Platform Notes: Using luxadm Software

Send comments about this document to: docfeedback@sun.com

Contents

Tables

Preface

Platform Notes: Using luxadm Software describes how to use the `luxadm` administrative program for the Sun™ StorEdge™ A5000 disk array (formerly named the Sun™ Enterprise Network Array™), and SPARCstorage™ disk arrays. These instructions are designed for an experienced system administrator.

Note – The `ssaadm` command is now linked to the `luxadm` command; the `luxadm` command has incorporated all the features of the `ssadm` command.

Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

Typeface or Symbol	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	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename*.

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

Title	Part Number
Sun StorEdge A5000 Installation and Service Manual	802-7573

Ordering Sun Documentation

Fatbrain.com, an Internet professional bookstore, stocks select product documentation from Sun Microsystems, Inc.

For a list of documents and how to order them, visit the Sun Documentation Center on Fatbrain.com at:

```
http://www1.fatbrain.com/documentation/sun
```

Accessing Sun Documentation Online

The `docs.sun.com`^{SM} web site enables you to access Sun technical documentation on the Web. You can browse the `docs.sun.com` archive or search for a specific book title or subject at:

```
http://docs.sun.com
```

Sun Welcomes Your Comments

We are interested in improving our documentation and welcome your comments and suggestions. You can email your comments to us at:

```
docfeedback@sun.com
```

Please include the part number (806-3993-10) of your document in the subject line of your email.

`luxadm` Command Basics

The `luxadm` program is an administrative command that manages both the Sun StorEdge A5000 and SPARCstorage Array disk arrays. `luxadm` performs a variety of control and query tasks, depending on the command-line arguments and options used.

Command Syntax

The command line must contain a subcommand. You can enter options, usually at least one enclosure name or path name, and other parameters depending on the subcommand. You specify a device by entering either a physical path name or a logical path name.

The basic syntax is as follows:

```
luxadm [options] subcommand [options] {enclosure[,dev]... | pathname...}
```

When specifying a subcommand, you need to enter only as many characters as are required to uniquely identify the subcommand. For example, to run the `display` subcommand on an enclosure named `box1`, you could enter:

```
#luxadm disp box1
```

Addressing

This section explains how to specify, or address, a disk array.

Addressing a StorEdge A5000 Disk Array

You can address a StorEdge A5000 disk array by path name or enclosure name.

Specifying the Path Name

You can specify the device or controller using either a complete physical path name or a complete logical path name. A typical physical path name for a StorEdge A5000 disk array is:

```
/devices/sbus@1f,0/SUNW,socal@1,0/sf@0,0/
ssd@w2200002037000f96,0:a,raw
```

or

```
/devices/io-unit@f,e0200000/sbi@0,0/SUNW,socal@2,0/sf@0,0/
ssd@34,0:a,raw
```

For all StorEdge A5000 disk array interface boards (IBs) on the system, a logical link to the physical paths is kept in the directory `/dev/es`. An example of a logical link is `/dev/es/ses0`.

Specifying the Enclosure Name

For the StorEdge A5000 disk array, you can select a device or interface board using the world wide name (WWN) instead of the path name. The WWN is a unique 16-digit hexadecimal value that specifies either the port used to access the device or the device itself. A typical WWN value is `2200002037000f96`.

You can also specify the name of the StorEdge A5000 disk array and an identifier for the particular device in the enclosure. A device in a StorEdge A5000 disk array is identified as follows:

```
BOX_NAME,[f|r]slot_number
```

where:

TABLE 1-1   Addressing a StorEdge A5000 Disk Array by Enclosure Name

Options/Arguments	Description
BOX_NAME	is the name of the StorEdge A5000 enclosure, as specified by the enclosure_name subcommand
f or r	specifies the front or rear slots in the StorEdge A5000 enclosure
slot_number	is the slot number in the StorEdge A5000 enclosure, either 0-6 or 0-10

When addressing the StorEdge A5000 disk array, the path name or enclosure name specifies the StorEdge A5000 IB.

Addressing a SPARCstorage Array

When addressing the SPARCstorage Array, the path name specifies the SPARCstorage Array controller or a disk in the SPARCstorage Array.   The controller name is specified by its physical name. for example:

```
/devices/.../.../SUNW,soc@3,0/SUNW,pln@axxxxxxx,xxxxxxxx:ctlr
```

The controller name can also be specified by a name of the form cN, where N is the logical controller number. luxadm uses the cN name to find an entry in the /dev/rdsk directory of a disk that is attached to the SPARCstorage Array controller. The /dev/rdsk entry is then used to determine the physical name of the SPARCstorage Array controller.

A disk in the SPARCstorage Array is specified by its logical or physical device name. For example:

```
/dev/rdsk/c1t0d0s2
```

or

```
/devices/.../.../SUNW,soc@3,0/SUNW,pln@axxxxxxx,xxxxxxxx/
ssd@0,0:c,raw
```

See the disks(1M) and devlinks(1M) man pages for more information on logical
names for disks and subsystems.

Addressing a SPARCstorage RSM Tray

When addressing the SPARCstorage RSM tray, the path name specifies the controller
or a disk in the SPARCstorage RSM tray. The controller name is specified by its
physical name. For example:

```
/devices/sbus@1f,0/QLGC,isp@1,10000/sd@8,0:c,raw
```

The controller name can also be specified by a name of the form cN, where N is the
logical controller number. luxadm uses the cN name to find an entry in the
/dev/rdsk directory of a disk that is attached to the SPARCstorage Array
controller. The /dev/rdsk entry is then used to determine the physical name of the
controller.

A disk in the SPARCstorage RSM tray is specified by its logical or physical device
name. For example:

```
/dev/rdsk/c2t8d0s2
```

See the disks(1M) and devlinks(1M) man pages for more information on logical
names for disks and subsystems.

`luxadm` Subcommands

This chapter discusses the `luxadm` subcommands and is divided into the following sections:

- Subcommand Support Matrix
- Checking and Setting Disk LEDs
- Displaying Enclosure and Disk Information
- Downloading Firmware and fcode
- Accessing the Enclosure Services Card
- Performing Enclosure and Disk Operations
- Displaying and Setting NVRAM
- Removing, Inserting, and Replacing Enclosures and Disks

For information on how to specify (address) a disk array, see Section "Addressing".

Subcommand Support Matrix

The following basic `luxadm` subcommands are supported on the StorEdge A5000 disk array, the SPARCstorage Array, and SPARCstorage RSM trays. See Appendix A for information about export mode subcommands and their supported platforms.

TABLE 2-1　Subcommand Support Matrix

Subcommand	StorEdge A5000	SPARCstorage Array	SPARCstorage RSM
`alarm_off`		yes	yes
`alarm_on`		yes	yes
`alarm_set`		yes	yes
`display`	yes	yes	

TABLE 2-1 Subcommand Support Matrix *(Continued)*

Subcommand	StorEdge A5000	SPARCstorage Array	SPARCstorage RSM
download	yes	yes	
enclosure_name	yes		
env_display			yes
fast_write		yes	
fc_s_download		yes	
fcal_s_download	yes		
inquiry	yes	yes	yes
insert_device	yes		yes
led	yes	yes	yes
led_blink	yes		
led_off	yes	yes	
led_on		yes	yes
nvram_data		yes	
perf_statistics		yes	
power_off	yes	yes	
power_on	yes		
probe	yes		
purge		yes	
release	yes	yes	yes
remove_device	yes		yes
replace_device			yes
reserve	yes	yes	
set_boot_dev	n/a	n/a	n/a
start		yes	
stop		yes	
sync_cache		yes	

Checking and Setting Disk LEDs

Checking the Current State of a Disk LED (`led`)

Use the `led` subcommand to check the current state of the yellow LED associated with a specific disk.

Supported on:

- StorEdge A5000
- SPARCstorage Array
- SPARCstorage RSM

```
luxadm [ -v ] led { enclosure,dev... | pathname...}
```

TABLE 2-2   `led` Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in an enclosure
pathname	The physical or logical path name of a specific disk in an array

Example:

```
# luxadm led /devices/sbus@3,0/SUNW,socal@0,0/sf@0,0/
ssd@w21000020370412ec,0:c,raw
LED state is OFF for device in location: front,slot 0
#
```

Setting a Disk LED to the Blink Mode (`led_blink`)

Use the `led_blink` subcommand to make the yellow LED associated with a specific disk blink or flash.

Supported on:

■ StorEdge A5000

```
luxadm [ -v ] led_blink {  enclosure,dev...  |  pathname...}
```

TABLE 2-3   `led_blink` Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in an enclosure
pathname	The physical or logical path name of a specific disk in an array

Example:

```
# luxadm led_blink /devices/sbus@3,0/SUNW,socal@0,0/sf@0,0/
ssd@w21000020370412ec,0:c,raw
LED state is BLINKING for device in location: front,slot 0
#
```

Turning Off a Disk LED (`led_off`)

Use the `led_off` subcommand to turn off the yellow LED associated with a specific disk.

 Supported on:

■ StorEdge A5000
■ SPARCstorage Array
■ SPARCstorage RSM

```
luxadm [ -v ] led_off {  enclosure,dev...  |  pathname...}
```

TABLE 2-4   `led_off` Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in an enclosure
pathname	The physical or logical path name of a specific disk in an array

> **Note –** On a StorEdge A5000 disk array this may or may not cause the yellow LED to turn off or stop blinking depending on the state of the StorEdge A5000 disk array. Refer to StorEdge A5000 *Installation and Service Manual* for details.

Example:

```
# luxadm led_off /devices/sbus@3,0/SUNW,socal@0,0/sf@0,0/
ssd@w21000020370412ec,0:c,raw
LED state is OFF for device in location: front,slot 0
#
```

Turning On a Disk LED (`led_on`)

Use the `led_on` subcommand to turn on the yellow LED associated with a specific disk.

Supported on:

- SPARCstorage Array
- SPARCstorage RSM

```
luxadm [ -v ] led_on pathname
```

TABLE 2-5   `led_on` Options and Arguments

Option/Argument	Description
dev	The name of a specific disk in an enclosure
pathname	The physical or logical path name of a specific disk in an array

Displaying Enclosure and Disk Information

Probing for StorEdge A5000 Disk Arrays (`probe`)

Use the `probe` subcommand to display information about all attached StorEdge A5000 disk arrays. The information displayed includes the logical path names, the WWNs, and the enclosure names.

Supported on:

■ StorEdge A5000

```
luxadm [ -v ] probe [-p]
```

TABLE 2-6   `probe` Options

Option	Description
-p	Also displays the physical path name

Example:

```
# luxadm probe
Found
SENA Name:macs1    Node WWN:1234123412341234
  Logical Path:/dev/es/ses0
  Logical Path:/dev/es/ses1
#
```

Example:

```
# luxadm probe -p
Found
SENA             Name:macs1   Node WWN:5080020000000598
  Logical Path:/dev/es/ses0
  Physical Path:/devices/sbus@1f,0/SUNW,socal@0,0/sf@1,0/
ses@w5080020000000599,0:0
  Logical Path:/dev/es/ses1
  Physical Path:/devices/sbus@1f,0/SUNW,socal@0,0/sf@1,0/
ses@w508002000000059a,0:0
  Logical Path:/dev/es/ses2
  Physical Path:/devices/sbus@1f,0/SUNW,socal@0,0/sf@1,0/
ses@w5080020000000599,0:0
  Logical Path:/dev/es/ses3
  Physical Path:/devices/sbus@1f,0/SUNW,socal@0,0/sf@1,0/
ses@w508002000000059a,0:0
#
```

Displaying Enclosure or Device Specific Data (display)

Use the display subcommand to display enclosure specific or device specific data.

Enclosure data consists of enclosure environmental sense information and status for all subsystem devices including disks. Device data consists of inquiry, capacity, and configuration information.

 Supported on:

- StorEdge A5000
- SPARCstorage Array

```
luxadm [ -v ] display enclosure[,dev]... | pathname...
```

TABLE 2-7 display Options and Arguments

Option/Argument	Description
-v	Displays mode sense data
enclosure	The enclosure name of a StorEdge A5000
dev	The name of a specific disk in an enclosure

TABLE 2-7 `display` Options and Arguments *(Continued)*

Option/Argument	Description
pathname	The physical or logical path name of a StorEdge A5000, SPARCstorage Array, or a specific disk in an array
-p	Displays performance information for the specified device or subsystem
-r	Displays error information for the specified device or subsystem

Example:

```
# luxadm display macs1
                 (luxadm version: 1.36 98/03/10)
                              SENA
                          DISK STATUS
SLOT   FRONT DISKS      (Node WWN)         REAR DISKS       (Node WWN)
0     On (O.K.)       2000002037049dfa   Not Installed
1     On (O.K.)       2000002037070608   On (O.K.)        200000203704a9e1
2     On (O.K.)       2000002037070498   On (O.K.)        200000203704a285
3     On (O.K.)       2000002037049f31   On (O.K.)        200000203704a252
4     On (O.K.)       20000020370705e1   On (O.K.)        2000002037049d61
5     On (O.K.)       2000002037049b32   On (O.K.)        200000203704a8f1
6     On (O.K.)       2000002037049987   On (O.K.)        200000203704a9de
                          SUBSYSTEM STATUS
FW Revision:1.05   Box ID:0   Node WWN:5080020000000598   Enclosure Name:macs1
Power Supplies (0,2 in front, 1 in rear)
   0 O.K.(rev.-02)1 O.K.(rev.-02)2 O.K.(rev.-02)
Fans (0 in front, 1 in rear)
   0 O.K.(rev.-05)1 O.K.(rev.-00)
ESI Interface board(IB) (A top, B bottom)
   A: O.K.(rev.-04)
   GBIC module (1 on left, 0 on right in IB)
   0 O.K.(rev.-05)1 O.K. (rev.-05): Not Installed

   B: O.K.(rev.-04)
   GBIC module (1 on left, 0 on right in IB)
   0 O.K.(rev.-05)1 O.K. (rev.-05): Not Installed

Disk backplane (0 in front, 1 in rear)
   Front Backplane: O.K.(rev.-05)
     Temperature sensors (on front backplane)
     0:42ºC 1:42ºC 2:40ºC 3:39ºC 4:40ºC 5:42ºC
     6:43ºC  (All temperatures are NORMAL.)
   Rear Backplane:  O.K.(rev.-05)
     Temperature sensors (on rear backplane)
     0:37ºC 1:37ºC 2:39ºC 3:39ºC 4:39ºC 5:40ºC
     6:42ºC  (All temperatures are NORMAL.)
Interconnect assembly
   O.K.(rev.-03)
Loop  configuration
   Loop A is configured as a single loop.
   Loop B is configured as a single loop.
Language       USA English
#
```

Example:

```
# luxadm display -r macs1

                        (luxadm version: 1.36 98/03/10)
              SENA
   Information for FC Loop on port 0 of FC100/S Host Adapter
   at path: /devices/sbus@1f,0/SUNW,socal@0,0:0
Version Resets  Req_Q_Intrpts  Qfulls Requests Sol_Resps Unsol_Resps Lips
   1       0          0            0       0        0           0      2
Els_sent  Els_rcvd  Abts       Abts_ok Offlines Onlines Online_loops
   0          0      18           18       4       0          5
   Information from sf driver:
Version  Lip_count  Lip_fail Alloc_fail  #_cmds Throttle_limit  Pool_size
   1        0           0         0         0        1024           1
   TARGET ERROR INFORMATION:
AL_PA  Els_fail  Timouts Abts_fail Tsk_m_fail  Data_ro_mis Dl_len_mis Logouts
  1       0        5        0          0           0           0        0
 d2       0        2        0          0           0           0        0
 ef       0        3        0          0           0           0        0
 e8       0        0        0          0           0           0        0
 e4       0        0        0          0           0           0        0
 e2       0        2        0          0           0           0        0
 e1       0        2        0          0           0           0        0
 e0       0        0        0          0           0           0        0
 dc       0        0        0          0           0           0        0
 b5       0        0        0          0           0           0        0
 cc       0        0        0          0           0           0        0
 cb       0        0        0          0           0           0        0
 ca       0        0        0          0           0           0        0
 c9       0        0        0          0           0           0        0
 c7       0        0        0          0           0           0        0
 c6       0        0        0          0           0           0        0
```

Displaying Disk Information (inquiry)

Use the inquiry subcommand to display inquiry information for a specific disk

Supported on:

- StorEdge A5000
- SPARCstorage Array

- SPARCstorage RSM

```
luxadm [ -v ] inquiry { enclosure[,dev]... | pathname...}
```

TABLE 2-8 inquiry Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000
dev	The name of a specific disk in an enclosure
pathname	The physical or logical path name of a StorEdge A5000, SPARCstorage Array, or a specific disk in an array

Example:

```
# luxadm inquiry macs1
INQUIRY:
  Physical path:
  /devices/sbus@1f,0/SUNW,socal@0,0/sf@1,0/ses@w5080020000000599,0:0
Vendor:                   SUN
Product:                  SENA
Revision:                 1.05
Device type:              0xd (SES device)
Removable media:          no
Medium Changer Element:   no
ISO version:              0
ECMA version:             0
ANSI version:             3 (Device complies to SCSI-3)
Terminate task:           no
Response data format:     2
Additional length:        0x7b
Command queueing:         no
            VENDOR-SPECIFIC PARAMETERS
Byte#                Hex Value                              ASCII
51    00 00 00 00                                           ....
95    6d 61 63 73 31 00 00 00 00 00 00 00 00 00 00 00     macs1...........
      00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00     ................
#
```

Downloading Firmware and fcode

Downloading Firmware (`download`)

Use the `download` subcommand to download a prom image to the FEPROMs on a StorEdge A5000 disk array IB or on a SPARCstorage Array controller board.

In a StorEdge A5000 disk array, when the download is complete, the disk array is be reset and the downloaded code is executed.

In a SPARCstorage Array, when the download is complete, you must reset the SPARCstorage Array to execute the downloaded code.

Supported on:

- StorEdge A5000
- SPARCstorage Array

```
luxadm [ -v ] download [-s] [-f filename-path ]
```

Caution – When using the `-s` option, the download modifies the FEPROM in the StorEdge A5000 disk array.

Note – The -s option does not apply to the SPARCstorage Array controller, as it always writes the downloaded firmware into the FEPROM.

TABLE 2-9 `download` Options and Arguments

Option/Argument	Description
-s	Saves the downloaded firmware in the FEPROM in a StorEdge A5000 disk array . If -s is not specified, the downloaded firmware will not be saved across power cycles.
-f *filename*	Downloads the prom image in *filename*. If you do not specify a filename, the default prom image is used.
	The default prom image in a StorEdge A5000 is in the directory `/usr/lib/locale/C/LC_MESSAGES` and is named `ibfirmware`.
	The default prom image in a SPARCstorage Array is in the directory `/usr/lib/firmware/ssa` and is named `ssafirmware`.
-w *WWN*	This option is for the SPARCstorage Array only. See "Changing a SPARCstorage Array WWN (download)" on page 17.

Changing a SPARCstorage Array WWN (`download`)

Use the `download` subcommand to change the WWN of a SPARCstorage Array controller board.

 Supported on:

- SPARCstorage Array

```
luxadm [ -v ] download [-w WWN] pathname
```

TABLE 2-10 `download` Options and Arguments

Option/Argument	Description
pathname	A SPARCstorage Array controller
-w *WWN*	Changes the World Wide Name for the SPARCstorage Array. WWN is a twelve-digit hex number; leading zeros are required. The new SPARCstorage Array controller's image will have the least-significant 6 bytes of the 8-byte WWN modified to WWN.

Downloading fcode to FC25/S Host Adapters (`fc_s_download`)

Use the `fc_s_download` subcommand to download new fcode into all the FC25/S SBus Cards. (This is the 25 MHz host adapter card that connects to SPARCstorage Arrays.)

The `fc_s_download` subcommand is interactive; it waits for user confirmation before downloading the fcode.

The version of the FC/S SBus Cards fcode that was released with this version of the Operating System is located in the directory `usr/lib/firmware/fc_s` and is named `fc_s_fcode`.

 Supported on:

■ SPARCstorage Array

Caution – Ensure that you download the `usr/lib/firmware/fc_s/fc_s_fcode` file.

Caution – Only use `fc_s_download` subcommand in single user mode; otherwise the FC/S card could be reset.

```
luxadm [ -v ] fc_s_download [-F] [-f fcode-file]
```

TABLE 2-11 `fc_s_download` Options

Option	Description
`-F`	Forcibly downloads the fcode. The subcommand expects user confirmation before the download.
`-f` *fcode-file*	The name of the file that has the new fcode. When the `fc_s_download` subcommand is invoked without the `[-f fcode-file]`option, the current version of the fcode in each FC/S SBus card is printed.

Downloading fcode to FC100 Host Adapters (`fcal_s_download`)

Use the `fcal_s_download` subcommand to download new fcode into all the FC100/S SBus or FC100/P PCI host adapters or to display the current version of the fcode in each host adapter. (This is the 100-MHz host adapter card which connects to StorEdge A5000 disk arrays.)

The `fcal_s_download` subcommand is interactive and waits for user confirmation before downloading the fcode.

 Supported on:

■ StorEdge A5000

Caution – Ensure that you download the `/usr/lib/firmware/fc_s/` `fcal_s_fcode` file.

Caution – Do not attempt to download fcode to a FC100/S SBus Card that is in your boot path. Boot from another device, such as a CDROM, and then download the fcode.

```
luxadm [ -v ] fcal_s_download [ -f fcode-file ]
```

TABLE 2-12   `fcal_s_download` Options

Option	Description
–f *fcode-file*	This is the name of the file that has the new fcode. If you invoke the `fcal_s_download` subcommand without the `[ -f fcode-file ]` option, the current version of the fcode in each FC100/S SBus card is displayed. The version of the FC100/S SBus Cards fcode released with the operating system is located in the directory `usr/lib/firmware/fc_s` and is named `fcal_s_fcode`.

Accessing the Enclosure Services Card

The `env_display` and various `alarm` subcommands apply only to an Enclosure Services Card (SES) in a RSM tray in a SPARCstorage Array. The RSM tray is addressed by using the logical or physical path of the SES device or by specifying the controller followed by the tray number. The controller is addressed by `cN` or the physical path to the controller in the SPARCstorage Array.

Displaying Environmental Information (`env_display`)

Use the `env_display` subcommand to display the environmental information for a SPARCstorage Array.

Supported on:

- SPARCstorage Array
- SPARCstorage RSM

```
luxadm [ -v ] env_display { pathname | controller tray-number }
```

TABLE 2-13   `env_display` Options and Arguments

Option/Argument	Description
pathname	The path to an SES device
controller	The path to a SPARCstorage Array controller
tray-number	An RSM tray number. *tray-number* is valid only for an RSM tray in a SPARCstorage Array

Disabling the Alarm (`alarm_off`)

Use the `alarm_off` subcommand to disable the audible alarm for this enclosure. When invoked without an option, the current state of audible alarm is printed.

Supported on:

- SPARCstorage Array

- SPARCstorage RSM

```
luxadm [ -v ] alarm_off {  pathname | controller tray-number }
```

TABLE 2-14 `alarm_off` Options and Arguments

Option/Argument	Description
pathname	The path to an SES device
controller	iThe path to a SPARCstorage Array controller
tray-number	An RSM tray number. *tray-number* is valid only for an RSM tray in a SPARCstorage Array

Enabling the Alarm (`alarm_on`)

Use the `alarm_on` subcommand to enable the audible alarm for this enclosure. When invoked without an option, the current state of audible alarm is printed.

Supported on:

- SPARCstorage Array
- SPARCstorage RSM

```
luxadm [ -v ] alarm_on {  pathname | controller tray-number }
```

TABLE 2-15 `alarm_on` Options and Arguments

Option/Argument	Description
pathname	The path to an SES device
controller	The path to a SPARCstorage Array controller
tray-number	An RSM tray number. *tray-number* is valid only for an RSM tray in a SPARCstorage Array

Setting the Alarm (`alarm_set`)

Use the `alarm_set` subcommand to set the duration of the audible alarm to a specified number of seconds.

Supported on:

- SPARCstorage Array
- SPARCstorage RSM

```
luxadm [ -v ] alarm_set { pathname | controller tray-number } [ seconds ]
```

TABLE 2-16 `alarm_set` Options and Arguments

Option/Argument	Description
pathname	The path to an SES device
controller	The path to a SPARCstorage Array controller
tray-number	An RSM tray number. *tray-number* is valid only for an RSM tray in a SPARCstorage Array
seconds	The number of seconds

Performing Enclosure and Disk Operations

Renaming a StorEdge A5000 Disk Array (`enclosure_name`)

Use the `enclosure_name` subcommand to change the enclosure name of one or more StorEdge A5000 disk arrays. The new name must be 16 or less characters. The only allowed characters are alphabetic or numeric digits.

Supported on:

- StorEdge A5000

```
luxadm [ -v ] enclosure_name new-name enclosure... | pathname...
```

TABLE 2-17 `enclosure_name` Options and Arguments

Option/Argument	Description
new-name	The new enclosure name
enclosure	The enclosure name of a StorEdge A5000 disk array
pathname	The physical or logical path name of a StorEdge A5000 disk array

Collecting Performance Statistics (`perf_statistics`)

Use the `perf_statistics` subcommand to enable or disable the accumulation of performance statistics for a specific SPARCstorage Array controller.

Supported on:

- SPARCstorage Array

Note – The accumulation of performance statistics must be enabled before the `display -p` subcommand can be used.

```
luxadm [ -v ] perf_statistics [ -e ] pathname
```

TABLE 2-18 `perf_statistics` Options and Arguments

Option/Argument	Description
pathname	A SPARCstorage Array controller
-e	Enables the accumulation of performance statistics

Powering Off an Enclosure or Disk Drive (`power_off`)

Use the `power_off` subcommand to set an enclosure to the power-save mode.

Note – StorEdge A5000 disk drives are not available when in the power-save mode.

When an Enclosure Services card in a SPARCstorage Array is addressed, the RSM tray is powered off.

When a disk drive in a StorEdge A5000 is addressed, the drive is set to the drive off/unmated state. When it is set to the drive off/unmated state, the drive is spun down (stopped) and put in the bypass mode.

Supported on:

- StorEdge A5000
- SPARCstorage Array

```
luxadm [ -v ] power_off { enclosure[,dev]... | pathname...}
```

TABLE 2-19 `power_off` Options and Arguments

Option/Argument	Description
enclosure	is the enclosure name of a StorEdge A5000.
dev	is the name of a specific disk in an enclosure.
pathname	is the physical or logical path name of a StorEdge A5000, SPARCstorage Array, or a specific disk in an array.

Powering On Enclosures or Disk Drives (`power_on`)

Use the `power_on` subcommand to set a drive to its normal power-on state. If you specify a StorEdge A5000 disk drive, the `power_on` subcommand sets the specified disks to the normal start-up state.

Supported on:

- StorEdge A5000

```
luxadm [ -v ] power_on { enclosure[,dev]... | pathname...}
```

TABLE 2-20 `power_on` Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in a disk array
pathname	The physical or logical path name of a StorEdge A5000 disk array or a specific disk in a disk array

Releasing Disks (`release`)

Use the `release` subcommand to release one or more disk drives from reservation.

Supported on:

- StorEdge A5000
- SPARCstorage Array
- SPARCstorage RSM

```
luxadm [ -v ] release { pathname...}
```

TABLE 2-21 `release` Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in a disk array
pathname	The physical or logical path name of a StorEdge A5000 disk array, SPARCstorage Array, or a specific disk in a disk array

Reserving Disks (`reserve`)

Use the `reserve` subcommand to reserve the specified disk(s) for exclusive use by the host from which the subcommand was issued.

Supported on:

- StorEdge A5000
- SPARCstorage Array

■ SPARCstorage RSM

```
luxadm [ -v ] reserve { pathname...}
```

TABLE 2-22 `reserve` Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in a disk array
pathname	The physical or logical path name of a StorEdge A5000 disk array, SPARCstorage Array, or a specific disk in a disk array

Setting the Boot Device Variable (`set_boot_dev`)

Use the `set_boot_dev` subcommand to set the boot-device variable in the system PROM to a physical device name. The `set_boot_device` subcommand normally runs interactively; it requests confirmation for setting the default boot-device in the PROM.

Supported on:

■ StorEdge A5000
■ SPARCstorage Array
■ SPARCstorage RSM

```
luxadm [ -v ] set_boot_dev [ -y ] pathname
```

TABLE 2-23 `set_boot_dev` Options and Arguments

Option/Argument	Description
pathname	A block special device or a mount-point
-y	Runs non-interactively; no confirmation is requested or required

Starting Disks (`start`)

Use the `start` subcommand to spin up one or more disks.

Supported on:

■ SPARCstorage Array

```
luxadm [ -v ] start [ -t tray-number ] pathname
```

TABLE 2-24 start Options and Arguments

Option/Argument	Description
-t *tray-number*	The tray number
pathname	The physical or logical path name of a SPARCstorage Array, or a specific disk in a disk array

Stopping Disks (stop)

Use the stop subcommand to spin down one or more disks.

Supported on:

■ SPARCstorage Array

```
luxadm [ -v ] stop [ -t tray-number ] pathname
```

TABLE 2-25 stop Options and Arguments

Option/Argument	Description
-t *tray-number*	is the tray number.
pathname	is the physical or logical path name of a SPARCstorage Array, or a specific disk in a disk array

Displaying and Setting NVRAM

Enabling and Disabling Fast Write (fast_write)

Use the fast_write subcommand to enable or disable the use of the NVRAM to enhance the performance of writes in the SPARCstorage Array.

Supported on:

■ SPARCstorage Array

```
luxadm [ -v ] fast_write [-s] -c pathname
```

TABLE 2-26 `fast_write` Options and Arguments

Option/Argument	Description
pathname	A SPARCstorage Array controller or an individual disk
-e	Causes the SPARCstorage Array to save the change so it will persist across power-cycles
-c	Enables fast writes for synchronous writes only
-e	Enables fast writes
-d	Disables fast writes

Displaying Fast Write Data (`nvram_data`)

Use the `nvram_data` subcommand to display the amount of fast write data in the NVRAM for a specific disk. This command can only be used for an individual disk.

Supported on:

■ SPARCstorage Array

```
luxadm [ -v ] nvram_data pathname
```

TABLE 2-27 `nvram_data` Options and Arguments

Option/Argument	Description
pathname	A SPARCstorage Array controller or an individual disk

Purging Fast Write Data from NVRAM (`purge`)

Use the `purge` subcommand to purge any fast write data from NVRAM for one or more disks.

Supported on:

■ SPARCstorage Array

Caution – Use the `purge` subcommand with caution, usually only when a drive has failed.

```
luxadm [ -v ] purge pathname
```

TABLE 2-28 `purge` Options and Arguments

Option/Argument	Description
pathname	A SPARCstorage Array controller or an individual disk. If you specify a SPARCstorage Array controller, fast write data for all disks associated with that controller will be purged

Flushing NVRAM (`sync_cache`)

Use the `sync_cache` subcommand to flush all outstanding writes for one or more disks from NVRAM to the media

 Supported on:

■ SPARCstorage Array

```
luxadm [ -v ] sync_cache pathname
```

TABLE 2-29 `sync_cache` Options and Arguments

Option/Argument	Description
pathname	A SPARCstorage Array controller or an individual disk. If you specify a SPARCstorage Array controller, outstanding writes for all disks associated with that controller will be flushed

Removing, Inserting, and Replacing Enclosures and Disks

This section discusses how to remove, insert, and replace disk drives, enclosures, or a chain of enclosures. For more detailed instructions on performing these operations with a StorEdge A5000 disk array, see Chapter 3 and refer to the *Sun* StorEdge A5000 *Installation and Service Manual*.

Removing Devices (`remove_device`)

Use the `remove_device` subcommand to hot remove a disk drive, enclosure, or a chain of enclosures. This subcommand interactively guides you through the hot removal of one or more devices.

Supported on:

- StorEdge A5000
- SPARCstorage RSM

In the StorEdge A5000 disk array, the `remove_device` subcommand:

- Checks whether the device is busy and if so warns you.
- Offlines the device (this fails if the disk is open).
- Informs you when device(s) can be safely removed.
- Informs you which device to remove by blinking the activity LED on the enclosure.
- Requests confirmation that the list(s) is/are as expected.
- Removes the logical device(s) names for the device that was removed.

In the SPARCstorage RSM, the `remove_device` subcommand:

- Takes the device offline.
- Quiesces the bus for buses that support quiescing.
- Informs you that the device can be safely replaced.
- Requests confirmation that the device has been replaced.
- Unquiesces the bus for buses that support quiescing.
- Brings the (now removed) device back online.
- Removes the logical device name for the device that was removed.

```
luxadm [ -v ] remove_device [ -F ] { enclosure, dev... | pathname... }
```

TABLE 2-30 `remove_device` Options and Arguments

Option/Argument	Description
-F	Forces the hot-plugging operation on one or more devices even if those devices are being used by the host (and are, therefore, busy). Caution— Removing devices that are in use will cause unpredictable results. Try to hot-plug normally (without -F) first, resorting to this option only when you are sure of the consequences of overriding normal hot-plugging checks.
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in a disk array
pathname	The physical or logical path name of a StorEdge A5000 or a specific disk in an array

Example:

```
# luxadm remove_device macs1,f1


  WARNING!!! Please ensure that no filesystems are mounted on these
device(s).
   All data on these devices should have been backed up.



The list of devices which will be removed is:

   1: Box Name "macs1" frontslot 1

Please enter 'q' to Quit OR <Return> to Continue:

stopping: Drive in "macs1" front slot 1....Done
offlining: Drive in "macs1" front slot 1....Done

Hit <Return> after removing the device(s).
```

You must physically remove the device at this time. After you hit a key, the following is displayed:

```
 Drive in Box Name "macs1" front slot 1
    Removing Logical Nodes:
    Removing c2t1d0s0
    Removing c2t1d0s1
    Removing c2t1d0s2
    Removing c2t1d0s3
    Removing c2t1d0s4
    Removing c2t1d0s5
    Removing c2t1d0s6
    Removing c2t1d0s7
 #
```

Inserting Devices (`insert_device`)

Use the `insert_device` subcommand for hot insertion of a new disk drive, enclosure, or chain of enclosures. If you specify more than one enclosure, you can perform concurrent hot insertions on multiple buses.

Supported on:
- StorEdge A5000
- SPARCstorage RSM

The `insert_device` subcommand interactively guides you through the hot insertion of one or more devices. In the StorEdge A5000 disk array the `insert_device` subcommand:

- Informs you when the device(s) can be safely inserted.
- Requests confirmation that the list(s) is as expected.
- Creates the logical device names for the new devices.
- Displays the logical path name for the devices.

In the SPARCstorage RSM, the `insert_device` subcommand:
- Quiesces the bus for buses that support quiescing.
- Informs you that the device can be safely inserted.
- Requests confirmation that the device has been inserted.
- Unquiesces the bus for buses that support quiescing.
- Creates the logical device name for the new device.

```
luxadm [ -v ] insert_device enclosure,dev...
```

TABLE 2-31 insert_device Options and Arguments

Option/Argument	Description
enclosure	The enclosure name of a StorEdge A5000 disk array
dev	The name of a specific disk in a disk array

Example:

```
# luxadm insert_device, macs1,f1

The list of devices which will be inserted is:
  1: Box Name "macs1" front slot 1

Please enter 'q' to Quit or <Return> to Continue:


Hit <Return> after inserting the device(s).
```

You must physically install the disk drive at this time. After hitting any key, the
following is displayed:

```
  Drive in Box Name "macs1" front slot 1
  Logical Nodes under /dev/dsk and /dev/rdsk :
    c2t1d0s0
    c2t1d0s1
    c2t1d0s2
    c2t1d0s3
    c2t1d0s4
    c2t1d0s5
    c2t1d0s6
    c2t1d0s7
 #
```

Replacing Devices (`replace_device`)

Use the replace_device subcommand to hot replace a device.

The replace_device subcommand interactively guides you through the hot insertion of one or more devices. The replace_device subcommand:

- Takes the device offline.
- Quiesces the bus for buses that support quiescing.
- Informs you that the device can be safely replaced.
- Requests confirmation that the device has been replaced.
- Unquiesces the bus for buses that support quiescing.
- Brings the device back online.

Supported on:

- SPARCstorage RSM

```
luxadm [ -v ] replace_device [ -F ] pathname
```

TABLE 2-32 replace_device Options and Arguments

Option/Argument	Description
-F	Forces the hot-plugging operation on one or more devices even if those devices are being used by the host (and are, therefore, busy). Caution— Replacing devices which are in use will cause unpredictable results. Try to hot-plug normally (without -F) first, resorting to this option only when you are sure of the consequences of overriding normal hot-plugging checks.
pathname	A SPARCstorage Array controller or an individual disk

StorEdge A5000 Disk Array Hot-Plugging Procedures

This chapter describes how to hot-plug StorEdge A5000 disk arrays and disk drives. The procedures are grouped depending upon whether you are using UNIX file system (UFS) operations or Sun StorEdge Volume Manager to perform the procedures.

Note – The procedure for hot-plugging an entire StorEdge A5000 disk array is similar to the procedure for removing and replacing an individual disk drive. Instead of specifying an *enclosure,dev,* you need to specify only the *enclosure* in the appropriate procedure.

You cannot perform hot-plug reconfiguration or operations on an active disk drive. All disk access activity must be stopped before you remove or replace a disk drive.

Caution – As with other high-RAS products, you should not randomly remove disk drives. The StorEdge A5000 disk array design provides support to replace failed drives in redundant (mirrored or RAID) configurations. If the drive is active, you must stop that activity before removing it. You can do this without bringing down the operating system or powering down the unit. The StorEdge A5000 disk array supports hot-plugging, but there are software considerations that must be taken into account. Follow the procedures in this section when removing, replacing, or adding disk drives.

Refer to the *Sun* StorEdge A5000 *Installation and Service Manual* for details on removing disk drives.

It is divided into the following sections:

- UNIX File System (UFS) Operations
  - Adding a Disk Drive

- Replacing a Disk Drive
- Removing a Disk Drive
■ Volume Manager Operations
- Adding a Disk Drive
- Replacing a Disk Drive
- Removing a Disk Drive

UNIX File System (UFS) Operations

Adding a Disk Drive

This section describes how to configure your system when you add a disk drive while the power is on and the operating system is running.

Caution – These procedures should be performed only by a qualified system administrator. Performing hot-plug operations on an active disk drive can result in data loss and/or data corruption.

You must create a new device entry for the drive in the `/devices` and `/dev/dsk` and `/dev/rdsk` hierarchy. The new drive is assigned a name associated with the slot into which the drive was installed.

1. Select any available slot in the StorEdge A5000 disk array for the new disk drive.

For reference when you configure the software environment, make a note of which enclosure and slot you choose.

2. **Use the** `luxadm insert_device` **command to add the new device.**

This command is interactive. You will be guided through the procedure for inserting a new device or chain of devices.

```
# luxadm insert_device macs1,f1


The list of devices which will be inserted is:
  1: Box Name "macs1" front slot 1

Please enter 'q' to Quit or <Return> to Continue:


Hit <Return> after inserting the device(s).
```

3. **Insert the disk drive and hit return.**

The following is displayed:

```
 Drive in Box Name "macs1" front slot 1
  Logical Nodes under /dev/dsk and /dev/rdsk :
    c2t1d0s0
    c2t1d0s1
    c2t1d0s2
    c2t1d0s3
    c2t1d0s4
    c2t1d0s5
    c2t1d0s6
    c2t1d0s7
#
```

The new disk drive is now available for use as a block or character device. Refer to the `sd(7)` man page for further details.

4. **Verify that the device label meets your requirements.**

You can use the `prtvtoc` command to inspect the label for your disk. To modify the label, use the `format` command. Refer to the `prtvtoc(1M)` and `format(1M)` man pages for more information.

5. **Once you have selected a disk slice for your UFS file system, create a file system on the slice:**

```
# newfs /dev/rdsk/cwtxdysz
```

Refer to the newfs(1M) man page for more information.

6. **If necessary, create a mountpoint for the new file system:**

```
# mkdir mount_point
```

where: *mount_point* is a fully qualified path name. Refer to the mount(1M) man page for more information.

7. **After the file system and mountpoint have been created, modify the** /etc/vfstab **file to reflect the new file system.**

See the vfstab(4) man page for more details.

8. **Mount the new file system using the** mount **command:**

```
# mount mount_point
```

where: *mount_point* is the directory you created.

The file system is ready to be used.

Replacing a Disk Drive

This section describes how on configuring your system to replace a disk drive while the power is on and the operating system is running.

You must stop any activity on the disk; physically remove the old drive and install the new one; and configure the Solaris environment to recognize the drive. You must then configure your application to accept the new disk drive.

⚠ **Caution –** These procedures should be performed only by a qualified system administrator. Performing hot-plug operations on an active disk drive can result in data loss and/or data corruption.

Different applications provide various levels of error logging. In general, you can find messages about failing or failed disks in your system console window. The information is also logged in the /usr/adm/messages file(s). See the documentation that came with your application for more information.

Preparing to Replace the Disk Drive

The following procedure describes how to unconfigure a disk being used by one or more UFS file systems.

1. **Stop any application processes on the file systems to be unconfigured.**

2. **Back up your system.**

3. **Determine what file system(s) are on the disk:**

```
# mount | grep cwtxdysz
```

For example, if the device to be removed is c2t1d0, enter the following:

```
# mount | grep c2t3d0
/export/home   (/dev/dsk/c2t1d0s7 ):   98892 blocks   142713 files
/export/home2  (/dev/dsk/c2t1d0s5 ):  153424 blocks   112107 files
```

4. **Determine and save the partition table for the disk.**

If the replacement disk is the same type as the faulty disk, you can use the format command to save the partition table of the disk. Use the save command in format to save a copy of the partition table to the /etc/format.dat file. This enables you to configure the replacement disk so that its layout matches the current disk.

Refer to the format(1M) man page for more information.

5. **Unmount any file systems on the disk.**

> **Note –** If the file system(s) is on a disk that is failing or has failed, the `umount` operation may not complete. A large number of error messages may be displayed in the system console and in the `/var` directory during the `umount` operation. If the `umount` operation does not complete, you may have to reboot the system.

For each file system from Step 3 returned, type:

```
# umount filesystem
```

where *filesystem* is the first field for each line returned in Step 3.

For example:

```
# umount /export/home
# umount /export/home2
```

6. **Using the** `df` **command, verify that the file system has been unmounted.**

Removing the Disk Drive

1. **Use the** `luxadm remove_device` **command to remove the disk.**

   The `luxadm remove_device` command is interactive. You will be guided through the procedure for removing a device or chain of devices.

   ```
   # luxadm remove_device /dev/rdsk/c2t1d0s5


     WARNING!!! Please ensure that no filesystems are mounted on these
   device(s).
     All data on these devices should have been backed up.



   The list of devices which will be removed is:
     1: Box Name "macs1" front slot 1

   Please enter 'q' to Quit or <Return> to Continue:

   stopping:  Drive in "macs1" front slot 1....Done
   offlining: Drive in "macs1" front slot 1....Done

   Hit <Return> after removing the device(s).
   #
   ```

2. **Remove the disk drive and then hit any key.**

Note – The yellow LED on the designated disk drive(s) should be flashing.

The following is displayed:

```
  Drive in Box Name "macs1" front slot 1

     Removing Logical Nodes:
     Removing c2t1d0s0
     Removing c2t1d0s1
     Removing c2t1d0s2
     Removing c2t1d0s3
     Removing c2t1d0s4
     Removing c2t1d0s5
     Removing c2t1d0s6
     Removing c2t1d0s7
  #
```

Installing the New Disk Drive

1. **Use the** `luxadm insert_device` **command to add the new device.**

   This command is interactive. You will be guided through the procedure for inserting a new device or chain of devices.

   ```
   # luxadm insert_device, macs1,f1

   The list of devices which will be inserted is:
     1: Box Name "macs1" front slot 1

   Please enter 'q' to Quit or <Return> to Continue:


   Hit <Return> after inserting the device(s).
   ```

2. **Insert the disk drive and hit Return.**

   The following is displayed:

   ```
     Drive in Box Name "macs1" front slot 1
     Logical Nodes under /dev/dsk and /dev/rdsk :
       c2t1d0s0
       c2t1d0s1
       c2t1d0s2
       c2t1d0s3
       c2t1d0s4
       c2t1d0s5
       c2t1d0s6
       c2t1d0s7
    #
   ```

   The new disk drive is now available for use as a block or character device. Refer to the `sd(7)` man page for further details.

3. **Verify that the device label meets your requirements.**

   You can use the `prtvtoc` command to inspect the label for your disk. To modify the label, use the `format` command. See the `prtvtoc(1M)` and `format(1M)` man pages for more information.

4. **Verify that the device's partition table satisfies the requirements of the file system(s) you intend to re-create.**

   You can use the `prtvtoc` command to inspect the label for your device. If you need to modify the label, use the `format` command. Refer to the `prtvtoc(1M)` and `format(1M)` man pages for more information.
   For example:

   ```
   # prtvtoc /dev/rdsk/cwtxdysz
   ```

   If you have saved a disk partition table using the format utility and the replacement disk type matches the old disk type, then you can use the `format` utility's `partition` section to configure the partition table of the replacement disk. See the `select` and `label` commands in the partition section.

   If the replacement disk is of a different type than the disk it replaced, you can use the partition size information from the previous disk to set the partition table for the replacement disk. Refer to the `prtvtoc(1M)` and `format(1M)` man pages for more information.

5. **Once you have selected a disk slice for your UFS file system, create a file system on the slice:**

   ```
   # newfs /dev/rdsk/cwtxdysz
   ```

6. **Mount the new file system using the `mount` command:**

   ```
   # mount mount_point
   ```

   where: *mount_point* is the directory on which the faulty disk was mounted.

   The new disk is ready to be used. You can now restore data from your backups.

Removing a Disk Drive

This section describes how to configure your system to remove a disk drive while the power is on and the operating system is running. Use the procedures in this chapter if you do *not* intend to replace the disk drive.

You must select the disk and stop any activity or applications on it, unmount it, physically remove the drive, and configure the Solaris environment to recognize that the drive is no longer there. You must then configure your application to operate without this device in place.

Caution – These procedures should be performed only by a qualified system administrator. Performing hot-plug operations on an active disk drive can result in data loss and/or data corruption.

Preparing to Remove the Disk Drive

The following procedure describes how to unconfigure a disk being used by one or more UFS file systems.

1. **Stop any application processes on the file systems to be unconfigured.**

2. **Back up your system.**

3. **Determine what file system(s) are on the disk:**

```
# mount | grep cwtxdysz
```

For example, if the device to be removed is c2t1d0, enter the following:

```
# mount | grep c2t1d0
/export/home  (/dev/dsk/c2t1d0s7 ):   98892 blocks   142713 files
/export/home2 (/dev/dsk/c2t1d0s5 ):  153424 blocks   112107 files
```

4. **Unmount any file systems on the disk.**

> **Note –** If the file system(s) are on a disk that is failing or has failed, the umount operation may not complete. A large number of error messages may be displayed in the system console and in the /var directory during the umount operation. If the umount operation does not complete, you may have to restart the system.

For each file system returned, type:

```
# umount filesystem
```

where: filesystem is the first field for each line returned in Step 3.

For example:

```
# umount /export/home
# umount /export/home2
```

Removing the Disk Drive

1. **Use the** luxadm remove_device **command to remove the disk.**

   The luxadm remove_device command is interactive. You will be guided through the procedure for removing a device or chain of devices.

   ```
   # luxadm remove_device /dev/rdsk/c2t1d0s2


     WARNING!!! Please ensure that no filesystems are mounted on these
   device(s).
     All data on these devices should have been backed up.



   The list of devices which will be removed is:
     1: Box Name "macs1" front slot 1

   Please enter 'q' to Quit or <Return> to Continue:

   stopping:  Drive in "macs1" front slot 1....Done
   offlining: Drive in "macs1" front slot 1....Done

   Hit <Return> after removing the device(s).
   ```

2. **Remove the disk drive and then hit any key.**

Note – The yellow LED on the designated disk drive(s) should be flashing.

The following is displayed:

```
 Drive in Box Name "macs1" front slot 1
    Removing Logical Nodes:
    Removing c2t1d0s0
    Removing c2t1d0s1
    Removing c2t1d0s2
    Removing c2t1d0s3
    Removing c2t1d0s4
    Removing c2t1d0s5
    Removing c2t1d0s6
    Removing c2t1d0s7
 #
```

Volume Manager Operations

Adding a Disk Drive

This section describes how to use Volume Manager to configure your system when you add a disk drive while the power is on and the operating system is running.

Caution – These procedures should be performed only by a qualified system administrator. Performing hot-plug operations on an active disk drive may result in data loss and/or data corruption.

You must create a new device entry for the drive in the `/devices` and `/dev/dsk` and `/dev/rdsk` hierarchy. The new drive is assigned a name associated with the slot into which the drive was installed.

1. **Select any available slot in the StorEdge A5000 disk array for the new disk drive.**

   For reference when you configure the software environment, make a note of which enclosure and slot you choose.

2. **Use the** `luxadm insert_device` **command to add the new device.**

This command is interactive. You will be guided through the procedure for inserting a new device or chain of devices.

```
# luxadm insert_device macs1,f1


The list of devices which will be inserted is:
  1: Box Name "macs1" front slot 1

Please enter 'q' to Quit or <Return> to Continue:


Hit <Return> after inserting the device(s).
```

3. **Insert the disk drive and hit Return.**

The following is displayed:

```
 Drive in Box Name "macs1" front slot 1
  Logical Nodes under /dev/dsk and /dev/rdsk :
    c2t1d0s0
    c2t1d0s1
    c2t1d0s2
    c2t1d0s3
    c2t1d0s4
    c2t1d0s5
    c2t1d0s6
    c2t1d0s7
#
```

The new disk drive is now available for use as a block or character device. Refer to the `sd(7)` man page for further details.

4. **Configure the Volume Manager to recognize the disk drive.**

```
# vxdctl enable
```

5. **Add the new disk to a new or existing Volume Manager disk group:**

```
# vxdiskadd cwtxdysz
```

where: *cwtxdysz* is the new disk.

Refer to the vxdiskadd(1M) man page for further details.

The disk is now ready for use with Volume Manager as part of a new volume, added to an existing volume as a plex, or to increase an existing volume. Refer to your Sun StorEdge Volume Manager *User's Guide* for more information.

Replacing a Disk Drive

This section describes how on using Volume Manager to configuring your system to replace a disk drive while the power is on and the operating system is running.

Caution – These procedures should be performed only by a qualified system administrator. Performing hot-plug operations on an active disk drive can result in data loss and/or data corruption.

Terminate all user- and application-level processes on all volumes, plexes, and/or subdisks that are located on the drive to be removed before performing this procedure.

Preparing to Replace the Disk Drive

1. **Identify the faulty disk drive.**

   Different applications provide various levels of error logging. In general, you can find messages about failing or failed disks in your system console window. The information is also logged in the /usr/adm/messages file(s). See the documentation that came with your application for more information.

2. **Back up your system.**

   Refer to the documentation that came with your system for backup details.

3. **Identify the disk media name for the disk you intend to replace.**

```
# vxdisk list | grep cwtxdysz
```

For example, if the disk to be removed is `c2t1d0`, enter:

```
# vxdisk list | grep c0t1d0
c2t1d0s2     sliced     disk01          rootdg          online
```

The disk media name is the third field in the output above: `disk01`.

You can use the `vxdiskadm` utility to prepare the disk for replacement.

4. **Type** `vxdiskadm` **in a shell.**

```
# vxdiskadm
```

This operation is interactive and requires user confirmation of the operation.

5. **Select the "Remove a disk for replacement" option.**

When prompted for a disk name to replace, type the disk media name from Step 3.

`vxdiskadm` marks the disk for replacement and saves the subdisk information to be rebuilt on the replacement disk.

Redundant data is automatically recovered after the replacement disk has been reattached to Volume Manager. Nonredundant data is identified as unusable and must be re-created from backups.

Refer to the `vxdiskadm(1M)` man page for further details.

6. **Quit the** `vxdiskadm` **utility.**

Replacing the Disk Drive

1. **Use the** `luxadm remove_device` **command to remove the disk.**

   The `luxadm remove_device` command is interactive. You will be guided through the procedure for removing a device or chain of devices.

   ```
   # luxadm remove_device macs1,f1


     WARNING!!! Please ensure that no filesystems are mounted on these
   device(s).
      All data on these devices should have been backed up.



   The list of devices which will be removed is:

      1: Box Name "macs3" rear slot 1

   Please enter 'q' to Quit OR <Return> to Continue:

   stopping:  Drive in "macs1" front slot 1....Done
   offlining: Drive in "macs1" front slot 1....Done

   Hit <Return> after removing the device(s).
   ```

2. **Remove the disk drive and then hit any key.**

   Note – The yellow LED on the designated disk drive(s) should be flashing.

   The following is displayed:

   ```
    Drive in Box Name "macs1" front slot 1
       Removing Logical Nodes:
       Removing c2t18d0s0
       Removing c2t18d0s1
       Removing c2t18d0s2
       Removing c2t18d0s3
       Removing c2t18d0s4
       Removing c2t18d0s5
       Removing c2t18d0s6
       Removing c2t18d0s7
    #
   ```

3. **Use the** `luxadm insert_device` **command to add the new device.**

   This command is interactive. You will be guided through the procedure for inserting a new device or chain of devices.

   ```
   # luxadm insert_device macs1,f1

   The list of devices which will be inserted is:
     1: Box Name "macs1" front slot 1

   Please enter 'q' to Quit or <Return> to Continue:

   Hit <Return> after inserting the device(s).
   ```

4. **Insert the disk drive and then hit Return.**

   The following is displayed:

   ```
     Drive in Box Name "macs1" front slot 1
     Logical Nodes under /dev/dsk and /dev/rdsk :
       c2t1d0s0
       c2t1d0s1
       c2t1d0s2
       c2t1d0s3
       c2t1d0s4
       c2t1d0s5
       c2t1d0s6
       c2t1d0s7
   #
   ```

   The new disk drive is now available for use as a block or character device. Refer to the sd(7) man page for further details.

   ## Recreating a Volume Manager Configuration on the New Drive

   To re-create the replaced disk on the new drive:

1. **Configure the Volume Manager to recognize the disk drive.**

   ```
   # vxdctl enable
   ```

2. **Use the** `vxdiskadm` **utility to replace the failed disk.**

   Select the "Replace a failed or removed disk" option.

   This operation requires user confirmation. When prompted for a disk name to replace, use the disk media name from Step 3 of "Preparing to Replace the Disk Drive" on page 48.

   `vxdiskadm` supplies a list of available disks to be used as replacements.

3. **Select the replacement drive.**

   `vxdiskadm` automatically configures the replacement drive to match the failed drive.

   Redundant data is recovered automatically. Space for nonredundant data is created and identified. Nonredundant data must be recovered from backing store.

   See the `vxdiskadm` man page for further details.

Removing a Disk Drive

This section describes how to configure your system to remove a disk drive while the power is on and the operating system is running. Use the procedures in this section if you do *not* intend to replace the disk drive.

You must select the disk and stop any activity or applications on it, unmount it, physically remove the drive, and configure the Solaris environment to recognize that the drive is no longer there. You must then configure your application to operate without this device in place.

Caution – These procedures should be performed only by a qualified system administrator. Performing hot-plug operations on an active disk drive can result in data loss and/or data corruption.

Preparing to Remove the Disk Drive

1. **Back up your system.**

2. **Identify the disk media name for the disk you intend to remove.**

```
# vxdisk list | grep cwtxdysz
```

For example, if the disk to be removed is c2t1d0, enter:

```
# vxdisk list | grep c2t1d0
c2t1d0s2     sliced    disk01        rootdg        online
```

The disk media name is the third field in the output above: disk01.

You can use the vxdiskadm utility to prepare the disk for removal.

3. **Type** vxdiskadm **in a shell.**

For example:

```
# vxdiskadm
```

This operation is interactive and requires user confirmation of the operation.

4. **Select the "Remove a disk" option.**

When prompted for a disk name to remove, type the disk media name from Step 2.

vxdiskadm marks the disk to be removed.

Refer to the vxdiskadm(1M) man page for further details.

Removing the Disk Drive

1. **Use the** `luxadm remove_device` **command to remove the disk.**

   The `luxadm remove_device` command is interactive. You will be guided through the procedure for removing a device or chain of devices.

   ```
   # luxadm remove_device /dev/rdsk/c2t1d0s2


     WARNING!!! Please ensure that no filesystems are mounted on these
   device(s).
     All data on these devices should have been backed up.



   The list of devices which will be removed is:
     1: Box Name "macs1" front slot 1

   Please enter 'q' to Quit or <Return> to Continue:

   stopping:  Drive in "macs1" front slot 1....Done
   offlining: Drive in "macs1" front slot 1....Done

   Hit <Return> after removing the device(s).
   ```

2. **Remove the disk drive and then hit any key.**

   Note – The yellow LED on the designated disk drive(s) should be flashing.

   The following is displayed:

   ```
    Drive in Box Name "macs1" front slot 1
       Removing Logical Nodes:
       Removing c2t1d0s0
       Removing c2t1d0s1
       Removing c2t1d0s2
       Removing c2t1d0s3
       Removing c2t1d0s4
       Removing c2t1d0s5
       Removing c2t1d0s6
       Removing c2t1d0s7
    #
   ```

Expert Mode Subcommands

Caution – The expert mode subcommands should be used only by qualified personnel who are knowledgeable about the systems they are managing.

Expert mode subcommands are listed in the following table.

The command line must contain the `luxadm -e` (expert mode) option and a subcommand.

```
luxadm -e subcommand pathname
```

TABLE A-1   Expert Mode Subcommands

Subcommand	Description
bus_getstate	Gets and displays the state of the specified bus or the bus controlling the specified device.
bus_quiesce	Quiesces the specified bus or the bus controlling the specified device.
bus_reset	Resets the specified bus or the bus controlling the specified device.
bus_resetall	Resets the specified bus or the bus controlling the specified device, and all devices on that bus.
bus_unquiesce	Unquiesces the specified bus or the bus controlling the specified device.
dev_getstate	Gets and displays the state of the specified device.
dev_reset	Resets the specified device.
forcelip	Forces the link to reinitialize using the Loop Initialize Primitive (LIP) sequence. This subcommand is supported on the StorEdge A5000 disk array only.

TABLE A-1 Expert Mode Subcommands *(Continued)*

Subcommand	Description
offline	Takes the specified device offline
online	Puts the specified device online
rdls	Reads the link error status block from a specified device. This subcommand also displays the link error status information for the host adapter associated with the specified device, if available. The rdls subcommand is supported on the Sun StorEdge A5000 disk array only.

Index