

Compaq StorageWorks

Release Notes

Secure Path V2.0 for Sun on FC Arbitrated Loop

This document summarizes features and characteristics of the StorageWorks Secure Path product (Version 2.0) for Sun Solaris systems using StorageWorks HSG80 Array Controllers configured for Fibre Channel Arbitrated Loop (FCAL).

These *Release Notes* provide information not covered elsewhere in the documentation. This document should be used by individuals responsible for configuring, installing, and using the HSG80 Array controller.

NOTE: Read this entire document before installing or upgrading the software.

These release notes include the following sections:

- 1.0 Operating System Support
- 2.0 Installation Prerequisites
- 3.0 Installation Issues
- 4.0 Operating Constraints
- 5.0 Known Problems
- 6.0 Avoiding Problem Situations

Release Package Contents

The StorageWorks Secure Path Version 2.0 Software kit consists of the following:

- A customer letter
- The Secure Path documentation set:
 - **Product Description** – *COMPAQ StorageWorks Secure Path Version 2.0 for Sun Solaris – A High-Availability Fibre Channel Solution for Sun Solaris Platforms*
 - **Installation and Reference Guide** – *COMPAQ StorageWorks Secure Path v2.0 for Sun Solaris*
 - **Warranty Card**
 - **Release Notes** – *COMPAQ StorageWorks Secure Path V2.0 for Sun on FC-Arbitrated Loop* (This document)
- CD-ROM containing Secure Path Solution Software V2.0 for Sun Solaris and documentation

Intended Audience

This document has been prepared for customers who have purchased Secure Path software for use with the RAID Array 8000 or Enterprise Storage Array 12000 Fibre Channel with HSG80 controllers and for COMPAQ Multivendor Customer Services personnel responsible for installing and maintaining systems that include Secure Path.

Visit our Web Site for the Latest Information

Check our web for the latest drivers, technical tips and documentation for StorageWorks Secure Path at:

<http://www.compaq.com/products/storageworks>

1.0 OPERATING SYSTEM SUPPORT

Table 1 lists the hardware and software supported by StorageWorks Secure Path Software Version 2.0:

Table 1 Minimum System Requirements

Host Feature	Requirement
Platform	SPARC Ultra SPARC
Architectures	4d 4u
Operating System	Solaris 2.6 Solaris 2.7 (32-bit mode only)
Free Disk	500KB, before any log files
Fibre Channel Adapter	Compaq/JNI FC64-1063 (DS-SWSA4-SC) Compaq/JNI FCI-1063 (SWSA4-PC)
Fibre Channel Hub	Compaq 7-port hub 242795-B21 (DS-SWXHX-07) Compaq 12-port hub 245573-B22 (DS-DHGGB-AB)
Controller	HSG80 Controller operating Firmware ACS Version 8.5F

2.0 INSTALLATION PREREQUISITES

Listed below are the hardware configuration prerequisites for Secure Path:

- 2 paths between each server and storage system. Each path must consist of a separate:
 - Host Bus Adapter
 - On systems that support multiple I/O boards, each host bus adapter should be installed on separate I/O boards. This prevents an I/O board from becoming a single point of failure.
 - Fibre Channel Hub
 - HSG80 Controller
 - The RAID storage system must be configured for Fibre Channel Arbitrated Loop (FC-AL) in multiple-bus failover mode.
- Maximum 2 RAID systems per server configured with Secure Path
- Maximum 64 LUNs per RAID system

The software prerequisite for Secure Path is:

- StorageWorks Solutions Software V8.5 for Sun Solaris must be installed and configured for FC-AL (Loop) Mode.

3.0 INSTALLATION ISSUES

3.1 Automatic Configuration of Secure Path Devices (spconfig)

During the installation process, spconfig is automatically run to create and modify the driver configuration files. For the case of 2 host adapters on the server, the spconfig utility runs and completes configuration. For other cases, spconfig will not complete the configuration because there is an incomplete configuration or there are more than 2 adapters from which to choose.

After the installation of Secure Path, check the file `/kernel/drv/mda.conf` for entries of the form:

```
name="mda" ...;
```

If no such entries are found, the spconfig utility must be run interactively before you reboot the server. This procedure is described in Chapter 4 of the *Secure Path V2.0 for Sun Solaris Installation and Reference Guide*, in the section entitled *The Secure Path Configuration Tool*.

3.2 Secure Path on Solaris 7 – Only Supported in 32-bit Mode

- If the server has previously had a StorageWorks RAID system installed on Solaris 7 in 64-bit mode, you must set the FC Adapter driver to boot in 32-bit mode. By default, the 64-bit sbus adapter is configured to operate in 32-bit mode and changes are needed only if it had previously been set to run in 64-bit mode. Do this by following the following steps:
 1. Open the file `/etc/system` with a text editor.
 2. Find the StorageWorks edits marked by, **Start of CPQfcaw edits*
 3. Find the line that reads `set fcaw:force32=1` If it has been commented out, uncomment it. **NOTE:** In this file use the "*" character for the comment.
 4. Check your edit, and save the `/etc/system` file when you are finished.
 5. Shut down and reboot your system. **NOTE:** Your system must be shut down and rebooted for the changes to take effect.

- If after installing Secure Path and rebooting the server, the targets are not visible using *format*, it is possible that the system has been booted in 64-bit mode. To verify this, issue the following command:

```
# isainfo -b
```

This will report the current bit-mode of the kernel.

If the kernel is in 64-bit mode, reboot the kernel in 32-bit mode using the following command:

```
# reboot - "diskN kernel/unix"
```

If the kernel is in 32-bit mode, check the configuration. See Chapter 6 of the *Secure Path V2.0 for Sun Solaris Installation and Reference Guide* for details.

4.0 OPERATING CONSTRAINTS

4.1 Limit on Number of Secure Path Devices

A maximum number of 128 Secure Path devices are supported per Solaris server.

4.2 Restriction on Using Secure Path Device as a Boot Device

Secure Path devices cannot be used as boot devices.

4.3 Solaris 2.7 Support

Secure Path on Solaris 7 is supported only in 32-bit mode.

4.4 Limit on Number of Paths per LUN

A maximum number of 2 paths per LUN on a RAID storage system are supported.

4.5 Per-instance Adapter Configuration

Secure Path V2.0 only supports Fibre Channel Arbitrated Loop (FC-AL) mode and requires a pair of host adapters. The pair of adapters must both be Sbus (fcaw) or PCI (fca-pci) adapters. Mixed adapter configurations have not been tested and are not supported at this time.

Note: The Compaq 32-bit S-bus Fibre Channel adapter (p/n DS-SWSA4-SB) is NOT supported in a Secure Path configuration.

4.6 Dynamic Reconfiguration Support

Solaris Dynamic Reconfiguration (DR) is not supported.

4.7 Veritas Volume Manager

Veritas Volume Manager Version 3.0.2 is supported with Secure Path v2.0 for Sun Solaris. However, if Veritas Volume Manager is currently installed, the procedures defined in Section 4.7.1 **MUST** be performed.

Veritas Volume Manager 2.5.1 and 2.6.1 are supported if DMP is disabled.

The steps to disable DMP for VxVM are as follows:

```
# mv /kernel/drv/vxdmp /kernel/drv/DNRvxdmp
# mv /kernel/drv/vxdmp.conf /kernel/drv/DNRvxdmp.conf
# cd /dev/vx ; rm -rf dmp rdmp
# ln -s /dev/dsk dmp
# ln -s /dev/rdisk rdmp
```

Edit the file /etc/system and comment out the following entry:

```
forceload drv/vxdmp
```

Perform a reconfiguration boot, as follows:

```
# reboot -- -r
```

4.7.1 Installing StorageWorks Secure Path when Veritas Volume Manager is Currently Installed

This installation guide assumes that the CPQhsg80 package for Sun Solaris version 8.5 is already installed and the HSG80 targets are under Veritas Volume Manager control. It is also assumed that the system is set up with a single fibre channel host bus adapter to RAID system configuration. To install Secure Path when Veritas Volume Manager is already installed, proceed as follows:

1. Start the Veritas Volume Manager Disk Administrator by entering:

```
# vxdiskadm
```
2. Select option 9, “Remove access to (deport) a disk group”.
3. At the following prompt that appears, list all disk groups. Enter:
Enter name of disk group [<group>,list,q,?] (default: list) **list**
4. At the next prompt, specify all disk groups that contain HSG units that are to be deported.

Note: Units to be deported may not exist in group *rootdg*. If unsure whether a unit is an HSG80 unit or not, use the format command and look at the device description.

IMPORTANT NOTE: When prompted if you want to “Disable (offline) the indicated disks?”, select “yes”.

5. Power down the system, install the new adapter, and bring the system back up, as described in Chapter 3 of the *StorageWorks Secure Path v2.0 for Sun Solaris* Installation and Reference Guide.
6. Upon system reboot, start the Veritas Volume Manager Disk Administrator, using the command:

```
# vxdiskadm
```

7. Select option 11, “Disable (offline) a disk device”.
8. At the following prompt that appears, list all disk devices. Enter:
Select a disk device to disable [<address>,list,q,?] **list**
9. At the next prompt that queries disk devices to disable (offline), specify all disk devices that contain HSG units that are to be disabled.

In the example below, d0, d1 and d2 have been disabled (offline).

DEVICE	DISK	GROUP	STATUS
c0t0d0	rootdisk	rootdg	online
c1t65d0	-	-	offline
c1t65d1	-	-	offline
c1t65d2	-	-	offline
c2t65d0	-	-	offline
c2t65d1	-	-	offline
c2t65d2	-	-	offline

10. Quit from the Veritas Volume Manager Disk Administrator
11. Install the Secure Path package according to the standard installation procedures defined in Chapter 4 of the *StorageWorks Secure Path v2.0 for Sun Solaris* Installation and Reference Guide.
12. Reboot the system with a configuration boot (as per installation

instructions).

13. Start the Veritas Volume Manager Disk Administrator using the command:

```
# vxdiskadm
```

14. Select option 8, “Enable access to (import) a disk group”.

15. At the following prompt that appears, list all disk groups. Enter:

```
Enter name of disk group [<group>,list,q,?] (default: list) list
```

16. At the next prompt, import all device groups that were previously deported.

17. Quit from the Veritas Volume Manager Disk Administrator.

18. Ensure that the correct disks are under Veritas Volume Manager control by entering:

```
# vxdisk list
```

The coexistence of Secure Path with Volume Manager is now established.

Note: If Secure Path for Sun Solaris is removed, this process must again be followed to ensure access to Veritas Volume Manager controlled volumes and proper operation of the Sun Solaris server.

5.0 KNOWN PROBLEMS

5.1 Driver Messages

On occasion the following messages are seen on the console at boot time:

```
/kernel/drv/mda symbol ddi_get_lbolt multiply defined
```

These messages indicate an invalid configuration. For example, the mda driver has found 3 paths to a LUN. Another situation is to have the fibre channel driver set to loop mode but have the fibre channel cables connected to a switch instead of a hub.

5.2 CCL Device Not Automatically Configured by sponfig

The Command Console LUN (CCL) is used by the server to communicate with the storage system. For the HSG80, it is a virtual LUN that can relocate itself as necessary on the RAID system.

The CCL may be in one of two states at the controller: Enabled or Disabled. In Compaq platform kits for Sun Solaris installations, it is recommended to disable

the CCL. This is due to the fact that it is neither readable nor writeable for normal I/O and *format* will be unable to label it. However, it is available for inquiry at a code/program level.

In the Secure Path implementation, an entry is created in one of the key files documented in Chapter 6 of the Installation and Reference Guide. The file: */kernel/drv/ldLite.conf* will contain an entry for the CCL LUN and it can be easily identified as it is the only entry that used the World Wide Node Name of the controller plus the string "-4853-4738-3043-434C". This string is the hex form of the LUN label for the HSG80CCL.

If this installation does not have a user-written application that inquires directly to the controller under program control, then this entry may be deleted.

If this installation has a user-written application that inquires directly to the controller under program control, then the following steps must be taken:

- an entry must be made in the */kernel/drv/mda.conf* file, creating two paths for the CCL
- an entry should exist in the */kernel/drv/sd.conf* file for the LUN assignment made in the *mda.conf*.

NOTE

Should the creation of an additional unit on the subsystem cause the CCL to move to another LUN, then the adjustments must be made to the *mda.conf* and *sd.conf* file.

5.3 Completing the Removal of Secure Path

- Removing Secure Path Device Files

During the installation and configuration of the Secure Path software, a new set of device files are created in the */dev/dsk* and */dev/rdisk* directories.

After the package remove process, these files remain in both areas. These files will be removed if the server is re-booted as follows:

```
# touch /reconfigure
# reboot
```

An alternate method is to visit each directory area and using

```
# ls -l | grep "pseudo/ldLite"
```

to identify the device files that were created by Secure Path. These device files will be of the form cXtYdZ and when the controller is identified (X is 3 for example) the files may be removed with

```
# rm /dev/[r]dsk/c3*
```

- Removing Extra Entries in */kernel/drv/sd.conf*

In the documentation for removing the Secure Path application, one of the steps involved regenerating the file */kernel/drv/sd.conf* by invoking */opt/steam/bin/config.sh*, selecting each adapter and configuring it as desired.

On inspecting the file */kernel/drv/sd.conf*, entries that were created by the Secure Path installation may remain. These entries start with a header:

```
# CPQswsp: start of Secure Path edits. Caution: do not  
remove! This line is used by pkgadd/pkgrm.
```

and are terminated with a trailing comment of:

```
# CPQswsp: end of Secure Path edits. Caution: do not  
remove! This line is used by pkgadd/pkgrm.
```

It is possible that these entries are needed by the current configuration for the fabric or loop installation. If not, they can be deleted.

6.0 AVOIDING PROBLEM SITUATIONS

6.1 Adding and Deleting LUNs

If LUNs are added or removed on the RAID system after Secure Path has been configured, the Secure Path configuration files must be edited to reflect the change. Full details are in Chapter 4 of the *Secure Path V2.0 for Sun Solaris Installation and Reference Guide*.