

Compaq StorageWorks

Release Notes

MA6000 HSG60 Array Controller ACS Version 8.5c Solution Software for Hewlett Packard HP-UX

This document summarizes features and characteristics of the HSG60 Array Controller (Array Controller Software Version 8.5) for Hewlett Packard systems that are supported in the 8.5c release of the HSG60 Solution Software for the Hewlett Packard (HP-UX) platform kit.

These *Release Notes* provide information for the HSG60 Array Controller Software (ACS) Version 8.5 not covered elsewhere in the documentation, and takes precedent over all other sources. This document should be used by individuals responsible for installing, configuring, and using the HSG60 Array controller.

NOTE

Read this entire document before installing the software.

WARNING

In certain configurations there may be difficulties with the software installation procedure published in the included *MA6000 HSG60 Array Controller ACS Version 8.5c Solution Software for HP-UX Installation and Configuration Guide*.

The procedure defined in Section 10 is the preferred method for Solution Software Kit installation. These instructions take precedence.

These release notes include the following sections:

- 1.0 Identifying Your ACS Software Revision Level
- 2.0 Hardware and Software Support

NOTE

Refer to this section for updates to SWCC
Software revision levels.

- 3.0 New Features
- 4.0 Configuration Rules
- 5.0 Operating Constraints
- 6.0 Saving Your Configuration
- 7.0 Host Operating System Notes
- 8.0 Avoiding Problem Situations
- 9.0 StorageWorks Command Console
- 10.0 Solution Software Kit Installation

Intended Audience

This document has been prepared for customers who have purchased the MA6000 Fibre Channel with an HSG60 controller, and for Compaq Customer Services personnel responsible for installing and maintaining systems that include the HSG60 array controller.

Visit our Web Site for the Latest Information

Check our web for the latest drivers, technical tips and documentation for the HSG60 Array Controller. We can be found in the technical area of our web page:

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

Release Package Contents

The Solution Software Version 8.5c kit consists of the following:

- The HSG60 Solutions documentation set:
 - *Modular Array Cabinet Restrictions EK-MACON-CA. B01*
 - *Compaq StorageWorks Command Console V2.3 for the MA6000 User Guide, AA-RMBDA-TE*
 - *MA6000 HSG60 Array Controller Solution Software Kit Overview, AA-RMBCA-TE*
 - *HSG60/HSG80 Array Controller ACS Version 8.5 CLI Reference Manual, EK-HSG85-RG. B01*
 - *HSG60/HSG80 Array Controller ACS Version 8.5 Maintenance and Service Guide, EK-HSG84-SV. D01*
 - *Registration MA6000, RA7000/8000, ESA10000/12000 and MA8000/EMA12000, EK-RAESA-RC. E01*
 - *StorageWorks Warranty Package Warranty Terms and Conditions, EK-HSXSU-WC. C01*
Warranty Terms and Conditions Addendum 3R-Q178A-3V. B01
158199-021
 - *MA6000 HSG60 Array Controller ACS Version 8.5 Solution Software for HP-UX Installation and Configuration Guide, AA-RMD6B-TE*
- MA6000 HSG60 Array Controller ASC Version 8.5 Solution Software for Hewlett Packard CD-ROM

1.0 IDENTIFYING YOUR ACS SOFTWARE REVISION LEVEL

You can identify ACS Software Version 8.5 by entering the following command at the CLI prompt:

SHOW THIS_CONTROLLER

The resulting display lists the software revision level as the following:

V8.5L-0

2.0 HARDWARE AND SOFTWARE SUPPORT

This section lists the hardware and software supported by ACS Version 8.5L for the HP-UX kit release.

2.1 Operating System Support

Table 1 Minimum System Requirements

Host Feature	Requirement
Platform	HP9000 Series K-Class, Models 2xx, 3xx, 4xx, and 5xx HP9000 Series D-Class, Models 2xx, 3xx HP 9000 Series L-Class, Model 1000/2000 HP 9000 Series N-Class, Model N4xxx HP 9000 Series T-Class, Model T6xx HP 9000 Series V-Class, Model V2xxx
Operating System	HP-UX Versions 10.20 and 11.0
Fibre Channel Adapter Compatibility	HP A3404A, HP A3591A, HP A3591B, HP A3636A, HP A3740A, HP A5158A, 218409-B21 (Compaq/QLA2200) Notes: 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 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. FC-SW connectivity is not supported with the HP A5158A FC Adapter
Controller Compatibility	HSG60 Array Controller operating firmware ACS Version 8.5L

2.2 Device Support

ACS Software Version 8.5 supports the devices listed in the Table 2 below at the indicated hardware levels.

Table 2 Supported Disk Drives

Device	Capacity in Gigabytes	Spindle Speed (RPM)	Minimum Microcode Version	Minimum Hardware Version
328939-B22 BD009122BA	9.1	10,000	3B07	A01
142671-B22 BD00962373 BD00962A66	9.1	10,000	BCJE B007	A01 A01
128418-B22 BD018122C9	18.2	10,000	B016	A01
142673-B22 BD01862376 BD01862A67	18.2	10,000	BCJE B007	A01 A01
188120-B22 BF00963643	18.2	15000	3B01	A01
188122-B22 BF01863644	18.2	15000	3B01	A01
176496-B22 BD03663622 BD0366349C	36.4	10,000	BDC4 3B01	A01 A01
176494-B21 BC072638A2	72.8	10,000	BDC4/BDC7	A01

2.3 StorageWorks Command Console

The StorageWorks Command Console (SWCC) version 2.3 is included in this release. SWCC provides a graphical user interface that can be used to configure and monitor your storage subsystem. Use of SWCC is highly recommended. Refer to the *Compaq StorageWorks Command Console V2.3 for the MA6000 User Guide* for information about installing and using SWCC.

NOTE

Due to problems found with the A28696A HPPB SCSI adapter on HP systems during the qualification of SWCC agent version 2.3, this release of SWCC version 2.3 will not include support for this adapter.

When the problem involving this adapter is resolved, a new copy of the agent will be made available on the Compaq Storage web site.

2.3.1 Identifying Your SWCC Software Revision

The StorageWorks Command Console Client software suite for the HSG60 V8.5 consists of various components. The following SWCC components are included in this release of the Solution Software kit:

SWCC Command Console (storage window manager)	V 2.2.0.213
SWCC CLI Window	V 2.0.0.33
HSG80 ACS85 StorageWindow	V 2.3.0.13
HSG80 StorageWindow	V 2.1.0.28
HSG60 StorageWindow	V 2.3.0.4
HSZ StorageWindow	V 2.3.0.47
HSZ80 StorageWindow	V 2.3.0.15
HSD StorageWindow	V 2.0.0.5
HSJ StorageWindow	V 2.0.0.5

Verification of the individual components can be done with Explorer by right clicking on the particular executable program in its folder and selecting the Properties option. In the resulting Properties window, click on the Version tab and select the Product Version to display the version of the program

3.0 NEW FEATURES

This section briefly describes features that are supported by the HSG60 controller. For more information on these features, see the *MA6000 HSG60 Array Controller ACS Version 8.5 Solution Software for HP-UX Installation and Configuration Guide* and the *HSG60/HSG80 Array Controller ACS Version 8.5 CLI Reference Manual*.

3.1 External Cache Battery

Compaq recommends that you replace the ECB every two years to prevent battery failure.

If you are shutting down your controller for longer than one day, complete the additional steps in “Shutting Down the Subsystem” in the *HSG60/HSG80 Array Controller ACS Version 8.5 Maintenance and Service Guide*. This will prevent the ECB from discharging during planned power outages.

3.2 218409-B21 (Compaq/QLA2200) HBA and FC-SW Support

This version of the StorageWorks 8.5c Solution Kit now supports SAN (Fibre Channel) Switches F-port connectivity through the use of the 218409-B21 HBA and Compaq v2.5.8 HBA driver, and up to 64 units per HSG60 controller.

4.0 CONFIGURATION RULES

- The following list outlines the configuration rules for the controller:
 - Maximum of 128 LUNs: if Command Console LUN is enabled, the result is 127 visible LUNs and one CCL
 - Maximum 512-GB LUN capacity
 - Maximum 24 physical devices
 - Maximum 8 RAID-5 storagesets
 - Maximum 8 partitions of a storageset or individual disk
 - Maximum 6 physical devices per RAID 1 (mirrorset)
 - Maximum 14 physical devices per RAID-5 storageset
 - Maximum 24 physical devices per RAID 0 (stripeset)
 - Maximum 24 physical devices per striped mirrorset

5.0 OPERATING CONSTRAINTS

This section describes the operating constraints for ACS Software Version 8.5. An operating constraint is a limitation placed on the operation of the controller.

5.1 Using FRUTIL to Insert a New Controller

When using FRUTIL to insert a new controller in a dual-redundant controller configuration, the user will see a new set of instructions after the new controller has been inserted:

If the other controller did not restart, follow these steps:

1. Press and hold the other controller's reset button.
2. Insert the other controller's program card.
3. Release the reset button.

NOTE

Be aware that running FRUTIL will quiesce all I/O. Consequently, never run this program when under heavy load.

5.2 Dual External Cache Battery Failures

The HSG60 Array Controller cache policy provides for proper handling of a single ECB failure as described in the *MA6000 HSG60 Array Controller ACS Version 8.5 for HP-UX Installation and Configuration Guide* and in the *HSG60/HSG80 Array Controller ACS Version 8.5 CLI Reference Manual*.

For dual ECB failures, no failover occurs. For this release, if a dual ECB failure is detected both controllers will be restarted.

6.0 SAVING YOUR CONFIGURATION

6.1 Saving a Configuration to Previously Initialized Stagesets

When enabled, the `SAVE_CONFIGURATION` switch allows you to do the following on single-controller configurations only:

- Save a configuration to a disk or stageset. The configuration may be retrieved later and downloaded onto a replacement controller.
- Retain code patches to the operating software.

If any stageset within your configuration was previously initialized with the `INITIALIZE container-name SAVE_CONFIGURATION` command to save your

configuration to disk, it will not be necessary to reconfigure your devices with a new controller. `SAVE_CONFIGURATION` also retains code patch information to the software. This option is supported on single controller configurations only.

ACS Software Version 8.5 saves any installed software patches on disks initialized with the `SAVE_CONFIGURATION` option. Should you need to replace a controller and restore the configuration from a disk, you will not have to reinstall any software patches.

NOTE

You must use the same software version when replacing the controller. You can also hold in port button 6 on the operator control panel, and press the reset button to restore the configuration.

Configuration information cannot be retrieved from storagesets created on other HSx controllers (for example, HSD, HSJ, or HSZ controllers). You can only restore a configuration from a configuration saved on this or another HSG60 array controller.

7.0 HOST OPERATING SYSTEM NOTES

7.1 StorageWorks Command Console (SWCC) Version 2.3

This version of StorageWorks Solutions Software includes the StorageWorks Command Console (SWCC) Version 2.3 Client and Agent programs. SWCC may be used to configure and monitor storage subsystems attached to SGI, IBM, SUN, HP and Tru64 UNIX systems. Refer to Section 10.0 for SWCC related notes.

7.2 HP-UX Bootability

Using the HSG60 array controller running on ACS 8.5, HP-UX bootability is not supported.

7.3 Configuring the HP-UX File System

Adding the RAID Storageset to Volume Groups:

CAUTION

When using HP Fibre Channel Host Bus Adapters only:

Do not use SAM to create Volume Groups. Creating volume groups must be accomplished using HP-UX commands.

This is because, when SAM scans the hardware, any HSG60 controller LUNs created after the first LUN are not parsed correctly and consequently cannot be selected to create a volume group. The solution around this problem is to use HP-UX commands to create the Volume Groups and then use SAM to create and manage Logical Volumes. For additional details, refer to Chapter 3 of the *MA6000 HSG60 Array Controller ACS Version 8.5 Solution Software for HP-UX Installation and Configuration Guide*.

8.0 AVOIDING PROBLEM SITUATIONS

Under certain conditions, you may experience unusual controller behavior. This section presents information to help you avoid such situations and to recover from them if they occur.

8.1 Adding, Moving, and Changing Devices

The controller maintains a configuration map of a device's type and location. This map is used to communicate with devices. If you add, move, or change a device while the controller is powered off without first changing the controller configuration, the controller is not able to communicate with the changed device when it returns to service.

If a device is removed by mistake while the controller is off, delete all containers associated with the removed device after power has been restored to the controller.

If a device is replaced while the controller is off, remove the device before restoring power to the controller. Correctly remove the current device and add the new device after restoring power to the controller.

See the *HSG60/HSG80 Array Controller ACS Version 8.5 Maintenance and Service Guide* for correct device removal and addition procedures.

8.2 Moving Stagesets

Move only normal stagesets. Do not move stagesets that are reconstructing or reduced, or data corruption will result.

8.3 Adding, Moving, and Changing Controllers, Cache Modules, or External Cache Batteries

It is permissible to replace the controller, cache module, or external cache battery while the subsystem is shut down. However, you must enter the SHUTDOWN THIS_CONTROLLER command before shutting the subsystem down to make configuration changes. If two controllers are configured in a dual-redundant configuration, you must first enter the SHUTDOWN OTHER_CONTROLLER command.

These commands instruct the controllers to flush all unwritten data from the cache modules and discontinue all I/O activity. For more information regarding the SET controller command or maintenance and replacement of the controller, cache module, and external cache battery, see the *HSG60/HSG80 Array Controller ACS Version 8.5 CLI Reference Guide and the HSG60/HSG80 Array Controller ACS Version 8.5 Maintenance and Service Guide*.

If the first attempt to establish a SWCC SCSI or serial direct connection fails, try making the connection again.

8.4 Establishing a SCSI Direct Connection

Establishing a SCSI direct connection lists all available drives, including the system drive. You must select a drive that belongs to the HSG60 controller; otherwise the connection will fail.

SCSI Direct Connection is not supported on HP platforms.

9.0 STORAGEWORKS COMMAND CONSOLE V2.3

This portion of the release notes provides application information on Version 2.3 of Command Console HSG60 Client software. Command Console HSG60 Client 2.3 is a feature-rich graphical user interface (GUI) for StorageWorks HSG60, Fibre channel controllers. This document covers the Command Console HSG60 Client 2.3 Storage and CLI Window modules.

SWCC HSG60 Storage Windows Restrictions

When you install the SWCC HSG60 Storage Window component, you must also install the HSG80 and HSG80ACS85 Storage Windows components. This assures that the proper library elements are available for all of the components.

If you cannot install the HSG80 and HSG80ACS85 Storage Windows or if you remove these later, you will need to execute the following command from a command line to register the required OCX component.

```
REGSVR32 C:\Progra~1\Compaq\SWCC\HSG60\PhysView.ocx
```

This path is the default path for the file, *physview.ocx*.

Logical View and Physical View Note

Note that Logical View is an accurate representation of your subsystem; however, the physical view may not be an accurate representation of your subsystem.

SWCC Manual Refresh Rate

We recommend that you do not refresh SWCC windows more often than once every 30 seconds.

Storage Area Network (SAN) Configuration

In a SAN configuration, only one SWCC Agent should be active at one time.

9.1 Product Description

Command Console HSG60 Client 2.3 is a standalone or plug-in GUI for HSG60 controller-based storage subsystems. It does not operate with other subsystem types.

Command Console contains two main components—Client and Agent. For most versions of Command Console, Client includes the following components:

- **Navigation Tree**—The enterprise storage management window, from which you can open multiple Storage Windows. Client can be shipped with or without the Navigation Tree component, depending upon the application of the product.

- **Storage Window**—The graphical window into a specific storage subsystem. There is a separate Storage Window type for each controller type to be managed. You must open a separate Storage Window for each subsystem you wish to manage.
- **CLI Window**—The text-based, command-line window into a specific storage subsystem, from which you can manage the subsystem using CLI commands.

Document Issues

The term “Command Console” can refer to the Storage Window Manager. It can also refer to the entire Command console product suite and all of its components, or simply as “the software”.

In this section, Storage Window Manager, paging, and automatic event notification issues are presented to cover situations that Command Console Clients have been installed under an installation that includes a Storage Window Manager.

Client and Agent are intimately connected to their operation. Although these release notes are meant to cover Client issues, some Agent-specific issues are included for completeness.

More Information

For complete product information on Command Console, see the product’s on-line Help. Also, for details on the features of the controller software, see the controller documentation.

9.2 Installation Notes

Be careful about the order in which you install certain SWCC products. If you install SWCC from a Switch CD-ROM kit, it may overwrite newer SWCC components that have been installed with the CD-ROM that ships with this kit. You should reinstall using the CD-ROM in this kit to ensure that you have the latest client versions.

Stand-Alone Installations

After doing a stand-alone install of a device-specific Client, exit Command Console before adding or accessing a system with that type of device. Command Console will then recognize the installation

SWCC 1.1B Client Will Not Work if Version 2.x Client Was Already Installed

SWCC 1.1b will malfunction if you already have SWCC 2.x on a Windows NT/Windows 2000 operating system. The Asynchronous Event Service that comes with SWCC 2.x uses the same port as SWCC 1.1b. SWCC 1.1b can be removed without impacting SWCC.

Perform the following to solve this:

1. Uninstall SWCC 1.1b. Ignore the error box that appears.
2. Reboot the computer. The integration for SWCC 1.1b will have been removed.

"There is no disk in the drive" Message

When you install the Command Console Client, the software checks the shortcuts on the desktop and in the Start menu. If you have Windows NT or Windows 2000, the installation will check the shortcuts of all users for that computer, even if they are not currently logged on. You may receive an error message if any of these shortcuts point to empty floppy drives, empty CD-ROM drives, or removable disks that are no longer present. Do the following:

- Ignore the error message by clicking Ignore.
- Replace the removable disks, and place a disk in the floppy drive and a CD-ROM in the CD-ROM drive. Then, click Retry.

9.3 Clarifications

This section presents clarifications on the behavior of the software in certain situations.

SWCC provides generic physical views of modular storage components (MA6000). These views may not exactly match the actual configuration that you have. Take care in interpreting the shelf position in the physical view when determining your actual shelf location

SWCC Agent Uninstall

The Windows NT or Windows 2000 SWCC Agent may not be completely uninstalled (that is, the service is not removed) until a system reboots.

Duplicate Client Entries

If an upgrade was performed, duplicate client entries may appear in the Windows NT or Windows 2000 Start menu. The extra shortcuts can be removed as follows:

1. Click Start>Settings>Taskbar.
2. Click Start Menu>Programs.
3. Click Advanced.
4. Click Program folder.
5. Click Command Console folder.

Remove duplicate entries manually from this folder.

EMU Status

The EMU status indicators do not reflect the proper status in modular storage (MA6000). "CLI show EMU" gets "ERROR C000 EMU not installed or operational" when it may be working correctly.

Event Logs

The event log on the Windows NT or Windows 2000 client may have extra error message text appended.

Cautions when Configuring from a Configuration File

When reconfiguring a storage subsystem from a configuration file, the program prompts you to choose whether or not the program initializes your virtual disks. You must choose the appropriate option or you risk the loss of your data as the configuration file is loaded and your subsystem is reconfigured.

- Do not initialize virtual disks—Choose this option when your virtual disks contain valuable user data, and you wish to retain that data. You might, for instance, need to replace a failed subsystem component such as a controller or cache module. In this case, your subsystem configuration must be transferred to the new hardware, but you do not wish to change any information on your storage devices themselves.

- Initialize virtual disks—Choose this option when your virtual disks do not contain user data, or when you do not care if the data on them is lost. You might use this option when configuring a storage subsystem from scratch, to make it match the configuration in your configuration file.

Virtual Disk Recovery from a Configuration File

Note that when you delete a virtual disk, the disk's member drives are all reinitialized and any user data is lost. You cannot restore the virtual disk's data by reconfiguring your subsystem from a configuration file. A configuration file contains only information about the structure of a virtual disk and does not contain the disk's data itself.

Warning Message Windows

The controller software responds to problems in parsing and executing commands from Client and Agent by returning a message window entitled "Warning". The content of such messages may contain such indications as "Command Execution Error," along with pertinent detailed information.

These messages are simply passed through for display by Client and Agent and are normally associated with problems in the controller. However, sometimes "Command Execution Error" does indicate a problem with SWCC.

Local Client/Agent Network Connection

To create a local connection to take advantage of Agent's event notification features, you can run both Client and Agent on the same Windows NT host machine and connect them using a network connection. No special installation instructions are necessary to implement this type of connection. Install each component as if Client were to run on a system remote from the host machine.

Note that, because Client only runs on Windows NT and Windows 2000 systems, and Agent runs on Windows NT, UNIX-based systems, and OpenVMS, you can only implement this type of connection on a Windows NT system.

Note also that you cannot use Client with a local connection of either type while an Agent is running on the local machine.

Windows NT/Windows 2000 Configuration

On a Windows NT/Windows 2000 host, after you create or delete a virtual disk using Client (or the CLI), you must perform the following steps to properly configure the file system to recognize your changes.

1. Boot the host system. This action has the effect of forcing the Disk Administrator to recognize added virtual disks as raw disks, available for use. It also notes that deleted virtual disks are no longer present.
2. Create file system partitions on your disks. When you create a virtual disk in the controller, you have the option to partition it *at the controller level* in any way you wish, as long as you create at least one partition per disk. Each of the *controller-level* partitions you create becomes a virtual disk, visible to the host. In Disk Administrator, you must partition these newly added virtual disks at NT's file system (NTFS) level.
3. Once you have partitioned your drives in Windows NT/Windows 2000, the file system assigns each drive a unique drive letter. Make a note of the drive letters assigned.
4. Format your disks—You must format each newly added disk.
5. Start the Agent Configurator by double clicking its icon in the Command Console Start Menu group.
6. Navigate through the menus until a popup appears, prompting you to rescan your subsystems. Click Yes to perform the rescan and display a list of subsystems.
7. Make sure that the access device you've been using for your subsystem still exists. If you inadvertently deleted it, you must assign another device in its place. If no access device exists, Client cannot communicate with your subsystem unless the CCL is used.
8. Click the Next button until you can exit the configurator.
9. Select the Services option in the Windows Control Panel.
10. Scroll down to highlight the Steam entry.

11. Click the Stop button and wait for a prompt indicating that the service is halted.
12. Click the Start button and wait for a prompt indicating that the service is started.
13. Exit Control Panel.
14. Windows NT/Windows 2000 now recognizes any changes you may have made in your virtual disk configuration.

UNIX-Based Configuration

On a UNIX-based host and after you create or delete a virtual disk using Client (or the CLI), you must perform the following steps to properly configure the UNIX file system to recognize your changes.

1. Reboot the host system—This action has the effect of forcing the file system to recognize added virtual disks as raw disks, available for use. It also notes that deleted virtual disks are no longer present.
2. (Optional) Create file system partitions on your disks—When you create a virtual disk in the controller, you have the option to partition it *at the controller level* in any way you wish. Each of the *controller-level* partitions you create becomes a virtual disk, visible to the host.
3. Afterward, if you desire, you can partition these newly added virtual disks at UNIX's file system level. Use the appropriate commands for your operating system version to perform this task. Once you have partitioned your drives in UNIX, the file system assigns each drive a unique drive identifier.
4. Stop and Restart the Agent—Using the Agent configuration script, you must stop and restart the Agent running on your UNIX host, using the configuration program. In the program, you must choose the option to create a new *storage.ini* file. This action updates the Agent to recognize any virtual disk changes you have made.

Display in VGA Mode

There are numerous issues involving the use of Client on a system with standard, VGA resolution. The Storage window requires a minimum amount of screen space to properly display its contents. When you use VGA display resolution, screen space becomes more limited. It is highly recommended that you use Client with a minimum of SVGA (800x600) display resolution.

If you must use VGA resolution, consider the following suggestions:

- You may not be able to see the scroll bars on the bottom of the display. You can use the Storage window's menu settings to remove the toolbar from the display to make room for the bottom scroll bars.
- If you are using Client with a 24-device, high-availability enclosure, it may be easier to configure the subsystem if you set the system type to *Generic* for configuration purposes. Return the setting to *High-Availability 24-Device Pedestal* for monitoring and viewing.

9.4 Operating Constraints

This section describes the operating constraints for the software. An operating constraint is a limitation placed on the operation of the controller by the nature of its design. Keep these constraints in mind, to avoid problems and to help you to get the maximum performance from your controller.

Failover Mode Set in CLI

Client is intended to be used to configure and monitor your storage only, and there are some functions available in the CLI that are not available in graphic form in the GUI. If you wish to use your controller's multiple-bus failover mode, you must enable and control that function via the CLI.

Also, if you wish to use virtual disk preferencing in multiple-bus failover mode, you must set your virtual disk preferences via the CLI when you set the failover mode.

Connection Limitations

Local SCSI or serial connections are only available with standalone Storage Windows. You cannot use the Storage Window Manager to connect locally to a subsystem.

Some Features Dependent upon Connection Type

Because of the nature of the connections you can use between Client and your subsystems, the features available with each connection type vary slightly. Some connection types impose limitations on Client's features, as noted in Table 4.

Table 4 Feature Limitations

Feature Connection Type	Create virtual disk	Delete virtual disk	Fault Events: Client Visual Notification	Fault Events: Paging Notification	Windows NT and Windows 2000 Fault Events: Event Logging	Email Notification (UNIX/VMS only)
Local Serial Connection (Storage Window Manager and Agent not used)	Supported	Supported	Supported	Not Supported	Not Supported	Not Supported
Local SCSI Bus Connection (Storage Window Manager and Agent not used)	Supported	Supported	Supported	Not Supported	Not Supported	Not Supported
Local Network Connection (Client and Agent running on the same host)	Supported	Supported	Supported	Supported	Supported	Supported
Remote Network Connection (Client running on a PC remote from Agent on a host)	Supported	Supported	Supported	Supported	Supported	Supported
RAS Connection (Client running on a remote PC with a dialup network connection)	Supported but not recommended. Follow-up operating system configuration cannot be performed remotely	Supported but not recommended. Follow-up operating system configuration cannot be performed remotely	Supported reliably only while RAS intact. Some events may be missed while dialup connection is broken.	Supported reliably only while RAS intact. Some events may be missed while dialup connection is broken.	Supported reliably at host end only. Some events may be missed at Client end while dialup connection is broken.	Supported

Delayed Event Notification on RAS Connections

Visual fault notification, paging, and event logging may be delayed significantly in situations where RAS connections are used for multiple Clients. An Agent with multiple Clients in its *client.ini* file must poll each Client whenever a fault occurs. Any Clients not currently network-connected significantly delay this process, because Agent must wait for their connections to time out before moving on to the other Clients.

To avoid this situation, set the *notification_method* parameter for each Client in the *client.ini* file to “0”, to defeat event fault notification.

CLI RUN Commands

Do not issue RUN commands in the CLI Window. Use only a maintenance terminal connection to issue RUN commands.

Creating Partition Units Across Targets or Ports

Be aware that the name you pick for a unit assigns it to a particular host bus target. If you create a unit from free space on a device, the program forces you use a unit name that puts the unit on the same host target as the other partitions on the device.

On dual-port controllers, partitions on the same device that are assigned to different host ports are not supported.

Maximum Number of Active Connections Limited

The controller maintains a table of host port connections that can contain up to 64 named connections. Only 8 of those connections can be active (that is, “on line”) at any time, however. Client shows only those connections that the controller recognizes as “on line”.

Avoiding Problem Situations

In certain situations and under specific conditions, you may experience unusual behavior with the software. This section presents information to help you avoid such situations and to recover from them if they occur.

Enable Read-ahead Cache Before Enabling Write-back Cache

The controller requires that read-ahead cache mode is enabled before you can enable write-back cache mode.

Incomplete Scans Cause Connection Loss

For proper display of subsystem status, Client performs a “scan” to collect information about your storage subsystems. The program displays scan progress screens while the process occurs. In some, rare situations, you may experience incomplete scans or scans that appear to hang. In these cases, the likely cause is that Client has lost its connection with the virtual disk it was using for communication with your subsystem.

This problem may show up with either local SCSI or network connections.

To remedy this situation, you must first restart both of your controllers, followed by restarting Client and Agent. If the system still does not operate properly, you must reboot your host system. If your host is running Windows NT or Windows 2000, you must ensure that the special device driver, HSZDISK.SYS, is installed and running properly after it is booted.

Mirrored Cache Mode Not Retained After Configuration Restore

If you restore your controller configuration from a configuration file, the mirrored cache setting may not be properly enabled. You must restore the mirrored cache setting manually, using a CLI Window.

Error Message on Exiting Storage Window

Under certain conditions, when you exit a Storage Window, you may experience an “Illegal Operation Error” message. You may ignore this message.

Inappropriate Error Message on Device Delete

If you select a disk, then chose Device/Delete, a dialog box may appear, asking “Are you sure?” If you choose the “NO” option, the message “Nothing selected to delete!” is displayed. You may ignore this message.

Storage Window Corruption After Making/Removing Spare Device

If you select a disk and make it a spare (using either menu or context menu options), then remove the device as a spare, some information in the Storage Window may be left corrupted. To reconstruct the window, you must exit the window and open a new one.

Cache Policy Not Shown in Controller Properties Sheet

The controller cache policy may not be properly shown in the controller properties sheet. The field may be blank. You must use a CLI Window to obtain the cache policy setting.

Incorrect Capacity Shown in Add Virtual Disk Wizard

In some circumstances, in Step 3 of the Add Virtual Disk Wizard, if you specify a capacity greater than the available disk capacity, an error message results. If you back up to Step 2 of the Wizard and return to Step 3, the correct capacity is then displayed. An attempt to move to Step 4 of the Wizard at this point, however, results in the same error message, even though the correct capacity is shown.

To complete your virtual disk, you must exit the Wizard and attempt to recreate the virtual disk.

Storage Window Corruption While Deleting a Virtual Disk

In some circumstances, if you delete and confirm deletion of a RAID-based virtual disk, a “Subsystem Connection Status” window may be displayed, and the Storage Window goes blank. The Storage Window may remain blank for several seconds until the “Subsystem Connection Status” window disappears.

Application Errors When Restarting Agent

You may experience an “application error” error when attempting to restart Agent after manually changing the Agent configuration files. Either of the following issues may be the cause:

- The *client.ini* file must end with a carriage return. If any other character terminates the file, it may cause an application error.
- The *storage.ini* file must not end with a carriage return. If a carriage return terminates the file, it may cause an application error.

Client Access Changes Not In Effect

After manually editing or changing the Agent *client.ini* file with a configurator program, you may notice that your Clients’ access has not changed. To place your changes in effect, you must restart Agent after editing any of the Agent configuration files.

Reconfiguration After Controller Replacement

If you replace either of the controllers in your subsystem, you must reconfigure your Agent *storage.ini* file to match the serial numbers of the new hardware. See your Agent documentation for details on reconfiguring your *storage.ini* file.

Storage Window Won't Open

If you cannot open a Storage Window from the Storage Window Manager or in standalone mode, the *client.ini* ACCESS_ALLOWED parameter for your Client is probably set to "0", disabling Storage Window access. Use the Agent configuration script or edit the *client.ini* file to enable access to the subsystem.

Network Port Assignments for UNIX-Client/Server Systems

A UNIX host may use Network Information Services (NIS) to serve the *services* file containing its network port assignments.

Agent must use the *services* file to determine which network ports to use.

Because of this requirement, you may need to configure your system so that Agent can access the proper *services* file.

You have two options to prevent a conflict between the two possible locations of the *services* file. See the Agent user guide for your particular Agent for more information.

Error on First Attempt to Make Connection

You may experience a system error such as a "Command Execution Error" on your first attempt to make a network connection using the Storage Window. If this happens, try the connection again, and it will succeed.

Client Hangs if Virtual Disk Deleted

If Client is monitoring a particular subsystem, and you delete the virtual disk being used to communicate with that subsystem, the program may hang. To delete the virtual disk Client is using for communications with an Agent, you must first reassign another virtual disk as the communications LUN, using the Agent Configurator.

If you are using the CCL as your communications LUN, and you disable it, Client may lose its connection with your subsystem. If you wish to disable the communication LUN, you must first reassign another virtual disk as the communications LUN.

Invalid Cache Errors

Your controller module, cache module, and subsystem devices all contain configuration information used to keep their activity synchronized. This data is called *metadata*. The controller software reports an invalid cache error on the

affected controller in situations where there is a mismatch between the metadata in the controller module and a cache module containing unwritten data. This mismatch can result in loss of the unwritten cache data if the error is not cleared properly.

CAUTION

Use extreme care in responding to the Command Console invalid cache error prompt. If you inappropriately instruct the program to delete unwritten cache data, you may lose valid user data.

Client displays a message and prompt box when an invalid cache error occurs. You must tell the program whether or not to delete unwritten cache data as the error is cleared. If you are not familiar with the proper treatment of unwritten cache data, see the information in the on-line Help documentation under the topic “Invalid Cache Errors.”

Connecting Via the Host SCSI Port

Client may indicate that it cannot find your subsystem if you attempt to connect via the host SCSI port by using Windows NT/Windows 2000 in either of the following situations:

- A StorageWorks controller subsystem is connected to the host, but the subsystem has no virtual disks configured on it in SCSI-2 mode with CCL disabled.
- A StorageWorks controller subsystem is not connected to the host.
If you are using SCSI-2 mode and Windows NT/Windows 2000, you must disable the Command Console LUN and create a virtual disk by using a serial connection. For more information on the Command Console LUN, refer to the *Compaq StorageWorks Command Console V2.3 User Guide*.

Note that because Agent uses a SCSI host bus connection to its subsystems, the same rules mentioned above also apply.

Communications Failure on Power Up with Low Batteries

If the battery in your cache is discharged when you power up the controller, the controller may produce an invalid cache error. If you are using Client as your controller interface at that time, the error may prevent communication with the controller. In this case, the controller status bar in Client changes to yellow, and

the program displays a window containing error information.

To clear the error, you must exit Client and use a normal controller maintenance terminal to issue the `CLEAR ERRORS INVALID_CACHE` command before you can use the controller. See your controller documentation for instructions on use of the `CLEAR ERRORS INVALID_CACHE` command.

If the battery remains low, the invalid cache error may reappear. In this case, you can operate your controller with reduced capability, or you can change its cache policy to get around its built-in battery protection, although at some risk to your data. Refer to your controller documentation for details on its cache policy controls.

After you have cleared the invalid cache error, you can use either a normal maintenance terminal or Client as your controller interface.

Lost Connections Cause Invalid or Missing Fault Displays and Event Logging

Client receives notification for most types of changing subsystem fault conditions on the next monitor interval after they occur. You may experience invalid or lost notifications in situations in which Client's connection with its subsystems is broken. Any Windows NT/Windows 2000 event logs that might have occurred while the connection was broken are also lost.

If the connection between Client and its subsystems is broken for any reason, Client may continue to display faults that are cleared while the connection is broken. Similarly, faults that occur while the connection is broken are not displayed at all.

To avoid lost fault indications, make sure that Client's connections with its subsystems are monitored and maintained. To reestablish a connection with a storage subsystem, you must exit and restart Client.

Broken connections can occur for a variety of reasons:

- For RAS connections—It is the nature of a RAS connection that it is not a full-time connection. Events that occur during a period when the RAS connection is not made are not logged to Windows NT's/Windows 2000's event logging facility.
- For serial controller connections—Bad or missing serial cable. To repair this situation, plug in or replace the cable.
- For host port SCSI connections—Bad or missing SCSI host cable, no LUNs configured on controller on Client startup.

- For network connections—Agent missing or not running, network discontinuity, Agent not properly configured for your Clients.
- THIS controller halted, reset or hung—To repair this situation, restart or replace THIS controller.
- The virtual disk being used for communications with the storage subsystem is no longer available.

No Agent Notification Causes Invalid or Missing Fault Displays

For some types of faults, Agent does not send Client notification of changes in status as they occur. Client displays whatever fault information it last received. Following are three situations in which a fault can occur without immediate display in Client:

- The OTHER controller fails or is shut down.
- A cache battery on either controller fails or goes low.
- A cache module fails.
- A fan fails.
- A power supply fails.

In all of these cases, you can get current status by viewing the subsystem in question using the REFRESH option in the View menu.

Manual Restart Required in Some Situations

In some situations in multiple-bus mode, both controllers must be restarted to properly continue subsystem operation. Usually, this function is automatically performed by the software. If only one controller in a dual-redundant pair restarts, however, you must manually restart the other controller.

CCL Recognition

The Windows NT/Windows 2000 Agents will now recognize a CCL. The CCL cannot be assigned a drive letter because it is a logical device and must be recognized by its physical drive number. The Windows NT/Windows 2000 x86 Agents will recognize both device names (a-z) and physical drive numbers. The disk administrator can be used to find the associated drive number for any of the recognized devices.

Reservation Error Message

The Agent application, and other applications which access RAID storage through SCSI, will get a reservation error if a device is reserved by one host and another host attempts to access the same device. When this occurs, a generic I/O error will be logged.

Reservation Conflict

Agent will discard reserved LUNs from its list of devices to be statused. The reservation conflict will be recorded for each reserved LUN in the system error log. A notification will appear in the log for each LUN reserved. In addition to the system's binary error log (Tru64 UNIX), an error message will also be recorded in the *daemon.log* file. An example of the error message is "Device *lunName* is reserved and cannot be statused by steamd." This only applies to Agent during its current run. If Agent is restarted without either a) releasing the reservation or b) rescanning the bus, the reservation conflict will be recorded again each time Agent is restarted.

For **prior Agent releases**, to avoid filling the binary error log, Agent must be stopped and restarted with bus scan enabled. Agent will not record the reserved LUN in the *storage.ini* file, and will not status the reserved LUN.

Multi-agent Functionality

With the current Agent and the direct SCSI connect Client, several Agents and direct connect Clients can talk to the same controller. Only one will access the controller at a time, with the others being blocked until the current request is serviced. The multi-agent functionality will work with any controller with ACS version 8.5+. This functionality is provided by the controller which the Agent software takes advantage of.

Problems will still be encountered if running in a heterogeneous environment, for example, running multiple agents or communicating with a combination of HSZ70 and HSG80s. It is recommended that only one Agent be running in such a heterogeneous configuration. The multi-agent functionality is not available in the HP-UX Agent.

Switching SCSI Modes

When switching HSG80 controllers from SCSI-3 to SCSI-2 mode, the host system should be rebooted after the change is made. This will clear any unclaimed SCSI-3 CCL devices from the system. Failure to clear devices can cause erratic Agent behavior or crash the NT system (BSOD). It is also recommended that you reboot when changing from SCSI-2 to SCSI-3 mode.

NOTE

SCSI-3 mode is not supported on HP-UX platforms.

Add Virtual Disk Wizard Cache Functionality

The Add Virtual Disk Wizard allows you to try to add a unit that has readahead cache enabled while read cache is disabled. This is an invalid action. The controller will not allow the “add unit” to execute. The result is a storageset without an attached unit. This “orphaned” storageset may be used to create a new unit by returning to the Add Virtual Disk Wizard and adding a unit of the same redundancy level as the failed unit.

Ensure that you do not check Enable readahead cache if Enable read cache is unchecked. Refer to Step 4 of the Add Virtual Disk Wizard.

Add Virtual Disk Wizard – Partitioned Units and Ports Functionality

The Add Virtual Disk Wizard allows you to choose a port when adding a unit based upon a partitioned set that is different from the port of a current unit that is using the same partition.

Ensure that you use a LUN ID that corresponds to units that have already been used for a partitioned storageset. For example, if a unit using a partitioned set has a LUN ID below 100 (e.g., D55), then the subsequent units should also be below 100. Likewise, if a LUN ID is 100 or above, subsequent LUN IDs should also be above 100.

LUN ID is set on Step 4 of the Add Virtual Disk Wizard.

NT Agent CCL Access Device Recognition

For ACS 8.5 in SCSI-3, it is possible to have multiple CCLs based on the unit offsets. Agent picks the last of the set as the access device. The CCLs will not appear in the disk administrator, but are visible in the registry with their port, target, and LUN. The CCL will show as CCLp:b:t:I, each with a different target number (port bus target LUN, e.g., CCL2:1:1:0) in the storage.ini file.

In SCSI-2, you will only get one CCL, which is presented as an offline device in disk administrator. This CCL will show as “PhysicalDrive#” in the storage.ini file.

Host Non-descriptive Error Message

If the host machine running the Storage Window is not in the client.ini file of an Agent and attempts to access that Agent, a non-descriptive error message is returned. For example, “Cannot establish communication with ‘77FORD’ ”. [Socket message is incorrect type.]

Multiple Connections in Controller Properties Connections Tab

When paging through more than 8 connections in the Controller Properties window Connections tab and then pressing the Previous button to return to previous pages, some of the host id and adapter id labels may disappear. This will not affect functionality.

Selecting Disk Drives When Creating Snapshots

When creating a snapshot, if you select disk drives of different sizes, Storage Windows reports the size erroneously. Storage Window adds all selected devices together for selected capacity. The selected capacity is actually the smallest drive multiplied by the quantity of drives selected. Storage Windows will allow you to proceed when you have inadequate storage selected. When you select drives of different sizes, you should calculate the selected storage by multiplying the smallest drive by the quantity of drives selected. If you select drives of the same size, this feature functions properly.

Client Domain Network Server (DNS) Setup Application Error

You must ensure that your client DNS is set up correctly. In some situations, Storage Window will get an application error if the Host of the Agent exists but cannot be reached directly by the Client machine.

Expand Option Not Implemented

The Expand Unit option is not implemented in ACS version 8.5.

Agent Failure using Multiple Storage Windows

If the Agent fails while you have multiple Storage Windows connected to different subsystems, you may not be able to close the Storage Window. When this occurs, close the Storage Window by using Windows Task Manager.

10.0 Solution Software Kit Installation

The procedure defined in these Release Notes is the method to follow for Solution Software installation. These instructions take precedence over those published in the included *RA8000/ESA12000 and MA8000/EMA12000 Solution Software V8.5c for HP Installation Reference Guide*.

However, you should still follow the procedure for installing the SWCC Agent as defined in the Installation Reference Guide.

Installing the 218409-B21 (Compaq/QLA2200) Driver

1. Make sure the Compaq/QLA2200 Host Bus Adapter is correctly installed in your system.
2. Place the CD labeled *Solution Software V8.5c* 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 use the following command:

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

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

```
#nohup pfs_mountd &
```

System will respond with "Sending Output to Nohup.out"

Press "enter" to return to the command prompt.

```
#nohup pfsd &
```

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:

NOTE: to find the CD-ROM device file, issue the `ioscan -fnkCdisk`.

```
pfs_mount /dev/rdisk/cdrom_device_file /mnt_directory
```

For example:

```
#pfs_mount /dev/rdisk/elt2d0 /cdrom
```

4. Start the installation by entering the following commands:

```
cd /CDROM_MOUNT_POINT
```

```
./cpqinstall
```

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

For example:

#cd /cdrom

#!/cpqinstall

The following menu appears:

Installation Menu

1) Install Compaq/QLA2200 FC Mass Storage Driver Software

2) Exit

Enter Choice:

Type **1** and enter.

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

NOTE: In Terminal Mode, this 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 menubar at the top like this:

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

- use "Tab" to move from the list to the menubar
- 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 menubar 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.

BHPUX1100QLC2200

6. Select Mark For Install from the Actions menu. In the status window, the word Yes should appear under the Marked? column.
7. Select Install (analysis) from the Action menu. The Install Analysis window should appear.
8. When Ready appears in the Status item, select the OK button to begin the installation procedure.
9. Select the Yes button in the dialog box for each warning that appears.
10. 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.
11. Select the Done button and hit enter. A dialog box will appear indicating that a reboot is required.
12. Select the OK button and hit enter to reboot the system.