Sun StorEdge™ 6130 Array Release Notes

Sun Microsystems, Inc.
www.sun.com

Part No. 819-0034-13
September 2005, Revision 01

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Sun StorEdge 6130 Array Release Notes

This document contains important information about the Sun StorEdge ™ 6130 array that was not available at the time the product documentation was published. Read this document so that you are aware of issues or requirements that can impact the installation and operation of the Sun StorEdge 6130 array.

The Release Notes consist of the following sections:

Features in this Release

The online help describes the main features of the Sun StorEdge 6130 array, including using the data replication software and reviving virtual disks and drives. Each of these features is described in the subsections that follow.

Using the Sun StorEdge Data Replicator Software

The Sun StorEdge Data Replicator software is a volume-level replication tool that protects your data. You can use it to replicate volumes between physically separate primary and secondary Sun StorEdge 6130 arrays in real time. The software is active while your applications access the volumes, and it continuously replicates the data between volumes.

As part of a disaster recovery and business continuance plan, the software enables you to keep up-to-date copies of critical data from the primary volume on the secondary volume. You can also rehearse your data recovery strategy to fail data over to the secondary volume. Subsequently, you can write any data changes that occurred back to the primary volume.

The software replicates data from a primary volume to a secondary volume. The association between the primary and secondary volumes constitutes a replication set. After the volumes in a replication set have been initially synchronized, the software ensures that the primary and secondary volumes contain the same data on an ongoing basis.

For additional information on configuring data replication zoning and cabling, see Appendix A.

Reviving Virtual Disks and Disk Drives

A series of browser interface buttons and command-line interface (CLI) commands have been added in release 1.3 to allow trained service personnel to revive virtual disks and disk drives.

Caution – These tasks must be performed in a specific order and only under the direct supervision of a Sun Customer and Technical Support representative.

Using the Browser Interface

The Virtual Disk Details page in the Sun StorEdge 6130 Configuration Service interface allows you to do the following:

- Revive a virtual disk

  If one or more disk drives in a virtual disk are in the failed state, you can attempt to recover from this failure by reviving the virtual disk. Reviving a virtual disk automatically revives the failed disk drives included in the virtual disk.

- Place a virtual disk offline

  Placing a virtual disk offline disables the virtual disk.

- Place a virtual disk online

  Placing a virtual disk online enables the virtual disk.

The Disk Details page in the Sun StorEdge 6130 Configuration Service interface allows you to do the following:

- Revive the disk drive

  Reviving a drive spins the drive and sets it as online and optimal. You can attempt to recover an individual disk drive. If the operation fails, however, you can then manually revive that disk drive.

- Reconstruct the disk drive

  Reconstructing a drive spins the drive and starts rebuilding the affected volumes. You can attempt to reconstruct a disk drive when it meets the following criteria:

  - It is assigned to a RAID-1, 3, or 5 virtual disk.
  - It has a Failed or Replaced status and did not automatically revive during a virtual disk revive operation.

- Fail the disk drive

  Failing the disk drive disables the drive.

Using the CLI

The following CLI commands allow you to revive virtual disks and disk drives.

- To force a disk to the optimal state, use this command:

  `sscs revive -a` *array-name* [`-t` *tray-id*] `disk` [*disk-name*]

  You use the following options and arguments here:

  `-a,--array` *array-name*

  Specifies the array on which you wish to revive the disk.

  `-t,--tray` *tray-id*

  (Optional) Identifies the tray where the disk resides. Tray ID values are from 00 to 77.

  `disk` *disk-name*

  Specifies the name of the disk you wish to force to the optimal state.

- To set a disk to the failed state, use this command:

  `sscs fail -a` *array-name* [`-t` *tray-id*] `disk` [*disk-name*]

  You use the following options and arguments here:

`-a,--array` *array-name*

Specifies the array on which you wish to fail the disk.

`-t,--tray` *tray-id*

(Optional) Identifies the tray where the disk resides. Tray ID values are from 00 to 77.

`disk` *disk-name*

Specifies the name of the disk that you wish to fail.

- To start reconstructing a disk, use this command:

  `sscs reconstruct -a` *array-name* [`-t` *tray-id*] `disk` [*disk-name*]

  You use the following options and arguments here:

  `-a,--array` *array-name*

  Specifies the array on which you wish to reconstruct the disk.

  `-t,--tray` *tray-id*

  (Optional) Identifies the tray where the physical disk resides. Tray ID values are from 00 to 77.

  `disk` *disk-name*

  Specifies the name of the disk that you wish to reconstruct.

- To revive a virtual disk, use this command:

  `sscs revive -a` *array-name* `vdisk` [*virtual-disk-name*]

  You use the following options and arguments here:

  `-a,--array` *array-name*

  Specifies the array on which you wish to revive the virtual disk.

  `vdisk` *virtual-disk-name*

  Specifies the name of the virtual disk you wish to revive.

- To set a virtual disk offline, use this command:

  `sscs offline -a` *array-name* `vdisk` [*virtual-disk-name*]

  You use the following options and arguments here:

  `-a,--array` *array-name*

  Specifies the array on which you wish to set the virtual disk offline.

  `vdisk` *virtual-disk-name*

  Specifies the name of the virtual disk that you wish to set offline.

- To set the virtual disk online, use this command:

`sscs online -a` *array-name* `vdisk` [*virtual-disk-name*]

You use the following options and argument here:

`-a,--array` *array-name*

Specifies the array on which you wish to set the virtual disk online.

`vdisk` *virtual-disk-name*

Specifies the name of the virtual disk that you wish to set online.

System Requirements

The software and hardware products that have been tested and qualified to work with the Sun StorEdge 6130 array are described in the following sections:

Management Host System Requirements

The management host on which the management software resides must meet the system requirements described in TABLE 1.

TABLE 1 Management Host System Requirements

Host System Feature	Requirement
Platform	SPARC server or workstation
Operating system	Solaris 8 OS 4/01 Solaris 9 Solaris 10
Disk space for Solaris 9 and 10	500 Mbytes (Includes 300 Mbytes in the `/opt` directory and 200 Mbytes in the `/var` directory) **Note:** Be aware that you need 500 Mbytes more disk space than is required for your OS installation.
Minimum memory (2 arrays, 2 users)	512 Mbytes
Recommended memory	1 Gbyte
Client memory	256 Kbytes

Remote CLI Client Platforms

TABLE 2 lists the remote CLI clients, also called thin-scripting clients for remote management, available by platform. You can obtain the package from the Sun Download Center (SDLC), `http://www.sun.com/software/download/`, or from the Sun StorEdge 6130 Host Installation Software CD (Solaris only).

TABLE 2 Remote CLI Client Available by Platform

Operating System	Remote CLI Client
Windows 2000 Server and Advanced Server	Available from SDLC
Windows Server 2003 Standard, Web, and Enterprise Editions	Available from SDLC
Red Hat Linux AS/ES/WS 2.1 and AS/WS 3.0 (32-bit)	Available from SDLC
Suse Linux LES 8.x 32 and 64 bit	Available from SDLC
HP-UX 11.0, 11.11	Available from SDLC
IBM AIX 5.2	Available from SDLC
Solaris 8 OS 4/01 (SPARC systems only)	Distributed on Host CD

TABLE 2 Remote CLI Client Available by Platform *(Continued)*

Operating System	Remote CLI Client
Solaris 9 (SPARC systems only)	Distributed on Host CD
Solaris 10	Distributed on Host CD
Novell NetWare 6 and 6.5	Not available
SGI IRIX 6.5.22	Not available

Supported Data Host Platforms

Note – The information in Tables 3, 4, 5, and 6 is being re-evaluated Thus, it is recommended that you periodically check Sun's documentation web site at `http://www.sun.com/documentation` for future updates.

TABLE 3 lists the recommended security patches and host-bus adapters (HBAs) for the Solaris 8, 9, and 10 OSs.

Note that you must install multipathing software on each data host that communicates with the Sun StorEdge 6130 array. For Solaris OS data hosts, the multipathing software is part of the Sun StorEdge SAN Foundation Software. For data hosts running the Solaris OS, follow the instructions in the *Sun StorEdge 6130 Array Getting Started Guide* to install the software from CD.

TABLE 3 Solaris Patches and HBAs

Operating System	Recommended and Security Patches	HBA Driver	HBA Firmware	SAN Foundation Kit Patches
Solaris 8	U4 and above HW 2/04	SG-XPCI1FC-QF2		4.4.3
		(Amber2-6767A)	1.14.09	111095-18
		SG-XPCI2FC-QF2		111413-14
		(Cystal2-6768A)	1.14.09	114877-08
		6757A (Ivory)	1.14.05	111412-16
		6727A (Crystal+)	1.14.09	
		6799A (Amber)	1.14.09	
		6748A (Diamond)	1.14.09	
		SG-XPCI1FC-JF2)		
		(Amber2J)	1.5.b.3	
		SG-XPCI2FC-JF2		
		(Crystal2J)	1.5.b.3	

TABLE 3 Solaris Patches and HBAs *(Continued)*

Operating System	Recommended and Security Patches	HBA Driver	HBA Firmware	SAN Foundation Kit Patches
Solaris 9	FCS and above	SG-XPCI1FC-QF2		4.4.3
	HW 4/04	(Amber2-6767A)	1.14.09	113039-08
		SG-XPCI2FC-QF2		113040-10
		(Cystal2-6768A)	1.14.09	113043-08
		6757A (Ivory)	1.14.05	114878-08
		6727A (Crystal+)	1.14.09	
		6799A (Amber)	1.14.09	
		6748A (Diamond)	1.14.09	
		SG-XPCI1FC-JF2)		
		(Amber2J)	1.5.b.3	
		SG-XPCI2FC-JF2		
		(Crystal2J)	1.5.b.3	
Solaris 10	FCS	SG-XPCI1FC-QF2		
		(Amber2-6767A)	1.14.09	
		SG-XPCI2FC-QF2		
		(Cystal2-6768A)	1.14.09	
		6757A (Ivory)	1.14.05	
		6727A (Crystal+)	1.14.09	
		6799A (Amber)	1.14.09	
		6748A (Diamond)	1.14.09	
		SG-XPCI1FC-JF2)		
		(Amber2J)	1.5.b.3	
		SG-XPCI2FC-JF2		
		(Crystal2J)	1.5.b.3	
Solaris 10 x86	FCS	SG-XPCI1FC-QF2		
		(Amber2- 6767A)		
		SG-XPCI2FC-QF2		
		(Crystal2-6768A)		

TABLE 4, TABLE 5, and TABLE 6 list security patches and HBAs for Windows, Linux, and other supported data host platforms. For data hosts running these operating systems, you can use the Sun StorEdge Traffic Manager software or other multipathing software as listed in the respective tables.

You can download the software for hosts running these operating systems from the Sun Download Center, `http://www.sun.com/software/download/`, or other URL indicated in each table.

Note – If a data host needs multipathing software, you must install it before you install the patches.

For HBA drivers supported by Sun StorEdge Traffic Manager, go to the Sun Download Center. Be sure to download operating system updates from the web site of the operating system company.

TABLE 4 Supported Microsoft Windows Data Host Platforms

Host OS	Patches or Service Pack	Sun Servers	HBAs	HBA Firmware	HBA Drivers	MPxIO	JRE Version (min level)	Cluster Configs
Windows 2000 Server and Windows 2000 Advanced Server	Service Pack 4 (SP4)	V65 V65X V20z V40z W1100z W2100z	Emulex LP952/LP9002 (SCSI Miniport driver) Emulex LP982/LP9802 (SCSI Miniport driver) QLogic QLA2310/2342	3.92a 1.90a4 BIOS-1.34	v5-5.10a10 (SCSI port Miniport driver, adjunct version) 8.2.3.12	SSTM 4.6	1.4	MS Cluster software included in the Base OS (2 nodes)
Windows Server 2003 Standard, Web, and Enterprise Editions	N/A	V65 V65X V20z V40z W1100z W2100z	Emulex LP952/LP9002 (SCSI Miniport driver) Emulex LP982/LP9802 (SCSI Miniport driver) QLogic QLA2310/2342	3.92a 1.90a4 BIOS-1.34	v5-5.10a10 (SCSI port Miniport driver, adjunct version) 8.2.3.12	SSTM 4.6	1.4	MS Cluster software included in the Base OS (2 nodes)

Note: All HBAs and switches supported by Sun StorEdge Traffic Manager (SSTM) 4.6 on Microsoft Windows systems are supported for the Sun StorEdge 6130 array.

TABLE 5 Supported Linux Data Host Platforms

Host OS	Patches or Service Pack	Sun Servers	HBAs	HBA Firmware	HBA Drivers	MPxIO	Cluster Configs
Suse Linux ES 8.0, 9.0 - AMD 64	SP2		LSI 44929O LSI 40919O QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	2.00.09 2.00.09	2.05.22 2.05.22 7.00.90 7.00.90 7.00.90	MPP	SteelEye LifeKeeper does not support the LSI HBA
Suse Linux ES 8.0, 9.0 - IA 32	SP2		Emulex LP952L Emulex LP982 Emulex 9802DC Emulex 9002DC Emulex LP1050 Emulex LP10000DC Emulex LP1000DC LSI 44929O LSI 40919O QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	3.92a2 1.90a4 1.90a4 3.92a2 1.90a4 1.90a4 1.90.04 2.00.09 2.00.09	7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 2.05.22 2.05.22 7.00.90 7.00.90 7.00.90	MPP	SteelEye LifeKeeper Server Clustering 4.5.0
Red Hat Linux AS 2.1	Kernel 2.4.9-e.40 (FCS Distribution) 32-bit only		Emulex LP982 Emulex LP9802DC Emulex LP952L Emulex 9002DC Emulex LP1050 Emulex LP10000DC Emulex LP1000DC QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	1.90a4 1.90a4 3.92a2 3.92.a2 1.90.a4 1.90a4 1.90a4	7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 2.05.22 7.00.90 7.00.90	MPP	SteelEye LifeKeeper Server Clustering 4.5.0. 4.6.0

TABLE 5 Supported Linux Data Host Platforms *(Continued)*

Host OS	Patches or Service Pack	Sun Servers	HBAs	HBA Firmware	HBA Drivers	MPxIO	Cluster Configs
Red Hat Linux ES/WS 2.1	Kernel 2.4.9-e.3 (FCS Distribution) 32-bit only		Emulex LP982 Emulex LP9802DC Emulex LP952L Emulex 9002DC Emulex LP1050 Emulex LP10000DC Emulex LP1000DC QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	1.90a4 1.90a4 3.92a2 3.92.a2 1.90.a4 1.90a4 1.90a4	7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 2.05.22 7.00.90 7.00.90	MPP	SteelEye LifeKeeper Server Clustering 4.5.0. 4.6.0
Red Hat Linux 3.0 32-Bit WS/AS IA32	Kernel 2.4.21-15EL Kernel 2.4.21-20		Emulex LP982 Emulex LP9802DC Emulex LP952L Emulex 9002DC Emulex LP1050 Emulex LP10000DC Emulex LP1000DC QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	1.90a4 1.90a4 3.92a2 3.92.a2 1.90.a4 1.90a4 1.90a4	7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 7.1.14 2.05.22 7.00.90 7.00.90	MPP	SteelEye LifeKeeper Server Clustering 4.5.0. 4.6.0
Red Hat Linux 3.0 AS for AMD64 IA64	Kernel 2.4.21- 15EL Kernel 2.4.21-20		LSI 44929O LSI 40919O QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	2.00.09 2.00.09	2.05.22 2.05.22 7.00.90 7.00.90 7.00.90	MPP	None

Note: If the Sun Servers column is blank, the servers from all Linux vendors are supported with that particular OS.

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TABLE 6 Other Supported Data Host Platforms

Host OS	Patches or Service Pack	Sun Servers	HBAs	HBA Firmware	HBA Drivers	MPxIO	Cluster Configs
Novell NetWare 6.0	SP4 QLogic HBA BIOS 1.35	Not tested with Sun servers	QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	Firmware is packaged with the driver	6.51d	QLogic Failover Driver	Novell Cluster Services (NCS 1.6)
Novell NetWare 6.5	SP4	Not tested with Sun servers	QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F	Firmware is packaged with the driver	6.51d	QLogic Failover Driver	Novell Cluster Services (NCS 1.7)
SGI IRIX 6.5.24	None	Not tested with Sun servers	QLogic QLA 2200F QLogic QLA 2310F QLogic QLA 2340 QLogic QLA 2342		2.2.6 3.2.15 3.2.15 3.2.15	SGI XLV	N/A

Notes:

- AIX- The multipathing driver is VERITAS DMP and Volume Manager 3.2 supported on IBM AIX 5.1 and 5.2. You can download it from `http://seer.support.veritas.com/docs.273698.htm`
- HPUX- To be supplied

The enterprise software applications listed in TABLE 7 are compatible with the Solaris OS on the Sun StorEdge 6130 array.

TABLE 7 Supported Enterprise Software

Software	Version
Sun Cluster	3.0, 3.1
VERITAS Volume Manager (VxVM)	3.2, 3.5, 4.0
VERITAS File System (VxFS)	3.2, 3.5, 4.0
VERITAS Cluster Server (VCS)	3.2, 3.5, 4.0
Legato Networker	7.1
VERITAS NetBackup (NBU)	5.0 or higher
Sun StorEdge Performance Suite with Sun StorEdge QFS software	4.0 minimum

TABLE 7 Supported Enterprise Software *(Continued)*

Software	Version
Sun StorEdge Utilization Suite with Sun StorEdge SAM-FS software	4.0 minimum
Sun StorEdge Availability Suite	3.2 minimum
Sun StorEdge Enterprise Backup Software	7.1
Solstice DiskSuite	4.2.1 (in conjunction with the Solaris 8 OS)
Solaris Volume Manager	Embedded in the Solaris 9 OS

The Fibre Channel (FC) switches listed in TABLE 8 are compatible for use on data hosts with data paths or network connections to the Sun StorEdge 6130 array.

TABLE 8 Supported FC Switches

FC Switches	Firmware	Switch Software
Sun Sanbox 1 8/16	4.02.42	SANbox_Manager 2.00.16
Sun Sanbox 2 8/16/64[1]	2.00.50	SANbox_Manager 2.00.16
Brocade SW2400/2800	2.6.2a	Fabric Manager 4.1.1
Brocade SW3200/3800	3.1.3	Fabric Manager 4.1.1
Brocade SW3900, SW12000, 3250/3850/24000	4.2.2	Fabric Manager 4.1.1
McData 2G ES4300[1]	6.02	No EFCM
McData 2G ES4500[1] ED6064/6140	6.02	EFCM Lite 08.01

Notes:

1. Supported HBA and host driver with the Solaris 8, 9, and 10 OSs.

2. There may be additional FCs switches that are compatible with the Sun StorEdge 6130 array. Refer to the SAN WWWW (Sunwin 397802) document for more details.

TABLE 9 lists the maximum tray capacity for the supported FC and Serial Advanced Technology Attachment (SATA) drives in the Sun StorEdge 6130 array.

TABLE 9 Supported FC and SATA Drives

Drive	Description
73G10K	73 GB, 10,000-RPM FC drives 1022 GB per tray (3RU)
73G15K	73 GB, 15,000-RPM FC drives 1022 GB per tray (3RU)
146G10K	146 GB, 10,000-RPM FC drives 2044 GB per tray (3RU)
146G15K	146 GB, 15,000-RPM FC drives 2044 GB per tray (3RU)
300G10K	300 GB, 10,000-RPM FC drives 4200 GB per tray (3RU)
400K7.2K (Expansion trays only)	400 GB 7,200-RPM SATA drives 5600 GB per tray (3RU)

Supported Management Control Tools

The Sun StorEdge 6130 array provides the management control tools listed in TABLE 10.

TABLE 10 Supported Management Control Tools

OS	Version	Browser-based Management	Management Host	Remote CLI Software	JRE Version	CIM Provider
Solaris 8 SPARC	4/01	Yes	Yes	Yes	1.4.x and above	Yes
Solaris 9 SPARC	8/03	Yes	Yes	Yes	1.4.x and above	Yes
Solaris 10 SPARC		Yes	Yes	Yes	1.4.x and above	Yes
Windows 2000 Server	Server (SP4) and Advanced Server (SP4)	Yes	No	Yes	1.4.x and above	No
Windows Server 2003	Standard/Web/ Enterprise Edition	Yes	No	Yes	1.4.x and above	No

TABLE 10 Supported Management Control Tools *(Continued)*

OS	Version	Browser-based Management	Management Host	Remote CLI Software	JRE Version	CIM Provider
Red Hat Linux	AS/ES/WS 2.1 AS/WS 3.0 (32-bit only)	Yes	No	Yes	1.4.x and above	No
Suse Linux	LES 8.x, 9.x (32- and 64-bit only)	Yes	No	Yes	1.4.x and above	No
IBM AIX	5.1, 5.2	Yes	No	Yes	1.4.x and above	No
HP-UX	11.0, 11.11	Yes	No	Yes	1.4.x and above	No
Novell NetWare	6 SP4, 6.5 SP 1.1	Yes	No	No	N/A	No
SGI IRIX	6.5.22	Yes	No	No	N/A	No

Supported Web Browsers

The Sun StorEdge 6130 array supports the web browsers listed in TABLE 11.

TABLE 11 Supported Web Browsers

Browser	Minimum Version
Netscape Navigator	7.0
Mozilla	1.2.1
Firefox	1.0.1
Microsoft Internet Explorer	5.0

Note – The Sun StorEdge 6130 management software requires that you enable pop-up windows in your web browser.

Supported Languages

The Sun StorEdge 6130 array software and the Sun Storage Automated Diagnostic Environment (StorADE) application support the languages and locales listed in TABLE 12.

TABLE 12 Supported Languages and Locales

Language	Locale
English	en
French	fr
Japanese	ja
Korean	ko
Simplified Chinese	zh
Traditional Chinese	zh_TW

Note – Man pages are available only in English and Japanese.

Installing Packages and Patches

The array installation procedures are described in the *Sun StorEdge 6130 Array Getting Started Guide* that came with your array. This section describes release-specific steps for firmware and patch upgrades that you must perform:

Before You Begin

The Sun StorEdge 6130 management software is distributed on the Sun StorEdge 6130 Host Installation Software CD. The installation script on that CD verifies any host requirements. In particular, it ensures that there are at least 500 Mbytes of disk space available before starting the installation script.

If a requirement is not met, the script informs you and then cleans up afterwards, where appropriate. Specifically, the script prompts you when the following are present in the system:

- Older versions of the Sun Storage Automated Diagnostic Environment or `sscs`
- Pre-installation versions of the Sun Storage Automated Diagnostic Environment or Sun StorEdge SAN Foundation software
- Unsupported versions of Sun's Lockhart software which provides the Java Web Console and web-based UI components

The script fails and then exits when these conditions occur:

- Less than 500 Mbtyes of disk space are available
- The operating system is not one of the following:
  - Solaris 8 OS 4/01
  - Solaris 9 OS for the SPARC platform
  - Solaris 10
- The root password is unavailable to run the installation script
- An unsupported version of Tomcat, the servlet container used by Java, is present in the system
- The `/usr/bin/gunzip` command, which is part of the SUNWgzip package, is not present in the system

Should a failure occur, be sure to check the available disk space again. Then, consult the system log `/var/sadm/install/se6130/6130_Host_SW_install.log` for more information.

Initially Installing Management Software

If you are installing the array and the management software for the first time, follow the entire installation and configuration procedure in the *Sun StorEdge 6130 Array Getting Started Guide*.

After the initial installation and configuration, you will be able to upgrade the management software and firmware with each release.

Upgrading Array Firmware and Management Software

If your array has a previous release of the Sun StorEdge 6130 array management software and array firmware installed, you must upgrade to the 1.3 firmware for this release. To do so, use the upgrade script available on the Sun StorEdge 6130 Host Installation Software CD, or on the software you obtain from the Sun Download Center at `http://www.sun.com/software/download/`.

TABLE 13 lists the version information for the software included in this release.

TABLE 13 Host CD Contents

Type	Version
Sun StorEdge Configuration Service application	3.01.01.00
Remote Management application	2.1
CRM-F	06.12.09.10
Sun Storage Automated Diagnostic Environment software	2.4.50.009
Sun StorEdge SAN Foundation software	4.4.6
Java Web Console software	2.2.4
Sun StorEdge Configuration Service Online Help	1.0
Localized versions - Sun StorEdge Configuration Service application and Sun StorEdge Configuration Service Online Help	1.0
Localized versions - Sun Storage Automated Diagnostic Environment Software	2.4.50.009

TABLE 14 lists the firmware files for this release.

TABLE 14 Array Firmware

Type	Version
CRM-F	06.12.09.10
CRM-F-NVSRAM	N2882-612843-003
IOM-F	9631
IOM-S	9722
DISK/ST314680FSUN146G	0407

TABLE 14 Array Firmware *(Continued)*

Type	Version
DISK/ST373307FSUN72G	0407
DISK/ST373453FSUN72G	0449
DISK/HDS7240SBSUN400G	KFAOAC7A
DISK/MAT3300FSUN300G	0602
DISK/MAT3073FSUN72G	0602
DISK/MAT3146FSUN146G	0602
DISK/MAU3073FCSUN72G	0402
DISK/MAU3147FCSUN146G	0402
DISK/ST373454FSUN72G	042D
DISK/ST314685FSUN146G	042D

Firmware files are installed to the `/var/sadm/swimages/117856-17/`directory.

The directories contain the following firmware files:

- `CRM-F/` contains controller firmware
- `CRM-F-NVSRAM`/contains controller Non-Volatile System Random Access Memory (NVSRAM)
- `IOM-F/` contains FC Switched Bunch of Disks (SBOD) Input/Output Module (IOM) firmware
- `IOM-S/` contains SATA IOM firmware
- `IOM-S-CSB`/contains SATA Customer-Specific Behavior (CSB) images
- `DISK`/contains disk drive firmware

Within each of these directories, there is a symlink, `image.fw,` which points to the firmware image and a text file, `baseline.txt`, which contains the version of the firmware image.

Note – `IOM-S-CSB` does not have a version. As a result, this file is applied to the system whenever `IOM-S` is out-of-date and the only element reported by the update tool as being out-of-date is `IOM_S`.

▼ To Upgrade the Software and Firmware

1. **Verify that you registered the arrays in the Sun Storage Automated Diagnostic Environment software after the previous installation.**
2. **Go to the Sun Storage Automated Diagnostic Environment software to review, acknowledge, and clear all existing alarms.**

   The upgrade script will not upgrade arrays that have critical or down alarms.
3. **Log in to the management host as `root`.**
4. **Insert the Host Installation Software CD into a local drive.**
5. **Change to the `/cdrom/cdrom0` directory:**

   ```
   cd /cdrom/cdrom0
   ```

   If you downloaded the build software over the network, change to the directory where the software installed after you uncompressed and untarred the build.
6. **Start the installation script by typing:**

   ```
   ./upgrade -n
   ```

   The `-n` option specifies a non-interactive upgrade. After asking whether you want to upgrade software or firmware, the script will complete the upgrade without pausing for questions.
7. **Go to the Sun Storage Automated Diagnostic Environment software to review and clear any alarms that were logged for components upgraded during the upgrade process.**

Note – The array will remain in a degraded state until all alarms are cleared.

Downgrading Array Firmware and Management Software

Use the `downgrade` command if you need to bring your array back to the previously installed firmware level. The downgrade command is an undo operation and will undo the most recent upgrade action on the system. For example, if you ran upgrade once to upgrade array A, and then ran upgrade again to upgrade arrays B and C, the first run of downgrade will downgrade B and C, and a second run of downgrade will downgrade array A.

You can use the downgrade command if you upgraded the array from Sun StorEdge 6130 array release 1.0, 1.1, or 1.2 to release 1.3.

▼ To Downgrade the Array Firmware and Management Software

1. **Log in to the management host.**
2. **Change to the `/cdrom/cdrom0` directory:**

   ```
   cd /cdrom/cdrom0
   ```

   If you downloaded the build software over the network, change to the directory where the software installed after you uncompressed and untarred the build.
3. **Run the downgrade script:**

   ```
   ./downgrade -n
   ```

   The `-n` option specifies a noninteractive downgrade. After asking whether you want to downgrade software or firmware, the script will complete the downgrade without pausing for questions.

Backing Up and Restoring Persistent Files

Use the archive and restore commands to back up and restore all persistent files for the Sun StorEdge 6130 Host Installation Software CD.

The first time you use the archive and restore commands, run them from the CD. Thereafter, you can run them from:

```
/var/sadm/install/se6130
```

▼ To Back Up and Restore Persistent Files

1. **Insert the Sun StorEdge 6130 Host Installation Software CD into the CD drive on the management host.**
2. **Change to the software directory.**

   `cd` *location-of-your-software*

   The default directory is:

   ```
   /var/sadm/install/se6130
   ```
3. **Archive the state of the management host:**

   `./archive` *archive-location*

For example:

```
./archive /tmp
```

An archive file is created in the archive file directory with the name `SP_Personality.tar.Z`.

Store the archive file somewhere other than on the local disk so that it is available in case of host failure.

Note – You can use the `cron` command to schedule jobs to create archive files automatically.

---

4. **Reinstall the management host software on the new host.**
5. **Restore the saved state in the archive file:**

   `./restore` *archive-location*

   For example: `./restore /tmp`

Updating the SSD Driver for the Solaris OS

After installing software for the data hosts from the Sun StorEdge 6130 Host Installation Software CD, download from SunSolve (`http://www.sun.com/sunsolve`) the `SSD` driver for data hosts running the Solaris 8 and 9 Operating Systems.

▼ To Update the SSD Driver for the Solaris 8 OS

Note – Patch `108974-41` or higher requires patch `108528-29` or higher. If needed, apply patch `108528-29` or higher first.

---

1. **Download the 108974-41 or higher patch from SunSolve.**

   Refer to the README file for more information on downloading patches.
2. **Unpack the patch:**

   ```
   unzip 108974-41.zip
   ```
3. **Read the README file:**

   ```
   108974-41/README.108974-41
   ```

4. **Apply the patch with the `patchadd` command:**

   ```
   patchadd 108974-41
   ```

5. **Reboot your system.**

   ```
   reboot -- -r
   ```

▼ To Update the SSD Driver for the Solaris 9 OS

Note – Patch `113277-26` or higher requires patches `112233-02` and `112834-02`, which are already included in most versions of the Solaris 9 OS. If needed, apply patches `112233-02` and `112834-02` first.

---

1. **Download the 113277-26 or higher patch from SunSolve.**

   Refer to the README file for more information on downloading patches.

2. **Unpack the patch:**

   ```
   unzip 113277-26.zip
   ```

3. **Read the README file:**

   ```
   113277-26/README.113277-26
   ```

4. **Apply the patch with the `patchadd` command.**

   ```
   patchadd 113277-26
   ```

5. **Reboot your system.**

   ```
   reboot -- -r
   ```

Downloading the VERITAS Volume Manager ASL

The VERITAS Volume Manager 3.2, 3.5, and 4.0 provide support for the Sun StorEdge 6130 array in the form of Array Support Library (ASL) software packages for the Solaris 8 and 9 OSs and IBM AIX 5.2. The ASL must be installed on the same host system as the Volume Manager 3.2, 3.5, or 4.0 software to enable the software to recognize the Sun StorEdge 6130 array modules. Download the ASL and the accompanying README file for the Sun StorEdge 6130 array from the Sun Download Center or from `http://support.veritas.com`. The AIX ASL is available only from VERITAS.

▼ To Download the ASL

1. **Log in as superuser on the Sun server to be connected to the array.**
2. **Go to the Products Download page:**

   `http://www.sun.com/software/download`

3. **In the Search area, search for VERITAS.**

   The Products Downloads > VERITAS Volume Manager ASL link is displayed.

4. **Click Download to go to the Sun Download Center.**

   The page identifies the product you selected as VERITAS Volume Manager Array Support Library (ASL) for your platform and language.

5. **If you have not previously registered, register as follows:**

   a. **Click the Register Now link at the bottom of the left column.**

   b. **On the registration page, complete the required fields and click Register.**

6. **Log in:**

   a. **Type your user name and password in the left column, and click Login.**

   b. **On the Terms of Use page, read the license agreement, click Yes to Accept, and click Continue.**

7. **Download the compressed `zip` file that contains the ASL package for the Sun StorEdge 6130 array and** README **file.**
8. **Use the `unzip` command to extract the files from the zip file.**
9. **Refer to the** README **file to determine how to install the VERITAS Volume Manager ASL.**

▼ To Download the UNIX ASL

1. **Go to the Volume Manager page:**

   `http://support.veritas.com`

2. **In Step 1 - Select Product window, select Volume Manager.**
3. **In Step 2 - Select Volume Manager for UNIX.**

   The Volume Manager for UNIX is displayed.

4. **Select the Downloads tab.**

5. **In the Downloads window, select the default All in each search category, and click GO. (Otherwise, you can refine your search to Drivers or other criteria).**

   A list of documents and files display for the product.

6. **Scroll to the File list and select the appropriate ASL for the Sun StorEdge 6130 array.**

   A page displays with the ASL installation instructions.

7. **Scroll down and select the Download Now button.**

8. **Follow the instructions to uncompress and install the ASL.**

Known Issues

The following sections provide information about known issues and bugs filed against this product release:

If a recommended workaround is available for a bug, it follows the bug description.

Installation and Initial Configuration Issues

This section describes known issues and bugs related to installing and initially configuring the Sun StorEdge 6130 array.

Misleading Warning Message

Bug 6317923 - After a successful array firmware upgrade, a warning message may indicate that the array cannot be downgraded because the downgrade patch cannot be located.

This is not an error message. It indicates that the previously installed firmware patch is not available from the host. Thus, the array upgrade session cannot be downgraded or undone.

Configuring IP Using BOOTP Services

The *Sun StorEdge 6130 Array Getting Started Guide* describes a method of setting the IP address using the BOOTP services that are included in the DHCP server. BOOTP services are included with the DHCP server as a convenience. They are different services.

You can also make BOOTP services available using Solaris Operating System commands.

Bootability Issues With 1-Gigabit HBAs and Direct Attached Configurations

Bug 5084873 - When you use a Sun StorEdge 6130 array as a boot device, the host system boots its operating system from the array. There are known issues with using the array as a boot device using 1-gigabit host bus adapters (HBAs) in direct attach configurations. Therefore, 1-gigabit HBAs can be used with the Sun StorEdge 6130 array for nonboot applications only. If you want to use the Sun StorEdge 6130 array as a direct attached boot device, use it only with 2-gigabit HBAs supported by Sun.

In Fibre Channel switched configurations in which a Fibre Channel switch is connected between the host and a Sun StorEdge 6130 array being used as a boot device, both 1-gigabit and 2-gigabit Sun HBAs can be used.

General Issues

This section describes general issues related to the Sun StorEdge 6130 array.

RAID Restriping Segment Size Limitation

Bug 6276030 - Dynamic Capacity Expansion and Dynamic RAID Migration will not succeed for all drive configurations if the segment size of the existing drives profile is greater than 128KB. Contact your Sun Microsystems Sales or Support representative for more details.

Data Replication Issues

Data replication can generate three warnings in the Sun Storage Automated Diagnostic Environment software that require no action:

- RMTVOL.Link Up (0x6502)

  This warning indicates a positive state change. The data replication link is operating nominally.

- RMTVOL.Link Down (0x6503)

  This warning indicates a negative state change. Either the data replication link is physically broken, or the round-trip time exceeds the maximum allowed delay.

- RMTVOL.Node WWN Changed Failed (0x6505)

  This warning indicates a significant change in the World Wide Name (WWN) of the mirrored volume and may indicate a change in configuration.

Recognizing Secondary Volumes in a Replication Set

Bug 6266943 - After becoming a secondary volume of a replication set, a volume that was previously recognized by a host (through the `format` command) is viewed as `drive type unknown`. This secondary volume should be designated as a read-only device.

Workaround - Ensure that the intended secondary volume is a new (unlabelled) volume. Do not use an existing volume.

Disk Scrubbing Might Be Prolonged for Large Volumes

Bug 6266127 - Disk scrubbing takes significantly longer than 30 days if the volume size is over 1.85 terabytes. A buffer allocated in the array firmware can only handle 32 bits.

Workaround - Reduce the data scrubbing duration to allow the LUN to finish scrubbing sooner. Be aware that by setting the duration to one (1) day, it still takes at least 36 days to scrub a 1.86-terabyte volume.

Initial `format` *Command Might Fail to Detect All Configured LUNs*

Bug 5084996 - When run for the first time from one of the hosts in a multihost configuration, the `format` command might fail to detect all 256 or more LUNs created on the Sun StorEdge 6130 array.

Workaround - Wait a few minutes, and then execute a second `format` command. All LUNs should be now detected.

The Array Stops Reporting I/O Data When a Controller Is Removed

Bug 5086807 - In Sun StorEdge 6130 array configurations using expansion modules, if one RAID controller or one of the inter-tray cables connecting the RAID controller to the expansion modules is removed, some expansion module data fields are reported incorrectly.

This results from the loss of one monitoring path to the expansion module. The incorrect data fields from the expansion module can cause the Sun Storage Automated Diagnostic Environment to incorrectly report a firmware revision change on the expansion modules.

Workaround - When the missing cable or missing RAID controller is replaced, full and accurate status reporting of the expansion trays is restored.

Maximum Temperature Threshold

Bug 5093731 - In the event that a high-temperature threshold is reached, to prevent temperature-related damage and to protect data integrity, the Sun StorEdge 6130 array power supplies will terminate power to the array. This event occurs only during extreme, sustained, elevation of ambient room temperatures and typically occurs only with a simultaneous failure of one or both fans.

Workaround - In the event of a high-temperature warning message from the Sun StorEdge 6130 array monitoring facilities, ensure that air flow passages to the array are unobstructed and that ambient room temperature is not elevated. Should these issues not be immediately correctable, manually shut down the array until the elevated room temperature issues are resolved.

Ensure that ambient room temperature monitoring and adequate cooling is in place at all times.

Faulty Expansion Cable Causes an Event but the Front Panel Status LED Remains Green

Bug 6180131 - Using a faulty expansion cable causes the management software to report the array health as Degraded and causes the Sun Storage Diagnostic Environment to report the error `Drive tray path redundancy lost`. However, the status LED on the front of the chassis does not signal an error and remains green instead of turning amber, as expected.

Replacing Failed Disk Drives From Another Array

Bug 6203836 - If a volume failure on a Sun StorEdge 6130 array results from failed disk drives, you must be careful when introducing replacement drives that were part of a volume in use by another Sun StorEdge 6130 array.

Workaround - To avoid having the 6130 system incorrectly initiate a volume migration process with the newly introduced replacement drives, perform one of the following tasks:

- Verify that the volume on the Sun StorEdge 6130 array with the failed disk drives has not been deleted. You should leave the volume in a failed state and not delete the volume.
- Verify the disk drives being taken from the inactive Sun StorEdge 6130 array are not part of an active volume. If the disk drives are part of an active volume, delete the drives associated with the volume before removing the disk drives.

Controller Module Battery Information

During bootup, the battery light might flash for an extended period. The battery charger performs a series of battery qualification tests before starting a battery charge cycle. This series of tests occurs at subsystem power-up. The tests are automatically reinitialized approximately every 25 hours by a timer.

Each controller module contains a 4V lead acid battery pack for cache backup in case of power loss. The on-board battery is capable of holding cache up for three days (72 hours) for a 1-gigabyte cache. The service life of the battery pack is two years, at the end of which the battery pack must be replaced.

Deleting Initiators That No Longer Appear on the SAN

Bug 6224251 - When creating initiators on an array previously connected to a host, be aware that should this host be removed and another host attached, the pull-down menu for creating an initiator shows the WWNs for the original host, plus the WWNs of the new host.

Browser Refresh Causes Data Reposting

Bug 6238963 - If you refresh the browser page using the reload button, the following message is displayed:

```
The page you are trying to view contains POSTDATA. If you
resend the data, any action the form carried out (such as
search or online purchase) will be repeated. To resend the
data, click OK. Otherwise, click Cancel.
```

If you click OK in response, it executes the command and causes either error messages to appear or unexpected actions to occur. For example, when copying volumes, the potential targets are listed.

Reloading the page after a successful copy causes another copy command with the same index of listed targets to be created. The next one in the original list is now chosen since it is referenced by the index. Thus, a second copy is created without your knowledge.

Array Locking for Service Advisor Not Global

Bug 6246249 - A reservation message that the array is locked for a Service Advisor procedure only displays in the Sun StorEdge Configuration Service browser interface on the management host initiating the procedure. Be sure to warn others via the Sun Storage role of pending Service Advisor procedures since they will not receive a warning when making configuration changes from a different host.

Firmware Hangs With Multiple Operations on Volumes

Bug 6258674 - You should not perform volume operations, such as volume resizing, until volume initialization is complete. The Sun StorEdge 6130 array can hang if volume resizing operations are done before a volume is initialized.

Sun StorEdge Configuration Service Issues

This section describes known issues and bugs related to the Sun StorEdge Configuration Service software.

Detection of Large Numbers of LUNs Is Delayed With the Format Command

Bug 5084996 - When you run the `format` command under the Solaris OS to detect a large number of LUNs that have just been mapped to a Solaris system from a Sun StorEdge 6130 array, there might be some delay before the Solaris host actually detects and reports these newly added LUNs. This behavior typically happens only when more than 100 LUNs are being mapped to the Solaris system simultaneously.

When creating volumes, wait until all of the volumes have been created before issuing a `format` command. Otherwise, the `format` command might return an invalid number of LUNs.

Workaround - Wait approximately 20 minutes after the volumes have been created for all of the LUNs to be properly detected when you issue the `format` command.

Array Health Is Displayed Incorrectly During RAID-5 and RAID-1 Reconstruction

Bug 6202126 - During RAID-1 or RAID-5 reconstruction, the array health status is incorrectly reported as OK in the Sun StorEdge Configuration Service application while the Sun Storage Automated Diagnostic Environment correctly reports volumes in degraded mode.

Using a Volume Before It Is Fully Initialized

When you create a volume and label it, you can start using the volume before it is fully initialized.

Command-Line Interface Issues

This section describes known issues and bugs related to the Sun StorEdge 6130 array CLI.

Command Displays the Wrong Volume Status

Bug 6174028 - During a volume copy process, the target volume becomes inaccessible for any I/O operation. The format command on a Solaris 8 or Solaris 9 host displays the volume status as `drive type unknown`.

The `cfgadm` command incorrectly displays a message that the target volume is still available and does not mark it as “unusable.”

Sun Storage Automated Diagnostic Environment Issues

This section describes known issues and bugs related to the Sun Storage Automated Diagnostic Environment software. Read the release notes that came with your Sun Storage Automated Diagnostic Environment software for a complete understanding of issues and bugs.

If there are additional arrays in the SAN running the Sun Storage Automated Diagnostic Environment software, you must download and install `SUNWstade` patch `117650-10` and `SUNWstadm` patch `117654-10` to obtain the latest fixes for the Sun Storage Automated Diagnostic Environment. These patches also include late-breaking enhancements to the Service Advisor.

To locate potential patches on SunSolve, go to:

`http://www.sun.com/sunsolve` -> PatchFinder 116720 and 117654

Revised Service Advisor Procedures

The following procedures in the Service Advisor section of the Sun Storage Automated Diagnostic Environment software have been updated to reflect non-disruptive, hot expansion:

- Installing Storage Trays
- Adding Expansion Trays
- Removing Storage Trays

Displaying Diagnostics

Bug 5076153 - Sun Storage Automated Diagnostic Environment diagnostic results are not updated in the client UI if the data host or management station host is using Perl Version 5.8. However, the test results are updated when the test finishes.

The following error message appears:

`Error on` *test-name*`: ERR: Invalid PID:`

Workaround - Run the diagnostics from the command-line interface on the client, or simply wait for the test to reach completion.

Alternatively, use an older version of Perl.

Placing a Controller in the Offline State

Bug 5096265 - When you manually place a controller offline using the Sun Storage Automated Diagnostic Environment, monitoring applications might report this offline controller as “failed.” This is expected behavior. After you place the controller back online, the controller state will change to “optimal.”

Configuring Slave Agents on Data Hosts

After installing the Sun Storage Automated Diagnostic Environment on a data host, enter the following command to configure the software as a slave agent and to synchronize the slave agent with the master agent on the management host. The management host software must be installed and the IP address defined before entering this command on the data host:

```
/opt/SUNWstade/bin/ras_install
```

Use the `ras_install` command only on data hosts, never on the management host that contains the management software with the master agent.

The `ras_install` script displays. Enter the following options:

`S` for the slave agent

`IP` address of the management host

`C` to start the agent cron

Following is the output from a sample `ras_install` script:

```
+---------------------------------+
| Installing the Package and Crons |
+---------------------------------+
? Are you installing a Master or a Slave Agent? (Enter M=master, S=slave, E=Empty
Master)
[M/S/E]: (default=M) S
The address of the master must already be defined before a slave can be installed.
If the master has not been installed yet, abort this install and go install this
package on the host that was selected to be the master.
? Enter the IP Name/Address of the Master Host Agent 10.8.88.135
- Testing communication with host '10.8.88.135' ..
- Communication successful.
- Starting the Storage A.D.E service (rasserv):
/opt/SUNWstade/rasserv/bin/apachectl startssl: ./rasserv started
- Setting up crons:
? Do you want to C=start or P=stop the Agent cron
[C/P] : (default=C) C
- cron installed.
- Testing access to rasserv (this test will timeout after 4 tries of 10 secs):
- ping '10.8.88.135' succeeded!
- 1/4 attempting to contact agent service...
- Contacted agent with hostid=80cffc87.
+------------------------------+
| SUNWstade installed properly |
+------------------------------+
- Sending monitored device-list to agent at 10.8.88.135
-- diag-lsi1.Central.Sun.COM already there
OK
```

Localization Issues

This section describes known issues and bugs related to internationalization and language translation.

Incorrect Virtual Disk Status Messages

Bug 6319070- The virtual disk status displays incorrect messages in a localized environment.

Workaround - After you choose an array and select the Logical Storage tab and Virtual Disks, be sure to ignore the virtual disk status in the translated messages. Specifically, in the Virtual Disks table, two values in the Status column display incorrectly translated messages. The word OK in translation should actually be Failed, and Degraded in translation should be Impaired.

Note – The 118161-04 patch is available to fix this problem. Be sure to download the patch from Sunsolve and apply it before you start using the application. This patch can be applied to a system that has the previous 118161-03 revision applied. It cannot be applied to a system that has only patch 118161-01 or 118161-02 installed. Ensure that your system has patch 118161-03 installed before you install 118161-04.

Documentation Issues

This section describes known issues and bugs related to the online help, the command-line interface `sscs` man page, or any other Sun StorEdge 6130 array release documentation.

No Dedicated Hot Spares

Bug 6299577 - The About Trays and Disk Drives description in the online help incorrectly states that the Sun StorEdge 6130 array supports dedicated hot-spares. The array spare is the only supported type of spare.

Incorrect Web Site Link

A web site link in the introductory chapter of the *Sun StorEdge 6130 Array Getting Started Guide* directs you to a non-existent location from which to download the Sun StorEdge documentation. The correct pointer is as follows:

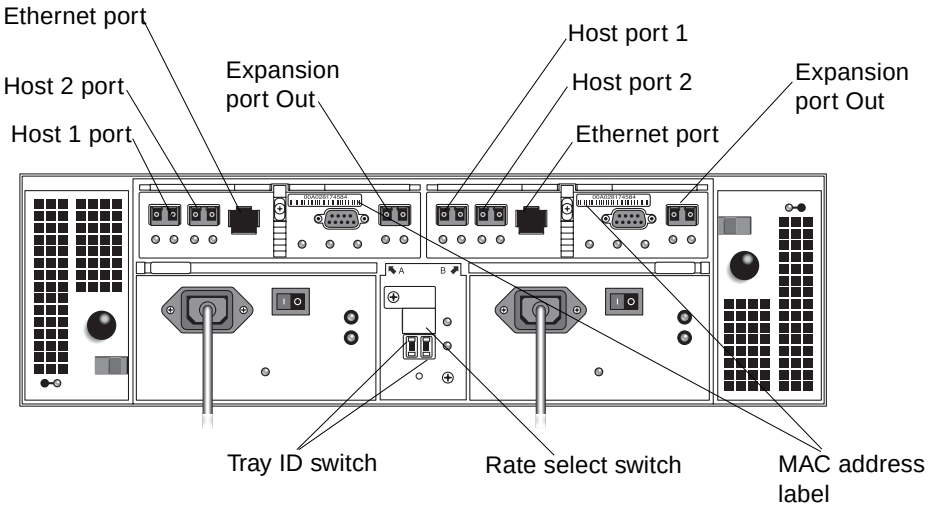
```
http://www.sun.com/products-n-solutions/hardware/docs/
Network_Storage_Solutions/Midrange/6130/index.html
```

Sun is in the process of updating a number of the documentation links on its web pages. If you encounter a bad link, use the following general Sun documentation web site to search for online copies of documents:

```
http://www.sun.com/documentation
```

Additional Callout for the Rear View of the Controller Tray

Bug 6177528 - Figure 1-3 in the *Sun StorEdge 6130 Array Getting Started Guide* shows the ports and switches at the back of the controller tray. An additional callout has been added to identify the location of the MAC address label.



Volume Snapshot Creation

Bug 6183884 - The online help for volume snapshots indicates that creating a snapshot causes the array controller module to suspend input/output (I/O) to the base volume while creating a physical volume. Note that you must execute the `fsck` command before you can mount the snapshot volume if the snapshot was created while the I/O was running on the base volume.

No Default Password for Storage and Guest Users

The *Sun StorEdge 6130 Array Getting Started Guide* erroneously states that the Storage and Guest users have a default password of `!Storage` and `!Guest`, respectively. There are no default users or passwords for the Sun StorEdge 6130 array.

The array has roles of storage and guest that you assign to Solaris user accounts with access to the management host. These roles define the privileges available to the user.

You initially install the array software on a new server and sign in to the browser interface using `root`. You then use the User Management function in the browser interface to assign the roles of storage or guest to valid Solaris user accounts. Users can then sign in to the browser interface using their Solaris user names and passwords.

For information about creating Solaris user accounts, refer to the Solaris system administration documentation.

Correction to Man -M Command Option

The *Sun StorEdge 6130 Array Getting Started Guide* references the location of the `sscs`(1M) man page in the `/opt/se6x20/cli/man` directory. The note that follows this path location then explains about updating the `MANPATH` variable or using the man command `-m` option to locate the `sscs` man page. The correct option for the man command should be `-M`. As a result, the complete command and path should be:

```
man -M /opt/se6x20/cli/man sscs
```

When you enter this command, you will be given a general introduction to sscs. To see the specific man page for a Sun StorEdge 6130 array, follow the `sscs` command with `-6130` as follows:

```
man -M /opt/se6x20/cli/man sscs-6130
```

This enables you to access `sscs` commands that are specific to the Sun StorEdge 6130 array. Note here that when you are in the management host software, you should continue to enter `sscs` and its command options, such as `sscs list array`.

Correction to the Process for Creating an Initiator

The *Sun StorEdge 6130 Array Getting Started Guide* discusses the process of creating an initiator. When doing so, you can either select an existing WWN, or enter a new one. Specifically, when you are prompted to select an existing WWN, the drop-down menu list displays only those existing WWNs that are currently unassigned. The WWN you select automatically appears in the `Type a New WWN` field.

If no WWNs exist, the list is empty and you must enter a new WWN in this field. Be aware that when you enter a new WWN, the delimiting colons (:) of the 16-character hexadecimal WWN are optional.

Note – The Sun StorEdge 6130 array firmware retains all created or discovered WWNs until they are manually deleted. If the WWNs no longer apply because a server is moved or rezoned, you should delete the WWNs from the Initiator page and reboot the controllers.

Correction to the Cabinet Environmental Specifications

In the *Sun StorEdge 6130 Array Site Preparation Guide*, be aware of the following corrections to the cabinet environmental specifications:

- Table 2-4 lists the nonoperating temperature specifications as -40˚ F to -150.8˚ F (-40˚C to -66˚ C). They should be -40˚ F to 149˚ F (-40˚C to 65˚ C)
- Table 2-9 lists the nonoperating temperature specifications as -40˚F to 140˚F (-20˚C to -60˚C). They should be -4˚F to 140˚F (-20˚C to 60˚C).
- Table 2-13 lists the nonoperating temperature specifications as -40˚F to 150.8˚F (-40˚C to -66˚C). They should be -40˚ F to 149˚ F (-40˚C to 65˚ C).

Release Documentation

Following is a list of documents related to the Sun StorEdge 6130 array. For any document number with *nn* as a version suffix, use the most current version available.

You can search for this documentation online at `http://www.sun.com/documentation.`

Application	Title	Part Number
Site planning information	*Sun StorEdge 6130 Array Site Preparation Guide*	819-0033-*nn*
Regulatory and safety information	*Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*	819-0035-*nn*
Installation and initial configuration instructions	*Sun StorEdge 6130 Array Getting Started Guide*	819-0032-*nn*
Instructions for installing the Sun StorEdge Expansion cabinet	*Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067-*nn*

Application	Title	Part Number
Instructions for installing the Sun Rack 900/1000 cabinets	*Sun Rack Installation Guide*	816-6386-*nn*
Instructions for installing the Sun Fire cabinet	*Sun Fire Cabinet Installation and Reference Manual*	806-2942-*nn*
Release-specific information for the Storage Automated Diagnostic Environment	*Sun Storage Automated Diagnostic Environment Enterprise Edition Release Notes*	819-0432-*nn*

In addition, the sun StorEdge 6130 array includes the following online documentation:

- Sun StorEdge Configuration Service online help

  Contains system overview and configuration information.

- Sun Storage Automated Diagnostic Environment online help

  Includes system maintenance, management, and basic troubleshooting information.

- Service Advisor

  FRU replacement procedures with system information are available in this section of the Sun Storage Automated Diagnostic Environment interface.

- `sscs` man page commands

  Man page commands are available on a management host running the Solaris OS work station or on a remote CLI client.

Service Contact Information

If you need help installing or using this product, go to:

`http://www.sun.com/service/contacting`

Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

APPENDIX **A**

Configuring Zoning and Cabling for Data Replication

This appendix provides the information you need to configure switch zoning for data replication using the Sun StorEdge Data Replicator software. It also provides the cabling schemes you need and includes the following sections:

Overview of Switch Zoning for Data Replication

To configure Fibre Channel (FC) switch zoning, use the management software provided by the manufacturer of the FC switch.

Zoning for data replication has the following general following requirements:

- Set the zoning of FC switches so that a single host bus adapter (HBA) can access only one controller per storage array.

  This requirement is due to potential restrictions at the data host level.
- Set a separate zone for the ports reserved for data replication.
- Do not zone the uplink port (E_port) that connects cascaded switches within a fabric.

Each array hardware configuration will have additional requirements.

Switch zoning works differently for non-cascaded and cascaded switches. The rest of this section describes these differences.

Note – For more information about using the software for zone configuration, see the manufacturer's documentation provided with the switch.

Zoning With Non-Cascaded Switches

FIGURE 1 shows non-cascaded (independent) switches on a network. Switch 1 and Switch 2 exist as two 16-port FC switches, each showing ports 0 through 15. Even though both switches contain a Zone 1 and Zone 2 (shown as Zones A and B in Switch 2), these zones are independent of each other.

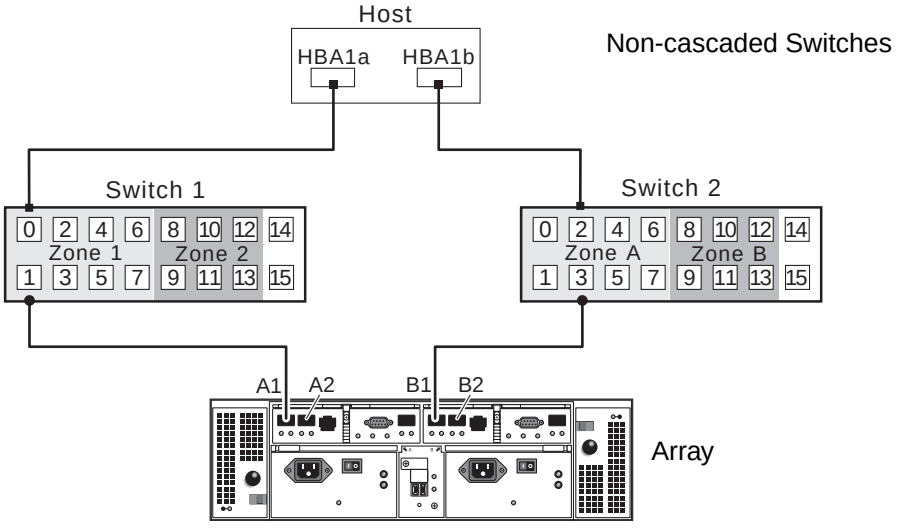


FIGURE 1 Switch Zoning in Non-Cascaded FC Switches

Zoning With Cascaded Switches

Switches can share zones and combine port numbering if they are cascaded. Cascaded switches are switches that are linked to form one fabric.

To cascade two or more 16-port FC switches, connect an FC cable between the uplink ports on the switches.

Note – In a single-mode FC environment, the two switches are connected by a single port on each switch, designated as an E_port, which is not assigned a zone.

After you cascade the switches, the switch management software combines their ports. For example, if you cascade two 16-port FC switches, each showing ports 0 through 15, the switch management software will then show ports 0 through 31 participating in the fabric. A new zone you create containing any of these ports can exist across the multiple switches.

FIGURE 2 shows two switches cascaded together. An FC cable connects uplink ports 15 and 16. The uplink ports are not zoned. The switch management software combined the ports on the switches and shows ports 0 through 31 participating in the fabric. Switch 1 and Switch 2 now share Zone 1 and Zone 2.

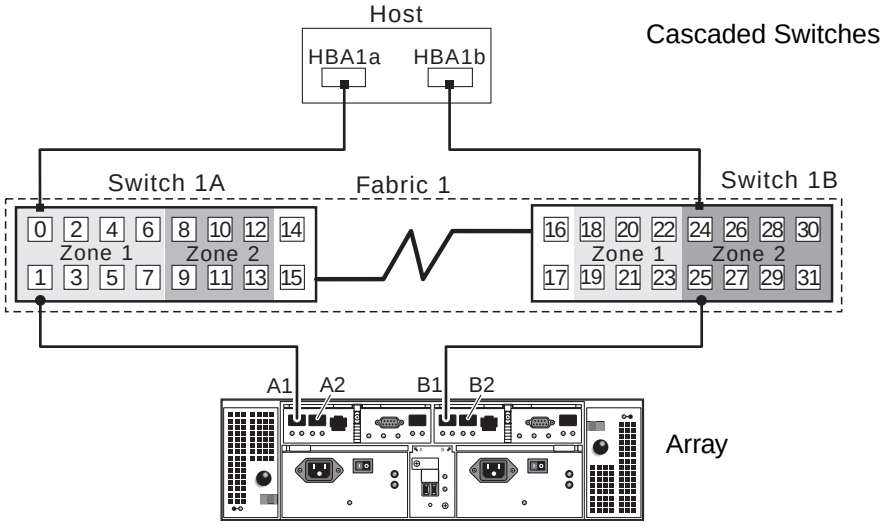


FIGURE 2 Switch Zoning in Cascaded FC Switches

Overview of Array Hardware Configurations

This section provides an overview of the array hardware configurations you can use for data replication.

For more detailed information and for instructions on setting up these configurations, see the following sections:

- "Setting Up the Highest Availability Campus Configuration" on page 44
- "Setting Up the Campus Configuration" on page 51
- "Setting Up the Intra-Site Configuration" on page 56

TABLE A-1 summarizes the configurations.

TABLE A-1 Array Hardware Configurations

Configuration	Redundancy	Number of Switches	Single Point of Failure?
Highest Availability Campus Configuration	Complete	4	None
Campus Configuration	Host bus adapters, controllers, and replication ports	2	Switch and fabric
Intra-Site Configuration	Host bus adapters, controllers, replication ports, and switches	2	Site disaster

Setting Up the Highest Availability Campus Configuration

Note – The Highest Availability Campus configuration is the recommended configuration for the Sun StorEdge Data Replicator software.

The Highest Availability Campus configuration provides complete redundancy without a single point of failure for data configuration. This configuration includes four FC switches, two at the primary and two at the secondary site, to provide for complete redundancy in fabrics, storage array components, and hosts. Data synchronization can continue despite any single switch failure, and data recovery is easier. Potential failures could include FC switches, FC cables, and any host or storage array. Two switches at each site also provide redundancy to the local site in addition to a fully redundant remote configuration.

FIGURE 3 shows the Highest Availability Campus configuration. The following sections describe the zoning and cabling for this configuration:

- "Switch Zoning for the Highest Availability Campus Configuration" on page 47
- "Connecting Cables for the Highest Availability Campus Configuration" on page 48

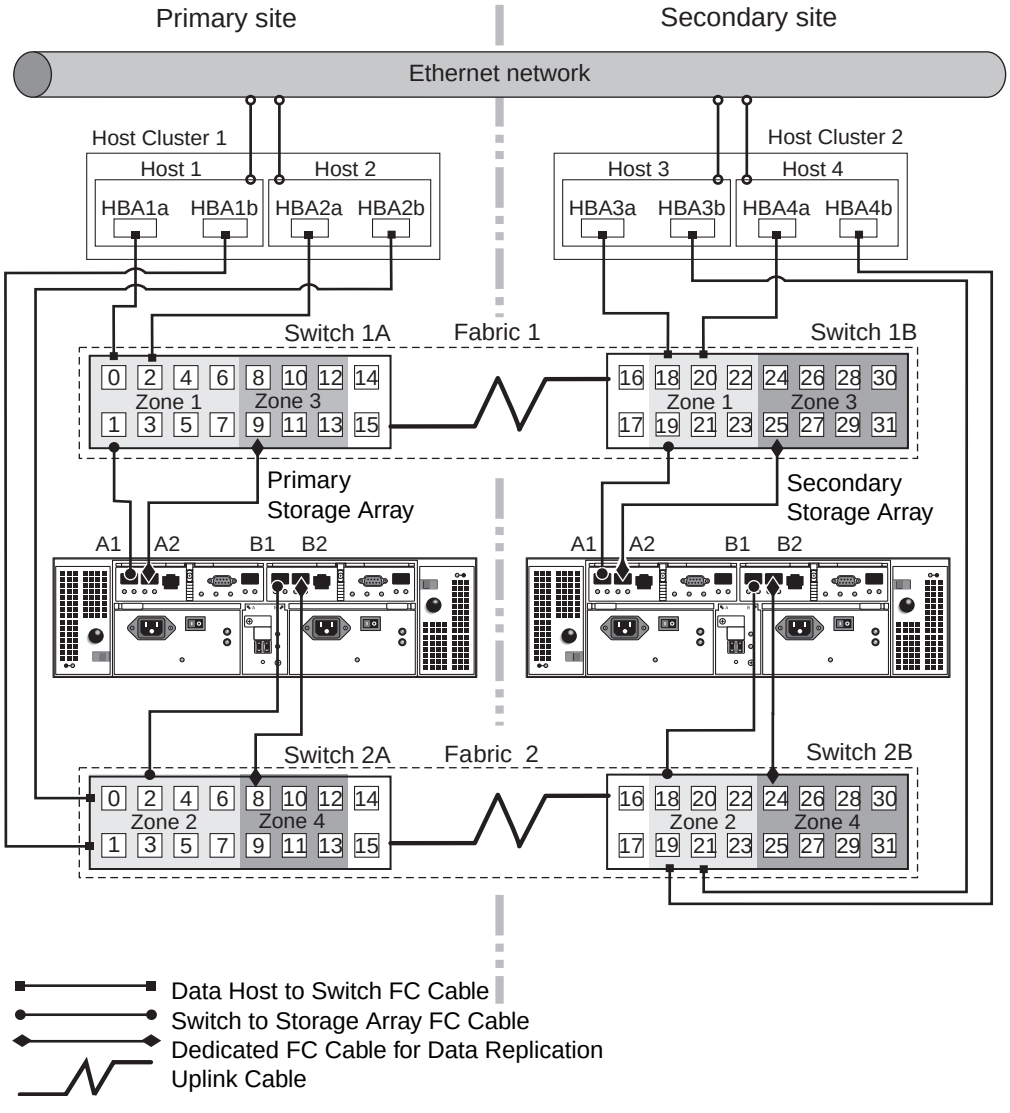


FIGURE 3 Highest Availability Campus Configuration

Switch Zoning for the Highest Availability Campus Configuration

The Highest Availability Campus configuration allows for a separate zone for each reserved port for the Sun StorEdge Data Replicator software.

There are total of four zones in this configuration:

- Zones 1 and 3 exist on Fabric 1 (Switch 1A at the primary site, and Switch 1B at the secondary site).
- Zones 2 and 4 exist on Fabric 2 (Switch 2A at the primary site, and Switch 2B at the secondary site).

The switches do not need to be zoned exactly as presented in this configuration. However, you must meet the following requirements for zoning switches for the Highest Availability Campus configuration:

- Configure the zones on the switch so that there is one port per zone for a storage array connection and one port per zone for each host.
- Do not assign zones to the uplink ports (E_ports) on the switches.
- Zone the switches so that a single HBA can access only one controller per storage array.

FIGURE 4 shows how the four switches are zoned for the Highest Availability Campus configuration.

The switches in FIGURE 4 contain 16 ports each, which leaves many unused ports per switch. The remaining ports can be distributed among the other zones. However, it is recommended that most remaining ports be assigned to the zones containing the host connections (Zones 1 and 2 in FIGURE 4). This will allow easy setup for additional hosts being connected to the environment.

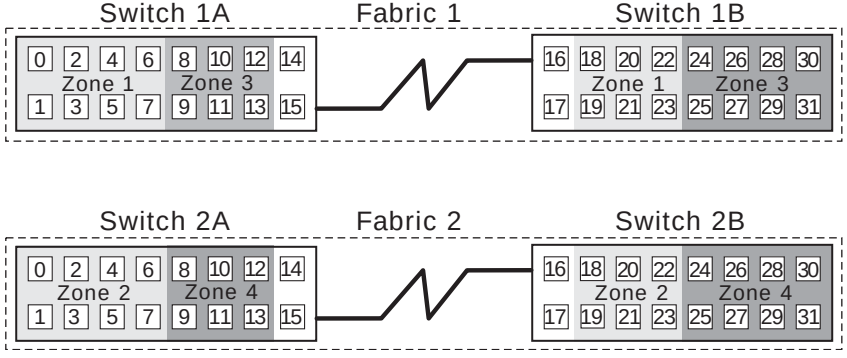


FIGURE 4 Switch Zoning for the Highest Availability Campus Configuration

After you have zoned your switches, you are ready to connect cables as described in the next section.

Connecting Cables for the Highest Availability Campus Configuration

After the four FC switches are properly zoned, complete the following procedure to set up the Highest Availability Campus configuration for the Sun StorEdge Data Replicator software. Complete all connections using FC cables of appropriate length.

To connect cabling for the Highest Availability Campus configuration:

1. **If the hardware for use with the Sun StorEdge Data Replicator software is being added to an existing storage array environment, stop I/O activity from all hosts and power down all storage arrays, hosts, FC switches, and all other equipment in the storage array environment at both sites.**

Note – Verify that FC port 2 on each controller is not currently in use before enabling data replication. The Sun StorEdge 6130 array dedicates FC port 2 on each controller for use with the Sun StorEdge Data Replicator software. If FC port 2 is in use, you must move all connections from FC port 2 to FC port 1.

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2. **Ensure that cabling between all controller trays and expansion modules is complete, as described in the** *Sun StorEdge 6130 Array Getting Started Guide***.**
3. **Connect the primary HBA for each host at this site to an available port in Zone 1 of Switch 1 (**FIGURE 5**).**

Note – The cables can be connected to any port in the proper zone of the switch.

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4. **Connect the secondary HBA for each host at this site to an available port in Zone 2 of Switch 2 (**FIGURE 5**).**

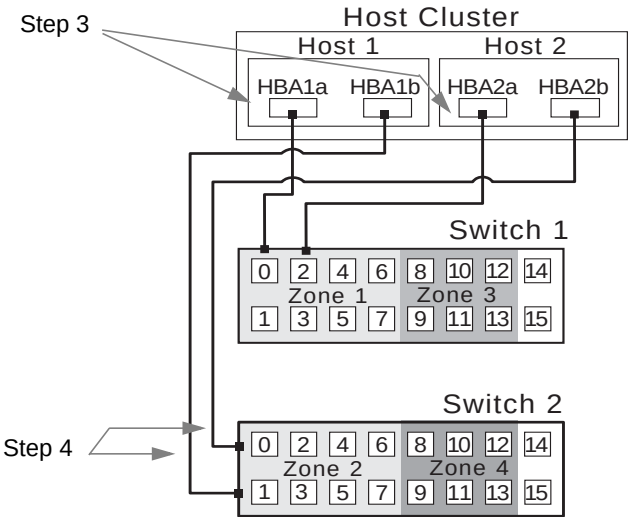

FIGURE 5 Host Bus Adapter Connections to FC Switches

5. **Connect controller port A1 on the storage array to an available port in Zone 1 of Switch 1 (**FIGURE 6**).**
6. **Connect controller port B1 on the storage array to an available port in Zone 2 of Switch 2 (**FIGURE 6**).**
7. **Connect controller port A2 on the storage array to an available port in Zone 3 of Switch 1 (**FIGURE 6**).**
8. **Connect controller port B2 on the storage array to an available port in Zone 4 of Switch 2 (**FIGURE 6**).**

Note – Controller ports A2 and B2 are reserved for mirror relationship synchronization upon activation of the Sun StorEdge Data Replicator software.

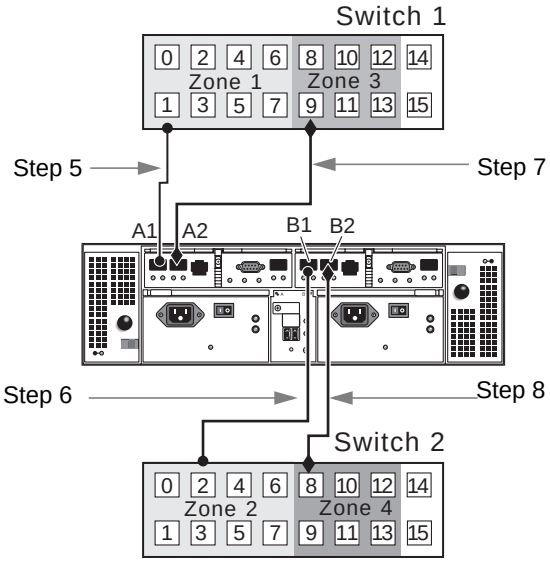

FIGURE 6 Storage Array Connections to FC Switches

9. **Repeat Step 2 through Step 8 for the secondary site.**

10. **Complete the fabric environment as follows (**FIGURE 7**):**

    a. **For Switch 1, connect an FC cable between the uplink ports on Switch 1A (primary site) and Switch 1B (secondary site).**

    b. **For Switch 2, connect an FC cable between the uplink ports on Switch 2A (primary site) and Switch 2B (secondary site).**

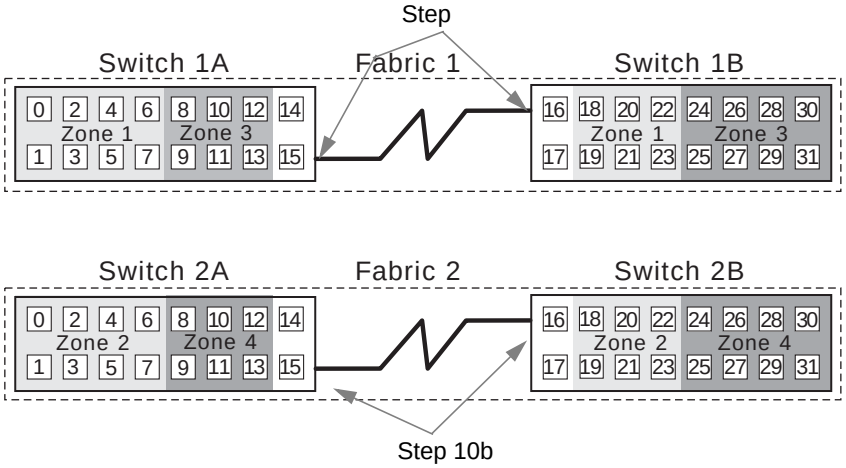

FIGURE 7 Connecting Remote Switches to Complete Fabric Environments

11. **If you have any additional storage arrays in the same cabinet that will use the Sun StorEdge Data Replicator software, repeat Step 3 through Step 10.**

12. **Power up all storage arrays, hosts, FC switches, and any other hardware at both sites that were powered down in Step 1.**

    The array hardware installation for data replication is complete. You can now configure the Sun StorEdge Data Replication software.

Setting Up the Campus Configuration

The Campus configuration offers functionality similar to the Highest Availability Campus configuration, but contains only one switch at each site. The configuration provides redundancy for host bus adapters, controllers, and Sun StorEdge Data Replicator software ports, but it has a single point of failure for switches. If a switch at either site fails, data replication cannot function. For this reason, the Highest Availability Campus configuration is recommended instead of the Campus configuration if you want total environment redundancy.

FIGURE 8 shows the Campus configuration. The following sections describe the zoning and cabling for this configuration:

- "Switch Zoning for the Campus Configuration" on page 52
- "Connecting Cables for the Campus Configuration" on page 53

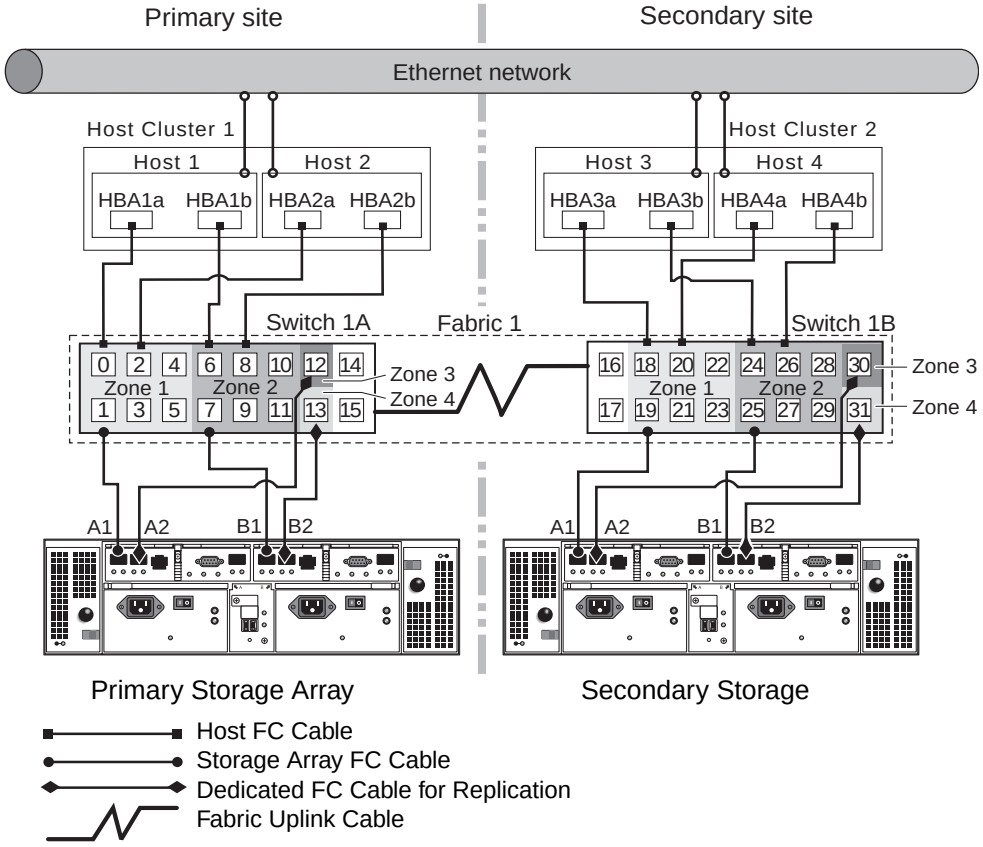

FIGURE 8 Campus Configuration

Switch Zoning for the Campus Configuration

The Campus configuration allows for a separate zone for each reserved port for the Sun StorEdge Data Replicator software.

There are four zones in this configuration:

- All zones exist on Fabric 1 (Switch 1A at the primary site, and Switch 1B at the secondary site).
- Zones 3 and 4 are reserved for the dedicated Sun StorEdge Data Replicator software connections.

The switches do not need to be zoned exactly as presented in this configuration. However, you must meet the following requirements for zoning switches for the Campus configuration:

- Configure the zones on the switches so that there is one port per zone for a storage array connection and one port per zone for each host.
- Do not assign zones to the uplink ports (E_ports) on the switches.
- Zone the switches so that a single HBA can access only one controller per storage array.

FIGURE 9 shows how the two switches are zoned for the Campus configuration.

The switches in FIGURE 9 contain 16 ports each, which leaves many unused ports per switch. The remaining ports can be distributed among the other zones. However, it is recommended that most remaining ports be assigned to the zones containing the host connections (Zone 1 in FIGURE 9). This will allow easy setup for additional hosts being connected to the environment.

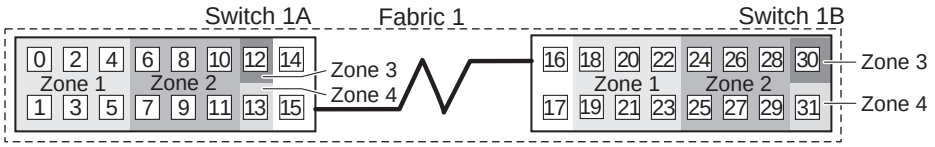

FIGURE 9 Switch Zoning for the Campus Configuration

After you have zoned your switches, you are ready to connect cables as described in the next section.

Connecting Cables for the Campus Configuration

After both FC switches are properly zoned, complete the following procedure to set up the Campus configuration for the Sun StorEdge Data Replicator software. Complete all connections using FC cables of appropriate length.

To connect cabling for the Campus configuration:

1. **If the hardware for use with the Sun StorEdge Data Replicator software is being added to an existing storage array environment, stop I/O activity from all hosts and power down all storage arrays, hosts, FC switches, and all other equipment in the storage array environment at both sites.**

Note – Verify that FC port 2 on each controller is not currently in use before enabling data replication. The Sun StorEdge 6130 array dedicates FC port 2 on each controller for use with the Sun StorEdge Data Replicator software. If FC port 2 is in use, you must move all connections from FC port 2 to FC port 1.

2. **Ensure that cabling between all controller trays and expansion modules is complete, as described in the** *Sun StorEdge 6130 Array Getting Started Guide***.**
3. **Connect the primary HBA for each host at this site to an available port in Zone 1 of Switch 1 (**FIGURE 10**).**

Note – The cables can be connected to any port in the proper zone of the switch.

4. **Connect the secondary HBA for each host at this site to an available port in Zone 2 of Switch 1 (**FIGURE 10**).**

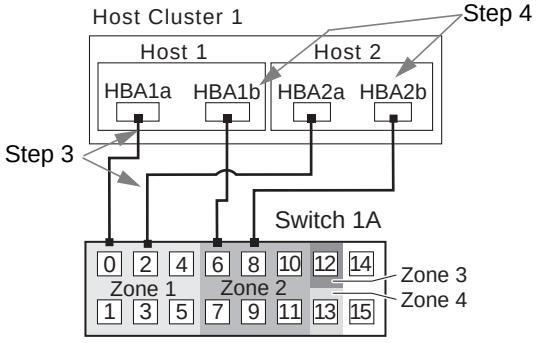

FIGURE 10 Host Bus Adapter Connections to FC Switches

5. **Connect controller port A1 of the storage array to an available port in Zone 1 of Switch 1 (**FIGURE 11**).**
6. **Connect controller port B1 of the storage array to an available port in Zone 2 of Switch 1 (**FIGURE 11**).**
7. **Connect controller port A2 of the storage array to an available port in Zone 3 of Switch 1 (**FIGURE 11**).**
8. **Connect controller port B2 of the storage array to an available port in Zone 4 of Switch 1 (**FIGURE 11**).**

Note – Controller ports A2 and B2 are reserved for mirror relationship synchronization upon activation of the Sun StorEdge Data Replicator software.

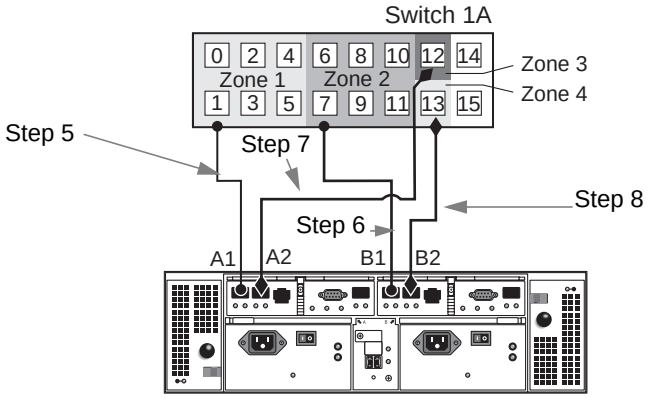

FIGURE 11 Storage Array Connections to FC Switches

9. **Repeat Step 3 through Step 8 for the secondary site.**

10. **Complete the fabric (**FIGURE 12**) by connecting an FC cable between the uplink ports on Switch 1A (primary site) and Switch 1B (secondary site).**

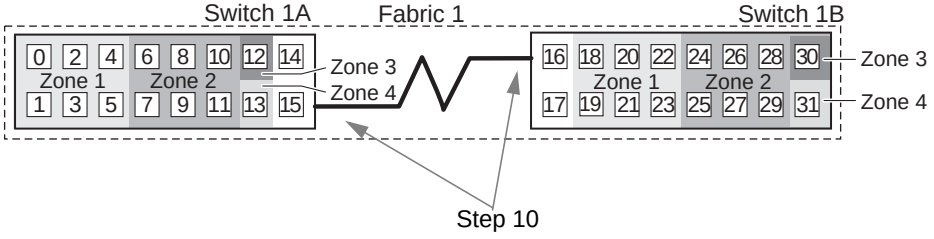

FIGURE 12 Connecting Remote Switches to Complete a Fabric Environment

11. **If you have additional storage arrays in the same cabinet that will use the Sun StorEdge Data Replicator software, repeat Step 5 through Step 10.**

12. **Power up all storage arrays, hosts, FC switches, and any other hardware at both sites that was powered down in Step 1.**

    The array hardware installation for data replication is complete. You can now configure the Sun StorEdge Data Replication software.

Setting Up the Intra-Site Configuration

The Intra-Site configuration uses two switches, similar to the Campus configuration. However, both switches and all hosts and storage arrays are located at the same site. The Intra-Site configuration provides data path redundancy for HBA, controllers, Sun StorEdge Data Replicator software ports, and switches. However, it creates a single point of failure, because a disaster at the site can destroy all equipment. For this reason, the Highest Availability Campus configuration is highly recommended for total environment redundancy.

Note – A switch failure in this configuration does not affect data access; however, it can cause an unsynchronized state for all mirror relationships on both primary and secondary storage arrays.

FIGURE 13 shows the Intra-Site configuration. The following sections describe the zoning and cabling for this configuration:

- "Switch Zoning for the Intra-Site Configuration" on page 57
- "Connecting Cables for the Intra-Site Configuration" on page 58

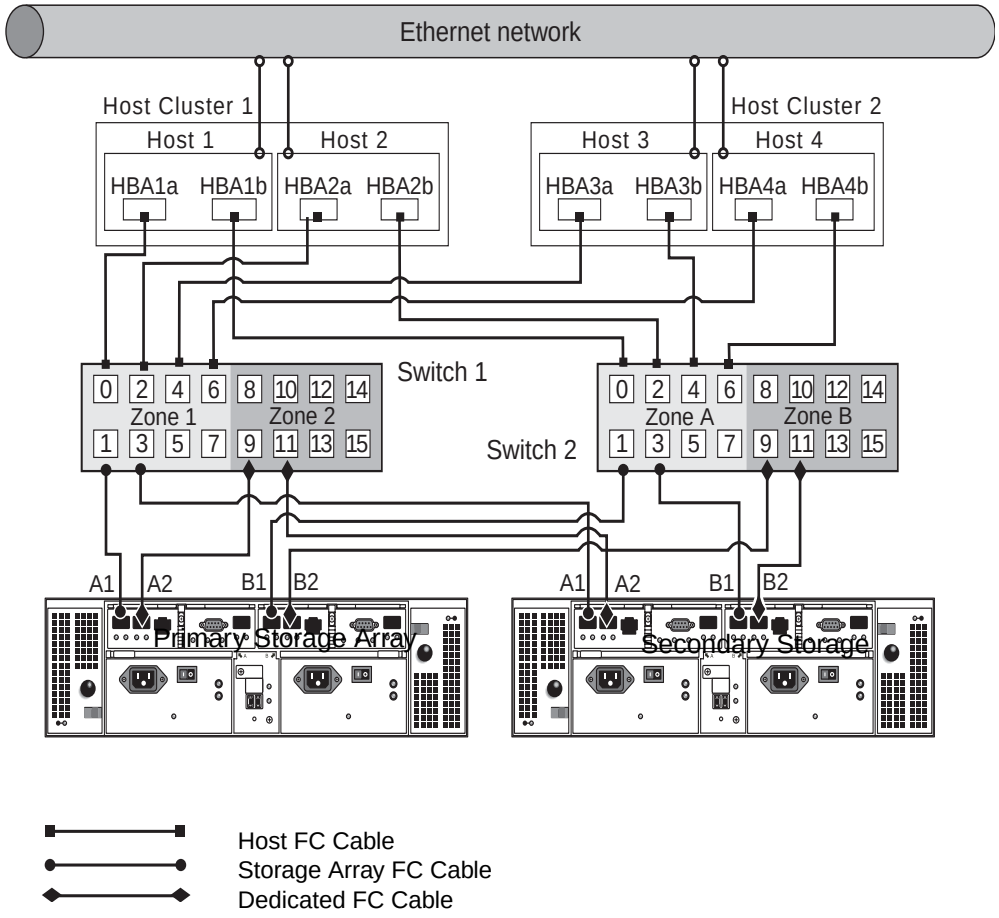

FIGURE 13 Intra-Site Configuration

Switch Zoning for the Intra-Site Configuration

The Intra-Site configuration is designed for switch redundancy. However, the switches are independent and because they are not cascaded, they do not share zones.

There are four zones in this configuration.

- Zones 1 and 2 exist on Switch 1.
- Zones A and B exist on Switch 2.

Note – Zones 1 and 2 on Switch 2 are labelled as Zones A and B to illustrate that Switch 1 and Switch 2 do not share zones.

The switches do not need to be zoned exactly as presented in this configuration. However, you must meet the following requirements for zoning switches for the Intra-Site configuration:

- Configure the zones on the switch so that there is one port per zone for a storage array connection and one port per zone for each host.
- Zone the switches so that a single HBA can only access one controller per storage array.

The switches in FIGURE 14 contain 16 ports each, which leaves many unused ports per switch. The remaining ports can be distributed among the other zones. However, it is recommended that most remaining ports be assigned to the zones containing the host connections (Zone 1 for Switch 1 and Zone A for Switch 2). This will allow easy setup for additional hosts being connect to the environment.

For simplicity in this example, the switches use one-half of the ports for each zone, although Zone 2 on Switch 1 and Zone B on Switch 2 require less ports.

FIGURE 14 Switch Zoning for the Intra-Site Configuration

After you have zoned your switches, you are ready to connect cables as described in the next section.

Connecting Cables for the Intra-Site Configuration

After both FC switches are properly zoned, complete the following procedure to set up the Intra-Site configuration for the Sun StorEdge Data Replicator software. Complete all connections using FC cables of appropriate length.

To connect cabling for the Intra-Site configuration:

1. **If the hardware for use with the Sun StorEdge Data Replicator software is being added to an existing storage array environment, stop I/O activity from all hosts and power down all storage arrays, hosts, FC switches, and all other equipment in the storage array environment at both sites.**

Note – Verify that FC port 2 on each controller is not currently in use before enabling data replication. The Sun StorEdge 6130 array dedicates FC port 2 on each controller for use with the Sun StorEdge Data Replicator software. If FC port 2 is in use, you must move all connections from FC port 2 to FC port 1.

2. **Ensure that cabling between all controller trays and expansion modules is complete, as described in the** *Sun StorEdge 6130 Array Getting Started Guide***.**

3. **Connect the primary HBA for each host at this site to an available port in Zone 1 of Switch 1 (**FIGURE 15**).**

Note – The cables can be connected to any port in the proper zone of the switch.

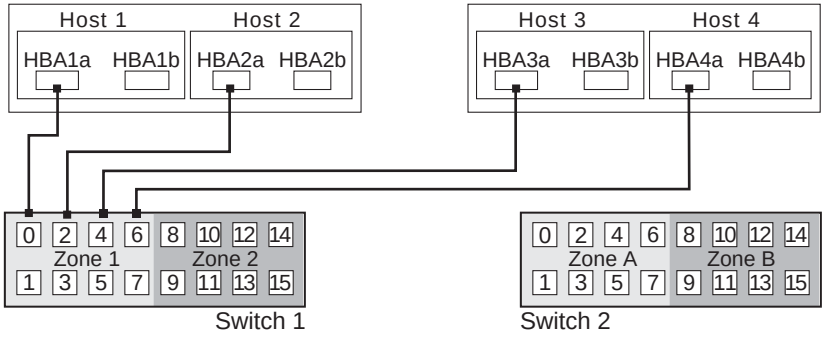

FIGURE 15 Primary Host Bus Adapter Connections to FC Switches

4. **Connect the secondary host bus adapter for each host to an available port in Zone A of Switch 2 (**FIGURE 16**).**

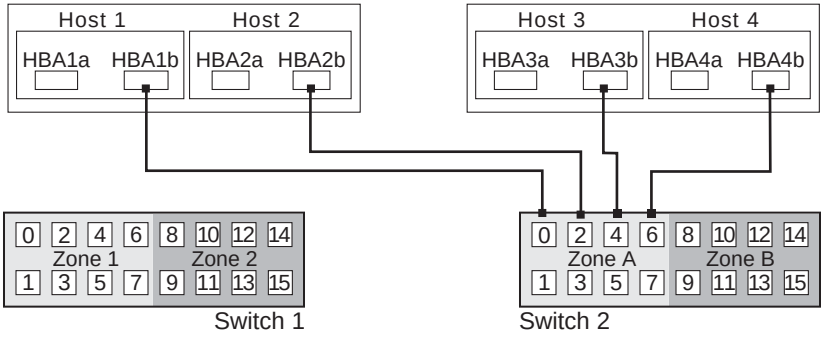

FIGURE 16 Secondary Host Bus Adapter Connections to FC Switches

5. **Connect controller port A1 of the primary storage array to an available port in Zone 1 of Switch 1 (**FIGURE 17**).**
6. **Connect controller port B1 of the primary storage array to an available port in Zone A of Switch 2 (**FIGURE 17**).**
7. **Connect controller port A2 of the primary storage array to an available port in Zone 2 of Switch 1 (**FIGURE 17**).**
8. **Connect controller port B2 of the primary storage array to an available port in Zone B of Switch 2 (**FIGURE 17**).**

Note – Controller ports A2 and B2 are reserved for mirror relationship synchronization upon activation of the Sun StorEdge Data Replicator software.

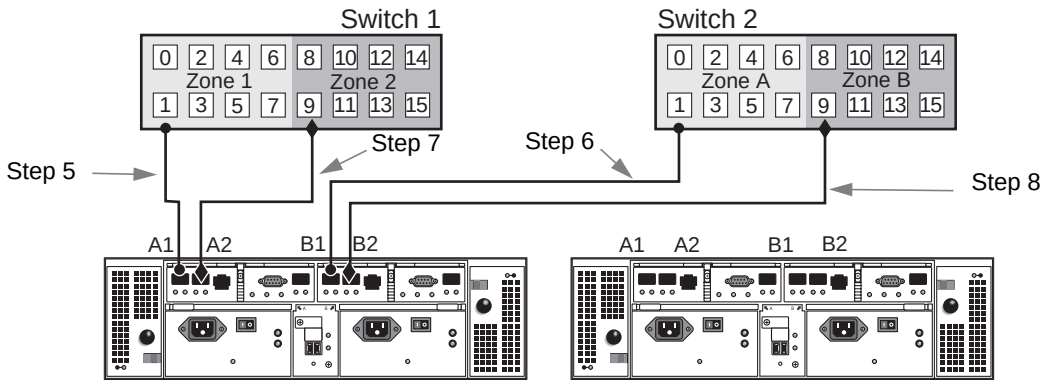

FIGURE 17 Primary Storage Array Connections to FC Switches

9. **Connect controller port A1 of the secondary storage array to an available port in Zone 1 of Switch 1 (**FIGURE 18**).**

10. **Connect controller port B1 of the secondary storage array to an available port in Zone A of Switch 2 (**FIGURE 18**).**

11. **Connect controller port A2 of the secondary storage array to an available port in Zone 2 of Switch 1 (**FIGURE 18**).**

12. **Connect controller port B2 of the secondary storage array to an available port in Zone B of Switch 2 (**FIGURE 18**).**

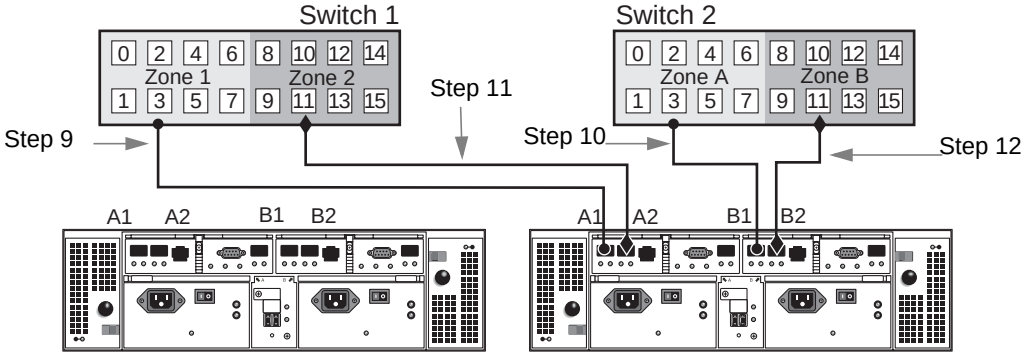

FIGURE 18 Secondary Storage Array Connections to FC Switches

13. **Repeat Step 5 through Step 12 for any additional storage arrays in the cabinet that will use the data replication software.**

14. **Power up all storage arrays, hosts, FC switches, and any other hardware that was powered down in Step 1.**

    The array hardware installation for data replication is complete. You can now configure the Sun StorEdge Data Replication software.