

Compaq StorageWorks

Addendum for HSG60/HSG80 Solution Software Version 8.6A for HP-UX

This addendum only applies to the following documents:

Compaq StorageWorks HSG80 ACS Solution Software Version 8.6 for HP-UX Installation and Configuration Guide

AA-RFBEG-TE (June 2001)

Compaq StorageWorks HSG60 ACS Solution Software Version 8.6 for HP-UX Installation and Configuration Guide

AA-RMD6C-TE (June 2001)

An addendum is comprised of two parts:

- Pen-And-Ink Changes—provides instructions for locating specific text and to either delete text, replace text with new text, or add new text at a specific location
- Page Additions—identifies where to add a page at a specific place in the document and a recommendation on how to attach the replacement pages.

IMPORTANT: If the changes within this addendum are not incorporated into the specified documents and then used, potential problems might arise from using obsolete information.

Pen-And-Ink Changes

For each document, incorporate the required change listed in Table 1.

Table 1: Pen-And-Ink Changes

| For Document... | On page... | Under Section... | Make This Change... |
|-----------------|-----------------------|---|--|
| Readme | HSG80 CD | N/A | Disregard |
| Readme | HSG60 CD | N/A | Disregard |
| AA-RFBEG-TE | 3-5 through 3-8 | Chapter 3, Making a Physical Connection | Delete the following subsections: “Preparing to Install the Host Bus Adapter” “Host Bus Adapter and Driver” “Installing the Host Bus Adapter” “Connecting to Your Host System” |
| AA-RFBEG-TE | 6-1 through 6-2 | Chapter 6, Verifying Storage Configuration from the Host | Delete the entire chapter |
| AA-RMD6C-TE | 3-2 through 3-4 | Chapter 3, Making a Physical Connection | Delete the following subsections: “Preparing to Install the Host Bus Adapter” “Host Bus Adapter and Driver” “Installing the Host Bus Adapter” “Connecting to Your Host System” |
| AA-RMD6C-TE | 6-1 through 6-2 | Chapter 6, Verifying Storage Configuration from the Host | Delete the entire chapter |

Page Additions

For all documents, insert the following sheets as specified:

- *HSG60/HSG80 Version 8.6 Software - Supplemental Notes* replaces On-CD *Readme* files.
- *Chapter 3 - Making a Physical Connection* replaces deleted subsections only.
- *Chapter 6 - Verifying Storage Configuration from the Host* replaces entire chapter.

NOTE: Consider securing this sheet into the document by using tape on the inside edge.

HSG60/HSG80 Version 8.6 Software - Supplemental Notes

MA6000, RA8000/ESA12000, MA8000/EMA12000 for Hewlett Packard Systems

Thank you for purchasing a Compaq MA6000, RA8000/ESA12000 or MA8000/EMA12000 storage subsystem. These notes will help you set up your system.

Please be sure to read the Release Notes as well as this *Readme* file, included here. Also, please visit the Compaq Storage Support Website for last minute updates which may not have made it into our documentation:

<http://www.compaq.com/support/storage/index.html>

Your storage subsystem(s) support many operating systems. This solution software provides support for the Hewlett Packard HP-UX operating system, Versions 11.0 and 10.20, running on HP-UX platforms.

Minimum System Requirements

Platforms:

- HP9000 Series A-Class, Models 4xx and 5xx
- HP9000 Series D-Class, Models 2xx and 3xx
- HP9000 Series K-Class, Models 2xx, 3xx, 4xx and 5xx
- HP9000 Series L-Class, Model 1000/2000
- HP9000 Series N-Class, Model N4xxx
- HP9000 Series T-Class, Model T6xx
- HP9000 Series V-Class, Model V2xxx

Operating Systems:

- HP-UX Versions 10.20 and 11.0

Fibre Channel (FC) Host Bus Adapter (HBA) Compatibility:

- HP A3404A, HP A3591A, HP A3591B, HP A3636A, HP A3740A, HP A6685A, HP A5158A, 218409-B21 (Compaq/QLA2200)

NOTES:

- Only two Compaq 218409-B21 FC HBAs per PCI bus carrier are supported on HP V-Class Systems.
- The Compaq 218409-B21 and HP (PCI) FC HBAs are not supported on the same PCI bus.
- The Compaq 218409-B21 FC HBA is only supported on A, L, N, and V series servers running HP-UX V11.0.
- Fibre Channel Switch (FC-SW) connectivity is not supported with the HP A5158A FC Adapter.

Controller Compatibility:

- HSG60 or HSG80 Array Controller operating firmware ACS Version 8.6-1
NOTE: Before installing the HP-UX solution software, your storage subsystem(s) should be running ACS Version 8.6-1 as a minimum. The Version 2.4 SWCC Agent (included in the Version 8.6 solution software) is backward compatible with the previous version. However, in an open SAN environment problems can occur if the installation is run with a second server running the Version 2.3 SWCC Agent (included in the Version 8.5 solution software) at the same time. When upgrading, all SWCC Agents should be shut down and “auto-start at reboot” disabled. Because of this, Compaq recommends that you upgrade to the latest version of the ACS firmware to prevent any problems.

Preparing Your Host for Use with the HSG Controller

Installing Hardware

Fibre Channel mass storage HBAs manufactured by HP, or the Compaq/QLA2200, can be used with your storage subsystem and HP platform. To install an HP HBA in your HP System, use the instructions provided in the HP HBA documentation before preparing the system to interface with your storage subsystem. To install a Compaq/QLA2200 HBA in your HP L, N, or V class system, use the instructions provided by HP for installing PCI interfaces. Refer to the appropriate HP documentation and web pages.

NOTE: Hewlett Packard D, K, and T-Class hosts function as private hosts when attached to a fabric. Therefore, the Compaq Fibre Channel Switch QuickLoop feature must be enabled. This allows private hosts on fabric attached loops to access private devices on different fabric attached loops.

Installing the Compaq/QLA2200 Driver

For native HP HBAs, follow the instructions that came with your adapter. For the Compaq/QLA2200 HBA, the following procedure should be followed.

1. Make sure the Compaq/QLA2200 HBA is correctly installed in your system.

2. Place the CD-ROM labeled *Solution Software V8.6 for HP-UX* in your host system's CD-ROM drive.

NOTE: `pfs_mount` requires `pfs_mountd` and `pfsd` daemons to be running. To verify these daemons are running, enter the following command:

```
#ps -ef | grep pfs
```

If `pfs_mountd` and `pfsd` are not listed, they can be started by entering the following commands at the root prompt:

```
#nohup pfs_mountd &
```

The system will respond with `Sending Output to Nohup.out`. Press **Enter** to return to the command prompt.

```
#nohup pfsd &
```

The system will respond with `Sending Output to Nohup.out`. Press **Enter** to return to the command prompt.

3. Mount the CD-ROM by entering the following command at the root prompt:

```
#pfs_mount /dev/rdisk/<cdrom device file>/<mount directory>
```

Example:

```
#pfs_mount /dev/rdisk/c1t2d0/cdrom
```

NOTE: To find the cdrom device file (`c1t2d0` in the example), enter the following command:

```
ioscan -fnkC disk
```

NOTE: Some HP-UX systems may require additional parameters to mount the CD-ROM. For example, the following command forces Rock Ridge Interchange Protocol and UNIX as the operating system:

```
#pfs_mount -t rrip -x unix /dev/rdisk/c1t2d0/cdrom
```

For more detailed information regarding `pfs_mount`, please review the associated man pages.

4. Start the installation by entering the following commands:

```
#cd /<cdrom mount point>
```

```
#swinstall -s /<cdrom mount point>/driver/qlc2200
```

Example:

```
#cd /cdrom
```

```
#swinstall -s /cdrom/driver/qlc2200
```

Then select **1) Install Compaq/QLA2200 FC Mass Storage Driver Software**

- a. Highlight the following swpackage when it appears on the screen:

BHPUX1100QLC2200

NOTE: In Terminal Mode, the following message appears:

To move around in swinstall:

- use the "Tab" key to move between screen elements
- use the arrow keys to move within screen elements
- use "Ctrl-F" for context-sensitive help anywhere in swinstall

On screens with a menu bar at the top like this:

```
|-----|  
File View Options Actions Help  
|-----|
```

- use "Tab" to move from the list to the menu bar
- use the arrow keys to move around
- use "Return" to pull down a menu or select a menu item
- use "Tab" to move from the menu bar to the list without selecting a menu item
- use the spacebar to select an item in the list

On any screen, press **CTRL-K** for more information on how to use the keyboard. In GUI mode, just Point and Click.

- b. Select **Mark For Install** from the **Action** menu. In the Status window, the word *Yes* should appear under the *Marked?* column.
- c. Select **Install (analysis)** from the **Action** menu. The Install Analysis window should appear.
- d. When *Ready* appears in the Status item, select the **OK** button to begin the installation procedure.
- e. Select the **Yes** button in the dialog box for each warning that appears.
- f. If the installation was successful, the status item will change to *Ready*. If this is not the case, check the log file and correct any errors that occurred.
- g. Select the **Done** button and press **Enter**. A dialog box will appear indicating that a reboot is required.
- h. Select the **OK** button and press **Enter** to reboot the system.

NOTE: In order to unmount the CD-ROM device without rebooting, enter the following command:

```
#pfs_umount /<cdrom mount point>
```

5. Updating the Compaq/QLA2200 driver

a. Uninstall the current driver entering the following command:

```
#swremove
```

b. Install the new driver by following the procedures defined in Step 4, *Start the installation*, and all of its substeps.

NOTE: Before removing the Compaq/QLA200 driver, Compaq highly recommends that you make a backup of your system and volume groups.

Supported Configurations

Your storage subsystem can be configured either as a single, dual-redundant or Multiple-bus controller configuration (Multiple-bus is supported on HP-UX 10.20 only).

This allows support for up to 64 logical units (LUNs) per controller shelf (8 LUNS with an HP HBA). Dual-redundant controller configurations require that Fibre Channel connections to both controllers be set to the same Host Operating System type. HP-UX requires that HSG controller connections be set as: `Operating System = HP`.

Please refer to the *HSG80 Array Controller ACS Version 8.6 CLI Reference Guide* (EK-G80CL-RA. A01) or the *HSG60 Array Controller ACS Version 8.6 CLI Reference Guide* (EK-G60CL-RA. A01), contained in the `/document` subdirectory of your solution software CD-ROM for further instructions.

For more details about supported configurations, see the *Heterogeneous Open SAN Design Reference Guide* (AA-RMPNB-TE), available from the Compaq Storage Website:

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

StorageWorks Command Console (SWCC) Version 2.4 Client and Agent software is included with your solution software. SWCC Client runs under Windows NT or Windows 2000, and provides a graphical user interface (GUI) to your storage subsystem. A connection to the subsystem can be made using a serial cable. With the Agent software you can also make a network connection. More information is available in the *Command Console Version 2.4 User Guide* (AA-RFA2H-TE) contained in the `/document` subdirectory of your solution software CD-ROM.

General Information

This solution software distribution contains the complete documentation set in both Postscript (.ps) and Adobe Portable Document Format (.pdf). These files are located in the /document subdirectory of the solution software CD-ROM. A full list of the documents comprising the set can be found in the doc-list.txt file contained in the /document subdirectory of your solution software CD-ROM.

You can view .pdf files with the Adobe Acrobat Reader. Installation programs for the Windows and HP-UX versions are available on the CD-ROM in the /acrobat subdirectory. In addition a new catalog file has been added to the distribution CD-ROM called manuals.pdf. This catalog file allows search and indexing on all the documents contained in the /document subdirectory.

NOTE: In order to take full advantage of the Adobe Acrobat Search Function, when using Unix Acrobat Readers, you must manually mount your index. This is due to a bug in the Adobe Catalog build tools.

The workaround is as follows:

1. After launching the Reader application, load the manuals.pdf file.
2. From the **Edit Menu**, select **Search > Select Indexes**.
3. From the **Index Selection Dialogue** click the **Add Button**.
4. Enter the path to the index.pdx file, typically located here:
/cdrom/acrobat/index.pdx
5. Click **OK** to accept.
6. Making sure the newly added index is selected, click **OK** to exit the Index Selection Dialogue.

The Search Function will now operate normally.

Chapter 3 - Making a Physical Connection

Preparing to Install the Host Bus Adapter

Fibre Channel (FC) mass storage host bus adapters (HBAs) manufactured by HP/QLogic can be used with the storage subsystem and your HP platform. Install the HBA in your HP system using the instructions provided in the HBA documentation before preparing the system to interface with the subsystem.

NOTE: Hewlett Packard hosts function as private hosts when attached to a fabric. Therefore, the Compaq Fibre Channel Switch QuickLoop feature must be enabled. This allows private hosts on fabric attached loops to access private devices on different fabric attached loops.

Before installing the host bus adapter, perform the following steps:

1. Perform a complete backup of the entire system.
2. Shut down the computer system.

Please note the following limitations regarding HBA usage:

- Only two 218409-B21 (Compaq/QLA2200) FC HBAs per PCI bus carrier are supported on HP V-Class Systems.
- The 218409-B21 and HP (PCI) FC HBAs are not supported on the same PCI bus.
- The 218409-B21 HBA is only supported on A, L, N and V series servers running HP-UX 11.00.
- The 218409-B21 HBA does not support Compaq Enterprise Backup Systems (EBS) tape drives in a fabric environment.
- Fibre Channel Switch (FC-SW) connectivity is not supported with the HP A5158A FC Adapter.

Host Bus Adapter and Driver

Ensure that you have the required FC HBA and drivers available to your system by issuing one of the following commands, based on HBA type:

For HP FC HBAs:

```
#ioscan -fn |grep fc
```

For Compaq FC HBAs:

```
#ioscan -fn |grep qlc2200
```

For HP FC HBAs, the output from the HP-based command will be similar to:

| Class | I | H/W Path | Driver | S/W State | *H/W Type | Description |
|-------|---|----------|----------|-----------|-----------|----------------------------|
| fc | 0 | 10/8 | fcT1 | CLAIMED | INTERFACE | HP FC Mass Storage Adapter |
| lan | 1 | 10/8.6 | fcT1_cnt | CLAIMED | INTERFACE | HP FC Mass Storage Cntl |
| fcp | 0 | 10/8.8 | fcp | CLAIMED | INTERFACE | FCP Protocol Adapter |

For Compaq FC HBAs, the output from the Compaq-based command will be similar to:

| Class | I | H/W Path | Driver | S/W State | *H/W Type | Description |
|---------|---|----------|--------------------------|-----------|-----------|---------------------|
| ext_bus | 4 | 0/4/0/0 | qlc2200 /dev/qlc22004 | CLAIMED | INTERFACE | PCI SCSI (10772200) |

*Indicates the type of HBA/Driver such as HP FC or Compaq.

Installing the Host Bus Adapter

The first step in making a physical connection is the installation of a host bus adapter.



CAUTION: Protect the host bus adapter board from electrostatic discharge by wearing an ESD wrist strap. DO NOT remove the board from the antistatic cover until you are ready to install it.

You need the following items to begin:

- Host bus adapter board
- The computer hardware manual
- Appropriate tools to service your computer

The host bus adapter board plugs into a standard PCI slot in the host computer. Refer to the system manual for instructions on installing PCI devices.

NOTE: Do not power on anything yet. For the FC switches to autoconfigure, power on equipment in the sequence described below. Also, the controllers in the subsystem are not yet configured for compatibility with HP-UX.

For native HP HBAs, follow the instructions that came with your adapter. For the Compaq/QLA2200 HBA, the following procedure should be followed.

1. Make sure the Compaq/QLA2200 HBA is correctly installed in your system.
2. Place the CD-ROM labeled *Solution Software V8.6 for HP-UX* in your host system's CD-ROM drive.

NOTE: `pfs_mount` requires `pfs_mountd` and `pfsd` daemons to be running. To verify these daemons are running, enter the following command:

```
#ps -ef | grep pfs
```

If `pfs_mountd` and `pfsd` are not listed, they can be started by entering the following commands at the root prompt:

```
#nohup pfs_mountd &
```

The system will respond with `Sending Output to Nohup.out`. Press **Enter** to return to the command prompt.

```
#nohup pfsd &
```

The system will respond with `Sending Output to Nohup.out`. Press **Enter** to return to the command prompt.

3. Mount the CD-ROM by entering the following command at the root prompt:

```
#pfs_mount /dev/rdisk/<cdrom device file>/<mount directory>
```

Example:

```
#pfs_mount /dev/rdisk/c1t2d0/cdrom
```

NOTE: To find the cdrom device file (c1t2d0 in the example), enter the following command:

```
ioscan -fnkC disk
```

NOTE: Some HP-UX systems may require additional parameters to mount the CD-ROM. For example, the following command forces Rock Ridge Interchange Protocol and UNIX as the operating system:

```
#pfs_mount -t rrip -x unix /dev/rdisk/c1t2d0/cdrom
```

For more detailed information regarding `pfs_mount`, please review the associated man pages.

4. Start the installation by entering the following commands:

```
#cd /<cdrom mount point>
```

```
#swinstall -s /<cdrom mount point>/driver/qlc2200
```

Example:

```
#cd /cdrom
#swinstall -s /cdrom/driver/qlc2200
```

Then select **1) Install Compaq/QLA2200 FC Mass Storage Driver Software**

a. Highlight the following swpackage when it appears on the screen:

```
BHPUX1100QLC2200
```

NOTE: In Terminal Mode, the following message appears:

To move around in swinstall:

- use the "Tab" key to move between screen elements
- use the arrow keys to move within screen elements
- use "Ctrl-F" for context-sensitive help anywhere in swinstall

On screens with a menu bar at the top like this:

```
|-----|
File View Options Actions Help
|-----|
```

- use "Tab" to move from the list to the menu bar
- use the arrow keys to move around
- use "Return" to pull down a menu or select a menu item
- use "Tab" to move from the menu bar to the list without selecting a menu item
- use the spacebar to select an item in the list

On any screen, press **CTRL-K** for more information on how to use the keyboard. In GUI mode, just Point and Click.

- b. Select **Mark For Install** from the **Action** menu. In the Status window, the word *Yes* should appear under the *Marked?* column.
- c. Select **Install (analysis)** from the **Action** menu. The Install Analysis window should appear.
- d. When *Ready* appears in the Status item, select the **OK** button to begin the installation procedure.
- e. Select the **Yes** button in the dialog box for each warning that appears.
- f. If the installation was successful, the status item will change to *Ready*. If this is not the case, check the log file and correct any errors that occurred.

- g. Select the **Done** button and press **Enter**. A dialog box will appear indicating that a reboot is required.
- h. Select the **OK** button and press **Enter** to reboot the system.

NOTE: In order to unmount the CD-ROM device without rebooting, enter the following command:

```
#pfs_umount /<cdrom mount point>
```

5. Updating the Compaq/QLA2200 driver

- a. Uninstall the current driver entering the following command:

```
#swremove
```

- b. Install the new driver by following the procedures defined in Step 4, *Start the installation*, and all of its substeps.

NOTE: Before removing the Compaq/QLA200 driver, Compaq highly recommends that you make a backup of your system and volume groups.

Connecting to Your Host System

To connect to your host system perform the following steps:

1. Shut down the HP System. Ensure that all power switches on the array controller and the host computer system are in the **OFF** position.
2. Connect an FC cable between the FC adapter connector on the back of the HP system and a port on the Compaq FC switch.
3. Connect FC cables from each array controller to the Compaq FC switch.
4. Turn on the power to the system and perform the following steps:
 - a. Configure the system for loop hard by accessing the Command Line Interpreter (CLI).

- b. At the CLI prompt, enter the following command:

```
HSG80>set this_controller port_1_topology = loop hard
```

NOTE: For HSG60 controllers, HSG60> will be shown as the CLI prompt.

- c. At the CLI prompt, enter the following command:

```
HSG80>set this_controller port_2_topology = loop hard
```

- d. At the CLI prompt, verify the changes by entering the following command:

```
HSG80>show this_controller full
```

5. Turn on the power to the FC switch and perform the following steps:

a. Log on to the switch. For more information, refer to the QuickLoop Management Guide that was shipped with your switch.

b. At the `switchx:admin>` prompt, enter the following command:

```
switchx:admin>qlEnable
```

NOTE: Switch prompts for `admin` accounts will vary depending on the name of the switch being accessed. For example, with a switch named `switch1`, `switch1:admin>` will be shown as the `admin` prompt.

c. At the `switchx:admin>` prompt, verify that all ports are online by entering the following command:

```
switchx:admin>qlShow
```

6. Turn on the power to the HP system, but do not boot the system.

7. Use the CLI to configure your array controller if it is not yet configured.

8. Boot the system. During the boot process, device special files are created for each logical unit configured on the array controller, and a Logical Unit Number (LUN) is assigned to each storage set configured on the array controller.

If you need to reconfigure the controller at a later time, device special files can be created without Reboot, either manually or automatically, by using the `insf -e` command:

After rebooting the new kernel, use `ioscan -f` to verify that drivers are installed, HBA status is OK and all target LUNs are identified.

NOTE: If you are using the Compaq Enterprise HBA (218409-B21) and units are added after you start your server, you must run `savecfg` in order to use the units without rebooting. Otherwise, you can use the units after you reboot.

Chapter 6 - Verifying Storage Configuration from the Host

This chapter describes how to verify that LUNs (virtual disk units) are being correctly presented to HPUX.

After configuring units (virtual disks) through either the CLI or SWCC restart the host. If you are adding units dynamically, then use `ioscan` and `insf -e` commands to verify that the device special files and logical unit numbers are created and correctly assigned to each storageset.

NOTE: If you are using the Compaq Enterprise HBA (218409-B21) and units are added after you start your server, you must run `savecfg` in order to use the units without rebooting. Otherwise, you can use the units after you reboot.

Verify that the units are correctly presented to the host by entering the following command:

```
#ioscan -fnCdisk
```

The resulting display will appear as follows (HSG80 controller example provided):

| Class | I | H/W Path | Driver | S/W State | H/W Type | Description |
|-------|----|---------------|------------------|-----------|--------------------|-------------------|
| disk | 0 | 0/0/1/0.1.0 | sdisk | CLAIMED | DEVICE | HP DVD-ROM 6x/32x |
| | | | /dev/dsk/c0t1d0 | | /dev/rdisk/c0t1d0 | |
| disk | 1 | 0/0/2/0.6.0 | sdisk | CLAIMED | DEVICE | SEAGATE ST39102LC |
| | | | /dev/dsk/c1t6d0 | | /dev/rdisk/c1t6d0 | |
| disk | 8 | 0/0/2/1.6.0 | sdisk | CLAIMED | DEVICE | SEAGATE ST39204LC |
| | | | /dev/dsk/c2t6d0 | | /dev/rdisk/c2t6d0 | |
| disk | 12 | 0/10/0/0.8.0 | sdisk | CLAIMED | DEVICE | DEC HSG80 |
| | | | /dev/dsk/c6t8d0 | | /dev/rdisk/c6t8d0 | |
| disk | 13 | 0/10/0/0.8.1 | sdisk | CLAIMED | DEVICE | DEC HSG80 |
| | | | /dev/dsk/c6t8d1 | | /dev/rdisk/c6t8d1 | |
| disk | 14 | 0/10/0/0.12.0 | sdisk | CLAIMED | DEVICE | DEC HSG80 |
| | | | /dev/dsk/c6t12d0 | | /dev/rdisk/c6t12d0 | |

For more details on using the CLI, refer to the *HSG80 Array Controller ACS Version 8.6 CLI Reference Guide* or the *HSG60 Array Controller ACS Version 8.6 CLI Reference Guide*.

For more details on using SWCC, see the *StorageWorks Command Console Version 2.4 User Guide*.