Sun StorEdge™ 3000 Family CLI 1.6 User's Guide

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Contents

Preface

Use the Sun StorEdge™ 3000 Family Command-Line Interface (CLI) to manage Sun StorEdge 3000 family array controllers, examine and configure Sun StorEdge 3000 family arrays, save and restore configuration data, and to download new firmware to RAID controllers and JBODs. The CLI utility communicates with the storage subsystem using in-band or out-of-band communication with the RAID controller over LVD SCSI, Fibre Channel, or Ethernet connections.

Note – The Sun StorEdge 3120 SCSI array is a standalone JBOD. It does not have a RAID controller to manage the disks. For a list of the available JBOD CLI commands, see "JBOD Commands" on page 118.

For instructions on installing the CLI, refer to the *Sun StorEdge 3000 Family Software Installation Guide*.

This guide is written for experienced system administrators who are familiar with Sun hardware and software products.

How This Book Is Organized

This book covers the following topics:

Chapter 1 introduces the Sun StorEdge CLI and provides an overview.

Chapter 2 provides the available system function commands with sample code.

Chapter 3 provides the available controller, disk, and serial ATA (SATA) commands with sample code.

Chapter 4 provides the available host and drive channel commands with sample code.

Chapter 5 provides the available CLI commands with sample code for logical drives, partitions, and logical volumes.

Chapter 6 provides the firmware, disk drive, router, and path controller show and download commands.

Appendix A contains a list of the CLI options, a list of CLI commands for RAID arrays, and a list of CLI commands for JBODs.

Appendix B lists error and status messages and error codes.

Appendix C includes a list of the items included in the output of the `show configuration` command and the sample XML output of the `show configuration XML` file command.

The Glossary provides RAID terminology and definitions used throughout the product documentation

Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris™ operating system documentation, which is at

  `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Typographic Conventions

The CLI syntax and examples use the typeface conventions described in the following table.

TABLE P-1 Typeface Conventions

Typeface[1]	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your .login file. Use ls -a to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% **su** Password:
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type rm *filename*.

1 The settings on your browser might differ from these settings.

The CLI syntax and examples use the special characters described in the following table.

TABLE P-2 Special Characters

Character	Description	Example
[ ] brackets	Brackets indicate that the option or argument is optional. If the brackets are omitted, the argument must be specified.	`mute [controller]`
{ } braces	Braces indicate that the enclosed options or arguments are mutually dependent. Treat everything enclosed in braces as a unit.	`check parity {ld {`*n*`} | `*LD-ID*`}`
| separator	A separator indicates that only one of the arguments separated by this character can be specified.	`shutdown logical-drive `*ld*`{`*n*`} | `*LD-ID*

Accessing Sun Documentation

All Sun StorEdge 3000 family documentation is available online in both PDF and HTML format at the following location:

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

The following locations are specific for the SCSI array and FC array:

http://docs.sun.com/db/coll/3120SCSIarray

http://docs.sun.com/db/coll/3310SCSIarray

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

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

You can view, print, or purchase a broad selection of Sun documentation at:

http://www.sun.com/documentation

Contacting Sun Technical Support

For late-breaking news and troubleshooting tips, review the release notes for your array located in the appropriate directory:

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

If you have technical questions about this product that are not answered in the documentation, go to:

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

To initiate or check on a USA-only service request, contact Sun support at:

800-USA-4SUN

To obtain international technical support, contact the sales office of each country at:

http://www.sun.com/service/contacting/sales.html

508 Accessibility Features

The Sun StorEdge documentation is available in 508-compliant HTML files that can be used with assistive technology programs for visually impaired personnel. These files are provided on the Documentation CD for your product as well as on the websites identified in the previous “Accessing Sun Documentation” section. Additionally, the software and firmware applications provide keyboard navigation and shortcuts, which are documented in the user's guides.

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http://www.sun.com/hwdocs/feedback

Please include the title and part number of your document with your feedback: *Sun StorEdge 3000 Family CLI 1.6 User's Guide*, part number 817-4951-12.

CHAPTER 1

Overview

This chapter introduces the CLI and includes the following topics:

Supported Communication Modes

The CLI provides the capability to monitor and configure Sun StorEdge 3000 arrays from an operating system command-line interface using in-band or out-of-band interfaces.

Note – All methods that involve accessing a local device require superuser privileges. Only when an IP address is specified on the command line can the user invoke the CLI without being root.

The management mode is determined based on the following:

- If a host name or IP address is specified on the command line, it is used. This is out-of-band mode. For more details, see "Device Names for Out-of-Band Communication" on page 10.
- If a local FC or SCSI device is specified on the command line, it is used.This is in-band mode. For more details, see "Device Names for In-band Communication" on page 9.

- Otherwise, a search of local devices is done. If only one device is found, it is automatically selected. If more then one device is found, the user is presented with a menu of devices to select from. This is in-band mode. For more details, see "Device Names for In-band Communication" on page 9.
- If the user selects a local device and specifies the `--oob` option, the CLI retrieves the network address of the device using in-band methods. However, from that point forward, out-of-band access is used.

Note – If the array's IP address cannot be found, the `--oob` option does not switch to out-of-band mode. This prevents scripts from failing when the array's IP address is not set.

Accessing the CLI

In order to access the CLI, it must be installed on the server attached to the array that you want to access. For instructions about installing the CLI, refer to the *Sun StorEdge 3000 Family Software Installation Guide*. To access the CLI, follow the appropriate procedure for your operating system.

Note – To prevent unauthorized access to administrative functions of the RAID controller, the CLI requires superuser or system administrator privileges for in-band access, and uses the controller password to authorize users of the out-of-band interface.

▼ To Access the CLI from UNIX Operating Systems

To access the CLI from Solaris, Linux, HP-UX, or AIX operating systems, perform the following steps.

1. **To access the CLI, log in as `root` on the server that is attached to the array.**
2. **Type:**

```
# sccli (with options and commands as described in this guide)
```

Note – If you do not have `/usr/sbin` in your PATH environment variable, you can run the CLI as `/usr/sbin/sccli`.

▼ To Access the CLI from Windows Operating Systems

To access the CLI, go to Start → Programs → Sun StorEdge 3000 Family → Command Line Interface. This launches the file located in: `c:\program files\sun\sccli\sccli.bat`. You can modify this file if you want to change the command-line options passed to the CLI utility.

You can also access the CLI from a command shell. In the shell window, type:

```
c:\program files\sun\sccli\sccli.exe
```

Accessing Man Pages

Reference the man pages and the Release Notes for the latest documentation updates.

▼ To Access the Man Page from UNIX Operating Systems

In Solaris, Linux, HP-UX, and AIX operating systems, to access the man page, type:

```
# man sccli
```

▼ To Access Help from Windows Operating Systems

To access help in Windows, go to Start → Programs → Sun StorEdge 3000 Family → Command Line Help.

Interactive Command Mode

The CLI utility supports single-command mode and interactive mode. In interactive mode no command is specified on the command line. Specifying the device name on the command line is optional. If the device name is omitted, the CLI searches for any locally-attached Sun StorEdge 3000 Family arrays. If one is found, it is selected automatically. If more than one device is found, a list of choices is displayed. If no device is found, the CLI exits with an error.

In interactive mode, specify the device on the command line. For instance, type:

```
# sccli 192.168.0.1
sccli: selected se3000://206.6.181.38:58632 [Sun StorEdge 3510
SN#00028E]
sccli> show disks free
No disks are free.
sccli> quit
```

Or you can specify nothing on the command line. For instance, in Solaris, type:

```
# sccli
Available devices:
       1.  /dev/rdsk/c1t0d0s2 [SUN StorEdge 3310 00028E]
       2.  /dev/rdsk/c1t1d0s2 [SUN StorEdge 3310 00028F]
Enter selection: 1
sccli> show events
       :
sccli> quit
```

Note – In interactive mode, special characters must be enclosed in single or double quotes, which are parsed and stripped off. For example, if you want to set your password to an empty string, specify an empty string by typing two quote characters with nothing in between, such as `set password ""`.

Single-Command Mode

In single-command mode, the name of the target device and the command to execute are specified on the command line. The CLI executes the command and exits.

To start single-command mode, type:

```
# sccli option [device-name |host-name [:port]] command  parameters
```

TABLE 1-1 Single-Command Syntax

Syntax	Description
device-name	Specify a native operating system device file name for a locally attached SCSI target.
host-name	Specify a controller name or the IP address for the host of the primary agent.
port	Specify a port number for the primary agent on the specified controller or IP address.

In single-command mode, type the entire command on the command line. For instance, in Solaris, type:

```
# sccli /dev/rdsk/c1t0d0s2 show events
```

For example, in single-command mode in Windows, type:

```
c:\> sccli \\.\PhysicalDrive3 show events
```

When the CLI performs a single command, an exit code indicates the success or failure of the command. An exit code of 0 indicates success, and any non-zero code indicates the command failed.

Command Keywords

CLI commands are case-independent. Uppercase, lowercase, or mixed case parameters, commands, and options can be used. Options have a long form and a single-letter form. Options begin with a single dash "-" for single-letter form and with two dashes "--" for long form.

In most cases, you can abbreviate command keywords to the shortest unambiguous substring. For example, abbreviate the `show disks` command to `sh d`. For example, type `show lds` to execute the `show logical-drives` command. However, to avoid ambiguity, do not abbreviate the command name.

The general syntax for commands in single-command mode is:

```
# sccli option [device-name | host-name [:port]] command parameters
```

Except for the `help`, `about`, and `version` commands, all CLI commands require the specification of a device name.

The following table shows the parameters and options that are used with commands in the following chapters. TABLE 1-2 also shows the options that can be used to simplify script creation and retrieve information.

TABLE 1-2 Command Parameters and Options

Parameter or Option	Short Form	Description
ch.id.lun		A single host LUN mapping for a logical unit on a host channel can be specified using 3 dotted decimals in this form. Where `ch` is the physical host channel number, `id` is the SCSI ID of the logical unit, and `lun` is the logical unit number.
device		For more information, see "Device Names for In-band Communication" on page 9 and "Device Names for Out-of-Band Communication" on page 10.
disk		Physical disk drives are specified as two decimal integers separated by a period. The first number is the physical channel number, and the second number is the SCSI target ID for the drive on that channel. For example, specify the disk with target ID 1 on channel 2 as `2.1`.

TABLE 1-2 Command Parameters and Options *(Continued)*

Parameter or Option	Short Form	Description
`--disk` *disk*	`-d` *disk*	*LVD JBOD enclosure only.* This option selects the disk enclosure containing the specified disk. Specify a Solaris device name such as `sd31` or `c1t0d0`. This option is an alternative to specifying an enclosure services device such as `/dev/es/ses`*n* when selecting a JBOD enclosure. This option does not support dual-bus JBOD enclosures.
disk-list		A list of disk specifiers, separated by commas. For example, `1.0, 1.1, 1.2`.
`--help`, `--usage`	`-h`	This option displays a usage message and exits without processing any commands. This option can also be used as a command. For information about the `help` command, see "help" on page 17.
`inter-controller-link`	`icl`	This command abbreviation, `icl`, provides an alternative to typing the full command name.
ld-list		A comma separated list of logical drive indexes, for example, `ld0,ld1,ld2`, or a list of logical drive identifiers. Note that these logical-drive numbers do not necessarily correspond to the single-digit logical drive identifiers in the firmware menu interface. The CLI logical drive indexes might change when logical drives are deleted.
`--list`	`-l`	The list option displays a list of local or remote devices that the CLI manages, and exits without processing any commands. The output includes a file name or URL that can be used to access the device in subsequent commands and the SCSI inquiry data and serial number of the subsystem. If a network URL is specified on the command line, the output is limited to that device. If a local device file name or directory name is specified, the search is limited to matching devices. The output includes the device name, vendor, product ID, and serial number.
logical-drive	*ld* or *lds*	A logical drive can be represented by a logical drive *index* (a small decimal number distinguished by an `ld` prefix), or a logical drive *identifier* (an eight-digit hexadecimal number). For example, a logical drive might be identified both by its logical drive index `ld3` and its logical drive ID `71038221`. For additional information, see "Logical Drive Syntax" on page 12. Note that these logical-drive numbers do not necessarily correspond to the single-digit logical drive identifiers in the firmware menu interface. The CLI logical drive indexes might change when logical drives are deleted.

TABLE 1-2 Command Parameters and Options *(Continued)*

Parameter or Option	Short Form	Description
logical-volume	*lv* or *lvs*	Logical volumes are specified using either a logical volume index, such as `lv12`, or an eight-digit hexadecimal logical volume ID. For additional information, see "Logical Volume Syntax" on page 13. Note that these logical volume numbers do not necessarily correspond to the single-digit logical volume identifiers in the firmware menu interface. The CLI logical volume indexes might change when logical volumes are deleted.
lun		Partitions of a logical drive or logical volume are made available to hosts by mapping each partition to a target ID and logical unit number on one or more channels on the array controller. Commands with a *lun* parameter accept the physical channel number, target ID, and logical unit as three decimal numbers separated by periods. For example, `4.1.2` represents physical channel 4, target ID 1, logical unit number 2.
lv-list		A comma separated list of logical volume indexes, for example, `lv0,lv1,lv2`, or a list of logical volume identifiers. Note that these logical volume numbers do not necessarily correspond to the single-digit logical volume identifiers in the firmware menu interface. The CLI logical volume indexes might change when logical volumes are deleted.
`--no`	`-n`	Use this option to assume a `no` response to any yes/no prompts. Use this option to prompt the user before running scripts.
`--oob`	`-o`	This option accesses the selected device using out-of-band communication rather than using the SCSI or Fibre Channel HBA with which the array is connected to the host. This option accesses the device using a local HBA only briefly, to retrieve the array's network address, and all subsequent access is done over the network. This can provide better performance when the array is processing large quantities of SCSI I/O. If the IP address for the array cannot be determined, in-band communication is used instead.
partition		A logical drive or logical volume identifier with a suffix indicating a specific partition within the logical drive or volume, for example, `ld2-03` or `2CA48914-03`. The suffix is a hexadecimal number ranging from 0 to 7F.

TABLE 1-2 Command Parameters and Options *(Continued)*

Parameter or Option	Short Form	Description
`--password` *password*	`-w` *password*	This option specifies the password assigned to the array controller. The user must supply the correct password when issuing potentially dangerous commands to the array over a network connection. For security reasons, it is preferable to supply this password using the CLI `password` command, or enter the password interactively when prompted for it. No password is required for commands which do not modify the state of the controller, or commands issued using the in-band communication mode.
`--port` *port*	`-p` *port*	This option accesses the selected device out-of-band, similar to the `--oob` option, but using the specified TCP port number.
target-list		A comma-separated list of SCSI target ID numbers.
`--version`	`-v`	This option displays the version number of the CLI utility and exits without processing any commands.
`--yes`	`-y`	This option assumes a `yes` response to any `yes/no` prompts. Use this option to run scripts without prompting the user.

Device Names for In-band Communication

For in-band communication, the device name includes the:

- Native SCSI or FC disk device file names
  or
- Native device file names with the directory names and partitions removed

For systems using the Solaris operating system, the device name is typically specified as:

```
/dev/rdsk/cXtYdZs2
```

In the preceding device name code:

X = controller number

Y = SCSI target number

Z = logical unit number

s2 = slice 2 of the (logical) disk. Usually, slice 2 is specified when identifying a disk for administrative purposes, but any slice number between 0 and 7 (if the slice exists) works.

An example of the device name in Solaris is:

```
/dev/rdsk/c2t0d0
```

To access a JBOD enclosure services device using Solaris, specify the device name as shown in the following example, or use the `--disk` option and specify the name of a disk device within the enclosure.

```
/dev/es/sesn
```

For Windows operating systems, the device name is specified using the Windows internal device name for the physical device where *N* corresponds to the disk number displayed in the Disk Administrator.

```
\\.\PhysicalDriveN
```

For example:

```
PhysicalDrive3
```

Note – If no device is specified on the command line, and more than one array is connected to the host, a menu of devices is presented with one device file name for each array. If there is only one Sun StorEdge array device connected to the host, that device is selected automatically.

Device Names for Out-of-Band Communication

To access a RAID array using its out-of-band network interface rather than using the SCSI or FC HBA with which the array is connected to the host, specify the `--oob` option. This option accesses the device using a local HBA only briefly, to retrieve the array's network address, and all subsequent access is done over the network. This is useful when heavy SCSI I/O makes in-band access slow. It can also be used when the host has no path to the primary controller, but can still retrieve the IP address of the array from a LUN mapped from the secondary controller.

Alternately, if the host on which the CLI is running is not connected to the array with a SCSI or FC HBA, a URL can be specified to indicate that the CLI should connect to the remote array over the network.

In out-of-band management, the device name is typically specified as a URL in the format:

```
[se3000://] hostname-or-address[:port]
```

TABLE 1-3 Out-of-Band Device Name Syntax

Syntax	Description
[*se3000://*]	Optionally, use this prefix to ensure that the string that follows is interpreted only as a host name and not as a device name.
hostname-or-address	Specify a host name or the IP address for the host of the primary agent.
port	Optionally, specify the TCP/IP port number to use. The default value, 58632, is the only supported value.

Disk Device Syntax

A physical disk attached to the array can be identified with any of the following:

TABLE 1-4 Disk Device Syntax

Syntax	Description
ch.id	Dotted-decimal format where **ch** is physical device channel and **id** is the SCSI ID of the device.
ch.m-n	Where **ch** is physical device channel and **m** to **n** represents a contiguous range of IDs on the same channel.
sdn or *c<X>t<Y>d<Z>*	*JBOD LVD disks only.* Specify a disk device using a Solaris or SPARC device name such as *sd31* or *c1t0d0* when a JBOD chassis is selected.

Logical Drive Syntax

Logical drives can be specified by one of the following alphanumeric strings:

- their logical drive identifier, which is an eight-digit hexadecimal number assigned when the logical drive is created
- a logical drive index, which is a temporary name assigned to the logical drive for the sake of convenience

Logical drive indexes are constructed by concatenating the string “ld” with a small, zero-based ordinal number. Whenever a logical drive is created or deleted, logical drives are renumbered so that the logical drive indexes range from 0 to n-1, where n is the number of logical drives. Care must be taken not to assume that a logical drive keeps the same logical drive index after creating or deleting any logical drive or rebooting the array controller.

Some commands accept a list of logical drives, or LD-list. This list is constructed by concatenating one or more logical drive identifiers or indexes as shown in the following examples.

Caution – Any time logical drives are created or deleted, the numbering of logical drive indexes might change. After creating or deleting logical drives, issue a `show logical-drives` command to view an updated list of logical drive indexes. Or, use logical drive IDs, which do not change over the lifetime of the logical drive, rather than logical drive indexes.

This example lists logical drives using the index number.

```
ld0,ld1,ld2
```

This example lists logical drives using the local drive identifier.

```
0043BF50,05CC1F19,025E42E1
```

Note – Do not include spaces before or after the commas when specifying a logical drive list.

Logical Volume Syntax

Logical volumes are specified by one of the following alphanumeric strings:

- an eight-digit hexadecimal logical volume identifier.
- a logical volume index composed of the prefix “lv” followed by a temporary decimal ordinal number ranging from 0 to n-1, where n is the number of logical volumes configured on the array.

A list of logical volumes identifiers or indexes can be specified by concatenating one or more logical drive identifiers or logical volume indexes, separating them with commas.

Caution – Any time logical volumes are created or deleted, the numbering of logical volume indexes might change. After creating or deleting logical volumes, issue a `show logical-volumes` command to view an updated list of logical volume indexes. Or, use logical volume IDs, which do not change over the lifetime of the logical volume, rather than logical volume indexes.

This example lists logical volumes using the local volume identifier.

```
52AD5DEB,472C1397,E2054317
```

This example lists logical volumes using the local volume index number.

```
lv0,lv1,lv2
```

CHAPTER 2

System Function Commands

This chapter provides the available system function commands with sample code. Topics covered in this chapter include:

Note – To prevent unauthorized access to administrative functions of the RAID controller, the CLI requires superuser or system administrator privileges for in-band access, and uses the controller password to authorize users of the out-of-band interface.

Note – If no command is entered on the command line, the CLI enters an interactive mode, prompting you to enter commands until the `quit` command is entered. All commands operate on the currently selected device.

Basic Commands

The following commands are explained in this section:

- about
- exit
- help
- inquiry
- quit
- select
- version

about

The about command displays version and copyright information.

```
about
```

The following example shows the about text for the CLI:

```
sccli> about
Sun StorEdge 3000 Family CLI
Copyright 2002 Dot Hill Systems Corporation.
All rights reserved. Use is subject to license terms.
sccli version 1.6.0
built 2004.01.26.23.49
```

exit

This command exits the interactive mode.

```
exit
```

help

The `help` command displays a short synopsis of the available commands.

```
help [command]
```

If no command is specified, basic usage information is displayed.

The following example shows the help text for the `show channels` command.

```
sccli> help show channels
  show channels
        display channel configuration
```

inquiry

The `inquiry` command displays SCSI inquiry data returned by the array controller. The output of this command varies from one product to another, and from one channel to another. (Shortcut for `show inquiry-data`).

```
inquiry
```

The following example shows an out-of-band Sun StorEdge 3510 inquiry:

```
sccli> inquiry
Vendor: SUN
 Product: StorEdge 3510
 Revision: 327R
 NVRAM Defaults: 327R 3510 v2.54
 Bootrecord Version: 1.31H
 Serial Number: 000187
 IP Address: 199.249.246.28
 Ethernet Address: 00:C0:FF:00:01:87
```

The following example shows an in-band Sun StorEdge 3510 inquiry:

```
sccli> inquiry
 Vendor: SUN
 Product: StorEdge 3510
 Revision: 327R
 Peripheral Device Type: 0x0
 NVRAM Defaults: 327R 3510 v2.54
 Bootrecord version: 1.31H
 Page 80 Serial Number: 0001870043BF5000
 Page 83 Logical Unit Device ID: 600C0FF00000000000001870043BF5000
 Page 83 Target Device ID: 206000C0FF000187
 IP Address: 199.249.246.28
 Page D0 Fibre Channel Address: EF (id 0)
 Page D0 Node Name: 206000C0FF000187
 Page D0 Port Name: 216000C0FF000187
 Ethernet Address: 00:C0:FF:00:01:87
 Device Type: Primary
```

quit

The `quit` command exits the interactive mode.

```
quit
```

select

The `select` command selects a new device to which subsequent commands are issued. If no device is specified, and more than one choice exists, a menu of choices is displayed. This command should not be used on the command line because a `select` command is implicitly done if no device name is specified.

```
select device
```

For example:

```
sccli> select c15t0d0
sccli: selected /dev/rdsk/c0t5d0s2 [SUN StorEdge 3310 SN#00028E]
sccli> select 199.249.246.28
sccli: selecting se3000://199.249.246.28:58632[SUN StorEdge 3510
SN#000187]
```

version

The `version` command displays the version number of the CLI.

```
version
```

For example:

```
# sccli version
sccli: selected se3000://199.249.246.28:58632[SUN StorEdge 3510
SN#000187]
sccli version 1.6.0
```

Network Commands

The following commands are explained in this section:

- `configure network-interface`
- `create host-wwn-name`
- `delete host-wwn-name`
- `show host-wwn-names`
- `show ip-address`
- `show network-parameters`
- `show port-wwn`
- `show rs232-configuration`

configure network-interface

This command configures the LAN interface, enabling the Telnet, FTP, SNMP, and out-of-band management functions.

For dynamic addressing, use the following syntax:

```
configure network-interface lan0 [bootp | rarp | dhcp]
```

For static addressing, use the following syntax:

```
configure network-interface lan0 [ip-address ip-address | netmask
netmask-ip | gateway gateway-ip]
```

The following *dynamic* options are accepted:

TABLE 2-1 Dynamic Options for `configure network-interface`

Argument	Description
bootp	Specifies that the BOOTP protocol is used to establish an IP address. Some devices support bootp only as a subset of DHCP. If you receive an error message when you try to specify the bootp protocol, specify *dhcp* instead.
rarp	Specifies that the RARP protocol is used to establish an IP address.
dhcp	Specifies that the DHCP protocol is used to obtain an IP address.

Note – The `bootp`, `rarp`, and `dhcp` options can be combined to specify that multiple protocols be tried in the specified order.

Note – All LAN parameters must be specified on the same command line.

Alternately, if none of the dynamic options are specified on the same command line, a *static* IP address can be specified along with optional netmask and default gateway parameters.

TABLE 2-2 Options for `configure network-interface`

Argument	Description
ip-address *n.n.n.n*	The IP address of the array.
netmask *m.m.m.m*	The netmask, in dotted-decimal format, for example, `255.255.255.0`
gateway *g.g.g.g*	The IP address of a default router.

The following example configures the controller IP address as 192.168.0.10, netmask as 255.255.255.0, gateway as 192.168.0.1:

```
# sccli c2t0d0 configure network-interface lan0 ip 192.168.0.10
netmask 255.255.255.0 gateway 192.168.0.1
```

The following example specifies the DHCP protocol is used to establish an IP address:

```
# sccli c2t0d0 configure network-interface lan0 dhcp
```

create host-wwn-name

Fibre Channel devices only. This command creates a list of Host ID/WWN name entries to associate a symbolic name with a host WWPN. This enables the user to use the symbolic name instead of the numeric WWPN when creating host LUN filters.

```
create host-wwn-name wwn name [position]
```

TABLE 2-3 Arguments for `create host-wwn-name`

Argument	Description
wwn	Specify a WWPN corresponding to a host bus adapter, expressed as a 16-digit hexadecimal number.
name	Specify a symbolic name for the host bus adapter. Names that contain special characters must be enclosed in double-quotes.
[*position*]	Specify a number representing the position in the list of names where this name will appear. To add the WWN name to the top of the WWN name list, specify `head`. To add the WWN name to the bottom of the WWN name list, specify `tail`.

The following example creates the alias `sun-hba-1` for the HBA WWPN value 210000e08b095562:

```
# sccli c2t0d0 create host-wwn-name 210000e08b095562 "sun-hba-1"
```

delete host-wwn-name

Fibre Channel devices only. This command deletes a Host/WWN name entry.

```
delete host-wwn-name [name | wwn]
```

show host-wwn-names

Fibre Channel devices only. This command displays all registered HBA WWNs in the controller for host channels.

```
show host-wwn-names
```

TABLE 2-4 Arguments for `show host-wwn-names`

Argument	Description
[*name* | *wwn*]	Specify the host or WWN name.

The following example shows all host WWN names for the specified device.

```
# sccli c2t0d0 show host-wwn-names
  Host-ID/WWN       Name
--------------------------------------
  210000e08b095562  sun-hba-1
  210100e08b295562  sun-hba-2
```

If no host WWN names are defined, a message is displayed, but it is not considered an error.

If a Qlogic HBA is connected to a host channel, the Qlogic HBA WWN is automatically detected by the controller and registered into the table.

If the HBA is another brand, the user must register this HBA WWN to the controller using the RS232 application. Use the serial port of the array to access the firmware. For information about the firmware menus and commands, refer to the RAID firmware user's guide for your product.

show ip-address

This command displays the IP address of the array controller.

Note – Before running this command, make sure the network parameters on the controller are set.

```
show ip-address
```

The following example shows the IP address for device `c2t0d0`:

```
# sccli c2t0d0 show ip-address
206.6.182.71
```

show network-parameters

This command displays the IP address, netmask, and default router address of the network management port.

```
show network-parameters
```

The following example shows the network parameters for the network management port.

```
sccli> show network-parameters
 ip-address: 206.235.238.223
 netmask: 255.255.255.0
 gateway: 0.0.0.0
 mode: static
```

show port-wwn

Fibre Channel devices only. This command displays FC host channel port WWNs.

```
show port-wwn
```

The following example shows the port WWNs for the FC host channels.

```
sccli> show port-wwn
Ch  Id   WWPN
-------------------------
 0  40   216000C0FF800238
 0  41   216000C0FF900238
 1  43   226000C0FFB00238
 1  42   226000C0FFA00238
 4  44   256000C0FFC00238
 4  45   256000C0FFD00238
 5  47   266000C0FFF00238
 5  46   266000C0FFE00238
```

show rs232-configuration

This command displays the RS232 connection configuration. Returned values include the port number and current band-rate. In a redundant controller configuration, the COM port rate is always the same for both ports. Valid rates include: 2400, 4800, 9600, 19200, 38400, 115200.

```
show rs232-configuration
```

The following example shows the band-rate is set to `38400 bps` for COM1 and COM2.

```
sccli> show rs232-configuration
 COM1 speed: 38400bps
 COM2 speed: 38400bps
```

Component Status Commands

The following commands are explained in this section:

- `show battery-status`
- `show enclosure-status`
- `show frus`

For details on displaying all the components for an array, see "`show configuration`" on page 36.

show battery-status

Fibre Channel arrays only. This command displays the status of the battery modules, which preserve the nonvolatile cache memory in each RAID controller. For redundant controllers, status for both batteries is shown. Status values include: Expired, Warning, or Good. A status of Warning indicates that the battery will expire within 21 days.

Note – If the battery in-service-date is not set, you are prompted to set the in-service date to the system clock date when you run the `show battery-status` command. If you replace a battery, run this command immediately to ensure that the battery status is accurate when you run the command in the future. For details on replacing the battery, refer to the *Sun StorEdge 3000 Family FRU Installation Guide*.

If the battery type is an early board module (FRU ID 370-5545 REVB), then battery expiration monitoring is not supported. In this case, a message displays, "battery board type is not supported." If your configuration requires the battery expiration feature, consult your sales representative to obtain a new battery.

```
show battery-status
```

The following example shows one good battery and one expired battery:

```
sccli> show battery-status
 Upper Battery Type: 1
 Upper Battery Manufacturing Date: Sat Jan 04 00:00:00 2003
 Upper Battery Placed In Service:  Thu Jan 22 10:59:58 2004
 Upper Battery Expiration Date:    Tue Jan 03 06:00:00 2006
 Upper Battery Status: good


 Lower Battery Type: 1
 Lower Battery Manufacturing Date: Tue Jan 02 00:00:00 2001
 Lower Battery Placed In Service: Sun Dec 09 00:00:00 2001
 Lower Battery Expiration Date: Tue Dec 09 00:00:00 2003
 Lower Battery Status: expired
```

The following example shows one good battery one and one battery that is set to expire within the next week:

```
sccli> show battery-status
 Upper Battery Type: 1
 Upper Battery Manufacturing Date: Sat Jan 04 00:00:00 2003
 Upper Battery Placed In Service:  Thu Jan 22 10:59:58 2004
 Upper Battery Expiration Date:    Tue Jan 03 06:00:00 2006
 Upper Battery Status: good


 Lower Battery Type: 1
 Lower Battery Manufacturing Date: Tue Jan 02 00:00:00 2001
 Lower Battery Placed In Service: Sat Dec 29 00:00:00 2001
 Lower Battery Expiration Date: Mon Dec 29 00:00:00 2003
 Lower Battery Status: warning
```

show enclosure-status

LVD SCSI devices only. The `show enclosure-status` command shows the status for all chassis components including SAF-TE information, fan, power supply, temperature sensor, and drive slot status.

Note – In split-bus configurations, half the drives display a status of Unknown. The drives are present, but because of a SAF-TE design limitation, the information does not display.

```
show enclosure-status
```

The following example shows the enclosure status for a Sun StorEdge 3310 SCSI device.

```
sccli> show enclosure-status
Ch  Id  Chassis  Vendor  Product ID        Rev   Package   Status
-------------------------------------------------------------------
 0  14  00476F   SUN     StorEdge 3310  A  1159  1159         OK

Enclosure Component Status:
     Type Unit Status   FRU P/N   FRU S/N   Add'l Data
-------------------------------------------------------------------
      Fan 0    OK       370-5398  031018     --
      Fan 1    OK       370-5398  031043     --
       PS 0    OK       370-5398  031018     --
       PS 1    OK       370-5398  031043     --
     Temp 0    OK       370-5524  00476F     temp=25
     Temp 1    OK       370-5524  00476F     temp=27
     Temp 2    OK       370-5398  031018     temp=31
     Temp 3    OK       370-5394  005180     temp=35
     Temp 4    OK       370-5394  013331     temp=32
     Temp 5    OK       370-5524  00476F     temp=30
     Temp 6    OK       370-5398  031043     temp=25
      EMU 0    OK       370-5394  005180
      EMU 1    OK       370-5394  013331
 DiskSlot 0    Absent   370-5524  00476F     addr=0,led=off
 DiskSlot 1    Absent   370-5524  00476F     addr=1,led=off
 DiskSlot 2    Absent   370-5524  00476F     addr=2,led=off
 DiskSlot 3    Absent   370-5524  00476F     addr=3,led=off
 DiskSlot 4    Absent   370-5524  00476F     addr=4,led=off
 DiskSlot 5    Absent   370-5524  00476F     addr=5,led=off
 DiskSlot 6    OK       370-5524  00476F     addr=8,led=off
 DiskSlot 7    OK       370-5524  00476F     addr=9,led=off
 DiskSlot 8    OK       370-5524  00476F     addr=10,led=off
 DiskSlot 9    OK       370-5524  00476F     addr=11,led=off
 DiskSlot 10   OK       370-5524  00476F     addr=12,led=off
 DiskSlot 11   OK       370-5524  00476F     addr=13,led=off

Enclosure SCSI Channel Type: single-bus
```

Disk slots refer to the backplane FRU to which disks are connected.

If the selected device is a RAID subsystem consisting of more than one chassis, the output in the example is repeated for each chassis in the subsystem.

Note – The Enclosure SCSI Channel Type values include single-bus and split-bus. Throughout the documentation and the CLI, the term "split-bus" is interchangeable with the term "dual-bus." For details on configuring an array, refer to the *Sun StorEdge Installation, Operation, and Service* manual for your array.

Enclosure status values include:

Status	Description
OK	This component has a status of OK.
Absent	This component is absent.
Fault	The component is exhibiting a fault condition.
Unknown	This component status is not available.

show frus

This command displays field-replaceable units (FRU) ID information for the RAID and any related JBODs, including dynamic FRU status information. All FRU information is retrieved from the SAF-TE device (SCSI unit) or SES (FC unit).

```
show frus
```

The following example returns all FRU information in the RAID and JBOD unit:

```
# sccli c2t0d0 show frus
```

The following example returns all FRU information in the JBOD unit:

```
# sccli /dev/scsi/processor/c6t15d0 show frus
```

The following example shows a partial list of the FRUs in a Sun StorEdge 3310 SCSI device:

```
sccli> show frus
 Name: PRI RAID CONTROLLER
 Description: SE3310 LVD RAID CTLR, 512MB MEM, BATT
 Part Number: 370-5403
 Serial Number: 011149
 Revision: 02
 Manufacturing Date: Thu Oct  2 11:32:38 2003
 Manufacturing Location: Milpitas California, USA
 Manufacturer JEDEC ID: 0x0301
 FRU Location: PRIMARY CONTROLLER SLOT
 Chassis Serial Number: 00476F

 Name: SEC RAID CONTROLLER
 Description: SE3310 LVD RAID CTLR, 512MB MEM, BATT
 Part Number: 370-5403
 Serial Number: 002034
 Revision: 02
 Manufacturing Date: Fri Oct  3 11:35:34 2003
 Manufacturing Location: Milpitas California, USA
 Manufacturer JEDEC ID: 0x0301
 FRU Location: SECONDARY CONTROLLER SLOT
 Chassis Serial Number: 00476F

7 FRUs found in chassis SN#00476F at ch 0 id 14

 Name: RAID_CHASSIS_BKPLN
 Description: Minnow BOX, RAID, LVD, Chassis+Bkpln
 Part Number: 370-5524
 Serial Number: 00476F
 Revision: 01
 Manufacturing Date: Tue Sep 23 22:18:02 2003
 Manufacturing Location: Milpitas,CA,USA
 Manufacturer JEDEC ID: 0x0301
 FRU Location: SCSI RAID MIDPLANE SLOT
 Chassis Serial Number: 00476F
 FRU Status: OK
...
```

FRU status values include:

Status	Description
OK	All subcomponents of this FRU have a status of OK.
Fault	One or more of the FRU components is exhibiting a fault condition.

Configuration Commands

The following commands are explained in this section:

- download nvram
- reset nvram
- show bypass device
- show bypass RAID
- show bypass SFP
- show configuration
- show loop-map
- upload nvram

For details on uploading and downloading the controller configuration, see "download controller-configuration" on page 44 and "upload controller-configuration" on page 55.

download nvram

This command restores the NVRAM configuration from a NVRAM file to the RAID controller. The binary NVRAM file contains information specific to the host device, such as channel settings, RAID controller parameters, and so on. The IP address, password, controller name and unique ID are not downloaded from the NVRAM file to the host device since these settings differ for each controller. After the download completes, reset the controller for the NVRAM settings to take effect.

```
download nvram filename [-r | --reset]
```

The following example downloads the NVRAM file, `tmpsn2-1.nvram`, and then resets the controller.

```
# sccli 192.168.0.1 download nvram /tmpsn2-1.nvram -r
```

reset nvram

Caution – This command only restores the primary controller. In a redundant environment, this can create a dangerous environment in which the primary controller no longer mirrors the secondary controller. Use this command with caution.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers. After running a `reset` command, to stay in prompt mode, run the `select` command to reselect the device.

This command clears the NVRAM configuration memory and restores factory defaults. After issuing this command, reset the controller and reconfigure the controller to restore any non-default configuration options.

Caution – Logical devices are not deleted, but it is possible for them to become inaccessible after this command is run. This might result in data loss.

```
reset nvram
```

```
# sccli /dev/rdsk/c0t5d0s2 reset nvram
WARNING: The configuration of the RAID controller will be erased.
Factory default parameters will take effect at next controller
reset. Logical devices may not be accessible until mappings are
reconfigured.
Are you sure? y
sccli>
```

show bypass device

Note – This command should only be used by Sun support personnel during troubleshooting procedures.

Sun StorEdge 3510 FC arrays only. The `show bypass device` command displays the bypass status of all devices on a specified loop.

Note – This command does not work with Sun StorEdge 3511 FC arrays at the time of this publication. Refer to the product release notes for software updates.

Note – Loop A and Loop B refer to the redundant FC loops that each device is connected to. The SES device in the top slot of the chassis is connected to Loop A, which is the first drive channel. The bottom SES device is connected to Loop B, which is the second drive channel.

```
show bypass device ses-channel channel loop [loopa|loopb]
```

TABLE 2-5 Arguments for `show bypass device`

Argument	Description
ses-channel *channel*	Specify the drive channel number of the FC port from which to send the command. The channel must be configured as a drive channel.Valid values: 0-5.
loop	Specify the drive loop of the SFP for which the bypass information will be displayed. Valid values: loopa, loopb, a, or b.

If a device is bypassed, the Attributes column displays a code, **S**, **H**, or **F**, that details the bypass. An **S** means the device was bypassed due to a CLI command. An **H** means the device was bypassed due to a hardware problem (no signal was present). And, an **F** means a drive fault caused the bypass.

The following example is sent on channel 2 and shows the bypass information for Loop A.

```
sccli> show bypass device ses-channel 2 loop loopa

CH      ID      TYPE    ENCL    LOOP    BYP-STATUS      ATTRIBUTES
--      --      ----    ----    ----    ----------      SHF-------
2       0       DISK    RAID    LOOP-A  Unbypassed       ---
2       1       DISK    RAID    LOOP-A  Bypassed         S
2       2       DISK    RAID    LOOP-A  Unbypassed       ---
2       3       DISK    RAID    LOOP-A  Unbypassed       ---
2       4       DISK    RAID    LOOP-A  Unbypassed       ---
2       5       DISK    RAID    LOOP-A  Unbypassed       ---
2       6       DISK    RAID    LOOP-A  Unbypassed       ---
2       7       DISK    RAID    LOOP-A  Unbypassed       ---
2       8       DISK    RAID    LOOP-A  Unbypassed       ---
2       9       DISK    RAID    LOOP-A  Unbypassed       ---
2       10      DISK    RAID    LOOP-A  Unbypassed       ---
2       11      DISK    RAID    LOOP-A  Bypassed         HF
2       12      SES     RAID    LOOP-A  Unbypassed       ---
```

The following example is sent on channel 3 and shows the bypass information for Loop B.

```
sccli> show bypass device ses-channel 3 loop loopb

CH      ID      TYPE    ENCL    LOOP    BYP-STATUS      ATTRIBUTES
--      --      ----    ----    ----    ----------      SHF-------
3       0       DISK    RAID    LOOP-B  Bypassed         S
3       1       DISK    RAID    LOOP-B  Bypassed         H
3       2       DISK    RAID    LOOP-B  Unbypassed       ---
3       3       DISK    RAID    LOOP-B  Unbypassed       ---
3       4       DISK    RAID    LOOP-B  Unbypassed       ---
3       5       DISK    RAID    LOOP-B  Unbypassed       ---
3       6       DISK    RAID    LOOP-B  Unbypassed       ---
3       7       DISK    RAID    LOOP-B  Unbypassed       ---
3       8       DISK    RAID    LOOP-B  Unbypassed       ---
3       9       DISK    RAID    LOOP-B  Unbypassed       ---
3       10      DISK    RAID    LOOP-B  Unbypassed       ---
3       11      DISK    RAID    LOOP-B  Unbypassed       ---
3       12      SES     RAID    LOOP-B  Unbypassed       ---
```

show bypass RAID

Note – This command should only be used by Sun support personnel during troubleshooting procedures.

Sun StorEdge 3510 FC arrays only. The `show bypass RAID` command displays the hardware bypass status of the RAID controllers on Loop A and Loop B. In a redundant RAID controller system, there is a RAID controller in the top slot of the chassis and a RAID controller in the bottom slot of the chassis. Each RAID controller has a connection to Loop A and Loop B. In a normal redundant RAID controller system, the top and bottom RAID controllers indicate unbypassed status on both loops. If a RAID controller has failed due to natural causes, or has failed as a result of the `fail primary` or `fail secondary` command, the `show bypass RAID` command indicates that the RAID controller is bypassed.

Note – This command does not work with Sun StorEdge 3511 FC arrays at the time of this publication. Refer to the product release notes for software updates.

```
show bypass raid
```

The following example shows the bypass status of the RAID controllers.

```
sccli> show bypass raid
SLOT    LOOP    BYP-STATUS
----    ----    ----------
TOP     LOOP-A  Bypassed
TOP     LOOP-B  Bypassed
BOTTOM  LOOP-A  Unbypassed
BOTTOM  LOOP-B  Unbypassed
```

show bypass SFP

Note – This command should only be used by Sun support personnel during troubleshooting procedures.

Sun StorEdge 3510 FC arrays only. The `show bypass SFP` command displays the bypass status of all SFPs on a specified loop.

Note – This command does not work with Sun StorEdge 3511 FC arrays at the time of this publication. Refer to the product release notes for software updates.

Note – Loop A and Loop B refer to the redundant FC loops that each device is connected to. The SES device in the top slot of the chassis is connected to Loop A, which is the first drive channel. The bottom SES device is connected to Loop B, which is the second drive channel.

```
show bypass sfp ses-channel channel loop [loopa|loopb]
```

TABLE 2-6 Arguments for `show bypass SFP`

Argument	Description
ses-channel *channel*	Specify the drive channel number of the FC port from which to send the command. The channel must be configured as a drive channel.Valid values: 0-5.
loop	Specify the drive loop of the SFP for which the bypass information is displayed. Valid values: loopa, loopb, a, or b.

If a device is bypassed, the Attributes column displays a code, **S** or **H**, that details the bypass. An **S** means the device was bypassed due to a CLI command. An **H** means the device was bypassed due to a hardware problem (no signal was present).

The following example is sent on channel 2 and shows the bypass information for Loop A.

```
sccli> show bypass sfp ses-channel 2 loop loopa

PORT    ENCL-ID ENCL-TYPE       LOOP    BYP-STATUS      ATTRIBUTES
----    ------- ---------       ----    ----------      SH--------
0       0       RAID            LOOP-A  Unbypassed       --
1       0       RAID            LOOP-A  Not-Installed    --
L       0       RAID            LOOP-A  Bypassed         -H
R       0       RAID            LOOP-A  Not-Installed    --
4       0       RAID            LOOP-A  Not-Installed    --
5       0       RAID            LOOP-A  Bypassed         -H
```

The following example is sent on channel 2 and shows the bypass information for Loop B.

```
sccli> show bypass sfp ses-channel 2 loop loopb

PORT    ENCL-ID ENCL-TYPE       LOOP    BYP-STATUS      ATTRIBUTES
----    ------- ---------       ----    ----------      SH--------
0       0       RAID            LOOP-B  Not-Installed   --
1       0       RAID            LOOP-B  Bypassed        -H
L       0       RAID            LOOP-B  Bypassed        -H
R       0       RAID            LOOP-B  Not-Installed   --
4       0       RAID            LOOP-B  Bypassed        -H
5       0       RAID            LOOP-B  Not-Installed   --
```

show configuration

This command displays the array configuration including inquiry information, FRU information, SATA information, and the enclosure status, which includes the status for the SES or SAF-TE device and all chassis components—the fan, power supply, temperature sensor, and drive slots. The configuration can be displayed onscreen, or written to the specified file. The output is plain text by default, but XML output can be obtained by specifying the `--xml` option. To see a sample XML report, see "Show Configuration Command Output" on page 147.

Note – In split-bus configurations, half the drives display a status of Unknown. The drives are present, but because of a SAF-TE design limitation, the information does not display.

Note – FC enclosures contain two SES processors in a dual-controller array, and there can be more than one enclosure in a RAID subsystem.

```
show configuration [--xml | -x] [filename]
```

TABLE 2-7 Arguments for `show configuration`

Argument	Description
{--xml | -x}	If the -x or --xml options are specified, XML output is generated.
filename	Specify the file name for the configuration file that you want to show.

Configuration values in the report include: inquiry data, network parameters, drive parameters, redundancy mode, cache policy, RS232 configuration, channels, disks, logical drives, logical volumes, partitions, LUN maps, host WWNs (FC only), port WWNs (FC only), intercontroller link (FC only), battery status (FC only), SATA router (SATA only), SATA mux (SATA only), FRUs, SES (FC only), and SAF-TE (SCSI only).

The following example shows a portion of a RAID configuration.

```
sccli> show configuration

* inquiry-data

 Vendor: SUN
 Product: StorEdge 3510
 Revision: 327R
 NVRAM Defaults: 327R 3510 v2.57
 Bootrecord Version: 1.31H
 Serial Number: 0043E6
 IP Address: 206.6.180.17
 Ethernet Address: 00:C0:FF:00:43:E6
 unique-identifier: 0043E6
 controller-name: ""

* network-parameters

 ip-address: 206.6.180.17
 netmask: 255.255.255.0
 gateway: 206.6.180.9
 mode: static

* host-parameters

 max-luns-per-id: 32
 queue-depth: 1024
 fibre connection mode: loop
```

The following example writes the RAID configuration information to the `myconfig.xml` file.

```
# sccli c2t0d0 show configuration --xml myconfig.xml
```

show loop-map

Note – This command should only be used by Sun support personnel during troubleshooting procedures.

Fibre Channel devices only. The `show loop-map` command shows the FC loop positional map for a given channel. This information shows how the FC devices are connected in the loop. The positional map displays the Arbitrated Loop Physical Address (ALPA) and the SCSI Select ID that corresponds to that ALPA. Use the positional loop map during the diagnostic process to determine which devices to selectively bypass in order to isolate faulty devices.

There can be two RAID controllers on each drive loop. The first device displayed in the loop map is the RAID controller that executes the diagnostics and performs the port bypass operations. Both ALPAs and SCSI Select IDs are displayed. Additional information is also displayed including device type, chassis enclosure ID, and slot number that the device resides in.

```
show loop-map channel channel
```

TABLE 2-8 Arguments for `show loop-map`

Argument	Description
channel *ch*	Specify the drive channel number of the FC port from which the loop map information is to be obtained. Valid values: 0-5.

Note – The channel must be configured as a drive channel and there must be an SES device present on the channel.

The following example displays the loop map on channel 2.

```
sccli> show loop-map channel 2

14 devices found in loop map

=== Channel Loop Map retrieved from CH 2 ID 12 ===

AL_PA    SEL_ID   SEL_ID  TYPE     ENCL_ID SLOT
(hex)    (hex)    (dec)
-----    -----    -----   ----     ------  ----
CE       0F       15      RAID     N/A     N/A
D4       0B       11      DISK     0       11
DC       06       6       DISK     0       6
D5       0A       10      DISK     0       10
DA       07       7       DISK     0       7
D3       0C       12      SES      0       N/A
E8       01       1       DISK     0       1
E1       04       4       DISK     0       4
E4       02       2       DISK     0       2
E2       03       3       DISK     0       3
E0       05       5       DISK     0       5
EF       00       0       DISK     0       0
D9       08       8       DISK     0       8
D6       09       9       DISK     0       9
```

Note – The first line of output in the loop map identifies the primary RAID controller that requested the loop map and that issues any subsequent FC diagnostic commands.

upload nvram

The `upload nvram` command saves the NVRAM configuration to a host file. The binary NVRAM file contains information specific to the host device, such as channel settings, RAID controller parameters, IP address, RAID controller password and name, and unique IDs, and so on.

```
upload nvram file
```

For details on downloading the NVRAM file, see "download nvram" on page 30.

Event Message Commands

The following commands are explained in this section:

- clear events
- show events

clear events

This command clears the RAID controller event log.

```
clear events
```

The following example clears the event log for controller c0t5d0s2.

```
# sccli /dev/rdsk/c0t5d0s2 clear events
```

show events

This command displays the contents of the specified RAID controller.

```
show events [last {n} | all]
```

TABLE 2-9 Arguments for show events

Argument	Description
last {*n*}	Gets the latest *n* events for the controller.
latest {*n*}	Gets the latest *n* events for the controller.
all	Gets all the events for the controller.

If no option is specified, the command shows all events.

```
# sccli /dev/rdsk/c0t5d0s2 show events
Tue Jul 30 16:04:45 2002
[0181] #1: StorEdge Array SN#600001 Controller NOTICE: controller
initialization completed

Tue Jul 30 16:04:24 2002
[0181] #2: StorEdge Array SN#600001 Controller NOTICE: controller
initialization completed
```

To show the last 10 events for a controller, type:

```
# sccli c2t0d0 show events last 10
```

CHAPTER 3

Controller, Disk, and SATA Commands

This chapter provides the available controller, disk, and serial ATA (SATA) commands with sample code. Topics covered in this chapter include:

Note – To prevent unauthorized access to administrative functions of the RAID controller, the CLI requires superuser or system administrator privileges for in-band access, and uses the controller password to authorize users of the out-of-band interface.

Note – If no command is entered on the command line, the CLI enters an interactive mode, prompting you to enter commands until the `quit` command is entered. All commands operate on the currently selected device.

Controller Commands

The following commands are explained in this section:

- download controller-configuration
- fail
- mute controller
- password
- reset controller
- set cache-policy
- set controller-name
- set controller-password
- set password
- set rs232-configuration
- set unique-identifier
- show cache-policy
- show controller-name
- show inquiry-data
- show redundancy-mode
- show shutdown-status
- show unique-identifier
- shutdown controller
- unfail
- upload controller-configuration

For details on downloading controller firmware, see "download controller-firmware" on page 103.

Note – The secondary controller in dual-controller configurations does not support any administrative functions. In *active/active* configurations where LUNs are assigned to both the primary and secondary controllers, the CLI command can be used only with those LUNs assigned to the primary controller.

---

download controller-configuration

This command restores controller configuration information previously saved using the upload controller-configuration command. A logical drive or logical volume create operation might be required to completely restore the saved configuration. However, creating a logical drive might take a long time, and block other operations. The command provides an option to specify whether to build the logical drive.

Caution – The `download controller-firmware` command deletes all existing logical drives if they do not match the configuration file that is being downloaded.

Note – Optimally, rebuild any logical drives before running this command.

```
download controller-configuration [-b | --build] filename
```

TABLE 3-1 Arguments for `download controller-configuration`

Argument	Description
-b, --build	Rebuild RAID sets specified in the saved configuration. If this option is not specified, RAID sets are not created.
-r, --reset	Reset the controller so that the newly-restored configuration takes affect immediately.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers. After running a `reset` command, to stay in prompt mode, run the `select` command to reselect the device.

`fail`

The `fail` command simulates a controller failure and causes all the LUNs assigned to the specified controller to fail over to the redundant controller, if it is configured for fail over. If the controller is configured for fail over, the inter-controller link is not disconnected with this command.

Note – Before running this command, perform a `show redundancy` command to make sure a secondary controller exists.

```
fail {primary | secondary}
```

TABLE 3-2 Arguments for `fail`

Argument	Description
primary	Fails the logical drive to the primary controller.
secondary	Fails the logical drive to the secondary controller.

The following example fails the secondary controller if **`Y`** is specified at the prompt. Specify **`N`** to cancel the failure.

```
sccli> fail secondary
Are you sure?
```

mute controller

The `mute controller` command silences the controller's audible alarm. After the fault condition that caused the alarm to sound is cleared, the next fault condition causes the alarm to sound again.

```
mute [controller]
```

For details on alarms, refer to the *Sun StorEdge 3000 Family Installation, Operation, and Service Guide* for your array.

Note – This command works on RAID subsystems. It does not work on JBODs. To manually silence a JBOD alarm, push the Reset button on the right ear of the array.

password

Use the `password` command to supply the password assigned to the array controller. The user must specify the correct password when issuing potentially dangerous commands to the array over a network connection. For interactive sessions, the CLI prompts the user for this password only when necessary; the `password` command is provided for non-interactive applications where the password must be embedded in a script. No password is required when accessing the array using in-band SCSI. For details on setting the password, see "`set password`" on page 50.

Note – Use quotation marks around password strings that contain spaces or apostrophes.

```
password password
```

The following example supplies the controller password, `test`.

```
sccli> password "test"
```

reset controller

The `reset controller` command shuts down the controller, flushes its cache to disk, and then restarts the controller. This temporarily causes the array to go offline, which might affect applications running on any hosts connected to the array. Also see "shutdown controller" on page 54.

Caution – All reset commands are potentially dangerous. Use only as instructed.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers. After running a reset command, to stay in prompt mode, run the `select` command to reselect the device.

```
reset controller
```

```
# sccli /dev/rdsk/c0t5d0s2 reset controller
WARNING: This is a potentially dangerous operation. The controller
will go offline for several minutes. Data loss may occur if the
controller is currently in use.
Are you sure? y
sccli: resetting controller...
sccli: controller has been reset
sccli: /dev/rdsk/c0t5d0s2: waiting for device to be ready
sccli: /dev/rdsk/c0t5d0s2: device reset
sccli: /dev/rdsk/c0t5d0s2: device is ready
```

set cache-policy

This command sets cache mode (write-back or write-through) and optimization (sequential or random-access). However, once the optimization mode is chosen and data written in logical units, the only way to change the optimization mode is to back up all data to another location, delete all logical configurations of drives, reconfigure the logical drive configuration with the new optimization mode, and reboot the array.

This limitation results from the redundant configuration of controllers. Data inconsistency can occur when a controller configured with one optimization mode is used to replace a failed controller with a different mode.

The controller must be reset for this change to take effect.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers.

```
set cache-policy [random-access | sequential] [write-through |
write-back]
```

TABLE 3-3 Arguments for `set cache-policy`

Argument	Description
random-access	Optimizes for random access.
sequential	Optimizes for sequential access.
write-through	Disables the write cache (writes go through to the disk drives before being acknowledged).
write-back	Enables write caching (also known as "write-back" or "write-behind" caching).

The following example sets the cache mode to write-back.

```
sccli> set cache-policy write-back
```

The following example sets the cache mode to write-back and the optimization to sequential.

```
sccli> set cache-policy sequential write-back
```

set controller-name

The `set controller-name` command specifies a name for the array. The name can be between 1 and 15 characters, but the number of characters plus the length of the current controller password must not be more than 16 characters.

```
set controller-name controller-name
```

The following example sets the controller name as `testname`:

```
# sccli c2t0d0 set controller-name "testname"
```

set controller-password

This command sets the controller password. The password must be fewer than eight characters.

```
set controller-password password
```

The following example sets the controller password as `sun123`:

```
# sccli c2t0d0 set controller-password "sun123"
```

set password

This command specifies a password that protects the RS232 character interface, Telnet, and FTP services from unauthorized use. The string can be any alphanumeric string up to 15 characters in length, provided that the sum of the lengths of the password and the controller-name parameter is not more than 16.

```
set password string
```

To remove an existing password, specify a zero-length string with a pair of double-quote characters. For example:

```
# sccli c2t0d0 set password ""
```

set rs232-configuration

This command specifies the speed, in bits per second, for the specified RAID controller port. Single controller configurations have a single RS232 port (port 1). Redundant controllers have a second port (port 2). Usually, both ports are connected to support controller failover, so both should be set to the same speed. The default speed is 38400. The controller must be reset for this change to take effect.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers. After running a `reset` command, to stay in prompt mode, run the `select` command to reselect the device.

```
set rs232-configuration port-number speed
```

In the following example, the RAID controller RS232 port 1 band rate is set to 38400.

```
# sccli c2t0d0 set rs232-configuration 38400
```

set unique-identifier

Caution – This value is used to construct unique values for Ethernet address, FC WWNs, and other identifiers, and changing it unnecessarily might cause the logical units to become inaccessible to hosts.

This command specifies the unique identifier for the array subsystem as a six-digit hexadecimal number from 0 to 0xfffff. This identifier is initialized from the chassis serial number automatically, and should not be changed unless the chassis is replaced. The controller must be reset for this change to take effect.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers. After running a `reset` command, to stay in prompt mode, run the `select` command to reselect the device.

Note – If the value 0 is specified, it is interpreted as a request to set the controller unique ID to match the chassis serial number, which is obtained from the enclosure services device in the chassis.

```
set unique-identifier
```

The following example sets the controller unique identifier as `0x1234`.

```
# sccli c2t0d0 set unique-identifier 0x12345
```

The following example sets the controller unique identifier to the default value based on the chassis serial number. This command must be followed by the `reset controller` command before the change takes effect.

```
# sccli c2t0d0 set unique-identifier 0
```

show cache-policy

This command displays the cache write policy for the controller. Values returned include write-through or write-back.

```
show cache-policy
```

The following example shows the cache policy is set to `write-back`.

```
sccli> show cache-policy
 mode: write-back
 optimization: sequential
```

show controller-name

This command displays the RAID controller name. If the RAID controller name is not set, the command returns `not set`.

```
show controller-name
```

The following example shows the controller name is `test`.

```
sccli> show controller-name
 controller-name: test
```

show inquiry-data

This command displays the SCSI inquiry data returned by the array controller. The output of this command varies from one product to another, and from one channel to another.

```
show inquiry-data
```

The following example shows an in-band Sun StorEdge 3510 inquiry:

```
sccli> show inquiry-data
 Vendor: SUN
 Product: StorEdge 3510
 Revision: 327R
 Peripheral Device Type: 0x0
 NVRAM Defaults: 327R 3510 v2.54
 Bootrecord version: 1.31H
 Page 80 Serial Number: 0001870043BF5000
 Page 83 Logical Unit Device ID: 600C0FF00000000000001870043BF5000
 Page 83 Target Device ID: 206000C0FF000187
 IP Address: 199.249.246.28
 Page D0 Fibre Channel Address: EF (id 0)
 Page D0 Node Name: 206000C0FF000187
 Page D0 Port Name: 216000C0FF000187
 Ethernet Address: 00:C0:FF:00:01:87
 Device Type: Primary
```

show redundancy-mode

The `show-redundancy mode` command shows whether the two controllers are operating correctly as a redundant pair. Returned values include Active-Active, disabled, enabled, primary, or secondary.

```
show redundancy-mode
```

The following example shows the controller mode is `Active-Active`.

```
sccli> show redundancy-mode
 Primary controller serial number: 3341097
 Redundancy mode: Active-Active
 Redundancy status: Enabled
 Secondary controller serial number: 3341045
```

show shutdown-status

Fibre Channel arrays only. This command displays the controller shutdown status.

```
show shutdown-status
```

The following example shows the controller shut down is complete.

```
sccli> shutdown controller
WARNING: This is a potentially dangerous operation.
The array will remain offline until it it is reset.
Data loss may occur if the controller is currently in use.
Are you sure? y
sccli: shutting down controller...
sccli: controller is shut down
sccli> show shutdown-status
        Controller shutdown complete.
```

show unique-identifier

This command displays the controller unique identifier, which defaults to the enclosure serial number. A valid controller unique identifier is a hexidecimal number from 0 to 0xfffff. It is displayed as a six-digit value, where the first digit is always 0 for consistency with the presentation of FRU serial numbers. The default value for the unique ID is the FRU serial number of the midplane/chassis in which the controller resides.

```
show unique-identifier
```

The following example shows the unique identifier is `00476F`.

```
sccli> show unique-id
 unique-identifier: 00476F
```

shutdown controller

This command shuts down the RAID controller and stops I/O processing. This temporarily causes the array to go offline, which might affect applications running on any hosts connected to the array. Data in the controller cache is flashed to logical drives. After issuing this command, issue the `reset controller` command.

Caution – The shutdown command causes the array to stop responding to I/O requests from the host. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers.

Note – Use this command whenever the RAID controller is powered off. It ensures that all data is written to disk, and that the backup battery (if present) is not drained by the cache memory.

```
shutdown controller
```

```
# sccli /dev/rdsk/c0t5d0s2 shutdown controller
WARNING: This is a potentially dangerous operation. The controller
will go offline for several minutes. Data loss may occur if the
controller is currently in use.
Are you sure? y
sccli: shutting down controller...
sccli: controller is shut down
```

unfail

This command restores the controller pair to redundant operation. When a primary controller fails, the secondary controller becomes the primary controller. The `unfail` command makes the initial primary controller the secondary controller.

The `unfail` command reverses the `fail secondary` command, permitting the secondary controller to resume operation and restore the controller pair to redundant operation.

```
 unfail
```

The following example reverses the `fail` command.

```
sccli> unfail
Are you sure? y
```

upload controller-configuration

This command saves a description of the configuration of the array to a user-specified file. The file can be used to restore the same configuration to the array at a later date, or to copy the configuration to another array. The file includes: channel settings, host and drive side parameters, array parameters, network port setup, controller general parameters, logical drive, logical volume, and SCSI drive information, partition information, and mappings on host channels.

Note – The file contains binary data and cannot be viewed with a text editor.

```
upload controller-configuration file
```

The following example saves the RAID configuration into the binary file, `raidcfg.bin`:

```
# sccli c2t0d0 upload controller-configuration raidcfg.bin
```

For details on downloading the controller configuration file, see "download controller-configuration" on page 44.

Disk Commands

The following commands are explained in this section:

- `configure global-spare`
- `set led`
- `show disks`
- `show led-status`
- `unconfigure global-spare`

For details on downloading disk firmware, see "download disk-firmware" on page 104.

configure global-spare

This command specifies a global spare disk. The disk drive status is set to standby.

```
configure global-spare disk
```

TABLE 3-4 Arguments for `configure global-spare`

Argument	Description
disk	Specify the disk to configure. For example, specify the disk with target ID 1 on channel 2 as `2.1`.

The following example configures disk drive ID 5 on SCSI channel 2 as a global spare:

```
# sccli c2t0d0 configure global-spare 2.5
```

set led

SCSI arrays only. This command illuminates the drive LED for the specified disk (or slot). For JBODs, specify a disk device using a Solaris device name such as `sd31` or `c1t0d0s2`, or specify a slot number. Use the `show led-status` command to show the status of the identified disk drive.

Note – Selecting a slot by disk name is not supported in dual-bus enclosure configurations because the enclosure services processor resides on only one of the internal buses and the CLI might not be able to determine the slot location of a particular device. In such configurations, use the `show enclosure-status` command and the disk documentation provided with your enclosure to determine the correct slot number instead.

To illuminate a specific drive LED in a RAID array, use the following parameters:

```
set led disk ch.id {on | off}
```

To illuminate a specific drive LED in a JBOD, use the following parameters:

```
set led {slot n | disk sdn | disk cXtYdZ} {on | off}
```

TABLE 3-5 Arguments for `set led`

Argument	Description
slot *n*	Illuminates the drive LED for the specified disk drive slot.
disk *sdn*	Illuminates the drive LED for the specified Solaris disk drive slot.
disk *cXtYdZ*	Illuminates the drive LED for the specified Solaris disk drive slot.
ch.id	Illuminates the drive LED for the specified drive within a RAID subsystem.
{on | off}	Specify whether to illuminate the LED.

The following example illuminates the drive with SCSI address 8 in the enclosure associated with the enclosure device `/dev/es/ses0`:

```
sccli> set led disk 0.8 on
 (enclosure sn 005362) led-slot-0: on
```

show disks

This command displays information about the disk drives in the array enclosure and any expansion chassis.

```
show disks [disk-list | channel {ch} | free | all] [-b | --buffer-size]
```

TABLE 3-6 Arguments for `show disks`

Argument	Description
disk-list	Shows specific disks. Use any of the following formats: *ch.id*, *ch.idm-n*. *ch* is physical device channel and *id* is the SCSI ID of the device and *m* to *n* represents a contiguous range of IDs on the same channel. For example, 2.0, 2.3 or 2.2-5.
channel ch	Shows all disks on the specified channel.
all	Shows all disk drives.
free	Shows all unassigned disks.
-b, --buffer-size	Shows the disk buffer size.

The following example returns information for disks ID 0, ID 3, and ID 7 on SCSI channel 2:

```
# sccli c2t0d0 show disks 2.0,2.3,2.7
```

The following example returns information for disks on SCSI channel 2 for disks 3 through 7, and for SCSI channel 1 disk 4:

```
# sccli c2t0d0 show disks 2.3-7,1.4
```

Returned values include: channel number, disk SCSI ID, size, speed (megabytes per second), LD assignment, status, vendor and product ID. If the `-b` option is specified, the drive buffer size and drive serial number are displayed.

LD assignment values include:

- Global – global spare
- None – unassigned

Status values include:

- On-Line – in good condition
- Stand-By – standby for global or local spare
- Initing – processing initialization
- Rebuild – processing rebuild
- New – new disk that has not been configured
- Used – contains RAID meta data
- Bad – failed disk
- Absent – disk does not exist
- Missing – disk previously existed, but is missing
- SB-Miss – spare drive missing
- FRMT – drive was part of a logical drive that no longer exists, but the controller still recognizes the logical drive data format contained on it
- Unknown – component status is not available

The following example shows all disk information.

```
# sccli s28 show disks
sccli: selected se3000://199.249.246.28:58632 [SUN StorEdge 3510  SN#000187]
Ch  Id      Size   Speed  LD     Status   IDs
-------------------------------------------------------------------
 2   0   33.92GB   200MB  ld0    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET10CZK00007325
 2   1   33.92GB   200MB  ld0    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0RSCH00007309
 2   2   33.92GB   200MB  ld0    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET109TH00007325
 2   3   33.92GB   200MB  ld1    STAND-BY SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET1097C00007325
 2   4   33.92GB   200MB  ld1    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0ZZYZ00007325
 2   5   33.92GB   200MB  ld1    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0QQHK00007307
 2   6   33.92GB   200MB  ld2    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0TJL300007303
 2   7   33.92GB   200MB  ld2    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0TM3100007312
 2   8   33.92GB   200MB  NONE   NEW      SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0T3L000007229
 2   9   33.92GB   200MB  GLOBAL STAND-BY SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0SX7400007312
 2  10   33.92GB   200MB  GLOBAL STAND-BY SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0TJFT00007313
 2  11   33.92GB   200MB  ld3    ONLINE   SEAGATE ST336752FSUN36G 0205
                                            S/N 3ET0TJSD00007309
```

show led-status

This command displays the status of the LED adjacent to the specified disk drive slot in the array enclosure or expansion chassis.

To display the status of LEDs in LVD RAID enclosures, use the following syntax:

```
show led-status disk ch.id
```

To show the status of LVD JBOD enclosures, use the following parameters:

```
show led-status {slot n | disk sdn | disk cXtYdZ}
```

TABLE 3-7 Arguments for `show led-status`

Argument	Description
slot *n*	Shows the status for the LED adjacent to the specified disk drive slot. This argument is not accepted for RAID controllers.
disk *sdn*	Shows the status for the LED adjacent to the specified Solaris disk drive slot. This argument is not accepted for split-bus chassis.
disk *cXtYdZ*	Shows the status for the LED adjacent to the specified Solaris disk drive slot. This argument is not accepted for split-bus chassis.
ch.id	Shows the status for the LED adjacent to the specified drive within a RAID subsystem.

The following example shows the status of the LED adjacent to the disk assigned to drive slot 3 for an expansion chassis:

```
sccli> show led slot 3
 led-slot-3: on
```

unconfigure global-spare

This command unconfigures a global spare disk.

```
unconfigure global-spare disk
```

TABLE 3-8 Arguments for `unconfigure global-spare`

Argument	Description
disk	Specify the disk to unconfigure. For example, specify the disk with target ID 1 on channel 2 as `2.1`.

The following example unconfigures disk drive ID 5 on SCSI channel 2 as a global spare:

```
# sccli c2t0d0 unconfigure global-spare 2.5
```

SATA Commands

The following commands are explained in this section:

- `show sata-mux`
- `show sata-router`

For SATA download commands, see "Firmware Show and Download Commands" on page 99.

`show sata-mux`

This command shows the SATA multiplexor (mux) board information for all drives. Each drive has one mux board. The information for the mux board includes the Channel Number and ID of the drive attached to the mux board, mux board serial number, mux board type (active-passive or active-active), path controller (PC150) firmware revision number, and PC150 boot revision.

```
show sata-mux
```

The following example shows the mux board information for the drives attached to the specified device. When no serial number has been programmed for the mux board, `n/a` displays in the Mux-SN column.

```
sccli> show sata-mux
24 mux boards found

Ch Id  Mux-SN Mux-Type PC150/Rev PC150/Boot
-----------------------------------------
 2   0 000226 A/A      BB42      0300
 2   1 000222 A/A      BB42      0300
 2   2 00021D A/A      BB42      0300
 2   3 000224 A/A      BB42      0300
 2   4 00021F A/A      BB42      0300
 2   5 00021E A/A      BB42      0300
 2   6 n/a    A/A      BB42      0300
 2   7 000228 A/A      BB42      0300
 2   8 000220 A/A      BB42      0300
 2   9 000225 A/A      BB42      0300
 2  10 000223 A/A      BB42      0300
 2  11 000221 A/A      BB42      0300
 2  32 n/a    A/A      BB42      0300
 2  33 n/a    A/A      BB42      0300
 2  34 n/a    A/A      BB42      0300
 2  35 n/a    A/A      BB42      0300
 2  36 n/a    A/A      BB42      0300
 2  37 n/a    A/A      BB42      0300
 2  38 n/a    A/A      BB42      0300
 2  39 n/a    A/A      BB42      0300
 2  40 n/a    A/A      BB42      0300
 2  41 n/a    A/A      BB42      0300
 2  42 n/a    A/A      BB42      0300
 2  43 000559 A/A      BB42      0300
```

show sata-router

This command shows all accessible SATA routers behind the RAID controller. The information displayed includes the Enclosure ID and Enclosure FRU serial number of the chassis that the SATA router resides in, the channel number that the SR-1216 router controls, slot position of the IOM board that the SR-1216 router resides on, SR-1216 firmware revision number, SATA router boot revision, CSB revision number, hardware revision number, and the self-test revision number.

```
show sata-router
```

The following example shows the data returned from a redundant configuration. Two routers are assigned to the same chassis in a redundant configuration. (The Encl-SN column displays the same chassis serial number for both routers.).

```
sccli> show sata-router
Encl-ID Encl-SN Ch Slot  Rev      Boot-rev CSB  HW-rev ST-rev
-------------------------------------------------------------
0       07ECC0  2  upper DP0553   0548     0500 11     0552
0       07ECC0  3  lower DP0553   0548     0500 11     0552
```

In the following example, no valid path exists on the lower router, so `n/a` displays to indicate that no data was returned.

```
#sccli  206.6.180.20 show sata-router
sccli: selected se3000://206.6.180.20:58632 [SUN StorEdge 3511
SN#07ECDF]
Encl-ID Encl-SN Ch Slot  Rev      Boot-rev CSB  HW-rev ST-rev
-------------------------------------------------------------
0       07ECDF  2  upper DP0548   0509     0500 00     0552
0       07ECDF  3  lower n/a      n/a      n/a  n/a    n/a
```

CHAPTER 4

Channel Commands

This chapter provides the available host and drive channel commands with sample code.

Note – To prevent unauthorized access to administrative functions of the RAID controller, the CLI requires superuser or system administrator privileges for in-band access, and uses the controller password to authorize users of the out-of-band interface.

Note – If no command is entered on the command line, the CLI enters an interactive mode, prompting you to enter commands until the `quit` command is entered. All commands operate on the currently selected device.

Channel Commands

The following commands are explained in this section:

configure channel

This command configures a host or drive channel and establishes channel IDs on the primary and secondary controller. After a SCSI channel configuration change, the RAID controller must be reset.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers. After running a `reset` command, to stay in prompt mode, run the `select` command to reselect the device.

```
configure channel channel [{host|drive}] [primary-id target-list] [secondary-id target-
list] [-r | --reset]
```

Note – Unless the `--reset` option is specified, subsequent CLI commands might fail or might have unexpected results since the controller has not been reset.

TABLE 4-1 Arguments for `configure channel`

Argument	Description
channel *channel*	Specify the physical drive channel. Use the following format: {p}[,..{q}[,….{n}]]. Valid values include 0-7.
[host | drive]	Specify whether the channel is used to interface with a host or a disk drive. Each host channel can have multiple SCSI IDs. If the channel is configured as a host channel, multiple IDs can be applied. However, if the channel is configured as a drive channel, only one ID can be applied.
primary-id *target-list*	Specify one or more comma-separated target IDs for the primary controller on the specified channel. Specify `None` if you do not want to configure a primary ID. `primary-id` can be abbreviated `pid`.
secondary-id *target-list*	Specify one or more comma-separated target IDs for the secondary controller. Specify `None` if you do not want to configure a secondary ID. `secondary-id` can be shortened to `sid`.
[-r | --reset]	Specifies that the controller reset immediately so that the specified changes take effect. By default, the specified changes do not take effect until a `reset controller` command is issued.

The following example sets the SCSI channel mode as host and resets the controller immediately:

```
# sccli c2t0d0 configure channel 0 mode host --reset
```

The following example sets the SCSI channel primary ID as 112 and the secondary ID as 114 and 115:

```
# sccli c2t0d0 configure channel 0 primary-id 112 secondary-id 114,115
```

set drive-parameters

This command sets the specified RAID controller parameters that affect the operation of drive channels.

```
set drive-parameters parameter name value
```

TABLE 4-2 Arguments for `set drive-parameters`

Argument	Description
scsi-io-timeout	Disk drive I/O timeout in milliseconds. The default value is 7000 (for example, 7 seconds).
spin-up {enabled | disabled}	Specifies whether the drive automatically spins up.
reset-at-power-up {enabled | disabled}	Specifies whether the RAID controller automatically resets when it is powered on.
disk-access-delay	Specify in seconds or milliseconds the amount of time to wait before disk access is granted.
queue-depth	Maximum queue depth that the controller uses when queuing commands for each disk drive. To indicate that the queue depth value can be computed automatically, specify auto or the value 0. The default value is 32.
enclosure-polling-interval	Specifies the interval at which the array controller polls the SAF-TE or SES environmental services processor in the enclosure. The default value of 0 specifies that polling is disabled.
auto-detect-swap-interval	Interval (in milliseconds) between checks to determine if a failed drive has been physically replaced. The default value of 0 specifies that auto-detecting is disabled.
smart {enabled | disabled}	Determines whether the disk drives are to perform predictive failure analysis.
auto-global-spare {enabled | disabled}	Specifies whether the RAID controller automatically allocates disk drives as global spares.

Note – The range of valid values for certain numeric parameters can vary depending on the array controller firmware. Refer to the firmware documentation, or the firmware menus, for the exact list of values supported in a given version of firmware. For example, the valid values for scsi-io-timeout in 3.27P firmware for the Sun StorEdge 3510 are 500ms, 1s, 2s, 4s, 6s, 8s, 10s, 15s, 20s, and 30s. A value of 29s is not accepted.

The following example sets the SCSI I/O timeout to 30 seconds:

```
# sccli c2t0d0 set drive-parameters scsi-io-timeout 30s
```

The following example sets the queue depth to 32 (the default value):

```
# sccli c2t0d0 set drive-parameters queue-depth 32
```

The following example sets the interval of drive polling to 10 seconds:

```
# sccli c2t0d0 set drive-parameters poll-interval 10s
```

set host-parameters

This command sets the specified host-channel related parameter.

```
set host-parameters [queue-depth | max-luns-per-id] value
```

TABLE 4-3 Arguments for `set host-parameters`

Argument	Description
max-luns-per-id	This parameter determines the maximum number of logical units that can be assigned to any one SCSI target address. The default value is 8. Valid values range from 1-32.
queue-depth	Controls the number of I/O operations that can be queued simultaneously for a given LUN. The default value is 32. Valid values range from 1-1024.

The following example sets the max I/O number in the controller queue to 16:

```
# sccli c2t0d0 set host-parameters queue-depth 16
```

The following example sets the max LUN number of each SCSI ID to 8:

```
# sccli c2t0d0 set host-parameters max-luns-per-id 8
```

set icl

This is a shortcut for the `set inter-controller-link` command. For details, see `set inter-controller-link`.

set inter-controller-link

Redundant Sun StorEdge 3510 FC arrays only. This command connects or disconnects an individual FC port on the upper of lower RAID controller in a redundant-controller configuration. The two controllers are effectively disconnected (on that channel) if either one of the two inter-controller links are disconnected. If the controllers are not connected, host applications might not experience transparent failover in the event of a controller failure.

Note – This command does not work with Sun StorEdge 3511 FC arrays at the time of this publication. Refer to the product release notes for software updates.

```
set inter-controller-link {upper|lower} channel channel {connected|disconnected}
```

TABLE 4-4 Arguments for `set inter-controller-link`

Argument	Description
{upper | lower}	Specify the location of the array controller slot, upper or lower.
channel *ch*	Specify the channel to modify. Valid values include: 0, 1, 4, and 5.
{connected | disconnected}	Specify the desired state for the port bypass circuit. Normally, all inter-controller-links on both the upper and lower controllers are connected; disconnecting the upper or lower controllers' inter-controller-link on any given host channel breaks the internal connection between the two controllers, and between the upper controller and the external connector on the lower controller and vice versa. This potentially doubles aggregate bandwidth because the controllers do not have to share bandwidth on each channel, but also prevents controller failover from working.

The following example disconnects the port on lower channel 1:

```
# sccli c2t0d0 set inter-controller-link lower channel 1 disconnected
```

The following example sets the port bypass circuit for channel 5 on the upper controller slot to enabled.

```
# sccli c2t0d0 set icl upper channel 5 connected
```

show channels

The `show channels` command displays information about the host and drive channels.

```
show channels [channel-list]
```

TABLE 4-5 Arguments for `show channels`

Argument	Description
channel-list	Specify the SCSI channel. The format for channel-list is {n}[,...{m}] or a range format "{n}-{m}" or {n}[,...{p}-{m}]. A valid channel number is 0-7 or 0-5 depending on the hardware. If {m} is greater than the largest channel number, information for all the channels is displayed.

The following example returns information for channels 0 and 2:

```
# sccli c2t0d0 show channels 0,2
```

The following example returns all SCSI channel information:

```
sccli> show channels
Ch  Type    Media   Speed   Width  PID / SID
-----------------------------------------
 0  Host    FC(L)   2G      Serial  40 / 41
 1  Host    FC(L)   2G      Serial  43 / 42
 2  Drive   FC(L)   2G      Serial  14 / 15
 3  Drive   FC(L)   2G      Serial  14 / 15
 4  Host    FC(L)   2G      Serial  44 / 45
 5  Host    FC(L)   2G      Serial  47 / 46
 6  Host    LAN     N/A     Serial  NA / NA
```

Returned values include: Channel Number, Channel Type, Media (Mode), Speed, Width, Primary ID (PID), and Secondary ID (SID).

CH Type values include:

- Host
- Drive

Media (Mode) values include:

- L – loop mode (FC only)
- P – point-to-point (FC only)
- SCSI
- FC
- LAN – network channel

When multiple IDs exist for the primary ID or secondary ID, an asterisk (*) displays in the PID or SID field.

show drive-parameters

The `show drive-parameters` command displays the specified RAID controller parameters that affect the operation of drive channels.

```
show drive-parameters
```

The following example shows all drive parameters of the array controller at IP address 192.168.1.42:

```
# sccli 192.168.1.42 show drive-parameters
sccli: selected se3000://199.249.246.28:58632 [SUN StorEdge 3510
SN#000187]
 spin-up: disabled
 reset-at-power-up: enabled
 disk-access-delay: 15s
 scsi-io-timeout: 10s
 queue-depth: 32
 polling-interval: 0ms
 enclosure-polling-interval: 30s
 auto-detect-swap-interval: 0ms
 smart: disabled
 auto-global-spare: disabled
```

show host-parameters

The `show host-parameters` command displays the maximum I/O queue depth per LUN and the number of LUNs that can be configured per target ID. Returned values include: max-luns-per-id, queue-depth, and fc-connection-mode (point-to-point or loop for FC only).

```
show host-parameters
```

The following example shows the maximum I/O number for the controller and LUN number of each SCSI ID for a FC array:

```
sccli> show host-parameters
 max-luns-per-id: 32
 queue-depth: 1024
 fibre connection mode: loop
```

show icl

This command is a shortcut for the `show inter-controller-link` command. For details, see `show inter-controller-link`.

show inter-controller-link

Redundant Sun StorEdge 3510 FC arrays only. This command displays the status of the port bypass circuit for the specified channel on the array controller in the upper or lower slot. If specified, the arguments must specify an array controller slot location and a channel specifier. If no arguments are specified, the upper and lower slots of channels 0, 1, 4, and 5 are displayed.

```
show inter-controller-link {upper | lower} channel ch
```

Note – This command does not work with Sun StorEdge 3511 FC arrays at the time of this publication. Refer to the product release notes for software updates.

TABLE 4-6 Arguments for `show inter-controller-link`

Argument	Description
{upper | lower}	Specify the upper or lower controller slot in the chassis to which the command is directed.
channel *ch*	Specify the channel number of the inter-controller-link.

The following example shows the inter-controller-links for channels 0, 1, 4, and 5:

```
# sccli 206.6.182.71 show inter-controller-link
 inter-controller-link upper channel 0: connected
 inter-controller-link lower channel 0: connected
 inter-controller-link upper channel 1: connected
 inter-controller-link lower channel 1: connected
 inter-controller-link upper channel 4: connected
 inter-controller-link lower channel 4: connected
 inter-controller-link upper channel 5: connected
 inter-controller-link lower channel 5: connected
```

show luns

This command shows all partitions mapped to specified host channels. Returned values include: Partition Number, Logical Volume or Logical Drive Index, Logical Volume or Logical Drive ID, Host Channel Number, On-Controller, and SCSI ID.

```
show luns [channel host-channel-list]
```

TABLE 4-7 Arguments for `show luns`

Argument	Description
host-channel-list	Specify the lun format. Use the format {n}[,…{m}] or a range format "{n}-{m}" or {n}[,…{p}-{m}]. A valid channel number is from 0-6 or 0-5 depending upon the hardware configuration.

The following example returns all partitions mapped to host channel 5 and 6:

```
# sccli c2t0d0 show luns channel 5-6
```

The following example shows all partitions mapped to the host channels:

```
sccli> show luns
Ch Tgt LUN   ld/lv  ID-Partition  Assigned  Filter Map
------------------------------------------------------------
 0  40   0   ld0    48CE0175-00   Primary
 0  40   1   ld0    48CE0175-01   Primary
 0  40   2   ld0    48CE0175-02   Primary
 0  41   0   ld1    172613B6-00   Secondary
 0  41   1   ld1    172613B6-01   Secondary
 0  41   2   ld1    172613B6-02   Secondary
 1  42   0   ld1    172613B6-00   Secondary
 1  42   1   ld1    172613B6-01   Secondary
 1  42   2   ld1    172613B6-02   Secondary
 1  43   0   ld0    48CE0175-00   Primary
 1  43   1   ld0    48CE0175-01   Primary
 1  43   2   ld0    48CE0175-02   Primary
 4  44   0   ld0    48CE0175-00   Primary
 4  44   1   ld0    48CE0175-01   Primary
 4  44   2   ld0    48CE0175-02   Primary
 4  45   0   ld1    172613B6-00   Secondary
 4  45   1   ld1    172613B6-01   Secondary
 4  45   2   ld1    172613B6-02   Secondary
 5  46   0   ld1    172613B6-00   Secondary
 5  46   1   ld1    172613B6-01   Secondary
 5  46   2   ld1    172613B6-02   Secondary
 5  47   0   ld0    48CE0175-00   Primary
 5  47   1   ld0    48CE0175-01   Primary
 5  47   2   ld0    48CE0175-02   Primary
```

CHAPTER 5

Logical Drive, Partition, and Logical Volume Commands

This chapter provides the available CLI commands with sample code for logical drives, partitions, and logical volumes. Topics covered in this chapter include:

Note – To prevent unauthorized access to administrative functions of the RAID controller, the CLI requires superuser or system administrator privileges for in-band access, and uses the controller password to authorize users of the out-of-band interface.

Note – If no device is specified on the command line, and more than one array is connected to the host, a menu of devices is presented with one device file name for each array. If there is only one StorEdge array device connected to the host, that device is selected automatically.

Note – Logical drive indexes can change whenever a logical drive is deleted, while a logical drive identifier never changes over the life of the logical drive.

Logical Drive Commands

The following commands are explained in this section:

check parity

This command performs a parity check on qualified logical drives. A qualified logical drive must be configured as a RAID1, RAID3, or RAID5.

```
check parity {ld {n} | LD-ID}
```

TABLE 5-1 Arguments for `check parity`

Argument	Description
ld n	Specify the logical drive index number. For example, `ld3`.
LD-ID	Specify the logical drive ID. For example, `71038221`.

To check parity and view the parity status for logical drive 0, type:

```
sccli> check parity ld0
sccli> show ld parity
LD      LD-ID     Status
-----------------------
ld0     627D800A  2% complete
```

configure local-spare

This command specifies a local spare disk as a dedicated spare disk for the specified logical drive. The disk drive status is set to standby.

```
configure local-spare disk [ld-index | ld-id]
```

TABLE 5-2 Arguments for `configure local-spare`

Argument	Description
disk	Specify the disk to configure. For example, specify the disk with target ID 1 on channel 2 as `2.1`.
ld-index	Specify the logical drive index number. For example, `ld3`.
LD-ID	Specify the logical drive ID. For example, `71038221`.

The following example configures disk drive ID 5 on SCSI channel 2 as a local spare for the logical drive with index number 2:

```
# sccli c2t0d0 configure local-spare 2.5 ld2
```

The following example configures disk drive ID 5 on SCSI channel 2 as a local spare for the logical drive with ID 2C33AAEA:

```
# sccli c2t0d0 configure local-spare 2.5 2C33AAEA
```

create logical-drive

This command creates a logical drive with a RAID level and disk drives, and assigns the logical drive to a primary or secondary RAID controller.

Caution – Any time logical drives are created or deleted, the numbering of logical drive indexes might change. After creating or deleting logical drives, issue a `show logical-drives` command to view an updated list of logical drive indexes. Or, use logical drive IDs, which do not change over the lifetime of the logical drive, rather than logical drive indexes.

```
create logical-drive raid-level disk-list [assigned-to] [local-spare {disk-list}] [max-disk-capacity]
[size]
```

TABLE 5-3 Arguments for `create logical-drive`

Argument	Description
raid-level	Specify the RAID level to assign to the logical drive. Valid values include: raid0, raid1, raid3, raid5, raid1+, raid3+, raid5+, NRAID. The plus (+) sign includes a local spare. The local spare is randomly chosen from the disk-list. Using the plus sign is an alternative to specifying the `local-spare` option.
disk-list	Specify a comma-separated list of IDs to use for the RAID set and the local spare, if specified. Use the `show disks free` command to determine which disks are available.
assigned-to	Specify primary to map the logical drive to the primary controller (default). Specify secondary to map the logical drive to the secondary controller. Valid values include: primary or secondary.
local-spare	Specify a local spare, for example, 2.0.
max-disk-capacity *n*MB	Allocates only *n*MB of each drive, instead of the entire drive; the remaining space on the drives can be used to expand the logical drive later. Include a MB or GB suffix with the specified parameter.
size *n*MB	An alternative to the `max-disk-capacity` keyword that specifies the total usable size of the resulting logical drive. The logical drive can be expanded later until it fills the capacity of all the member drives.

The following example creates a logical drive as RAID 1 with disks 1 through 4 on SCSI channel 2 on the primary controller. Channel 2 ID 0 is assigned as the local spare:

```
# sccli c2t0d0 create logical-drive raid1 2.1-4 primary local-spare 2.0
```

The following example creates a 10-Gbyte RAID 5 volume using six disk drives (disks with IDs 0 to 5 on channel 2), one of which is reserved as a dedicated spare for this logical drive:

```
# sccli c2t0d0 create logical-drive raid5 size 10gb local-spare 2.0-5
```

The following example creates a logical drive as RAID 1 with disks 1, 3, and 4 on SCSI channel 2 on the primary controller. Channel 2 ID 0 is assigned as the local spare, and each disk drive uses 1000-Mbyte capacity to build the RAID:

```
# sccli c2t0d0 create logical-drive 1 2.1,2.3,2.4 primary local-spare 2.0 max-
disk-capacity 1000MB
```

delete logical-drives

This command deletes the specified logical drives and unmaps all partitions of the logical drive from all host channels, and disassociates all disks that are assigned to the logical drive.

Caution – Any time logical drives are created or deleted, the numbering of logical drive indexes might change. After creating or deleting logical drives, issue a `show logical-drives` command to view an updated list of logical drive indexes. Or, use logical drive IDs, which do not change over the lifetime of the logical drive, rather than logical drive indexes.

```
delete logical-drives {ld{n} | LD-ID}
```

TABLE 5-4 Arguments for `delete logical-drives`

Argument	Description
ld n	Specify the logical drive index number. For example, `ld3`.
LD-ID	Specify the logical drive ID. For example, `71038221`.

The following example deletes the logical drive with the logical drive index number 2:

```
# sccli c2t0d0 delete logical-drive ld2
```

The following example deletes the logical drive with the logical drive ID number 3C24554F:

```
# sccli c2t0d0 delete logical-drive 3C24554F
```

show disks in a logical drive

This command displays information about the disk drives in the specified logical drive. Returned values include: Channel number, SCSI ID, Size (MB), Speed, LD Index, LD ID that the disk is assigned to, Status, and Vendor.

```
show disks [logical-drive {LD-index | LD-ID}]
```

TABLE 5-5 Arguments for `show disks`

Argument	Description
LD-Index	Show specific disks. The index number is generated from the CLI. Use the `show logical-drives` command to find the number.
LD-id	Show a specific logical drive. The ID is generated from the CLI. Use the `show logical-drives` command to find the hex-digit string.

Note – `ld` can be substituted for the keyword `logical-drive`.

The following example returns all logical drive disks with a logical drive index of 0:

```
# sccli c2t0d0 show disks ld ld0
```

The following example returns all logical drive disks with the logical drive ID of 3C256723:

```
# sccli c2t0d0 show disks logical-drive 3C256723
```

The following example returns all logical drive disks:

```
sccli> show disks
Ch  Id      Size    Speed  LD      Status    IDs
-------------------------------------------------------------------
 2   0   68.37GB   200MB  ld0     ONLINE    SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VHWR00007333
 2   1   68.37GB   200MB  ld0     ONLINE    SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VLWG00007334
 2   2   68.37GB   200MB  ld0     ONLINE    SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0TMWH00007333
 2   3   68.37GB   200MB  GLOBAL  STAND-BY SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VLL100007334
 2   4   68.37GB   200MB  ld0     ONLINE    SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VMEF00007334
 2   5   68.37GB   200MB  ld0     ONLINE    SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VDXZ00007333
 2   6   68.37GB   200MB  NONE    FRMT      SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0MS6A00007326
 2   7   68.37GB   200MB  NONE    FRMT      SEAGATE ST373405FSUN72G 0638
                                              S/N 3EK1V38B00007251
 2   8   68.37GB   200MB  NONE    FRMT      SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VHY000007332
 2   9   68.37GB   200MB  NONE    USED      SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VMBJ00007334
 2  10   68.37GB   200MB  NONE    FRMT      SEAGATE ST373307FSUN72G 0207
                                              S/N 3HZ0VE7A00007332
```

show logical-drives

This command displays information about a specified list of logical drives.

```
show logical-drives [ld-list]
```

TABLE 5-6 Arguments for `show logical-drives`

Argument	Description
ld-list	Specify a list of logical drives.

If no options are specified, all logical drives are displayed.

The following example returns all logical drive information:

```
sccli> show logical-drives
LD    LD-ID         Size  Assigned    Type     Disks Spare  Failed Status
------------------------------------------------------------------------
ld0   48CE0175   39.06GB  Primary     RAID5      5     0      0    Good
ld1   172613B6   39.06GB  Secondary   RAID5      5     0      0    Good
```

Note – The abbreviation `ld` can be substituted for the keyword `logical-drive`.

The following example returns all logical drives with logical drive index numbers 0 and 2. Logical drive 2 is not assigned.

```
sccli> show logical-drives ld0,ld2
LD    LD-ID         Size  Assigned    Type     Disks Spare  Failed Status
------------------------------------------------------------------------
ld0   48CE0175   39.06GB  Primary     RAID5      5     0      0    Good
```

Returned values include: LD Index, LD ID, RAID level, Size (MB), Status, Number of disks, number of spares, and number of failed disk.

Status values include:

- Good – in good condition
- Initing – processing initialization
- Incomplete – two or more drives failed
- Invalid – wrong optimization setting
- Drv Failed – drive failed
- Drv Absent – drive not detected
- Rebuilding

show logical-drives in a logical volume

This command displays information for all logical drives in a specified logical volume.

```
show logical-drives logical-volume {LV-Index | LV-ID}
```

TABLE 5-7 Arguments for `show logical-drives in a logical volume`

Argument	Description
LV-Index	Show specific drives in a logical volume. The index number is generated from the CLI. Use the `show logical-volumes` command to find the number.
LV-ID	Show specific drives in a logical volume. The ID number is generated from the CLI. Use the `show logical-volumes` command to find the number

The following example returns all logical drives with the logical volume ID of 12345678:

```
# sccli c2t0d0 show logical-drives logical-volume 12345678
```

Note – The abbreviation `ld` can be substituted for the keyword `logical-drive`. The abbreviation `lv` can be substituted for the keyword `logical-volume`.

The following example shows all logical drives in the logical volume with the ID of 0:

```
sccli> show ld lv lv0
LD    LD-ID         Size  Assigned    Type     Disks Spare  Failed Status
------------------------------------------------------------------------
ld0   627D800A    2.00GB  Primary     RAID3      3     0       0    Good
ld1   29C8306F    2.00GB  Primary     RAID5      3     0       0    Good
```

Returned values include: LD Index, LD ID, RAID Level, Size (MB), Status, Number of Disks, Number of Spares, and Number of Failed Disks.

Status values include:

- Good – in good condition
- Initing – the logical drive is initializing
- Incomplete – two or more drives failed
- Invalid – wrong optimization setting
- Drv Failed – drive failed
- Drv Absent – drive not detected

show logical-drives initializing

The `show logical-drives initializing` command displays the progress of the RAID controller initialization.

```
show logical-drives initializing
```

Returned values include: LD Index, LD ID, and Progress.

The following example returns the completion percentage of the RAID controller for the logical drive:

```
# sccli c2t0d0 show logical-drives initializing
```

show logical-drives parity-check

The `show logical-drives parity-check` command displays the status of a parity check being performed on a logical drive. Returned values include: LD Index, LD ID, and Progress.

```
show logical-drives parity-check
```

Note – The abbreviation `ld` can be substituted for the keyword `logical-drive`.

The following example returns the percent complete for the parity check for logical drive 0:

```
sccli> check parity ld0
sccli> show ld parity
LD      LD-ID     Status
------------------------
ld0     627D800A  2% complete
```

show logical-drives rebuilding

The `show logical-drives rebuilding` command displays the status for all logical drives being rebuilt. Returned values include: LD Index, LD ID, and Progress.

```
show logical-drives rebuilding
```

The following example returns the rebuilding process percent complete for the logical drive:

```
# sccli c2t0d0 show logical-drives rebuilding
```

shutdown logical-drive

This command permanently deactivates the specified logical drive so the associated physical drive can be physically removed from the array. For example, so the drives can be removed from the chassis.

Note – Other logical drives in the array are still accessible if only one logical drive is shut down.

Caution – This command is not reversible. To access the logical drive again, the array must be rebooted.

```
shutdown logical-drive ld{n} | LD-ID
```

TABLE 5-8 Arguments for `shutdown logical-drive`

Argument	Description
ld *n*	Specify the logical drive index number. For example, `ld3`.
LD-ID	Specify the logical drive ID. For example, `71038221`.

Note – The abbreviation `ld` can be substituted for the keyword `logical-drive`.

The following example shuts down the logical drive and then shows the status of that drive:

```
sccli> shutdown logical-drive ld3
WARNING: This is a potentially dangerous operation.
The logical drive will be placed permanently offline.
A controller reset will be required to bring it back online.
Are you sure? yes
sccli: ld3: offlined logical drive
sccli> show logical-drives
LD    LD-ID         Size  Assigned    Type     Disks Spare  Failed Status
------------------------------------------------------------------------
ld0   0043BF50  101.01GB  Primary     RAID0      3     0      0    Good
ld1   025E42E1   33.67GB  Primary     RAID1      2     3      0    Good
ld2   05CC1F19   67.34GB  Primary     NRAID      2     0      0    Good
ld3   52AD5DEB   33.67GB  Primary     NRAID      1     0      0    ShutDown
```

unconfigure local-spare

The `unconfigure local-spare` command removes a local spare disk as a dedicated spare disk for the specified logical drive.

```
unconfigure local-spare disk [ld-index | ld-id]
```

TABLE 5-9 Arguments for `unconfigure local-spare`

Argument	Description
disk	Specify the disk to unconfigure. For example, specify the disk with target ID 1 on channel 2 as `2.1`.
ld-index	Specify the logical drive index number. For example, `ld3`.
ld-id	Specify the logical drive ID. For example, `71038221`.

The following example unconfigures disk drive ID 5 on SCSI channel 2 as a local spare for the logical drive with index number 2:

```
# sccli c2t0d0 unconfigure local-spare 2.5 ld2
```

The following example unconfigures disk drive ID 5 on SCSI channel 2 as a local spare for the logical drive with ID 2C33AAEA:

```
# sccli c2t0d0 unconfigure local-spare 2.5 2C33AAEA
```

Partition Commands

The following commands are explained in this section:

- `configure partition size`
- `configure partition delete`
- `map partition`
- `show lun-maps`
- `show partitions`
- `unmap partition`

`configure partition size`

This command specifies how much disk space to assign to the partition. When a logical drive or logical volume is created, it is automatically assigned to partition 0.

```
configure partition partition size
```

TABLE 5-10 Arguments for `configure partition size`

Argument	Description
partition ID	Specify a combination of LD-ID/LV-ID and partition-number in XXXXXXXX-PP format where XXXXXXXX represents the Logical Drive/Volume ID, or a combination of LD/LV Index and partition number in ld{X}/lv{X}-PP format where LD/LV Index is the Logical Drive/Volume Index number. PP is a two-digital hexidecimal number that represents the partition number.
size	Specify the partition size in MB. For example, `4000MB`.

Note – Changes to a partition tend to cause the next-higher-numbered partition to shrink or grow. Any change in the size of one partition causes the dimensions of the partition next to it to change as well, invalidating whatever data might be stored on both partitions. Before implementing a new partition layout, the layout is displayed and the user is warned that data in the old partitions will be lost. The user is prompted to continue.

The following example creates a partition for a logical drive with a logical drive index number of 2, partition number of 2, partition size of 4000 Mbyte, and leaves the remaining capacity for the next partition:

```
# sccli c2t0d0 configure partition ld2-02 4000MB
```

The following example creates a partition for a logical drive with a logical drive ID of 1D2F34AA, partition number of 2, partition size of 4000 Mbyte, and leaves the remaining capacity for the next partition:

```
# sccli c2t0d0 configure partition 1D2F34AA-02 4000MB
```

The following example creates a partition for a logical drive with a logical volume ID of AABBCCDD, partition number of 2, partition size of 4000 Mbyte, and leaves the remaining capacity for the next partition:

```
# sccli c2t0d0 configure partition AABBCCDD-02 4000MB
```

configure partition delete

This command deletes a specified partition.

```
configure partition partition delete
```

To delete a partition, assign a size of zero, or specify the delete keyword. For example:

```
# sccli device configure part ld0-0 delete
```

map partition

This command maps a partition to the specified host channel, target, and LUN on the specified controller.

To map a partition, use the following syntax:

```
map partition-id channel channel-number target SCSI-id lun lun-number
```

Or, to map a partition, use the following syntax:

```
map partition-id channel.target.lun
```

Note – In redundant controller configurations, the specified channel and target must be valid on the controller to which the specified logical drive or volume is assigned. This means you cannot assign a partition of a logical drive or logical volume to a target ID assigned to the secondary controller, and vice versa.

TABLE 5-11 Arguments for `map partition`

Argument	Description
partition ID	Specify a combination of LD-ID/LV-ID and partition-number in XXXXXXXX-PP format where XXXXXXXX represents the Logical Drive/Volume ID, or a combination of LD/LV Index and partition number in ld{X}/lv{X}-PP format where LD/LV Index is the Logical Drive/Volume Index number. PP is a two-digital hexidecimal number that represents the partition number. Valid partition-ids for a logical drive, for example, are `3C2B1111-01` or `ld2-03`. Valid partition-ids for a logical volume, for example, are `205FB9AC-01` or `lv2-03`.
channel *ch*	Specify a host channel number between 0-7.
target *target*	Specify a host channel SCSI target number between 0-126.
lun *lun*	Specify a host channel LUN number.
channel.target.lun	Specify the channel, target, and lun to map. For example, `4.1.2` represents physical channel 4, target ID 1, logical unit number 2.
primary	Maps the logical drive to the primary controller (default).
secondary	Maps the logical drive to the secondary controller.

The following example maps partition 0 of the logical drive with index number 2 to LUN 0 of SCSI channel 1 on SCSI ID 112 and 113:

```
# sccli c2t0d0 map ld2-00 channel 1 target 112 lun 0
```

The following example maps partition 0 of the logical drive with ID 2D1A2222 to LUN 0 of SCSI channel 1 on SCSI ID 112:

```
# sccli c2t0d0 map 2D1A2222-00 channel 1 target 112 lun 0
```

The following example maps partition 0 of the logical volume with index number 2 to LUN 0 of SCSI channel 1 on SCSI ID 112:

```
# sccli c2t0d0 map lv2-00 1.112.0
```

show lun-maps

This command shows all partitions mapped to a specified host channel. Returned values include: Partition Number, Logical Volume or Logical Drive Index, Logical Volume or Logical Drive ID, Host Channel Number, On-Controller, and SCSI ID.

```
show lun-maps [channel host-channel-list]
```

TABLE 5-12 Arguments for `show lun-maps`

Argument	Description
host-channel-list	{n}[,…{m}] or a range format "{n}-{m}" or {n}[,…{p}-{m}] a valid channel number is from 0-7 or 0-5 depending upon hardware configuration

The following example shows all partitions mapped to host channel 1 and 3:

```
sccli> show lun-maps channel 1-3
Ch Tgt LUN   ld/lv  ID-Partition  Assigned  Filter Map
-------------------------------------------------------------
 1   0   0   ld0    64D138EC-00   Primary
 3   1   0   ld1    3C67B2FD-00   Secondary
```

The following example shows all partitions mapped to the host channel:

```
sccli> show lun-maps
Ch Tgt LUN   ld/lv  ID-Partition  Assigned  Filter Map
-------------------------------------------------------------
 0  40   0   ld0    6508FFD9-00   Primary
```

show partitions

The `show partitions` command displays information about all disk partitions, or just those partitions allocated from the specified logical volumes or logical drives. Returned values include: Logical Volume or Logical Drive Index, Logical Volume or Logical Drive ID, Partition Number, Offset (MB), and Size (MB).

```
show partitions [{lv-index | lv-id} | {ld-index | ld-id}]
```

TABLE 5-13 Arguments for `show partitions`

Argument	Description
lv-index	Specify a comma-separated list of logical volume indexes, for example, `lv0,lv1,lv2`.
ld-index	Specify the logical drive index number. For example, `ld3`.
lv-id	Specify a logical volumes using an eight-digit hexadecimal logical volume ID, for example, `3C24554F`.
ld-id	Specify the logical drive ID. For example, `71038221`.

The following example shows the logical drive partition table for the logical drive with the ID 3C2D3322:

```
# sccli c2t0d0 show partitions logical-drive 3C2D3322
```

The following example shows the logical volume partition table for the logical volume with index number 0:

```
sccli> show part lv0
LD/LV    ID-Partition      Size
------------------------------
lv0-00   02CE9894-00     4.00GB
```

unmap partition

This command unmaps a partition. Use the appropriate syntax depending on the target you want to unmap.

You can unmap a partition currently mapped to the specified channel.target.lun address. If a host WWPN or alias (previously defined using `create host-wwn-name`) is specified, the specified host LUN mapping is removed without affecting other host LUN maps on the same host LUN.

To unmap a partition using a channel, target, LUN address, use the following syntax:

```
unmap partition channel.target.lun [wwpn | host-wwn-name]
```

You can unmap a specified partition from any LUNs to which its mapped, or if `channel` is specified, from LUNs on the specified channel.

To unmap a partition from a specified partition or channel, use the following syntax:

```
unmap partition partition [channel]
```

TABLE 5-14 Arguments for `unmap partition`

Argument	Description
partition ID	Specify a combination of LD-ID/LV-ID and partition-number in XXXXXXXX-PP format where XXXXXXXX represents the Logical Drive/Volume ID, or a combination of LD/LV Index and partition number in ld{X}/lv{X}-PP format where LD/LV Index is the Logical Drive/Volume Index number. PP is a two-digital hexidecimal number that represents the partition number. Valid partition IDs for a logical drive, for example, are `3C2B1111-01` or `ld2-03`. Valid partition IDs for a logical volume, for example, are `205FB9AC-01` or `lv2-03`.
channel *ch*	Specify a host channel number between 0 and 7 when unmapping a specific partition from only one channel.
target *target*	Specify a host channel SCSI target number between 0-126. Since a host channel can have multiple SCSI IDs, the user can map the partition to multiple SCSI IDs of a host channel. Use the SCSI-ID-list format: {p}[,…{q}[,…{n}]]
lun *lun*	Specify a host channel LUN number.
channel.target.lun	Specify the channel, target, and LUN to unmap. This must be on the same controller as the logical volume or the logical drive that you are unmapping. For example, `4.1.2` represents physical channel 4, target ID 1, logical unit number 2.

The following example unmaps the partition from host channel 1 LUN 1 on SCSI ID 112:

```
# sccli c2t0d0 unmap partition channel 1 target 112 lun 1
```

The following example unmaps the partition from host channel 1 LUN 1 on SCSI ID 114:

```
# sccli c2t0d0 unmap partition 1.114.1
```

Logical Volume Commands

The following commands are explained in this section:

- `create logical-volume`
- `delete logical-volumes`
- `show logical-volumes`

`create logical-volume`

This command creates a logical volume from the specified logical drives on the specified controller. The logical drives used to create the logical volume must not already be mapped to any host channels. Be sure to specify the secondary keyword if the underlying logical drives are mapped to the secondary controller.

Caution – Any time logical volumes are created or deleted, the numbering of logical volume indexes might change. After creating or deleting logical volumes, issue a `show logical-volumes` command to view an updated list of logical volume indexes. Or, use logical volume IDs, which do not change over the lifetime of the logical volume, rather than logical volume indexes.

```
create logical-volume ld-list [primary | secondary]
```

TABLE 5-15 Arguments for `create logical-volume`

Argument	Description
ld-list	A comma separated list of logical drive indexes, for example, `ld0,ld1,ld2`, or a list of logical drive identifiers, such as, `71038221`.
primary	Maps the logical drive to the primary controller (default).
secondary	Maps the logical drive to the secondary controller.

The following example creates a logical volume using `ld0` and `ld2` and assigns it to the primary controller:

```
# sccli c2t0d0 create logical-volume ld0,ld2 primary
```

The following example creates a logical volume using IDs 2378FDED, 7887DDAB and assigns it to the secondary controller:

```
# sccli c2t0d0 create logical-volume 2378FDED,7887DDAB secondary
```

delete logical-volumes

This command deletes the specified logical volumes.

Caution – Any time logical volumes are created or deleted, the numbering of logical volume indexes might change. After creating or deleting logical volumes, issue a `show logical-volumes` command to view an updated list of logical volume indexes. Or, use logical volume IDs, which do not change over the lifetime of the logical volume, rather than logical volume indexes.

```
delete logical-volumes {lvn | LV-ID}
```

TABLE 5-16 Arguments for `delete logical-volumes`

Argument	Description
lv*n*	Specify a comma-separated list of logical volume indexes, for example, `lv0,lv1,lv2`.
LV-ID	Specify a logical volumes using an eight-digit hexadecimal logical volume ID, for example, `3C24554F`.

The following example deletes the logical volume with the logical volume index number 2:

```
# sccli c2t0d0 delete logical-volume lv2
```

The following example deletes the logical volume with the logical volume ID number 3C24554F:

```
# sccli c2t0d0 delete logical-volume 3C24554F
```

show logical-volumes

The `show logical-volumes` command displays information about all, or a specified list, of logical volumes. Returned values include: LV Index, LV ID, LD Count, LD ID list, Size (MB), and Assign to information.

```
show logical-volumes lv-list
```

TABLE 5-17 Arguments for `show logical-volumes`

Argument	Description
lv-list	Specify a list of logical volumes.
all	Show all logical volumes.

If no options are specified, all logical volumes are displayed. The following example returns all logical volume information:

```
sccli> show logical-volumes
LV    LV-ID         Size  Assigned    LDs
-----------------------------------------
lv0   02CE9894    4.00GB  Primary     2   ld0,ld1
```

The following example returns all logical volumes with logical volume index numbers 0 and 2:

```
# sccli c2t0d0 show logical-volumes lv0,lv2
LV    LV-ID         Size  Assigned    LDs
-----------------------------------------
lv0 02CE9894    4.00GB  Primary     2   ld0,ld1
lv2 02CE9894    4.00GB  Primary     2   ld0,ld1
```

CHAPTER 6

Firmware Show and Download Commands

This chapter provides the firmware, disk drive, router, and path controller show and download commands. Topics covered in this chapter include:

Note – To prevent unauthorized access to administrative functions of the RAID controller, the CLI requires superuser or system administrator privileges for in-band access, and uses the controller password to authorize users of the out-of-band interface.

Show Commands

The following commands are explained in this section:

- `show pld-revision`
- `show safte-devices`
- `show ses-devices`

show pld-revision

Standalone Fibre Channel expansion chassis SES devices only. This command displays the PLD hardware revision of the specified standalone Sun StorEdge 3510 FC expansion chassis SES device. The FC expansion chassis must be connected directly to the host (not to an array controller), and the SES device must be specified explicitly with the `select` command.

```
show pld-revision
```

To retrieve the PLD hardware revision of an array controller chassis, or of an expansion chassis connected to an array controller, use the `show ses-devices` command instead. For details, see "`show ses-devices`" on page 101.

show safte-devices

SCSI devices only. This command displays information returned by the SAF-TE device embedded in SCSI LVD RAID enclosures or JBODs. When this command is issued to an LVD SCSI RAID with one or more expansion chassis attached, the output includes one line for the RAID chassis and one line for each expansion chassis, since each enclosure contains a separate SAF-TE device.

The output includes the channel and target ID of the SAF-TE device, the serial number of the chassis in which it is installed, the vendor and product IDs and SAF-TE firmware revision, the status of the overall health of the enclosure, and the SAF-TE firmware package revision, which refers to firmware for other microprocesses in the chassis that are managed by the SAF-TE processor.

```
show safte-devices
```

The following example shows the SAF-TE device information for a Sun StorEdge 3310.

```
# sccli /dev/device show safte
sccli: selected /dev/device [SUN StorEdge 3310 SN#000187]
Ch  Id  Chassis  Vendor  Product ID        Rev   Package Status
-------------------------------------------------------------
 0  14  00476F   SUN     StorEdge 3310 A   1150  1025     OK
```

The following example shows the SAF-TE device information for a Sun StorEdge 3120.

```
# sccli /dev/device show safte
sccli: selected /dev/device [SUN StorEdge 3120 SN#000187]
Ch  Id  Chassis  Vendor  Product ID        Rev   Package Status
-------------------------------------------------------------
 0  14  012345   SUN     StorEdge 3120  D  1159  1159     OK
```

show ses-devices

Fibre Channel devices only. This command displays a list of enclosure services devices visible to the selected array controller or JBOD. The output includes the channel and target ID of the SES device, the serial number of the chassis in which it is installed, the vendor and product IDs and the SES firmware revision, the PLD firmware revision, the status of the overall health of the enclosure, and the FC worldwide port name (WWPN) for the device.

In redundant configurations, SES devices are installed in pairs in a single chassis. Therefore, two devices show the same chassis serial number. It is important to ensure the SES firmware and PLD revisions are consistent for SES devices installed in the same chassis. Any firmware revision mismatches that might result from replacement of an SES device FRU are flagged with an asterisk (“*”), as well as by a visual indicator on the chassis itself.

Information is shown for the array device's enclosure, as well as any expansion chassis that might be connected to the array. To view information about an SES device in an expansion chassis connected directly to the host instead of an array controller, use the `select` command to specify an SES device in the expansion chassis, and issue a `show inquiry` and `show pld-revision` command to each device.

```
show ses-devices
```

Returned values include: Channel Number, SCSI ID, Chassis Number, Vendor, Product ID, Revision, PLD Revision, SES WWNN, SES WWPN, SES Topology (loop A, top slot, or loop B bottom slot), and Status.

The following example shows the SES devices for a Sun StorEdge 3510.

```
# sccli /dev/device show ses
sccli: selected /dev/device [SUN StorEdge 3510 SN#000187]
Ch  Id Chassis Vendor/Product ID    Rev  PLD  WWNN             WWPN
------------------------------------------------------------------------------
 2  12 000187  SUN StorEdge 3510F D 1000 1000 204000C0FF000187 214000C0FF000187
                                              Topology: loop(a)  Status: OK
```

Download Commands

The following commands are explained in this section:

- download controller-firmware
- download disk-firmware
- download pld-hardware
- download safte-firmware
- download sata-path-controller-firmware
- download sata-router-firmware
- download ses-firmware

Caution – All download commands are potentially dangerous. Use only as instructed.

Caution – In redundant-controller configurations, download commands affect all LUNs on both controllers. After running a download command, you need to run the `select` command to reselect the device.

Caution – Stop the Configuration Service agent if it is running.

Note – Although redundant controller configurations support live firmware upgrades using its failover capability, the failover operation itself might cause warning messages to be displayed on the console or system log. These messages can be ignored.

Note – If the download firmware files are not under the same directory as the CLI, you need to specify the full path.

download controller-firmware

This command downloads firmware to the RAID controller. In a dual-controller configuration, the failover capability of the redundant controller pair is used to activate the new firmware without requiring the array to be shut down in what is known as a live upgrade or hot firmware download operation. In a single-controller configuration, the new firmware is activated by resetting the controller.

If the `-r` or `--reset` option is specified, the controllers are always reset instead of performing a live upgrade. This option is faster and is recommended when a live upgrade is not required.

Caution – All reset commands cause the array to stop responding to I/O requests from the host for a period of time. This might result in data loss unless all I/O activity is suspended by halting all applications that are accessing the array, and unmounting any file systems that are mounted from the array. In redundant-controller configurations, these commands affect all LUNs on both controllers.

```
download controller-firmware filename
```

The following example downloads firmware to the RAID controller:

```
sccli> download controller-firmware SUN327Q-3510.bin
sccli: selected se3000://199.249.246.28:58632 [Sun StorEdge 3510 SN#000187]
The controllers will be reset sequentially.
One controller will remain online while the other restarts.
This should not affect normal I/O activity.
Are you sure? yes
  :
```

download disk-firmware

Caution – Do not use this command with Solaris operating systems. 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. For details, refer to the Release Notes for your array.

RAID arrays only. This command downloads disk driver firmware into disk drives connected to the array. The disk-model is matched against SCSI inquiry data to determine which drives should be programmed. The disk firmware file is matched to the capacity, family, and drive type of the drive to which you are downloading. For instance, if you attempt to download 73-Gbyte drive Fuji firmware to a Seagate drive, the download fails.

Note – This command only upgrades firmware in drives attached to RAID array controllers. To upgrade disk firmware in drives contained within a standalone expansion chassis (JBOD), use the procedure documented in the README file provided with the firmware.

Note – The `download disk-firmware` command does not support a live upgrade (a hot download operation). This command shuts down the array controller first, preventing the host from performing I/O for several minutes.

When using this command:

- All daemons that access the RAID controller must be stopped.
- I/O is interrupted.
- The controller is reset after disks are flashed.

```
download disk-firmware filename disk-model
```

TABLE 6-1 Arguments for `download disk-firmware`

Argument	Description
disk-model	Specify the disks to which to download firmware. For example, type "ST336607FSUN36G" or "ST373453FSUN37G." To determine the disk model name, run the `show disks` command.
filename	Specify the firmware file name for the file that you want to download.

The following example shows the disk model on channel 2 ID 6 to discover the disk model name and then downloads the disk firmware to that drive:

```
sccli> show disks
Ch  Id      Size    Speed  LD      Status    IDs
-------------------------------------------------------------------------
 2   6   33.92GB   200MB  ld0     ONLINE    SEAGATE ST336753FSUN36G 0349
                                                S/N 3HX0YEJT00007349
 2   7   33.92GB   200MB  ld0     ONLINE    SEAGATE ST336753FSUN36G 0349
                                                S/N 3HX0Y6J300007349
 2   8   33.92GB   200MB  ld1     ONLINE    SEAGATE ST336753FSUN36G 0349
                                                S/N 3HX0YC1Y00007349
 2   9   33.92GB   200MB  ld1     ONLINE    SEAGATE ST336753FSUN36G 0349
                                                S/N 3HX0Y7W100007349
 2  10   33.92GB   200MB  GLOBAL STAND-BY SEAGATE ST336753FSUN36G 0349
                                                S/N 3HX0YAQF00007349
sccli> download disk-firmware newfile ST336753FSUN36G
```

The following example downloads the firmware to the disk in the JBOD unit `/dev/rdsk/c6t0d0s2`, which is attached to a RAID controller.

```
# sccli /dev/rdsk/c6t0d0s2 download disk-firmware new_disk_fw
```

download pld-hardware

Fibre Channel devices only. This command downloads PLD hardware into the SES microprocessor in a FC or JBOD device.

Note – The `download pld-hardware` command does not support a live upgrade (a hot download operation). Shut down the array before performing this command. When the download completes, restart the device to activate the new hardware.

```
download pld-hardware filename
```

The following example downloads the hardware using the SES device in the RAID controller with the IP address 192.168.0.1.

```
# sccli 192.168.0.1 download pld-hardware pld-file
```

The following example downloads the hardware using the SES device to a FC JBOD unit.

```
# sccli /dev/scsi/ses/c6t12d0 download pld-hardware pld-file
```

download safte-firmware

SCSI devices only. This command downloads firmware into the microprocessors within a SCSI RAID controller or JBOD. The firmware file contains code for the various microprocessors that monitor and control the enclosure. The CLI utility detects whether the firmware file is a more recent version. If the version is out-of-date, the CLI will not download the firmware. However, you can use the `-f` or `--force` command to download the firmware unconditionally.

This procedure can be performed live without resetting the controller. However, the updated firmware version number might not correctly display in the firmware Telnet or serial menu interface until the controller is reset.

```
download safte-firmware [-f | --force] filename
```

TABLE 6-2 Arguments for `download safte-firmware`

Argument	Description
[-f | --force]	Specify the firmware is downloaded unconditionally, regardless of the version detected.
filename	Specify the firmware file name for the file that you want to download.

The following example downloads SAF-TE firmware to the SAF-TE device in the RAID controller with the device name `c2t0d0`.

```
# sccli c2t0d0 download safte-firmware safte-fw-file
```

The following example downloads SAF-TE firmware to the SAF-TE device in the JBOD `/dev/scsi/processor/c6t15d0`.

```
# sccli /dev/scsi/processor/c6t15d0 download safte-firmware safte-fw-file
```

download sata-path-controller-firmware

SATA devices only. This command downloads the path controller microcode that resides on the multiplexor (mux) boards behind the SATA router. Before downloading the SATA path controller firmware, the CLI checks the redundancy of all SATA routers. If the configuration is redundant, then a live upgrade (hot download) is performed.

Caution – All download commands are potentially dangerous. Use only as instructed.

If the configuration is not redundant, the user cannot perform a live upgrade. Since routers can cause critical damage to the RAID system, in a non-redundant configuration, the controller must be shut down before the download and must be reset after the download. In single-controller and non-redundant configurations, the CLI prompts the user to continue in safe mode. If the user specifies Y at the prompt, the CLI shuts down the controller, performs the download, and then resets the controller. When the controller shuts down, the host is prevented from performing I/O for several minutes.

Note – To manually check the array redundancy, run a `show sata-router` command. Two routers are assigned to the same chassis in a redundant configuration. (The Encl-SN column displays the same chassis serial number for both routers.)

```
download sata-path-controller-firmware filename
```

The following example downloads the path controller microcode to the specified device.

```
#sccli 192.168.0.1 download sata-path-controller-firmware pc150fw_b90a.dat
```

download sata-router-firmware

SATA devices only. This command downloads SR-1216 router firmware to accessible SR-1216 routers behind the RAID controller. Before downloading the SATA router firmware, the CLI checks the redundancy of all SATA routers. If the configuration is redundant, then a live upgrade (hot download) is performed.

Caution – All download commands are potentially dangerous. Use only as instructed.

If the configuration is not redundant, the user cannot perform a live upgrade. Since routers can cause critical damage to the RAID system, in a non-redundant configuration, the controller must be shut down before the download and must be reset after the download. In single-controller and non-redundant configurations, the CLI prompts the user to continue in safe mode. If the user specifies Y at the prompt, the CLI shuts down the controller, performs the download, and then resets the controller. When the controller shuts down, the host is prevented from performing I/O for several minutes.

To manually check the array redundancy, run a `show sata-router` command. Two routers are assigned to the same chassis in a redundant configuration. (The Encl-SN column displays the same chassis serial number for both routers.)

```
download sata-router-firmware filename
```

The following example downloads SATA firmware to the specified device.

```
# sccli 192.168.0.1 download sata-router-firmware sr-dp0548.dlf
```

download ses-firmware

Fibre Channel devices only. This command downloads firmware to the SES device in a FC RAID controller or JBOD unit.

```
download ses-firmware filename
```

The following example downloads SES firmware to the SES device in the RAID controller with device name `c2t0d0`.

```
# sccli c2t0d0 download ses-firmware ses-fw-file
```

The following example downloads SES firmware to the SES device in the JBOD `/dev/scsi/processor/c6t15d0`.

```
# sccli /dev/scsi/processor/c6t15d0 download ses-firmware ses-fw-file
```

APPENDIX **A**

Summary of CLI Options and Commands

This appendix contains:

- A list of the CLI options
- A list of CLI commands for RAID arrays
- A list of CLI commands for JBODs

A list of the CLI commands is also available with the `help` or `usage` command within the CLI program.

TABLE A-1 Optional Parameters Available With Most Commands

Options	Function
`-d, --disk`	LVD JBOD enclosure only. Selects the disk device name that you specify such as `sd31` or `c1t0d0` when a JBOD chassis is selected.
`-h, --help, --usage`	display valid commands
`-l, --list`	display a list of local or remote devices that the CLI manages, and exits without processing any commands
`-n, --no`	assumes a no response to any yes/no prompts. Use this option to run scripts without prompting the user
`-o, --oob`	access the selected device using out-of-band communication (through its network interface) rather than using SCSI commands
`-w, --password`	specify the password assigned to the array controller
`-p, --port`	access the selected device out-of-band, similar to the `--oob` option, but using the specified TCP port number
`-v, --version`	display program version information
`-y, --yes`	assumes a yes response to any yes/no prompts. Use this option to run scripts without prompting the user

Note – An "X" in the FC Array or SCSI Array column in the following table indicates the CLI command works with that device.

TABLE A-2 RAID Array Commands

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"about" on page 16	display program version and copyright info	X	X	X
"check parity" on page 78	check device parity	X	X	X
"clear events" on page 40	clear the event log	X	X	X
"configure channel" on page 66	configure a host or drive channel	X	X	X
"configure global-spare" on page 56	configure a disk as a global spare	X	X	X
"configure local-spare" on page 79	configure a disk as a local spare for a specific logical drive	X	X	X
"configure network-interface" on page 19	set network interface parameters	X	X	X
"configure partition size" on page 89	configure a logical drive partition of the specified size	X	X	X
"configure partition delete" on page 90	delete a logical drive partition	X	X	X
"create host-wwn-name" on page 21	create a Host-ID/WWN name item	X	X	
"create logical-drive" on page 79	create a logical drive	X	X	X
"create logical-volume" on page 95	create a logical volume over the specified LDs	X	X	X
"delete host-wwn-name" on page 21	delete a Host-ID/WWN name item	X	X	
"delete logical-drives" on page 81	delete a logical drive	X	X	X
"delete logical-volumes" on page 96	delete one or more logical volumes	X	X	X

TABLE A-2 RAID Array Commands *(Continued)*

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"download controller-configuration" on page 44	download array controller binary configuration	X	X	X
"download controller-firmware" on page 103	download array controller firmware (optionally with hard reset)	X	X	X
"download disk-firmware" on page 104	download disk drive firmware to internal drives	X	X	X
"download nvram" on page 30	download nvram file	X	X	X
"download pld-hardware" on page 105	download enclosure PLD hardware	X	X	
"download safte-firmware" on page 106	download enclosure SAFTE firmware			X
"download sata-path-controller-firmware" on page 107	downloads the path controller microcode that resides on the mux boards behind the SATA router.		X	
"download sata-router-firmware" on page 108	downloads SR-1216 router firmware to accessible SR-1216 routers behind the RAID controller		X	
"download ses-firmware" on page 109	download enclosure SES firmware	X	X	
"exit" on page 16	exit the CLI	X	X	X
"fail" on page 45	fail a controller in a redundant controller pair	X	X	X
"help" on page 17	display help for commands	X	X	X
"inquiry" on page 17	displays SCSI inquiry data returned by the array controller	X	X	X
"map partition" on page 90	map an LD or LV partition to a host channel/target/lun	X	X	X
"mute controller" on page 46	silence the enclosure alarm	X	X	X
"password" on page 46	specifies the array controller password	X	X	X

TABLE A-2 RAID Array Commands *(Continued)*

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"quit" on page 18	exit the program	X	X	X
"reset controller" on page 47	reset the array controller	X	X	X
"reset nvram" on page 31	restore NVRAM to factory defaults	X	X	X
"select" on page 18	specify a storage device to monitor or configure	X	X	X
"set cache-policy" on page 48	set cache write-behind and optimization policy	X	X	X
"set controller-name" on page 49	set the controller name	X	X	X
"set controller-password" on page 49	set the controller password	X	X	X
"set drive-parameters" on page 68	set drive channel parameters	X	X	X
"set host-parameters" on page 69	set host channel parameters	X	X	X
"set inter-controller-link" on page 70	enable/disable per-channel inter-controller-link (Sun StorEdge 3510 arrays only)	X		
"set led" on page 57	specify a name for a disk drive slot in the array enclosure or expansion chassis			X
"set password" on page 50	set the controller password	X	X	X
"set rs232-configuration" on page 50	set the RS232 interface baud rate	X	X	X
"set unique-identifier" on page 51	set the subsystem's 6-digit hexadecimal serial number	X	X	X
"show battery-status" on page 24	display battery information including battery type, manufacturing data, in-service date, expiration date, and status	X	X	

TABLE A-2 RAID Array Commands *(Continued)*

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"show bypass device" on page 32	display the bypass status of all devices on a specified loop (Sun StorEdge 3510 arrays only)	X		
"show bypass RAID" on page 34	display the hardware bypass status of the RAID controllers on Loop A and Loop B (Sun StorEdge 3510 arrays only)	X		
"show bypass SFP" on page 34	display the bypass status of all SFPs on a specified loop (Sun StorEdge 3510 arrays only)	X		
"show cache-policy" on page 52	display cache policy	X	X	X
"show channels" on page 71	display channel configuration	X	X	X
"show configuration" on page 36	display the RAID enclosure device's configuration	X	X	X
"show controller-name" on page 52	display controller name	X	X	X
"show disks" on page 58	display information for array disks	X	X	X
"show disks in a logical drive" on page 81	display information for array disks in a logical drive	X	X	X
"show drive-parameters" on page 72	display drive parameters	X	X	X
"show enclosure-status" on page 26	display the status for all chassis components including the fan, power supply, temperature sensor, and drive slots		X	X
"show events" on page 40	display the controller event log	X	X	X
"show frus" on page 28	display FRU-ID information	X	X	X
"show host-wwn-names" on page 21	display all registered HBA WWNs in the controller for host channels	X	X	

TABLE A-2 RAID Array Commands *(Continued)*

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"show host-parameters" on page 73	display host i/o parameters	X	X	X
"show inquiry-data" on page 52	display SCSI inquiry data for selected device	X	X	X
"show inter-controller-link" on page 73	display status of inter-controller link on specified channel (Sun StorEdge 3510 arrays only)	X		
"show ip-address" on page 22	display the controller's IP network address	X	X	X
"show led-status" on page 60	display the status for the specified disk drive slot in the array enclosure or expansion chassis.			X
"show logical-drives" on page 83	display logical drives	X	X	X
"show logical-drives in a logical volume" on page 84	display information about for all logical drives in a specified logical volume	X	X	X
"show logical-drives initializing" on page 86	display the progress of the RAID controller initialization	X	X	X
"show logical-drives parity-check" on page 86	display the parity check progress for a logical drive	X	X	X
"show logical-drives rebuilding" on page 86	display the rebuilding progress for all logical drives	X	X	X
"show logical-volumes" on page 97	display logical volumes	X	X	X
"show loop-map" on page 38	show the FC loop positional map for a given channel	X	X	
"show lun-maps" on page 92	display lun maps for host channels	X	X	X
"show network-parameters" on page 23	display controller network parameters	X	X	X
"show partitions" on page 93	display partitions of logical drives	X	X	X
"show pld-revision" on page 100	display PLD revision of directly-connected FC expansion chassis	X	X	

TABLE A-2 RAID Array Commands *(Continued)*

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"show port-wwn" on page 23	display host channel FC Port Name WWNs	X	X	
"show redundancy-mode" on page 53	display redundancy status	X	X	X
"show rs232-configuration" on page 24	display serial port configuration	X	X	X
"show safte-devices" on page 100	display status of SAF-TE devices			X
"show sata-mux" on page 62	shows the SATA mux board information for all drives		X	
"show sata-router" on page 63	shows all accessible SATA routers behind the RAID controller		X	
"show ses-devices" on page 101	display status of SES devices	X	X	
"show shutdown-status" on page 53	display the controller shutdown status	X	X	
"show unique-identifier" on page 54	display subsystem 6-digit unique identifier	X	X	X
"shutdown controller" on page 54	shut down controller (prepare for power off)	X	X	X
"shutdown logical-drive" on page 87	shut down (force offline) a logical drive	X	X	X
"unconfigure global-spare" on page 61	unconfigure a global spare drive	X	X	X
"unconfigure local-spare" on page 88	unconfigure a local spare drive	X	X	X
"unfail" on page 55	restore (deassert) a failed controller	X	X	X
"unmap partition" on page 93	unmap a LD or LV partition to a host channel/target/lun	X	X	X

TABLE A-2 RAID Array Commands *(Continued)*

Command / Page Number	Function	3510 FC Array	3511 FC Array	3310 SCSI Array
"upload controller-configuration" on page 55	upload array controller binary configuration	X	X	X
"upload nvram" on page 39	upload an nvram file	X	X	X
"version" on page 19	display program version	X	X	X

Note – An "X" in the FC JBOD or SCSI JBOD column indicates the CLI command works with that device.

TABLE A-3 JBOD Commands

Command / Page Number	Function	3510 FC JBOD	3310 SCSI JBOD	3120 SCSI JBOD
"about" on page 16	display program version and copyright info	X	X	X
"download pld-hardware" on page 105	download PLD hardware into the SES microprocessor in a FC JBOD device	X		
"download ses-firmware" on page 109	download enclosure SES firmware	X		
"exit" on page 16	exit the CLI	X	X	X
"help" on page 17	display help for commands	X	X	X
"inquiry" on page 17	displays SCSI inquiry data	X	X	X
"quit" on page 18	exit the program	X	X	X
"select" on page 18	specify a storage device to monitor or configure	X	X	X
"set led" on page 57	specify a name for a disk drive slot in the array enclosure or expansion chassis		X	X
"show configuration" on page 36	display the device's configuration			X
"show enclosure-status" on page 26	display the status for all chassis components including the fan, power supply, temperature sensor, and drive slots		X	X

TABLE A-3 JBOD Commands *(Continued)*

Command / Page Number	Function	3510 FC JBOD	3310 SCSI JBOD	3120 SCSI JBOD
"show frus" on page 28	display FRU-ID information	X	X	X
"show inquiry-data" on page 52	display SCSI inquiry data for selected device	X	X	X
"show led-status" on page 60	display the status for the specified disk drive slot in the array enclosure or JBOD		X	X
"show pld-revision" on page 100	display PLD revision of directly-connected FC expansion chassis	X		
"show safte-devices" on page 100	display status of SAF-TE devices		X	X
"show ses-devices" on page 101	display status of SES devices	X		
"version" on page 19	display program version	X	X	

APPENDIX **B**

Error and Event Messages

This appendix lists:

Error and Status Messages

The following table lists the onscreen error and status messages for the CLI.

TABLE B-1 Error and Status Messages

Description
LD-ID %.8X on StorEdge Array SN#%s: ALERT: add scsi drive operation failed
LD-ID %.8X on StorEdge Array SN#%s: ALERT: clone failed (CH%d ID%d)
LD-ID %.8X on StorEdge Array SN#%s: ALERT: expansion failed
LD-ID %.8X on StorEdge Array SN#%s: ALERT: initialization failed
LD-ID %.8X on StorEdge Array SN#%s: ALERT: parity regeneration failed
LD-ID %.8X on StorEdge Array SN#%s: ALERT: rebuild failed
LD-ID %.8X on StorEdge Array SN#%s: ALERT: SCSI drive failure (CH%d ID%d)
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: adding SCSI drive completed
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: adding SCSI drive operation paused
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: clone operation completed), (CH%d ID%d)
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: continue adding SCSI drive operation

TABLE B-1 Error and Status Messages *(Continued)*

Description
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: expansion of logical drive completed
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: initialization of logical drive completed
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: parity regeneration of logical drive completed
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: rebuild of logical drive completed
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: starting add SCSI drive operation
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: starting clone operation (CH%d ID%d)
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: starting initialization
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: starting logical drive expansion
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: starting logical drive rebuild
LD-ID %.8X on StorEdge Array SN#%s: NOTICE: starting parity regeneration
Peripheral Device on StorEdge Array SN#%s: ALERT: current sensor failure detected (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: current sensor low threshold exceeded (current sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: current sensor low threshold exceeded (current sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: current sensor not present or failure detected (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: current sensor state changed to critical (current sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d cooling fan failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d cooling fan low speed threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d cooling fan low speed threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d cooling fan not present or failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d high speed threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d high speed threshold exceeded

TABLE B-1 Error and Status Messages *(Continued)*

Description
Peripheral Device on StorEdge Array SN#%s: ALERT: Fan %d state changed to critical
Peripheral Device on StorEdge Array SN#%s: ALERT: high temperature threshold exceeded (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply AC failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply AC is OK
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply DC failure condition ended
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply DC failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply high voltage threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply high voltage threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply low voltage threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply low voltage threshold exceeded
Peripheral Device on StorEdge Array SN#%s: ALERT: PS%d power supply state changed to critical
Peripheral Device on StorEdge Array SN#%s: ALERT: temperature sensor failure detected (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: temperature sensor high temperature threshold exceeded (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: temperature sensor low threshold detected (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: temperature sensor low threshold detected (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: temperature sensor not installed or failure detected (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: temperature sensor state changed to critical (T#%d)
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d AC line failure condition ended

TABLE B-1 Error and Status Messages *(Continued)*

Description
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d AC line failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d battery failure condition ended
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d battery failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d DC line failure condition ended
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d DC line failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d general failure detected
Peripheral Device on StorEdge Array SN#%s: ALERT: UPS %d state changed to critical
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor failure detected (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor high voltage threshold exceeded (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor high voltage threshold exceeded (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor low voltage threshold detected (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor low voltage threshold exceeded (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor not present or failure detected (sensor %d)
Peripheral Device on StorEdge Array SN#%s: ALERT: voltage sensor state changed to critical (sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: current sensor is ok (sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: current sensor no longer critical (current sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: current sensor no longer critical (current sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: Fan %d cooling fan is ok
Peripheral Device on StorEdge Array SN#%s: NOTICE: Fan %d cooling fan state no longer critical

TABLE B-1 Error and Status Messages *(Continued)*

Description
Peripheral Device on StorEdge Array SN#%s: NOTICE: Fan %d state no longer critical
Peripheral Device on StorEdge Array SN#%s: NOTICE: Fan %d state no longer critical
Peripheral Device on StorEdge Array SN#%s: NOTICE: PS%d power supply no longer critical
Peripheral Device on StorEdge Array SN#%s: NOTICE: PS%d power supply OK
Peripheral Device on StorEdge Array SN#%s: NOTICE: PS%d power supply state is no longer critical
Peripheral Device on StorEdge Array SN#%s: NOTICE: PS%d power supply voltage is OK
Peripheral Device on StorEdge Array SN#%s: NOTICE: temperature sensor is OK (T#%d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: temperature sensor low threshold no longer critical (T#%d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: temperature sensor no longer critical (T#%d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: temperature sensor no longer critical (T#%d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: UPS %d general failure condition ended
Peripheral Device on StorEdge Array SN#%s: NOTICE: UPS %d state change notification
Peripheral Device on StorEdge Array SN#%s: NOTICE: voltage sensor high voltage threshold no longer critical (sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: voltage sensor is ok (sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: voltage sensor ok (sensor %d)
Peripheral Device on StorEdge Array SN#%s: NOTICE: voltage sensor state no longer critical (sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: %s failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: %s threshold status critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor failure detected (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor low threshold detected (current sensor %d)

TABLE B-1 Error and Status Messages *(Continued)*

Description
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor low threshold detected (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor not present or failure detected (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor state changed to critical (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan not present or failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d high speed threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d high speed threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d low speed threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d low speed threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d state changed to critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply AC failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply AC OK
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply DC failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply DC is OK
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply high voltage threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply high voltage threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply low voltage threshold exceeded

TABLE B-1 Error and Status Messages *(Continued)*

Description
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply low voltage threshold exceeded
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply state changed to critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor failure detected (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor high temperature threshold exceeded (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor high temperature threshold exceeded (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor low temperature threshold exceeded (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor low temperature threshold exceeded (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor not installed or failure detected (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor state changed to critical (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d AC line failure condition ended
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d AC line failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d battery failure condition ended
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d battery failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d DC line failure condition ended
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d DC line failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d general failure detected
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d state changed to critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor failure detected (voltage sensor %d)

TABLE B-1 Error and Status Messages *(Continued)*

Description
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor high voltage threshold exceeded (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor high voltage threshold exceeded (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor low voltage threshold exceeded (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor low voltage threshold exceeded (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor not present or failure detected (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor state changed to critical (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: %s now online
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: %s threshold status back to normal
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: current sensor is ok (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: current sensor low threshold critical ended (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: current sensor no longer critical (current sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d condition no longer critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d cooling fan is OK
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d high speed condition no longer critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d low speed condition is no longer critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply high voltage condition is no longer critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d Power Supply OK
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply state is no longer critical
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply state is no longer critical

TABLE B-1 Error and Status Messages *(Continued)*

Description
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor is no longer critical (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor is no longer critical (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor is no longer critical (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor is OK (T#%d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: UPS %d general failure condition ended
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: UPS %d state change notification--check UPS
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor is OK (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor no longer critical (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor no longer critical (voltage sensor %d)
SAF-TE Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor no longer critical (voltage sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: %s failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: %s threshold status critical
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor failure detected (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor low threshold exceeded (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor low threshold exceeded (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor not present or failure detected (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: current sensor state changed to critical (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan Failure Detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan high speed threshold detected (%d RPM)

TABLE B-1 Error and Status Messages *(Continued)*

Description
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan high threshold detected (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan low speed threshold detected (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan low speed threshold detected (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d cooling fan not present or failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Fan %d coolng fan state changed to critical
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: high temperature threshold exceeded (T%d = %6.2f%c)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: high temperature threshold exceeded (T%d = %6.2f%c)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: low temperature threshold exceeded (T%d = %6.2f%c)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: low temperature threshold exceeded (T%d = %6.2f%c)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply AC failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d Power Supply AC is OK
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply DC failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply DC is OK
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply high voltage threshold exceeded (%5.2fV)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply high voltage threshold exceeded (%5.2fV)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply low voltage threshold exceeded (%5.2fV)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply low voltage threshold exceeded (%5.2fV)

TABLE B-1 Error and Status Messages *(Continued)*

Description
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: PS %d power supply state changed to critical
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor failure detected (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor not installed or failure detected (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: temperature sensor state changed to critical (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d AC line failure condition ended
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d AC line failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d battery failure condition ended
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d battery failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d DC line failure condition ended
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d DC line failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d general failure detected
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: UPS %d state change critical
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Voltage Sensor %d low threshold Detected (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: Voltage Sensor %d low threshold Detected (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor failure detected (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor high voltage threshold exceeded (sensor %d) (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor high voltage threshold exceeded (sensor %d) (%d RPM)
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor not present or failure detected (sensor %d)

TABLE B-1 Error and Status Messages *(Continued)*

Description
SES Device on StorEdge Array SN#%s CH%d ID%d: ALERT: voltage sensor state changed to critical (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: %s Back Online
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: %s threshold status back to normal
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: current sensor is no longer critical (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: current sensor is OK (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: current sensor state is no longer critical (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d cooling fan is no longer in critical state
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d cooling fan is now operational
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d cooling fan now above low speed threshold
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Fan %d cooling fan now below high speed threshold
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply is no longer critical
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply is OK
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply voltage now within acceptable limits
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: PS %d power supply voltage now within acceptable limits
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature no longer below low threshold (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor now below high threshold (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor now online (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: temperature sensor state changed is no longer critical (T#%d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: UPS %d general failure condition ended

TABLE B-1 Error and Status Messages *(Continued)*

Description
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: UPS %d state change notification
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: Voltage Sensor %d low threshold Critical Ended
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor is OK (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor now within acceptable limits (sensor %d)
SES Device on StorEdge Array SN#%s CH%d ID%d: NOTICE: voltage sensor now within acceptable limits (sensor %d)
StorEdge Array SN#%s CH%d ID%d LUN %d: ALERT: parity error detected
StorEdge Array SN#%s CH%d ID%d LUN %d: ALERT: re-select timeout
StorEdge Array SN#%s CH%d ID%d LUN %d: NOTICE: clear/abort-queue/abort-tag message received
StorEdge Array SN#%s CH%d ID%d LUN %d: NOTICE: SCSI bus device reset
StorEdge Array SN#%s CH%d ID%d LUN %d: NOTICE: SCSI bus reset
StorEdge Array SN#%s CH%d ID%d: ALERT: redundant path failure detected (CH%d ID%d)
StorEdge Array SN#%s CH%d ID%d: NOTICE: redundant path restored (CH%d ID%d)
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: aborted command
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: bad block encountered (%.2Xh, %.2Xh,%.2X/%.2X)
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: block reassignment failed
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: block successfully reassigned
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: data overrun/underrun detected
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: drive hardware error (%.2Xh, %.2Xh,%.2X/%.2X)
StorEdge Array SN#%s CH%d ID%d: SCSI Drive ALERT: unexpected sense received (%.2Xh, %.2Xh,%.2X/%.2X)
StorEdge Array SN#%s CH%d ID%d: SCSI Drive NOTICE: scan SCSI drive successful
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: gross error on scsi bus detected

TABLE B-1 Error and Status Messages *(Continued)*

Description
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: invalid status/sense data received (%.2Xh, %.2Xh,%.2X/%.2X)
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: negotiation error detected
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: SCSI parity/CRC error detected
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: timeout waiting for io to complete
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: unexpected disconnection encountered
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: unexpected drive not ready (%.2Xh, %.2Xh,%.2X/%.2X)
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: unexpected select timeout
StorEdge Array SN#%s CH%d ID%d: SCSI Target ALERT: unit attention received (%.2Xh, %.2Xh,%.2X/%.2X)
StorEdge Array SN#%s CH%d: ALERT: fibre channel loop connection failure detected (ALT CH%d)
StorEdge Array SN#%s CH%d: ALERT: redundant loop connection error detected
StorEdge Array SN#%s CH%d: ALERT: redundant loop failure detected (ALT Surviving CH%d)
StorEdge Array SN#%s CH%d: ALERT: redundant path expected but not found (CH%d ID%d)
StorEdge Array SN#%s CH%d: NOTICE: fibre channel loop connection restored
StorEdge Array SN#%s CH%d: SCSI Drive Channel ALERT: SCSI bus reset issued
StorEdge Array SN#%s CH%d: SCSI Drive Channel ALERT: SCSI channel failure
StorEdge Array SN#%s CH%d: SCSI Drive Channel NOTICE: SCSI bus reset issued
StorEdge Array SN#%s Controller ALERT: DRAM Parity Error Detected
StorEdge Array SN#%s Controller ALERT: pci bus 2 parity error
StorEdge Array SN#%s Controller ALERT: pci bus 3 parity error
StorEdge Array SN#%s Controller ALERT: power supply unstable
StorEdge Array SN#%s Controller ALERT: redundant controller failure detected
StorEdge Array SN#%s Controller NOTICE: controller initialization completed
StorEdge Array SN#%s Controller NOTICE: controller reset
StorEdge Array SN#%s Controller NOTICE: memory is now sufficient to fully support current configuration

TABLE B-1 Error and Status Messages *(Continued)*

Description
StorEdge Array SN#%s Controller NOTICE: NVRAM factory defaults restored
StorEdge Array SN#%s Controller WARNING: memory not sufficient to fully support current configuration
StorEdge Array SN#%s Peripheral Device ALERT: %s %s threshold exceeded (%6.2f%c)
StorEdge Array SN#%s Peripheral Device ALERT: +%sV %s threshold exceeded (%5.2fV)
StorEdge Array SN#%s Peripheral Device ALERT: battery board failure detected
StorEdge Array SN#%s Peripheral Device ALERT: battery board not fully charged
StorEdge Array SN#%s Peripheral Device ALERT: battery board not installed
StorEdge Array SN#%s Peripheral Device ALERT: cooling fan failure detected
StorEdge Array SN#%s Peripheral Device ALERT: cooling fan not installed
StorEdge Array SN#%s Peripheral Device ALERT: cooling fan not installed or failure detected
StorEdge Array SN#%s Peripheral Device ALERT: elevated temperature alert
StorEdge Array SN#%s Peripheral Device ALERT: Fan %d %s threshold exceeded(%d RPM)
StorEdge Array SN#%s Peripheral Device ALERT: Fan %d fan failure detected
StorEdge Array SN#%s Peripheral Device ALERT: Fan %d fan not present
StorEdge Array SN#%s Peripheral Device ALERT: Fan %d not present or failure detected
StorEdge Array SN#%s Peripheral Device ALERT: power supply failure detected
StorEdge Array SN#%s Peripheral Device ALERT: primary battery board failure detected
StorEdge Array SN#%s Peripheral Device ALERT: primary battery board not fully charged
StorEdge Array SN#%s Peripheral Device ALERT: primary battery board not installed
StorEdge Array SN#%s Peripheral Device ALERT: secondary battery board failure detected
StorEdge Array SN#%s Peripheral Device ALERT: secondary battery board not fully charged
StorEdge Array SN#%s Peripheral Device ALERT: secondary battery board not installed
StorEdge Array SN#%s Peripheral Device NOTICE: %s temperature %s now back to non-critical level (%6.2f%c)

TABLE B-1 Error and Status Messages *(Continued)*

Description
StorEdge Array SN#%s Peripheral Device NOTICE: +%sV %s: voltage now within acceptable limits
StorEdge Array SN#%s Peripheral Device NOTICE: battery board back online
StorEdge Array SN#%s Peripheral Device NOTICE: battery board fully charged
StorEdge Array SN#%s Peripheral Device NOTICE: battery board present
StorEdge Array SN#%s Peripheral Device NOTICE: elevated temperature now back to normal level
StorEdge Array SN#%s Peripheral Device NOTICE: Fan %d now online
StorEdge Array SN#%s Peripheral Device NOTICE: fan now online
StorEdge Array SN#%s Peripheral Device NOTICE: primary battery board back online
StorEdge Array SN#%s Peripheral Device NOTICE: primary battery board fully charged
StorEdge Array SN#%s Peripheral Device NOTICE: primary battery board present
StorEdge Array SN#%s Peripheral Device NOTICE: secondary battery board back online
StorEdge Array SN#%s Peripheral Device NOTICE: secondary battery board fully charged
StorEdge Array SN#%s Peripheral Device NOTICE: secondary battery board present
StorEdge Array SN#%s SMART: CH%d ID%d predictable failure detected

Error Codes

Most of the functionality in the Sun StorEdge CLI is implemented by a library, `smlib`, which reports success or failure using a status code beginning with "sm_". When a command fails, the CLI typically reports the operation that was in progress, the word "error," and an `smlib` status code. For example:

```
sccli: failed to set parameter: error: sm_err_illegal_request
```

The following table lists the `smlib` error codes and their descriptions.

TABLE B-2 `smlib` Error Codes

Status Code	Description
Agent errors or socket errors	
sm_err_bad_socket	cannot get a socket
sm_err_bad_connection	unable to connect to Primary Agent
sm_err_ift_agent_not_found	no IFT Primary Agent found
sm_err_network_busy	network traffic
Battery errors	
sm_err_battery_type_too_old	battery does not contain service date info
sm_err_set_battery_in_service_failure	could not set battery in-service date
sm_err_set_battery_all_info_failure	could not program battery info
sm_err_get_battery_info_failure	could not retrieve battery info
sm_stat_battery_in_service_date_not_set	battery in-service date is not set
Configuration errors	
sm_err_bad_parameter	bad parameter found to configure raid
sm_err_bad_raid_data	bad data returned from controller
sm_err_illegal_request	illegal request to controller
sm_err_invalid_request	invalid LUN mapping request
sm_err_invalid_command	invalid CLI command

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
Controller access errors	
sm_err_ctrl_access	access error to controller
sm_err_ctrl_busy	controller busy
sm_err_ctrl_not_ready	controller not ready
sm_err_not_primary_ctrl	not a primary controller
sm_err_no_valid_data	no valid returned from controller
Controller parameter errors	
sm_err_get_controller_name	cannot get controller name parameter
sm_err_set_controller_name	cannot set controller name
sm_err_set_controller_unique_id	error setting controller unique ID
sm_err_get_controller_unique_id	cannot retrieve controller unique ID
sm_err_get_rs232_config	cannot retrieve rs232 configuration info
sm_err_set_rs232_config	cannot set rs232 parameters
sm_err_mute_controller_beep	failed to mute controller
sm_err_get_write_policy	failed to retrieve write-policy
sm_err_set_write_policy	failed to set write policy
sm_err_show_drive_side_param	failed to retrieve drive-side parameters
sm_err_set_drive_side_param	failed to set drive-side parameters
sm_err_show_host_side_param	failed to retrieve host-side parameters
sm_err_set_host_side_param	failed to set host-side parameters
sm_err_get_ctrl_net_interface	failed to retrieve network parameters
sm_err_no_ctrl_net_interface	device has no network interface
sm_err_set_ctrl_net_interface	failed to set drive-side parameters
sm_err_check_or_set_password	failed to check or set controller password
sm_err_get_ctrl_redundant_mode	failed to retrieve drive-side parameters
sm_err_set_cache_param	failed to set drive-side parameters

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
sm_err_get_cache_param	failed to retrieve drive-side parameters
Device errors	
sm_err_not_supported	device not supported
sm_err_not_dev_on_primary_ctrl	user-specified device path does not correspond to a LUN mapped to the primary controller--this path cannot be used for administrative functions.
sm_err_excluded_path	specified device file is not usable due to SANpath LUN masking
File access errors	
sm_error_open_device	Open inband/outband device error.
sm_error_close_device	Close inband/outband device error.
sm_error_open_file	open file failure
sm_error_close_file	close file failure
FRU ID related errors	
sm_err_bad_fru_id	FRU ID data is bad
sm_err_get_fru_id_failure	get FRU ID failure
sm_scan_fru_done_some_missing	scanning FRU is done but at least one FRU missing
sm_err_program_fruid	error in programming the FRU-ID
sm_err_scan_fruid	error in discovering FRU-ID info
sm_err_read_fruid	error in reading FRU-ID info
sm_err_some_fru_missing	expected FRU data not found
Host LUN mapping errors	
sm_err_map_partition_to_host_channel	failed to retrieve host channel mappings
sm_err_unmap_partition_from_host_channel	failed to unmap partition from host channel
Lib database errors	
sm_err_database_not_valid	lib database data is not valid
sm_err_database_bad_lg_id	bad ld ID returned from database
sm_err_database_bad_lg_idx	bad ld index returned from database

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
sm_err_database_bad_lv_id	bad lv ID returned from database
sm_err_database_bad_lv_idx	bad lv index returned from database
sm_err_database_bad_log_drvchl	bad log drv chl
sm_err_database_bad_log_hostch	bad log host chl
sm_err_database_bad_phys_chl	bad physical channel
sm_err_database_update	error on database update
Link diag errors	
sm_err_get_channel_statistics	get channel statistics error
sm_err_set_channel_statistics	set/reset channel statistics error
sm_err_get_controller_statistics	get controller statistics error
sm_err_set_controller_statistics	set/reset controller statistics error
sm_err_get_host_statistics	get host statistics error
sm_err_set_host_statistics	set/reset host statistics error
sm_err_get_drive_statistics	get drive statistics error
sm_err_set_drive_statistics	set/reset drive statistics error
sm_err_get_caching_statistics	get caching statistics error
sm_err_set_caching_statistics	set/reset caching statistics error
sm_err_set_all_statistics	
sm_err_io_chl_diag_failure	I/O chl diagnostic command failed
sm_err_io_chl_diag_busy	I/O chl diagnostic command busy
sm_err_io_chl_diag_parameter_error	I/O chl diagnostic command parameter error
sm_err_io_chl_diag_bad_target	I/O chl diagnostic command bad target parameters
sm_err_io_chl_diag_cmdnotrun	I/O chl diagnostic command not running
sm_err_io_chl_diag_no_resource	I/O chl diagnostic command out of resource
sm_err_io_chl_diag_toomuchops	I/O chl diagnostic command too much ops running
sm_err_io_chl_diag_not_ready	I/O chl diagnostic command not ready

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
sm_stat_io_chl_diag_in_progress	I/O chl diagnostic command in progress
sm_stat_io_chl_diag_complete_noerr	I/O chl diagnostic command completed with no error
sm_stat_io_chl_diag_complete_err	I/O chl diagnostic command completed with errors
sm_stat_io_chl_diag_aborted_user	I/O chl diagnostic command aborted by user
sm_err_get_ctrl_cfg_string	failed to get controller cfg string in page 1 subpage 8
sm_err_get_ctrl_cfg	failed to get controller cfg (page 1 subpage 1)
sm_err_not_host_channel	specified channel is not a host channel
sm_err_not_drive_channel	specified channel is not a drive channel
sm_err_not_existing_channel	specified channel is not an existing channel
sm_err_not_qualifying_channel	specified channel is not a qualifying channel
sm_err_not_existing_target	specified target is not an existing target
sm_err_not_valid_target	specified target is not a valid target
LUN masking errors	
sm_err_get_hostwwn_name_list_failure	could not retrieve host-WWN name list
sm_err_hostwwn_item_exist	attempted to assign duplicate host-WWN name
sm_err_hostwwn_name_too_long	host-WWN name max length exceeded
sm_err_hostwwn_invalid_wwn	host-WWN WWN not valid
sm_err_create_hostwwn_name_failure	could not assign host-WWN name
sm_err_hostwwn_item_not_exist	host-WWN name not assigned
sm_err_delete_hostwwn_name_failure	could not delete host-WWN name assignment
sm_err_restore_hostwwn_name_list_failure	failed to restore host-WWN name list

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
Misc errors	
sm_err_out_of_resource	out of resources (cannot allocate memory)
sm_err_bad_parameters	bad parameters in command
sm_err_shutdown_ctrl_failure	shutdown controller failed
sm_err_get_ctrl_boot_time_failure	failed to get controller boot time
Monitoring errors	
sm_err_bad_event_data	not a valid data for event
sm_err_clear_event_failure	clear events failure
sm_err_get_event_failure	get events failure
Normal (good) status codes	
sm_ok	good status
sm_being_init	logical drive initializing
sm_being_rebuid	logical drive is rebuilding
Physical disk, logical drive, logical volume errors	
sm_err_create_logical_drive_disk_not_available	A specified disk drive is already in use
sm_err_create_logical_volume	could not create logical volume
sm_err_remove_logical_drive	could not delete logical drive
sm_err_remove_logical_volume	could not delete logical volume
sm_err_partition_logical_volume	could not modify lv partitions
sm_err_map_logical_volume	could not map lv to host channel
sm_err_write_params	could not write configuration data to controller
sm_err_reset_timeout	reset-controller operation timed out
sm_err_comp_scsidrv	SCSI drive does not match selection criteria
sm_err_get_ld_partition	could not retrieve ld partition map
sm_err_assign_logical_drive	could not assign ld to host channel
sm_err_show_logical_volumes	could not retrieve logical volume info
sm_err_delete_logical_volume	could not delete logical volume

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
sm_err_partition_ld_lv	failed to set partition table on ld or lv
sm_err_get_logical_drive_status	failed to get logical drive status
sm_err_map_logical_volume_filter	failed to restore lv LUN filters
sm_err_convert_logical_volume	failed to map lv number to lv ID
sm_err_config_file_format	invalid configuration file format
sm_being_init	logical drive is initializing
sm_being_rebuid	logical drive is rebuilding
Read/write configuration file errors	
sm_err_upload_raid_config	get RAID configuration error
sm_err_download_raid_config	set RAID configuration error
sm_err_upload_raid_config_get_params_failure	failed to get ctrl param in upload_raid_config
sm_err_upload_raid_config_get_lun_failure	failed to get LUN map in upload_raid_config
sm_err_upload_raid_config_get_ld_lv_info_failure	failed to get ld and lv info in upload_raid_config
sm_err_upload_raid_config_get_scsi_drv_failure	failed to get SCSI drv info in upload_raid_config
sm_err_upload_raid_config_get_fru_failure	failed to get FRU ID in upload_raid_Config
sm_err_write_raid_config	save RAID configuration to file error
sm_err_read_raid_config	get RAID configuration from file error
sm_writing_download_raid_config	writing_download_raid_config
SAF-TE/SES errors	
sm_err_not_supported_safte_target	specified target is not a supported SAF-TE target
sm_err_not_supported_ses_target	specified target is not a supported SES target
sm_err_scan_ses_failure	failed to scan SES target
sm_err_scan_safte_failure	failed to scan SAF-TE target
sm_err_bad_config_sespage	bad SES configuration page

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
sm_err_element_type_not_found	element type not found in SES config page
sm_err_element_not_found	specified element not found in SES pages
sm_err_get_ses_page_failed	failed to get SES page
sm_err_send_ses_page_failed	failed to send SES page
sm_err_get_offset_encl_pg	failed to get offset in enclosure page for specified element type
sm_err_parse_config_pg_failed	failed to parse SES configuration page
sm_err_invalid_encl_pg_length	invalid enclosure page length
sm_err_get_pld_rev_failure	failed to get pld rev
sm_err_get_pld_register_failure	failed to get pld register raw data
SATA errors	
sm_err_no_path_inq_sr1216	no valid path found to inquiry SATA router
sm_err_no_sr1216_found	no SATA router found
sm_err_no_mux_found	no SATA mux board found
sm_err_get_sr1216_failure	retrieving SATA router information failure
sm_err_get_pc150_failure	retrieving SATA mux information failure
sm_err_download_sr1216_failure	downloading SATA router firmware failure
sm_err_download_pc150_failure	download SATA path-controller firmware failure
sm_err_show_ddb_failure	retrieving SATA ddb information failure
sm_err_ddb_not_programmed	ddb information found as not programmed
sm_err_sata_op_on_wrong_unit_type	SATA related operation specified on wrong unit type
sm_err_reset_sr1216_failure	reset SATA router error

TABLE B-2 `smlib` Error Codes *(Continued)*

Status Code	Description
SCSI channel errors	
sm_err_get_channel_data	failed to get SCSI channel parameters
sm_err_set_channel_data	failed to set SCSI channel parameters
Upload/download errors	
sm_err_target_not_ready	target device not ready
sm_err_target_not_found	target device not found
sm_err_transfer_timeout	data transfer timed out
sm_err_bad_status_returned	bad status returned while download
sm_err_no_firmware_data	no firmware data for download
sm_err_bad_firmware_data	bad firmware data for download
sm_err_no_model_specified	SCSI device model name missing
sm_err_fw_download_failed	firmware download failed
sm_err_fw_download_not_performed	firmware download not performed
sm_err_set_wdt_jbod_failed	set SES wdt failed on JBOD
sm_err_get_wdt_status_jbod_failed	get ses wdt status JBOD failed
sm_err_engage_failure	controller fw download ok but engage fw failed
sm_err_ctrl_download_ok_but_no_engage_request	after ctrl fw download but ctrl does not request engage
sm_err_nvram_download_failure	failed to download NVRAM data to controller
sm_err_nvram_upload_failure	failed to upload NVRAM from controller to a host file

APPENDIX C

Show Configuration Command Output

This appendix includes a list of the items included in the output of the `show configuration` command and the sample XML output of the show configuration XML file command. Regardless of the file format, xml, txt, or onscreen, the output content is the same.

Topics in this appendix include:

For details on how to execute the `show configuration` command, see "show configuration" on page 36.

C.1 Show Configuration Output

The `show configuration` command runs the following commands:

- show inquiry-data
- show unique-identifier
- show controller-name
- show network-parameters
- show host-parameters
- show drive-parameters
- show redundancy-mode
- show cache-policy
- show RS232-configuration
- show channels
- show disks
- show logical-drives
- show logical-volumes
- show partitions
- show lun-maps
- show SES
- show port-WWNs
- show inter-controller-link
- show battery-status
- show SAF-TE
- show enclosure-status
- show sata-router
- show sata-mux
- show FRUs

The XML output produced by `show configuration --xml` includes the following data:

- Name - Model and Serial Number
- Status
- Manufacturer
- Model
- Firmware Revision
- Boot Record Version
- MAC Address
- IP Address
- Netmask
- Gateway
- Primary Serial Number
- Secondary Serial Number
- Controller Name
- Unique ID

- ID of NVRAM Defaults
- Total Number of Logical Drives
- Total Number of Partitions
- Total Number of Physical Drives
- Total Number of SES Controllers
- Cache Size
- CPU

The SATA Router output shows:

- enclosure ID
- enclosure serial number
- channel
- slot
- revision
- boot revision
- CSB revision
- hardware revision

The SATA Mux output shows:

- channel
- ID
- Mux serial number
- Mux type
- Path controller (PC150) revision
- Path controller (PC150) boot revision

The FRU Information output shows:

- FRU ID
- Name
- Description
- Part Number
- Serial Number
- Revision
- Manufacturing Date
- Manufacturing Location
- FRU Location
- Chassis Serial Number

The Channel Information output shows:

- Channel ID
- Logical Channel
- Mode
- Type
- PID
- SID
- Termination
- Default Clock Speed

- Current Clock Speed
- Default Width
- Current Width

The Network Setting output shows:

- Network IDX
- MAC Address
- Static Address
- IP Address
- Netmask
- Gateway
- Current IP Assignment Mechanism List
- Transfer Speed Configurable
- Current Transfer Speed
- Supported Transfer Speed
- MAC Address Configurable

The Communications Port Settings output shows:

- Com Port IDX
- Max Bits Per Seconds
- Min Bits Per Seconds
- Default Bits Per Seconds
- Current Bits Per Seconds

The Cache Parameters output shows:

- Write Back Flag
- I/O Optimization

The Array Parameters output shows:

- Verify On Initialization
- Verify On Rebuild
- Verify On Normal
- Rebuild Priority

The Drive Parameters output shows:

- SCSI Motor Start-up
- Power-up SCSI Reset
- Disk Access Latency
- SCSI I/O Timeout
- Tag Count Per Drive
- Drive Check Time Period
- SAF-TE Polling Period
- Auto-detect Drive Check
- Drive SMART
- Auto Global Spare

The Host Parameters output shows:

- Queue I/O Count
- LUNs Per Host
- Fiber Connection Mode

The Redundant Parameters output shows:

- Role
- Primary Controller Serial Number
- Redundancy Mode
- Redundant Status
- Secondary Controller Serial Number

The Logical Drive Parameters output shows:

- Logical Drive ID Number (8 digit hex)
- Logical Drive IDX
- Assignment
- Status
- RAID Level
- Number of Drives
- Physical Drives
- Size
- Total Partitions

The Partitions output shows:

- Partition IDX
- Effective Size
- Offset
- Mapping

The SES Parameters output shows:

- SES index
- Channel
- ID
- Chassis Serial Number
- Vendor Product ID
- Revision
- PLD Revision
- WWNN
- WWPN
- Topology

The SAF-TE Parameters output shows:

- SAF-TE index
- Channel
- ID
- Chassis Serial Number

- Vendor
- Product ID
- Revision
- Package Revision

The Port WWN output shows:

- PORT index
- Channel
- Channel SCSI ID
- WWNN

The Inter Controller Link (ICL) Parameters output shows:

- Inter Controller Link IDX
- Slot Number
- Channel Number
- Channel Mode
- Bypass Status

The Battery Status output shows:

- Name
- Type
- Manufacturing Date
- Placed In-Service Date

The Disk Drives output shows:

- Channel Number
- Target Number
- Status
- Manufacturer
- Model
- Serial Number
- Product Revision
- Capacity
- Size Remaining
- RPM
- LD-ID

The Host WWN output shows:

- Host WWN

C.2 XML DTD

The `show configuration --xml` command conforms to the following DTD.

```
<?xml version="1.0" ?>

<!-- ************************************************** -->
<!-- Root element, the RAID BaseView                    -->
<!-- ************************************************** -->
<!ELEMENT raidbaseview (raidsystem*)>

<!-- ************************************************** -->
<!-- raidsystem element : The entire RAID system, which    -->
<!--   consists of:    -->
<!--     name: The RAID System name    -->
<!--     status: the system status    -->
<!--     manufacturer:    -->
<!--     model: product model    -->
<!--     firmware_version: Firmware version    -->
<!--     bootrecord_version: Boot Record version.    -->
<!--     mac_address: network MAC address.    -->
<!--     ip: network IP address.    -->
<!--     netmask: network mask address.    -->
<!--     gateway: network gateway address.    -->
<!--                                    (optional)    -->
<!--     primary_sn: Primary Serial Number    -->
<!--     secondary_sn: Secondary Serial Number    -->
<!--                                    (optional)    -->
<!--     controller_name: Controller Name    -->
<!--     unique_id: Unique ID of the RAID System.    -->
<!--     id_of_nvram_defaults:    -->
<!--     total_logical_drives:    -->
<!--     total_partitions:    -->
<!--     total_physical_drives: Total Phyical Drivers    -->
<!--     total_ses_devices:    -->
<!--     cache_size:    -->
<!--     cpu:      -->
<!--     fru: Controller FRU info    -->
<!--                                    (optional)    -->
<!--     channel: RAID System Channel info.    -->
<!--     network: network channel info    -->
```

```
<!--                                        (optional)    -->
<!--     com_port: RAID System COM port info    -->
<!--     cache_param: Cacahe parameter    -->
<!--     array_param: Disk Array parameter    -->
<!--     drive_param: Disk side parameter    -->
<!--     host_param: Host side parameter    -->
<!--     redundant_param: is system in redundant model    -->
<!--     logical_volume Logical Volumes    -->
<!--                                        (optional)    -->
<!--     logical_drive: Logical Drivers    -->
<!--                                        (optional)    -->
<!--     ses: the SES device info    -->
<!--                                        (optional)    -->
<!--     port_wwn: port wwn info            (optional)    -->
<!--     inter_controller_link:             (optional)    -->
<!--                                        (optional)    -->
<!--     battery_status: Battery status    -->
<!--                                        (optional)    -->
<!--     config_components Disk and SAFTE device info.    -->
<!--     hostwwns: host wwn info            (optional)    -->
<!--     enclosure:              (optional enclosure status) -->
<!-- ************************************************** -->
<!ELEMENT raidsystem
(name,status,manufacturer,model,firmware_version,

bootrecord_version,mac_address?,ip?,netmask?,gateway?,
             primary_sn,secondary_sn?,controller_name,unique_id?,

id_of_nvram_defaults?,total_logical_drives,total_partitions,
              total_physical_drives,total_ses_devices,cache_size,
                cpu,fru*,channel+,network*,com_port+,cache_param,
              array_param,drive_param,host_param,redundant_param,
                logical_volume*,logical_drive*,ses*,
                port_wwns*,inter_controller_link+,
                battery_status*,config_components,
                hostwwns*,enclosure*)>
```

```
<!-- name element:                                              -->
<!ELEMENT name (#CDATA)>

<!-- status element:                                            -->
<!--                It may be one of Online, Offline,          -->
<!--                Critical, Degraded                         -->
<!ELEMENT status (#CDATA)>

<!-- manufacturer element:                                      -->
<!ELEMENT manufacturer (#CDATA)>

<!-- model element:                                             -->
<!ELEMENT model (#CDATA)>

<!-- firmware_version element:                                  -->
<!--      The RAID system Firmware version                      -->
<!--      format is major.minorEnginer                          -->
<!ELEMENT firmware_version (#CDATA)>

<!-- bootrecord_version element:                                -->
<!--      The RAID system boot record version                   -->
<!ELEMENT bootrecord_version (#CDATA)>


<!-- primary_sn element:                                        -->
<!--      The RAID system primary controller serial number      -->
<!ELEMENT primary_sn (#CDATA)>

<!-- secondary_sn element:                                      -->
<!--      The RAID system seconday controller serial number     -->
<!--      It is optional, for some system may have only         -->
<!--      one controller                                        -->
<!ELEMENT secondary_sn (#CDATA)>

<!-- controller_name element:                                   -->
<!--      The RAID system controller name                       -->
<!ELEMENT controller_name (#CDATA)>

<!-- unique_id element:                                         -->
<!--      The RAID system Unique ID                             -->
<!ELEMENT unique_id (#CDATA)>

<!-- id_of_nvram_defaults element:                              -->
<!ELEMENT id_of_nvram_defaults (#CDATA)>
```

```
<!-- total_logical_drives element:                              -->
<!--                The RAID system total logical               -->
<!--                driver number                               -->
<!ELEMENT total_logical_drives (#CDATA)>

<!-- total_partitions element:                                  -->
<!--                The RAID system total partition             -->
<!--                number                                      -->
<!ELEMENT total_partitions (#CDATA)>

<!-- total_physical_drives element:                             -->
<!--                The RAID system total phyical drives        -->
<!--                number                                      -->
<!ELEMENT total_physical_drives (#CDATA)>

<!-- total_ses_devices element:                                 -->
<!--                The RAID system total SAFTE device          -->
<!--                number                                      -->
<!ELEMENT total_ses_devices (#CDATA)>

<!-- cache_size element: The cache size, in binary MB           -->
<!ELEMENT cache_size (#CDATA)>

<!-- cpu element: The CPU type of the RAID system               -->
<!ELEMENT cpu (#CDATA)>

<!-- ************************************************** -->
<!-- fru element: FRU info for one FRU component    -->
<!--        Includes these sub-elements:    -->
<!--        idx: the index    -->
<!--        name: the name of the FRU    -->
<!--        description:    -->
<!--        part_number: the part number    -->
<!--        serial_number: the serial number    -->
<!--        revision:    -->
<!--        manufacturing_date: Manufacture Date    -->
<!--        manufacturing_location: Manufacture Location    -->
<!--        manufacturer_jedec_id: Vendor JEDEC ID    -->
<!--        fru_location: location with the chassis    -->
<!--        chassis_serial_number: sn    -->
<!-- ************************************************** -->
```

```
<!ELEMENT fru (idx,name,description,part_number,serial_number,
              revision,manufacturing_date,manufacturing_location,

manufacturer_jedec_id,fru_location,chassis_serial_number)>

<!-- idx element:                                          -->
<!ELEMENT idx (#CDATA)>

<!-- part_number element:                                  -->
<!ELEMENT part_number (#CDATA)>

<!-- revision element:                                     -->
<!ELEMENT revision (#CDATA)>

<!-- manufacturer_jedec_id element:                        -->
<!ELEMENT manufacturer_jedec_id (#CDATA)>

<!-- fru_location element:                                 -->
<!ELEMENT fru_location (#CDATA)>

<!-- chassis_serial_number element:                        -->
<!ELEMENT chassis_serial_number (#CDATA)>

<!-- manufacturing_date element:                           -->
<!ELEMENT manufacturing_date (#CDATA)>

<!-- manufacturing_location element:                       -->
<!ELEMENT manufacturing_location (#CDATA)>

<!-- descriptionn element:                                 -->
<!ELEMENT descriptionn (#CDATA)>

<!-- ************************************************** -->
<!-- channel element: The channel info of the RAID system   -->
<!--     It include these elements    -->
<!--        idx: the index, the phyical channel number    -->
<!--        logchl: Logical Channel number    -->
<!--        mode: Channel model    -->
<!--        type: Channel Type    -->
<!--        pid: Channel PID    -->
<!--        sid: Channel SID    -->
<!--        term: Channel Terminl    -->
<!--        defclk: Channel default clock    -->
<!--        curclk: Channel current clock    -->
<!--        defwid: Channle default width    -->
<!--        curwid: Channle current width    -->
```

```
<!-- ************************************************  -->
<!ELEMENT channel (idx,logchl,mode,type,pid,sid,term,
                       defclk,curclk,defwid,curwid)>

<!-- logchl element: Logical Channel number                 -->
<!ELEMENT logchl (#CDATA)>

<!-- mode element: The Channel work mode can be "Host"      -->
<!--               "Drive", "RCCOM", "Other"                -->
<!ELEMENT mode (#CDATA)>

<!-- type element: Channel type can be "SCSI" "PCI" "FC"    -->
<!ELEMENT type (#CDATA)>

<!-- pid element: PID of this channel                       -->
<!ELEMENT pid (#CDATA)>

<!-- sid element: SID of this channel                       -->
<!ELEMENT sid (#CDATA)>

<!-- defclk element: Default clock                          -->
<!ELEMENT defclk (#CDATA)>

<!-- defwid element: Default width                          -->
<!ELEMENT defwid (#CDATA)>

<!-- term element: This channel have term or not            -->
<!ELEMENT term (#CDATA)>

<!-- defclk element: Current clock                          -->
<!ELEMENT curclk (#CDATA)>

<!-- defwid element: Current width                          -->
<!ELEMENT curwid (#CDATA)>

<!-- ************************************************** -->
<!-- network element: The channel info of the RAID system   -->
<!--     It include these elements    -->
<!--        idx:    -->
<!--        mac_address:    -->
<!--        static_address:    -->
<!--        current_ip_assignment_mechanism_list:    -->
<!--        transfer_speed_configurable:    -->
<!--        current_transfer_speed:    -->
<!--        supported_transfer_speed:    -->
<!--        mac_address_configurable:    -->
```

```
<!-- ************************************************** -->
<!ELEMENT network (idx,mac_address,static_address,
                current_ip_assignment_mechanism_list,
                transfer_speed_configurable,
                current_transfer_speed,supported_transfer_speed,
                mac_address_configurable)>

<!-- mac_address element: Mac address                          -->
<!--                  format is ##:##:##:##:##:##              -->
<!ELEMENT mac_address (#CDATA)>

<!-- defclk current_ip_assignment_mechanism_list:              -->
<!ELEMENT current_ip_assignment_mechanism_list (#CDATA)>

<!-- transfer_speed_configurable element:                      -->
<!ELEMENT transfer_speed_configurable (#CDATA)>

<!-- current_transfer_speed element: in MB                     -->
<!ELEMENT current_transfer_speed (#CDATA)>

<!-- supported_transfer_speed element: in MB                   -->
<!ELEMENT supported_transfer_speed (#CDATA)>

<!-- mac_address_configurable element: Enable, Disable         -->
<!ELEMENT mac_address_configurable (#CDATA)>

<!-- static_address element:                                   -->
<!ELEMENT static_address  (ip, netmask, gateway)>

<!-- ip element: IP address                                    -->
<!ELEMENT ip (#CDATA)>

<!-- netmask element:                                          -->
<!ELEMENT netmask (#CDATA)>

<!-- gateway element:                                          -->
<!ELEMENT gateway (#CDATA)>
```

```
<!-- ************************************************** -->
<!-- com_port element: The RS-232 port info    -->
<!--     It include these elements    -->
<!--        idx: the index    -->
<!--        max_bps:    -->
<!--        min_bps:    -->
<!--        default_bps:    -->
<!--        current_bps:    -->
<!-- ************************************************** -->
<!ELEMENT com_port (idx, max_bps, min_bps, default_bps,
current_bps)>

<!-- max_bps element: Max baud rate, in BPS    -->
<!ELEMENT max_bps (#CDATA)>

<!-- min_bps element: Min baud rate, in BPS    -->
<!ELEMENT min_bps (#CDATA)>

<!-- default_bps element: Default baud rate, in BPS    -->
<!ELEMENT default_bps (#CDATA)>

<!-- current_bps element: Current baud rate, in BPS    -->
<!ELEMENT current_bps (#CDATA)>


<!-- ************************************************** -->
<!-- drive_param element: The Driver side configuation    -->
<!--     It include these elements    -->
<!--        scsi_motor_spin_up:    -->
<!--        power_up_scsi_reset:    -->
<!--        disk_access_latency:    -->
<!--        scsi_io_timeout:    -->
<!--        tag_count_per_drive:    -->
<!--        drive_check_period:    -->
<!--        safte_polling_period:    -->
<!--        auto_detect_drive_check:    -->
<!--        drive_smart_mode    -->
<!--        auto_global_spare    -->
<!-- ************************************************** -->
```

```
<!ELEMENT drive_param (scsi_motor_spin_up,power_up_scsi_reset,
                       disk_access_latency,scsi_io_timeout,
                       tag_count_per_drive,drive_check_period,
                    safte_polling_period,auto_detect_drive_check,
                       drive_smart_mode,auto_global_spare)>

<!-- scsi_motor_spin_up element : in sec                    -->
<!ELEMENT scsi_motor_spin_up (#CDATA)>

<!-- power_up_scsi_reset element:                           -->
<!ELEMENT power_up_scsi_reset (#CDATA)>

<!-- disk_access_latency element:                           -->
<!ELEMENT disk_access_latency (#CDATA)>

<!-- tag_count_per_drive element:                           -->
<!ELEMENT tag_count_per_drive (#CDATA)>

<!-- safte_polling_period element:                          -->
<!ELEMENT safte_polling_period (#CDATA)>

<!-- scsi_io_timeout element:                               -->
<!ELEMENT scsi_io_timeout (#CDATA)>

<!-- drive_check_period element:                            -->
<!ELEMENT drive_check_period (#CDATA)>

<!-- auto_detect_drive_check element:                       -->
<!ELEMENT auto_detect_drive_check (#CDATA)>

<!-- drive_smart_mode element:                              -->
<!ELEMENT drive_smart_mode (#CDATA)>

<!-- auto_global_spare element:                             -->
<!ELEMENT auto_global_spare (#CDATA)>

<!-- ************************************************** -->
<!-- cache_param element: RAID system cache modes    -->
<!--     write_back_flag: (Enabled,Disabled)    -->
<!--     optimization: (Sequential I/O,Random I/O)    -->
<!-- ************************************************** -->
```

```
<!ELEMENT cache_param (write_back_flag, optimization)>

<!-- write_back_flag element: can be "Sequential I/O"       -->
<!--                          "Random I/O"                  -->
<!ELEMENT write_back_flag (#CDATA)>

<!-- optimization element: can be "Enabled", "Disabled"    -->
<!ELEMENT optimization (#CDATA)>


<!-- ************************************************** -->
<!-- array_param element: RAID system array info, includes  -->
<!--              verify_on_init    -->
<!--              verify_on_rebuild    -->
<!--              verify_on_normal    -->
<!--              rebuild_priority    -->
<!-- ************************************************** -->
<!ELEMENT array_param (verify_on_init, verify_on_rebuild,
                       verify_on_normal, rebuild_priority)>

<!-- verify_on_init element: can be "Enable" "Disable"      -->
<!ELEMENT verify_on_init (#CDATA)>

<!-- verify_on_rebuild element: can be "Enable" "Disable"   -->
<!ELEMENT verify_on_rebuild (#CDATA)>

<!-- verify_on_normal element: can be "Enable" "Disable"    -->
<!ELEMENT verify_on_normal (#CDATA)>

<!-- rebuild_priority element: can be "Hight" "Improved"    -->
<!--                               "Normal" "Low"           -->
<!ELEMENT rebuild_priority (#CDATA)>


<!-- host_param element: RAID system host side bus info:    -->
<!--              queue_io_count                            -->
<!--              luns_per_host                             -->
<!--              fibre_connection_mode                     -->
<!ELEMENT host_param (queue_io_count,luns_per_host,
                                fibre_connection_mode)>

<!-- queue_io_count element:                                -->
<!ELEMENT queue_io_count (#CDATA)>
```

```
<!-- luns_per_host element:                                          -->
<!ELEMENT luns_per_host (#CDATA)>

<!-- fibre_connection_mode element:                                  -->
<!ELEMENT fibre_connection_mode (#CDATA)>


<!-- ************************************************** -->
<!-- redundant_param element for RAID controllers:    -->
<!--              Primary_sn    -->
<!--              Redundancy_mode    -->
<!--              redundant_status    -->
<!--              secondary_sn    -->
<!-- ************************************************** -->
<!ELEMENT redundant_param (role,Primary_sn,Redundancy_mode,
                           redundant_status,secondary_sn)>

<!-- role element:                                                   -->
<!ELEMENT role (#CDATA)>

<!-- Primary_sn element:                                             -->
<!ELEMENT Primary_sn (#CDATA)>

<!-- Redundancy_mode element:                                        -->
<!ELEMENT Redundancy_mode (#CDATA)>

<!-- redundant_status element:                                       -->
<!ELEMENT redundant_status (#CDATA)>

<!-- ************************************************** -->
<!-- logical_drive element: The Logical Drive info, include -->
<!--              ld_id    -->
<!--              ld_idx    -->
<!--              assignment    -->
<!--              status    -->
<!--              raid_level    -->
<!--              number_of_drives    -->
<!--              physical_drive    -->
<!--              size    -->
<!--              total_partitions    -->
<!--              partition    -->
<!-- ************************************************** -->
```

```
<!ELEMENT logical_drive (ld_id,ld_idx,assignment,status,
                      raid_level,number_of_drives,physical_drive,
                        size,total_partitions?,partition*)>

<!-- ld_id element:                                              -->
<!ELEMENT ld_id (#CDATA)>

<!-- ld_idx element:                                             -->
<!ELEMENT ld_idx (#CDATA)>

<!-- assignment element:                                         -->
<!ELEMENT assignment (#CDATA)>

<!-- raid_level element: can be RAID0, RAID1, RAID3 ....   -->
<!ELEMENT raid_level (#CDATA)>

<!-- number_of_drives element:                                   -->
<!ELEMENT number_of_drives (#CDATA)>

<!-- physical_drive element:                                     -->
<!ELEMENT physical_drive (#PCDATA)>

<!-- size element: in MB                                         -->
<!ELEMENT size (#CDATA)>

<!-- ************************************************** -->
<!-- ses element: The SES device info, include    -->
<!--              idx: index number    -->
<!--              ch: channel number    -->
<!--              id: SCSI ID    -->
<!--              chassis    -->
<!--              vendor_product_id    -->
<!--              rev    -->
<!--              pld    -->
<!--              wwnn    -->
<!--              wwpn    -->
<!--              topology    -->
<!-- ************************************************** -->
<!ELEMENT ses (idx,ch,id,chassis,vendor_product_id,
                rev,pld,wwnn,wwpn,topology)>
```

```
<!-- id element:                                                    -->
<!ELEMENT id (#CDATA)>

<!-- chassis element:                                               -->
<!ELEMENT chassis (#CDATA)>

<!-- vendor_product_id element:                                     -->
<!ELEMENT vendor_product_id (#CDATA)>

<!-- rev element:                                                   -->
<!ELEMENT rev (#CDATA)>

<!-- pld element:                                                   -->
<!ELEMENT pld (#CDATA)>

<!-- wwnn element:                                                  -->
<!ELEMENT wwnn (#CDATA)>

<!-- wwpn element:                                                  -->
<!ELEMENT wwpn (#CDATA)>

<!-- topology element:                                              -->
<!ELEMENT topology (#CDATA)>

<!-- ************************************************** -->
<!-- port_wwns element:                      include    -->
<!--             port_wwn    -->
<!-- ************************************************** -->
<!ELEMENT port_wwns (port_wwn*)>

<!-- ************************************************** -->
<!-- port_wwn element: include    -->
<!--             idx    -->
<!--             ch    -->
<!--             id    -->
<!--             wwnn    -->
<!-- ************************************************** -->
<!ELEMENT port_wwn (idx,ch,id,wwnn)>
<!-- ************************************************** -->
<!-- hostwwns element:                      include    -->
<!--             hostwwns    -->
<!-- ************************************************** -->
<!ELEMENT hostwwns (hostwwns*)>
```

```
<!-- ************************************************** -->
<!-- hostwwn element: include    -->
<!--             wwn    -->
<!--             name    -->
<!-- ************************************************** -->
<!ELEMENT hostwwn (wwn,name)>

<!-- wwn element:                                       -->
<!ELEMENT wwn (#CDATA)>


<!-- ************************************************** -->
<!-- inter_controller_link element: include    -->
<!--             idx    -->
<!--             slot    -->
<!--             ch    -->
<!--             ch_mode    -->
<!--             bypass_status    -->
<!-- ************************************************** -->
<!ELEMENT inter_controller_link
(idx,slot,ch,ch_mode,bypass_status)>

<!-- slot element:                                      -->
<!ELEMENT slot (#CDATA)>

<!-- ch_mode element:                                   -->
<!ELEMENT ch_mode (#CDATA)>

<!-- bypass_status element:                             -->
<!ELEMENT bypass_status (#CDATA)>

<!-- ************************************************** -->
<!-- battery_status element: battery status info, include   -->
<!--             name    -->
<!--             type    -->
<!--             manufacturing_date    -->
<!--             placed_in_service    -->
<!-- ************************************************** -->
<!ELEMENT battery_status
(name,type,manufacturing_date,placed_in_service)>

<!-- placed_in_service element:                         -->
<!ELEMENT placed_in_service (#CDATA)>
<!-- ************************************************** -->
```

```
<!-- partition element: The partition info, include    -->
<!--              idx    -->
<!--              effective_size    -->
<!--              offset    -->
<!--              mapping    -->
<!-- ************************************************** -->
<!ELEMENT partition (idx, effective_size, offset, mapping?,
filter_mapping?)>

<!-- effective_size element: in MB                          -->
<!ELEMENT effective_size (#CDATA)>

<!-- offset element: in MB                                  -->
<!ELEMENT offset (#CDATA)>

<!-- mapping element:                                       -->
<!ELEMENT mapping (#CDATA)>

<!-- filter_mapping element:                                -->
<!ELEMENT filter_mapping (#CDATA)>


<!-- ************************************************** -->
<!-- logical_volume element: Logical Volume Info    -->
<!--              lv_id    -->
<!--              lv_idx    -->
<!--              assignment    -->
<!--              status    -->
<!--              size    -->
<!--              logical_drive    -->
<!--              total_partitions    -->
<!--              partition    -->
<!-- ************************************************** -->
<!ELEMENT logical_volume (lv_id,lv_idx,assignment,status,

size,logical_drive,total_partitions,partition+)>

<!-- lv_id element:                                         -->
<!ELEMENT lv_id (#CDATA)>

<!-- number_of_logical_drive element: LV include LD number  -->
<!ELEMENT number_of_logical_drive (#CDATA)>

<!-- lv_idx element:                                        -->
<!ELEMENT lv_idx (#CDATA)>
```

```
<!-- ************************************************** -->
<!-- config_components element:    -->
<!-- ************************************************** -->
<!ELEMENT config_components (disk*)>

<!-- ************************************************** -->
<!-- Disk element:    -->
<!-- ************************************************** -->
<!ELEMENT disk (ch,target,status,manufacturer,model,
                serial_number, product_revision,capacity,
                remaining_size,rpm,ld_id,ld_idx)>

<!-- ch element:                                          -->
<!ELEMENT ch (#CDATA)>

<!-- target element:                                      -->
<!ELEMENT target (#CDATA)>

<!-- serial_number element:                               -->
<!ELEMENT serial_number (#CDATA)>

<!-- product_revision element:                            -->
<!ELEMENT product_revision (#CDATA)>

<!-- capacity element:                                    -->
<!ELEMENT capacity (#CDATA)>

<!-- remaining_size element:                              -->
<!ELEMENT remaining_size (#CDATA)>

<!-- rpm element:                                         -->
<!ELEMENT rpm (#CDATA)>

<!-- ************************************************** -->
<!-- enclosure element:    -->
<!-- added in sccli 1.5 (LVD SCSI only)    -->
<!-- ************************************************** -->
<!ELEMENT enclosure (mgmt_device,component)>
<!ATTLIST enclosure status (OK|Fault|Missing|Unknown) #REQUIRED>
<!ATTLIST enclosure fru-pn CDATA #REQUIRED>
<!ATTLIST enclosure fru-sn CDATA #REQUIRED>

<!-- ************************************************** -->
```

```
<!-- mgmt_device element:    -->
<!-- (a reference to an ses or saf-te element)    -->
<!-- ************************************************** -->
<!ELEMENT mgmt_device (EMPTY)>
<!ATTLIST mgmt_device name CDATA #REQUIRED>
<!ATTLIST mgmt_device idx CDATA #REQUIRED>

<!-- ************************************************** -->
<!-- component element:    -->
<!-- ************************************************** -->
<!ELEMENT component (#PCDATA)>
<!ATTLIST component type (diskslot,fan,ps,temp) #REQUIRED>
<!ATTLIST component unit CDATA #REQUIRED>
<!ATTLIST component status (OK|Fault|Missing|Unknown) #REQUIRED>
<!ATTLIST component fru-pn CDATA #REQUIRED>
<!ATTLIST component fru-sn CDATA #REQUIRED>

<!-- ************************************************** -->
<!-- component sub-elements:    -->
<!--               -->
<!-- Unique attributes for certain chassis components. They -->
<!-- are defined as ad-hoc child elements so we can treat   -->
<!-- all chassis  components the same way, rather than    -->
<!-- displaying each type differently.    -->
<!-- ************************************************** -->

<!-- SCSI backplane select id for diskslot component    -->
<!ELEMENT addr (#CDATA)>

<!-- disk slot's led state (on|off) for diskslot component  -->
<!ELEMENT led (#CDATA)>

<!-- temperature in degrees celsius for temp component    -->
<!ELEMENT temp (#CDATA)>
```

C.3 Sample `Show Configuration XML` Output

The following pages show a sample of the `show configuration` command output in XML format for the Sun StorEdge 3510 FC array. The following output is specific to this configuration. Each configuration varies based on how the array is set up. Regardless of the file format, xml or txt or onscreen, the output content is the same.

```
<raidbaseview>
  <raidsystem>
  <name>StorEdge 3510 A-A Array SN#000001</name>
  <status>Online</status>
  <manufacturer>SUN</manufacturer>
  <model>StorEdge 3510</model>
  <firmware_version>327R</firmware_version>
  <bootrecord_version>1.31H</bootrecord_version>
  <mac_address>00:c0:ff:00:00:01</mac_address>
  <ip>206.235.238.125</ip>
  <netmask>255.255.255.0</netmask>
  <gateway>0.0.0.0</gateway>
  <primary_sn>8000568</primary_sn>
  <secondary_sn>8000095</secondary_sn>
  <controller_name />
  <unique_id>0x000001</unique_id>
  <id_of_nvram_defaults>327R 3510 v2.58</id_of_nvram_defaults>
  <total_logical_drives>4</total_logical_drives>
  <total_partitions>4</total_partitions>
  <total_physical_drives>12</total_physical_drives>
  <total_ses_devices>1</total_ses_devices>
  <cache_size>1024MB ECC SDRAM</cache_size>
  <cpu>PPC750</cpu>
```

```
  <fru>
  <idx>0</idx>
  <name>FC_RAID_IOM</name>
  <description>SE3510 I/O w/SES + RAID Cont 1GB</description>
  <part_number>370-5537</part_number>
  <serial_number>000463</serial_number>
  <revision>01</revision>
  <manufacturing_date>Tue Jan 28 06:05:29
2003</manufacturing_date>
<manufacturing_location>Milpitas,CA,USA</manufacturing_location>
  <manufacturer_jedec_id>0x0301</manufacturer_jedec_id>
  <fru_location>UPPER FC RAID IOM SLOT</fru_location>
  <chassis_serial_number>N/A</chassis_serial_number>
  </fru>
  <fru>
  <idx>1</idx>
  <name>BATTERY_BOARD</name>
  <description>SE3510 Hot Swap Battery Module</description>
  <part_number>370-5545</part_number>
  <serial_number>000548</serial_number>
  <revision>01</revision>
  <manufacturing_date>Thu Jan 23 06:07:40
2003</manufacturing_date>
<manufacturing_location>Milpitas,CA,USA</manufacturing_location>
  <manufacturer_jedec_id>0x0301</manufacturer_jedec_id>
  <fru_location>UPPER BATTRY BOARD SLOT</fru_location>
  <chassis_serial_number>N/A</chassis_serial_number>
  </fru>
  <fru>
  <idx>2</idx>
  <name>FC_RAID_IOM</name>
  <description>SE3510 I/O w/SES + RAID Cont 1GB</description>
  <part_number>370-5537</part_number>
  <serial_number>000466</serial_number>
  <revision>01</revision>
  <manufacturing_date>Tue Jan 28 05:23:40
2003</manufacturing_date>
<manufacturing_location>Milpitas,CA,USA</manufacturing_location>
  <manufacturer_jedec_id>0x0301</manufacturer_jedec_id>
  <fru_location>LOWER FC RAID IOM SLOT</fru_location>
  <chassis_serial_number>N/A</chassis_serial_number>
  </fru>
```

```
  <fru>
  <idx>3</idx>
  <name>BATTERY_BOARD</name>
  <description>SE3510 Hot Swap Battery Module</description>
  <part_number>370-5545</part_number>
  <serial_number>000425</serial_number>
  <revision>01</revision>
  <manufacturing_date>Thu Jan 23 06:05:11
2003</manufacturing_date>

<manufacturing_location>Milpitas,CA,USA</manufacturing_location>
  <manufacturer_jedec_id>0x0301</manufacturer_jedec_id>
  <fru_location>LOWER BATTERY BOARD SLOT</fru_location>
  <chassis_serial_number>N/A</chassis_serial_number>
  </fru>
  <channel>
  <idx>0</idx>
  <logchl>0</logchl>
  <mode>Host</mode>
  <type>Fiber</type>
  <pid>40</pid>
  <sid>41</sid>
  <term>N/A</term>
  <defclk>AUTO</defclk>
  <curclk>2G</curclk>
  <defwid>Serial</defwid>
  <curwid>Serial</curwid>
  </channel>
  <channel>
  <idx>1</idx>
  <logchl>1</logchl>
  <mode>Host</mode>
  <type>Fiber</type>
  <pid>42</pid>
  <sid>43</sid>
  <term>N/A</term>
  <defclk>AUTO</defclk>
  <curclk>2G</curclk>
  <defwid>Serial</defwid>
  <curwid>Serial</curwid>
  </channel>
```

```
<channel>
<idx>2</idx>
<logchl>0</logchl>
<mode>Drive</mode>
<type>Fiber</type>
<pid>14</pid>
<sid>15</sid>
<term>N/A</term>
<defclk>AUTO</defclk>
<curclk>2G</curclk>
<defwid>Serial</defwid>
<curwid>Serial</curwid>
</channel>
<channel>
<idx>3</idx>
<logchl>1</logchl>
<mode>Drive</mode>
<type>Fiber</type>
<pid>14</pid>
<sid>15</sid>
<term>N/A</term>
<defclk>AUTO</defclk>
<curclk>2G</curclk>
<defwid>Serial</defwid>
<curwid>Serial</curwid>
</channel>
<channel>
<idx>4</idx>
<logchl>2</logchl>
<mode>Host</mode>
<type>Fiber</type>
<pid>44</pid>
<sid />
<term>N/A</term>
<defclk>AUTO</defclk>
<curclk>2G</curclk>
<defwid>Serial</defwid>
<curwid>Serial</curwid>
</channel>
```

```
  <channel>
  <idx>5</idx>
  <logchl>3</logchl>
  <mode>Host</mode>
  <type>Fiber</type>
  <pid />
  <sid />
  <term>N/A</term>
  <defclk>AUTO</defclk>
  <curclk>ASYNC</curclk>
  <defwid>Serial</defwid>
  <curwid>N/A</curwid>
  </channel>
  <network>
  <idx>0</idx>
  <mac_address>00:c0:ff:00:00:01</mac_address>
  <static_address>
  <ip>206.235.238.125</ip>
  <netmask>255.255.255.0</netmask>
  <gateway>0.0.0.0</gateway>
  </static_address>

<current_ip_assignment_mechanism_list>N/A</current_ip_assignment_mechanism_lis
t>
  <transfer_speed_configurable>Disabled</transfer_speed_configurable>
  <current_transfer_speed>negotiating,100M</current_transfer_speed>
  <supported_transfer_speed>10M,100M</supported_transfer_speed>
  <mac_address_configurable>Disabled</mac_address_configurable>
  </network>
  <com_port>
  <idx>0</idx>
  <max_bps>38400bps</max_bps>
  <min_bps>2400bps</min_bps>
  <default_bps>38400bps</default_bps>
  <current_bps>38400bps</current_bps>
  </com_port>
  <com_port>
  <idx>1</idx>
  <max_bps>38400bps</max_bps>
  <min_bps>2400bps</min_bps>
  <default_bps>38400bps</default_bps>
  <current_bps>38400bps</current_bps>
  </com_port>
```

```
<cache_param>
<write_back_flag>Enabled</write_back_flag>
<optimization>Sequential I/O</optimization>
</cache_param>
<array_param>
<verify_on_init>Disabled</verify_on_init>
<verify_on_rebuild>Disabled</verify_on_rebuild>
<verify_on_normal>Disabled</verify_on_normal>
<rebuild_priority>Low</rebuild_priority>
</array_param>
<drive_param>
<scsi_motor_spin_up>Disabled</scsi_motor_spin_up>
<power_up_scsi_reset>Enabled</power_up_scsi_reset>
<disk_access_latency>15S</disk_access_latency>
<scsi_io_timeout>30S</scsi_io_timeout>
<tag_count_per_drive>32</tag_count_per_drive>
<drive_check_period>0S</drive_check_period>
<safte_polling_period>30S</safte_polling_period>
<auto_detect_drive_check>0S</auto_detect_drive_check>
<drive_smart_mode>Disabled</drive_smart_mode>
<auto_global_spare>Disabled</auto_global_spare>
</drive_param>
<host_param>
<queue_io_count>1024</queue_io_count>
<luns_per_host>32</luns_per_host>
<fibre_connection_mode>loop</fibre_connection_mode>
</host_param>
<redundant_param>
<role>Redundant Primary</role>
<Primary_sn>8000568</Primary_sn>
<Redundancy_mode>Active-Active</Redundancy_mode>
<redundant_status>Redundant deassert reset</redundant_status>
<secondary_sn>8000095</secondary_sn>
</redundant_param>
<logical_drive>
<ld_id>1CB42D13</ld_id>
<ld_idx>0</ld_idx>
<assignment>Primary</assignment>
<status>Good</status>
<raid_level>RAID 5</raid_level>
<number_of_drives>3</number_of_drives>
<physical_drive>2.0 2.1 2.2</physical_drive>
<size>67.34GB</size>
<total_partitions>1</total_partitions>
```

```
<partition>
<idx>0</idx>
<effective_size>67.34GB</effective_size>
<offset>0</offset>
<mapping>0.40.0</mapping>
</partition>
</logical_drive>
<logical_drive>
<ld_id>1869F0A4</ld_id>
<ld_idx>1</ld_idx>
<assignment>Secondary</assignment>
<status>Good</status>
<raid_level>RAID 5</raid_level>
<number_of_drives>3</number_of_drives>
<physical_drive>2.3 2.4 2.5</physical_drive>
<size>67.34GB</size>
<total_partitions>1</total_partitions>
<partition>
<idx>0</idx>
<effective_size>67.34GB</effective_size>
<offset>0</offset>
<mapping>N/A</mapping>
</partition>
</logical_drive>
<logical_drive>
<ld_id>4226ADEB</ld_id>
<ld_idx>2</ld_idx>
<assignment>Primary</assignment>
<status>Good</status>
<raid_level>RAID 5</raid_level>
<number_of_drives>3</number_of_drives>
<physical_drive>2.6 2.7 2.8</physical_drive>
<size>67.34GB</size>
<total_partitions>1</total_partitions>
<partition>
<idx>0</idx>
<effective_size>67.34GB</effective_size>
<offset>0</offset>
<mapping>N/A</mapping>
</partition>
</logical_drive>
```

```
<logical_drive>
<ld_id>5B6D4164</ld_id>
<ld_idx>3</ld_idx>
<assignment>Secondary</assignment>
<status>Good</status>
<raid_level>RAID 5</raid_level>
<number_of_drives>3</number_of_drives>
<physical_drive>2.9 2.10 2.11</physical_drive>
<size>67.34GB</size>
<total_partitions>1</total_partitions>
<partition>
<idx>0</idx>
<effective_size>67.34GB</effective_size>
<offset>0</offset>
<mapping>N/A</mapping>
</partition>
</logical_drive>
<ses>
<idx>0</idx>
<ch>2</ch>
<id>12</id>
<chassis>unknown</chassis>
<vendor_product_id>SUN StorEdge 3510F A</vendor_product_id>
<rev>1040</rev>
<pld>1000</pld>
<wwnn>204000C0FF000001</wwnn>
<wwpn>214000C0FF000001</wwpn>
<topology>loopa</topology>
</ses>
<ses>
<idx>1</idx>
<ch>3</ch>
<id>12</id>
<chassis>unknown</chassis>
<vendor_product_id>SUN StorEdge 3510F A</vendor_product_id>
<rev>1040</rev>
<pld>1000</pld>
<wwnn>204000C0FF000001</wwnn>
<wwpn>224000C0FF000001</wwpn>
<topology>loopb</topology>
</ses>
<port_wwns>
```

```
<port_wwn>
<idx>0</idx>
<ch>0</ch>
<id>40</id>
<wwnn>216000C0FF800001</wwnn>
</port_wwn>
<port_wwn>
<idx>0</idx>
<ch>0</ch>
<id>41</id>
<wwnn>216000C0FF900001</wwnn>
</port_wwn>
<port_wwn>
<idx>1</idx>
<ch>1</ch>
<id>42</id>
<wwnn>226000C0FFA00001</wwnn>
</port_wwn>
<port_wwn>
<idx>1</idx>
<ch>1</ch>
<id>43</id>
<wwnn>226000C0FFB00001</wwnn>
</port_wwn>
<port_wwn>
<idx>4</idx>
<ch>4</ch>
<id>44</id>
<wwnn>256000C0FFC00001</wwnn>
</port_wwn>
</port_wwns>
<inter_controller_link>
<idx>0</idx>
<slot>upper</slot>
<ch>0</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>connected</bypass_status>
</inter_controller_link>
<inter_controller_link>
<idx>1</idx>
<slot>lower</slot>
<ch>0</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>connected</bypass_status>
</inter_controller_link>
```

```
<inter_controller_link>
<idx>2</idx>
<slot>upper</slot>
<ch>1</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>connected</bypass_status>
</inter_controller_link>
<inter_controller_link>
<idx>3</idx>
<slot>lower</slot>
<ch>1</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>connected</bypass_status>
</inter_controller_link>
<inter_controller_link>
<idx>4</idx>
<slot>upper</slot>
<ch>4</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>connected</bypass_status>
</inter_controller_link>
<inter_controller_link>
<idx>5</idx>
<slot>lower</slot>
<ch>4</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>connected</bypass_status>
</inter_controller_link>
<inter_controller_link>
<idx>6</idx>
<slot>upper</slot>
<ch>5</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>disconnected</bypass_status>
</inter_controller_link>
<inter_controller_link>
<idx>7</idx>
<slot>lower</slot>
<ch>5</ch>
<ch_mode>host channel</ch_mode>
<bypass_status>disconnected</bypass_status>
</inter_controller_link>
```

```
<battery_status>
<name>Upper Battery</name>
<type>too old</type>
<manufacturing_date>N/A</manufacturing_date>
<placed_in_service>N/A</placed_in_service>
</battery_status>
<battery_status>
<name>Lower Battery</name>
<type>too old</type>
<manufacturing_date>N/A</manufacturing_date>
<placed_in_service>N/A</placed_in_service>
</battery_status>
<config_components>
<disk>
<ch>2</ch>
<target>0</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336753FSUN36G</model>
<serial_number>3HX03ALR00007314</serial_number>
<product_revision>0249</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>1CB42D13</ld_id>
<ld_idx>0</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>1</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0KV7E00007251</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>1CB42D13</ld_id>
<ld_idx>0</ld_idx>
</disk>
```

```
<disk>
<ch>2</ch>
<target>2</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0KBQ100007217</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>1CB42D13</ld_id>
<ld_idx>0</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>3</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0MFN100007301</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>1869F0A4</ld_id>
<ld_idx>1</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>4</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0MMJ100007251</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>1869F0A4</ld_id>
<ld_idx>1</ld_idx>
</disk>
```

```
<disk>
<ch>2</ch>
<target>5</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0N1FX00007303</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>1869F0A4</ld_id>
<ld_idx>1</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>6</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0KWV900007251</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>4226ADEB</ld_id>
<ld_idx>2</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>7</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0K6NP00007251</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>4226ADEB</ld_id>
<ld_idx>2</ld_idx>
</disk>
```

```
<disk>
<ch>2</ch>
<target>8</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0MFEH00007251</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>4226ADEB</ld_id>
<ld_idx>2</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>9</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0MSEQ00007302</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>5B6D4164</ld_id>
<ld_idx>3</ld_idx>
</disk>
<disk>
<ch>2</ch>
<target>10</target>
<status>ONLINE</status>
<manufacturer>SEAGATE</manufacturer>
<model>ST336752FSUN36G</model>
<serial_number>3ET0MYLD00007301</serial_number>
<product_revision>0205</product_revision>
<capacity>33.67GB</capacity>
<remaining_size>33.67GB</remaining_size>
<rpm>200M</rpm>
<ld_id>5B6D4164</ld_id>
<ld_idx>3</ld_idx>
</disk>
```

```
  <disk>
  <ch>2</ch>
  <target>11</target>
  <status>ONLINE</status>
  <manufacturer>SEAGATE</manufacturer>
  <model>ST336752FSUN36G</model>
  <serial_number>3ET0P9B400007303</serial_number>
  <product_revision>0205</product_revision>
  <capacity>33.67GB</capacity>
  <remaining_size>33.67GB</remaining_size>
  <rpm>200M</rpm>
  <ld_id>5B6D4164</ld_id>
  <ld_idx>3</ld_idx>
  </disk>
</config_components>
  <hostwwns />
  </raidsystem>
  </raidbaseview>
```

Glossary

The glossary lists acronyms and defines RAID terms found through the documentation. It also includes definitions of the operational states for disk drives and logical drives.

active-active controllers A pair of components, such as storage controllers in a failure-tolerant RAID array, that share a task or set of tasks when both are functioning normally. When one component of the pair fails, the other takes the entire load. Dual active controllers are connected to the same set of devices and provide a combination of higher I/O performance and greater failure tolerance than a single controller.

ANSI American National Standards Institute.

ARP Address Resolution Protocol.

automatic rebuild A process in which data is automatically reconstructed after a drive failure and written to a standby (spare) drive. An automatic rebuild also occurs when a new drive is installed manually in place of a failed drive. If the rebuild process is interrupted by a reset, use the Manual Rebuild command from the firmware application to restart the rebuilding process.

block striping *See* striping.

block striping with dedicated parity (RAID 3) This technique breaks data into logical blocks, the size of a disk block, and then stripes these blocks across several drives. One drive is dedicated to parity. In the event that a disk fails, the original data can be reconstructed using the parity information and the information on the remaining drives.

caching Allows data to be stored in a predesignated area of a disk or RAM (random access memory). Caching is used to speed up the operation of RAID arrays, disk drives, computers and servers, or other peripheral devices.

capacity The total number of physical drives available for data storage in a RAID array (logical drive). For example, if the capacity is N-1 and the total number of disk drives in a logical drives is six 36-Mbyte drives, the disk space available for storage is equal to five disk drives (5 x 36-Mbyte or 180 Mbyte).

CH Channel.

channel Any path used for the transfer of data and control information between storage devices and a storage controller or I/O adapter. Also refers to one SCSI bus on a disk array controller. Each disk array controller provides at least one channel.

CISPR International Special Committee on Radio Interference.

DHCP Dynamic Host Configuration Protocol.

disk mirroring *See* mirroring (RAID1).

EMC Electromagnetic compatibility.

EMU Event monitoring unit.

Fabric Fibre Channel network built around one or more switches.

Fabric switch A Fabric switch functions as a routing engine that actively directs data transfer from source to destination and arbitrates every connection. Bandwidth per node via a Fabric switch remains constant when more nodes are added, and a node on a switch port uses a data path of up to 100 Mbyte/sec to send or receive data.

failover A mode of operation for failure-tolerant arrays in which a component has failed and its function has been assumed by a redundant component.

fault tolerance The capacity to cope with internal hardware problems without interrupting the array's data availability, often by using backup systems brought online when a failure is detected. Many arrays provide fault tolerance by using RAID architecture to give protection against loss of data when a single disk drive fails. Using RAID 1 (mirroring), RAID 3 or RAID 5 (striping with parity), or RAID 1+0 (mirroring and striping) techniques, the array controller can reconstruct data from a failed drive and write it to a standby or replacement drive.

fault-tolerant logical drive A logical drive that provides protection of data in the event of a single drive failure by employing RAID 1, 1+0, 3, or 5.

FC-AL (Fibre Channel-Arbitrated Loop) FC-AL is implemented as either a loop or a Fabric. A loop can contain up to 126 nodes, accessible through only one or two servers.

Fibre Channel A cost-effective gigabit communications link deployed across a wide range of hardware.

Fibre Channel HBAs Fibre channel adapters of a host computer, server, or workstation.

Fibre hubs An Arbitrated Loop Hub is a wiring concentrator. “Arbitrated” means that all nodes communicating over this Fibre loop are sharing a 100 Mbyte/sec segment. Whenever more devices are added to a single segment, the bandwidth available to each node is further divided. A loop configuration allows different devices in the loop to be configured in a token ring style. With a Fibre hub, a Fibre loop can be rearranged in a star-like configuration because the hub itself contains port bypass circuitry that forms an internal loop. Bypass circuits can automatically reconfigure the loop once a device is removed or added without disrupting the physical connection to other devices.

FRU Field-replaceable unit.

GB Gigabyte. 1,000,000,000 (one billion) bytes.

GBIC (Gigabit Interface Converter) A hot-swappable input/output device that plugs into a Gigabit Ethernet port or Fibre Channel.

global spare A spare drive that is available to all logical drives in an array. Spare drives can be part of automatic logical drive rebuild.

group A group is a data object that enables multiple servers to be contained under a single category. Groups are similar in concept to domains, and enable you to organize servers.

HBA Host bus adapter.

hot spare A drive in a RAID 1 or RAID 5 configuration that contains no data and acts as a standby in case another drive fails.

hot-swappable The ability of a field-replaceable unit (FRU) to be removed and replaced while the RAID array remains powered on and operational.

ID Identifier number.

IEC International Electrotechnical Commission.

initialization The process of writing a specific pattern to all data blocks on all drives in a logical drive. This process overwrites and destroys existing data on the disks and the logical drive. Initialization is required to make the entire logical drive consistent at the onset. Initialization ensures that any parity checks performed in the future are executed correctly.

JBOD (Just a Bunch of Disks) A storage device that consists of drives with no controllers.

LAN Local area network.

LD Logical drive.

logical drive A section of disk storage space, also referred to as a LUN, that is presented to the host operating environment as a single physical drive. A logical drive might be located on one or more physical drives. Each controller can manage one to eight logical drives.

LUN (logical unit number) The major and minor device numbers make up the logical unit numbering sequence for a particular device connected to a computer.

LUN mapping The ability to change the virtual LUN as presented to the server from storage. This enables such benefits as the ability of a server to boot from the SAN without requiring of a local disk drive. Each server requires LUN 0 to boot.

LUN masking The characteristic that enables an administrator to dynamically map an HBA to a specified LUN. This provides an individual server or multiple servers access to an individual drive or to multiple drives, and prohibits unwanted server access to the same drives.

LVD A low-noise, low-power, and low-amplitude signaling technology that enables data communication between a supported server and storage devices. LVD signaling uses two wires to drive one signal over copper wire and requires a cable that is no longer than 25 meters (82 ft.).

management port The 10/100BASE-T Ethernet port that is used to configure a RAID array.

MB (megabyte) 1,000,000 bytes or characters of data.

mirroring (RAID 1) Data written to one disk drive is simultaneously written to another disk drive. If one disk fails, the other disk can be used to run the array and reconstruct the failed disk. The primary advantage of disk mirroring is 100 percent data redundancy. Since the disk is mirrored, it does not matter if one of the disks fails. Both disks contain the same data at all times and either can act as the operational disk.

Disk mirroring provides 100 percent redundancy but is expensive because each drive in the array is duplicated.

multiple-block striping with distributed parity A RAID technique (RAID 5) that offers redundancy with the parity information distributed across all disks in the logical drive. Data and its parity are never stored on the same disk. In the event that a disk fails, the original data can be reconstructed using the parity information and the information on the remaining disks.

NDMP Network Data Management Protocol.

NVRAM (non-volatile random access memory) A memory unit equipped with a battery so that the data stays intact even after main power is switched off.

N port A Fibre Channel port in a point-to-point or Fabric connection.

OBP OpenBoot™ PROM (OBP). When you first start Solaris, it shows an OK prompt, which is the OBP. It is a command-line interface.

out-of-band Refers to the connections and devices that are not in the data path.

parity check A process whereby the integrity of the redundant data on fault-tolerant arrays (RAID 3 and 5) is checked. The parity checking procedure on a logical drive recalculates the parity of data stripes in each of the logical drive's RAID stripe sets and compares it with the stored parity. If a discrepancy is found, an error is reported and the new correct parity is substituted for the stored parity.

partner group A pair of interconnected controller units. Expansion units interconnected to the pair of controller units can also be part of the partner group.

PID Primary controller identifier number.

RAID (redundant array of independent disks) An arrangement of two or more disk drives combined into a single virtual drive to provide more disk storage space, better performance and reliability, and redundant backup of data. Various combinations of these features are described by defined RAID levels. Arrays can support RAID 0, 1, 1+0, 3, and 5.

RAID Level Various techniques using combinations of mirroring, striping, duplexing, and parity to implement a RAID array are called RAID levels. Each technique uses a distinct algorithm to offer a mix of performance, reliability and cost.

RARP Reverse Address Resolution Protocol.

read policy A storage device parameter that determines whether the storage device holds data in cache before storing it to disk. The ability to hold data in cache while it is being written to disk can increase storage device speed during sequential reads.

rebuild The process of reconstructing the data that was on a disk before it failed. Rebuilding can be done only in arrays with data redundancy, such as RAID levels 1, 1+0, 3, and 5.

rebuild priority Rebuild priority enables the RAID controller to serve other I/O requests while rebuilding the logical drives. Priority ranges from low, which uses the controller's minimum resources to rebuild, to high, which uses the controller's maximum resources to complete the rebuilding process.

SAN (storage area networking) A high-speed, open-standard, scalable network of storage devices and servers providing accelerated data access.

SCSI (Small Computer Systems Interface) An industry standard for connecting disk and tape devices to a workstation.

SES An interface to SCSI Enclosure Services devices. These devices sense and monitor physical conditions within an enclosure, and enable access to the status reporting and configuration features of the enclosure (such as indicator LEDs on the enclosure).

SID Secondary controller identifier number.

SMART (Self-Monitoring Analysis and Reporting Technology) The industry-standard reliability prediction indicator for both the IDE/ATA and SCSI hard disk drives. Hard disk drives with SMART offer early warning of some hard disk failures so critical data can be protected.

SMTP (Simple Mail Transfer Protocol) A protocol for sending email messages between servers and from mail clients to mail servers. The messages can then be retrieved with an email client using either POP or IMAP.

SNMP (Simple Network Management Protocol) A set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

spanning Making use of the firmware's striping capability to stripe data across two otherwise independent RAID logical drives. The two spanned logical drives are presented to the operating environment as one logical drive.

standby drive A drive that is marked as a spare to support automatic data rebuilding after a physical drive associated with a logical drive fails. For a standby drive to take the place of another drive, it must be at least equal in size to the failed drive and all of the logical drives dependent on the failed disk must be redundant—RAID 1, 1+0, 3, and 5.

state The current operational status of a disk drive, a logical drive, or controller. The RAID array stores the states of drives, logical drives, and the controller in its nonvolatile memory. This information is retained across power interruptions.

stripe size This is the amount of data in kilobytes that is striped across each physical drive in a logical drive. The values are in increments of 8 kilobytes and range from 8 to 64 kilobytes. Generally, large stripe sizes are more effective for arrays with sequential reads.

To change the stripe size on an existing drive, you need to back up your data, redefine the stripe size, reconfigure the storage, and restore all the data.

striping The storing of sequential blocks of incoming data on all the different SCSI drives in a logical drive.

This method of writing data increases the disk array throughput because multiple drives are working simultaneously, retrieving and storing. RAID 0, 1+0, 3, and 5 and all use striping.

terminator A part used to end a SCSI bus. Terminators prevent energy from reflecting back into a cable plant by absorbing the radio frequency signals.

UPS Uninterruptible Power Supply.

volume Also called a logical unit number or LUN, a volume is one or more drives that can be grouped into a unit for data storage.

write-back cache A cache-writing strategy in which the array controller receives the data to be written to disk, stores it in the memory buffer, and immediately sends the host operating environment a signal that the write operation is complete, without waiting until the data is actually written to the disk drive. Within a short time, the controller, when not busy, writes the data to the disk drive.

write policy A cache-writing strategy used to control write operations. The write policy options are CIFS write-back and write-through cache.

write-through cache A cache-writing strategy in which the array controller writes the data to the disk drive before signaling the host operating environment that the process is complete. Write-through cache has lower write operation and throughput performance than write-back cache, but it is the safer strategy, with minimum risk of data loss on power failure.

WWN (worldwide name) A globally unique, hard-coded and embedded number assigned by the manufacturer and registered under IEEE that is used to identify hardware.

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