Compaq SANworks

Release Notes -
Tru64 UNIX Kit V1.0 for Enterprise Virtual Array

Part Number: AA-RQZZA-TE

First Edition (October 2001)

Product Version: 1.0

This document contains the most recent product information about the *Compaq SANworks*™Tru64 UNIX Kit V1.0 used for integrating host servers with the *Compaq StorageWorks*™ Enterprise Virtual Array (VCS Version 1.01).

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

http://www.compaq.com

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Release Notes Contents

These release notes cover the following major topics:

Intended Audience

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

- Compaq SANworks Virtual Controller Software Package V1.0 for Dual HSV Controllers

- Compaq SANworks Virtual Controller Software Snapshot V1.0 for Dual HSV Controllers

This document also is 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 V1.0 refer to the Software Package (kit) and documentation version level. The Software Package and documentation support VCS V1.01. VCS V1.01 is the controller software contained within the Compaq SANworks System Software Version 1.010 for Enterprise Virtual Array.

- 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 licensing references to host ID should be interpreted as the 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.

Enterprise Virtual Array Storage System

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

- A 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 Compaq SANworks HSV Element Manager, which is the graphical interface to the storage system. The element manager software resides on the Compaq SANworks Management Appliance and is accessed through a browser.

- SANworks Management Appliance, switches, and cabling.

- At least one host attached through the fabric.

Enterprise Virtual Array System Software

Compaq SANworks Virtual Controller Software (VCS) V1.01 provides storage controller software capability for the HSV110 Array Controller and is provided in the VCS V1.0 software kit.

Enterprise Virtual Array Documentation

This section lists the documents that ship in the following kits and that support the Enterprise Virtual Array:

- Compaq StorageWorks Enterprise Virtual Array Hardware Documentation Kit
- Compaq SANworks Virtual Controller Software Package V1.0 for Dual HSV Controllers
- Compaq SANworks Operating System Kits

Table 1 lists the standalone documents that ship with the Enterprise Virtual Array.

Table 1: Enterprise Virtual Array Standalone Documents

Document Title	Compaq Document Part Number
Compaq StorageWorks Enterprise Virtual Array World Wide Name Label	EK-E1WWN-IA. A01
Compaq StorageWorks Enterprise Virtual Array Read Me First	EK-E1RMF-IA. A01

Table 2 lists the documents that ship with the Enterprise Virtual Array in the Enterprise Virtual Array Hardware Documentation Kit.

Table 2: Enterprise Virtual Array Documents

Document Title	Compaq Document Part Number
Compaq StorageWorks Enterprise Virtual Array Drive Enclosure EMU User Guide	EK-52EMU-UA. A01
Compaq StorageWorks Enterprise Virtual Array Drive Enclosure User Guide	EK-52DRV-UA. A01
Compaq StorageWorks Enterprise Virtual Array Initial Setup User Guide	EK-E1SET-UA. A01
Compaq StorageWorks Enterprise Virtual Array HSV Controller User Guide	EK-E1HSV.UA. A01

Table 2: Enterprise Virtual Array Documents (Continued)

Document Title	Compaq Document Part Number
Compaq StorageWorks Enterprise Virtual Array Rack User Guide	EK-E1RAK-UA. A01

Table 3 lists the documents contained in the Compaq SANworks Virtual Controller Software (VCS) Package V1.0 for Dual HSV Controllers.

Table 3: Compaq Sanworks VCS Documents

Document Title	Compaq Document Part Number
Compaq StorageWorks Enterprise Virtual Array Release Notes	EK-E1REL-RA. A01
Compaq SANworks VCS License Key Retrieval Instruction Sheet	AV-RR17A-TE
Compaq SANworks Enterprise Virtual Array QuickSpec	AV-RR19A-TE

See Table 6 for additional documentation included in the Compaq SANworks Virtual Controller Software Package V1.0 for Dual HSV Controllers.

Table 4 lists the documents found in the Compaq SANworks Operating System Kits. These documents are shipped separately in the kit specific to your operating system.

Table 4: Compaq Sanworks Operating System Kits

Document Title	Compaq Document Part Number
Compaq SANworks Tru64 UNIX Kit V1.0 for Enterprise Virtual Array Installation and Configuration Guide	AA-RQZYA-TE
Compaq SANworks Tru64 UNIX Kit V1.0 for Enterprise Virtual Array Release Notes	AA-RQZZA-TE
Compaq SANworks Windows NT and 2000 Kit V1.0 for Enterprise Virtual Array Installation and Configuration Guide	AA-RR08A-TE
Compaq SANworks Windows NT and 2000 Kit V1.0 for Enterprise Virtual Array Release Notes	AA-RR09A-TE
Compaq SANworks OpenVMS Kit V1.0 for Enterprise Virtual Array Installation and Configuration Guide	AA-RR03A-TE
Compaq SANworks OpenVMS Kit V1.0 for Enterprise Virtual Array Release Notes	AA-RR04A-TE

Table 4: Compaq Sanworks Operating System Kits (Continued)

Document Title	Compaq Document Part Number
Compaq SANworks Sun Solaris Kit V1.0 for Enterprise Virtual Array Installation and Configuration Guide	AA-RR0DA-TE
Compaq SANworks Sun Solaris Kit V1.0 for Enterprise Virtual Array Release Notes	AA-RR0EA-TE
* Compaq SANworks Scripting Utility V1.0 for Enterprise Virtual Array Reference Guide	AA-RPK7A-TE

*Contains information about all platforms and is shipped in all kits.

Enterprise Virtual Array Related Documentation

Other supplemental documentation that is needed, but not shipped with the Enterprise Virtual Array, may include those in the following list.

- *Compaq StorageWorks HSV Controller Cache Battery Replacement Instructions* (EK-E1BTR-IA. A01), describing how to replace the controller cache battery in your Enterprise Storage system.

- *Compaq StorageWorks Fibre Channel Disk Drive Replacement Instructions* (EK-E1DSK-IA. A01), describing how to replace a disk drive in your Enterprise Storage System.

Table 5 lists the Compaq SANworks Open SAN documents that support the Enterprise Virtual Array. These documents are available via the Compaq website at: http://www.compaq.com.

Table 5: Compaq SANworks Open SAN Documents

Document Title	Compaq Document Part Number
Compaq StorageWorks Heterogeneous Open SAN Design Reference Guide, 3rd edition	AA-RMPND-TE
Supplemental Tables for the Heterogeneous Open SAN Design Reference Guide, 4th edition	AV-RNZED-TE
Compaq StorageWorks Heterogeneous Open SAN Design Addendum for Enterprise Virtual Array	AA-RQ6DA-TE

- *Compaq SANworks Management Appliance Update for Enterprise Only, September 2001*.

The Management Appliance documentation is included in the Compaq SANworks Management Appliance Update for Enterprise Only September 2001 kit. This kit provides Compaq StorageWorks HSV Element Manager and accompanying applications. It also includes instructions for installing the HSV Element Manager.

For your convenience, this information ships with the Compaq SANworks VCS kit. Table 6 lists the Management Appliance Update for Enterprise Only, September 2001 documents.

Table 6: Management Appliance Update, Sept. 2001 Documents

Document Title	Compaq Document Part Number
Compaq SANworks Management Appliance for Enterprise Only, Read Me First	AA-RQZCA-TE
Compaq SANworks Management Appliance for Enterprise Only, Cover Letter	AV-RQZDA-TE
Compaq SANworks Management Appliance for Enterprise Only, Release Notes	AA-RNEAC-TE
Compaq SANworks Management Appliance for Enterprise Only, Installation Card	AV-RNE9C-TE
Compaq SANworks Management Appliance Element Manager for Enterprise Only, User Guide	AA-RQZBA-TE

• Additional documentation, including white papers, best practices, and switch documents, are available via the Compaq website at: http://www.compaq.com.

Support Release Information

For future product support release information visit http://www.compaq.com/support/files/storage/index.html. This website provides downloadables for storage products.

Operating Constraints

This section contains operating constraints specific to the Enterprise Virtual Array.

Any operating constraints specific to the Compaq SANworks Management Appliance and Compaq SANworks HSV Element Manager can be found in the *Compaq SANworks Management Appliance Update for Enterprise Only Release Notes*. In addition, any operating constraint information pertaining to the hardware can be found in the *Compaq SANworks Enterprise Virtual Array Release Notes*.

Compaq SANworks Management Appliance

At the time these release notes were written, the SANworks Management Appliance used with an Enterprise Virtual Array must run only the HSV Element Manager. You cannot run an HSG Element Manager or any other application on the same management appliance as the HSV Element Manager.

Licensing

The HSV 110 Controllers use Compaq SANWorks Virtual Controller Software (VCS) Package V1.0 and Compaq SANworks VCS Snapshot V1.0. They are licensed products. The VCS software kits contain a license authorization key which is used in conjunction with the controllers' World Wide Name (WWN) to generate a license key. The license keys enable the use of VCS software and the value-added Snapshot functionality on a dual-controller basis. Snapshot for VCS requires, as a pre-requisite, VCS Software and is licensed by the capacity attached to the dual controllers. After the storage configuration is initialized, the license is associated with the WWN and will persist if the controllers are replaced.

To enable licensing, the License Authorization Key form from the VCS Software Kit and the VCS Snapshot Software Kit, and the WWN from the Enterprise Storage System WWN label are required. The customer may request a license key by visiting the licensing fulfillment website or using the manual methods outlined on the License Authorization Key Instruction Sheet.

Using the manual method you will receive your license key in one to 48 hours. The key will be returned to you via e-mail.

Supported Product Version

The Compaq SANworks System Software Version 1.010 for Enterprise Virtual Array Installation Instructions refer to Enterprise Virtual Array Storage System V1.010 which contains Virtual Controller Software (VCS), Environmental Monitoring Unit (EMU) firmware, programmable component images, diagnostics, and message files. The Virtual Controller Software contained on the installation CD-ROM is VCS V1.01.

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

Table 7 lists this kit's operating system versions, software, hosts, FCAs, and firmware compatible with the Enterprise Virtual Array.

Table 7: Operating Systems, Software, Hosts, FCAs & Firmware

Operating System	OS Versions	Cluster Software	Cluster Software Version	High Availability	Driver Version	FCA	Firmware Version
Tru64 UNIX	5.1 (patch kit 3) 5.1a	TruClusters 8 server nodes	V5.1 V5.1a	Native	1.29 1.32a	380574-001 (KGPSA-BC)	320X7
						168794-B21 (DS-KGPSA-CA)	3.81a4 for Alpha

NOTE: Single-FCA server configurations are not supported.

Multipathing Support

The Enterprise Virtual Array supports a multipathing environment (high availability).

For Tru64 UNIX and OpenVMS, the multipathing is native to the operating system. No additional software installation is required.

Supported Browsers

Table 8 lists those browsers that are compatible with the Enterprise Virtual Array software system.

Table 8: Supported Browsers

Operating System	OS Version	Browser Supported	Minimum Browser Version
Tru64 UNIX	5.1(patch kit 3) 5.1a	Netscape Communicator	v. 4.77

Connecting Hosts to Switches

This section describes how to connect your host servers to the SAN switches in order to access the virtual disks on the Enterprise Virtual Array. The documentation that came with the Enterprise Virtual Array hardware describes how to cable the controllers to the SAN switches.

Figure 1 provides an overview of connecting the Enterprise Virtual Array components (see *Compaq StorageWorks Enterprise Virtual Array Initial Setup User Guide* for more information).
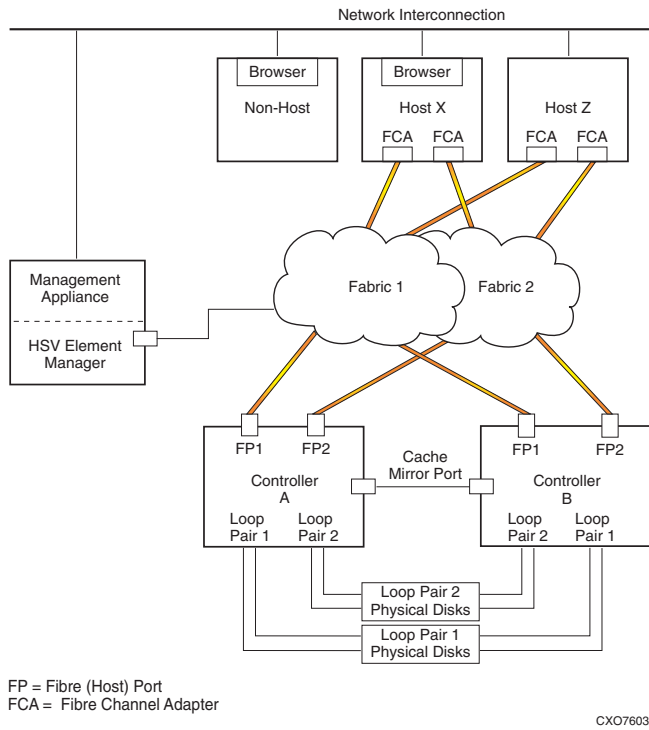

FP = Fibre (Host) Port
FCA = Fibre Channel Adapter

CXO7603A

Figure 1: Overview of Enterprise Virtual Array Component Connections

The Enterprise Virtual Array requires a multipathing environment. Each host must attach to two redundant switches (fabrics) using standard Fibre Channel cables. These two switches in turn attach to the two HSV110 controllers on the Enterprise Virtual Array.

1. Plug one end of the Fibre Channel cables into the FCAs on the servers. There must be at least two FCAs.

2. Plug the other ends of the cables into the two switches. You must plug each cable from the hosts' FCAs into different switches.

Figure 2 displays the connections between a single server with two FCAs and two switches.
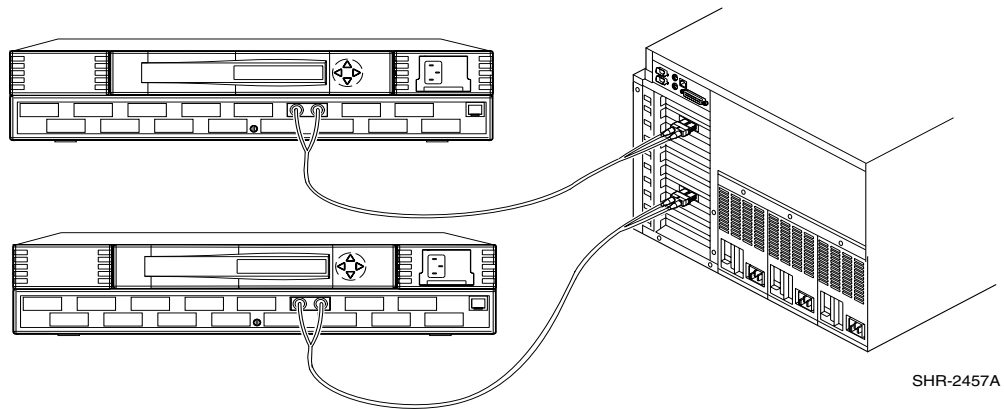
SHR-2457A

Figure 2: Cabling Hosts to Switches

NOTE: The FCAs for any one host must connect to separate and independent switches (fabrics).

Host Considerations

This section contains information on issues and important reminders regarding the host servers.

Dynamic Volume Expansion

Dynamic volume expansion is the ability to increase the size of a virtual disk (volume). In version V1.0 of the Enterprise Virtual Array, the virtual disk must be expanded while not presented to the host. Dynamic expansion of a virtual disk may have dependencies on the host operating system. Please refer to the appropriate documentation for you operating system and third-party software to understand the implications of using this feature on your particular host platform.

> △ **CAUTION:** Increasing the size of your virtual disk will require un-presenting the virtual disk in via the HSV Element Manager.

OS Unit ID

This is a required field (virtual disk properties page in the element manager) for OpenVMS hosts and recommended for Tru64 UNIX. This settable ID must be set to a number between 1 and 32767. It is necessary to ensure that each virtual disk have a unique OS Unit Number across the entire SAN, not just the controller subsystem.

Scripting Utility for Enterprise Virtual Array

This section contains information on using the Compaq SANworks Scripting Utility for the Enterprise Virtual Array. For errors in the *Compaq SANworks Scripting Utility V1.0 for the Enterprise Virtual Array Reference Guide*, see "Scripting Utility Reference Guide Anomalies" on page 16.

Username and Password Access

Username and password access to the controller must be set through the HSV Element Manager software (click **Options** in the **Session Pane**) before you can execute the Scripting Utility. You cannot set this password from within the Scripting Utility.

Once these are set, you can log into the storage system through the Scripting Utility, passing the username and password with the SELECT MANAGER command.

Naming Conventions

The Scripting Utility requires that you qualify specified names with full paths. Any path with spaces as part of the name must be enclosed within double quotes (""). For example, any path written as "\Disk Groups" or "\Virtual Disks" need the double quotes.

Use caution when creating object names (groups, folders, hosts, and virtual disks) regarding spaces. You must not use more than one contiguous space within these names. There is no warning when creating objects with more than one contiguous space, but there will be errors when you try to access these objects.

DELETE Commands

△ **CAUTION:** You should be very careful with the execution of either the DELETE CELL or the DELETE STORAGE commands. These commands permanently destroy data.

The Scripting Utility is intended for use in building scripts. These DELETE commands are intended for use within scripts. Although available interactively, you must use caution because they act immediately when you press the Enter key.

CAPTURE CONFIGURATION Command

The CAPTURE CONFIGURATION command is a very important and powerful command. It is the only method you can use to capture and re-create a storage system's configuration. See the *Compaq SANworks Scripting Utility V1.0 for Enterprise Virtual Array Reference Guide* for more information on using the CAPTURE CONFIGURATION command.

Host IP addresses

Host IP addresses are not captured with the CAPTURE CONFIGURATION command. If you have IP addresses set for your hosts and capture the configuration, the IP addresses are not captured. When you reset the configuration, you will need to manually reset the IP addressees for the hosts.

SHOW MONITOR Command

The data returned in response to the SHOW MONITOR FULL command may be either incomplete (some fields are empty) or inaccurate. This information is correctly retrieved from the HSV Element Manager interface under the "Hardware" navigation area.

Documentation Anomalies

This section describes errors found in the documents that came with your operating system kit.

Installation and Configuration Guide Anomalies

- URL links in the Installation and Configuration guide PDF file do not always work as links, or may take you to http://www.compaq.com instead of to the link described. If you wish to visit the links, type the address directly into your browser's location window.

- Information on cabling between the host servers and switches was mistakenly left out of the Installation and Configuration guide. This information is presented in these Release Notes (see "Connecting Hosts to Switches" on page 12).

Scripting Utility Reference Guide Anomalies

- URL links in the Scripting Utility Reference guide PDF file do not always work as links, or may take you to http://www.compaq.com instead of to the link described. If you wish to visit the links, type the address directly into your browser's location window.

- Page 2-11 mistakenly has the "ADD COPY" command indicated where it should be "ADD STORAGE." The error occurs in three places on this page, described in the following list:

  — Under the "Switch" heading—the correct wording should be: "Only the STORAGE switch is available with the ADD SNAPSHOT command."

  — Under the "STORAGE=" heading—the correct wording should be: "The name of the storage that will be presented to snapshot."

  — Under the "Required Switch" heading—the correct wording should be: "The following switch is required with the ADD SNAPSHOT command:"

- Page 2-27 mistakenly has the word "manger," where it should be "manager." The error occurs in the first line in the explanation of the SELECT MANAGER examples, and should read: "The first example selects the manager named *north_campus*."

- Page 2-37 remove the word "be" in the third sentence under MIRRORED_WRITEBACK. It should read:

   "If one mirrored cache is unusable, the write is not reported as completed until the data is on the media."