

## Release Notes

# HP StorageWorks Enterprise Virtual Array

Product Version: v3.025

First Edition  
March, 2005

Part Number: 5697-5237



This document contains the most recent product information about the HP StorageWorks Enterprise Virtual Array, v3.025. 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 web site:

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

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



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HP StorageWorks Enterprise Virtual Array Release Notes  
First Edition

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## Release notes contents

The release notes include the following topics:

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- [Operating constraints](#)
- [Avoiding problem situations](#)
- [Documentation updates](#)

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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.

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

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

## 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   | <a href="http://h18006.www1.hp.com/storage/array systems.html">http://h18006.www1.hp.com/storage/array systems.html</a>   |
| Enterprise Virtual Array product support                                 | <a href="http://h18000.www1.hp.com/products/storageworks/enterprise">http://h18000.www1.hp.com/products/storageworks/enterprise</a>                                   |
| HP OpenView Storage Operations Manager, HP StorageWorks Command View EVA | <a href="http://h18006.www1.hp.com/products/storage/software/som/index.html">http://h18006.www1.hp.com/products/storage/software/som/index.html</a>                   |
| HP StorageWorks Business Copy EVA  | <a href="http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html">http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html</a>     |
| HP StorageWorks Continuous Access EVA                                    | <a href="http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html">http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html</a> |
| Downloadable software and drivers for storage products                   | <a href="http://welcome.hp.com/country/us/eng/support.html">http://welcome.hp.com/country/us/eng/support.html</a>   |
| Storage Management Appliance updates                                     | <a href="http://h18000.www1.hp.com/products/sanworks/managementappliance">http://h18000.www1.hp.com/products/sanworks/managementappliance</a>                         |
| License key redemption   | <a href="http://h18000.www1.hp.com/products/software/softwarekeys/index.html">http://h18000.www1.hp.com/products/software/softwarekeys/index.html</a>                 |

## New features and enhancements

VCS 3.025 provides the following new features and enhancements.

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Access to the features included in VCS 3.025 requires the management software listed in [Table 1.2](#).

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### Added Features

- New disk drive firmware (see [Table 1.3](#))
- Adjust controller join timing to avoid job interruptions

### Operating system support enhancements

- Metrocluster and Continentalcluster support on HP-UX
- Cluster Extension support on Windows 2003
- Support for HP-UX 11i V2 PA-RISC

### Fault management and diagnostic enhancements

- Added event improvements to help maintain the array, and to assist support personnel in diagnosing issues quicker and more accurately.
- Improve detection and handling of failed drives through the use of a drive suspect list (see [Drive Suspect List](#))

### VCS Upgrade capability

The existing VCS Online Upgrade capability will be supported for VCS 3.025 but will not be further enhanced with the v3.025 release.

### Drive Suspect List

The drive suspect list is a persistent list of drives that have been identified as failed and have been removed from the array configuration. Once a failed drive is identified, it is added to the drive suspect list to prevent it from being returned to use. This ensures that all failed drives remain bypassed, rendering them incapable of adversely affecting the back-end loops.

### EVA Remote Support Tools

As a no-charge option, HP will install Instant Support Enterprise Edition (ISEE) remote service tool for any Enterprise Virtual Array under warranty or service support. This tool enables EVA self-monitoring and diagnosis. ISEE can significantly reduce the time required to isolate and correct problems. If desired, the tool 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.

## Resolved Issues

The following issues have been resolved in v3.025.

### General Issues

- Eliminated erroneous event log entries for “Blower speed out of range” errors. Upgrade to EMU firmware version 03010000 resolves this issue
- Enhanced Vraid5 data migration algorithms to ensure better data handling when multiple disks are removed simultaneously
- Eliminated low memory access errors during logical disk creation, which could cause system resynch or impact I/O performance
- Eliminated false “Unexpected metadata event” log entries during some reconstruction events
- Resolved a race condition that could occasionally cause system disruption when deleting or creating LUNs
- Eliminated "Attempt to set CBIT on merging drive" log entries that occurred during disk drive firmware downloads
- Resolved issue caused when requesting a logical disk's device ID
- Resolved issue to ensure capacity is returned when deleting virtual disks
- Resolved issue where a nonexistent memory access in cache forced a controller reset

### HP Continuous Access Issues

- Improved reliability and performance on low bandwidth IP connections. These improvements make optimal use of lower speed FC-IP links.
- Resolved issues where repeated clones on a destination could cause a stuck tunnel and eventually back up I/O at the source resulting in host I/Os failing
- Resolved issue where slow destination Vdisk allocation could potentially reduce host performance
- Eliminated a situation that could cause an unnecessary full copy of a replication group
- Made improvements to prevent extended system lock from interfering with array performance and availability

## 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 v3.025.

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HP OpenView Storage Management Appliance software v2.1 is required for managing an Enterprise Virtual Array running VCS 3.025. 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>

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**Table 1.2. HP StorageWorks Enterprise Virtual Array software**

| Software  | Version | Description  |
|---|---------|--|
| HP StorageWorks Virtual Controller Software v3.0d media kit for dual HSV110 and 100 controllers | v3.025  | Required for EVA5000 and EVA3000   |
| HP OpenView Storage Management Appliance software   | v2.1    | Required with VCS 3.025 system software.   |
| HP OpenView Storage Operations Manager, HP StorageWorks Command View EVA                        | v1.2    | Required with VCS 3.025 system software. HP Command View EVA v3.3 is included with HP OpenView Storage Operations Manager v1.2   |
| HP StorageWorks Business Copy EVA   | v2.3    | Optional. Offers enhanced management capability of local replication.  |
| HP StorageWorks Continuous Access EVA   | v1.2    | Optional. Offers enhanced management capability of remote replication.   |
| HP StorageWorks Replication Solution Manager  | 1.0     | Optional. A new HP graphical and command-line user interface that offers enhanced management capability of both local and remote replication. HP Replication Solution Manager is free with HP Business Copy EVA and HP Continuous Access EVA |

### VCS Media Kit for Dual HSV Controllers

The following items are included in the VCS Media Kit for Dual HSV110 and 100 Controllers.

- Upgrade License
- HP StorageWorks System Software for HSV110 and 100 v3.025 CD-ROM
- HP StorageWorks Enterprise Virtual Array Documentation CD-ROM

HP OpenView Storage Operations Manager is purchased separately and includes HP StorageWorks Command View EVA, which is required for VCS 3.025.

## Upgrading an Enterprise Virtual Array to VCS 3.025

HP recommends that you upgrade to VCS 3.025 to realize the benefits included in this release. To upgrade to VCS 3.025, a copy of the system software is provided on the CD-ROM in the HP StorageWorks Virtual Controller Software media kit for dual HSV controllers.

See *HP StorageWorks Enterprise Virtual Array Updating Product Software Instructions v3.025* for instructions to upgrade VCS and associated software applications.

## Licensing Information

VCS 3.025 requires installation of new licenses as follows:

- Controller software VCS 3.025 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 (HP StorageWorks Command View EVA) is licensed separately. Acceptance of the license agreement displayed during installation is the only licensing requirement for HP Command View EVA.
- The HP Business Copy EVA license activates the snapshot functionality. HP Business Copy licenses purchased for use with VCS v3.0 will work with v3.025. 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>
- HP Continuous Access EVA requires a license. Licenses purchased for use with VCS v3.0 will work with v3.025. 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 3.025.

## 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/eva5000>

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

## Supported operating system specifications

Detailed system specifications for each supported operating system are included in a series of *Connectivity Installation and Reference Guides* and associated *Connectivity Release Notes*. You can download the information necessary for your operating environment at the appropriate web site:

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

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

Click on the **Technical documentation** link under Product information.

## Supported disks

Table 1.3 lists the supported Fibre Channel disks.

- 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 high performance disks and FATA disks. It must contain only one type of disks.

**Table 1.3. Supported disks**

| Fibre Channel disk            | HP model displayed in HP Command View EVA | Minimum firmware revision |
|-------------------------------|---|---------------------------|
| <b>High performance disks</b> |   |                           |
| 10K RPM 36GB                  | BD03654499                                | 3BE9                      |
|                               | BD03655B28                                | HP05                      |
|                               | BD03656ABA                                | HP09                      |
|                               | BD03658223                                | HP00                      |
|                               | BD03659532                                | HP00                      |

| Fibre Channel disk              | HP model displayed in HP Command View EVA | Minimum firmware revision |
|---------------------------------|---|---------------------------|
| 10K RPM 72GB                    | BD07254498                                | 3BE9                      |
|                                 | BD07255B29                                | HP05                      |
|                                 | BD07256ABB                                | HP09                      |
|                                 | BD07258224                                | HP00                      |
|                                 | BD0725822B                                | HP01                      |
| 10K RPM 146GB                   | BD14655B2A                                | HP05                      |
|                                 | BD14656ABC                                | HP09                      |
|                                 | BD14658225                                | HP00                      |
|                                 | BD1465822C                                | HP01                      |
| 10K RPM 300GB                   | BD30058226                                | HP00                      |
|                                 | BD30058232                                | HP01                      |
| 15K RPM 36GB                    | BF03654564                                | 3BE9                      |
|                                 | BF03655B2B                                | HP05                      |
|                                 | BF03658242                                | HP00                      |
|                                 | BF036574C9                                | HP05                      |
| 15K RPM 72GB                    | BF07255B2C                                | HP05                      |
|                                 | BF0725754B                                | HP05                      |
|                                 | BF07258243                                | HP00                      |
| <b>FATA (near-online) disks</b> |   |                           |
| 250GB                           | ND2505823A                                | HP00                      |
|                                 | ND25058238                                | HP01                      |

## 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 3.3 Release Notes*
- *HP StorageWorks Continuous Access EVA 1.2 Release Notes*
- *HP StorageWorks Business Copy EVA 2.3 Release Notes*
- *HP StorageWorks Replication Solution Manager 1.0 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 VCS versions other than 3.010 and 3.020, 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.

Windows 2003 hotfix KB871268 addresses this issue.

## Operation on Microsoft Windows NT 4.0

The EVA v3.025 incorporates a 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.

HP strongly recommends running homogeneous Windows NT 4.0 environments and not mixing 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 selecting 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 HP Command View EVA. You should be aware that disabling the Critical Resource Management feature affects all hosts attached to the array.

## Overcommit of space efficient snapshots

The use of multiple space efficient snapshots of a single virtual disk can create an overcommit situation which will cause the array to resynch. This occurs if a host writes directly to one

of the snapshots and the disk group does not have enough remaining capacity to allocate the necessary storage to the snapshots. The snapshots are now overcommitted, causing their status to be set to inoperative and the array to resynch.

If this occurs, the problem can be solved by deleting the inoperative snapshots, and then reducing the occupancy of the disk group by deleting or moving virtual disks and snapshots. To prevent this problem from recurring, snapshots should always be deleted when no longer needed.

### **DR groups not supported between VCS 3.020 and VCS 3.025**

DR groups are not supported between VCS 3.020 and VCS 3.025. An exception is when upgrading the controllers on both systems from 3.020 to 3.025, in which case the VCS versions may differ briefly until both hosts have been upgraded.

## 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 3.3 Release Notes*
- *HP StorageWorks Continuous Access EVA 1.2 Release Notes*
- *HP StorageWorks Business Copy EVA 2.3 Release Notes*
- *HP StorageWorks Replication Solution Manager 1.0 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 HP Command View EVA). A lower alarm level provides an earlier warning that you are approaching the need to add more storage to the system. It is recommended that you always keep a minimum of 5 GB of Vraid0 capacity unallocated per disk group.

## 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

HP recommends that the host presentation status of all virtual disks associated with a snapshot be consistent. That is, all virtual disks associated with the snapshot should 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>

## **Ensure the latest connectivity requirements are met**

Detailed system specifications for each supported operating system are included in a series of *Connectivity Installation and Reference Guides* and associated *Connectivity Release Notes*. You can download the information necessary for your operating environment at the appropriate web site:

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

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

## **Perform VCS 3.025 online upgrade during off-peak hours**

When upgrading the controller software to VCS 3.025, be aware that the upgrade process can cause system time outs. To avoid this situation, upgrade the software during off-peak hours with minimal applications running.

Refer to *HP StorageWorks Enterprise Virtual Array Updating Product Software Instructions v3.025* for complete upgrading instructions.

## **HP Business Copy EVA upgrade**

HP Business Copy EVA must be upgraded to HP Business Copy EVA v2.3 to interface properly with VCS 3.025. Changes to the graphical user interfaces in each of the applications necessitate the upgrade requirement.

HP Business Copy EVA v2.3 can be downloaded from the following web site:

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

## **HP Business Copy EVA licensing**

HP Business Copy refers to the snapshot and snapclone replication features of HP StorageWorks arrays. You can use HP 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 HP Business Copy replication.

By installing HP Business Copy software, you can automate the replication of virtual disks using jobs. By installing HP Business Copy or HP Replications Solutions Manager 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 HP Business Copy jobs and host scripts. No additional licensing is required for HP Business Copy software.

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

## Changing Redundancy Levels Using Cross Vraid

The Cross Vraid feature enables you to create snapshots and snapclones with different Vraid levels than the source Vdisk. When using this feature, be aware of which Vraid levels you can use for the destination snapshot or snapclone.

Virtually capacity-free snapshots are intended to be temporary copies of data. They are created by capturing only the data changed on the source Vdisk. Because a snapshot shares the unchanged data with its source Vdisk, if the source goes into an inoperative state the snapshot will also become inoperative. A Cross Vraid snapshot can be used to maintain or decrease the redundancy level of the source Vdisk, but a snapshot cannot provide a higher level of redundancy than its source.

If you want to increase the redundancy level of a source Vdisk using Cross Vraid, you must create a snapclone. Once a snapclone is created, it no longer shares data with its source Vdisk, making it an independent entity that can provide a higher level of redundancy. A snapclone may be in the same or different disk group from the source Vdisk except as noted below.

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Vraid0 should not be used as the destination Vraid level from Vraid1 or Vraid5 source Vdisks. This limitation applies only to VCS v3.020 and v3.025.

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**Table 1.4. Recommended Cross Vraid Destinations**

| Source Vdisk Vraid Type | Redundancy Level of source Vdisk | Recommended Cross Vraid snapshots | Recommended Cross Vraid Snapclones |
|-------------------------|----------------------------------|-----------------------------------|------------------------------------|
| Vraid0                  | Lowest                           | Vraid0 <sup>a</sup>               | Vraid0 <sup>a</sup> , 5, 1         |
| Vraid5                  | Medium                           | Vraid5                            | Vraid5, 1                          |
| Vraid1                  | Highest                          | Vraid1, 5                         | Vraid1, 5                          |

<sup>a</sup>When using Vraid0 as a destination, both source and destination Vdisk must be created from the same disk groups.

## 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 1.5](#) describes the failback preference mode for each of the operating systems supported with HSV controllers and HP Command View EVA.

[Table 1.6](#) 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 1.5. 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.   |



| Setting                    | Point in time                      | Behavior   |
|----------------------------|------------------------------------|--|
| 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.  |
| 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. |

| Setting                    | Point in time                      | Behavior   |
|----------------------------|------------------------------------|--|
| 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 1.6. 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 Solaris® 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.                                 |
| VMS (7.3-1 and greater)  | Host follows the unit                                  | All settings allowed. Recommended setting: Path A/B - Failover/Failback. |

## Changing virtual disk failover/failback setting

Changing the failover/failback setting of a virtual disk may impact which controller presents the disk. [Table 1.7](#) identifies the presentation behavior that results when the failover/failback setting for a virtual disk is changed.

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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.

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**Table 1.7. 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. |