

# **SANworks™ by Compaq**

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Release Notes -  
HP-UX Kit V2.0 for Enterprise Virtual Array

Part Number: AA-RSX7D-TE

**Fourth Edition (February 2003)**

**Product Version: 2.0**

This document contains the most recent product information about the *SANworks™ by Compaq* HP-UX Kit V2.0 used for integrating host servers with the *StorageWorks™ by Compaq™* Enterprise Virtual Array (VCS Version 2.0).

For the latest version of these Release Notes and other Enterprise Virtual Array documentation, visit the Compaq website at:

<http://www.hp.com/country/us/eng/prodserv/storage.html>

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## Intended Audience

This document is intended to assist customers who purchased the StorageWorks by Compaq Enterprise Virtual Array and the associated SANworks by Compaq Operating System kits. Other associated software packages are:

- SANworks by Compaq Virtual Controller Software Package V2.0 for Dual HSV Controllers by Compaq

- SANworks by Compaq Snapshot for Virtual Controller Software V2.0 for Dual HSV Controllers by Compaq

This document is also intended for use by Compaq Customer Service personnel responsible for installing and maintaining designated devices associated with this storage system.

## Conventions

The following conventions are used throughout this document:

- Unless otherwise specified, all references to VCS V2.0 refer to the software package (kit) and documentation version level. These software packages and documentation support VCS V2.0.
- Unless otherwise specified, all documentation that supports VCS V1.0, VCS V1.01, and VCS V1.02, also supports VCS 2.0.
- The *SANworks System Software for Enterprise Virtual Array by Compaq* is the storage system software that contains Virtual Controller Software (VCS), Environmental Monitoring Unit (EMU) firmware, programmable component images, diagnostics, and message files. This storage system software is usually represented by a four-digit number, for example V2.000. The VCS version number is the first three digits of the storage system software version, for example, V2.00
- Unless otherwise specified, all references to a controller or controller pair should be interpreted as the HSV110 Controller or HSV110 Controller pair.
- Unless otherwise specified, all references to the Enterprise Storage System or storage system should be interpreted as the Enterprise Virtual Array.
- Unless otherwise specified, all references to rack should be interpreted as the 9000-Series Enterprise Storage System Rack.
- Unless otherwise specified, all licensing references to host ID should be interpreted as the storage system World Wide Name (WWN).
- Unless otherwise specified, all references to the management appliance should be interpreted as the Compaq SANworks Management Appliance.
- Unless otherwise specified, all references to a single instance of a management agent, or the element manager, should be interpreted as the Compaq SANworks HSV Element Manager.
- The term Fabric means Fibre Channel Switched (FC-SW) connectivity.

## **New in this Version**

HP-UX Kit V2.0 for Enterprise Virtual Array now supports HP MC/ServiceGuard clustering and Oracle configurations. Ensure that you are running with Enterprise Virtual Array VCS code 2.002 and Secure Path Version 3.0A SP1 for HP-UX to support these options.

## **Enterprise Virtual Array Storage System**

This document contains the most recent product information about the Enterprise Virtual Array. An Enterprise Virtual Array storage system consists of the following:

- One pair of HSV110 Controllers.
- An array of physical disk drives that the controller pair controls. The disk drives are located in drive enclosures that house the support systems for the disk drives.
- Associated physical, electrical, and environmental systems.
- The HSV Element Manager, which is the graphical interface to the storage system. The element manager software resides on the Management Appliance and is accessed through a browser.
- Management Appliance, switches and cabling.
- At least one host attached through the fabric.

## **Enterprise Virtual Array System Software**

SANworks Virtual Controller Software (VCS) V2.0 by Compaq provides storage software capability for the HSV110 Array Controller and is provided in the VCS V2.0 software kit.

## **Enterprise Virtual Array Documentation**

The Enterprise Virtual Array Catalog of Associated Documentation is included on the Technical Documentation page. You can display a comprehensive list of Enterprise Virtual Array documentation, as well as associated product documentation that may be required to operate your storage system. To access the Technical Documentation page, go to:

<http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html>

## Kit Description

The purpose of this section is to describe the SANworks by Compaq HP-UX Kit V2.0 for Enterprise Virtual Array contents.

The SANworks by Compaq HP-UX Kit V2.0 for Enterprise Virtual Array contains the following items:

- Release Notes for HP-UX Kit V2.0 for Enterprise Virtual Array
- SANworks™ by Compaq HP-UX Kit V2.0 for Enterprise Virtual Array Installation and Configuration Guide
- Licensing Materials
- CD-ROM—includes drivers (if applicable), Storage System Scripting Utility (SSSU), and documentation

## Support Release Information

For future product support release information visit <http://www.hp.com/country/us/eng/prodserv/storage.html>. This website provides downloadables for storage products.

## Supported Configurations

Refer to the Enterprise Virtual Array Quick Specs for supported configurations.

## Supported Operating Systems

The Enterprise Virtual Array storage system is compatible with the following operating systems:

- Tru64 UNIX
- Windows NT
- Windows 2000
- OpenVMS
- Sun Solaris
- HP-UX
- IBM AIX

- Linux (Single Path)
- Novell NetWare (Single Path)

Table 1–1 lists the operating system’s specifications, which are compatible with the Enterprise Virtual Array.

**NOTE:** Table 1-1 contains current minimum level operating system specifications at the time of the Enterprise Virtual Array V2.0 release. Some component versions may change due to revision. For the latest information go to:

**Table 1–1: Operating System Specifications**

Operating System	OS Version	Clustering	FCA (HBA)	Adapter Firmware	Adapter Driver	Secure Path
HP-UX	11.00	MC/Service Guard 11.13, 11.14 or later	A5158A 1GbPCI	Native	11.00.10	3.0a, SP1
			A6685A 1GbHSC	Native	11.00.10	3.0a, SP1
			A6795A 2GbPCI	Native	11.00.10	3.0a, SP1
	11.11	MC/Service Guard 11.13, 11.14 or later	A5158A 1GbPCI	Native	11.11.09	3.0a, SP1
			A6685A 1GbHSC	Native	11.11.09	3.0a, SP1
			A6795A 2GbPCI	Native	11.11.09	3.0a, SP1

Table 1–2 lists the latest patch revisions used in this release of the HP-UX Solution Software for Enterprise Virtual Array.

**Table 1–2: Patch Revisions**

HP-UX Version	Patch Revisions (minimum)
11.00	<p>Hardware Enablement Bundle Sept 2002—HWE1100 B.11.00.0209.5</p> <p><b>IMPORTANT:</b> VxVM 3.5 is included in the HWE bundles. However, VxVM 3.5 is not supported with Enterprise Virtual Array V2.0 and should be un-loaded to prevent a problem situation</p> <p><b>IMPORTANT:</b> Support Tools Manager (STM) and Event Monitoring Service (EMS) are included in the Online Diags bundle. However, EVA is not recognized by STM and EMS must be disabled. EVA is also not recognized by System Administration Manager (SAM) at this time.</p> <p>Quality Pack Bundle Sept 2002—QPK1100 B.11.00.58.5</p> <p>Support Tools Bundle Sept 2002—OnlineDiag B.11.00.22.09</p> <p>Kernel Patch (asyncio)—PHKL_27759—async disk driver, only required if running databases using raw (non-filessystem) data access.</p> <p>Tachyon Patch—PHSS_26798</p>

**Table 1–2: Patch Revisions**

<b>HP-UX Version</b>	<b>Patch Revisions (minimum)</b>
11.11	<p>HPUX 11.11—OE—MC B.11.11.0206</p> <p>Hardware Enablement Bundle Sept 2002—HWEEnable11i B.11.11.0209.5</p> <p><b>IMPORTANT:</b> VxVM 3.5 is included in the HWE bundles. However, VxVM 3.5 is not supported with Enterprise Virtual Array V2.0 and should be un-loaded to prevent a problem situation.</p> <p><b>IMPORTANT:</b> Support Tools Manager (STM) and Event Monitoring Service (EMS) are included in the Online Diags bundle. However, EVA is not recognized by STM and EMS must be disabled. EVA is also not recognized by System Administration Manager (SAM) at this time.</p> <p>Fibre Channel Mass Storage Patch—PHKL_27751</p> <p>SCSI IO Cumulative Patch—PHKL_27579</p> <p>Mount Patch—PHKL_27266</p> <p>PHKL_27830 (VxFS cumulative)</p> <p>PHKL_27800 getmount_entry</p> <p>PHCO_27740 libc cumulative patch</p> <p>PHCO_27957 umount(1M) cumulative</p> <p>PHCO_27959 umountall(1M)cumulative</p> <p>PHCO_27956 mount(1M) cumulative</p> <p>PHCO_27958 mountall cumulative</p> <p>PHCO_24402 (libc cumulative header file patch)</p>

Table 1-3 lists the latest Enterprise Virtual Array firmware code used in this release of the HP-UX Solution Software for Enterprise Virtual Array.

**Table 1–3: Firmware Revisions**

<b>HP-UX Operating System</b>	<b>Enterprise Virtual Array VCS Code</b>
11.00	2.002
11.11	2.002

Table 1-4 lists the supported switches used in this release of the HP-UX Solution Software for Enterprise Virtual Array.



**Table 1–4: Supported Switches**

Switch Bit Rate	Component	Firmware Version
1Gb	Compaq StorageWorks SAN Switch 8 Compaq StorageWorks SAN Switch 16 Compaq StorageWorks SAN Switch 16-EL Compaq StorageWorks 16 Port Switch ES-3016 Compaq StorageWorks 16 Port Switch ES-3032	2.6.0c or greater
	Compaq StorageWorks SAN Director 64	02.00.02-1 or greater
2Gb	HP StorageWorks SAN Switch 2/8 EL HP StorageWorks SAN Switch 2/8 HP StorageWorks SAN Switch 2/16 EL HP StorageWorks SAN Switch 2/16	3.0.2f
	HP StorageWorks Director 2/64 HP StorageWorks 2/32 Edge Switch HP StorageWorks 2/16 Edge Switch	02.00.02
	HP StorageWorks Core Switch 2/64	4.0.0c

**Table 1–5: Supported Browsers**

OS	OS Version	Browser	Version
HP-UX	11.0 and 11.i (v1.0)	Netscape Communicator	V4.79

## Multiple Path Support

HP-UX requires the installation of Compaq SANworks Secure Path on each host to achieve high availability multiple path capability. Secure Path is licensed on a per-host basis. Reference Table 1–1 for the specific Secure Path versions.

## Single Path Support Configurations

An HP-UX server with a single FCA supports single path mode.

**IMPORTANT:** Single path mode should not be used in mission critical environments.

Contact your account manager or your local service representative for details on single path configurations.

## Supported Servers

The following section list the servers supported by the Enterprise Virtual Array.

### Supported HP-UX Servers

Table 1–6 lists the Enterprise Virtual Array compatible HP-UX server models.

**NOTE:** Veritas Volume Manager for HP-UX is not supported in Enterprise Virtual Array V2.0.

**Table 1–6: Supported HP-UX Servers**

<b>A-class</b>	• rp24xx	• 5xx	
<b>B-class</b>	• B2000	• B2600	
<b>C-class</b>	• C3000	• C3600	• C3700
<b>J-class</b>	• J5600	• J6000	• J6700
<b>K-class (64-bit only)</b>	• Kx60	• Kx70	• Kx80
<b>L-class</b>	• 1000 • rp5430	• 2000 • rp5450	• 3000 • rp5470
<b>N-class</b>	• 4000	• rp7400	• rp7410
<b>rp8400</b>			
<b>Superdome (16, 32, 64-way)</b>	<b>NOTE:</b> PA-RISC processor only versions		

## Operating Constraints

Any operating constraints specific to the Enterprise Virtual Array hardware and HSV Element Manager can be found in their respective release notes.

## Failover/Failback

There are specific failback preference setting for the HSV controllers that are operating system specific (see the Enterprise Virtual Array hardware release notes for details).

## Avoiding Problem Situations

Avoiding problem situations specific to the Compaq SANworks Management Appliance can be found in the Management Appliance Update January 2002 Release Notes.

Avoiding problem situations specific to the Compaq SANworks HSV Element Manager can be found in the HSV Element Manager Release Notes.

In addition, avoiding problem situations pertaining Enterprise Virtual Array hardware can be found in the hardware release notes.

## Secure Path Version

The Enterprise Virtual Array with VCS 2.0 should not be operated with a down version of Secure Path. Ensure that you have the current version for your operating system (see Table 1–1).

## Codeload Usage

When a maximum configured system is running at maximum load, codeload functionality cannot be used effectively due to Secure Path timing constraints. The system may time out before codeload is completed. Because of this behavior, VCS upgrade should be done during off peak usage.

## Logical Volume Manager

- When creating snapshots or clones of a device that is managed by LVM, care must be taken to avoid misconfiguring LVM. After creating a snapshot or clone of a physical volume, always run `vgchgid(1M)` in order to break the association between the volume group and the snapshot or clone. Otherwise, snapshots or clones appear to LVM to be an alternate path to the original physical volume. This misconfiguration could lead to data corruption if the snapshot or clone is later added to the volume group by using `vgextent(1M)`, `vgimport(1M)`, or `vgscan(1M)`.

- When a path to a device managed by LVM becomes unavailable because of a controller, path link, switch or HBA failure, I/O requests can be delayed up to one minute immediately after the failure.

As a result, the responsiveness of mirrored logical volumes may be briefly affected. When a physical volume becomes unavailable, applications may normally experience a delay while an I/O request to that physical volume times out.

By default, this delay takes 30 seconds, but the timeout can be changed using the `pvchange (1M)` command. For a read, LVM selects another mirror and tries to request I/O again. For a write, LVM records the error and continues, as long as the data has been written to at least one mirror.

In either case, with Secure Path installed, this initial timeout may take up to one minute longer. After initial timeout, LVM remembers that the physical volume is unavailable and future I/O requests will *not* suffer this delay.

## Overloaded Enterprise Virtual Array Configurations

Under conditions where multiple servers are overloading an Enterprise Virtual Array, the boot or reboot of one of the servers may time-out. If the combined delayed access to Enterprise Virtual Array LUNs takes more than 10 minutes, the boot will not complete. To avoid this situation, restart the boot process and reduce the load to the array.

**IMPORTANT:** Persistent occurrence of this issue may indicate an overloaded configuration and additional array host port resources may be required to match the configuration to the actual workload. Consult your local HP account or service representative for help to properly configure the Enterprise Virtual Array for your newly designed or existing configuration.

## High Availability Environment Recommendations

In High Availability environments, under heavy I/O loads, you may experience I/O timeout conditions. If I/O timeouts occur, HP recommends that you increase the *IO\_timeout value* with the `pvchange` command from a default of 30 seconds to no more than 60 seconds for LUNs (virtual disks) on Version 2 of the Enterprise Virtual Array. Under heavy I/O load conditions, the increased *IO\_timeout* value allows for longer I/O completion times and for LUN access delays if a controller failover condition occurs.

**IMPORTANT:** Ensure that you have HP MC/ServiceGuard configured properly. Refer to your HP MC/ServiceGuard documentation for configuration information or go to the HP website at <http://docs.hp.com/hpux/ha/index.html#ServiceGuard>

## Event Monitor Service

For the Enterprise Virtual Array, you must disable EMS monitoring for all of the devices/LUNs in the array.

## Enterprise Storage System Notes

### Cable Requirements

When an Enterprise Virtual Array is installed, an SC-to-LC (1-Gb to 2-Gb) cable is required for host connectivity. Table 1-7 provides a listing of available cables.

**Table 1-7: LC-SC cables**

Length	Description	Compaq Part Number
2.0 m ± 40 mm	CA ASSY, LC-SC, Optical 2M	187891-002
5.0 m ± 80 mm	CA ASSY, LC-SC, Optical 5M	187891-005
15.0 m ± 150 mm	CA ASSY, LC-SC, Optical 15M	187891-015
30.0 m ± 300 mm	CA-ASSY, LC-SC, Optical 30M	187891-030
50.0 m ± 500 mm	CA-ASSY, LC-SC, Optical 50M	187891-050

**Table 1-8: LC-LC cables**

Length	Description	Compaq Part Number
2.0 m ± 40 mm	2-meter LC-LC Multi-Mode Fibre Cable	221692-B21
5.0 m ± 80 mm	5-meter LC-LC Multi-Mode Fibre Cable	221692-B22
15.0 m ± 150 mm	15-meter LC-LC Multi-Mode Fibre Cable	221692-B23
30.0 m ± 300 mm	30-meter LC-LC Multi-Mode Fibre Cable	221692-B26
50.0 m ± 500 mm	50-meter LC-LC Multi-Mode Fibre Cable	221692-B27

## Licensing Support Information

If you have trouble obtaining a License Key or need other licensing support information, refer to the *StorageWorks by Compaq Enterprise Virtual Array License Instructions* which are shipped with the VCS V2.0 software kit.

For assistance with incorrect Authorization ID, contact your authorized Compaq Authorized Service Provider.

For assistance with lost Authorization ID and Authorization ID not shipped, contact your Compaq order channel.

## Storage System Scripting Utility for Enterprise Virtual Array

Refer to the HSV Element Manager release notes prior to using the Storage System Scripting Utility (SSSU), as SSSU communicates directly with the element manager.