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 `/opt/fcms/bin/fcdutil /dev/fcd#` command.

2 Support 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 issuing the `ioscan -fkC ba` command:

```
# ioscan -fkC ba
```

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

```
ba          2 1/0/6/1/0 PCItPCI CLAIMED    BUS_NEXUS    PCItPCI 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-RISC, all networking cards that are supported for the server are supported for the server in a vPars environment.

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 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-RISC 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* ("Table of Supported Bootable Cards for Integrity Servers" in Appendix C).

Transitioning from Cards on PA-RISC to Integrity Not all cards supported for boot on PA-RISC are supported for boot on Integrity. You can check the following website for transitional information: http://h18000.www1.hp.com/products/quickspecs/11729_div/11729_div.HTML

Table 4-10 uses the following legend to indicate the type of boot support for each card on the various server models.

B — Bootable mass storage HBA	b — Bootable networking HBA	Bb — Bootable combo HBA
D — Data only (not bootable)	N — Not supported	N1 — Not supported with IOX

Table 4-10 Bootable Cards Supported for vPars on Integrity

Card Product Number	Description	Card Type	rx7620, rx8620	rx7640, rx8640	Integrity Superdome on sx1000	Integrity Superdome on sx2000	Supported vPars Release(s)
A6795A	2G FC Tachlite	Mass Storage	B	B	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A6825A	Next Gen 1000B-T (5701 chip)	Networking	b	b	D	b	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A6826A	2-port 2Gb FC	Mass Storage	B	B	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07

Table 4-10 Bootable Cards Supported for vPars on Integrity (continued)

Card Product Number	Description	Card Type	rx7620, rx8620	rx7640, rx8640	Integrity Superdome on sx1000	Integrity Superdome on sx2000	Supported vPars Release(s)
A6828A	1 port U160 SCSI	Mass Storage	B	B	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A6829A	2 port U160 SCSI	Mass Storage	B	B	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A6847A	Next Gen 1000B-SX (5701 chip)	Networking	b	b	D	b	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A7011A	1000BaseSX Dual Port (Intel® chip)	Networking	b	b	b	b	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A7012A	1000BaseT Dual Port (Intel® chip)	Networking	b	b	b	b	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A7173A	2 port U320 SCSI	Mass Storage	B	B	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07

Table 4-10 Bootable Cards Supported for vPars on Integrity (continued)

Card Product Number	Description	Card Type	rx7620, rx8620	rx7640, rx8640	Integrity Superdome on sx1000	Integrity Superdome on sx2000	Supported vPars Release(s)
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	Combo	Bb	Bb	Bb	Bb	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	Combo	Bb	Bb	Bb	Bb	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A9890A	SmartArray 6402 2-channel RAID	Mass Storage	B	B, N1	N	N	A.04.01, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
A9891A	SmartArray 6404 4-channel RAID	Mass Storage	B	B, N1	N	N	A.04.01, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AB287A	10G Ethernet	Networking	b	b	b	b	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AB290A	U320 SCSI/GigE Combo Card	Combo	Bb	Bb	Bb	Bb	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04

Table 4-10 Bootable Cards Supported for vPars on Integrity (continued)

Card Product Number	Description	Card Type	rx7620, rx8620	rx7640, rx8640	Integrity Superdome on sx1000	Integrity Superdome on sx2000	Supported vPars Release(s)
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	Combo	Bb	Bb	Bb	Bb	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AB545A	4-port 1000B-T Ethernet	Networking	b	b	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AB378A, AB379A	4 GB Fibre Channel (FC)	Mass Storage	B	B	B	B	A.04.01, A.04.02, A.04.03, A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AB378B	4 GB Fibre Channel (FC)	Mass Storage	B	B	B	B	A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AB379B	4 GB Fibre Channel (FC)	Mass Storage	B	B	B	B	A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	Combo	Bb	Bb	Bb	Bb	A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD221A	HP PCIe single port, 4GB, Fiber Channel (FC), and single port 1000Base-T adapter	Combo	—	Bb	—	Bb	A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD222A	HP PCIe dual port, 4GB, Fiber Channel (FC), and dual port 1000Base-T adapter	Combo	—	Bb	—	Bb	A.05.03, A.05.04, A.05.05, A.05.06, A.05.07

Table 4-10 Bootable Cards Supported for vPars on Integrity (continued)

Card Product Number	Description	Card Type	rx7620, rx8620	rx7640, rx8640	Integrity Superdome on sx1000	Integrity Superdome on sx2000	Supported vPars Release(s)
AD331A	PCI-X Single-Port 1000Base-T	Networking	b,N1	b,N1	b,N1	b,N1	A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD332A	PCI-X Single-Port 1000Base-SX	Networking	b,N1	b,N1	b,N1	b,N1	A.04.04, A.04.05, A.04.06, A.04.07 A.05.01, A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD337A, AD338A	PCIe 2-port 1000Base-T, PCIe 2-port 1000Base-SX	Networking	—	b	—	b	A.05.02, A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD299A	PCIe 1 port 4Gb FC (Emulex) HBA	Mass Storage	—	B	—	B	A.04.05, A.04.06, A.04.07 A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD300A	PCIe 2 port 4Gb FC (QLogic) HBA	Mass Storage	—	B	—	B	A.04.05, A.04.06, A.04.07 A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD339A	HP PCIe 4-port 1000Base-T Gigabit Adapter	Networking	—	b	—	b	A.05.03, A.05.04, A.05.05
AD355A	HP PCIe 2-Port 4Gb Fibre Channel HBA	Mass Storage	—	B	—	B	A.04.05, A.04.06, A.04.07 A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AD393A	HP PCIe dual-port, 4GB, Fiber Channel (FC), and dual-port 1000Base-X adapter	Combo	—	Bb	—	Bb	A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AH303A ¹	HP SC44Ge Host Bus Adapter	Mass Storage	—	B	—	B	A.04.05, A.04.06, A.04.07 A.05.03, A.05.04, A.05.05, A.05.06, A.05.07
AH400A	HP PCIe 1-port 8Gb FC SR (QLogic) HBA	Mass Storage	—	B	—	B	A.05.04, A.05.05, A.05.06, A.05.07
AH401A	HP PCIe 2-port 8Gb FC SR (QLogic) HBA	Mass Storage	—	B	—	B	A.05.04, A.05.05, A.05.06, A.05.07

¹ Ensure that you install the EFI Boot Services Driver version 3.05.01.01 or later versions.

Required Card Firmware (Integrity)

The tables in this section give details about the minimum revisions of card-related firmware required by vPars releases on HP Integrity platforms. The driver, firmware, boot code, and utility versions listed—or higher—are required by the vPars software releases indicated.

- Table 4-11 (page 40) lists the minimum revisions of card-related firmware for vPars A.04.01.
- Table 4-12 (page 41) lists the minimum revisions of card-related firmware for vPars A.04.02 and vPars A.04.03.
- Table 4-13 (page 42) lists the minimum revisions of card-related firmware for vPars A.04.04.
- Table 4-14 (page 43) lists the minimum revisions of card-related firmware for vPars A.04.05.
- Table 4-15 (page 45) lists the minimum revisions of card-related firmware for vPars A.04.06.
- Table 4-16 (page 47) lists the minimum revisions of card-related firmware for vPars A.05.01.
- Table 4-17 (page 48) lists the minimum revisions of card-related firmware for vPars A.05.02.
- Table 4-18 (page 49) lists the minimum revisions of card-related firmware for vPars A.05.03.
- Table 4-19 (page 51) lists the minimum revisions of card-related firmware for vPars A.05.04.
- Table 4-20 (page 53) lists the minimum revisions of card-related firmware for vPars A.05.05.

Table 4-11 vPars A.04.01 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	—	—	—	FCFUPDATE	B.00.12
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.47	3.03.154	—	—	efiutil.efi	2.02 ³
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	2.16	—	ibautil64.efi	3.03.07.01
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	2.16	—	ibautil64.efi	3.03.07.01
A7173A	2-Port U320 SCSI	1.04.02.00	1.03.35.65	—	—	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	—	—	saupdate.efi	1.04.12.00
AB287A	10G Ethernet	—	—	1.1.3.0	—	FCFUPDATE	B.00.12
AB290A	2-Port U320 SCSI+ Combo	1.04.02.00	1.03.35.65	2.16	—	p SCSI.efi ibautil64.efi	1.02.01 3.03.07.01
AB378A	1-Port 4Gb Fibre Channel	1.01	4.00.70	—	—	efiutil.efi	2.09
AB379A	2-Port 4Gb Fibre Channel	1.05	4.00.70	—	—	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	—	—	3.0.03	—	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.

Table 4-12 vPars A.04.02, A.04.03 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	—	—	—	FCFUPDATE	B.00.18
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.47	3.03.154	—	—	efiutil.efi	2.09
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	2.16	—	ibautil64.efi	3.03.07.01
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	2.16	—	ibautil64.efi	3.03.07.01
A7173A	2-Port U320 SCSI	1.05.01.00	1.03.35.69	—	—	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	—	—	2.0.3.1	—	FCFUPDATE	B.00.18
AB290A	2-Port U320 SCSI+ Combo	1.05.01.00	1.03.35.65	2.16	—	p SCSI.efi ibautil64.efi	1.02.01 3.03.07.01
AB378A	1-Port 4Gb Fibre Channel	1.01	4.00.70	—	—	efiutil.efi	2.09
AB379A	2-Port 4Gb Fibre Channel	1.05	4.00.70	—	—	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	—	—	3.0.03	—	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.

Table 4-13 vPars A.04.04 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	—	—	—	FCFUPDATE	B.00.29
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.49	3.03.154	—	—	efiutil.efi	2.17
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ²	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.03	—	FCFUPDATE	B.00.29
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.03	—	FCFUPDATE	B.00.29
A7173A	2-Port U320 SCSI	1.05.02.00	1.03.35.65	—	—	p SCSI.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	—	—	saupdate.efi	2.06.08
AB287A	10G Ethernet	—	—	2.0.4.2	—	FCFUPDATE	B.00.29
AB290A	U320 SCSI/GigE Combo Card	1.05.02.00	1.03.35.69	3.0.03	—	p SCSI.efi ibautil64.efi	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	—	—	3.0.03	—	FCFUPDATE	B.00.29
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.05	4.00.70	—	—	efiutil.efi	2.17
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.05	4.00.70	3.0.13	—	FCFUPDATE	B.00.29
AD331A, AD332A	PCI-X Single-Port 1000Base-T 1000Base-SX	—	—	3.0.13	—	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.

Table 4-14 vPars A.04.05 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	—	—	—	FCFUPDATE	B.00.29
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.49	3.03.154	—	—	efiutil.efi	2.17
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.13	—	FCFUPDATE	B.00.29
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.13	—	FCFUPDATE	B.00.29
A7173A	2-Port U320 SCSI	1.05.02.00	1.03.35.65	—	—	p SCSI.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	—	—	saupdate.efi	2.06.08
AB287A	10G Ethernet	—	—	2.0.4.2	—	FCFUPDATE	B.00.29
AB290A	U320 SCSI/GigE Combo Card	1.05.02.00	1.03.35.69	3.0.13	—	p SCSI.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	—	—	3.0.03	—	FCFUPDATE	B.00.29
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.05	4.00.70	—	—	efiutil.efi	2.17
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.05	4.00.70	3.0.13	—	FCFUPDATE	B.00.29
AD331A, AD332A	PCI-X Single-Port 1000Base-T 1000Base-SX	—	—	3.0.13	—	FCFUPDATE	B.00.29
AD299A	PCIe 1 port 4Gb FC (Emulex) HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AD300A	PCIe 2 port 4Gb FC (QLogic) HBA	1.09	4.0.90	—	—	efiutil.efi	

Table 4-14 vPars A.04.05 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)
(continued)

Card 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
AD355A	HP PCIe 2-Port 4Gb Fibre Channel HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AH303A ³⁴	HP SC44Ge Host Bus Adapter	03.05.01.01	01.23.33.00	—	—	sasflash.efi	1.14.00.00

- 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 The patch PHSS_37829 must be installed while using this card. For more information, see <http://docs.hp.com/en/5992-4876/5992-4876.pdf>.
- 4 Ensure that you install the EFI Boot Services Driver version 3.05.01.01 or later versions.

Table 4-15 vPars A.04.06 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	—	—	—	FCFUPDATE	B.00.29
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.49	3.03.154	—	—	efiutil.efi	2.17
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.13	—	FCFUPDATE	B.00.29
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.13	—	FCFUPDATE	B.00.29
A7173A	2-Port U320 SCSI	1.05.02.00	1.03.35.65	—	—	p SCSI.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	—	—	saupdate.efi	2.06.08
AB287A	10G Ethernet	—	—	2.0.4.2	—	FCFUPDATE	B.00.29
AB290A	U320 SCSI/GigE Combo Card	1.05.02.00	1.03.35.69	3.0.13	—	p SCSI.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	—	—	3.0.03	—	FCFUPDATE	B.00.29
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.05	4.00.70	—	—	efiutil.efi	2.17
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.05	4.00.70	3.0.13	—	FCFUPDATE	B.00.29
AD331A, AD332A	PCI-X Single-Port 1000Base-T 1000Base-SX	—	—	3.0.13	—	FCFUPDATE	B.00.29
AD299A	PCIe 1 port 4Gb FC (Emulex) HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AD300A	PCIe 2 port 4Gb FC (QLogic) HBA	1.09	4.0.90	—	—	efiutil.efi	

Table 4-15 vPars A.04.06 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)
(continued)

Card 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
AD339A	HP PCIe 4-port 1000Base-T Gigabit Adapter	—	—	3.02.06	—	FCFUPDATE	B.00.35
AD355A	HP PCIe 2-Port 4Gb Fibre Channel HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AH303A ³	HP SC44Ge Host Bus Adapter	03.05.01.01	01.23.33.00	—	—	sasflash.efi	1.14.00.00

- 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 Ensure that you install the EFI Boot Services Driver version 3.05.01.01 or later versions.

Table 4-16 vPars A.05.01 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	—	—	—	FCFUPDATE	B.00.29
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4		
A6826A	2-Port 2G Fibre Channel	1.49	3.03.154	—	—	efiutil.efi	2.17
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.01.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.03	—	FCFUPDATE	B.00.29
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.03	—	FCFUPDATE	B.00.29
A7173A	2-Port U320 SCSI	1.05.02.00	1.03.35.65	—	—	p SCSI.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	—	—	saupdate.efi	2.06.08
AB287A	10G Ethernet	—	—	2.0.4.2	—	FCFUPDATE	B.00.29
AB290A	U320 SCSI/GigE Combo Card	1.05.02.00	1.03.35.69	3.0.03	—	p SCSI.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	—	—	3.0.03	—	FCFUPDATE	B.00.29
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.05	4.00.70	—	—	efiutil.efi	2.17
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.05	4.00.70	3.0.13	—	FCFUPDATE	B.00.29
AD331A, AD332A	PCI-X Single-Port 1000Base-T 1000Base-SX	—	—	3.0.13	—	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.

Table 4-17 vPars A.05.02 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	1.37	—	—	—	FCFUPDATE	B.00.32
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4	—	—
A6826A	2-Port 2G Fibre Channel	1.50	3.03.171	—	—	efiutil.efi	2.30
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.02.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7173A	2-Port U320 SCSI	1.05.04.00	1.03.35.70	—	—	p SCSI.efi	1.02.05
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.30	efiutil.efi FCFUPDATE	2.30 B.00.32
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.33	efiutil.efi FCFUPDATE	2.30 B.00.32
A9890A A9891A	SmartArray 6402 SmartArray 6404 RAID	2.68	2.68	—	—	saupdate.efi	2.07.02
AB287A	10G Ethernet	—	—	2.0.4.6	—	FCFUPDATE	B.00.32
AB290A	U320 SCSI/GigE Combo Card	1.05.04.00	1.03.35.70	3.0.03	—	p SCSI.efi FCFUPDATE	1.02.05 B.00.32
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	1.50	3.03.171	7.0.a or 7.0.10	3.27	efiutil.efi FCFUPDATE	2.30 B.00.32
AB545A	4-port 1000B-T Ethernet	—	—	3.0.03	—	FCFUPDATE	B.00.32
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.09	4.00.90	—	—	efiutil.efi	2.30
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.09	4.00.90	3.0.13	—	efiutil.efi FCFUPDATE	2.30 B.00.32
AD331A, AD332A	PCI-X Single-Port 1000Base-T	—	—	3.0.13	—	FCFUPDATE	B.00.32
AD337A, AD338A	PCIe 2-port 1000Base-T, PCIe 2-port 1000Base-SX	—	—	3.0.48	—	FCFUPDATE	B.00.32

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

Table 4-18 vPars A.05.03 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	1.37	—	—	—	FCFUPDATE	B.00.32
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4	—	—
A6826A	2-Port 2G Fibre Channel	1.50	3.03.171	—	—	efiutil.efi	2.30
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.02.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7173A	2-Port U320 SCSI	1.05.04.00	1.03.35.70	—	—	p SCSI.efi	1.02.05
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.30	efiutil.efi FCFUPDATE	2.30 B.00.32
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.33	efiutil.efi FCFUPDATE	2.30 B.00.32
A9890A A9891A	SmartArray 6402 SmartArray 6404 RAID	2.68	2.68	—	—	saupdate.efi	2.07.02
AB287A	10G Ethernet	—	—	2.0.4.6	—	FCFUPDATE	B.00.32
AB290A	U320 SCSI/GigE Combo Card	1.05.04.00	1.03.35.70	3.0.03	—	p SCSI.efi FCFUPDATE	1.02.05 B.00.32
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	1.50	3.03.171	7.0.a or 7.0.10	3.27	efiutil.efi FCFUPDATE	2.30 B.00.32
AB545A	4-port 1000B-T Ethernet	—	—	3.0.03	—	FCFUPDATE	B.00.32
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.09	4.00.90	—	—	efiutil.efi	2.30
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.09	4.00.90	3.0.13	—	efiutil.efi FCFUPDATE	2.30 B.00.32
AD221A ²³	HP PCIe single port, 4GB, Fiber Channel (FC), and single port 1000Base-T adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD222A ²³	HP PCIe dual port, 4GB, Fiber Channel (FC), and dual port 1000Base-T adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	

Table 4-18 vPars A.05.03 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)
(continued)

Card 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
AD331A, AD332A	PCI-X Single-Port 1000Base-T	—	—	3.0.13	—	FCFUPDATE	B.00.32
AD337A, AD338A	PCIe 2-port 1000Base-T, PCIe 2-port 1000Base-SX	—	—	3.0.48	—	FCFUPDATE	B.00.32
AD299A	PCIe 1 port 4Gb FC (Emulex) HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AD300A	PCIe 2 port 4Gb FC (QLogic) HBA	1.09	4.0.90	—	—	efiutil.efi	
AD339A	HP PCIe 4-port 1000Base-T Gigabit Adapter	—	—	3.02.06	—	FCFUPDATE	B.00.35
AD355A	HP PCIe 2-Port 4Gb Fibre Channel HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AD393A ²³	HP PCIe dual-port, 4GB, Fiber Channel (FC), and dual-port 1000Base-X adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AH303A ⁴	HP SC44Ge Host Bus Adapter	03.05.01.01	01.23.33.00	—	—	sasflash.efi	1.14.00.00

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

2 This card has the following minimum system firmware requirements:

- rx7640, rx8640: SFW 9.48, Field Release v4.1
- Superdome on sx2000 (Integrity): SFW 9.48, Firmware Recipe 8.7e

3 The following workaround is needed when using this card (to resolve QXCR1000753480, Long hardware path from card not recognized by vparmodify): <http://docs.hp.com/en/T1335-90091/ar01s05.html>

4 Ensure that you install the EFI Boot Services Driver version 3.05.01.01 or later versions.

Table 4-19 vPars A.05.04 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	1.37	—	—	—	FCFUPDATE	B.00.32
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4	—	—
A6826A	2-Port 2G Fibre Channel	1.50	3.03.171	—	—	efiutil.efi	2.30
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.02.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7173A	2-Port U320 SCSI	1.05.04.00	1.03.35.70	—	—	p SCSI.efi	1.02.05
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.30	efiutil.efi FCFUPDATE	2.30 B.00.32
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.33	efiutil.efi FCFUPDATE	2.30 B.00.32
A9890A A9891A	SmartArray 6402 SmartArray 6404 RAID	2.68	2.68	—	—	saupdate.efi	2.07.02
AB287A	10G Ethernet	—	—	2.0.4.6	—	FCFUPDATE	B.00.32
AB290A	U320 SCSI/GigE Combo Card	1.05.04.00	1.03.35.70	3.0.03	—	p SCSI.efi FCFUPDATE	1.02.05 B.00.32
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	1.50	3.03.171	7.0.a or 7.0.10	3.27	efiutil.efi FCFUPDATE	2.30 B.00.32
AB545A	4-port 1000B-T Ethernet	—	—	3.0.03	—	FCFUPDATE	B.00.32
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.09	4.00.90	—	—	efiutil.efi	2.30
AD221A ²³	HP PCIe single port, 4GB, Fiber Channel (FC), and single port 1000Base-T adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD222A ²³	HP PCIe dual port, 4GB, Fiber Channel (FC), and dual port 1000Base-T adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.09	4.00.90	3.0.13	—	efiutil.efi FCFUPDATE	2.30 B.00.32

Table 4-19 vPars A.05.04 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)
(continued)

Card 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
AD331A, AD332A	PCI-X Single-Port 1000Base-T	—	—	3.0.13	—	FCFUPDATE	B.00.32
AD393A ²³	HP PCIe dual-port, 4GB, Fiber Channel (FC), and dual-port 1000Base-X adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD299A	PCIe 1 port 4Gb FC (Emulex) HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AD300A	PCIe 2 port 4Gb FC (QLogic) HBA	1.09	4.0.90	—	—	efiutil.efi	
AD339A	HP PCIe 4-port 1000Base-T Gigabit Adapter	—	—	3.02.06	—	FCFUPDATE	B.00.35
AD355A	HP PCIe 2-Port 4Gb Fibre Channel HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AH303A ⁴	HP SC44Ge Host Bus Adapter	03.05.01.01	01.23.33.00	—	—	sasflash.efi	1.14.00.00
AH400A	HP PCIe 1-port 8Gb FC SR (QLogic) HBA	2.01	04.03.02	—	—	efiutil.efi FCFUPDATE	2.50 B.00.38
AH401A	HP PCIe 2-port 8Gb FC SR (QLogic) HBA	2.01	04.03.02	—	—	efiutil.efi FCFUPDATE	2.50 B.00.38

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

2 This card has the following minimum system firmware requirements:

- rx7640, rx8640: SFW 9.48, Field Release v4.1
- Superdome on sx2000 (Integrity): SFW 9.48, Firmware Recipe 8.7e

3 The following workaround is needed when using this card (to resolve QXCR1000753480, Long hardware path from card not recognized by vparmodify): <http://docs.hp.com/en/T1335-90091/ar01s05.html>

4 Ensure that you install the EFI Boot Services Driver version 3.05.01.01 or later versions.

Table 4-20 vPars A.05.05 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)

Card 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	1.37	—	—	—	FCFUPDATE	B.00.32
A6825A	Next Gen 1000B-T (5701 chip)	—	—	— ¹	2.4	—	—
A6826A	2-Port 2G Fibre Channel	1.50	3.03.171	—	—	efiutil.efi	2.30
A6828A A6829A	1-Port/ 2-Port U160 SCSI	1.04.02.00	—	—	—	efi8xxfl.efi efihpvpd.efi	1.01.13 1.00.03
A6847A	Next Gen 1000B-SX (5701 chip)	—	—	— ¹	2.19		
A7011A	1000BaseSX Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7012A	1000BaseT Dual Port (Intel® chip)	—	—	3.0.48	—	FCFUPDATE	B.00.32
A7173A	2-Port U320 SCSI	1.05.04.00	1.03.35.70	—	—	p SCSI.efi	1.02.05
A9782A	PCI-X 1000Base-SX GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.30	efiutil.efi FCFUPDATE	2.30 B.00.32
A9784A	PCI-X 1000Base-T GigE / 2G FC Combo	1.50	3.03.171	7.0.b or 7.0.11	2.33	efiutil.efi FCFUPDATE	2.30 B.00.32
A9890A A9891A	SmartArray 6402 SmartArray 6404 RAID	2.68	2.68	—	—	saupdate.efi	2.07.02
AB287A	10G Ethernet	—	—	2.0.4.6	—	FCFUPDATE	B.00.32
AB290A	U320 SCSI/GigE Combo Card	1.05.04.00	1.03.35.70	3.0.03	—	p SCSI.efi FCFUPDATE	1.02.05 B.00.32
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	1.50	3.03.171	7.0.a or 7.0.10	3.27	efiutil.efi FCFUPDATE	2.30 B.00.32
AB545A	4-port 1000B-T Ethernet	—	—	3.0.03	—	FCFUPDATE	B.00.32
AB378A, AB378B, AB379A, AB379B	4GB Fibre Channel (FC)	1.09	4.00.90	—	—	efiutil.efi	2.30
AD221A ²³	HP PCIe single port, 4GB, Fiber Channel (FC), and single port 1000Base-T adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD222A ²³	HP PCIe dual port, 4GB, Fiber Channel (FC), and dual port 1000Base-T adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD193A, AD194A	PCI-X 4Gb FC & 1000Base-T	1.09	4.00.90	3.0.13	—	efiutil.efi FCFUPDATE	2.30 B.00.32

Table 4-20 vPars A.05.05 Minimum Required Card-Related Firmware (EFI, ROM, and Boot Code)
(continued)

Card 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
AD331A, AD332A	PCI-X Single-Port 1000Base-T	—	—	3.0.13	—	FCFUPDATE	B.00.32
AD393A ²³	HP PCIe dual-port, 4GB, Fiber Channel (FC), and dual-port 1000Base-X adapter	3.21a3	2.72a2	3.02.06	—	FCFUPDATE	
AD299A	PCIe 1 port 4Gb FC (Emulex) HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AD300A	PCIe 2 port 4Gb FC (QLogic) HBA	1.09	4.0.90	—	—	efiutil.efi	
AD339A	HP PCIe 4-port 1000Base-T Gigabit Adapter	—	—	3.02.06	—	FCFUPDATE	B.00.35
AD355A	HP PCIe 2-Port 4Gb Fibre Channel HBA	3.21a3	2.70x5	—	—	FCFUPDATE	
AH303A ⁴	HP SC44Ge Host Bus Adapter	03.05.01.01	01.23.33.00	—	—	sasflash.efi	1.14.00.00
AH400A	HP PCIe 1-port 8Gb FC SR (QLogic) HBA	2.01	04.03.02	—	—	efiutil.efi FCFUPDATE	2.50 B.00.38
AH401A	HP PCIe 2-port 8Gb FC SR (QLogic) HBA	2.01	04.03.02	—	—	efiutil.efi FCFUPDATE	2.50 B.00.38

- 1 The card utilizes the EFI driver that is in the platform's system firmware.
- 2 This card has the following minimum system firmware requirements:
 - rx7640, rx8640: SFW 9.48, Field Release v4.1
 - Superdome on sx2000 (Integrity): SFW 9.48, Firmware Recipe 8.7e
- 3 The following workaround is needed when using this card (to resolve QXCR1000753480, Long hardware path from card not recognized by vparmodify): <http://docs.hp.com/en/T1335-90091/ar01s05.html>
- 4 Ensure that you install the EFI Boot Services Driver version 3.05.01.01 or later versions.

Checking Card Firmware Versions (Integrity)

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

```
Shell> search all
Shell> drivers
          T   D
          Y C I E
          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

```

1 This line shows the current version for the HP 2 GB Fibre Channel Driver as 1.47.

Boot Code for the A9782A, A9784A, and AB465 Cards

1. In nPars mode from the EFI device prompt, issue the `ode fcfupdate` command. 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

```

2. To display the boot code version, execute the `dispbcc` command. For example:

```

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

```

Obtaining and Installing Card Firmware (Integrity)

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. Select the vPars release.
 - For vPars A.04.xx, select **HP-UX 11i v2 Virtual Partitions**.
 - For vPars A.05.xx, select **HP-UX 11i v3 Virtual Partition Software**.
5. Under **Select operating system** click **HP-UX 11.x** (it is the only one listed).
6. In the **EFI (extensible firmware interface)** table, click the applicable firmware version.
 - For vPars A.04.xx, select the “vPars HBA EFI/firmware for HP-UX 11i v2 on Integrity” download.
 - For vPars A.05.01, select the “vPars A.05.01” version of the “vPars HBA EFI/firmware for HP-UX 11i v3 on Integrity” download.
 - For vPars A.05.02 or later, select the “vPars A.05.xx” version of the “vPars HBA EFI/firmware for HP-UX 11i v3 on Integrity” download.
7. 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.

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.

Secure Path Installation on vPars-Enabled HP Integrity 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 virtual 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_33581 is installed on each virtual partition.
6. Install Secure Path in each virtual partition.

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

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



NOTE: EVA GL 5000/3000 with Secure Path is supported with vPars. However, the EVA GL with Secure Path is not supported with Ignite-UX.

EVA without Secure Path

EVA GLs are supported without 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.) 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. When moving to HP-UX 11i v2, EVAs without Secure Path is not enabled.

EVAs with Secure Path

EVAs with Secure Path are supported as follows:

	Prior to Secure Path 3.0c	Secure Path 3.0c	Secure Path 3.0d and Later
vPars Boot and Dump	Unsupported	Unsupported	Supported
vPars Data	Unsupported	Supported	Supported

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)
FC S10 hub	—
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)
VA7110	HP18
XP1024	21-03-03
SC10	HP05
Icicle	HP62
EMC 6.0	5669, 5670
DS2100	—

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.

Software Applications

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

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.

VSE Management Software

For system requirements and installation procedures related to the Virtual Server Environment (VSE) Management Software, refer to the *VSE Management Software Installation and Update Guide*.

The latest documentation for the Virtual Server Environment, including VSE Management Software and HP partitioning products, is available at the following website:

<http://docs.hp.com/en/vse.html>

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

NOTE: Ignite-UX C.6.8 or later will not work with vPars A.04.01 on PA-RISC systems. Either use an Ignite 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.

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>.

- 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 nPartitionable servers.
iCAP B.05.01 or later for non-nPartitionable servers.
- 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/en/vse.html#Virtual%20Partitions> as well as in the information library section of the WLM web page at <http://www.hp.com/go/wlm>.

iCAP Version



NOTE: When using dual-core Intel® Itanium® (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.xx and iCAP B.07.xx, see the A.04.xx resources chapter of the *HP-UX Virtual Partitions Administrator Guide* for information on using iCAP B.07.xx with vPars A.04.xx.

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.

vPars A.03.05 vPars A.03.05 requires iCAP version 8.03 or later.



NOTE: If you are updating to vPars A.03.05, or are configuring a mixed 11i v1/v2 vPars environment, you must install iCAP version 8.03 (B.11.11.08.03.00) on each HP-UX 11i v1 virtual partition. This will also install the required versions of WBEM and NParProvider and necessary patches.

Installing iCAP 8.03 onto an HP-UX 11i v1 system running versions of vPars prior to A.03.05 will exhibit an error message which can be ignored, and you can proceed with updating the vPars software. After the vPars installation (which includes halting every virtual partition and rebooting the nPartition to the new vPars Monitor), you must go to each HP-UX 11i v1 virtual partition and run the command `swconfig -v B9073BA` to complete the iCAP installation.

PPU Version

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.

Partition Manager and Virtual Partition Manager

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

Partition Manager (`parmgr`)

Partition Manager is no longer required for installation of vPars.

Virtual Partition Manager
(`vparmgr`)

The `vparmgr` graphical user interface (GUI) is not available for vPars A.05.xx and vPars A.04.xx.

vPars A.03.xx

Partition Manager (`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 nPartitionable servers, as well as non-nPartitionable servers (rp7400/N4000 and rp5470/L3000). (It is normal to have this product installed but not used on non-nPartitionable servers.) A compatible version is available from the HP Software Depot. The HP Software Depot home is at <http://www.hp.com/go/softwaredepot>.

Virtual Partition Manager
(`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 CD and is available from the HP Software Depot.

Online Diagnostics Versions

To run the Support Tools package on a vPars server, you need the STM versions listed in this section.

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).

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. because 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).

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.

Oracle with Dynamic Virtual Partitions

The following vPars releases support the use of Oracle with dynamic virtual partitions:

- vPars A.04.05 – Supports Oracle with dynamic virtual partitions on HP Integrity servers.
- vPars A.04.06 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.04.07 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.05.02 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.05.03 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.05.04 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.05.05 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.05.06 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.
- vPars A.05.07 – Supports Oracle with dynamic virtual partitions on HP Integrity and HP 9000 (PA-RISC) servers.

5 Related Information

The following websites provide useful 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>
- **HP Technical Documentation** <http://docs.hp.com/>
 - Documents for vPars on 11i v1 (A.02.xx, A.03.xx):
<http://docs.hp.com/hpux/os/11i/index.html#Virtual%20Partitions>
 - Documents for vPars on 11i v2 (A.04.xx):
<http://docs.hp.com/hpux/os/11iv2/index.html#Virtual%20Partitions>
 - Documents for vPars on 11i v3 (A.05.xx):
<http://docs.hp.com/hpux/os/11iv3/index.html#Virtual%20Partitions>

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