

StorageWorks by Compaq

SAN Switch Integrated/32 and Integrated/64, Version 2.6

Release Notes

These release notes contain last-minute and supplemental information for the SAN Switch Integrated/32 and SAN Switch Integrated/64.

Be sure to read these notes before installing a SAN Switch Integrated/32 or SAN Switch Integrated/64. This information is periodically updated and available on the Compaq Website:

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

Third Edition (February 2002)
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Compaq Computer Corporation

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StorageWorks by Compaq SAN Switch Integrated/32 and Integrated/64

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Release Notes Contents

These release notes cover the following major topics:

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Document Home Page

To view and access all documents on the StorageWorks SAN Switch Software v2.6 CD, open the *MANUALS.PDF* file from the root directory. This file provides links to all documents on the CD.

NOTE: To view Portable Document Format (PDF) files you need Adobe Acrobat Reader. If you do not have this program installed, you can install the Windows version from the *ACROBAT* folder.

To install Acrobat Reader from the StorageWorks SAN Switch Software v2.6 CD:

1. Open the *ACROBAT* folder from the root directory of the CD.
2. Double-click the *RS405ENG.EXE* executable.
3. Follow the instructions in the Acrobat Reader Setup Program.

Naming Conventions

Throughout this document, the Compaq StorageWorks SAN Switch Integrated/32 and SAN Switch Integrated/64, will be referred to as follows:

- Collectively both models will be called the SAN Integrated Switch.
- Individually, the models will be called the IS/32 or the IS/64.

Each of the six individual switches comprising the SAN Integrated Switch will be referred to as either:

- A switch element.
- The Fibre Channel SAN Switch 16-EL.

New Features and Enhancements

Firmware version 2.6 is a feature release that includes a number of new enhancements, described next.

Active Zone Configuration Warning

Web Tools now issues a warning before disabling an active zone configuration. This lowers the risk that a Zoned Fabric may become un-zoned. A “Confirm Zone Delete” window appears confirming deletion of a zone. The window also notifies the user that the specified zone member will be removed from corresponding configurations.

Fabric Assist Mode Zones

Fabric Assist zoning now supports the ability to assign Arbitrated Loop Physical Addresses (ALPAs) to the targets zoned with private initiators which require a fixed ALPA for specific services such as booting. For more information, see the `fazoneCreate` command listed in Appendix A of the *Fibre Channel SAN Switch Management Guide*, Part Number AA-RMMJB-TE.

Loop Port Control

Loop Port Control (LPC) is an Extended Link Service that provides a mechanism to an N*_Port to request and an FL_Port transmit the LPB or LPE primitive sequence on a remote arbitrated loop. There are now two ALPA bitmaps; one bitmap of devices to bypass and another bitmap of devices to enable.

Switch Names

Switch names can now begin with a numeric character.

Features of the SAN Integrated Switch

Features of the IS/32 and IS/64 with firmware version 2.6 include:

- New Grouping Function
- API support for new optional Fabric Manager application (also displays IS/32 and IS/64 as one icon).
- Supports rolling upgrade from OS version 2.1.9m to 2.6
- Automatic check of Interswitch Links (ISLs).
- High data throughput. All user ports are capable of the maximum Fibre Channel speed of one gigabit per second (GB/s) in a full Fibre Channel fabric architecture.
- Factory configured with short-wave optical Gigabit Interface Converters (GBICs) and ISL optical cables to provide either 32 or 64 user ports. Each port can also accept long-wave optical GBICs.
- Highly available fabric. Automatic, dynamic path rerouting in the event of a link failure. No single point of failure.
- Modular design. Single, integrated, rack-ready, 14U chassis.
- Preconfigured with firmware version 2.6, Web-based management tools, and zoning software.
- Backward compatibility between Fibre Channel SAN Integrated switches and Compaq StorageWorks Fibre Channel SAN switches.
- Individual switch elements can be replaced with Compaq SAN Switch 16-ELs, for great serviceability and reduced spares inventory.
- High port count solutions at unmatched low cost of ownership and scalability.

- Provides the ability to build large SAN networks.

NOTE: To determine the number of switches currently supported in a SAN, go to the Compaq Website at: <http://www5.compaq.com/products/storageworks/san/enterprise-san.html>

Firmware and Compatibility

IS/32 and IS/64 ship preconfigured with Firmware version 2.6. This version is also contained on the StorageWorks SAN Switch Software v2.6 CD. The required loaders and instructions for downloading the firmware are contained on the CD. The version 2.6 firmware is also available on the Compaq Website at: <http://www.compaq.com/storage>.

This firmware is for the Fibre Channel SAN Switch models 8, 8-EL, 16 and 16-EL, and will not work if loaded into older Compaq StorageWorks Fibre Channel Storage Switches.

The SAN Integrated Switch is not compatible with discontinued Compaq StorageWorks Fibre Channel Switches (version 1.6d).

Compatibility with StorageWorks Enterprise Virtual Array

When the StorageWorks™ SAN switch firmware is upgraded to v2.6, the minimum supported firmware level for the StorageWorks Enterprise Virtual Array (Enterprise) is VCS v1.02. The upgrade of the Enterprise storage subsystem firmware must be performed before the upgrade of the switch firmware. Please consult the Enterprise Virtual Array technical documentation for specific information for upgrading VCS firmware.

Compatibility with SANworks Data Replication Manager

V2.6 firmware supports *SANworks*™ Data Replication Manager (DRM) by Compaq in all configurations, with the following exceptions:

- DRM solutions using the Novell operating system are not currently supported by V2.6 firmware, and will require the use of earlier firmware versions. Please reference the DRM software support matrix for the latest information on Novell. View this matrix at: <http://www.compaq.com/products/sanworks/drm/software-support.html>
- V2.6 firmware supports DRM using Fiber Channel optical links. V2.6 firmware does not currently support some DRM configurations using FC-IP or FC-ATM links, and will require the use of earlier firmware versions. For the latest update on supported DRM configurations, please refer to the *DRM Application Notes* for inter-site links: <http://www.compaq.com/products/sanworks/drm/documentation.html>

Standards Compliance

Fabric OS v2.6 is compliant with the FC-GS-3 standard except for the following items:

- Fabric Zone Server (Section 6.3 of the standard)
- Time Server (Section 7 of the standard)
- Key Distribution Service (Section 9 of the standard)

The following Management Server Topology Discovery commands are not supported by v2.6:

- GTIN
- GATIN
- GNID

Additional Limitations

The following lists additional limitations.

- Fabric OS v2.6 cannot provide Management Server information for switches running Fabric OS v2.1.x or earlier. To access full Management Server functionality, all switches in the fabric must run Fabric OS v2.3.0 or later.
- Switches running Fabric OS v2.2 or earlier do not support the new Name Server commands introduced in Fabric OS v2.6.
- If operating in the same fabric with Fabric OS v2.2 or earlier, Fabric OS v2.6 is limited to 64 characters in zone, alias, and configuration names.
- Use of blank spaces in path names is not supported.
- Use of loop diagnostics will disrupt normal fabric operations, and should not be run in a fabric environment.

Switch Element Domain IDs

The default domain IDs on the six switch elements shipped with the SAN Integrated Switch are 231, 232, 233, 234, 235, and 236, beginning with the first switch element.

If you are connecting a SAN Integrated Switch to an existing SAN, you may have to change the domain ID of each switch element. The Domain IDs of the switch elements must be sequential. They must be different from any existing SAN Domain IDs.

NOTE: If the domain ID (whether default or a selected ID) is already in use when the switch element is connected to the fabric and then powered on, the SAN will temporarily assign the switch to a unique domain value. The domain IDs in use can be determined by issuing the Telnet command `fabricShow` on a switch element connected to the larger SAN fabric. To keep domain values from changing, always assign a unique domain value to each switch in the SAN.

1. Log on with administrative privileges to the first switch element, using a Telnet connection:
login: admin
password: "password".
2. Disable the switch element by entering: `switchDisable`.
3. Enter the command: `configure`.
4. Enter Y after the prompt:
Fabric parameters (yes, y, no, n): [no] y.
5. Enter a unique domain ID at the prompt:
Domain: (1...239) [1] 3.
6. Complete the remaining prompts (or press **CTRL + D** to accept the remaining settings without completing all the prompts).
7. Enable the switch element by entering: `switchEnable`.

SAN Management Station Requirements

The following sections defines SAN management station requirements.

Memory

Table 1 lists the memory requirements for a SAN management station with a Windows NT or 2000 operating system. Recommended disk space is four Gigabytes or more.

Number of Switches	Minimum Memory Requirements
1 - 4	64 MB
5 – 9	96 MB
10 – 20	128 MB
21 or more	256 MB

Disk Space

The SAN Management Station requires 5 MB or more of free disk space.

Web Browsers

One of the following web browsers must be installed:

- Netscape Communicator 4.5x, 4.7x
- Internet Explorer 4.x, 5.x

NOTE: The browser must be configured to work with Web Tools. For configuration information, refer to the *Fibre Channel SAN Switch Management Guide*, Part Number AA-RMMJB-TE.

Java Plug-in

Java Plug-in Version 1.3.1-01 is required for Windows 95, 98 or 2000.

CD Directory Structure

The SAN Integrated Switch Software CD version 2.6 contains the following items.

- Dsggb
 - Docs
 - README.TXT (CPQ SWK RELEASE NOTES; late-breaking doc changes)
 - AA-RNAPC-TE.PDF (CPQ SWK SAN Switch 16-EL Installation and Hardware Guide)
 - AA-RMMHB-TE.PDF (CPQ SWK SAN Switch 8-EL Installation and Hardware Guide)
 - EK-BCP24-IA.C01.PDF (CPQ SWK SAN Switch 8 Installation and Hardware Guide)
 - EK-BCP28-IA.C01.PDF (CPQ SWK SAN Switch 16 Installation and Hardware Guide)
 - AA-RPDFC-TE.PDF (CPQ SWK SAN Integrated Switch Installation and Hardware Guide)
 - AA-RMMJB-TE.PDF (CPQ SWK SAN Switch Management Guide)
 - EK-SANRS-AA.D01.PDF (CPQ SWK SAN Switch Remote Switch Services Installation Guide)
 - EK-SSRSR-AA.F01.PDF (CPQ SWK SAN Switch Remote Switch Services Release Notes)
 - EK-P24FR-AA.F01.PDF (CPQ SWK SAN Switch 8 Release Notes)
 - EK-P28FR-AA.F01.PDF (CPQ SWK SAN Switch 16 Release Notes)
 - AA-RMMGD-TE.PDF (CPQ SWK SAN Switch 8-EL Release Notes v2.6)
 - AA-RNAQC-TE.PDF (CPQ SWK SAN Switch 16-EL Release Notes v2.6)
 - AV-RPDGC-TE.PDF (CPQ SWK SAN Integrated Switch v2.6 Release Notes)
 - Firmware (Compaq StorageWorks Fibre Channel Firmware and updates)
 - firmwareupdate.txt (instructions for updating firmware)
 - v2.6 (switch firmware)
 - v2_6FE.mib (Management Information Base for fabric)
 - v2_6SW.mib (Management Information Base for switch)
 - v2_6TRP.mib (Management Information Base for traps)
 - javaplugin.exe (SUN java plug-in for browser)
 - NTAlpha
 - Cat.exe (mover for upgrading firmware from an Alpha)
 - Rshd.exe (small server for upgrading firmware from an Alpha)
 - NTIntel
 - Cat.exe (mover for downloading firmware from a PC)
 - Rshd.exe (small server for upgrading firmware from PC)
 - SWCC (SWCC software for managing the Compaq StorageWorks SAN Switch and the Compaq StorageWorks Fibre Channel Switch)
 - ccclient.txt (SWCC Command Console release notes)
 - fcinter.txt (Switch Agent & Client release notes)
 - readme.txt (SWCC late breaking changes)
 - AA-RHDAD-TE.PDF (CPQ SWK Command Console for Hubs, Switches, and Tape Controllers Version 2.6 Getting Started Guide)
 - setup.exe (SWCC Installation file)
 - Agent (contains the installSHIELD kit)
 - NT Intel
 - SAN Management

- Client (contains the installSHIELD kit for AppMgr)
 - Console
 - SanInterconnect
- Acrobat
 - rs405eng.exe (installer for Acrobat Reader plus search to enable viewing of pdf files)
- manuals.pdf (Home page for all PDF documentation included on the CD-ROM)

Using the Java Plug-In

Java Plug-In usage is described next.

- The proper execution of the Web Management Tools version 2.6 requires the Java Plug-In installed on your workstation. Web Management Tools version 2.6 requires the Java Plug-In version based on Java 1.3.1_01 (also known as Java 2) to operate correctly. The Java Plug-In is similar to other plug-ins used on your browser such as Real Audio, Adobe Acrobat, and Macromedia Director. Once the Java Plug-In is installed, it functions transparently. Microsoft Windows requires Java Plug-In 1.2.2, and Compaq Tru64 UNIX and Solaris require 1.2.
- The Java Plug-In can be loaded from the Compaq CD ROM included with the switch. The plug-in is located in the JRE subdirectory. Double-click on the *JAVAPLUGIN.EXE* file to begin the installation procedure.

MIB Files Version 2.6

The MIB Files for version 2.6 are as follows:

- v2_6FA.mib (Fibre Alliance Fibre Channel Management Framework Integration MIB)
- v2_6FE.mib (Fabric Element Management Information Base for fabric)
- v2_6SW.mib (Fibre Channel Switch Management Information Base)
- v2_6TRP.mib (Enterprise Specific Traps for Fibre Channel Switch).

New Telnet Commands

New telnet commands in firmware version 2.6 are listed next. For more information, see the specific command description in Appendix A of the *Fibre Channel SAN Switch Management Guide*, Part Number AA-RMMJB-TE.

- portCfgFAport command — Enables a user to lock a port as a Fabric Assist Host port.

- `loopPortTest` command — Verifies the intended functional operation of the switch.
- `portCfgLPort` command — This telnet command has been modified to allow the user the option to lock a port as a Public L_Port.
- `fazoneCreate` command — This telnet command has been modified to accept a preferred ALPA value that may be assigned to the targets that are zoned with the private initiator.

Cables

Optical cables for the Fibre Channel SAN Switches must be ordered separately. Cables that are 500 meters or less, should be multi-mode Fibre Channel cables. Cables that are longer than 500 meters should be single-mode.

Multi-mode optical cables are connected to short-wave GBIC modules in Fibre Channel SAN Switches. Single-mode optical cables are connected to long-wave GBIC modules in the Fibre Channel SAN Switches. Multi-mode cables should use 50/125 optical fibers, SC Duplex connectors with a PC finish. Use of 62.5/125 should be restricted to situations where 62.5/125 optical fiber was previously installed and the link lengths are to be kept shorter than 200 meters. Single-mode cables typically use 9/125 optical fibers for distances up to 10 km.

GBIC Modules

Replacement GBIC modules for the switch element must be ordered separately. The Compaq part number for the short-wave optical GBIC module for multi-mode cable is 380561-B21. Two long-wave GBIC modules and a short single-mode test cable can be ordered in a kit (part number 340412-B21).

In the Switch Management Application page of the Web Management Tools, the GBICs are identified differently depending on the type of GBIC and the supplier. Examples of the displays include ID for VIXEL short-wave GBICs and SW for IBM short-wave GBICs.

NOTE: Contact Compaq Customer Service for Extended Links greater than 10km and special single mode GBICs.

Known Issues

This section describes known issues and problems related to the SAN Integrated Switch.

configdefault Command

If the configdefault command is issued to a switch, it resets all switch settings to the Compaq default values (except for the “route.delayReroute” parameter). Therefore, if you use the configdefault command, you must reset the “route.delayReroute” parameter.

The Compaq default value is route.delayReroute: 1

The iodset command can be used to set the route.delayReroute: parameter to a 1:

```
it4:admin> iodset
```

Committing configuration...done.

The iodshow command can also be used to examine the state of the route.delay Reroute parameter:

```
it4:admin> iodshow
```

IOD is set

The command configshow can also be used to examine the state of the route.delay Reroute parameter.

```
route.delayReroute: 1
```

Web Management Tools

- Netscape 4.6 (IRIX) fails to load SwitchManager.html (core dump of Netscape or SwitchApplet cannot start error).
- When using Internet Explorer version 5.0 or lower, scrolling errors may occur. Internet Explorer version 5.01 or higher is recommended.
- When using an Internet Explorer or Netscape browser, for the SUN plug-in to work correctly, you must type a slash after the URL (for example: http://192.168.60.45/).

Keyboard Issues

During a Telnet session with a switch element in the SAN Integrated Switch from a Compaq Tru64 UNIX or OpenVMS machine, the following keyboard issues occur:

- The **Backspace** key produces a “question mark” character instead of deleting characters. It is necessary to type **Control + H** to delete characters.
- The **Delete** key changes the case of the letter at the cursor and prevents you from adding anything to the line.
- The **Left Arrow** key deletes the character to its left and prevents you from adding anything to the line.

backSpace Telnet Command

Firmware version 2.6 provides a Telnet command called **backSpace** which allow you to change the keyboard controls. To change the **Backspace** and **Delete** functions:

1. Log on with administrative privileges, using a Telnet connection:

```
login: admin  
password: "password"
```

2. Enter the Telnet command **backSpace** without any parameters, to return the current state of the parameter: **BACKSPACE** (hex 08) or **DEL** (hex 7f) .
3. To change the parameter, enter:

```
backSpace 1 to set the backspace character in the switch to the Delete character.  
backSpace 0 to set the Backspace character to Backspace (Control +H).
```

Default Ethernet IP Addresses

Switch elements in the SAN Integrated Switch are configured with default Ethernet IP addresses listed in Table 2 below.

Default Switch Name	IP Address
sw1	10.77.77.77
sw2	10.77.77.76
sw3	10.77.77.75
sw4	10.77.77.74
sw5	10.77.77.73
sw6	10.77.77.72

These IP addresses may not be compatible with your configuration. The IP addresses can be changed via a serial connection.

Configure the serial port settings as follows (see Table 3).

Parameter	Value
Bits per second	9600
Databits	8
Parity	None
Stop bits	1
Flow control	None
Function arrows and Ctrl keys act as:	Terminal Keys
Emulation	Autodetect

SWCC

Read this section for issues related to SWCC.

Fabric Window Times Out

If running Windows NT v4.0, SP6a, upon rebooting or disconnecting the switch from the network, the Fabric window sometimes hangs.

Workaround

Restart the SWCC SAN agent.

Enabling SNMP Trap Log

SWCC has the capability to log SNMP trap information (error and status events) occurring on the switch into the Windows NT application Event log. To enable this capability, the following parameters must be set on the switch:

NOTE: These parameters can be set either through the switch GUI by selecting the **admin.** button and clicking on the **SNMP Admin** tab, or by using the Telnet interface along with the `agtcfgSet` Telnet command.

- **swEventTrapLevel: (0..5)**—must be set for a severity level from 0 to 5

- 0 – none
- 1 – critical
- 2 – error
- 3 – warning
- 4 – informational
- 5 – debug

NOTE: Additional information is provided in the Compaq StorageWorks Fibre Channel SAN Switch Management Guide.

- **authTrapsEnabled: (true, t, false, f)**—must be set to “true” or “t” to enable sending of traps

NOTE: This parameter is set to “true” or “t” by default.