



Sun StorEdge™ 3510 FC Array and Sun StorEdge 3511 SATA Array Release Notes

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Sun StorEdge 3510 FC Array and Sun StorEdge 3511 SATA Array Release Notes

These release notes provide late-breaking information about the Sun StorEdge™ 3510 FC array and for the Sun StorEdge 3511 SATA array. These products both use Fibre Channel ports and technology but have important differences in their drive technology and purpose. Be sure to review “How Sun StorEdge 3511 SATA Arrays Differ From Sun StorEdge 3510 FC Arrays” on page 2.

New Features in This Release

The following enhanced SES firmware and controller FRUs are now available in this release:

- New SES firmware which improves performance and fixes known bugs is available in the following patches:
 - Firmware patch 113723-09 for the Sun StorEdge 3510 FC array
 - Firmware patch 113724-03 for the Sun StorEdge 3511 SATA arraySee “Installing Firmware Patches” on page 25 for more information.

Note – It is a recommended practice to always check the SunSolve Download Center located on <http://sunsolve.sun.com> for the latest available firmware upgrades.

How Sun StorEdge 3511 SATA Arrays Differ From Sun StorEdge 3510 FC Arrays

Sun StorEdge 3511 SATA arrays use Serial ATA (SATA) disk technology, and are recommended for cost-sensitive archival, static storage, and backup applications. Primary applications where the Sun StorEdge 3511 SATA array might be used rather than the Sun StorEdge 3510 FC array include:

- Applications requiring streaming or sequentially accessed data or those with cost-sensitive duty cycles such as backup and archival storage are best served by the Serial ATA-disk solution of the Sun StorEdge 3511 SATA array.

The StorEdge 3511 SATA array is designed for applications requiring lower-cost bulk storage (not a trait of FC disk-based solutions), where application or data availability is not a primary concern.

The StorEdge 3511 SATA array should be used only for archival, backup, or static storage; do not use it to store single instances of data. Do not use it as a boot device.

The Sun StorEdge 3511 SATA array can be used in multi-path and multi-host configurations where the array has a backup or archival role.

- Applications demanding transaction-based random access patterns with high duty cycles are best suited to a Fibre Channel disk-based solution such as the Sun StorEdge 3510 FC array. The Sun StorEdge 3510 FC array is designed for business-critical applications and their high-value data. These critical applications require higher availability (not a trait of SATA-disk based solutions).
- Sun StorEdge 3511 SATA expansion units can be connected to Sun StorEdge 3510 FC arrays, either alone or in combination with Sun StorEdge 3510 FC expansion units. Up to five expansion units can be used in this configuration.

Before installing and configuring your array, please review the key differences between the Sun StorEdge 3510 FC array and the Sun StorEdge 3511 SATA array in the following table.

Note – Although the two products are very similar in appearance and setup, the configurations have very important differences. While the Sun StorEdge 3510 FC array can be used for all applications, its higher cost makes it a less desirable choice for certain applications. The Sun StorEdge 3511 SATA array’s features are a subset of the Sun StorEdge 3510 FC array’s functionality, and it should only be used as indicated below. Using the Sun StorEdge 3511 SATA array where a Fibre Channel disk-based solution is appropriate may result in the loss of data access or even, in extreme cases, in data corruption.

TABLE 1 Comparison of Sun StorEdge 3510 FC and Sun StorEdge 3511 SATA Array Features

	Sun StorEdge 3510 FC Array	Sun StorEdge 3511 SATA Array
Applications	Best suited for production applications where the superior features of FC technical characteristics and performance are required. This includes online applications such as: <ul style="list-style-type: none"> • Database • Decision support • Data warehousing • Electronic commerce • Enterprise resource planning • Messaging, file and print 	Best suited for inexpensive secondary storage applications that are not mission-critical where higher capacity drives are needed, and where lower performance and less than 7/24 availability is an option. This includes near-line applications such as: <ul style="list-style-type: none"> • Information lifecycle management • Content-addressable storage • Backup and restore • Secondary SAN storage • Near-line DAS storage • Static reference data storage
Disks	Fibre Channel disks: 36, 73, or 146 GB at 10K RPM 36 or 73 GB at 15K RPM	SATA disks: 250 GB at 7200 RPM
Maximum FC Host Ports per I/O Controller Module	4 (one SFP port each for channels 0, 1, 4, and 5)	6 (two SFP ports each for channels 1 and 0; one SFP port each for channels 4 and 5)
Maximum Number of Expansion Units Connected to a RAID Array	8	5
Maximum Number of Disks per Configuration	108 (1 RAID array + 8 expansion units)	72 (1 RAID array + 5 expansion units)
Maximum Number of Logical Drives	8 logical drives	8 logical drives
Maximum Total Storage Capacity	15.75 TB	18.0 TB

TABLE 1 Comparison of Sun StorEdge 3510 FC and Sun StorEdge 3511 SATA Array Features (*Continued*)

	Sun StorEdge 3510 FC Array	Sun StorEdge 3511 SATA Array
Maximum Usable Storage Capacity	14.0 TB RAID 5 15.1 TB RAID 0	14.0 TB RAID 5 16.0 TB RAID 0
JBOD Array Support (direct-attach to host with no RAID controller)	One JBOD per host	Not supported

For additional configuration information, refer to the *Sun StorEdge 3000 Family Best Practices Manual* for your array. For other detailed information on these products, see “Release Documentation” on page 5.

Sun StorEdge 3511 SATA Array Limitations

This section describes limitations of the Sun StorEdge 3510 FC and 3511 SATA array as well as limitations in the supporting software.

Hardware Limitations for Sun StorEdge 3511 SATA Arrays

- The Sun StorEdge 3511 SATA array uses Serial ATA drives that provide larger storage capacity than Fibre Channel arrays but slower performance. Heavy I/O can impact performance still further, possibly introducing timeouts.
- With no I/O being processed, rebuilding a 2-TB RAID 5 logical drive can take up to 6.5 hours with the firmware’s Rebuild Priority set to Low (the default). This setting uses the controller’s minimum resources to rebuild and takes longer than other Rebuild Priority settings.
- Unlike Sun StorEdge 3510 FC products, at the time of this release no Sun StorEdge 3511 SATA JBOD can be directly attached to a host computer. Sun StorEdge 3511 SATA expansion units can be connected to Sun StorEdge 3511 SATA arrays.

Firmware Limitations for Sun StorEdge 3511 SATA Arrays

- For Sun StorEdge 3511 RAID arrays and expansion units, the SATA MUX chip does not support SMART monitoring of SATA drives. Therefore, the following RAID firmware's "Configuration Parameters" menu options are not supported for Sun StorEdge 3511 SATA arrays:
 - "Drive-side SCSI Parameters → Drive Predictable Failure Mode (SMART) - Detect Only"
 - "Drive-side SCSI Parameters → Drive Predictable Failure Mode (SMART) - Detect and Clone+Replace"
- Sequential optimization must be used. Do not use random optimization with Sun StorEdge 3511 arrays or expansion units.

Sun StorEdge Configuration Service Limitations for Sun StorEdge 3511 SATA Arrays

In this release, Sun StorEdge Configuration Service cannot be used to download SATA router firmware or SATA MUX firmware.

Release Documentation

These release notes supplement the documents shown in the following table.

TABLE 2 Sun StorEdge 3510 FC and 3511 SATA Array Documentation

Title	Part Number
<i>Sun StorEdge 3000 Family Installation, Operation, and Service Manual</i>	816-7300
<i>Sun StorEdge 3000 Family Best Practices Manual</i>	816-7325
<i>Sun StorEdge 3000 Family Software Installation Manual</i>	817-3764
<i>Sun StorEdge 3000 Family Configuration Service 1.5 User's Guide</i>	817-3337
<i>Sun StorEdge 3000 Family Diagnostic Reporter 1.5 User's Guide</i>	817-3338
<i>Sun StorEdge 3000 Family CLI 1.6 User's Guide</i>	817-4951
<i>Sun StorEdge 3000 Family RAID Firmware 3.25 and 3.27 User's Guide</i>	817-3711
<i>Sun StorEdge 3000 Family FRU Installation Guide</i>	816-7326

TABLE 2 Sun StorEdge 3510 FC and 3511 SATA Array Documentation (Continued)

Title	Part Number
<i>Sun StorEdge 3000 Family Safety, Regulatory, and Compliance Manual</i>	816-7930
<i>Sun StorEdge 3000 Family Rack Installation Guide for 2U Arrays (new universal rack kits)</i>	817-3629
<i>Sun StorEdge 3000 Family Rack Installation Guide for 2U Arrays (older rack kits)</i> ¹	816-7320

¹ This manual includes instructions for the universal rack kit. To obtain the rack kit guide for older rack-mount kits, refer to "Sun StorEdge 3000 Family EOL Items" on page 6.

You can download the documents listed in the preceding table (except EOL items) from either of the following locations:

http://www.sun.com/products-n-solutions/hardware/docs/Network_Storage_Solutions/Workgroup/3510

http://www.sun.com/products-n-solutions/hardware/docs/Network_Storage_Solutions/Workgroup/3511

<http://docs.sun.com/db/coll/3510FCarray>

<http://docs.sun.com/db/coll/3511FCarray>

Sun StorEdge 3000 Family EOL Items

For obsolete documentation for the Sun StorEdge 3000 Family products, refer to:

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

The item now available in this location is:

Sun StorEdge 3000 Family Rack Installation Guide for 2U Arrays (816-7320) which covers older rackmount kits

Service Contact Information

If you need help installing or using this product, call 1-800-USA-4SUN, or go to:

<http://www.sun.com/service/contacting>

System Requirements

The software and hardware identified in the following list have been tested and proven to work with the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array.

- “Supported Operating Systems and Management Software” on page 8
- “Other Supported Software” on page 10
- “Supported Platforms and Connection Methods” on page 12
- “Supported FC Switches” on page 18
- “Supported Disk Drives” on page 19
- “Supported Cabinets” on page 20
- “Supported Cables for Sun Systems” on page 21

Supported Operating Systems and Management Software

The following table lists the operating environments and operating systems supported for hosts connected to Sun StorEdge 3510 FC arrays and Sun StorEdge 3511 SATA arrays.

TABLE 3 Supported Operating Systems

Operating Systems and Management Software	Notes and Requirements
Solaris 8 4/01 and later operating system and Solaris 9 and 10 operating system.s The Solaris 2.6 operating system is supported on specific Sun servers using QLogic's native driver. Refer to TABLE 10 for details.	Requires the appropriate version of the Solaris recommended patch cluster. See "To Download the Recommended Solaris Patch" on page 23. SPARC Platform systems running the Solaris 8 operating system or Solaris 9 operating system must have the Sun StorEdge SAN Foundation software installed. The Sun StorEdge SAN Foundation software includes required patches and drivers for the supported host adapters and switches. The software also includes other SAN features, including the Sun StorEdge Traffic Manager software for the Solaris operating system. See "Installing Sun StorEdge SAN Foundation Software" on page 35. Note: Sun StorEdge SAN Foundation software is not supported for x86 platforms in this release.
Solaris x86 9, Update 6	Supported
HP-UX 11.0 and 11i operating system	Supported
IBM AIX 4.3.3 and 5.1L operating system (32-bit and 64-bit)	Supported
Red Hat AS 2.1 and 3.0 operating system	Supported
Windows 2000 Server, Windows 2000 Advanced Server, Windows 2003 Server, and Windows 2003 Advanced Server operating systems	Windows 2000 operating systems requires Service Pack 3.
Novell Netware 5.1 and 6.5	Supported

The following table lists the software components of the Sun StorEdge 3000 Family Professional Storage Manager software for Sun StorEdge 3000 Family SCSI, FC, and SATA arrays. See "Downloading Updated Sun StorEdge 3000 Family Software" on page 24 for information about how to obtain this software.

TABLE 4 Sun StorEdge 3000 Family Professional Storage Manager Software

Management Software	Notes and Requirements
Sun StorEdge 3000 Family Configuration Service 1.6.2 software ¹	This software provides centralized storage configuration, maintenance, and monitoring tools that can manage all Sun StorEdge 3xxx arrays from the same management host server.
Sun StorEdge 3000 Family Diagnostic Reporter 1.6.2 software	This utility provides monitoring and notification.
Sun StorEdge CLI 1.6.2	This utility can be used for script-based management.

¹ Note the limitations in “Sun StorEdge Configuration Service Limitations for Sun StorEdge 3511 SATA Arrays” on page 5

Java Runtime Environment Requirements

Before you install Sun StorEdge Configuration Service, Diagnostic Reporter, or CLI, make sure that your system meets the following Java Runtime Environment requirements.

TABLE 5 Java Runtime Environment Requirements

Operating System	Java Runtime Environment Version
Solaris	Sun JRE 1.2 to 1.4
IBM AIX	Sun JRE 1.2 to 1.5, IBM JRE 1.2 to 1.3, IBM JRE 1.4 is supported, but must have rt.jar file [see below]
HP-UX	Sun JRE 1.2 to 1.4
Red Hat Linux ¹	Sun JRE 1.2 to 1.5

¹ See the following section, “Additional Linux and IBM Java Requirements” on page 9 for more information.

Additional Linux and IBM Java Requirements

All Linux distributions need the **gettext** package, **gettext-xxx.rpm** (where **xxx** is the version number for your Linux installation), from a Linux CD. To determine whether **gettext** is installed, type:

```
# rpm -qa | grep gettext
```

For more information on **gettext**, see the following link:

<http://www.gnu.org/software/gettext/>

If you do not have a Linux CD, you can download `gettext` from the following FTP site:

`ftp://ftp.gnu.org/gnu/gettext/`

If the Sun StorEdge Configuration Service install fails on a Linux/AIX platform that has JRE 1.5 installed on it, check the JRE install path and make sure there is a link to the latest version of Java.

If IBM JRE 1.4 is installed, the Sun StorEdge Configuration Service install program may report that no JRE is installed. This is because JRE 1.4 has no `rt.jar` file in its `lib` path. To correct this, perform the following steps:

1. Create an empty file, `rt.jar`, in `<JRE_HOME>/lib`.
2. Install Sun StorEdge Configuration Service again.
3. If you still get an error, check the JRE install path. Create a link to the latest version of Java.

For details on uninstalling and installing Sun StorEdge Configuration Service, refer to the *Sun StorEdge 3000 Family Software Installation Guide*.

Other Supported Software

The following table lists backup, clustering, diagnostic, and other supported software.

TABLE 6 Other Supported Software

Type	Product Name
Backup Software	<ul style="list-style-type: none">• VERITAS NetBackup 4.5 software• Sun StorEdge Enterprise Backup 6.1 and 7.1 software (formerly Sun Solstice Backup software)
Clustering Software	<ul style="list-style-type: none">• Sun Cluster 3.0 and 3.1 software• Microsoft Windows Cluster for Windows 2000 and 2003• Red Hat Linux Cluster 3.0

TABLE 6 Other Supported Software (Continued)

Type	Product Name
Diagnostic Software	<ul style="list-style-type: none"> • The Sun StorEdge Automated Diagnostic Environment 2.3 utility supports the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array. The SUNWstade 116720-10 patch is required to support the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array. Sun Storage Automated Diagnostic Environment 2.3 software, Device Edition with patch (SUNWstade 116720-10) software is shipped separately without charge when the Sun StorEdge 3511 FC RAID array is ordered through WebDesk. • Sun StorEdge Diagnostic Expert 2.3 software (bundled with Sun StorEdge Enterprise Storage Manager 2.1 software) <p>Note: The Sun Storage StorEdge Automated Diagnostic Environment and Diagnostic Expert software products provide limited functionality for Sun StorEdge 3511 FC arrays. The functionality primarily covers asset and device health information.</p>
Point-in-Time Copying and Remote Mirroring Software	<ul style="list-style-type: none"> • Sun StorEdge Availability Suite 3.1 software (includes point-in-time copy service, formerly known as Sun StorEdge Instant Image software, and remote mirror service, formerly known as Sun StorEdge Network Data Replicator [SNDR] software).
Multipathing Software	<ul style="list-style-type: none"> • Sun StorEdge Traffic Manager software for the Solaris operating system, SPARC platform only (included in the Sun StorEdge SAN Foundation 4.4 software). See “Installing Sun StorEdge SAN Foundation Software” on page 35 for information about how to obtain the SAN Foundation software. This software can be configured to run on SPARC platforms that have Solaris 8 or later installed. Note: Sun StorEdge SAN Foundation software is not supported for x86 platforms in this release. • Sun StorEdge Traffic Manager 3.0 software for HP-UX, IBM AIX, Linux, Windows 2000 Server and Advanced Server, and Windows 2003 Server and Advanced Server. To purchase Sun StorEdge Traffic Manager 3.0 software for these platforms, contact Sun Sales or visit: <p style="text-align: center;">http://www.sun.com/sales</p> <p>Note: The 3.0 version of Traffic Manager software must be purchased and installed from a CD.</p>
Software-Based Volume Management Support	<ul style="list-style-type: none"> • Solstice DiskSuite™ 4.2.1 software (includes dynamic multipathing [DMP] support), included on installation CD 2 of 2 with the Solaris 8 4/01 operating system. • Solaris Volume Manager software, bundled in the Solaris 9 operating system • VERITAS Volume Manager (VxVM) 3.5 and 4.0 software. (See “Enabling VERITAS DMP for the Sun StorEdge 3511 SATA Array” on page 38 for more information.)
File System Software	<ul style="list-style-type: none"> • Sun StorEdge Performance Suite 4.0 or later software (Sun StorEdge™ QFS software) • Sun StorEdge Utilization Suite 4.0 or later software (Sun StorEdge SAM-FS software) • VERITAS File System (VxFS) 3.5 and 4.0

Supported Platforms and Connection Methods

TABLE 7, TABLE 8 and TABLE 9 list the Sun systems that are supported by the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array. The table also shows the connection methods supported for each of the supported Sun systems.

Note – For the Sun StorEdge 3511 SATA array, only channels 0 and 1 support 1-Gb connections. Channels 4 and 5 and the drive ports support only a 2-Gbit data transfer rate.

TABLE 7 Supported Sun SPARC Servers and 1-Gb Connection Methods

Servers	(X)6799A 1Gb PCI Single FC Network Adapter	(X)6727A 1Gb PCI Dual FC Network Adapter	(X)6757A 1Gb Sbus Dual FC Network Adapter¹
Ultra™ 60 workstation	Yes	Yes	No
Ultra 80 workstation	Yes	Yes	No
Sun Blade™ 1000 workstation	Yes	Yes	No
Sun Blade™ 1500 workstation	Yes	Yes	No
Sun Blade 2000 workstation	Yes	Yes	No
Sun Blade™ 2500 workstation	Yes	Yes	No
Netra™ 20	Yes	Yes	No
Netra 120	Yes	Yes	No
Netra 240	Yes	Yes	No
Netra 440	Yes	Yes	No
Netra 1280	Yes	Yes	No
Netra t 1120	Yes	Yes	No
Netra t 1125	Yes	Yes	No
Netra t 1400 server	Yes	Yes	No
Netra t 1405 server	Yes	Yes	No
Sun Enterprise 220R server	Yes	Yes	No
Sun Enterprise 250 server	Yes	Yes	No
Sun Enterprise 420R server	Yes	Yes	No
Sun Enterprise 450 server	Yes	Yes	No
Sun Enterprise 3500 server	Yes	Yes	Yes
Sun Enterprise 4500 server	Yes	Yes	Yes

TABLE 7 Supported Sun SPARC Servers and 1-Gb Connection Methods (Continued)

Servers	(X)6799A 1Gb PCI Single FC Network Adapter	(X)6727A 1Gb PCI Dual FC Network Adapter	(X)6757A 1Gb Sbus Dual FC Network Adapter¹
Sun Enterprise 5500 server	Yes	Yes	Yes
Sun Enterprise 6500 server	Yes	Yes	Yes
Sun Enterprise 10000 server	Yes	Yes	Yes
Sun Fire 280R server	Yes	Yes	No
Sun Fire V120 server	Yes	Yes	No
Sun Fire V210 server	Yes	Yes	No
Sun Fire V240 server	Yes	Yes	No
Sun Fire V250 server	Yes	Yes	No
Sun Fire V480 server	Yes	Yes	No
Sun Fire V880 server	Yes	Yes	No
Sun Fire V1280 server	Yes	Yes	No
Sun Fire E2900 server	Yes	Yes	No
Sun Fire 4800 server	Yes	Yes	No
Sun Fire 4810 server	Yes	Yes	No
Sun Fire E4900 server	Yes	Yes	No
Sun Fire 6800 server	Yes	Yes	No
Sun Fire E6900 server	Yes	Yes	No
Sun Fire 12K server	Yes	Yes	No
Sun Fire 15K server	Yes	Yes	No
Sun Fire E20K server	Yes	Yes	No
Sun Fire E25K server	Yes	Yes	No

¹ See the following note about setting the data rate for this adapter to 1 GHz. This note is applicable to the Sun Enterprise 3500 server, Sun Enterprise 4500 server, Sun Enterprise 5500 server, Sun Enterprise 6500 server, and Sun Enterprise 10000 server.

Note – The (X)6757A 1-Gb SBUS Dual FC Network Adapter does not support the latest autonegotiation protocols. To avoid difficulties, use the “view and edit Scsi channels →Data rate” menu option to set the data rate for channels connected to this HBA to 1 GHz rather than to Auto.

Note – Connecting the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array to Fibre Channel HBAs on the same channel that use different connection methods (1 Gb and 2 Gb) is not supported. This limitation is due to the design of the RAID array's port bypass circuitry and the inability of Fibre Channel to support auto-negotiation in a multi-drop loop configuration. You can, however, mix 1-Gb and 2-Gb FC HBAs on different channels (though for the Sun StorEdge 3511 SATA array only channels 0 and 1 are capable of supporting 1-Gb connection methods).

TABLE 8 Supported Sun SPARC Servers and 2-Gb Connection Methods

Servers	SG-(X)PCI1FC-QF2 (X6767A) 2Gb PCI Single Channel	SG-(X)PCI2FC-QF2 (X6768A) 2Gb PCI Dual Channel	SG-PCI1FC-JF2 JNI 2Gb PCI Single Channel FC HBA	SG-PCI2FC-JF2 JNI 2Gb PCI Dual Channel FC HBA
Ultra™ 60 workstation	Yes	Yes	Yes	Yes
Ultra 80 workstation	Yes	Yes	Yes	Yes
Sun Blade™ 1000 workstation	Yes	Yes	Yes	Yes
Sun Blade™ 1500 workstation	Yes	Yes	Yes	Yes
Sun Blade 2000 workstation	Yes	Yes	Yes	Yes
Sun Blade™ 2500 workstation	Yes	Yes	Yes	Yes
Netra™ 20	Yes	Yes	Yes	Yes
Netra 120	Yes	Yes	Yes	Yes
Netra 240	Yes	Yes	Yes	Yes
Netra 440	Yes	Yes	Yes	Yes
Netra 1280	Yes	Yes	Yes	Yes
Netra t 1120	No	No	No	No
Netra t 1125	No	No	No	No
Netra t 1400 server	No	No	No	No
Netra t 1405 server	No	No	No	No
Sun Enterprise 220R server	Yes	Yes	Yes	Yes
Sun Enterprise 250 server	Yes	Yes	Yes	Yes
Sun Enterprise 420R server	Yes	Yes	Yes	Yes
Sun Enterprise 450 server	Yes	Yes	Yes	Yes
Sun Enterprise 3500 server	Yes	Yes	Yes	Yes

TABLE 8 Supported Sun SPARC Servers and 2-Gb Connection Methods (Continued)

Servers	SG-(X)PCI1FC-QF2 (X6767A) 2Gb PCI Single Channel	SG-(X)PCI2FC-QF2 (X6768A) 2Gb PCI Dual Channel	SG-PCI1FC-JF2 JNI 2Gb PCI Single Channel FC HBA	SG-PCI2FC-JF2 JNI 2Gb PCI Dual Channel FC HBA
Sun Enterprise 4500 server	Yes	Yes	Yes	Yes
Sun Enterprise 5500 server	Yes	Yes	Yes	Yes
Sun Enterprise 6500 server	Yes	Yes	Yes	Yes
Sun Enterprise 10000 server	Yes	Yes	Yes	Yes
Sun Fire 280R server	Yes	Yes	Yes	Yes
Sun Fire V120 server	Yes	Yes	Yes	Yes
Sun Fire V210 server	Yes	Yes	Yes	Yes
Sun Fire V240 server	Yes	Yes	Yes	Yes
Sun Fire V250 server	Yes	Yes	Yes	Yes
Sun Fire V480 server	Yes	Yes	Yes	Yes
Sun Fire V880 server	Yes	Yes	Yes	Yes
Sun Fire V1280 server	Yes	Yes	Yes	Yes
Sun Fire E2900 server	Yes	Yes	Yes	Yes
Sun Fire 4800 server	Yes	Yes	Yes	Yes
Sun Fire 4810 server	Yes	Yes	Yes	Yes
Sun Fire E4900 server	Yes	Yes	Yes	Yes
Sun Fire 6800 server	Yes	Yes	Yes	Yes
Sun Fire 6900 server	Yes	Yes	Yes	Yes
Sun Fire 12K server	Yes	Yes	Yes	Yes
Sun Fire 15K server	Yes	Yes	Yes	Yes
Sun Fire E20K server	Yes	Yes	Yes	Yes
Sun Fire E25K server	Yes	Yes	Yes	Yes

Note – The Fibre Channel on-board (HSSDC port) controllers on Sun Fire 280R and V480 systems are not supported. For these systems you must use one of the supported Sun host adapters shown in TABLE 7 and TABLE 8.

Note – Before connecting the array to a SPARC platform host running the Solaris 8 operating system or Solaris 9 operating system, download and install the Sun StorEdge SAN Foundation software on the host where the adapter is installed. The SAN software includes the driver for the host adapter. See “Installing Sun StorEdge SAN Foundation Software” on page 35. Installation is mandatory for these operating systems because the driver is not included in the Solaris operating system. Without the driver, any array connected to the adapter cannot be seen by the host.

TABLE 9 Supported Sun x86 Servers and Connection Methods

Servers	SG-(X)PCI1FC-QF2 (X6767A) 2Gb PCI Single Channel FC HBA ¹	SG-(X)PCI2FC-QF2 (X6768A) 2Gb PCI Dual Channel FC HBA ²	(X)5133A 1Gb PCI Single Channel FC HBA	(X)9279A 2Gb PCI Single Channel FC HBA	Emulex LP10000DC-M2 Light Pulse PCI/PCI-X HBA ³
Sun Fire™ V 60x server	Yes	Yes	Yes	No	Yes
Sun Fire V65x server	Yes	Yes	Yes	No	Yes
Sun Fire V20z server	Yes	Yes	No	Yes	Yes
Sun Fire V40z server	Yes	Yes	No	Yes	Yes

1 Support of this HBA is provided for Red Hat AS 2.1 and 3.0, using Qlogic's native driver.

2 Support of this HBA is provided for Red Hat AS 2.1 and 3.0, using Qlogic's native driver.

3 Support of this HBA is provided for Solaris x86 9 Update 6, using Emulex's native driver available on www.emulex.com.

Note – Connecting the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array to Fibre Channel HBAs on the same channel that use different connection methods (1 Gb and 2 Gb) is not supported. This limitation is due to the design of the RAID array's port bypass circuitry and the inability of Fibre Channel to support auto-negotiation in a multi-drop loop configuration. You can, however, mix 1-Gb and 2-Gb FC HBAs on different channels (though for the Sun StorEdge 3511 SATA array only channels 0 and 1 are capable of supporting 1-Gb connection methods).

Support for Solaris 2.6 is now available. Use the following HBAs and the native Qlogic drivers. You must download and use the Qlogic Solaris SPARC driver package 4.13.01 or later. See the following Qlogic website for more details:

http://www.qlogic.com/support/oem_detail_all.asp?oemid=124

TABLE 10 Supported Servers and HBAs for Solaris 2.6 5/98 Operating Systems

Servers	SG-(X)PCI1FC-QF2 (X6767A) 2Gb PC Single Channel HBA	SG-(X)PCI2FC-QF2 (X6768A) 2Gb PCI Dual Channel HBA	(X)6757A 1Gb SBus Dual Channel FC HBA
Netra t 1120	No	No	No
Netra t 1125	No	No	No
Netra t 1400 server	No	No	No
Netra t 1405 server	No	No	No
Sun Enterprise 220R server	Yes	Yes	Yes
Sun Enterprise 250 server	Yes	Yes	Yes
Sun Enterprise 420R server	Yes	Yes	Yes
Sun Enterprise 450 server	Yes	Yes	Yes
Sun Enterprise 3500 server	Yes	Yes	Yes
Sun Enterprise 4500 server	Yes	Yes	Yes
Sun Enterprise 5500 server	Yes	Yes	Yes
Sun Enterprise 6500 server	Yes	Yes	Yes
Sun Enterprise 10000 server	Yes	Yes	Yes
Ultra™ 60/80 workstations	Yes	Yes	No

Note – Connecting the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array to Fibre Channel HBAs on the same channel that use different connection methods (1 Gb and 2 Gb) is not supported. This limitation is due to the design of the RAID array's port bypass circuitry and the inability of Fibre Channel to support auto-negotiation in a multi-drop loop configuration. You can, however, mix 1-Gb and 2-Gb FC HBAs on different channels (though for the Sun StorEdge 3511 SATA array only channels 0 and 1 are capable of supporting 1-Gb connection methods).

TABLE 11 lists information and connection methods supported for the Windows, Linux, Novell NetWare, HP-UX and IBM AIX operating systems.

TABLE 11 Other Supported Operating Systems and Connection Methods

Operating System	HBA Name
HP-UX 11.00 and 11i	HP A5158A, HP A6795A
Red Hat AS 2.1 and 3.0	QLogic QLA2310, QLA2340, and QLA2342
Microsoft Windows 2000 and 2003 Server and Advanced Server	Emulex LP952L, LP982, LP9002L, and LP9802 L8000 F1-N1 QLogic QLA2310, QLA2340, and QLA2342
IBM AIX 4.3.3 and 5.1L	IBM FC 6227 and 6228
Novell Netware 5.1 and 6.5	QLogic QLA2342

Supported FC Switches

The following table lists the FC switches that are supported by the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array.

Note – To avoid problems in mixed 1GB/2GB SANs with QLogic switches, run the Sun StorEdge FC 3510 array in point-to-point mode.

TABLE 12 Supported FC Switches

FC Switch	Part Number
Sun StorEdge 8-Port 1-Gb Redundant Pair ¹	X6746A
Sun StorEdge 16-Port 1-Gb Redundant Pair ²	SG-XSW16-32P
Sun StorEdge 8-Port 2-Gb FC Switch	SG-XSW8-2GB
Sun StorEdge 16-Port 2-Gb FC Switch	SG-XSW16-2GB
Sun StorEdge Network 2-Gb 64-Port FC Switch Base Unit	SG-XSW64-Base
Brocade Silkworm 3200 2-Gb 8-Port FC Switch	SG-XSWBRO3200
Brocade Silkworm 3250 2-Gb 8-Port FC Switch	SG-XSWBRO3250 and SG-XSWBRO3250VL2
Brocade Silkworm 3800 2-Gb 16-Port FC Switch	SG-XSWBRO3800
Brocade Silkworm 3850 2-Gb 16-Port FC Switch	SG-XSWBRO3850 and SG-XSWBRO3850VL2

TABLE 12 Supported FC Switches (*Continued*)

FC Switch	Part Number
Brocade Silkworm 3900 2-Gb 32-Port FC Switch	SG-XSWBRO3900
Brocade Silkworm 12000 2-Gb 32-Port Switch	SG-XSWBRO12000-32P
Brocade Silkworm 12000 2-Gb 64-Port Switch	SG-XSWBRO12000-64P
Brocade Silkworm 24000 2-Gb 64-Port Switch	SG-XSWBRO24K-32P
McData Sphereon 4300 2-Gb	SG-XSWMD4300-12P
McData Sphereon 4500 2-Gb 24-Port Switch	SG-XSWMD4500-8P
McData 6064 2-Gb Director 64-Port FC Switch	SG-XSWMD6064-32P
McData Intrepid 6140	SG-XSWM6140-64P

1 For the Sun StorEdge 3511 SATA array, only channels 0 and 1 are capable of supporting 1-Gb connection methods.

2 For the Sun StorEdge 3511 SATA array, only channels 0 and 1 are capable of supporting 1-Gb connection methods.

Supported Disk Drives

The following tables lists the disk drives that are supported by the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array.

TABLE 13 Supported Disk Drives for the Sun StorEdge 3510 FC Array

Drive Description	Part Number	FRU ID Number
36-GByte 15000-RPM, FC	XTA-3510-36GB-15K	F540-5628
73-GByte 10000-RPM, FC	XTA-3510-73GB-10K	F540-5629
73-GByte 15000-RPM, FC	XTA-3510-73GB-15K	F540-6098
146-GByte 10000-RPM, FC	XTA-3510-146GB-10K	F540-5735

TABLE 14 Supported Disk Drives for the Sun StorEdge 3511 SATA Array

Drive Description	Part Number	FRU ID Number
250-GByte 7200-RPM, Serial ATA	XTA-ST1NC-250G7K	F540-6180

Note – The array is not a slot-dependent device and can be shipped with fewer than 12 drives, with each empty slot in the array containing an air management sled to correctly handle the air flow and heat. Make sure that each drive slot has either a disk drive or an air management sled, part number XTA-3000-AMBS. In a minimum configuration of five drives, these drives occupy drive slots 1-5. However, there is no restriction on the slot placement of drives as long as air management sleds are used in the empty slots.

Note – Disk drive firmware is provided through Sun disk firmware patches which include the required download utility. Sun disk firmware patches are separate from the Sun StorEdge 3000 family firmware patches. Do not use the Sun StorEdge Configuration Service or CLI utility to download disk drive firmware.

Supported Cabinets

The following table shows the supported cabinets with their associated rackmount kits and other required kits. See the *Sun StorEdge 3000 Family Rack Installation Guide for 2U Arrays* for installation instructions.

TABLE 15 Supported Cabinets and Associated Rackmount Kits

Cabinet Name	Cabinet Part Number(s)	Required Kit(s)	Required Kit Part Number	Maximum Number of Arrays Supported per Cabinet
Sun StorEdge 72-inch Expansion Cabinet	SG-(X)ARY030A	Rackmount Kit	(X)TA-3000-2URK-19U	14
Sun Fire Cabinet	SF-(X)CAB, SFE-(X)CAB	Rackmount Kit	(X)TA-3000-2URK-19U	5
Sun Rack 900-38 Cabinet	SR9-(X)KM038A-IP	Rackmount Kit	(X)TA-3000-2URK-19U	18
Sun Rack 1000-38 Cabinet	SRK-(X)RS038A-IP	Rackmount Kit	(X)TA-3000-2URK-19U	18
Sun Fire 6800 System	F6800-1	Rackmount Kit	(X)TA-3000-2URK-19U	3
Sun Fire E6900 System	E6900-BASE	Rackmount Kit	(X)TA-3000-2URK-19U	2
Standard EIA Cabinets	Not Applicable	Rackmount Kit	(X)TA-3000-2URK-19U	Varies
Telco flushmount racks	Not Applicable	Rackmount Kit	(X)TA-3310-RK-19F	Varies
Telco center-of-gravity racks	Not Applicable	Rackmount Kit	(X)TA-3310-RK-19C	Varies

Note – For more information about using Sun StorEdge arrays with the Sun Rack 900 and 1000 cabinets, refer to the Sun Rack 900 Qualified Products web page at <http://www.sun.com/servers/rack/approved.html>

Supported Cables for Sun Systems

The following table lists the supported Fibre Channel cables for connecting to the host adapters that are supported for Sun systems. You can order cables using the marketing part numbers in this table.

TABLE 16 Supported Cables

Cable Type and Length	Marketing Part Number	Manufacturing Part Number
0.8-meter LC to LC Fibre Channel optical cable	X9730A	595-7110-01
2-meter LC to LC Fibre Channel optical cable	X9732A	595-6417-01
5-meter LC to LC Fibre Channel optical cable	X9733A	595-6418-01
15-meter LC to LC Fibre Channel optical cable	X9734A	595-6419-01
25-meter LC to LC Fibre Channel optical cable	X9736A	595-6730-01
50-meter LC to LC Fibre Channel optical cable	X9738A	595-6733-01
100-meter LC to LC Fibre Channel optical cable	X9740A	595-7109-01
0.4-meter SC to LC Fibre Channel optical cable	X9721A	595-6036-01
2-meter SC to LC Fibre Channel optical cable	X9722A	595-6035-01
5-meter SC to LC Fibre Channel optical cable	X9723A	595-6037-01
15-meter SC to LC Fibre Channel optical cable	X9724A	595-6038-01
25-meter SC to LC Fibre Channel optical cable	X9735A	595-6729-01
50-meter SC to LC Fibre Channel optical cable	X9737A	595-6731-01

Bootability

Booting from the Sun StorEdge 3510 FC array is supported and requires no special procedures, as long as the appropriate Solaris patches and SAN Foundation Suite software components are installed, as described in TABLE 3.

Do not use the Sun StorEdge 3511 SATA array as a boot device. Use the Sun StorEdge 3510 FC array instead.

Software Support for Sun StorEdge 3510 FC JBODs

Sun StorEdge Configuration Service software supports Sun StorEdge 3510 FC JBOD arrays (arrays without controllers which are directly attached to servers). However, since Sun StorEdge 3510 FC JBOD arrays do not have a RAID controller to manage the disks, this software support is necessarily limited. Monitoring functionality that does not require a RAID controller works properly.

The Sun StorEdge CLI supports Sun StorEdge 3510 FC JBOD arrays. However, since Sun StorEdge 3510 FC JBOD arrays do not have a RAID controller to manage the disks, this CLI support is limited to the following `sccli` commands:

- `about`
- `download pld-firmware`
- `download ses-firmware`
- `exit`
- `help`
- `quit`
- `select`
- `show frus`
- `show ses-devices`
- `version`

To obtain information on each command, refer to the *Sun StorEdge 3000 Family CLI User's Guide*.

Note – Sun StorEdge 3511 SATA expansion units are not supported as stand-alone JBODs.

Installing Required Solaris Patches

Make sure the Solaris Recommended Patch Cluster is installed on a Solaris host before connecting the host to the array.

▼ To Download the Recommended Solaris Patch

1. **Log in to the host that you want to connect to the array.**
2. **Go to:**
`http://www.sun.com/sunsolve`
3. **Under SunSolve Patch Contents, click Patch Portal.**
4. **Under Downloads, click Recommended Patch Clusters.**
5. **Find either Solaris 8 or Solaris 9 in the OS column of the Recommended Solaris Patch Clusters list, click README and then click Go.**
6. **Print or save the README file from the browser window.**
7. **Click the browser's Back icon to return to the previous page.**
8. **Select the format you want in the row that begins Solaris 8 or Solaris 9 in the Recommended Solaris Patch Clusters list, click either Download HTTP or Download FTP, and then click Go.**
9. **In the File Download dialog box, click Save.**
10. **In the Save As dialog box, type a destination directory for the patch cluster, and then click OK.**
11. **Follow the procedure in the INSTALLATION INSTRUCTIONS section in the README file to install the patches.**

Downloading Updated Sun StorEdge 3000 Family Software

The most recent version of Sun StorEdge 3000 Family software is available at the Sun Download Center.

▼ To Download the Updated Software

1. Go to:

<http://www.sun.com/software/download/>

2. Under System Administration > Storage Management, click the Sun StorEdge 3000 Family Storage Products - Related Software link, and click the Download button.

You are taken to a Sun Download Center page.

3. If not previously registered, register.

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

b. On the registration page, enter applicable data in the required fields and click Register.

4. Log in.

a. Type your Username and Password in the left column, and click Login.

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

5. On the software download page, click the link for your array and operating system.

6. In the dialog box that is displayed, specify a destination directory and save the file.

7. Follow the software installation instructions in the *Sun StorEdge 3000 Family Software Installation Guide*.

Installing Firmware Patches

Firmware patches for the Sun StorEdge 3510 FC array and Sun StorEdge 3511 SATA array are available to upgrade firmware for the array controller, PLD firmware, and firmware for the SCSI Enclosure Services (SES) processor. For the Sun StorEdge 3511 SATA array, the patch also includes firmware for the SATA Router and the SATA MUX module.

TABLE 17 Latest Firmware Patches

Sun StorEdge 3510 FC Array	Sun StorEdge 3511 SATA Array
Firmware patch ID # 113723-09 with the following firmware: Controller firmware 3.27R SES firmware 1046 PLD firmware 1000	Firmware patch ID # 113724-03 with the following firmware: Controller firmware 3.27R SES firmware 0413 PLD firmware 1000 SATA Router firmware DPO555a SATA MUX firmware BB42

Refer to the README file for specific information about fixed bugs, as well as other detailed information and installation instructions. The README file is included in the firmware patch download file.

Note – Disk drive firmware is provided through Sun disk firmware patches which include the required download utility. Sun disk firmware patches are separate from the Sun StorEdge 3000 family firmware patches. Do not use the CLI or Sun StorEdge Configuration Service to download disk drive firmware.

▼ To Determine Your Current Controller Firmware Version

To determine your current controller firmware version, use one of the following methods:

- Using the RAID Controller serial or telnet interface, choose the “view system Information” firmware menu option. The current firmware version is displayed as “Firmware Version.”

- In the Sun StorEdge Configuration Service program, highlight any component of the desired array, click the View menu and the View Controller command, and then check the “FW Rev” checkbox.
- Using the CLI, enter the `show inquiry` command.

▼ To Determine Your Current SES and PLD Firmware Versions

To determine your current SES and PLD firmware versions, use the CLI and enter the `show ses` command. The SES version of each controller is displayed in the `Rev` column. The PLD version is displayed in the `PLD` column.

▼ To Download and Install the Firmware Patch

1. Go to

`http://sunsolve.Sun.com`

2. Click Patch Portal.

3. Use Patch Finder to locate the appropriate patch ID by entering the patch ID into the search field and clicking the Find Patch button.

4. Select the link for the format that you want, either HTTP or FTP next to Download Patch, or HTTPS or FTP next to Download Signed Patch.

5. In the dialog box that is displayed, indicate the destination directory for the patch and proceed to download the file to that location.

6. Follow the instructions in the patch README file to install the patch, which are summarized in the following sections of these release notes:

- “Prerequisites for Upgrading Firmware” on page 27
- “To Invoke Sun StorEdge CLI” on page 27
- “To Upgrade the Controller and SES Firmware” on page 28
- “To Download SES Firmware and PLD Firmware to a Stand-Alone Sun StorEdge 3510 FC JBOD” on page 32

For more detailed information and procedures, refer to the patch README file.

Prerequisites for Upgrading Firmware

The prerequisites for installing the new firmware are summarized as follows:

- Version 1.6.2 of the Sun StorEdge CLI (sccli) utility. To download and install the CLI, see “Downloading Updated Sun StorEdge 3000 Family Software” on page 24.
- Ethernet connections required for out-of-band firmware upgrades. In order to use the Ethernet connection(s), the controller must have an IP address assigned.
- For in-band upgrades, a FC connection to the array that is being upgraded.
- Stop all I/O to the array before beginning the controller firmware upgrade.
- Unmount all StorEdge 3310 logical drives/LUNs from any Solaris hosts connected to the array, for the duration of the install procedure.
- Stop any Sun StorEdge Configuration Service (SSCS) agent that may be running on a host connected to the array controller.
- Stop the StorADE agent software, or any other software that monitors the array, following the procedures described in the documentation for that application.
- Unpack the patch into any convenient directory (for example, /var/tmp)

Refer to the patch README file for more information about these requirements.

▼ To Invoke Sun StorEdge CLI

The firmware procedures require the user to invoke Sun StorEdge CLI (sccli) using the appropriate syntax for the type of connection used to manage the array.

If the array to be upgraded is a RAID subsystem, type the sccli command with no arguments:

```
sccli
```

If more than one array is connected to the host, sccli will display a list from which the appropriate device may be selected.

If the array has an IP address configured, it may be managed remotely using a network (or “out-of-band”) connection. To specify this mode, type:

```
sccli [-w <password>] <hostname | ip>
```

where <password> is the password assigned to the controller, and <hostname | ip> is the hostname or IP address of the array.

Use single quote characters to quote the password if it contains any characters that are interpreted specially by the shell. If no controller password is set, the -w option and password argument should be omitted. If the hostname for a locally attached array is unknown, the --oob option may be specified instead of a hostname, and sccli will try to determine the IP address of a locally-attached array automatically.

▼ To Upgrade the Controller and SES Firmware

The following procedure is for the Sun StorEdge 3510 FC RAID array and for the Sun StorEdge 3511 SATA RAID array. Be sure to enter the filename which matches the array you wish to upgrade.

Note – If you are using controller firmware version 3.27R, then no controller firmware upgrade is necessary.

- 1. Stop I/O to the StorEdge 3310 RAID array. Halt applications which may be using the array and, if possible, unmount any filesystems, metadisks, or volume manager volumes mounted from the array.**

Since the SSCS agent may interfere with firmware downloads, it is necessary to stop any SSCS agent that may be running on any host connected to the array controller.

a. If the SSCS agent is running on your workstation:

- Issue the following shell command as root on the system where the SUNWscss package is installed to stop the SSCS agent:

```
# /etc/init.d/ssagent stop
```

- If the SSCS agent is running on a Microsoft Windows system connected to the array, issue the following command to stop the SSCS Agent service:

```
Start → Run → services.msc
```

- b. Stop the StorADE agent software, or any other software that monitors the array, following the procedures described in the documentation for that application.**

2. Change your working directory, if necessary, to the directory in which the patch was unpacked and confirm that the `SUN327R-3510.bin` for the Sun StorEdge 3510 FC array or the `SUN327R-3511.bin` file for the Sun StorEdge 3511 SATA array is present using the `ls` command.
3. Invoke the `sccli` command. For details, see “To Invoke Sun StorEdge CLI” on page 27.
 - a. Verify that you are running `sccli` version 1.6.2 or later with the `version` command.
 - b. Verify the product and revision of the array. Type the command:

```
sccli> show inquiry
```

Verify that the Product field begins with `StorEdge 3510` or `3511`. If it does not, this patch does not apply to the selected device. Specify an appropriate device or discontinue installation of this patch.

If the Product field reports `StorEdge 3510 D` or `3511 D` and the Device Type field is `Enclosure`, the selected device is a JBOD enclosure.

If the firmware revision is reported as `0327`, check the first 4 digits of the `NVRAM Defaults` string; if it starts with a 4-digit code `327R`, the controller firmware does not need to be updated.

Otherwise, continue the RAID controller firmware upgrade with the next step.

4. Type the following command at the `sccli>` prompt and examine the output.

```
sccli> show redundancy
```

If the "show redundancy" output shows that the Active-Active mode is Enabled and displays non-zero serial numbers for both controllers, then you can perform a live upgrade and proceed with step 4a below.

If the Redundancy mode is not "Active-Active" or the status is not "Enabled", or there is a zero in the Secondary controller serial number field, your configuration cannot be upgraded "live" and you must skip ahead to step 4b.



Caution – Do not power-cycle the subsystem or remove either of the controller FRUs within 10 minutes of performing a controller firmware upgrade, or the controller may be rendered inoperable.

- a. If the "show redundancy" command reports that the Redundancy mode is "Active-Active" and that the status is "Enabled", perform a live firmware upgrade by typing the following command at the CLI prompt:

```
sccli> download controller-firmware SUN327R-3510.bin
(for the Sun StorEdge 3510 FC array)

sccli> download controller-firmware SUN327R-3511.bin
(for the Sun StorEdge 3511 SATA array)
```

and verify that the controller firmware is programmed and that the controller has been upgraded successfully. The sccli will display messages indicating that it is downloading the firmware, programming the controller's flash memory, and "engaging" the new firmware. Wait until the sccli> prompt appears again, which may take 10 minutes or more, before proceeding.

If no errors are encountered, proceed to step 5.

If you see an error message containing the text: *"please repeat download command"* or *"controller firmware download ok, but engage operation is not allowed,"* the controller was unable to perform a live firmware upgrade. Wait until it is OK to stop I/O to the array, and then follow the instructions in step 4b to do a non-live firmware upgrade.

- b. To upgrade the controller firmware into a non-redundant controller configuration (a single-controller subsystem, or a dual-controller system where only one controller is active), the controller must be reset after programming the new firmware into flash memory.

This will cause the array to be offline for several minutes.



Caution – Do not power-cycle the subsystem or remove either of the controller FRUs within 10 minutes of performing a controller firmware upgrade, or the controller may be rendered inoperable.

Make sure all I/O activity has been stopped, and unmount any filesystems or volumes mounted from the array. Download the controller firmware using the following command at the sccli> prompt:

```
sccli> download controller-firmware -r SUN327R-3510.bin
or
sccli> download controller-firmware -r SUN327R-3511.bin
```

Wait until the sccli> prompt appears again, which may take 10 minutes or more, before proceeding.

5. Verify that the firmware upgrade succeeded by examining the firmware revision again. At the `sccli>` prompt, type:

```
sccli> show inquiry
```

and verify that the firmware revision is now reported as “327R”.

6. Type the following command to verify the SES firmware version:

```
sccli> show ses
```

The output of this command displays the SES version under `Rev`, and displays the PLD version under `PLD`.

Verify that the SES code version identified in the `Rev` column indicates 1030 or earlier. If so, proceed with step 7.

7. Type the following command to download the SES firmware:

```
sccli> Download ses-firmware sesfw_3510_1046.s3r (for 3510 array)
or
sccli> Download ses-firmware sesfw_3511_1046.s3r (for 3511 array)
```

The CLI upgrades the SES firmware.

8. Type the following command to verify that the SES device has been upgraded:

```
sccli> show ses
```

Ensure that the SES firmware version indicated in the `Rev` column has changed to 1040.

9. If the SSCS agent was stopped, restart it. On Solaris and other UNIX systems, use the command `“/etc/init.d/ssagent start.”` On Microsoft Windows, use the “Services” utility (Start > Run > `services.msc`).

If other software such as StorADE was stopped, restart it following the procedures in the documentation for that software.

▼ To Download SES Firmware and PLD Firmware to a Stand-Alone Sun StorEdge 3510 FC JBOD



Caution – Do not use a version of CLI earlier than version 1.6.2 to install this patch.

1. Using the bourne shell, korn shell (ksh) or the bash shell, type the following command to identify the two SES device filenames in the chassis.

```
# for d in /dev/es/*; do sccli --list $d; done | grep 3510F >
jbods.txt
```

This command runs the command `sccli -list /dev/es/<d>` for each device filename found in `/dev/es`, and save the lines that match the FC JBOD Array to the file `jbods.txt`. This command may take a few moments to complete and may display some harmless error messages referring to non-existent devices that may safely be ignored. When it completes, `jbods.txt` should contain two lines for each directly-attached JBOD chassis. For example, if `jbods.txt` contains:

```
/dev/es/ses3    SUN StorEdge 3510F D SN#000187
/dev/es/ses9    SUN StorEdge 3510F D SN#000187
```

it indicates that `/dev/es/ses3` and `/dev/es/ses9` are two separate SES devices within the JBOD expansion chassis with serial number 000187.

2. Verify that two device filenames are listed for each chassis serial number, identifying two SES devices in that chassis.

Note – If a chassis appears only once in the list, verify that the chassis contains only one I/O Module FRU. If a chassis with two I/O Module FRUs lists only one device file name, ensure that two cables are connected to the JBOD array. If two cables are connected to the JBOD array, ensure that they are connected according to the instructions in the *Sun StorEdge Family Installation, Operation and Service Manual* for the Sun StorEdge 3510 FC Array. Run the `devfsadm` command after making any cabling changes and verify that the chassis is represented by two device filenames in `/dev/es`. If a second device filename does not appear, troubleshoot the connection before attempting to upgrade the FC JBOD Array firmware.

3. Invoke the CLI with the name of an SES device identified in Step 1. Using the example given in Step 1:

```
# sccli /dev/es/ses3
```

4. Type the following command to verify the Product and Revision of the array:

```
sccli> show inquiry
```

If the device is a JBOD chassis, “Product: StorEdge 3510F D” and “Device Type: Enclosure” are displayed.

5. Type the following command to verify the SES firmware version:

```
sccli> show ses
```

The output of this command displays the SES version under `Rev`, and displays the PLD version under `PLD`.

6. Verify that the SES code version identified in the `Rev` column indicates 1030 or earlier. If the SES code version is 1046, proceed to Step 13.
7. If the SSCS agent is running on your workstation:
 - Issue the following shell command as root on the system where the `SUNWscss` package is installed to stop the SSCS agent:

```
# /etc/init.d/ssagent stop
```

- If the SSCS agent is running on a Microsoft Windows system connected to the array, issue the following command to stop the SSCS Agent service:
Start → Run → `services.msc`
8. If StorEdge Diagnostic Automated Diagnostic Environment or any other application which monitors the status of the enclosure is running, follow the procedure described in the documentation for that application to stop the agent software.
 9. Invoke the CLI with the name of an SES device identified in Step 1. Using the example given in Step 1:

```
# sccli /dev/es/ses3
```

10. Type the following command to download the SES firmware:

```
sccli> Download ses-firmware sesfw_3510_1046.s3r
```

The CLI upgrades the SES firmware. It is not necessary to reset the JBOD enclosure.

11. Type the following command to verify that the SES device has been upgraded:

```
sccli> show ses
```

12. Ensure that the SES firmware version indicated in the `Rev` column has changed to 1040.
13. Verify that the PLD code version identified in the `PLD` column indicates A000 or earlier. If the PLD code version is 1000, proceed to Step 20.



Caution – If you use a version of the CLI that precedes version 16.2, or if array power is lost during this procedure, the enclosure can be rendered unusable.

Note – The PLD firmware upgrade cannot be completed without power-cycling the array at the end of the procedure. Do not proceed if it is not possible to power cycle the array at this time.

14. Ensure that all host I/O activity has been stopped. The JBOD will be unable to process host I/O activity for up to 10 minutes.
15. Type the following command to download the PLD firmware:

```
sccli> download pld-firmware pld1r10.s3r
```

The CLI indicates that it is sending the PLD firmware data, and programming the flash memory. All the LEDs on the array light while flash is programmed, and the CLI will pause for three to five minutes.



Caution – Do not power cycle the array at this point. Note the time and wait at least five minutes for the PLD flash programming operation to complete.

16. Wait at least five minutes after seeing the message “Please wait 3 to 5 minutes until PLD flashing completes.” Then turn power to the array off, wait 10 seconds and then turn power back on.

Note – Be sure to turn off, or unplug both power supplies, because removing power from one power supply does not cause the array to lose power. Allow up to three minutes for the controller to restart fully.

17. Invoke the CLI with the name of an SES device identified in Step 1. Using the example given in Step 1:

```
# sccli /dev/es/ses3
```

18. Type the following command to verify that the SES device has been upgraded:

```
sccli> show ses
```

19. Verify that the `PLD` column says 1000, indicating that the PLD firmware has been upgraded.
20. If the JBOD array contains:

- a. Only one I/O Module FRU, the JBOD array can be returned to service.
- b. Two I/O Module FRUs and two cables, repeat Step 9 through Step 19 for the second ses device identified in Step 1. Using the example identified in Step 1, you would connect with the JBOD by typing the command:

```
# sccli /dev/es/ses9
```

- c. Two I/O Module FRUs and only one cable, move the cable from one I/O Module to the other and repeat Step 9 through Step 19.

Installing Sun StorEdge SAN Foundation Software

Before a Sun host running the Solaris 8 operating system or Solaris 9 operating system on SPARC platforms can communicate with the Sun StorEdge 3510 FC array or Sun StorEdge 3511 SATA array through any of the host adapters that are supported for Sun servers, you must install Sun StorEdge SAN Foundation software.

Note – Sun StorEdge SAN Foundation software is not supported for x86 platforms at the time of this release.

Note – Sun StorEdge SAN Foundation 4.1 does not work without a script file modification and is no longer supported. Instead use the current version of Sun StorEdge SAN Foundation software.

The Sun StorEdge SAN Foundation software is required in these operating environments because it provides drivers for the supported host adapters. (See “Supported Platforms and Connection Methods” on page 12 for listings of the applicable host adapters.)

Note – The Sun StorEdge SAN Foundation software also contains patches, firmware, and software packages that support switches and other optional SAN features, including the Sun StorEdge Traffic Manager multipathing software for the Solaris operating system described in TABLE 6.

Note – Sun StorEdge SAN Foundation software requires the Solaris 8 4/01 operating system or later release.

See the following procedure for instructions on downloading the SAN Foundation software without charge.

▼ To Download and Install the Sun StorEdge SAN Foundation Software

1. **Log in as superuser on the Sun server to be connected to the array.**
2. **Go to:**
`http://www.sun.com/storage/san`
3. **At the bottom of the page, below “Get the Software,” select the “Sun StorEdge SAN 4.4 release Software/Firmware Upgrades and Documentation” link.**
4. **If not previously registered, register.**
 - a. **Click the Register Now link at the bottom of the left column.**
 - b. **On the registration page, enter appropriate data in the required fields and click Register.**
5. **Log in.**
 - a. **Type your Username and Password in the left column, and click Login.**

- b. Click **Continue** on the **Sun Download Center Welcome** page to see the **Terms of Use** page.
 - c. On the **Terms of Use** page, read the license agreement, click **Accept** and then click the **Continue** button.
 6. On the **Download** page, download the **Solaris 8 SFS Base Packages** or **Solaris 9 SFS Base Packages**, depending on which version of the **Solaris Operating Environment** you are running.
 7. You can also download the **SFS Base Packages README** file for software download instructions.
 8. Once you **uncompress** and **untar** the **SFS Base Packages** archive, follow the instructions in the *Sun StorEdge SAN Foundation Software Installation Guide* to manually install the packages.
-

Downloading the VERITAS Volume Manager ASL for the Sun StorEdge 3510 FC Array

This section explains what you need to do to enable VERITAS Volume Manager 3.5 and 4.0 software to work with the Sun StorEdge 3510 FC array on Sun hosts. VERITAS has provided an Array Support Library (ASL) that must be installed on the same host system as the Volume Manager 3.5 or 4.0 software to enable the software to recognize the Sun StorEdge 3510 FC array. Follow the procedure to download the ASL and the accompanying installation guide for the Sun StorEdge 3510 FC array from Sun's Download Center.

▼ To Download the ASL

1. Log in as superuser on the Sun server to be connected to the array.
2. Go to the **All Products** listing at Sun's **Download Center**.
`http://www.sun.com/software/download/allproducts.html`
3. Under the **V** heading, click on **VERITAS Volume Manager Array Support Library (ASL)**.
4. Choose the link that is appropriate for your platform.

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

The page identifies the product you selected to download as VERITAS Volume Manager Array Support Libraries (ASL) for your platform and language.
 6. **If not previously registered, register.**
 - a. **Click the Register Now link at the bottom of the left column.**
 - b. **On the registration page, enter the required fields and click Register.**
 7. **Log in.**
 - a. **Type your Username and Password in the left column, and click Login.**
 - b. **On the Terms of Use page, read the license agreement, click Yes next to Accept, and click the Continue button.**
 8. **Download the compressed ZIP file that contains the ASL package for the 3510 FC array.**
 9. **Use the `unzip` command to expand the zip file.**
-

Enabling VERITAS DMP for the Sun StorEdge 3511 SATA Array

Since the Sun StorEdge 3510 FC and 3511 SATA array is a new product, VERITAS has not yet provided an Array Software Library (ASL) for it. To enable VERITAS Dynamic Multi-Pathing (DMP) support on VERITAS Volume Manager, perform the following steps.

1. **Configure at least two SCSI channels as host channels and add additional SCSI host IDs if needed.**
2. **Connect host cables to the I/O host ports in step 1.**
3. **Map each LUN to two host channels to provide dual-pathed LUNs.**

4. Add the correct SCSI string to vxddladm so VxVM can manage the LUNs as a multi-pathed JBOD.

```
# vxddladm addjbod vid=SUN pid="StorEdge 3511"
# vxddladm listjbod
VID          PID          Opcode  Page Code  Page Offset  SNO length
=====
SEAGATE     ALL PIDS          18      -1          36          12
SUN         StorEdge 3511    18      -1          36          12
```

5. Reboot the hosts. System reboot is required to implement these changes.

Known Issues

These known issues are arranged in numeric order and according to the platforms they affect. Some bugs affect both Sun StorEdge 3511 and Sun StorEdge 3510 arrays. Others affect only one of those platforms.

Known Issues Affecting Both Arrays

The following bugs affect the Sun StorEdge 3510 FC array and the Sun StorEdge 3511 SATA array.

- **Bug 4702532: Write cache not automatically disabled when battery is offline.** Write cache is not automatically disabled when battery is offline due to battery failure or a disconnected battery. The current design allows the user to enable or disable the write-back cache capabilities of the RAID controller. The cache in the Sun StorEdge 3510 and 3511 RAID arrays is mirrored between the primary and secondary controllers; however, to ensure data integrity, you may choose to disable the Write Back cache option and switch to the Write Through cache option.
- **Bug 4714227: The character interface sometimes fails to respond correctly.** While running heavy I/O to several LUNs on different logical drives and scrolling through a menu that is long, such as a long, multiple LUN mapping menu, occasionally the menu will “escape” back one or two menus. This problem only occurs under heavy I/O and occasionally when accessing the unit using telnet over long distances.

- **Bug 4743721: SSCS: no method for identifying disk drives.** The Sun StorEdge Configuration Service program currently cannot identify a disk drive by flashing disk drive LEDs on the array.
Workaround: Use the firmware application's "Identify scsi drive" command, which offers three modes for flashing the drive LEDs.
- **Bug 4822129: Inconsistent error message between reporting methods and documentation.** Event messages sometimes differ between firmware logs, Sun StorEdge Configuration Service, CLI, and SNMP traps.
- **Bug 4872004: Time not consistent between primary and secondary controllers during failure.** Time stamps in event messages from a secondary controller might not be consistent with time stamps included in the same event messages from a primary controller. While the time stamp in primary controller event messages are correct, secondary controller event message time stamps might be off by 12 hours, and the year might be incorrect.
- **Bug 487679: sccli commands don't work for standalone JBOD.** `sccli 1.5` was enhanced to support standalone JBODs by adding code to support the SHOW FRUs, SHOW SAF-TE, SHOW SES, DOWNLOAD PLD-FIRMWARE, DOWNLOAD SAF-TE-FIRMWARE, and DOWNLOAD SES-FIRMWARE commands. These commands are not yet supported for a standalone JBOD: display of both SES I/O Controllers using the SHOW FRU and SHOW SES commands, SHOW FRU also does not yet display voltage, temperature, fan and power supply status, as well as FRU status.
- **Bug 4883836: sccli: no method for identifying disk drives.** There is currently no way to identify a disk drive by turning on its LED via `sccli`.
- **Bug 4967520: Firmware doesn't track drive failure and the drive can scan back ok.** The 3510 controller can automatically scan a drive back into the system after a drive failure. The controller will update the status of all Logical Drive (LD) members that a drive has failed but will not update the failed disk. This allows a failed disk to be scanned back into the system in the case of a spurious error with a USED state. This potentially bad disk drive can then be added to the spares pool if the Automatic Assign Global Spares feature is enabled and the disk drive passes the controller validation criteria. To minimize the impact of this issue, the "automatic assignment of global spare" feature can be disabled so the device will not be used as a spare but remain in the USED state. Documentation is being enhanced to provide this information.
- **Bug 4976393: SSCS monitoring sw not backward-compatible with previous versions.** When using a central host with Sun StorEdge Configuration Service to monitor a number of systems with arrays attached, the SSCS software is not backward-compatible with previous versions. The upgraded software cannot discover any previously monitored systems until you upgrade the agent package on the attached hosts.

- **Bug 4993105: Read/Write Failures on SE3510/SE3511 during 24 hour RSCN fault injection test.** Occasionally when cables are pulled and replaced, the host may lose all paths to the Sun StorEdge 3510 or 3511 array. At this point, a read/write error occurs, and all I/O is stopped to the LUNs.
- **Bug 5016154: SCCLI: OOB connection failed with “network connection setup failed”.** While trying to communicate to diag67 (3310 SCSI) 00b via StorADE, I could not gain access to the unit. In-band works fine. The problem with StorADE is that the sccli can not communicate with the Sun StorEdge array. This applies to other Sun StorEdge 3000 arrays as well.
- **Bug 5022022: DRAM parity errors/SDRAM ECC errors can cause data corruption.** SDRAM error appeared in the syslog and kept on flooding the `/var/adm/messages`. However the event log showed DRAM parity errors. These messages are inconsistent. It was noticed that after the message in the `/var/adm/messages`, `vxf`s file system gave an error and the filesystem got corrupted. The workaround is to replace the controller for the first instance of SDRAM error on the syslog and make sure to run parity regeneration to ensure data integrity.
- **Bug 5026182: Firmware upgrade/downgrade displays incorrect timestamp via sccli show events.** The RAID controller generates a time stamp via firmware that can drift over time.
Workaround: Reset the time manually.
- **Bug 5029233: SE3510/SE3511 presenting unpermissioned LUNs to host.** The LUN filtering function does not work properly when the “name” attribute is set and the WWN mask is `0xffffffffffffffff`. The firmware uses the “name” field as the “WWN mask” to compare the HBA WWN with the filtered WWN and can get a incorrect result for some WWNs.
- **Bug 5034422: SE3510/3511 ethernet interface very slow / hangs when running at 100MB half duplex.** RAID array’s Ethernet connection is very slow if it is connected to a DLINK DFE 9080x running at 100MB half-duplex. The device is not a switch but a dual-speed hub that was EOL’d in 1999. Auto-negotiation was not ratified until 1997, probably before the hub was designed.

The controller firmware did not incorporate a robust link recovery algorithm resulting in intermittent operation in certain configurations.

Because auto-negotiation operates at 10BASE-T frequencies, the negotiation phase will often succeed on cable that will not support a 100BASE-TX link. 100BASE-TX half duplex must handle collisions, contentions and arbitration which are not factors with full duplex. Marginal cable can cause a link to either operate with a high rate of errors, or not at all. Cable length for half-duplex is limited to 330 feet; full-duplex is rated to 6600 feet.

Workaround: Use a switch port capable of full-duplex operation for the most reliable operation. Switch ports should be configured for auto-negotiation. You can check the error statistics and negotiated protocol from the user interface under communication parameters. There may also be signal integrity concerns.

- **Bug 5039653: Both controllers sometimes get hung with `sccli show lun-maps` with more than 16 filter entries.** When `sccli 1.5` is used with more than 16 filter entries configured for a LUN mapped on a particular port channel and multiple LUNs exist on the same channel, the yellow maintenance LED is lit on one or both controllers.
Workaround: Do not use `sccli show` configuration or `show lun-maps` if you have more than 16 filter entries.
- **Bug 5039690: Show lun-maps is limited to 256 lines.** For complex LUN filtering configurations, more than 256 items can occur in mapping configuration. `sccli show lun-maps` is unable to provide more than 256 entries.
Workaround: Use the RAID firmware menus to see the whole LUN configuration.
- **Bug 5051108: password security issue with minnow firmware/sccli.** When a password is required to perform certain operations over the network on StorEdge 3000 Family RAID controller products, `sccli` transmits the password in clear text. This may represent a security issue for sites where a hostile third party can capture network traffic between the host on which `sccli` is running and the storage device. As a workaround, the customer can configure their network so that snooping is not possible (this is the default behavior in most switched ethernet topologies).
- **Bug 5063863: Power-cycling Ex500 hosts with 1Gb HBA connected to 3510 array will lose access.** A Ex500 host using a supported 1-Gb HBA (PN# 375-3048) connected to a 3510 is working fine until the host is power-cycled (via the key switch). When the hosts is powered back on and booted the 3510 link status LED is not lit and the partitions/LUNs that the 3510 has mapped out are not seen in format.
Workaround: Change the data rate from Auto to 1GHz on the 3510 FC channel connected to the host.
- **Bug 5069970: SE3510FC: Addition of JBOD expansion unit to existing RAID unit not documented.** The current documentation set for the SE 3510 FC array doesn't include a specific procedure on how to install a JBOD expansion unit to an existing, configured RAID array, although it does say they can be "dynamically added." A documented procedure, including the need to at least quiesce host i/o to the array before connecting the expansion unit to the RAID unit, is requested as there has been confusion in the field over the meaning of being able to "dynamically add" expansion units to existing RAID units (literally cabling new expansion units to running, production RAID units).
- **Bug 5082717: `sccli 1.6.1 - 'show battery'` becomes INTERACTIVE when run for first time.** Running the `sccli (v1.6.1)` on an SE3511 for the first time. Run the command `'show battery'`, and it asks a question: `sccli> show battery The date 2004/ 8/ 4 will be stored as the In-Service Date of Upper Battery. Are you sure that this date is correct? y.` After the user answers the question, the command shows you the battery information. No "show" command should be interactive.
- **Bug 5105001: `sccli show disk` no longer displays the drive firmware revision.** 3.27T firmware for 3511 changed the drive data information structure, and made the disk model string 32 bytes long. The SCSI spec says it should be 24 bytes.

sccli always assumes a drive data structure will have a 24-byte-long model string instead of the model offset and length provided in the same SATA structure. Therefore the revision is not in ASCII, and the sccli display route doesn't display the revision number.

- **Under heavy load, the SSCS console might become unresponsive.** If the Sun StorEdge Configuration Service (SSCS) console does not reconnect after the load decreases, perform a rescan. This situation can also prevent event messages from being emailed by SSCS Console and Diagnostic Reporter software, as well as updating of the SSCS console. The workaround is to assign a primary host LUN for SSCS to communicate with exclusively. No data or I/O should be used on this path. In order for this workaround to be effective, you must map only the LUN that SSCS will use and configure SSCS before mapping the data drives.
- **When configuring the Web Server for use with ESM the Configure Web Server feature may fail.** When configuring the Web Server for use with Enterprise Storage Manager, the Configure Web Server feature under Custom Configuration Options may fail. To configure the Web Server manually, log in as superuser on the host on which the Sun StorEdge Configuration Service agent is running and issue the command:

```
# /usr/sbin/sscfhtml.sh -i ipaddress -p password
```

where *ipaddress* is the host name or IP address of the array, and *password* is the password assigned to the array. Allow 20-30 seconds for this command to complete, and then verify that it worked by using any web browser to visit:

<http://ipaddress/esm.html>

The Web browser displays a message “This page launches the Sun StorEdge(tm) Configuration Service Console applet” and, if the SUNWnsmat package is installed, the SSCS GUI will be launched.



Caution – Do not select the “Restore Factory Defaults” option in the SSCS Change Controller Parameters window. This command overwrites new or changed IDs, removes all mappings, and loses communication to the devices due to the loss of mappings.

Known Issues Affecting Sun StorEdge 3511 Arrays

- **Bug 5016154: sccli: OOB connection failed with “network connection setup failed.”** This appears to be a firmware problem in which the “primary agent” task in the RAID firmware (Sun StorEdge 3310 or Sun StorEdge 3511) refuses to accept a connection from sccli on its network interface. When this happens, sccli may ask for a password when trying to connect to the array out of band.

- **Bug 5034695: `sccli: show inter-controller-link` is not functioning properly.** In released SATA SES code, SATA SES has a different PBC than the 3510 array. All ICL operations are a PBC-related action, and will not be supported until SATA SES code starts to support that.
- **Bug 5036411: Luns created and mapped don't appear on the host without `forcelip`.** Logical drive 0 was created and partitioned; three partitions were mapped to the host using host filter. The LUNs are not seen by the host until a `forcelip` is issued on the paths.
- **Bug 5037166: `sccli <device> show config -xml` "outputs wrong total numbers of SES.** `show config --xml` is using the SES target numbers returned by the RAID controller firmware. However, the RAID controller firmware only reports the SES on one drive loop and does not report the SES on its redundant loop.
- **Bug 5045629: running "show disks in a logical-drive" returned value of LD Index is always 0.** The `sccli` command "show disks in a logical-drive" displays information about the disk drives in the specified logical drive. However, the returned value of the LD Index is always 0. The logical drive index is maintained by `sccli` rather than by the RAID firmware. The `sccli` utility should echo this information to the CLI command line, but did not.
- **Bug 5049271: unmap command fails to unmap LD partitions with filter mapped entries.** `sccli` checks the filter map before unmapping the logical drive. If the mapping has a filter map, `sccli` does not allow unmapping it.
- **Bug 5050720: Sscli & SCS with multiple lun filters create ID-partitions of 00000000-00 and {}.** `show conf` missed a LUN map filter entry and displayed two new entries with ID-Partition numbers of 00000000-00. The RAID firmware allows multi-partition mapping on the same mapping point due to a bug in the firmware's external interface. In some cases, it is possible to create this mapping using the management software. Once multi-mapping has been created, `show map` displays incorrect information.
- **Bug 5054686: Host filter mapping failed with the error "Map Host LUN Failed."** 13 luns were successfully mapped on the secondary controller. When attempting to map the 14th lun, the mapping failed with "Map Host Lun Failed!". If "map host lun" is used without host filtering, the mapping succeeds. If the 13th lun is removed and the 13th lun is mapped using host filtering it succeeds. The 14th lun is mapped successfully using host filtering. But lun 15 mapping fails using host filtering.
- **Bug 5059398: Data Corruption during IO, with LD rebuild and multiple fault condition.** Under very heavy I/O conditions from Diskomizer concurrent with a disk rebuild option and a script that performs automated RAID controller fail-over/fail-back or multiple boot cycles, a timing race condition within the RAID Controller firmware can occur after an extended period and can result in a RAID stripe not being properly locked. The results in the data for the stripe not being written to the disk, or in some cases, the data is incorrectly overwritten and the stripe can be corrupted. This has only been seen so far in a heavily loaded, double-fault condition of some kind, such as induced controller failure in

multiple cycles while rebuilding a drive, or server reboot cycles while rebuilding a drive with multiple hosts. This is not a Sun StorEdge array bug but a kernel bug, but may affect Sun StorEdge 3511 SATA array customers.

- **Bug 5091272: Cannot perform parity check on LD assigned to secondary via the CLI.** CLI doesn't allow two parity check operations at the same time. If a logical drive parity check operation is already underway, an incorrect error message is displayed.
- **Bug 5094897: LD rebuild only gets to 99%.** With an SE 3511 RAID array and six-drive LD assigned to a secondary controller, a disk drive was removed and replaced with a new one. The rebuild stalled at 99% for at least two days. There was heavy I/O during some of the time. The array was reset and the rebuild started at 0% again. Without I/O, the rebuild completed in around 12 hours.
- **Bug 5096149: Tip session displays garbage characters when failed sec. control is de-asserted.** Using a tip session to manage a 3511 array, a secondary controller failed and was allowed to remain in the degraded state for approximately twenty minutes. The “failed” secondary controller was de-asserted through the same tip session and garbage characters starting appearing on the Tip Display window. Workaround: <ctrl> L usually cleans up the screen. If this fails, close the tip session and start another tip session.
- **Bug 5102832: scli show events does not show MPxIO path degrade information for 3511.** When oob monitoring the 3511, the monitoring host may be different from the host that 3511 hooked (through a switch). When MPxIO path is degrading, there is no way to catch such information from /var/adm/messages.

Known Issues Affecting Sun StorEdge 3510 Arrays

- **Bug 4819218: Differences between firmware and scli events.** The firmware application menu event log timestamp and the scli event log timestamp appear as different times. This is because the firmware application menu gets its timestamp information from the time that is set on the RAID controller, and the scli utility gets its timestamp information from the server that it is running on. Additionally, the scli utility currently reports events from the primary controller only.
Workaround: Manually set the clock on the controller to match the server to which it is connected.
- **Bug 4825806: BBU warnings should not be as severe.** The array has a battery circuit board that monitors and charges the battery during normal operation. Since the battery is not charging while the array is powered off, some of the charge of the battery will dissipate. When the array is powered on, the battery circuit board will detect the power dissipation of the battery and will display the

following message: “[0125] WARNING: Controller BBU Not Fully Charged” and begin to recharge the battery. Once the battery is fully charged, the following message will be displayed: “[01A5] NOTICE: Controller BBU Fully Charged!”

- **Bug 4881785: Cluster panics with Logical Volume on Secondary Controller.** In a Sun cluster environment, when the logical volumes are assigned to the secondary controller, the cluster will panic during node failover. The documentation has been modified to warn against using logical volumes (a legacy feature) in a Sun Cluster environment.
- **Bug 4888608: Solaris SES driver receives incorrect response from RAID array in attach.** The issue concerns the SES emulation response with LUN masking. If the array is configured for LUN masking and LUN 0 is not mapped to a logical drive, the array will return a zero length response to an SES configuration mode page request. This causes the Sun driver not to attach the device.
- **Bug 4896313: Cache data isn't flushed correctly in case of primary battery failure.** If the battery is unplugged or dead, write cache is not disabled. This means that if power is lost, data in the cache could be lost.
- **Bug 4900452: Network connectivity through default gateway is unreliable.** The out-of-band connection of the RAID array may not communicate with a host through the configured default gateway until communication is established with a network device that is on the same subnet as the array.
- **Bug 4901347: Disk information from `sccli` and firmware don't match.** Information returned by the RAID array through `sccli` is not as complete as information returned when monitoring the array through the firmware. When you monitor drive parameters through `sccli`, the SCSI Motor Spin-Up, SCSI Reset at Power-Up, and Disk Access Delay Time parameters are not displayed, though they are through the firmware.
- **Bug 4901393: SCCLI error messages are too vague.** Error messages may be unclear as they are displayed by the `sccli`, and are not defined in the `sccli` manual.
- **Bug 4906783: Firmware is not integrated with the FRU-ID's.** The RAID Controller serial number is displayed in the error messages instead of the FRU-ID serial number.
- **Bug 4911841: Unable to send SNMP traps using 'agent.ini' file, as documented.** SNMP traps from the RAID array are unable to be sent using the 'agent.ini' file, as documented in the User's Manual.
Workaround: Use SSCS to send the SNMP traps.
- **Bug 4921484: RAID array did not shut down during extended overtemp conditions.** The unit must shut down if the temperature exceeds the given limit. Currently the unit does not shut down. However, the unit is fully NEBS certified, and will handle the required temperatures required by NEBS certification.

- **Bug 4924834: Physical disk drive are displayed with inconsistent size throughout the product.** The same disk drive size is displayed as 34476M by the `sccli`, 34476MB by the XML output, 33.92GB by the `sccli show config` command, and 34732MB by the `tip/telnet` output.
- **Bug 4926681: FC3510 does not log into switch after switch fault.** To avoid this problem in mixed 1GB/2GB SANs with QLogic switches, run the Sun StorEdge 3510 array in point-to-point mode.
- **Bug 4931174: Invalid Transmission Word stops incrementing when it reaches 65535.** The Invalid Transmission Word counter, which increments on detecting receive errors, stops counting when it reaches 65535. This counter is reset to zero when there is a power cycle or reset.
- **Bug 4942959: Storade - device port status is not monitored by 3510 firmware or sccli sw.** The host should detect that a cable is removed. Adding this functionality to the RAID Controller Firmware would require a very significant amount of effort.
- **Bug 4944252: After a disk failure, the drive is no longer displayed by sccli.** After a disk drive fails, the drive is no longer displayed by `sccli`.
- **Bug 4946986: SSCS reports incomplete information about a critical error.** A critical error message displayed by SSCS was decoded using the `error_msg_configService.pdf` provided by Dot Hill. When the error message was decoded, the last byte was not defined the table G-28 in this document. The documentation will be updated to clarify SSCS error codes.
- **Bug 4950237: sccli - show disks should show both disk channels, not just one.** The `sccli show disks` command shows only one channel. It does not show that disks are connected to two channels.
- **Bug 4950297: Parity checks run from the GUI always enable auto-correction of parity.** When you run a parity check from Sun StorEdge Configuration Service, auto-correction of parity is always enabled.
Workaround: Run the parity check manually from the serial port or a telnet session.
- **Bug 4955390: scgdevs cluster command causes array to reset.** After a firmware upgrade, array resets may occur when certain cluster commands, such as `scrubber` or `scgdevs`, store keys in the persistent reservation area.
Workaround: When the array resets, hit the 'skip' option to avoid writing into the persistent reservation area.
- **Bug 4959806: sccli: can't gain access to LG# from the firmware.** Logical drives created out of order, such as 0, 6 and 7, will be displayed by the `sccli` utility as LD0, LD1, and LD2. This is also true for logical volumes displayed through the `sccli` utility.
- **Bug 4960959: Controller replacement sometimes fails under heavy I/O load.** In certain cases, when a controller is pulled and then replaced, it sometimes fails to become primary/secondary under heavy load. The LEDs on both controllers are solid green and the LUNs assigned to the secondary controller cannot be accessed

from a host.

Workaround: Reseating the secondary controller fixes the problem in most instances.

- **Bug 4964418: LD initialization sends FW event but LD deletion does not send event.** The RAID array does not save an event to the event log when a logical drive is deleted.
- **Bug 4964422: LD initialization event is inconsistent between telnet and SCCLI.** The event message displayed by a telnet session with the RAID array is not the same as the event message that is displayed through `sccli` for the same event.
- **Bug 4966606: When a disk is pulled out from 3510/3511 array, `sccli: disk status` should be missing.** When a disk is pulled out of the array, the disk status is displayed through `sccli` is “Bad drive” instead of “Drive missing.”
- **Bug 4976393: SCS monitoring sw not backward-compatible with previous versions.** When using a central host with Sun StorEdge Configuration Service to monitor a number of systems with arrays attached, the SCS software is not backward-compatible with previous versions. The upgraded software cannot discover any previously monitored systems until you upgrade the agent package on the attached hosts.
- **Bug 4980144: Dual-ported disk can be scanned twice.** If a disk drive is assigned to two channels, that drive can be scanned two times, once time for each channel. If this happens, it is possible to assign the same disk drive to a logical drive twice. **Workaround:** Scan from only one channel any disk drives that are assigned to two channels.
- **Bug 4990550: disk drive firmware download failed, but script reset controller and says succeed.** When downloading disk drive firmware using `sccli`, if the download fails, `sccli` reports that the download was successful and resets the controller.
- **Bug 4991110: `sccli show channels` indicates speed has changed from 2G to ASYNC.** In some cases, after a firmware download, the host channel link speed is displayed incorrectly. This condition persists until the next controller reset or the next LIP on a given channel.
- **Bug 4992074: failed drive disappears.** If too many bad blocks are encountered on a hard drive during logical drive initialization, the initialization will fail. As a result, the failed drive will not show up on the “view and edit scsi drives” menu. It will still be displayed in the loop maps menu option in the `sccli` utility. After reseating the controller, the bad drive will be displayed in the “view and edit scsi drives” menu.
- **Bug 4995551: Serial numbers in event log are inconsistent or missing.** No serial numbers are displayed from the firmware for controller initialization events. Controllers are identified as `p` (primary) or `s` (secondary), but a controller's primary and secondary roles are not fixed, and may change over time. Similarly, in the `sccli`, all controller events display the serial number of the primary controller, even if the event was generated by the secondary controller.

- **Bug 4996006: 3510/3511 JBOD: “SES/PLD firmware mismatch” error should be captured by scli & SSCS.** If an SES/PLD firmware mismatch is encountered on a Fibre Channel JBOD, this condition is indicated by a flashing Event LED and an audible alarm. Neither of these indications are reported by `scli` or Sun StorEdge Configuration Service.
- **Bug 4999304: syntax problems with scli help and man pages.** The CLI online help uses the shorter form of the command, such as “show led-status” and “show led” are the same command, and “show safte-status” and “show safte” are the same command. These shortcut commands are not listed consistently throughout the SCCLI online help utility. The SCCLI utility needs to be more consistent with the user guide.
- **Bug 5006323: Download nvram command results in error and fails to restore a reset config.** Straight upload/download works, but if you reset NVRAM in between, it fails on the IP address. The workaround is to either use the tip via serial port connection, or an in-band CLI so the network interface parameters can be reset.
- **Bug 5007650: Controller offlines disk drive with an “Unexpected Sense Received” event.** Event logs were discovered where the drives on a system were wrongly failed by the controller firmware. Documentation is needed that describes all the sense codes returned by the drives and how the controller firmware responds to the drive sense codes.
- **Bug 5008088: scli show removed disk capacity as 2TB or 0MB, the status should be missing.** The RAID firmware external interface still returns stale data even though the drive is removed; size is reported as 0 or max (2TB).
- **Bug 5014422: scli show frus returns inconsistent result intermittently.** Running `scli` version 1.5 and FC 3510 firmware 3.27R in-band for 14 hours (3200 iterations), the command did not return FRU information in seven cases. This appears to have been a problem with the in-band connection, resulting in no FRUs shown but no “FRU missing” message. `scli` access to the 3510 array through an in-band connection sometimes retrieves bad pass-through command status when scanning SES targets, resulting in 0 SES targets found. Since all FRUs are reported by SES targets, if 0 SES targets are found, then no FRU is reported.
- **Bug 5016303: scli should show removed FRUs with status “missing.”** When we remove a FRU from an array, the `scli show fru` command does not show that FRU anymore. Instead it should keep showing the FRU information with status “missing.” However, since there is no unique default configuration; there can be multiple number of drives, controller, etc., and the array is displaying information as designed.
- **Bug 5018110: gui chops hostname.** SSCS stored the first 7 chars of the host name which SSCS agent is assigned to manage the storage unit. Because the controller firmware only enable 8 bytes (64-bit WWN) for each item, so only the first seven characters and the trailing zero are stored.

- **Bug 5020212: sscnsole allows two managing servers assigned for same array.** `sscconsole` accepts “controller assignment” for 2 servers simultaneously after merging installations into one GUI environment. SSCS stored the first 7 chars of the host name which SSCS agent is assigned to manage the storage unit. When “berlab060” is assigned to manage the RAID unit, “berlab0” is stored in the RAID unit. However, when “berlab061” is assigned again, the SSCS agent compares the first 7 chars and treats it the same as “berlab060”, so there is no warning message for this server.

Workaround: Reassign controllers after merging. This will allow only one of the visible servers to act as a controlling instance for GUI operations.
- **Bug 5021983: “SDRAM ECC error” is wrongly translated as “DRAM parity error”.** The firmware changed but the translation did not. Should always be “SDRAM ECC error” because there is no DRAM Parity.
- **Bug 5022022: DRAM parity errors/SDRAM ECC errors can cause data corruption.** SDRAM error appeared in the syslog and kept on flooding the `/var/adm/messages`. However the event log showed DRAM parity errors. These messages are inconsistent. It was noticed that after the message in the `/var/adm/messages`, `vxfs` file system gave an error and the file system got corrupted. The workaround is to replace the controller for the first instance of SDRAM error on the syslog and make sure to run parity regeneration to ensure data integrity.
- **Bug 5026029: Firmware upgrade/downgrade shown as controller failure detected from `sccli`.** Once the firmware is downloaded onto both controllers, they reset automatically one by one, and upon initialization are loaded with the new firmware. The RAID controller displays an informational message to the user concerning the controller going down, but `sccli` generates a “redundant controller failure detected” event.
- **Bug 5032470: When bad drive parity encountered 3.27Q, event is not fully logged.** When a drive parity inconsistency error is encountered, the event only has the event number and is not fully logged in the event log on the array.
- **Bug 5034422: SE3510/SE3511 ethernet interface very slow/hangs when running at 100MB half duplex.** SE3510 FC array ethernet connection is very slow, if it is connected to a DLINK DFE 9080x running at 100MB half duplex. The test script, using `sccli` commands, hangs after 2 or 3 days.
- **Bug 5036125: “`sccli <device> show config -xml`” outputs wrong total numbers of SES devices.** `show config --xml` is using the SES target numbers returned by the RAID firmware; however the RAID controller firmware only reports the SES on one drive loop, and does not report the SES on its redundant loop. Code will be added to scan all SES targets to get the total SES target.
- **Bug 5038581: FI: Fan failure recovery displays different error code for telnet and `sccli`.** The event descriptions are similar but the event codes are not the same. The telnet session event code was `[3FA2]` versus `sccli` event code `[3FdF]`. These are not error codes and will not be present in the next firmware and software release.

- **Bug 5038863: Command timeout on 3510 FC array due to no XF_RDY for ~ 90 seconds.** Intermittent time outs occur for SCSI commands pertaining to communication with the array. The SCSI command used for configuration and monitoring do not complete causing `/var/adm` error messages to be output. Commands are completed normally on a retry. The trace of this issue showed no response from the 3510 to a Send Diag command. This occurred intermittently when a server was rebooted in this SAN configuration and is a side affect of a firmware change in the 3.27R release. It has been determined this occurs in loop only, public and private, with fabric mode used as a valid workaround. The firmware did not always handle interrupts properly during login/logout and/or loop initialization, resulting in command time outs.
Workaround: This is currently believed to only affect 3510 arrays in loop mode. Changing the array to fabric point-to-point mode avoids the problem (refer to the SE3510 documentation for configuration limitations in fabric point-to-point mode). This workaround only applies to configurations with fewer than 64 LUNs.
- **Bug 5051991: sccli diags does not support interactive password option.** This bug prevents StorADE from supporting the diagnostic function when user sets password on the 3510 device. As interactive password is not supported when running `sccli`, `diag` option will open a security hole. The “show shutdown” and other diag commands do not invoke the `passwordcheck()` routine to prompt for a password interactively if one is not provided by an interactive user. This will be fixed in the next release. However, this bug should not affect StorADE because StorADE should be using the `password` command to specify the password prior to specifying other commands, rather than waiting for `sccli` to prompt for the password. The evaluation you have for this bug is incorrect. The “show shutdown” command does not permit the password redirection. There is no workaround for this bug without exposing the password in the process table.
- **Bug 5072698: Getting “NVRAM CRC Error! MVRAM must be reinitialized” on SE3510 while resetting.** The error “NVRAM CRC Error! NVRAM must be reinitialized” appears when the SE3510 is power cycled and the array booted. All the LUN mappings were gone and everything had to be remapped and only then the host could see the LUNs.
- **Bug 5085064: Bad Block reallocation success or failure is not indicated on reads.** When bad block errors occurs, the event log records the bad block error with no indication of a reallocation success or failure.
- **Bug 5089837: Show port-WWNs does not show all WWNs.** The system configuration is:

	PID	SID
FC0	40	41
FC1	NA	NA
FC4	NA	NA
FC5	45	46

When the `sccli` command `show port-wwns` is run, it does not show both WWNs for FC5. Similarly, if FC4 is configured, the `sccli` command will not show its WWNs.

- **Bug 5091272: cannot perform parity check on LD assigned to secondary via the cli.** The CLI currently performs the parity check operation only on RAID 1, 3 or 5 logical drives on the primary controller.
- **Bug 5091492: unmap partition does not work as documented.** Two of the command options do not work. The command `unmap partition <partition-id> [<channel>]` does not work. The syntax for unmapping a partition with a `wnn-name` works, but only when it applies to a partition without a filter map.
- **Bug 5093552: Host Chl PID marked NA shows different output of the Speed (CurSynClk).** When the chl Host PID is not assigned to any scsi ID as marked NA, the CurSynClk output shows a blank space in 'view and edit scsi channels' table and the "speed" output shows "ASYNC" in 'sccli show channel' table. These outputs should be the same.
- **Bug 5095223: Recovery behavior of LD needs to be a manual process.** The *Sun StorEdge 3000 Family Installation, Operation, and Service Manual - Sun StorEdge 3510 FC Array* states in Section "8.5 Recovering from Fatal Drive Failure" that you can recover from a Status: FATAL FAIL (two or more failed drives) by simply resetting the controller or powering off the array. This is invalid behavior and needs a manual process of recovery rather than an automatic one.
- **Bug 5097113: sccli show luns/maps commands displays wrong id information.** With SE 3510 RAID running 3.27T firmware, some output from the `sccli>show luns` command showed incorrect mapping and jumbled numeric IDs. On Solaris, data returned from the RAID controller needed to be converted from little endian to big endian numeric formats for Node Name and filter maps. For this particular issue, cli did not convert to big endian for enough filter maps.
- **Bug 5104240: Statement in the document is quite incorrect.** The phrase "the connective hosts must be inactive" can mean all I/O from the connected hosts must be stopped. Other documentation states that "with proper hardware and software configuration in dual-controller mode, a failed controller can be replaced while the existing controller is actively serving I/O". The difference must be reconciled.
- **Bug 5105460: Diagnostic reporter stays in a discovering state.** The diagnostic reporter is installed with the necessary host/agent information and the configuration saved. When the SSCS is probed using port 1270, the GUI only returns the status of discovering; it never turns to online.

Fixed Software Bugs

The following table contains the bugs that are fixed in Sun StorEdge CLI 1.6.2.

TABLE 18 Fixed CLI Bugs

Bug ID	Synopsis
4922658	"sccli --list" on a host with IDE cd-rom and "vold" disabled causes uata timeout
4986132	show disk output needs a space
5052701	1.5 sccli reports 'not supported' message for older revision batteries
5069625	Cache optimization mode can be incorrectly changed causing data integrity issue.
5092121	sscli allows failed controller operation before a failback has completed on a prev

