

release notes

hp StorageWorks enterprise virtual array

Product Version: v2.003

Sixth Edition (March 2003)

Part Number: EK-E1REL-RA. F01

This document contains the most recent product information about the HP StorageWorks Enterprise Virtual Array, as well as supplemental, support, and product feature details (VCS v2.003).

For the latest version of these Release Notes and other storage system documentation, visit the HP storage website at <http://h18000.www1.hp.com/storage/index.html>.



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Printed in the U.S.A.

Enterprise Virtual Array Release Notes
Sixth Edition (March 2003)
Part Number: EK-E1REL-RA. F01

About this Document

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Intended Audience

This document is intended to assist customers who purchased the HP StorageWorks Enterprise Virtual Array and the associated software.

- HP StorageWorks Virtual Controller Software v2.003 for Dual HSV Controllers
- HP StorageWorks Snapshot for Virtual Controller Software v2.0 for Dual HSV Controllers

This document is also intended for use by HP authorized service providers responsible for installing and maintaining designated devices associated with this storage system.

Enterprise Virtual Array Documentation

To access Enterprise Virtual Array Technical Documentation, visit <http://h18000.www1.hp.com/products/storageworks/enterprise/documentation.html>.

Conventions

The following conventions are used throughout this document:

- Unless otherwise specified, all documentation that supports VCS V1.0, VCS V1.01, and VCS V1.02, also supports VCS v2.0x.
- *HP StorageWorks Enterprise Virtual Array System Software* is the storage system software that contains 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 v2.003. The VCS version number is the first three digits of the storage system software version, for example, v2.00. It may also be referred to as v2.0, when both the second and third digits are zero.
- 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 storage system World Wide Name (WWN).
- Unless otherwise specified, all references to the management appliance should be interpreted as the HP Open View Storage Management Appliance.
- Unless otherwise specified, all references to a single instance of a management agent, or the element manager, should be interpreted as HP StorageWorks Command View EVA.
- The term Fabric means Fibre Channel Switched (FC-SW) connectivity.

Enterprise Virtual Array Storage System

Topics in this section include:

- [Enterprise Virtual Array System Software](#), page 5
- [VCS Software Descriptions](#), page 5
- [Support Release Information](#), page 6
- [Supported Configurations](#), page 6

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.
- Command View EVA, which is the graphical interface to the storage system. Command View EVA software resides on the Storage Management Appliance and is accessed through a browser.
- Storage Management Appliance, switches, and cabling.
- At least one host attached through the fabric.

Enterprise Virtual Array System Software

The *HP StorageWorks System Software System Software for Enterprise Virtual Array* is the storage system software that contains VCS, EMU firmware, programmable component images, diagnostics, and message files. It provides storage software capability for the HSV110 Controller. It is preinstalled on the Enterprise Virtual Array v2.003.

VCS Software Descriptions

VCS v2.003 provides storage controller software capability for the HSV110 controller. Dual-redundant HSV110 controllers are configured into the Enterprise Virtual Array, HP's ultrahigh performance, capacity, and availability, VersaStor-enabled, virtual RAID (Vraid) storage solution. One VCS base controller software license is required per controller pair.

Business Copy EVA provides snapshot functionality on the EVA. A snapshot is a fast virtual copy of a virtual disk at an instant in time. It requires a separate license for an HSV controller pair. The Business Copy license is ordered separately from the required basic VCS license.

Business Copy EVA provides three types of point-in-time copy functionality:

- Virtually Capacity-Free Snapshot (Vsnap)—Snapshots of data that do not require preallocation of disk capacity equal to the snapped volume. Disk capacity is used on an as-needed basis.
- Standard Snapshot (Snapshot)—Snapshots of data that require preallocation of disk capacity equal to the snapped volume.
- Virtually Instantaneous Snapclone—Provides instantaneous data duplication through the use of the snapshot technology. You have immediate access to the duplicated data while the background operation of creating the clone is accomplished over time.

Support Release Information

Additional documentation, including white papers, best practices, and switch documents, are available via the HP website at <http://www.hp.com>.

For product support release information, visit <http://h18007.www1.hp.com/support/files/storage/index.html>. This website provides downloadable information and software for storage products.

To download Storage Management Appliance updates, visit <http://h18000.www1.hp.com/products/sanworks/managementappliance>. You can access the latest update by selecting Software & Drivers.

To access Enterprise Virtual Array product support, visit <http://h18000.www1.hp.com/products/storageworks/enterprise>.

Supported Configurations

Refer to the Enterprise Virtual Array Quick Specs for supported configurations at: <http://h18000.www1.hp.com/products/storageworks/enterprise>.

Supported Operating Systems

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

- HP Tru64 UNIX
- Windows NT
- Windows 2000
- Windows Data Center Advanced Server
- HP OpenVMS
- Sun Solaris
- HP-UX
- IBM AIX
- NetWare
- Linux

Table 1 lists those operating systems specifications which are compatible with the Enterprise Virtual Array.

Note: **Table 1** contains current minimum level operating system specifications at the time of Enterprise Virtual Array v2.003 release. Some operating system component versions may change due to revision. For the latest version information, visit <http://www.hp.com>.

Table 1: Operating System Specifications

Operating System	OS Version	Clustering	HBA (FCA)	Adapter Firmware	Adapter Driver	Secure Path
Windows NT (Intel)	4.0SP 6a	MSCS	LP8000	ddb382a1BIOS 1.60a5	4-4.81a9	4.0* (kit 1030B)
			LP952 (FCA2101)	rcb382a1BIOS 1.60a5	4-4.81a9	4.0* (kit 1030B)
Windows 2000 (32-bit)	5.0SP 2, SP 3	MSCS	LP8000	ddb382a1BIOS 1.60a5	5-4.81a9	4.0* (kit 1030B)
			LP952 (FCA2101)	rcb382a1BIOS 1.60a5	5-4.81a9	4.0* (kit 1030B)
Data Center 32-bit Advanced Server	5.0SP 2	MSCS	LP8000	ddb382a1BIOS 1.60a5	5-4.81a9	4.0* (kit 1030B)
			LP952 (FCA2101)	rcb382a1BIOS 1.60a5	5-4.81a9	4.0* (kit 1030B)
Tru64 UNIX	5.1	TruCluster	LP8000	dd3.81a4	2.02	NR
			LP9002 (FCA2354)	cd3.81a4	2.02	
	5.1a	TruCluster	LP8000	dd3.81a4	2.02	NR
			LP9002 (FCA2354)	cd3.81a4	2.02	
Open VMS	7.2-2w/FIBRE SCSI-V0200	VMS Cluster	LP8000	dd3.81a4	NR	NR
			LP9002 (FCA2354)	cd3.81a4	NR	
	7.3w/FIBRE SCSI-V0300, 7.3-1	VMS Cluster	LP8000	dd3.81a4	NR	NR
			LP9002 (FCA2354)	cd3.81a4	NR	
IBM-AIX	4.3.3, 5.1	HACMP4.4	Cambex PCI-1000f	2.01.19	1.5.19.1	2.0b

Table 1: Operating System Specifications (Continued)

Operating System	OS Version	Clustering	HBA (FCA)	Adapter Firmware	Adapter Driver	Secure Path
Novell NetWare****	5.1	NetWare Cluster Server v1.01	QLA2340 (FCA2210)	3.01.13	6.50s	3.0c
	6.0	NetWare Cluster Server v1.06				
Linux	Red Hat AS 2.1 (2.4.9-e3 & 2.4.9-e1 2)	SteelEye's Lifekeeper for Linux 4.2	QLA 2340 (FCA2214) QLA 2342 (FCA2214 dc)	3.01.18	6.04	3.0
	SuSE SLES 7 (2.4.7-64 & 2.4.18-224)					
SUN 4U and SunFireSeries	6 (2.6), 7, 8	SunCluster 2.2	JNI 32 bit PCI	3.0.3	2.5.9-03	3.0a***
			JNI 64 bit S-bus	13.3.7	2.5.9-03	3.0a***
		Veritas Cluster 1.3	QlogicPCI 2Gb (FCA2257P)	FCode 1.18.5	3.26	3.0a***
			QlogicSbus 1Gb (FCA2257S)	FCode 1.18.3	3.26	3.0a***
			Qlogic **cPCI 1Gb (FCA2257C)	FCode 1.18.5	3.26	3.0a***

Table 1: Operating System Specifications (Continued)

Operating System	OS Version	Clustering	HBA (FCA)	Adapter Firmware	Adapter Driver	Secure Path
HP-UX	11.0	MCService Guard 11.13 (not supported at this time)	A5158A 1GbPCI	Native	11.00.10	3.0a SP1
			A6685A 1GbHSC	Native	11.11.10	3.0a SP1
			A6795A 2GbPCI	Native	11.11.10	3.0a SP1
	11.i (v1.0)	MCService Guard 11.13 (not supported at this time)	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

NR - Not required

* Secure Path V3.1a & V3.1aSP2 are only supported for migration purposes during the upgrade of VCS from V1.x to v2.0.

**Qlogic cPCI 1-Gb adapter is supported only on Solaris 8 for Enterprise v2.0.

*** Secure Path V2.1D is only supported for migration purposes during the upgrade of VCS from V1.x to v2.0.

****Only supported in Single Path mode.

Multipathing Support

HP OpenVMS and HP Tru64 UNIX require no additional software for high availability multipathing capability; multipathing is integrated into recent releases of these operating systems.

Windows, Sun Solaris, Data Center, HP-UX, and IBM-AIX require the installation of HP StorageWorks Secure Path to achieve high availability multipathing capability. Secure Path is licensed on a per-host basis. Each Windows host requires Secure Path for Windows and each Sun Solaris host requires Secure Path for Sun Solaris. Reference [Table 1](#) for the specific Secure Path versions.

Singlepathing Support Configurations

The following platforms are supported configurations using servers with a single HBA:

- HP-UX
- Windows 2000 and Windows NT
- Sun Solaris
- HP OpenVMS
- HP Tru64 UNIX
- Linux
- NetWare

Note: HP OpenVMS and HP Tru64 UNIX have “built in” multipathing features that are not removable, but single pathing is supported.

Single pathing should not be used in mission critical environments.

See *Connecting Single HBA Servers to the Enterprise Virtual Array without Secure Path* white paper for more information at:

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

Supported Switches

Table 2 lists the switches supported by the Enterprise Virtual Array.

Table 2: Fibre Channel Switches Supported

FC Switch	Firmware
FC SAN Switch 8-port, 16-port	2.6.0c
FC SAN Switch 8-EL, 16-EL	2.6.0c
FC SAN Switch Integrated -32 -64	2.6.0c
FC SAN 2-Gb Switch 16-port	3.0.2f
SAN Director 64	02.00.02
HP StorageWorks Director 2/64	02.00.02
HP StorageWorks Edge Switch 2/32	02.00.02
HP StorageWorks Edge Switch 2/16	02.00.02

Supported Disks

Table 3 lists the disks supported by the Enterprise Virtual Array.

Table 3: Supported Disks

Fibre Channel Disk	Model	Firmware
10K RPM 36-GB dual-ported	BD03654499	3BE3
10K RPM 36-GB dual-ported	BD03655B28	HP00
10K RPM 72-GB dual-ported	BD07254498	3BE3
10K RPM 72-GB dual-ported	BD07254498	HP00
10K RPM 146-GB dual-ported	BD14655B2A	HP00
15K RPM 36-GB dual-ported	BF03654564	No minimum
15k RPM 36GB dual-ported	BF03655B2B	HP00
15k RPM 72GB dual-ported	BF07255B2C	HP00

Note: Mixing disk types within a disk group is not recommended.

Supported Browsers

Table 4 lists the browsers supported by the Enterprise Virtual Array.

Table 4: Supported Browsers

OS	OS Version	Browser	Version
SUN Solaris	v6 (v2.6), v7, and v8	Netscape Communicator	V4.79
Windows NT (Intel)	4.0	Netscape Communicator	V4.79
		Internet Explorer	V5.5
Windows 2000 (32-bit)	5.0	Netscape Communicator	V4.79
		Internet Explorer	V5.5
Data Center 32-bit Advanced Server	5.0	Netscape - Not Supported	N/A
		Internet Explorer	V5.5
HP Tru64 UNIX	5.1 and 5.1a	Netscape Communicator	V4.77
HP OpenVMS	7.2-2, 7.3, and 7.3-1	Not Supported - customer needs to use an alternative supported platform for browsing	N/A
HP-UX	11.0 and 11i	Netscape Communicator	V4.79
IBM-AIX	4.3.3 and 5.1	Netscape Communicator	V4.79

Supported Servers

The following sections list the servers supported by the Enterprise Virtual Array:

- Supported HP Proliant Servers, page 15
- Supported Alpha Servers, page 16
- Supported Sun Servers, page 17
- Supported HP-UX Servers, page 18
- Supported IBM-AIX Servers, page 18

Supported HP Proliant Servers

Table 5 contains those HP Proliant-series servers that are compatible with the Enterprise Virtual Array.

Table 5: Supported HP Proliant Servers

Proliant	NT4.0/W2K hp Single Server supported	NT4.0/W2K HP Cluster supported	NT 4.0 Microsoft HCL Certified*	Windows 2000 Microsoft HCL Certified
DL760	✓	✓	x	✓
DL580	✓	✓	x	✓
DL380	✓	✓	x	✓
DL360	✓	✓	x	✓
ML750	✓	✓	x	Will certify on demand
ML570	✓	✓	x	Will certify on demand
ML530	✓	✓	x	Will certify on demand
ML370	✓	x	x	x
ML350	✓	x	x	Will not be certified
8500	✓	✓	x	Will certify on demand
8000	✓	✓	x	x
7000	✓	x	x	x
6500	✓	x	x	x
6400R	✓	✓	x	x

Table 5: Supported HP_Proliant Servers (Continued)

Proliant	NT4.0/W2K hp Single Server supported	NT4.0/W2K HP Cluster supported	NT 4.0 Microsoft HCL Certified*	Windows 2000 Microsoft HCL Certified
6000	✓	x	x	x
5500R	✓	x	x	x
3000	✓	x	x	x
1850R	✓	✓	x	x
1600	✓	x	x	x
800	✓	x	x	x

Legend:

✓ - Supported; Certified

x - Not supported; Not certified

* Microsoft will no longer accept submittals for HCL certification on NT 4.0.

Supported Alpha Servers

Table 6 contains those Alpha servers that are compatible with the Enterprise Virtual Array.

Table 6: Alpha Servers Supported

Product	Maximum Number of FCAs/Alpha System			
	HP Tru 64 UNIX Switch		HP OpenVMS Switch	
	Single	Cluster	Single	Cluster
AS800	2	2	2	2
AS1200	4	4	4	4
AS4100	4	4	4	4
AS4000	4	4	4	4
AS8200	64	32	26	26
AS8400	64	32	26	26
DS10	2	2	2	2
DS20	4	4	4	4
DS20 E	4	4	4	4

Table 6: Alpha Servers Supported (Continued)

Product	Maximum Number of FCAs/Alpha System			
	HP Tru 64 UNIX Switch		HP OpenVMS Switch	
	Single	Cluster	Single	Cluster
ES40	4	4	4	4
ES45	4	4	4	4
GS60	64	32	26	26
GS80	64	32	26	26
GS160	64	32	26	26
GS320	64	32	26	26
GS140	64	32	26	26

Supported Sun Servers

The following list contains those Sun server models that are compatible with the Enterprise Virtual Array:

4U Architecture:

- 4500
- 3500
- 220
- 3000
- 450
- 420
- R10K

Sunfire Models:

- 4800
- 4810
- 6800
- 3800 - Uses compact PCI slots. There is a new qualified Fibre Channel Adapter for compact PCI.

Supported HP-UX Servers

Table 7 contains those HP server models that are compatible with the Enterprise Virtual Array:

Table 7: HP Server Models Compatible with the Enterprise Virtual Array

Server Class	Models
A-class	4xx, 5xx, rp2300, rp24xx
B-class	B2000, B3000
C-class	C3000, C3650, C3700
K-class	2XX, 3XX, 4XX, 5XX
L-class	1000, 2000, 1000, 2000, rp5430, rp5450, rp5470,
N-class	rp7410, rp7400, 8400, Superdome (16, 32, 64-way)
J-class	J5600, J6000, J6700

Supported IBM-AIX Servers

The following list contains those IBM server models that are compatible with the Enterprise Virtual Array:

- P270
- F50
- H70
- S70
- M80
- P610
- F80
- H80
- S7A
- S80
- P620
- P660
- P680
- P690 with restrictions*
- P640

*For restrictions, see the HP StorageWorks Release Notes for IBM-AIX Kit v2.0 for Enterprise Virtual Array.

VCS v2.003 Enhancements

VCS v2.003 includes code fixes which will provide an immediate benefit and improve storage system performance.

The fixes include items covered below in the following categories:

- Specific fixes to known issues
- Improvements in FCAL robustness

- Serviceability enhancements
- Other improvements

Specific Fixes to Known Issues

- Leveling did not always complete with the desired level storage allocation across all disk drives in the disk group. A workaround was developed but is no longer necessary with v2.003.
- When accessing an inoperative unit through SUN Secure Path, the Release with Cookie command response was not correct.
- Leveling does not make all raw storage space available. Round off errors caused space to be left unused and unavailable to the user.
- A controller restart happened when deleting a disk group after an Add Volume command was initiated.
- When a drive sends a SMART error and then fails before the migration is completed, it is likely to result in a controller restart with BAD MEMBER STATE.
- One bad block could cause a VRaid0 unavailability of the units in the diskgroup due to the failure. This happens in the case of a BBR failure.
- Second (and subsequent) snapshot took too long. To obtain better snapshot performance, the **Write-Thru Cache** setting can be altered. This is a global setting which should be invoked about 30 minutes prior to taking a snapshot. This allows sufficient time for the cache to flush unwritten data which would cause slower snapshot creation. The Write-Thru-Cache may be reset immediately after the snapshot is taken. Although altering the setting will enhance the performance of the snapshot operation, depending on workload profile, it may decrease the performance of HOST I/O to the LUN being copied and the associated snapshots.

Note: See Enabling/Disabling Write-Thru Cache, page 26.

- If a unit was reserved by a host and a new host presentation is made, that new host would be granted access to the unit.
- In-band event presentation overloaded certain hosts. The number of logs was overwhelming host event logs.

Logging to Tru64 UNIX and Windows NT hosts has now been disabled by default. A maintenance invoke command to enable log presentation to hosts is available if desired. To enable the log presentation, see procedure *Enabling/Disabling Tru64 UNIX and Windows Host Event Mode*, page 25.

FCAL Robustness Additions

- It has been noted on some machines that some drives may stop working because of a Fibre Channel PLOGI failure. The FC LIP is now invoked to get drives back in service.
- Unexpected restarts are now avoided when both loops in a pair are experiencing loop communications problems.
- Ensure a 24 hour wait on failed port. Failed ports were getting retried too quickly in V2.002, causing poor performance due to excessive retries. A failed report will be retried automatically after 24 hours, but it can be retried sooner (manually using the OCP) if you believe it has been corrected.
- Assure that bad drives are marked inoperative if a command sent with a bypass error recovery flag has actually suffered a hard failure.
- The possibility of losing Storage Management Appliance access if the Quorum disk is removed has been resolved.
- Ensure that mirror traffic times out to hung controller (mirror port). If one controller attempts to send commands to a controller that is powered up but is not responding, make sure that those commands do not continue to be retried.
- Under some circumstances, link retry counters were improperly cleared, resulting in the controller not failing drives from the storage cell.
- Disk drive firmware code load enhanced.

Serviceability Enhancements

- Shutdown LCD messages were sometimes overwritten. Minor fix in LCD state handling.
- Check placed in boot CDRROM to ensure code is running on correct hardware. Prevents running EVA5000 code on EVA3000 or visa versa.
- Controller stuck in reboot loop. Fixed recursive bugcheck algorithm.
- Termination processing was not working with a bad port. Attempts to write a termination packet in this case would not work properly if one of the device ports was inoperative.

Other Enhancements

- Clear old errors in large commands that are aborted. This prevents controller unexpected restarts.
- HP hosts handling of the EVA failing Inquiry command. Now successful with unknown unit status and zero page length.
- A Tru64 UNIX Persistent Reservation command to a VRaid1 unit in an inoperative state would cause recursive controller software restarts. The controller shouldn't attempt to process those persistent reserve commands to an inoperative drive. They should immediately be failed to the host.
- Resolve a recursive unexpected restart problem if controller firmware encounters a DSI Exception or Low memory access violation.
- Resolve a bad unit state on unavailability so that after the condition is resolved, the unit will be recoverable. RAID1 data could be left unavailable to the user even though it is really possible to access the data.

Accessing the Field Service Options Page

Use the following procedure to access the Command View EVA Field Service Options page to send commands directly to the HSV110 controllers:

1. Browse to the Storage Management Appliance and launch Command View EVA.
2. In the browser Address field, add **FieldService** to the Management Appliance address: `http://<appliance address>/FieldService`.
The address appears as:
`http://<your_San_Management_Appliance>:2301/ResEltCpqFusion/fieldservice`
3. Press **Enter**.
The **Storage System Selection** page displays (see [Figure 1](#)).
4. Choose a storage system from the drop-down menu and Click **Select System**.
The **Field Service Options** page displays (see [Figure 2](#)).
5. To display the Command-Line Interface page, click **Open Command Line Interface** (see [Figure 3](#)).

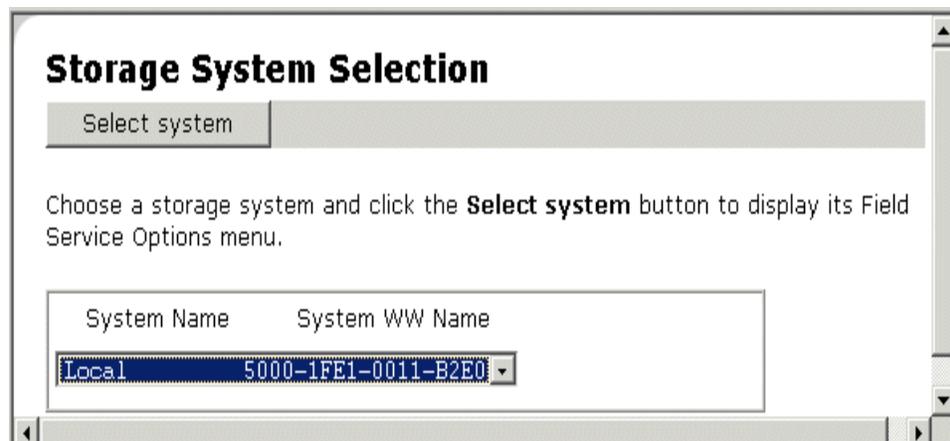


Figure 1: Storage System Selection page

Field Service Options

OK

The features offered in this menu are intended for use by authorized Hewlett-Packard service engineers only. If not properly used, some features can cause data loss or corruption. Do not use these features, unless you are authorized to do so.

System name:	Local
Node WWN:	5000-1FE1-0011-B2E0
Master controller:	Controller B: 5005-08b4-0001-0124-0000-0000-0000-0000
Slave controller:	Controller A: 5005-08b4-0001-008e-0000-0000-0000-0000

- Configure Integrated Logging Facility (ILF)
- Open command line interface
- Crash controller(s)
- Configure software tracing options
- Save MLD to appliance
- Capture system information

Figure 2: Field Service Options page

Command-Line Interface

Enter a command :

Select command from list:	Enter hex equivalent of command:
<input type="button" value="Click to select from list"/> ▾	—OR— <input type="text" value="Enter a command"/>
Argument 1:	<input type="text"/>
Argument 2:	<input type="text"/>
Argument 3:	<input type="text"/>
Argument 4:	<input type="text"/>
Argument 5:	<input type="text"/>
Argument 6:	<input type="text"/>

Figure 3: Command-Line Interface page

Enabling/Disabling Tru64 UNIX and Windows Host Event Mode

Use the following procedure to **Enable/Disable the Tru64 UNIX Host Event Mode**:

Note: After upgrading from VCS v2.002 to v2.003, host event mode is turned off by default and the hosts stop seeing the events sent from EVA. Only Windows NT (with Secure Path) and Tru64 UNIX host type can have this feature turned on.



CAUTION: Please use maximum caution when using the Field Service page and the Command Line Interface. Entry of improper commands and parameters could result in system corruption

1. To enable/disable the host event mode for **all specific type hosts**, enter 3B in the **Enter a Command** field on the Command Line Interface page (see [Figure 3](#)).
2. Enter 3 (for Windows NT/Secure Path) or 5 (for Tru64 UNIX) in the **Argument 1** field.
If you enter any other host, an error will be returned.
3. Enter 1 (to turn on) or 0 (to turn off) in the **Argument 2** field.
4. Click **Execute Command**.

Enabling/Disabling Host Event Mode for a Specific Host

1. Navigate to the **Host Properties** page in Command View EVA.
2. Note the UUID field (6005-08b4-0001-400e-002e-5000-001a-0000).
3. To enable/disable the host event mode for a specific host, enter 39 in the **Enter a Command** field on the Command Line Interface page (see [Figure 3](#)).
4. Enter the following in the Argument fields:
 - Argument 1 - 600508b4
 - Argument 2 - 0001400e
 - Argument 3 - 002e5000
 - Argument 4 - 001a0000
 - Argument 5 - 1 (to turn on) or 0 (to turn off)

5. Click **Execute**.
Operation was Successful displays.

Check if Host Event Mode is Enabled/Disabled

To check if the Host Event Mode is turned on or off for a specific host, follow these procedures:

1. Navigate to the Host Properties page in Command View EVA.
2. Note the UUID field (6005-08b4-0001-400e-002e-5000-001a-0000).
3. Enter the following on the Command Line Interface page:
 - Enter a Command - 3A
 - Argument 1 - 600508b4
 - Argument 2 - 0001400e
 - Argument 3 - 002e5000
 - Argument 4 - 001a0000
4. Click **Execute**.
Command output displays. If the event mode is on, 0001h displays. If the event mode is off, 0000h displays.

Note: If arguments are entered incorrectly or other incorrect entries are made, the following error message will display: Storage System is not initialized.

Enabling/Disabling Write-Thru Cache

Use the following procedure to turn on Write-Thru Cache:

1. Enter the following on the Command Line Interface page:
 - Enter a Command - e
 - Argument 1- 100
 - Argument 2 - 0
 - Argument 3 - 0
2. Click **Execute**.
Command output displays 0001h.

Use the following procedure to **turn off** Write-Thru Cache:

1. Enter the following on the Command Line Interface page:
 - Enter a Command - e
 - Argument 1- 101
 - Argument 2 - 0
 - Argument 3 - 0
2. Click **Execute**.
Command output displays 0000h

Note: If the arguments are entered incorrectly or other incorrect entries made, the following error message will display: Storage System is not initialized.

Operating Constraints

This section contains operating constraints specific to the Enterprise Virtual Array Hardware and Enterprise Virtual Array VCS software. Other operating constraints can be found as follows:

- Operating constraints specific to the HP Open View Storage Management Appliance can be found in the Storage Management Appliance Release Notes.
- Operating constraints specific to HP StorageWorks Command View EVA can be found in the Command View EVA Release Notes.

In addition, any operating constraints pertaining to the host operating system can be found in the individual operating system release notes.

Topics in this section include:

- [Failback Preference Setting for HSV Controllers](#), page 29
- [VCS v2.0 Software Cannot be Downgraded](#), page 31

Failback Preference Setting for HSV Controllers

Table 8 describes the failback preference mode for each of the operating systems supported by HSV controllers and Command View EVA.

Table 8: Failback Preference Settings

Setting	Point in Time	Behavior
No Preference	At initial presentation	The units are alternately brought online to Controller A or to Controller B.
	On dual boot or controller resynch	If there is cache data for a LUN on a particular controller, the unit will be brought online there. Otherwise, the units are alternately brought online to Controller A or to Controller B.
	On controller failover	All LUNs are brought online to the surviving controller.
	On controller failback	All LUNs remain on the surviving controller. There is no failback except if a host moves it using SCSI commands.
Path A - Failover Only	At initial presentation	The units are brought online to Controller A.
	On dual boot or controller resynch	If there is cache data for a LUN on a particular controller, the unit will be brought online there. Otherwise, the units are brought online to Controller A.
	On controller failover	All LUNs are brought online to the surviving controller.
	On controller failback	All LUNs remain on the surviving controller. There is no failback except if a host moves it using SCSI commands.
Path B - Failover Only	At initial presentation	The units are brought online to Controller B.
	On dual boot or controller resynch	If there is cache data for a LUN on a particular controller, the unit will be brought online there. Otherwise, the units are brought online to Controller B.
	On controller failover	All LUNs are brought online to the surviving controller.
	On controller failback	All LUNs remain on the surviving controller. There is no failback except if a host moves it using SCSI commands.

Table 8: Failback Preference Settings (Continued)

Setting	Point in Time	Behavior
Path A - Failover/Failback	At initial presentation	The units are brought online to Controller A.
	On dual boot or controller resynch	If there is cache data for a LUN on a particular controller, the unit will be brought online there. Otherwise, the units are brought online to Controller A.
	On controller failover	All LUNs are brought online to the surviving controller.
	On controller failback	All LUNs remain on the surviving controller. After controller restoration, the units that are online to Controller B and set to Path A are brought online to Controller A. This is a one time occurrence. If the host then moves the LUN using SCSI commands, it will remain where moved.
Path B - Failover/Failback	At initial presentation	The units are brought online to Controller B.
	On dual boot or controller resynch	If there is cache data for a LUN on a particular controller, the unit will be brought online there. Otherwise, the units are brought online to Controller B.
	On controller failover	All LUNs are brought online to the surviving controller.
	On controller failback	All LUNs remain on the surviving controller. After controller restoration, the units that are online to Controller A and set to Path B are brought online to Controller B. This is a one time occurrence. If the host then moves the LUN using SCSI commands, it will remain where moved.

Table 9 describes the failback default behavior and settings allowed for each operating system. The table indicates when Secure Path is used in conjunction with the operating system.

Table 9: Failback Settings by Operating System

Operating System	Default Behavior	Settings Allowed
Windows Secure Path	Autoback done by the host	No Preference, Path A/B - Failover Only
Sun Solaris Secure Path	Autoback done by the host	No Preference, Path A/B - Failover Only
HP Secure Path	Autoback done by the host	No Preference, Path A/B - Failover Only
IBM AIX Secure Path	Autoback done by the host	No Preference, Path A/B - Failover Only

Table 9: Failback Settings by Operating System

Operating System	Default Behavior	Settings Allowed
HP Tru64 UNIX	Host follows the unit	All settings allowed. Recommended setting: Path A/B - Failover/Failback.
HP OpenVMS (7.3 and below)	Attempts to move the unit to the first path discovered	No Preference, Path A/B - Failover Only
HP OpenVMS (7.3-1 and greater)	Host follows the unit	All settings allowed. Recommended setting: Path A/B - Failover/Failback

VCS v2.0 Software Cannot be Downgraded

It is important to note that you cannot downgrade VCS v2.0 to an earlier version.

Avoiding Problem Situations

This section addresses avoiding problem situations specific to the Enterprise Virtual Array hardware and Enterprise Virtual Array VCS software.

Avoiding problem situations specific to the HP Open View Storage Management Appliance can be found in the Storage Management Appliance Release Notes.

Avoiding problem situations specific to HP StorageWorks Command View EVA can be found in the Command View EVA Release Notes.

In addition, avoiding problem situations pertaining to operating systems can be found in the individual operating system release notes.

Topics in this section include:

- [Licensing and the Upgrade Process](#), page 32
- [Operating HSV Controller at or Near Storage Limit](#), page 32
- [Secure Path Version](#), page 33
- [Upgrading to VCS v2.003 Software](#), page 33
- [Code Load Usage](#), page 33
- [Disk Resource Pending Timeout for Large Configurations](#), page 33
- [Upgrading HSV110 Controllers System Software to VCS v2.003 with Windows 2000 hosts](#), page 34

Licensing and the Upgrade Process

It is mandatory that the user first obtain and enter all licenses prior to performing the VCS upgrade. If the licenses are not entered before performing the upgrade, the user will get an “HSV upgrade manager - open file read failure” error and will be dropped from the code load process. The user will then have to restart the code load process and proceed as usual.

Operating HSV Controller at or Near Storage Limit

When operating the HSV controller at or near its available storage limit, use the high water threshold warnings to ensure you are aware when you must add more storage to the system.

Secure Path Version

The Enterprise Virtual Array with VCS v2.003 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](#)).

Upgrading to VCS v2.003 Software

Your Enterprise Virtual Array VCS must be at v2.002 in order for you to do a rolling upgrade to VCS v2.003. You cannot do a rolling upgrade from a version level below 2.002.

You can upgrade from v1.021, v2.000, and v2.001, but not as rolling upgrades. There is the possibility of a restart associated with the battery firmware upgrade, but the system works after a power cycle. Contact your HP authorized service provider if your controller is below V1.02.

Caution: Storage System Passwords must be disabled through the controller OCP prior to the upgrading to v2.003. All LOCATE commands should be OFF prior to the upgrade.

Code Load Usage

When a maximum configured system is running at maximum load, code load may not complete fast enough to avoid application time-outs. Because of this behavior, it is recommended that the VCS upgrade be done during off-peak usage.

Disk Resource Pending Timeout for Large Configurations

In order to ensure continuous operation of disk resources across SAN perturbations with disk resource counts greater than eight, HP recommends that the Pending Timeout parameter for each disk resource be increased from 180 seconds to 360 seconds.

To view and set the Pending Timeout parameter:

1. Open the **Microsoft Cluster Administrator**.
2. Select a **Disk Group** resource in the left pane.
3. Right click **Each Disk Resource** in right pane, one at a time, and select **Properties**.

4. Select the **Advanced** tab from the **Properties** dialog box.
5. Locate the **Pending Timeout** value and change it to **360**.
6. Click **OK**.

Upgrading HSV110 Controllers System Software to VCS v2.003 with Windows 2000 hosts

Windows 2000 hosts implementation of the Device discovery code/Plug and Play detection code are responsible for rolling upgrade restrictions when you are upgrading from VCS v1.x or v2.000.

If you are upgrading from VCS v1.0x or v2.000 to v2.002 or v2.003, rolling upgrades for Windows 2000 hosts are NOT supported. If you are upgrading from VCS v2.001 to VCS v2.002, rolling upgrades ARE supported (see [Table 10](#)).

Rolling upgrades are also supported when upgrading from VCS v2.002 to VCS v2.003. Windows NT and all other supported Enterprise operating systems support rolling upgrades of VCS.

If Securepath is being upgraded, it is necessary to shutdown the Windows 2000 hosts, execute the HSV110 upgrade and reboot the Windows 2000 hosts. Secure Path, which also requires a host reboot, should be installed at the same time.

Note: If Secure Path V4.0 has already been installed on the Windows 2000 hosts, it is not necessary to reinstall.

Table 10: Windows 2000 Rolling Upgrade Support

Upgrading from	Upgrading to	Rolling Upgrade supported	Rolling Upgrade not supported
v1.0x	v2.002 or v2.003		X
v2.000	v2.002 or v2.003		X
v2.001	v2.002	X	
v2.002	v2.003	X	

Enterprise Storage System Notes

Topics in this section include:

- [Cable Requirements](#), page 35
- [Dynamic Volume Expansion](#), page 36
- [Upgrading the Storage System Software from v2.002 to v2.003](#), page 36
- [Licensing Support Information](#), page 36
- [Special Consideration for 1-GB and 2-GB Switch Users](#), page 36

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 11](#) and [Table 12](#) provide a listing of available cables.

Table 11: LC-SC cables

Length	Description	HP 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 12: LC-LC Cables

Length	Description	HP 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

Dynamic Volume Expansion

If you need a virtual disk to be bigger than you originally specified, use dynamic volume expansion functionality to increase the capacity. Your host operating system must support dynamic volume expansion.

Upgrading the Storage System Software from V2.002 to v2.003

When upgrading your Storage System software from V2.002 to v2.003, get the latest version of any Enterprise documentation at the following website:
<http://h18000.www1.hp.com/products/storageworks/enterprise/documentation.html>

Licensing Support Information

If you have trouble obtaining a License Key or need other licensing support information, refer to *HP StorageWorks Enterprise Virtual Array License Instructions* at: <http://h18000.www1.hp.com/products/storageworks/enterprise/documentation.html>

For assistance with incorrect Authorization ID, contact an HP authorized service provider.

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

Special Consideration for 1-GB and 2-GB Switch Users

If you operate 1-GB or 2-GB switches in your Enterprise storage system and are preparing to upgrade your switch firmware to revision level 2.6 (1-GB switches), or revision level 3.02 (2-GB switches), determine whether VCS V1.02 is already installed. If VCS is BELOW version V1.020/V1.021, then you must upgrade to V1.021 **prior** to installing the switch firmware upgrade.