



Sun StorEdge Network FC Switch-8 and Switch-16 Operations Guide

Switch 3.0

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Preface

The *Sun StorEdge Network FC Switch-8 and Switch-16 Operations Guide* describes how to upgrade the Sun StorEdge the Sun StorEdge Network FC Switch-8 and Switch-16 software. It provides information on how to replace switches within a working system. It provides information and pointers to additional documentation you may need for installing, configuring, and using the configuration. The book is primarily intended for use by experienced system support engineers who already have a good understanding of the product.

Using UNIX Commands

This document may 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*
- AnswerBook2[™] online documentation for the Solaris[™] operating environment
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

Product	Application	Title	Part Number
SANbox	Installer/User's information	SANbox-16STD Fibre Channel Switch Installer's/User's Manual	875-3141-10
	Installer/User's information	SANbox-8 Fibre Channel Switch Installer's/User's Manual	875-3142-10
	Installer/User's Information	SANbox 8/16 Switch Management User's Manual	875-3143-10
	Install/configuration	Sun StorEdge Network FC Switch-8 and Switch-16 Installation and Configuration Guide	816-0830-10
	Latest Information	<i>Sun StorEdge network FC switch-8 and switch-16 Release Notes</i>	816-0842-10
	Software	<i>CDInsert</i>	
Arrays	Latest Information	<i>Sun StorEdge A5000 Product Notes¹</i>	805-1018-13
	Administration	<i>Sun StorEdge T3 Disk Tray Administrator's Guide</i>	806-1063-11
	Installation, Operations, and Service	<i>Sun StorEdge T3 Disk Tray Installations, Operations and Service Manual</i>	806-1062-11
	Latest Information	<i>Sun StorEdge T3 Disk Tray Release Notes</i>	806-1497-12
	Late news - Best Practices	<i>Sun StorEdge A3x00/A3500 FC Best Practices Guide</i>	806-6419-10
	Latest Information	<i>Sun StorEdge A3500FC Release Notes¹</i>	805-7758-11
Other Components	Sun StorEdge T3 Array/Switch	<i>Sun StorEdge T3Array to Sun StorEdge Network FC Switch Configuration Guide</i>	816-2096-10

Product	Application	Title	Part Number
	Traffic Management	<i>Sun StorEdge Traffic Manager Installation and Configuration Guide</i>	816-1420-10
	Hub information	<i>Sun StorEdge FC-100 Hub Installation and Service Manual</i>	805-0315-12
Storage Cabinet	Rackmount information Online	Rackmount Placement Matrix	805-4748-xx
Software	RAID software	<i>RAID Manager 6.22 User's Guide</i>	806-0478-10
Switch	Troubleshooting customer	Sun StorEdge network FC switch-8 and switch-16 Troubleshooting Guide	806-6923-10
	Troubleshooting internal	<i>Sun StorEdge Network FC Switch-8 and Switch-16 Troubleshooting Guide</i>	816- 1701-xx
manpage	cfgadm utility	<i>cfgadm_fp</i>	manpage

1. Check for the latest updates at <http://sunsolve.sun.com>.

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Sun StorEdge Network FC Switch-8 and Switch -16 Switch Operations—Switch 3.0

0.1 Introduction

This manual is intended for administrators who encounter trouble in setting up their configurations. It provides information on how to replace a switch in the fabric.

The SAN environment consists of hosts, Fibre Channel switches, and storage subsystems.

The SAN environment can be configured into various different forms, depending on the type of elements used in the SAN environment.

The Sun StorEdge network Fibre Channel Switch-8 and the Sun StorEdge Network Fibre Channel Switch-16 are the two switches used to configure the Sun SAN environment. The Sun StorEdge Network Fibre Channel Switch-8 consists of eight FC ports; the Sun StorEdge network Fibre Channel Switch-16 consists of 16 FC ports.

Refer to the *Sun StorEdge Network FC Switch-8 and Switch-16 Installation and Configuration Guide* for information on new features and upgrades.

You can configure a maximum of four hosts or domains per switch.

Supported hosts:

- Sun Enterprise 220R, 250, 420R, and 450
- Sun Enterprise 3000 - Enterprise 6000
- Sun Enterprise 3500 - 6500

- Sun Enterprise F3800 server host (only with the Sun StorEdge CPCI Dual Fibre Channel Adapter)
- Sun Enterprise 4800 server host with PCI Single Fibre Channel Adapter and PCI Dual Fibre Channel Adapter
- Sun Enterprise F4810 server host with PCI Single Fibre Channel Adapter and PCI Dual Fibre Channel Adapter
- Sun Enterprise F6800 server host with PCI Single Fibre Channel Adapter and PCI Dual Fibre Channel Adapter

You can attach different types of storage subsystems to the switches.

Supported storage subsystems:

- Sun StorEdge A5200 Array
- Sun StorEdge T3 Array
- Sun StorEdge A3500FC Array

You can configure different zones with the switch, with a maximum of eight zones on the 8-port switch and eight zones on the 16-port switch.

Zoning is done by assigning ports to separate zones.

0.2 Product Software Installation

Current GUI, firmware, and documents, FC Switch 2.0 / 2.1, are available at

www.sun.com/storage/san/

at the link entitled Downloads: Software/Firmware Upgrades and Documentation.

Current GUI, firmware, and documents, FC Switch 3.0, are available at

This site provides the following versions of the Sun StorEdge network FC switch-8 and switch-16 GUI and firmware for download:

Firmware: 3.04.60

GUI: 2.08.xx

GUI revision 2.08.xx is the GUI supplied with the Sun StorEdge Network FC Switch 3.0 CD.

0.2.1 Minimum System Requirements

See the updated *Sun StorEdge Network FC Switch-8 and Switch-16 Release Notes* posted on this site for information on minimum system requirements and required Solaris 8 patches.

Your system must meet minimum requirements before proceeding with switch GUI or firmware upgrade. Note that the StorTools diagnostics package listed in the minimum system requirements is optional, and is not required for switch operation.

0.2.2 Firmware Download

Information on how to download the firmware can be found in the Switch Management Users Manual, pages 2-42 and 3-7.

If an earlier version of the Sun StorEdge FC Switch SANSurfer GUI has been installed in the system, you must perform a package remove before you install the Sun StorEdge FC Switch 3.0 GUI.

Current switch GUI, FW and docs are posted at the Sun Download Center, accessible by going to

<http://www.sun.com/storage/san/>

and clicking the Software/Firmware Upgrades and Documentation link.

0.2.3 Upgrading the GUI

If the Sun StorEdge FC Switch 2.0 (Version 2.07.50) or 2.1 (Version 2.07.54) GUI has been installed in the system, you must perform a package removal before you install the Sun StorEdge FC Switch 3.0 GUI.

Note – If you have the patch for the Sun StorEdge FC Switch 3.0, you can update your version using `patchadd`.

▼ To Remove the 2.0 GUI

1. In the root directory, type:

```
# pkgrm SUNWsmgr
```

The following message displays:

```
The following package is currently installed.
SUNWsmgr SANSurfer, Qlogic Fibre Channel Administration
(i86pc, sparc) 2.07
Do you want to remove this package?
```

2. Type:

```
# y [Yes]
```

The following message is displayed.

```
## Removing installed package instance <SUNWsmgr>
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <none>
/usr/opt/SUNWsmgr/bin/esm_smgr
/usr/opt/SUNWsmgr/bin/Sun.jar
/usr/opt/SUNWsmgr/bin
/usr/opt/SUNWsmgr/app.dat
/usr/opt/SUNWsmgr <non-empt directory not removed>
## Updating system information.
Removal of <SUNWsmgr> was successful.
```

▼ To Install the 3.0 GUI Software

- Add the GUI package by typing:

```
pkgadd -d SUNWsmgr
```


▼ To Install the 3.0 GUI Patch

If you have the 2.0 or 2.1 GUI already installed and you have the patch for the 3.0 GUI, you can upgrade the GUI with the 3.0 patch.

1. **If you want to preserve your current user administration and fabric configurations, copy the current user administration file (`app.dat`) and fabric information file (`default.fab`) to another file.**

2. **Type:**

```
# patchadd 110696-xx
```

▼ To Start the GUI Software

You can start the GUI with either the command line or Component Manager 2.2.

▼ To Use the Command Line

Type:

```
java -jar /usr/opt/SUNWsmgr/bin/esm_smgr
```

▼ To Use Component Manager 2.2.

1. **Click the `Launch` button.**

See the Component Manager documentation that came with your software for more details on how to install and use Component Manager.

The login window appears.

If this is the first time this switch has been logged into, or if no `username` and `password` file have been created by a superuser, use the default `username` and `password`, which is `su` for each one. Otherwise, use the `username` and `password` assigned during a previous session.



2. Enter the switch IP address in the Fabric window of the GUI.

It may take a few seconds for the switch icon to become gray. You can click the Refresh button.

3. After the switch icon becomes gray, click the icon.

Note – If the icon remains red, it is likely that the IP address is wrong, or that the switch cannot be accessed from that subnet, or the switch lacks power or an ethernet connection.

▼ To Verify the Flash

You must have the correct flash for the 3.0 version of the GUI in each switch of the fabric. For cascaded switches, both switches must have the same flash version.

▼ To Verify the Firmware Revision Level of the switch(es):

Perform the following procedure for each switch.

1. Verify that the switches are not connected to each other.

2. Connect one switch to the net.

3. Launch the GUI and bring up the switch.

See “To Start the GUI Software” on page 5.

4. Open the Topology View screen.

The switch icon representing the connected switch displays in the right window pane.

5. Double-click the switch icon.

The Topology View screen is erased, and the Switch FacePlate Display screen displays.

6. Make a note of the firmware revision level.

The revision level appears on the second line of the text in the upper right corner of the Switch FacePlate Display screen.

▼ **To Load the Flash**

1. Locate the file containing the new flash code on the management station.

The default location is `/usr/opt/SUNWsmgr/flash`.

2. Choose Special>Update Flash.

The application displays a standard Open dialog box that allows you to browse to and then open the Flash Update binary file. When you select the Flash Update file, the switch checks the file for a valid `checksum`. Then, if the `checksum` is correct, the Flash load begins.

If the `checksum` is not correct, the application warns you.

3. Make sure you select the correct flash code.

The flash file for the 8-port switch is `m080304xx.flsh`.

The flash file for the 16-port switch is `m160304xx.flsh`.

Select the filename with the highest `xx` number.

The application displays information about the progress of the flash update:

- File: The name of the flash update binary file
- Position: Number of bytes downloaded
- Total: The total number of bytes in the file
- Complete: The percentage of the file sent to the chassis

When the flash load is complete, the application displays a dialog box that states that the flash load is complete and asks whether to Reset Immediately.

4. If you want to Reset, click Yes.

Remember that a Reset operation disrupts the operation of the switch.

5. If you do not want to Reset until traffic is removed from the switch, click No.

You can perform the Reset later by choosing Special>Reset in any of the Chassis FacePlate windows.

0.3 Removal and Replacement of FRUs By Service Providers

For removal and replacement procedures, see the “Removal/Replacement” chapter of the *SANbox Segmented Loop Switch User’s Manual*.

0.4 Power-On-Self-Test (POST)

Refer to the *SANbox-8/16 Segmented Loop Switch Management and User’s Manual* for information about the POST and the HeartBeat LEDs.

At startup, a switch runs a series of tests known as Power-On-Self-Test (POST) diagnostics. These POST diagnostics check for proper switch operation, excluding the GBICs. If no fatal errors are encountered, the switch becomes operational.

During the POST, the switch logs any errors encountered. Some POST messages are fatal; others are non-fatal. A fatal error disables the switch so that it will not operate. A non-fatal error allows the switch to operate, but with some decrease in performance.

The switch uses HeartBeat LEDs to blink the error code that describes the first error encountered. If the error encountered is non-fatal, and affects one or more ports, it disables the bad ports and blinks the Logged-in LED to indicate which ports are down.

See the *Sun StorEdge Network FC Switch-8 and Switch-16 Installation, and Configuration Guide* and the *SANbox-8/16 Segmented Loop Switch Management and User’s Manual* for information about the POST diagnostics tool.

0.4.1 POST Diagnostics

See the *Sun StorEdge network FC switch-8 and switch-16 Installation, and Configuration Guide* and the *SANbox-8/16 Segmented Loop Switch Management and User’s Manual* for information about the POST diagnostics tool. The POST diagnostics tool supplies information about the following:

- The correctness of the boot firmware loaded in the PROM and the switch firmware loaded in FLASH memory by checking the checksum.
- The correctness of the internal switch memory.

- The correctness of the switch logic, with the help of various read/write register and loopback data-path tests.

0.5 Troubleshooting

Customer level troubleshooting instructions are provided in the Switch 3.0 Installation and Configuration Guide. Additional troubleshooting information, for ES use only, is provided in the *Sun StorEdge Network FC Switch-8 and Switch-16 Troubleshooting Guide*, 816-1701-xx.

0.5.1 Capture

The line command `capture` gathers switch configuration data and writes it to standard output.

0.5.1.1 Synopsis

```
capture [-nvram] Sw_IP_addr
```

0.5.1.2 Description

Capture provides a convenient way to retrieve all SANbox switch configuration information and the current operational status, and print it in a readable form. The information is written to standard output.

Capture is a useful way to document a configuration and the conditions when a problem is reported, and its output should be included with all problem reports. If it is specified, the parameter `[-nvram]` dumps the configuration in hex format. This information is not useful unless the HeartBeat light indicates `nvram` corruption. If `nvram` corruption is present, the HeartBeat light blinks 15 times, pauses, and then repeats the error code.

The following data is recorded:

IP Address Configuration

Net IP Address: IP address of the switch

Net Mask: Network mask used by the switch

Broadcast: Broadcast address used by switch, if specified
Gateway: Gateway address used by the switch
Address Discovery: RARP, Bootp, or none
ArpTimeOut: Time in milliseconds, before ARP table entries are discarded.

Version Information

HW: ASIC Version
PROM: Prom Version
FLASH: Firmware version
CHASSIS TYPE: 8 or 16 port switch
CHASSIS NUMBER: Assigned chassis number
Fabric Id: Assigned Fabric Id
WWN: WorldWide Name
MAC: MAC Address

Operating Mode

Switch Operating Mode: Indicates whether the switch is using proprietary (T-Port) or FC-SW-2 compliant protocol (E-Port) between switches.

Nameserver Zoning Mode

Zoning Mode: Indicates whether the switch is using Port mode or WWN mode for nameserver zoning.

Chassis Status

This section shows the status of power, temperature, and the fan(s). It also indicates what type of GBIC is installed in each port.

SNMP *CONFIGURATION*

Name:	Switch IP address
Contact:	snmp contact string, if configured
Location:	snmp location string, if configured
Trap Address:	IP address to send traps to
Read Community:	Read Community String
Write Community:	Write Community String
Trap Community:	Trap Community String
Switch description:	SysDesc, (programmed at the factory)
Switch Object ID:	SysObjectId, (programmed at the factory)

Stage Type & Time Out Values

Active:

Chassis Stage Type: Operating mode of the switch, I O Transfer (normal), Cross Connect, or Hub Emulation

Timeout Values:

edtov: Value in milliseconds of Fibre Channel ED_TOV

mfstov: Timeout in milliseconds, port will lock on to a source, when running Non-Interleave Sequence mode.

ratov: Value in milliseconds of Fibre Channel RA_TOV

rttov: Value in milliseconds of Fibre Channel RT_TOV

Port Tuning

For each port, tuning mode is indicated, as follows:

Normal - No tuning selected

NON-I - Do not interleave sequences

MIN-I - Minimize interleave of sequences

FRAME-L - Limit frames transmitted per loop open

Port Status

For each port, the following information is provided:

Port operating mode - F_Port, T_Port, TL_Port, SL_Port, or FL_Port

Administrative state - online or offline

Operational state - online or offline

Status - not-logged-in or logged-in

For loop Ports the AL_PAs of loop devices will be displayed For TL ports it will indicate whether they are in Target or Initiator mode, and any public devices proxied as a private device on the loop will be displayed.

Topology

For each port the remote chassis id, stagetype, and port address will be displayed, if any.

Links Information

This section displays Interswitch Link ports of each switch in the fabric, and the port, Fibre Channel Address, and WWN connected to that port.

Switch Count

This section displays switch level error and event counters.

Port count

For each port, non-zero error and event counters will be displayed.

Name Server

This display lists the contents of the name server data base on the switch, including port, Fibre Channel address, port name, node name, and registered FC-4 types for each device.

NameServer Zone

This section shows the nameserver zones effective in the switch.

If port zoning is in effect, it will list all of the ports that are members of each active nameserver zone. If WWN zoning is in effect, it will list all of the WWNs that are members of each active nameserver zone.

Broadcast Zone

This section shows the broadcast zones effective in the switch.

It will list all of the ports that are members of each active broadcast zone.

Hard Zone

This section shows the hard zones effective in the switch. It will list all of the ports that are members of each active hard zone.

SL Zone

This section shows the SL zones effective in the switch. It will list all of the ports that are members of each active SL zone.

0.6 Sun StorEdge A5200 Array

The troubleshooting procedures for the Sun StorEdge A5200 Array are detailed in the *Sun StorEdge A5x00 Trouble Shooting Guide*, available on-line at <http://webhome.ebay.sun.com/networkstorage/products/A5000/>

After going to the Sun StorEdge A5000 website, select Trouble shooting Guide from the Tech FAQs/Knowledge base section.

0.7 Switch Replacement

Note – To perform the tasks in switch replacement you must have access to a SANsurfer GUI with network access to a working switch in the Fabric. You must also have SuperUser (root) access within the GUI.

Note – You can use only a switch with factory default settings as a replacement switch.

- The procedures for switch replacement need to be used with the *SANBox-8/16 Switch Management User's Manual Sun StorEdge network FC switch 3.0* (part number 875-3143, Rev. R19).
- Switch replacement is not disruptive only in a high availability configuration.

If you are replacing a switch in:

- A two-switch Fabric, see “To Replace a Switch in a Two-Switch Fabric” on page 14.
- A single-switch Fabric, see “To Replace a Switch in a Single-Switch Fabric” on page 18.

If you are replacing both switches in:

- A two-switch Fabric, see “To Replace Both Switches in a Two-Switch Fabric” on page 22.

To move a port:

- Containing a disk array from one zone to another, see Section 0.7.1, “Moving a Port with a Disk Array From One Zone to Another” on page -27.
- From one zone to another, see Section 0.7.2, “Moving a Port from One Zone to Another” on page -30.

To add a port to a zone, see Section 0.7.3, “Adding a Port to a Zone” on page -31.

To verify that service or system administrators techniques were successful, see Section 0.7.4, “Verifying the Results” on page -32.

▼ To Replace a Switch in a Two-Switch Fabric

Three conditions may require you to replace a switch.

- The switch to be replaced within the Fabric is responding to the SANsurfer GUI either through the Ethernet or in-band from a second switch.
- The switch to be replaced within the Fabric has experienced a catastrophic failure and is not responding to the SANsurfer GUI, either through the Ethernet or in-band from a second switch. If you have an archive of the Fabric and zoning template, skip the Saving Settings section because there is no way of recovering the switch's current settings.
- The switch to be replaced within the Fabric has experienced a catastrophic failure but you do not have an archive of the Fabric or a zoning template. Skip the Saving Settings section and the Restoring Saved Settings" section because you cannot recover the switch's current settings and there are no saved settings.

1. Launch the SANsurfer GUI.

Type:

```
# /usr/opt/SUNWsmgr/bin/esm_smgr
```

2. Log in.

Use the username `su` and the password `su`.
The Fabric screen appears.

3. Select the Sun logo under the status column.

The Topology window appears. If it does not appear, select Refresh and select the Sun logo again.

If subsequent attempts to enter the Topology window fail, troubleshoot the network connection. The management switch may be bad.

4. If the failed switch is currently selected, select the second switch that is not failed in the fabric.

a. Change the IP address on the Fabric line by selecting the line.

b. Select the IP address or hostname under the IP Address column and use the Delete button.

You can now select the empty IP Address box and enter the second switch's address.

▼ **To Change the Chassis ID**

Each switch in the Fabric must have a unique chassis ID. The default chassis ID is 0. If the switch you are using to manage the Fabric has a chassis ID of 0, you must change it temporarily to another number. All chassis IDs are restored when you restore the saved settings. See "To Restore the Saved Settings" on page 17.

1. **Double-click the Sun logo to display the Topology window.**
2. **Double-click the switch icon with the RJ45 connector to display the Faceplate window.**
Do not double click the RJ45 connector.
3. **Change the Chassis ID to a unique number from 1 to 63.**
Do not choose a Chassis ID number that is currently assigned to the other switch.
4. **Save the changes by clicking the Apply button.**
Select yes to messages about disrupting traffic and reconfiguring the switch.
5. **Click Back to display the Topology window.**

▼ To Save the Settings

1. **In the Topology window, from the Special menu, select the Archive Fabric option.**
This collects and stores the port configuration, network access, and chassis settings of all the switches within the Fabric. It does not gather zoning or SNMP settings.
2. **Select a unique .cfg filename and save the configuration.**
3. **Save the SNMP information.**
 - a. **Select the switch you are replacing.**
The Faceplate window appears. Wait for it to populate fully.
 - b. **Select the RJ45 icon in the switch Faceplate window to enter the Network Configuration window.**
Document the SNMP configuration information. This information is not saved in any configuration file; you must manually enter the information again after you replace the switch.
4. **Select Return to Fabric Screen from the View menu.**
5. **Double-click the Sun logo in the status column to display the Topology window.**
6. **Click the Zoning button to enter the Zoning window.**
7. **From the Special pull-down menu, select the Save Template to File option.**
Select a unique .tp2 file name to save the zoning template.
Zoning settings for all the switches in the Fabric are collected and stored.
8. **Click the Back button to return to the Topology window.**

▼ To Replace the Switch

1. **Turn off the power on the failed switch.**

2. **Within SANsurfer, highlight the switch you just powered off, and click the Delete button to confirm the deletion of the switch.**
3. **Label all the cables for replacement.**
4. **Disconnect all the Fibre cables from the failed switch.**
Remove all the GBICs from their ports.
5. **Disconnect the Ethernet cable from the failed switch.**
6. **Disconnect all the power cables from the failed switch.**
7. **Remove the old switch and document serial numbers.**
8. **Write down the new switch serial number.**
9. **Install the new switch in the old switch's place.**
10. **Reconnect the power cables and the Ethernet cable to the new switch.**
11. **Reinsert the GBICs into the new switch and connect the Fibre cables.**
Use the same ports that were used on the failed switch.
12. **Power on the new switch.**

▼ To Restore the Saved Settings

Allow the GUI to change the stage type and update the firmware of the switch. The GUI will prompt you. The flash is stored in the directory
/usr/opt/SUNWsmgr/flash
The files begin with m08 or m16. The m08 file is for an 8-port switch and the m16 is for a 16-port.

1. **While in the Topology window, from the Special pull-down menu, select Restore Fabric.**
In the dialog box, you are prompted with the saved configuration files.
.cfg is listed on the left side.
2. **Find the configuration of the replaced switch on the left side of the dialog box and select the name of the new switch on the right side of the dialog box. Press OK.**
The old switch's settings are restored onto the new switch.
3. **Restore zoning by entering the Zoning window.**
4. **From the Zoning window, select the Load Template from File option from the Special pull-down menu.**
The old switch's zoning settings are restored onto the new switch.

▼ To Replace a Switch in a Single-Switch Fabric

This section covers the replacement of a failed switch within a single switch Fabric. Three conditions may require you to replace a switch in a single-switch Fabric.

- The switch to be replaced is responding to the SANsurfer GUI through the Ethernet.
- The switch to be replaced has experienced a catastrophic failure and is not responding to the SANsurfer GUI, but you have an archive of the Fabric and zoning template. Skip the Saving settings section because you cannot recover the switch's current settings.
- The switch to be replaced has experienced a catastrophic failure, but you do not have an archive of the Fabric or a zoning template. Skip the Saving Settings section and the Restoring Saved Settings section because you cannot recover the switch's current settings, and no saved settings exist.

1. Launch the SANsurfer GUI.

Type:

```
# /usr/opt/SUNWsmgr/bin/esm_smgr
```

2. Log in.

Use the username `su` and the password `su`.
The Fabric screen appears.

3. Select the Sun logo under the status column.

The Fabric window appears. If it does not appear, select Refresh and select the Sun logo again.

▼ To Save the Settings

1. In the Topology window, from the Special menu, select the Archive Fabric option.

This collects and stores the port, network access, and chassis settings of all the switches within the Fabric. It does not gather zoning or SNMP settings.

2. Select a unique `.cfg` filename to save the configuration.

3. Save the SNMP information.

a. Select the switch you are replacing.

The Faceplate window appears. Wait for it to populate fully.

b. Select the RJ45 icon in the switch Faceplate window to enter the Network Configuration window.

Document the SNMP configuration.

4. Select **Return to Fabric Screen** from the **View** menu.
5. Click the **Sun logo** in the status column.
6. Click the **Zoning** button to enter the **Zoning** window.
7. From the **Special** pull-down menu, select the **Save Template to File** option.
Select a unique `.tp2` file name to save the zoning template.
Zoning settings for all the switches in the Fabric are collected and stored.
8. Click the **Back** button to return to the **Topology** window.

▼ To Replace the Switch

1. Turn off the power to the switch.
2. Within **SANsurfer**, highlight the switch you just powered off, and click the **Delete** button to confirm the deletion of the switch.
3. Label all the cables for replacement.
4. Disconnect all the Fibre cables and remove all the GBICs from their ports.
5. Disconnect the Ethernet cable.
6. Disconnect all the power cables [to the switch?].
7. Remove the old switch and write down the serial numbers.

▼ To Configure the Network for a Replacement Switch

1. Reconfigure the host IP address.
 - a. Save the workstations network configuration information by typing:

```
# ifconfig -a > /tmp/save_address
```

- b. Verify the saved information by typing:

```
# cat /tmp/save_address
```

- c. Reconfigure the workstations IP address and netmask by typing:

```
# ifconfig hme0 10.0.0.2 netmask 255.0.0.0 up
```

d. Verify the change by typing:

```
# ifconfig -a
```

2. Enable the FORCED PROM mode on the switch.

Using FORCED PROM mode allows the switch to use firmware stored in PROM, rather than flash memory, while you configure the switch IP address. You can use either the Force PROM button (16-port switch) or the Test Mode switch (8-port switch).

▼ **To Use the Force PROM Button for the 16-port switch.**

The button is on the back panel of the switch chassis below port 16.

- a. Isolate the switch chassis from the fabric and power the switch off.**
- b. Press and hold the Force PROM button, and power the switch on.**
- c. Allow the switch to complete the POST, and release the Force PROM button (this should take 5-10 seconds).**
- d. Observe the heartbeat LED for error codes (5 blinks is normal when in Force PROM mode).**

Correct the conditions or reconfigure the switch as required.

▼ **To Use the Test Mode Switch for the 8-port Switch**

The test mode switch is a small rotary switch on the back of the switch chassis. The test mode switch position determines which operating mode the switch enters when the switch chassis is powered on. Normal operation is indicated by the alignment of the small notch on the test mode switch with the dot on the faceplate.

- a. Using a small screwdriver, rotate the test mode switch four clicks clockwise to the Force PROM position.**
- b. Turn the power switch off for three seconds, and then back on to reset the switch chassis.**
- c. Observe the heartbeat LED for error codes (5 blinks is normal when in Force PROM mode).**
- d. If you do not observe the blink code, re-align the small notch on the test mode switch with the dot on the faceplate and return to Step a.**
- e. Rotate the test mode switch four clicks counter-clockwise to the normal operating position.**

3. Plug the switch into the same Ethernet segment or subnet as the host and verify connectivity to the switch by typing:

```
# ping 10.0.0.1
```

If the ping fails, replace the local area network with a crossover cable between the switch and the host Ethernet port. See the *SANBox 8/16 Switch Management User's Manual*, Switch Preparation section, under “Using a Crossover Cable.”

4. Open the SANsurfer GUI.
5. From the Fabric screen enter 10.0.0.1 for the IP address of the switch and press Return twice.

The PROM logo appears in the status column.

6. Select the text that appears in the Fabric Name column.

The Network configuration screen appears. See the *SANBox 8/16 Switch Management User's Manual*, Switch Preparation section, under “To Activate SANsurfer to Modify a Switch IP Address” for instructions on filling in the fields necessary to configure the IP address of the switch. Remember to click Apply after filling in all the fields.

7. Reset the Switch.

You can now reset the switch using the power button to return the switch to normal operating mode. You can observe the heartbeat LED blinking approximately once a second.

8. Restore the Workstation IP Address to the value stored in `/tmp/save_address` by typing:

```
# ifconfig hme0 <ip address> netmask <orig netmask> up
```

9. Verify network configuration changes by typing:

```
# ifconfig -a  
# cat /tmp/save_address
```

A comparison of the current configuration and the saved configuration appears.

▼ To Install the New Switch

1. Write down the new switch serial number.

2. **Install the new switch in the old switch's place.**
3. **Reconnect the power cables and the Ethernet cable.**
4. **Reinsert the GBICs into their previous ports and connect the Fibre cables.**
5. **Power on the new switch.**

▼ To Restore the Saved Settings

You may have to let the GUI change the stage type and update the firmware of the switch. The GUI will prompt you. The flash is stored in the directory `/usr/opt/SUNWsmgr/flash`. The files begin with `m08` or `m16`. The `m08` file is for an 8-port switch and the `m16` is for a 16-port.

1. **While in the Topology window, from the Special pull-down menu, select Restore Archive.**

In the dialog box, you are prompted with the saved configuration files. `.cfg` is listed on the left side.

2. **Find the configuration of the replaced switch on the left side of the dialog box and select the name of the new switch on the right side of the dialog box. Press OK.**

The old switch's settings are restored onto the new switch.

3. **Restore zoning by entering the Zoning window.**
4. **From the Zoning window, select Load Template from File from the Special pull-down menu.**

The old switch's zoning settings are restored onto the new switch.

▼ To Replace Both Switches in a Two-Switch Fabric

Five conditions may require you to replace a switch.

- Both the switches to be replaced within the Fabric are responding to the SANsurfer GUI.
- One of the switches to be replaced within the Fabric is responding to the SANsurfer GUI either through the Ethernet or in-band from a second switch. You have an archive of the Fabric and zoning template.
- One of the switches to be replaced within the Fabric has experienced a catastrophic failure and is not responding to the SANsurfer GUI, either through the Ethernet or in-band from a second switch. You do not have an archive of the Fabric or a zoning template.

- Both the switches to be replaced within the Fabric have had catastrophic failures and you have a copy of the Fabric archive and zoning template.
- Both switches have had catastrophic failures and you do not have an archive of the Fabric or a zoning template. settings.

▼ To Replace the Switches When Both Are Responding to the SANsurfer GUI

The First Switch

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

2. Save the settings.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for saving the settings.

3. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

4. Restore the saved settings.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for restoring the saved settings. The settings restored are from saved configuration files.

The Second Switch

5. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

6. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

7. Restore the saved settings.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for restoring the saved settings. The settings restored are from saved configuration files.

▼ To Replace the Switches When One of the Switches Within the Fabric is Responding to the SANsurfer GUI

The First Switch

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

2. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

3. Restore the saved settings.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for restoring the saved settings. The settings restored are from saved configuration files.

The Second Switch

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

2. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

3. Restore the saved settings.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for restoring the saved settings. The settings restored are from saved configuration files.

▼ To Replace the Switches When One of the Switches Is Responding to the SANsurfer GUI

The Failed Switch

1. See “To Replace a Switch in a Two-Switch Fabric” on page 14.

Perform all the steps in the section, until the catastrophically failed switch has been replaced.

The Second Switch

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

2. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

3. Restore the saved settings.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for restoring the saved settings. The settings restored are from saved configuration files.

▼ **To Replace the Switches When Both Switches Have Had Catastrophic Failures—Saved Settings**

The First Switch

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Single-Switch Fabric” on page 18 and follow the steps for launching and connecting.

Note – Remember that neither switch is functional. You may have to omit one or more steps.

2. Replace the switch.

See “To Replace a Switch in a Single-Switch Fabric” on page 18 and follow the steps for replacing the switch.

3. Configure the replacement switch for the Network.

See “To Configure the Network for a Replacement Switch” on page 19.

4. Restore the saved settings.

See “To Replace a Switch in a Single-Switch Fabric” on page 18 and follow the steps for restoring the saved settings. The settings restored are from saved configuration files.

The Second Switch

One switch on the network, and you must replace the second switch.

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

2. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

3. Configure the replacement switch for the Network.

See “To Configure the Network for a Replacement Switch” on page 19.

▼ **To Replace the Switches When Both Switches Have Had Catastrophic Failures—No Saved Settings**

The First Switch

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for launching and connecting.

2. Save the settings.

See “To Save the Settings” on page 16.

3. Replace the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14 and follow the steps for replacing the switch.

4. Install the new switch.

See “To Install the New Switch” on page 21 .

The Second Switch

You must replace the second switch.

1. Launch the SANsurfer and connect to the switch.

See “To Replace a Switch in a Two-Switch Fabric” on page 14. Use the IP address of the switch you just replaced.

Note – Pay close attention to the Chassis ID section.

2. Replace the switch.

3. See “To Replace a Switch in a Two-Switch Fabric” on page 14.

Both switches have been replaced and are on the network. Because of the lack of the saved configuration you must reconfigure the switches.

0.7.1 Moving a Port with a Disk Array From One Zone to Another



Caution – Removing a Zone or port is a destructive process. You must perform all the steps before removing the port from the Zone.

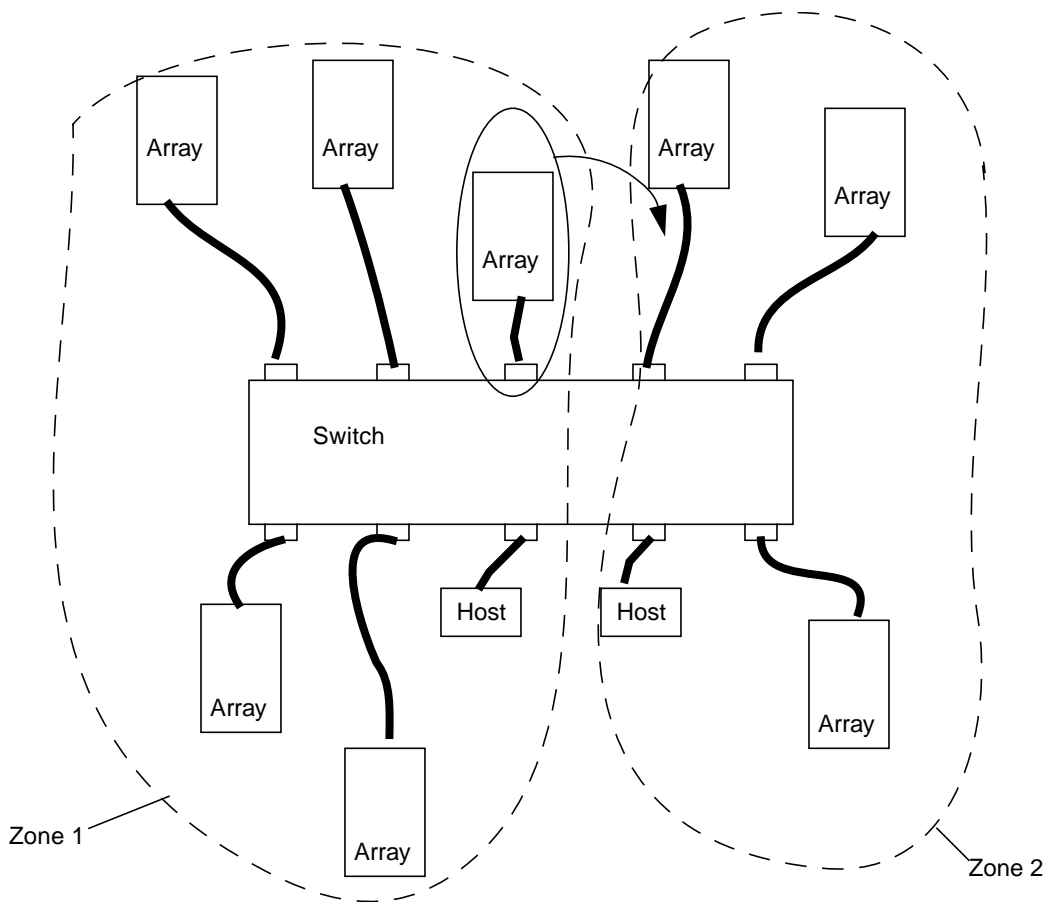


FIGURE 0-1 Moving a Port with Disk Array—Switch with Two Hosts and Two Zones

▼ To Prepare the System

1. Unmount all the filesystems mounted on the devices present on that port.
2. Unconfigure and update the applications that were using the devices on that port.
3. Bring down all the hosts present in Zone 1.

▼ To Remove the Port

1. Using the SANSurfer application launched from another host, remove the port from Zone 1.

See *SANbox 8/16 Switch Management User's Manual*.

If the port in Zone 1 is connected to A3500FC Disk Array and Zone 2 already contains at least one A3500FC Disk array, then go to Step 3.

2. Bring down the host in Zone 2.

If the SANSurfer application is running on any other host, you can make the changes from that application.

If you have the SANSurfer application up and running on any other host, you can go ahead with the changes from that application. If you have configured only two zones on the switch and there are no other hosts, bring up the host on the Zone 1 and launch the SANSurfer application.

3. Add the port to Zone 2.

See *SANbox 8/16 Switch Management User's Manual*.

4. Bring up the hosts on Zones 1 and 2.

0.7.2 Moving a Port from One Zone to Another

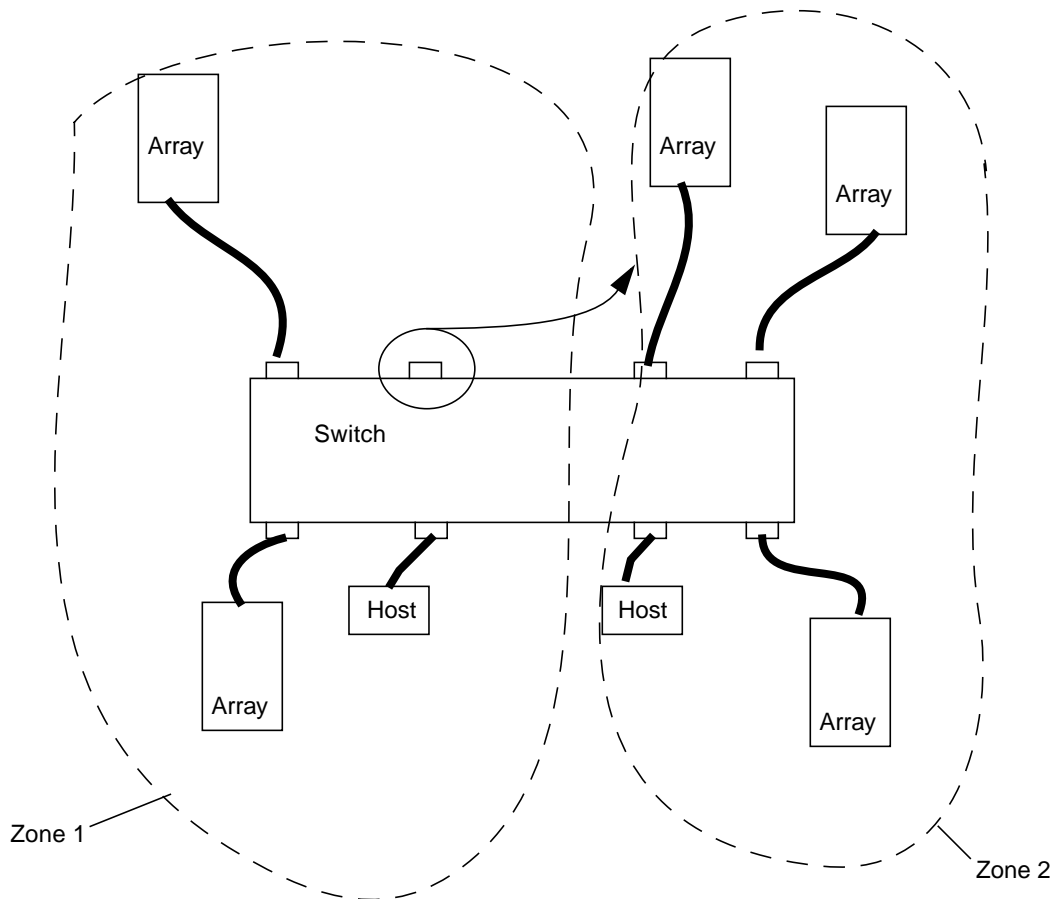


FIGURE 0-2 Moving a Port to Another Zone

1. Using the SANSurfer application launched from another host, remove the port from Zone 1.

See .

2. Add the port to zone 2.

See *SANbox 8/16 Switch Management User's Manual*.

0.7.3 Adding a Port to a Zone



Caution – Removing a Zone or port is a destructive process. The addition will have a LIP circulated through the loop by the switch. Adding a port is a nondestructive process.

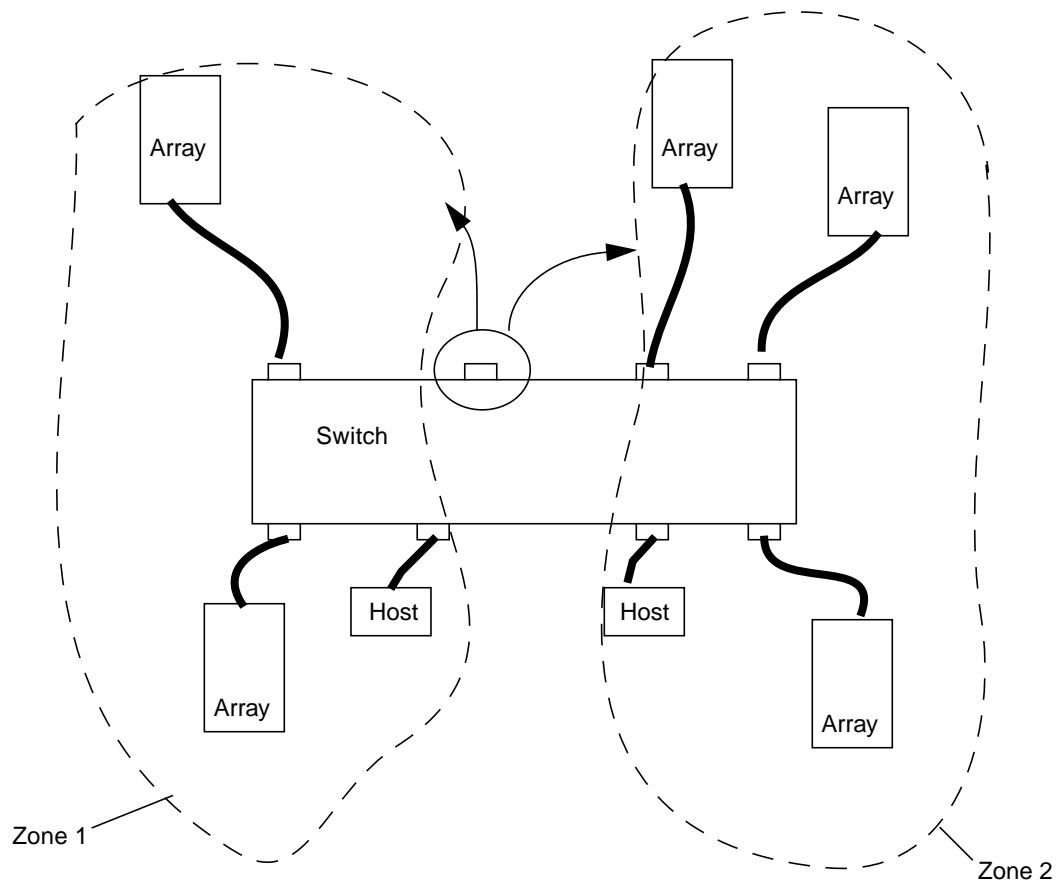


FIGURE 0-3 Adding a Port to a Zone

- **Add the port to zone 1 or Zone 2.**

See the *SANbox 8/16 Switch Management User's Manual*.

▼ To Add a Host to an Existing Zone or Switch (Non disruptive)

- **Add the port that contains the host to the zone.**

See the *SANbox 8/16 Switch Management User's Manual*.

0.7.4 Verifying the Results

Verifying that the service or system administrators techniques were successful is different for the software package and patches and the device driver packages.

0.7.4.1 Verifying the Software Package Installation

You can use `pkginfo -l <packagename>` to see which driver packages have been installed on the system.

0.7.4.2 Firmware

You can check which firmware revision has been installed from the switch GUI.

For more information on Fibre Channel and troubleshooting the switch, see the *Sun StorEdge network FC switch-8 and switch-16 Troubleshooting Guide*.

Glossary

This glossary contains a definitions for terms used in this guide.

Terms

- AL_PA** Arbitrated Loop Physical Address; 8-bit value used to identify a device.
- FL_Port** On a Fibre Channel switch, a port that supports Arbitrated Loop devices.
- F_Port** On a Fibre Channel switch, a port that supports an N_Port. A Fibre Channel port in a point-to-point or Fabric connection.
- N_Port** A Fibre Channel port in a point-to-point or Fabric connection.
- NL_Port** Node loop port; a port that supports Arbitrated Loop protocol.
- G_Port** On a Fibre Channel switch, a port that supports either F_Port or E_Port
- SL_Port** Segmented Loop Port. A port connected to a private loop device.
- T_Port** An inter-switch port, one that is used to attach a port on one switch to a port on another switch.
- TL_Port** A Translated Loop Port on the Sun StorEdge T3 array.
- Public Loop** An Arbitrated Loop attached to a Fabric switch.
- Private Loop** An Arbitrated Loop without a Fabric switch
- Segmented Loop** A set of ports that behave as one private loop.
- Zone** A set of ports and their connected devices that have been grouped together to control information exchange.

- Zoning** Zoning allows the user to divide the Fabric ports into zones for more efficient and secure communication among functionally grouped nodes. There are several types of zones and a port may be defined in any. No port can be in all zone types simultaneously.
- Hard Zones** Hard Zones allow the division of the Fabric (one or more Switch chassis) into as many as 16 Fabric-wide zones that define the ports that can communicate with each other. A particular port may be placed in only one Hard Zone (no overlapping Hard Zones). If Hard Zones are enabled, Name Server Zones and SL Zones will not communicate across defined Hard Zone boundaries.
- Broadcast Zone** Zone type used to filter broadcast traffic away from end nodes that cannot use or interpret it. A port will broadcast to all ports in the same Broadcast Zone(s) in which the port is defined. Broadcast zoning is primarily used for doing IP over Fibre Channel or when mixing IP and SCSI traffic on the switch. These zones are not yet useful or interesting in Sun's current SAN implementations.
- SL_Port Zone** A set of ports and their connected devices (zone) that behave as a single private loop. SL Zones on the switch allow the division of the Fabric (one or more Switch chassis) into Fabric-wide zones that define the ports that can communicate with each other.
- Cascade** Connection of two or more switches together to increase the number of available ports or to allow for increased distances between components of the SAN.
- Name Server** Zones allow the division of the Fabric (one or more Switch chassis) into as many as 256 Fabric-wide zones that define which ports or devices receive Name Server information. If Hard Zones are enabled, Name Server Zones will not communicate across defined Hard Zone boundaries.
- Fabric** Fibre channel network built around one or more switches. It is also common to refer to something as a "Fabric device" or being in "Fabric mode". When used in this context, it simply means a public device, capable of logging into a Fabric and having public loop characteristics (as opposed to a private loop legacy device).