Release Notes

HP StorageWorks Enterprise Virtual Array

Product Version: v3.020

Fourth Edition
August, 2004

Part Number: T3030–98501

This document contains the most recent product information about the HP StorageWorks Enterprise Virtual Array, as well as supplemental, support, and product feature details. This information applies to both the EVA5000 (HSV110) and EVA3000 (HSV100) products.

For the latest version of these Release Notes and other Enterprise Virtual Array documentation, go to the appropriate website:

http://www.hp.com/go/eva5000

http://www.hp.com/go/eva3000

HP StorageWorks Enterprise Virtual Array Release Notes
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Release notes contents

The release notes include the following topics:

Note

Much of the information included here is not documented elsewhere, so it is recommended that you read this information thoroughly before installing and operating the Enterprise Virtual Array.

The information in this document was the current at the time of publishing. To ensure you have the most current information, check the following web sites for a newer version:

http://www.hp.com/go/eva5000

http://www.hp.com/go/eva3000

Intended audience

This document is intended to assist those involved in the installation and operation of the HP StorageWorks Enterprise Virtual Array and the following associated software:

- HP StorageWorks Virtual Controller Software v3.0c media kit for dual HSV110 controllers (EVA5000)
- HP StorageWorks Virtual Controller Software v3.0a media kit for dual HSV100 controllers (EVA3000)
- HP OpenView Storage Operations Manager EVA
- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA

Additional Enterprise Virtual Array information

Additional information for the Enterprise Virtual Array and associated software is listed in Table 1.1.

Table 1.1. Additional information

Information	Location
General Enterprise Virtual Array	http://h18006.www1.hp.com/storage/arraysystems.html
Enterprise Virtual Array product support	http://h18000.www1.hp.com/products/storageworks/enterprise
HP OpenView Storage Operations Manager, Command View EVA	http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html
HP StorageWorks Business Copy EVA	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html
HP StorageWorks Continuous Access EVA	http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html
Downloadable software and drivers for storage products	http://welcome.hp.com/country/us/eng/support.html
Storage Management Appliance updates	http://h18000.www1.hp.com/products/sanworks/managementappliance
Storage Management Appliance	http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html
License key redemption	http://h18000.www1.hp.com/products/software/softwarekeys/index.html
Operating system platform kits	http://www.hp.com/go/evaplatformkit

Known issues

In certain situations, VCS 3.020 does not interact correctly with the following versions of B-Series Switch (Brocade) firmware: V3.1.2, and V3.1.2a. This problem may occur following some inter-switch link disruptions. This problem has been seen in the qualification labs, but not in the field with current versions of VCS firmware. If this problem is detected in the field, the current workaround is to downgrade the switch firmware to V 3.1.1c. Look for additional Engineering Advisories on this issue.

New features and enhancements

The Enterprise Virtual Array v3.020 provides the following new features and enhancements.

Note

Access to the features included in VCS v3.020 requires the management software listed in Table 1.2.

Added Features

- 300 GB disk drive
- 250 GB Fibre Attached Technology Adapted (FATA) near-online disk drive
- EVA3000 (HSV100) single disk enclosure configuration (2C1D)
- New disk drive firmware
- Asynchronous background delete
- Cross VRaid snapshot and snapclone support
- VCS standard support for snapclones across disk groups now includes support for snapclones between online high performance disks and FATA near-online disk groups. This feature, in conjunction with Cross Vraid Snaps, also allows you to change the Vraid type while performing a snapclone between disk groups.
- Improvements for snap and metadata issues
- 250GB FATA disks (if available) used as default storage for data replication logs.
- Improved handling of fibre channel disk drive and link errors
- Performance improvements in storage management interface
- VCS downgrade procedures now fully documented in the *HP StorageWorks Enterprise Virtual Array Updating Product Software Instructions v3.020*
  Emergency (EM) drive code load is offered only at the VCS 3.020 level.

Operating system support enhancements

- HP-UX boot support from SAN
- Single-path boot support on HP-UX, Windows, and Linux
- Freeze console LUN 0 at VCS v3.010 version to ensure proper operation on Windows 2003. See the section called “Upgrading VCS on Windows 2003”.
- Increase Emulex HBA queue depth on Windows. The QueueDepth parameter for the SCSIport driver for Microsoft has been increased from 25 per port to 32 per LUN or 8K per port.
- Added support for the following:
  - Sun Clusters 3.1
  - Veritas Cluster Server 4.0 on Solaris
  - Veritas Filesystem 4.0 on Solaris
  - Veritas Volume Manager 4.0 on Solaris
  - Veritas Cluster Server 3.5 on HP-UX 11i v1
  - Veritas Filesystem 3.5 on HP-UX 11i v1
  - Veritas Volume Manager 3.5 on HP-UX 11i v1

Continuous Access enhancements

- Support for low cost storage mix of online and FATA disks with Continuous Access
- Support mixed code versions in Continuous Access configurations
- Improvement in performance for remote replication
- Up to 128 Continuous Access copy sets in asynchronous mode (up from 12)
- Continuous Access fast synchronize on log full to avoid a full copy
- Support a Continuous Access read only destination (cluster mode) on more host platforms
- Serviceability improvements in the Continuous Access event area

Fault management and diagnostic enhancements

- Improved handling of two disk drive failure scenarios
- Additional and enhanced corrective action codes
- Better event time correlation capability
- Error event correlation improvements
- Generate a “no significant events reported” event automatically at regular intervals to indicate fault management reporting is still active.
- Termination code improvements
- Ensure audible alarm sounds when a disk enclosure I/O module is removed.
- Reduction in probability of lost error events
- Soft error handling enhancements – threshold tightened and some recovered errors included
- Decreased time required to perform disk drive Loop Initialization Disrupter (LID) recovery.
- Additional integrity utilities are provided for HP Services personnel to verify Enterprise Virtual Array operation

Cross Vraid snapshot and snapclone support

Cross Vraid snapshots and snapclones are supported in VCS v3.020. This feature will be immediately available via Command View (create/delete via GUI) and SSSU (scripting). Business Copy management software (enhanced mode) will support Cross Vraid in a future release.

VCS v3.020 provides Cross Vraid snap functionality (changing the Vraid type when snapping or snapcloning) with the following support.

- Cross Vraid Snapshot and Snapclones within the same Vdisk group.
- Cross Vraid Snapclones Across Vdisk groups (including standard Vdisk and FATA Vdisk groups)

Online upgrades for system software

VCS v3.020 supports online or Enhanced Rolling Upgrade of the storage system software. These features will allow you to upgrade the VCS with little or no impact to host access to the array. VCS Enhanced Rolling Upgrade is included in VCS v3.020 and can be utilized with the next upgrade to VCS firmware.

During a VCS enhanced rolling upgrade of the storage system software, VCS is upgraded on the HSV controllers while they are still processing I/Os from the host servers. The HSV controllers are upgraded one controller at a time, using the native redundancy of the EVA to provide continuous communication with the hosts.

You must suspend replication before installing a rolling upgrade in CA environments.

EVA Remote Support Tools

As a no charge option, HP will install remote service tools for any Enterprise Virtual Array under warranty or service support. These tools enable self-monitoring and diagnosis, and can significantly reduce the time required to isolate and correct problems. If desired, the tools can

be configured to transmit status information directly to an HP service center for proactive problem resolution. Contact your local HP Services department for more details.

Enterprise Virtual Array overview

Enterprise Virtual Array software

Table 1.2 lists the HSV controller software and the optional software products supported on the Enterprise Virtual Array v3.020.

Note

HP OpenView Storage Management Appliance software v2.1 is required for managing an Enterprise Virtual Array running VCS v3.020. If the appliance software must be upgraded, it will be necessary to order the free Storage Management Appliance software v2.1 update CD from the following website:

http://h18000.www1.hp.com/products/sanworks/softwaredrivers/managementappliance/index.html

Table 1.2. HP StorageWorks Enterprise Virtual Array software

Software	Version	Description
HP StorageWorks Virtual Controller Software v3.0c media kit for dual HSV110 controllers	v3.020	Required for EVA5000
HP StorageWorks Virtual Controller Software v3.0a media kit for dual HSV100 controllers	v3.020	Required for EVA3000
HP OpenView Storage Management Appliance software	v2.1	Required with VCS 3.020 system software.
HP OpenView Storage Operations Manager, Command View EVA	v3.2	Required with VCS 3.020 system software. Command View EVA v3.2 is included with OpenView Storage Operations Manager v1.1
HP StorageWorks Business Copy EVA	v2.2.2	Optional for general operation. Required for snapshot capability.
HP StorageWorks Continuous Access EVA	v1.1a	Optional for general operation. Required for remote data replication.
Non-Windows operating system platform kits	v3.0e	Required with VCS 3.020 system software.
Windows platform kit	v3.0f	Recommended with VCS 3.020 system software.

VCS Media Kit for Dual HSV Controllers

The following items are included in the VCS Media Kit for Dual HSV Controllers. There are separate kits for the HSV110 controllers (EVA5000) and the HSV100 controllers (EVA3000).

- *HP StorageWorks Enterprise Virtual Array Read Me First*
- *HP StorageWorks Enterprise Virtual Array Release Notes*
- Upgrade License
- HP StorageWorks System Software for HSV110 v3.0c CD-ROM (EVA5000)
- HP StorageWorks System Software for HSV100 v3.0a CD-ROM (EVA3000)
- HP StorageWorks Enterprise Virtual Array Documentation CD-ROM

HP OpenView Storage Operations Manager, Command View EVA is purchased separately but is required for VCS v3.020 to function.

http://www.hp.com/go/evaplatformkit

Upgrading an Enterprise Virtual Array to VCS v3.020

It is recommended that you upgrade to VCS 3.020 to realize the benefits included in this release. To upgrade to VCS 3.020, a copy of the system software is provided on the CD-ROM in the HP StorageWorks Virtual Controller Software v3.0 media kit for dual HSV controllers.

Refer to *HP StorageWorks Enterprise Virtual Array Updating Product Software Instructions v3.020* for complete upgrading instructions and sequences for v3.020 and associated software applications.

Licensing Information

VCS v3.020 requires installation of new licenses as follows:

- Controller software VCS v3.020 does not require a basic license. A VCS Upgrade User License Agreement is included in the VCS software kit. No action is required to activate the agreement.
- HP OpenView Storage Operations Manager, Command View EVA is licensed separately. Acceptance of the license agreement displayed during installation is the only licensing requirement for Command View EVA.
- The Business Copy EVA license activates the snapshot functionality. Business Copy licenses purchased for use with VCS v3.0 will work with v3.020. For licensing information, see the *HP StorageWorks Business Copy EVA QuickSpecs* at the following web site:
  http://h18006.www1.hp.com/products/storage/software/bizcopyeva/specifications.html
- Continuous Access EVA requires a license. Licenses purchased for use with VCS v3.0 will work with v3.020. For licensing information refer to the *HP StorageWorks Continuous Access EVA QuickSpecs* at the following web site:
  http://h18006.www1.hp.com/products/storage/software/conaccesseva/specifications.html

For assistance with an incorrect Authorization ID, contact an HP authorized service provider. For assistance with a lost Authorization ID or missing Authorization ID, contact your HP order channel.

Supported components

This section identifies the various hardware and software components supported by the Enterprise Virtual Array running VCS v3.020.

Supported system configurations

For complete information on supported configurations, refer to the *HP StorageWorks Enterprise Virtual Array QuickSpecs*, which can be downloaded from appropriate web site:

http://www.hp.com/go/eva3000

http://www.hp.com/go/eva5000

Supported operating systems

Table 1.3 lists the operating systems supported at the time of release.

Table 1.3. Supported operating system specifications

Operating system	Version	HBA (FCA)	Adapter firmware/ Boot BIOS	Adapter driver
Windows Server 2003, Enterprise Edition [a] (32–bit)		KGPSA-CB FCA2101 FCA2355	3.92a2/1.70a1	5-5.10a9
		FCA2404 DC FCA2404 FCA2408	1.81a2/1.70a1	5-5.10a9
		FCA2214 FCA2214 DC FC Mezzanine card for BL20p	BIOS 1.34	9.00.13
		A7388A A7387A	1.81a3/1.70a1	5-5.10a9
Windows® 2000 (32-bit)	SP3, SP4			
Windows NT® (Intel®) [b]	4.0 SP6a	KGPSA-CB	3.92a1/1.63a1	4–482a16
		FCA2101 FCA2355	3.91a1/1.63a1	4–482a16
		FCA2404 FCA2404 DC FCA2408	1.01a2/1.63a1	4–482a16
Windows Server 2003 Enterprise Edition (64-bit) and Datacenter (64-bit)		AB232A A7298A	1.81a2/3.00a9	6-5.10a9

Operating system	Version	HBA (FCA)	Adapter firmware/ Boot BIOS	Adapter driver
HP-UX	11.0, 11i v1 11i v2	A5158A 1Gb PCI (11.0 and 11i v1) A6685A 1Gb HSC (11.0 and 11i v1) A6795A 2Gb PCI (All) A6826A 2Gb (11i v1, v2) A9782A 2Gb (11i v1, v2) A9784A 2Gb (11i v1, v2)	Native	
Tru64 UNIX®	5.1a PK6, NHD7	DS-KGPSA-CA	3.92a2, 3.82a1	Native
		FCA2354	3.92a2	
		FCA2384	1.81a5	
	5.1b PK3, NHD7	DS-KGPSA-CA	3.92a2, 3.82a1	Native
		FCA2354	3.92a2	
		FCA2384	1.81a5	
		FCA2684	1.81a5	
		FCA2684DC	1.81a5	
OpenVMS	7.2-2 VMS722_FI-BRE_SCSI_V0600	DS-KGPSA-CA	3.92a2/3.82a1	Native
	7.3 VMS73_FI-BRE_SCSI_V0700	FCA2354	3.92a2	
	7.3-1 VMS731_FI-BRE_SCSI_V0600 7.3-2 VMS732_FI-BRE_SCSI_V0300	FCA2384	1.81a5	

Operating system	Version	HBA (FCA)	Adapter firmware/ Boot BIOS	Adapter driver
Sun Solaris	2.6, 7, 8	SWSA4–PC (JNI FCI-1063) (32-bit PCI)	3.0.3	2.5.9.03 2.6.13
		SWSA4–SC (JNI FC64-1063) (64-bit Sbus)	13.3.7	2.5.9.03 2.6.13
		FCA2257P	3.2.9 Fcode v1.18.5 & v2.00.05	4.11
			3.2.15	4.13.01
		FCA2257S	2.2.4 Fcode v1.18.3	4.11
			2.2.6	4.13.01
		FCA2257C [c]	2.2.4 Fcode v1.18.5	4.11
			2.2.6	4.13.01
	9	SWSA4–PC (JNI FCI-1063) (32-bit PCI)	3.0.3	2.6.13
		SWSA4–SC (JNI FC64-1063) (64-bit Sbus)	13.3.7	2.6.13
		FCA2257P	3.2.9 Fcode v1.18.5 & v2.00.05	4.11
			3.2.15	4.13.01
		FCA2257S	2.2.4 Fcode v1.18.3	4.11
			2.2.6	4.13.01
		FCA2257C	2.2.4 Fcode v1.18.5	4.11
			2.2.6	4.13.01
i386 Red Hat AS 2.1	2.4.9-e.35* 2.49-3.35.s mp 2.4.9-e.35 enterprise 2.4.9-e.40, 2.4.9-e.40s mp, 2.4.9-e.40 enterprise	281541-B21 321835-B21 FCA2214 FCA2214DC	1.34	7.00.03
i386 Red Hat EL 3.0	*2.4.21-9.E L 2.4.21-9.EL smp 2.4.21-9.0. 1.EL 2.4.21-9.0. 1.ELsmp 2.4.21-15. EL, 2.4.21-15. Elsmp	FCA2214 FCA2214DC	1.34	7.00.03

Operating system	Version	HBA (FCA)	Adapter firmware/ Boot BIOS	Adapter driver
SUSE Linux Enterprise Server 8	2.4.21-169 -default 2.4.21-169 -smp 2.4.21-215 -default, 2.4.21-215 -smp	FCA2214 FCA2214DC	1.34	7.00.03
SUSE Linux Enterprise Server 7	2.4.7-4GB 2.4.7-64G B-SMP 2.14.18-4 GB 2.14.18-64 GB-SMP	281541-B21 321835-B21 FCA2214 FCA2214DC	1.34	6.04.00
IA64 Red Hat AS	2.4.18-e.41 2.4.18-3.41smp 2.4.18-e.43, 2.4.18-e.43	A6826A	1.34	6.06.50
IA64 Red Hat EL 3.0	2.4.21-9.EL 2.4.21-15. EL	A6826A BL20P FC Mezzanine card BL40P FC Mezzanine card	1.34	7.00.03
SUSE Linux Enterprise Server 8	2.4.21-112 -itanium2 2.4.21-112 -itanium2-smp 2.4.21-215 -itanium2, 2.4.21-215 -itanium2-s mp	A6826A BL20P FC Mezzanine card BL40P FC Mezzanine card	1.34	7.00.03
X86_64 Red Hat EL 2.1 [ES/AS]	2.4.9-e40 2.4.9-e40smp 2.4.9-e40enterprise 2.4.9-e41 2.4.9-e41smp	FCA2214 281541-B21 FCA2214DC 321835-B21 EL BL20P FC Mezzanine card BL40P FC Mezzanine card	1.34	7.00.03
X86_64 Red Hat EL 3 [AS/ES/WS]	2.4.21-15.EL 2.4.21-15.ELsmp 2.4.21-15.0.2.EL 2.4.21-15.0.2.ELsmp	FCA2214 281541-B21 FCA2214DC 321835-B21	1.34	7.00.03
X86_64 SuSE Linux Enterprise and Standard server 8	2.4.21-215 2.3.1-215-smp	FCA2214 281541-B21 FCA2214DC 321835-B21	1.34	7.00.03
IBM-AIX	4.3.3, 5.1, 5.2	PC2000LC-HPSP (Cambex 2Gb PCI)	3.2.10	1.5.26.0 1.5.25.3 (multi-path)
Novell NetWare	5.1 SP7 6.0 SP4 6.5 SP1	FCA2210	1.34	6.51b
		QLA2340 (FCA2214)	1.34	6.51b

[a]This platform is not supported in Enterprise storage system configurations with Continuous Access EVA. (32 bit)
[b]Windows NT is limited to supported configurations as of VCS v3.010 release.

[c]QLA cPCI 1Gb adapter (FCA2257C) is only supported under Solaris 8 and 9 per Sun. The new cPCI capable servers only run Solaris 8 or higher .

Note

VCS v3.020 requires v3.0e (v3.0f recommended for Windows) of the operating system platform kits. The operating system platform kits and associated documentation are available from the following website:

http://www.hp.com/storage/evaplatformkit

Clustering support

Table 1.4 lists the clustering applications and cluster node sizes supported by VCS v3.020.

Table 1.4. Clustering support

Operating system	Cluster service	Number of cluster nodes SP=single path MP=multi-path
Windows NT (SP6); Windows 2000 SP3, 4 (32-bit); Windows Server 2003, Enterprise Edition (32-bit)	MSCS	SP - no support MP - 2-node (NT, W2K) MP - 8-node (WS2003) MP - 4-node (WS03-32 with MPIO)
Windows Server 2003 Enterprise Edition(64-bit); Datacenter (64-bit)	MSCS, Oracle 9iRAC	SP - no support MP - 8-node
HP-UX 11i v1	ServiceGuard 11.14, ServiceGuard 11.15, ServiceGuard 11.16 Veritas Foundation Suite v3.5	SP - no support MP - 4-node
HP-UX 11i v2	ServiceGuard 11.15, ServiceGuard 11.16	SP - no support MP - 4-node
Tru64	TruCluster	Max = 8 SP - no support MP - 8-node
OpenVMS	VMS Cluster	Max = 96 SP - no support MP - test with 8-node
Sun Solaris 2.6, 7, 8	SunCluster v2.2 Veritas Volume Manager v3.2 with Veritas Cluster Service v2.0 with no DMP	Max = 32-node (VERITAS) SP - no support MP - 4-node
Sun Solaris 8, 9	Veritas Volume Manager v3.5 with Veritas Cluster Service v3.5 with no DMP Veritas Volume Manager v4.0 with Veritas Cluster Service v4.0 with no DMP[a]	Max = 32-node (VERITAS) SP - no support MP - 4-node
Sun Solaris 9	SunCluster 3.1 with Veritas Volume Manager 3.5 (FCA2257P only) SunCluster 3.1 with Sun Volume Manager (FCA2257P only)	Max = 32-node (VERITAS) SP - no support MP - 4-node SunCluster 3.1 - max nodes 4

Operating system	Cluster service	Number of cluster nodes SP=single path MP=multi-path
Linux Red Hat AS2.1 (2.4.9-e3, 2.4.9-e12, 2.4.9-e3smp, 2.4.9-e12smp) +U2 2.4.9-e25smp (32-bit) Linux Red Hat AS 3.0 U1 (32 and 64 bit) Suse SLES8 SP3/United Linux1.0 (32-bit)	Lifekeeper v4.5.0	SP - 16-node MP - 2-node MP - 8-node
	ServiceGuard 11.14.02	SP - test with 4-node - support 16-node MP - 4-node
	ServiceGuard 11.15.02	SP - test with 4-node - support 16-node MP - 8-node
Suse SLES8 SP3/United Linux 1.0 (64-bit)	ServiceGuard 11.15.02	SP - 16-node MP - 4- or 8-node
IBM AIX 4.3.3	HACMP 4.4.1	SP - no support MP- 2-node
IBM AIX 5.1	HACMP 4.4.1, 4.5, 5.1	
IBM AIX 5.2	HACMP 5.1, 4.5	
Novell NetWare 5.1 SP7 6.0 SP4 6.5 SP1.1	NetWare Cluster Services v1.01, 1.06, v1.7 [b] NetWare Cluster Services v1.6 (NW v6.0) NetWare Cluster Services v1.7 (NW v6.5).	SP - no support MP - 12-node

[a]Supported on FCA2257P adapter only
[b]Novell NetWare clusters are limited to 12 nodes when Secure Path is installed.

Multiple path support

Multiple path is the use of multiple connections between one or more host adapters (HBA) in a server and a LUN for high availability. OpenVMS and Tru64 UNIX have integrated multiple path capability and require no additional software.

HP StorageWorks Secure Path provides multiple path capability for hosts running Windows, Sun Solaris, HP-UX, IBM-AIX, NetWare, and Linux. See Table 1.5 for the Secure Path versions required for each operating system. Secure Path documentation can be downloaded from the following web site:

http://h18006.www1.hp.com/products/sanworks/secure-path/documentation.html

For information on other multiple path options available for the Enterprise Virtual Array, go the following web site:

http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html

Table 1.5. Secure Path versions for supported operating systems

Operating system[a]	In configurations with	Secure Path version for use in configurations without Continuous Access EVA	Secure Path version for use in configurations with Continuous Access EVA
Windows NT (Intel), Windows 2000 (32-bit), and Windows Server 2003 Enterprise Edition (32-bit)	Any supported adapter/ firmware/driver as shown in Table 1.3	4.0c, 4.0c SP1	4.0c, 4.0c SP1
Windows Server 2003 Enterprise Edition (64-bit) and Datacenter (64-bit)	Any supported adapter/ firmware/driver as shown in Table 1.3	4.0c, 4.0c SP1	4.0c, 4.0c SP1
HP-UX	Any supported adapter/ firmware/driver as shown in Table 1.3	3.0d	3.0d
Sun Solaris	Version 2.6, 7, or 8	3.0c SP1, 3.0d	3.0c SP1, 3.0d
	Version 9	3.0c SP1, 3.0d	3.0c SP1, 3.0d
Linux	Any supported adapter/ firmware/driver as shown in Table 1.3	3.0c	3.0c
IBM-AIX	Adapter firmware 2.2.6 (1Gb)	2.0d SP2	2.0d SP2
	Adapter firmware 3.2.10 (2Gb)	2.0d SP2	2.0d SP2
Novell NetWare [b]	Any supported adapter/ firmware/driver as shown in Table 1.3	3.0c SP2 or later	3.0c SP2 or later

[a]See Table 1.3 for supported versions.
[b]Novell NetWare clusters are limited to 12 nodes when Secure Path is installed.

Single path support configurations

The following platforms support single path configurations:

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

Note

Single path should not be used in mission-critical environments.

Single path is not supported in Continuous Access EVA environments. Hosts in a Continuous Access EVA configuration must contain multiple host bus adapters.

For more information about single path, download the *Single Path Implementation on the Enterprise Virtual Array* white paper from the following web site:

http://h18006.www1.hp.com/storage/arraywhitepapers.html

Supported disks

Table 1.6 lists the supported Fibre Channel disks.

Note

- Mixing disk capacities within a disk group is not recommended. Mixing disks can result in an inefficient use of capacity when using the disk failure protection level option. This option always uses the capacity of the largest disk in the disk group when reserving space for failure protection.
- A minimum of eight disks is required to create a disk group. Additional disks may be added up to the established disk group limits.
- A disk group cannot contain both online (high performance) disks and FATA disks. It must contain only one type of disks.

Table 1.6. Supported disks

Fibre Channel disk	HP model shown by Command View EVA	Minimum firmware revision
Online disks		
10K RPM 36GB dual ported	BD03654499	3BE3
	BD03655B28	HP00, HP03
	BD03656ABA	HP09
	BD03658223	HP00
10K RPM 72GB dual ported	BD07254498	3BE3
	BD07255B29	HP00, HP03
	BD07256ABB	HP09
	BD07258224	HP00
10K RPM 146GB dual ported	BD14655B2A	HP00, HP03
	BD14656ABC	HP09
	BD14658225	HP00
10K RPM 300GB dual ported	BD30058226	HP00
15K RPM 36GB dual ported	BF03654564	3BE6
	BF03655B2B	HP05
15K RPM 72GB dual ported	BF07255B2C	HP05
FATA (near-online) disks		
250GB dual ported	ND2505823A	HP00

Supported servers

Supported servers are listed in Table 1.7 and Table 1.8.

Table 1.7. Supported servers by operating system

Operating system	Supported servers
Windows	• HP ProLiant servers that are compatible with the supported adapters listed in Table 1.3. • Other industry-standard x86 servers that are compatible with the supported adapters listed in Table 1.3.
HP-UX	See Table 1.8.
Sun Solaris	• Sun Fire V210, V240, V440, 280R, V480, V880, V1280 (PCI only) • Sun Fire 3800 (cPCI only) • Sun Fire 4800, 4810, 6800 (PCI and/or cPCI, with I/O Assembly change) • Sun Enterprise 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500 (PCI and/or sBus, check customer configuration) • Sun Enterprise 10000 • Sun Enterprise 220R, 250, 420R, 450 (PCI only) • Sun Fire 12K, 15K (limited HBA support)
Linux	• HP ProLiant servers that are compatible with the supported adapters listed in Table 1.3. • Other industry-standard x86 servers that are compatible with the supported adapters listed in Table 1.3.
IBM-AIX	• RS/6000- (PCI & PCI-X Based Servers ONLY). 43P, 44P, F50, F80, H50, H70, H80, M80, S70, S7A, S80, 170, 270 • SP 9076 model, P-Series (PCI-Based Servers ONLY): P610, P615, P620, P630, P640, P650, P655, P660, P670, P680, P690
Novell NetWare	• HP ProLiant servers that are compatible with the supported adapters listed in Table 1.3. • Other industry-standard x86 servers that are compatible with the supported adapters listed in Table 1.3.
Tru64 UNIX and OpenVMS	• AS800, AS1200, AS4000, AS4100, AS8200, AS8400 • DS10, DS10L, DS15, DS20, DS20E, DS20L, DS25 • ES40, ES45, ES47, ES80 • GS60, GS60E, GS80, GS140, GS160, GS320, GS1280

Table 1.8. Supported HP-UX servers

Server class	Models
A-class	4xx, 5xx, rp2300, rp24xx
B-class	B2000, B2600
C-class	C3000, C3650, C3700
J-class	J5600, J6000, J6700
K-class (64-bit only)	Kx60, Kx70, Kx80
L-class	1000, 2000, rp5430, rp5450, rp5470
N-class	4000, rp7400, rp7410, rp8400
V-class	V2200, V2250, V2500, V2600

Server class	Models
PA 8800	rp7420, rp8420, rp3440, rp4440
Integrity	rx4640, rx7620, rx8620, rx1600
Workstations	zx2000, zx6000
—	Superdome (16-, 32-, and 64-way)
IA64	rx2000, rx2600, rx5670 servers; and zx2000 and zx6000 workstations with McKinley processors

Operating constraints

This section identifies operating constraints specific to the Enterprise Virtual Array hardware and VCS software. Operating constraints for related software applications are included in the following documents:

- *HP OpenView Storage Management Appliance Software v2.1 Release Notes*
- *HP StorageWorks Command View EVA v3.2 Release Notes*
- *HP StorageWorks Continuous Access EVA v1.1a Release Notes*
- *HP StorageWorks Business Copy EVA v2.2.2 Release Notes*

Any operating constraints pertaining to the host operating system can be found in the individual operating system release notes.

Sun Servers with Qlogic HBAs and Brocade FC switches

When operating Sun servers in a SAN environment that includes Qlogic HBAs and Brocade FC switches, ensure that the switch firmware has been upgraded to version 3.1 or 4.1 (depending on the switch model). The Enterprise Virtual Array does not support Qlogic HBAs running 1.18 firmware in the same environment with Brocade switch firmware versions older than 3.1 and 4.1. Failure to observe this restriction may result in continuously rebooting switches in certain situations.

Upgrading VCS on Windows 2003

When performing an online upgrade from any VCS version other than 3.010, the logical drives being presented to a Windows 2003 host may become inaccessible, resulting in job loss. Rebooting the Windows 2003 host will make the logical drives accessible once again.

Operation on Microsoft Windows NT 4.0

The EVA v3.020 incorporates a new Critical Resource Management function that will send Queue Full responses to SCSI commands before the maximum allowable Queue Depth of 2048 has been reached for a Fabric Port.

It is strongly recommended to run homogeneous Windows NT 4.0 environments and not mix Windows NT 4.0 hosts with hosts running any other operating systems on a given EVA subsystem.

Windows NT 4.0 does not properly handle these queue full responses and I/O errors may result. The Critical Resource Management feature can be disabled by selection a Custom Host Mode for NT 4.0 hosts. This is accomplished by entering the value 00000004 1F80B8A8 into the **Custom mode number** window on the **Add a Host** page of Command View EVA. However, note that the action of disabling the Critical Resource Management feature affects the entire array.

Avoiding Problem Situations

This section describes how to avoid problem situations specific to the Enterprise Virtual Array hardware and VCS software. Problem information for related software applications are included in the following documents:

- *HP OpenView Storage Management Appliance Software v2.1 Release Notes*
- *HP StorageWorks Command View EVA v3.2 Release Notes*
- *HP StorageWorks Continuous Access EVA v1.1a Release Notes*
- *HP StorageWorks Business Copy EVA v2.2.2 Release Notes*

Information on avoiding problem situations specific to operating systems can be found in the individual operating system release notes.

Operating an Enterprise Virtual Array at or near its storage limit

When operating an Enterprise Virtual Array at or near its available storage limit, consider reducing the occupancy alarm level (set with Command View EVA) from the default of 95%. A lower alarm level provides an earlier warning that you are approaching the need to add more storage to the system.

Disk Resource Pending Timeout for Microsoft® Windows® cluster configurations

If the disk resource count is greater than 8, HP recommends increasing the Pending Timeout parameter for each disk resource from 180 seconds to 360 seconds. Increasing the timeout value helps maintain continuous operation of disk resources across SAN perturbations.

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 menu.
5. Locate the Pending Timeout value and change it to 360.
6. Click OK.

Consistent Presentation of Disks while Making a Snapshot

It is recommended that the host presentation status of all of the virtual disks associated with a snapshot be consistent. That is, all virtual disks associated with the snapshot be presented or be not presented.

Avoiding Slow Creation of Multiple Related Snapshots

The creation of a second snapshot of the same virtual disk may take a long time. When this occurs, the delay in responding to the snapshot creation command may give the appearance of a hung system. This condition may occur when multiple snapshots of the same virtual disk are active simultaneously. This condition typically does not occur when only one snapshot operation on a particular virtual disk is active.

If the slow creation of multiple snapshots of the same virtual disk is causing a problem, a workaround is available. Refer to *How to Optimize Creation of Multiple Related Snapshots* at the following web site:

http://h18006.www1.hp.com/storage/arraywhitepapers.html

Install latest version of the operating system platform kits

All host operating system platform kits, with the exception of Windows, must be upgraded to version 3.0e for compatibility with VCS v3.020. Although not required, it is recommended that you upgrade to version 3.0f of the Windows platform kit. This version enables all the functionality available in VCS 3.020, including support for new HBAs. It is also recommended that you install the 3.0f kit on any host running the SSSU. The latest version of the SSSU exploits all the capabilities provided in VCS 3.020.

The latest platform kits are available for download at the following web site:

http://www.hp.com/go/evaplatformkit

Perform VCS v3.020 online upgrade during off-peak hours

When upgrading the controller software to VCS v3.020, be aware that the upgrade process can cause system time outs to occur. To avoid this situation, an online upgrade should be done during off-peak hours with minimal applications running.

Refer to *HP StorageWorks Enterprise Virtual Array Updating Product Software Instructions v3.020* for complete upgrading instructions.

Business Copy EVA upgrade

Business Copy EVA must be upgraded to Business Copy EVA v2.2.2 to interface properly with VCS v3.020. Changes to the graphical user interfaces in each of the applications necessitates the upgrade requirement.

Business Copy EVA v2.2.2 can be downloaded from the following website:

http://h18006.www1.hp.com/products/storage/software/softwaredrivers/bizcopyeva/index.html

Business Copy EVA licensing

Business Copy refers to the snapshot and snapclone replication features of HP StorageWorks arrays. You can use Command View EVA, or host platform interfaces to specify the virtual disks (LUNs) to replicate. You must acquire and install a replication license key for each array that is to support Business Copy replication.

By installing Business Copy server software, you can automate the replication of virtual disks using Business Copy jobs. By installing Business Copy host agents, you can also perform replication by specifying host volumes and logical volumes. With host agents, you can also: suspend/resume application I/O, mount/unmount volumes, and launch backup applications. The host agent interface (EVMCL) supports interaction between Business Copy jobs and host scripts. No additional licensing is required for Business Copy server and host agent software.

For more information on Business Copy EVA, visit the HP Storage web site:

http://hp.com/country/us/en/prodserv/storage.html

Documentation updates

The following information supplements the contents of the indicated documentation. This information will be included in the next edition of the documentation.

Failback Preference Setting for HSV Controllers

Table 1.9 describes the failback preference mode for each of the operating systems supported with HSV controllers and Command View EVA.

Table 1.10 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 1.9. 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 cache data for a LUN exists 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 the LUN 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 cache data for a LUN exists 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 the LUN 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 cache data for a LUN exists 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 the LUN using SCSI commands.

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 cache data for a LUN exists 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, the LUN 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 cache data for a LUN exists 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, the LUN will remain where moved.

Table 1.10. Failback Settings by Operating System

Operating system	Default behavior	Settings supported
Windows® Secure Path	Autoback done by the host	No Preference, Path A/B - Failover Only.
Sun UNIX® Secure Path	Autoback done by the host	No Preference, Path A/B - Failover Only.
HP-UX 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.
Tru64 UNIX	Host follows the unit	All settings allowed. Recommended setting: Path A/B - Failover/ Failback.
VMS (7.3 and below)	Attempts to move the unit to the first path discovered	No Preference, Path A/B - Failover Only.

Operating system	Default behavior	Settings supported
VMS (7.3-1 and greater)	Host follows the unit	All settings allowed. Recommended setting: Path A/B - Failover/ Failback.
Linux		Path A/B - Failover Only

Changing virtual disk failover/failback setting

Changing the failover/failback setting of a virtual disk may impact which controller presents the disk. Table 1.11 identifies the presentation behavior that results when the failover/failback setting for a virtual disk is changed.

Note

If the new setting causes the presentation of the virtual disk to move to a new controller, any snapshots or snapclones associated with the virtual disk will also be moved.

Table 1.11. Impact on virtual disk presentation when changing failover/failback setting

New setting	Impact on virtual disk presentation
No Preference	None. The disk maintains its original presentation
Path A Failover	If the disk is currently presented on controller B, it is moved to controller A. If the disk is on controller A, it remains there.
Path B Failover	If the disk is currently presented on controller A, it is moved to controller B. If the disk is on controller B, it remains there.
Path A Failover/Failback	If the disk is currently presented on controller B, it is moved to controller A. If the disk is on controller A, it remains there.
Path B Failover/Failback	If the disk is currently presented on controller A, it is moved to controller B. If the disk is on controller B, it remains there.