Compaq SANworks

Release Notes -
Secure Path Version 3.0 for HP-UX

Part Number: AA-RR4WA-TE

First Edition (October 2001)

Product Version: 3.0

This document summarizes features and characteristics of SANworks Secure Path Version 3.0 for HP-UX systems, using StorageWorks Array Controllers for Fibre Channel Switched Fabric. For the latest version of these Release Notes and other Secure Path documentation, visit the Compaq storage website at:

http://www.compaq.com/storage/

COMPAQ

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Release Notes Contents

These release notes cover the following major topics:

- Intended Audience, page 3
- Secure Path Kit Contents, page 4
- Features, page 5
- Operating System Support, page 5
- Configuration Limitations,page 8
- Avoiding Problem Situations, page 8
- Troubleshooting Secure Path, page 12

Intended Audience

This document is intended for customers who purchased *Compaq SANworks* Secure Path Version 3.0 for HP-UX and are responsible for installing, configuring and maintaining this product in their HP-UX server environment with any one of the following StorageWorks RAID Arrays:

- RA8000/ESA12000 (HSG80)
- MA8000/EMA12000 (HSG80)
- EMA16000 (HSG80)
- MA6000 (HSG60)

Secure Path Kit Contents

The Secure Path Version 3.0 for HP-UX kit also includes:

- Compaq SANworks Secure Path Version 3.0 for HP-UX Quick Specification, part number AA-RR4XA-TE
- *Compaq SANworks Secure Path Version 3.0 for HP-UX Installation and Reference Guide*, part number AA-RR4VA-TE
- Warranty Card
- Compaq SANworks Secure Path Version 3.0 for HP-UX Release Notes, part number AA-RR4WA-TE (this document)

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

Features

Secure Path Version 3.0 for HP-UX provides the following features:

- Multi-pathing up to 32 paths per LUN
- Multiple path driver that includes
  - — Path verification for all paths
  - — Auto Restore for failed paths
  - — Load balancing using a round robin process
- Dynamic uninterrupted operation for
  - — Add/Delete of arrays
  - — Add/Delete of LUNS
  - — Controller replacement

    NOTE: A kernel rebuild is required for persistence across system reboots.
- Secure Path Management (spmgr)
- Event Notification via email
- Controller Partition Support for clustered and non-clustered HSG80 and HSG60 Homogeneous hosts

Operating System Support

Table 1 lists the hardware and software supported by SANworks Secure Path Version 3.0 for HP-UX.

Table 1: Secure Path Version 3.0 for HP-UX Requirements

System Feature	Requirement
Operating System Versions	HP-UX 11.0 64 bit HP-UX 11.0 32 bit (K-class servers)
HP-UX Server System types	A-class L-class N-class V-class K-class
File Systems	UFS (HFS) VxFS (JFS)
Fibre Channel Adapters	HP A5158A HP A6685A (K-class servers)
SAN Switches	Compaq 8 port 158222-B21 (DS-DSGGB-AA) Compaq 8 port 158223-B21 (DS-DSGGB-AB) Compaq 8 port 176219-B21 (DS-DSGGC-AA) Compaq 16 port 158224-B21 (DS-DSGGB-BA) Compaq 16 port 158225-B21 (DS-DSGGB-BB) Compaq 16 port 212776-B21 (DS-DSGGC-AB)
SAN Switch Firmware	Version 2.1.9g or greater
Controllers	Dual HSG80 controllers operating one of the following ACS Versions: 8.5F, 8.5S, 8.6F, 8.6S Dual HSG60 controllers operating ACS Versions 8.5L or 8.6L
SCSI Modes	SCSI-2 with or without CCL SCSI-3 with CCL
Volume Managers	HP Logical Volume Manager
Clustering	MC/Service Guard 11.0
Fibre Channel Modes	Switched Fabric

Depending upon your configuration, the following driver or patch minimum revisions are required to insure proper operation.

Table 2: Required Drivers and Patches

Drivers/Patches	Minimum Revision	Description
A5158A (A,L,N, V-class)	B.11.00.06	HP PCI/HSC Tachyon TL FC Driver
A6685A (K-class)	B.11.00.08	HSC Fibre Channel Driver
PHKL_21834 or PHKL_23939	B.11.00.AA 1.0	Fibre Channel Mass Storage Driver patch
PHKL_22759 or PHKL_24004	1.0 1.0	SCSI IO Subsystem Cumulative Patch
PHNE_15537	1.0	Fibre Channel Cumulative patch

NOTE: Required drivers and minimum required patches are located in the HP-UX 11.0 June 2001 release.

Configuration Limitations

Table 3 shows the configuration limits for Secure Path for HP-UX.

Table 3: Configuration Limitations

Parameter	Minimum	Max Qualified	Max Supported
Host Bus Adapter support	1	8	Platform Limit
Storage arrays per host	1	8	128

Avoiding Problem Situations

The following section lists problems that may arise during Secure Path operation and how to avoid them.

- Rebooting with a known failed path results in losing all knowledge of that path. For example, start with an initial condition of 4 paths to a LUN with 3 alive and 1 dead paths as seen with spmgr display. Reboot the system. Spmgr display then sees only 3 alive paths. A subsequent repair of the path and an ioscan allows spmgr to again find the path but spmgr notify has no record of a "repair" event.
- Due to constraints imposed by the Software Distributor (SD) tools, the Server's network must be configured prior to the installation of Secure Path.
- The kernel must be rebuilt after any and all configuration changes for those changes to persist across reboots. If the kernel is not rebuilt and the server is rebooted, there is a chance to loose the previous configuration. Any subsequent changes to the configuration such as *spmgr add WWLUNID,* will overwrite the persistent parameter file (/usr/conf/space.h.d/hsx.h) and the tuneable parameter file *(*/usr/conf/master.d/hsx) and effectively erase the previous configuration.

  To avoid this situation, rebuild the kernel following any configuration changes.
- If a preferred path to a device is in the failed state and you issue a *spmgr restore –d device*, the command line responds with a prompt (no apparent response). The path remains in a failed state and no path change is made. This is the expected response to the command.

- The spmgr alias command is used to reference a large cumbersome old_name with a shorter or clearer alias_name. Reversing the argument order in "spmgr alias alias_name old_name" results in the alias_name replacing the old_name such that any command using the old_name results in error. The alias must then be deleted for the old_name to again work correctly.
- The *spmgr* alias command checks a table of reserved words to protect you from aliasing words that would result in unexpected behavior. This list is, however, not a comprehensive list. Take precautions to avoid using special characters that could be misinterpreted by the shell such as a leading "-" or "$".

  The current list of reserved words maintained by spmgr is:

add	alias	client	delete	display	help	log
notify	on	off	password	prefer	quiesce	restart
restore	select	set	spmgr	unalias	unprefer	

- Stopping spagent using "spinit stop" and then starting spagent using "spinit start" results in stderr messages being printed in that session. To remedy this, start spagent in a new session and then exit that session.
- The *spmgr quiesce* command has an undocumented option that should be avoided. Do not use *spmgr quiesce –d device*. This option will Quiesce all paths to the specified device and make that device unavailable. As a result, *spmgr display –d device* results in an "invalid LUN" response and *spmgr restart –d device* does not work. If this option is inadvertently used, the device can be restarted with the *spmgr restart all* command.
- Any server reboot results in the following message being written to the syslog:

  SecurePath: WARNING

  To recover Secure Path configuration

  that existed prior to the reboot, the

  kernel must be rebuilt and the system

  rebooted BEFORE any Secure Path

  configuration changes are made.

  This message is pertinent ONLY when configuration changes have been made and the server has been rebooted without rebuilding the kernel.
- Do not use HP's System Administration Manager (SAM) to create or extend volume groups. Creating and extending volume groups must be done using HP-UX commands. When SAM scans for hardware, any HSG80/HSG60 LUNs

created after the first LUN are not parsed correctly by SAM and cannot be selected to create a volume group. Use HP-UX commands to create or extend volume groups, and then use SAM to create and manage logical volumes.

Using StorageWorks Command Console with Secure Path

The Secure Path installation modifies device names as seen by StorageWorks Command Console (SWCC) and therefore requires a modification of one SWCC script. The modified script will be included in all kits following version 8.6 (8.6a for example). Perform the following procedure shown below if you are using Solution Software versions 8.6 or below. This procedure insures that the updated script is in place so that the SWCC configuration operates correctly.

NOTE: SWCC is not supported in SCSI-3 mode. SWCC requires a */dev/rdsk/c#t#d#*, which is changed to a */dev/rscsi/c#t#d#* entry in SCSI-3 mode.

Installing SWCC After Installing Secure Path

1. Follow the instructions found in the *Compaq StorageWorks HSG80 ACS Solution Software Version 8.6 for HP-UX Installation and Configuration Guide* for installing and configuring the SWCC Agent. Run through the *install.sh* script until you get to the Installation Script menu. Select "2" to exit. Note the page and step in the guide so you can easily return after Step 3.
2. Mount the Secure Path V3.0 HP-UX CDROM and follow the procedure in the section titled "Installing Secure Path" in Chapter 3 of the *Compaq SANworks Secure Path Version 3.0 for HP-UX Installation and Reference Guide*.
3. Copy the updated SWCC configuration script *ha_config_hp.sh* from directory */cdrom/swcc* to directory */opt/steam/bin*.
4. Complete the SWCC installation by running the script */opt/steam/bin/stgwrks.sh*. This script returns you to the Installation Script menu where you can continue to install and configure the SWCC Agent at the point where you exited the menu in Step 1.

Updating an Existing SWCC Version Before Installing Secure Path

1. Exit any SWCC Client session that you have running for this host and stop the SWCC Agent by running */opt/steam/bin/config.sh*.
   a. Select "3" Start/Stop the Agent at the menu.
   b. Select Quit to exit the menu.

2. Mount the Secure Path 3.0 HPUX CDROM using the procedure in the section titled "Installing Secure Path" in Chapter 3 of the *Compaq SANworks Secure Path Version 3.0 for HP-UX Installation and Reference Guide*.
3. Copy the updated SWCC configuration script *ha_config_hp.sh* from directory */cdrom/swcc* to directory */opt/steam/bin*.
4. Refer to the *Compaq SANworks Secure Path Version 3.0 for HP-UX Installation and Reference Guide* to install Secure Path.
5. Use ioscan to identify a new SWCC access device in the form of /dev/dsk/c#d#t# after Secure path has been installed and the system has rebooted. For the example in the next step, assume that the new SWCC access device is c10t0d0.
6. Modify the old SWCC access device to the new access device by editing */opt/steam/etc/storage.ini*. This file includes one line of data per array. The following example file assumes a single array. Use an editor of your choice to change the access device in the file from:

   HSG80.0|180|60|10|0|ZG10602127|ZG10602181|V85F|c37t0d0|c37t0d0|0|

   Assume c37t0d0 (in 2 places) is the old SWCC access device. Change the old SWCC access device to

   HSG80.0|180|60|10|0|ZG10602127|ZG10602181|V85F|**c10t0d0**|**c10t0d0**|0|

   where c10t0d0 is the new SWCC access device. Change only the device instance in 2 places for each array line entry. Do not change anything else.

NOTE: Editing the file is required due to a known anomaly with */opt/steam/bin/config.sh,* menu option *15) Modify a Subsystem*.

7. Restart the SWCC agent and client.

Troubleshooting Secure Path

Table 4 defines the way that an "Event" such as a failure or state change is reported to the server through the Secure Path driver (hsx) or agent (spagent). The Response Action column shows where the event is logged. LOG is the */var/adm/syslog/syslog.log* file, CONSOLE is the root console and NOTIFY is email notification. The Level column indicates the criticality of the event and is used by the Secure Path Manager (spmgr) to allow the system administrator to route events to specific users. The levels are further defined in the *Compaq Secure Path Version 3.0 for HPUX Installation and Reference Guide.*

Table 4: Responses and Severity Level for Supported Events

Event	Response Action	Level
Path failed	LOG+CONSOLE+NOTIFY	WARNING
Failover condition detected	LOG+CONSOLE+NOTIFY	CRITICAL
Failover start	LOG+CONSOLE+NOTIFY	INFORMATIONAL
Failover complete	LOG+CONSOLE+NOTIFY	INFORMATIONAL
Restore start	LOG+CONSOLE+NOTIFY	INFORMATIONAL
Restore complete	LOG+CONSOLE+NOTIFY	INFORMATIONAL
Restore failed	LOG+CONSOLE+NOTIFY	INFORMATIONAL
Excessive restores	LOG+CONSOLE+NOTIFY	WARNING - auto restore has been disabled until next time quantum (1 hour)
Availability Changed	LOG+CONSOLE+NOTIFY	CRITICAL
Select Complete	LOG+CONSOLE+NOTIFY	INFORMATIONAL
Select Failed	LOG+CONSOLE+NOTIFY	WARNING
Unit Attention	LOG	INFORMATIONAL
Select Start	LOG +CONSOLE+NOTIFY	INFORMATIONAL