Sun
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Sun StorEdge™ 3900 and 6900 Series Reference Manual

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Preface

The *Sun™ StorEdge™ 3900 and 6900 Series Reference Manual* gives an overview of the products, discusses all components, describes the utilities available for performing administrative tasks on the storage subsystems, and tells how to repair and replace the components.

This guide is written for Sun support and Sun-trained personnel who are already familiar with Sun's hardware and software products.

How This Book Is Organized

This book contains the following topics:

Chapter 1 introduces the Sun StorEdge 3900 and 6900 series storage subsystems.

Chapter 2 offers an overview of the components in the Sun StorEdge 3900 and 6900 series storage subsystems. This chapter includes discussions of all hardware and software that make up the storage subsystems.

Chapter 3 presents information about the default Sun StorEdge 3900 and 6900 series configurations. The information includes all settings for the virtualization engine, Sun StorEdge T3+ arrays, Sun StorEdge Network FC switches, and Ethernet addresses.

Chapter 4 describes the features associated with each of the supported Sun StorEdge 3900 and 6900 series configurations.

Chapter 5 gives an overview of the command utilities that configure the various components that make up the Sun StorEdge 3900 and 6900 series storage subsystems.

Chapter 6 discusses using the Storage Automated Diagnostic Environment software to perform fault detection and isolation on the Sun StorEdge 3900 and 6900 series storage subsystems.

Chapter 7 gives the step-by-step instructions for setting up the software on the Sun StorEdge 3900 and 6900 series storage subsystems in the field.

Chapter 8 provides a listing of the tasks that must be performed when setting up Sun StorEdge 3900 and 6900 series systems.

Chapter 9 contains the software instructions for repair and replacement of FRUs in the Sun StorEdge 3900 and 6900 series storage subsystems.

Chapter 10 presents the software instructions for upgrades and additions that can be made to the Sun StorEdge 3900 and 6900 series cabinet and the Sun StorEdge T3+ arrays in the field.

Chapter 11 contains the software instructions for connecting Sun servers to the Sun StorEdge 3900 and 6900 series.

Chapter 12 contains the software instructions for connecting NT servers to the Sun StorEdge 3900 and 6900 series storage subsystems in the field.

Appendix A provides the step-by-step procedures that were used to build the default configuration of the Sun StorEdge 3900 and 6900 series subsystems in the Sun factory.

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 `.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

Product	Title	Part Number
Late-breaking News	• *Sun StorEdge 3900 and 6900 Series Release Notes*	816-3247-13
Sun StorEdge 3900 and 6900 series hardware information	• *Sun StorEdge 3900 and 6900 Series Site Preparation Guide* • *Sun StorEdge 3900 and 6900 Series Regulatory and Safety Compliance Manual* • *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual*	816-3242-10 816-3243-10 816-3244-10
Sun StorEdge T3 and T3+ array	• *Sun StorEdge T3 and T3+ Array Start Here* • *Sun StorEdge T3 and T3+ Array Installation, Operation, and Service Manual* • *Sun StorEdge T3 and T3+ Array Administrator's Guide* • *Sun StorEdge T3 and T3+ Array Configuration Guide* • *Sun StorEdge T3 and T3+ Array Site Preparation Guide* • *Sun StorEdge T3 and T3+ Field Service Manual* • *Sun StorEdge T3 and T3+ Array Release Notes*	816-0772-10 816-0773-10 816-0776-10 816-0777-10 816-0778-10 816-0779-10 816-0781-12
Diagnostics	• *Storage Automated Diagnostics Environment User's Guide*	816-3142-10
Sun StorEdge network FC switch-8 and switch-16	• *Sun StorEdge Network FC Switch-8 and Switch-16 Release Notes* • *Sun StorEdge Network FC Switch-8 and Switch-16 Installation and Configuration Guide* • *Sun StorEdge Network FC Switch-8 and Switch-16 Best Practices Manual* • *Sun StorEdge Network FC Switch-8 and Switch-16 Operations Guide* • *Sun StorEdge Network FC Switch-8 and Switch-16 Field Troubleshooting Guide*	816-0842-10 816-0830-12 816-2688-10 816-1986-10 816-0252-10
SANbox switch management using SANsurfer	• *SANbox 8/16 Segmented Loop Switch Management User's Manual* • *SANbox-8 Segmented Loop Fibre Channel Switch Installer's/ User's Manual* • *SANbox-16 Segmented Loop Fibre Channel Switch Installer's/ User's Manual*	875-3060-10 875-1881-11 875-3059-10
Expansion cabinet	• *Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067-12
Storage Server Processor	• *Netra X1 Server User's Guide* • *Netra X1 Server Hard Disk Drive Installation Guide*	806-5980-10 806-7670-10

Accessing Sun Documentation Online

A broad selection of Sun system documentation is located at:

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

A complete set of Solaris documentation and many other titles are located at:

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

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```
docfeedback@sun.com
```

Please include the part number (816-3245-10) of your document in the subject line of your email.

Introduction

The Sun StorEdge 3900 and 6900 series storage subsystems are complete preconfigured storage solutions. The Sun StorEdge 3900 series provides two different configurations for the direct attach storage (DAS) environment. The Sun StorEdge 6900 series also has two configurations that can be used in the Storage Area Network (SAN) arena.

This chapter is organized as follows:

- "Overview" on page 1
- "Architecture" on page 7
- "System-Level Support Information" on page 9
- "Features" on page 9

Overview

The Sun StorEdge 3900 and 6900 series storage subsystems provide midrange and enterprise customers with the following features:

- Modular storage elements that can be incrementally expanded in a predefined footprint
- Logical unit number (LUN) segmenting or carving for storage consolidation (This is available only on the Sun StorEdge 6900 series.)
- LUN security access (masking) for the storage consolidation models (This is available only on the Sun StorEdge 6900 series.)
- Fibre Channel (FC) interface
- Sun-tested and supported preconfigured components packaged for specific storage solutions
- A high degree of data availability in a unit that reduces cost of ownership

A small server, referred to as the Storage Service Processor, is included in each subsystem and provides support for monitoring and configuration, upgrades of firmware, and software and diagnostic tools to support effective fault isolation. The Storage Service Processor supports the Sun StorEdge^{SM} Remote Response service, which provides remote monitoring and serviceability. Failure to add the optional Sun StorEdge Remote Response software requires that the customer configure an alternate way to communicate with the Storage Service Processor through a local network.

Sun StorEdge 3910 System

The Sun StorEdge 3910 system targets the midrange DAS market. This product offers a model that uses two Sun StorEdge Network FC Switch-8 switches as the host interface. The Sun StorEdge 3910 system can support up to four Sun StorEdge T3+ array partner groups. FIGURE 1-1 provides an illustration of the Sun StorEdge 3910 system.
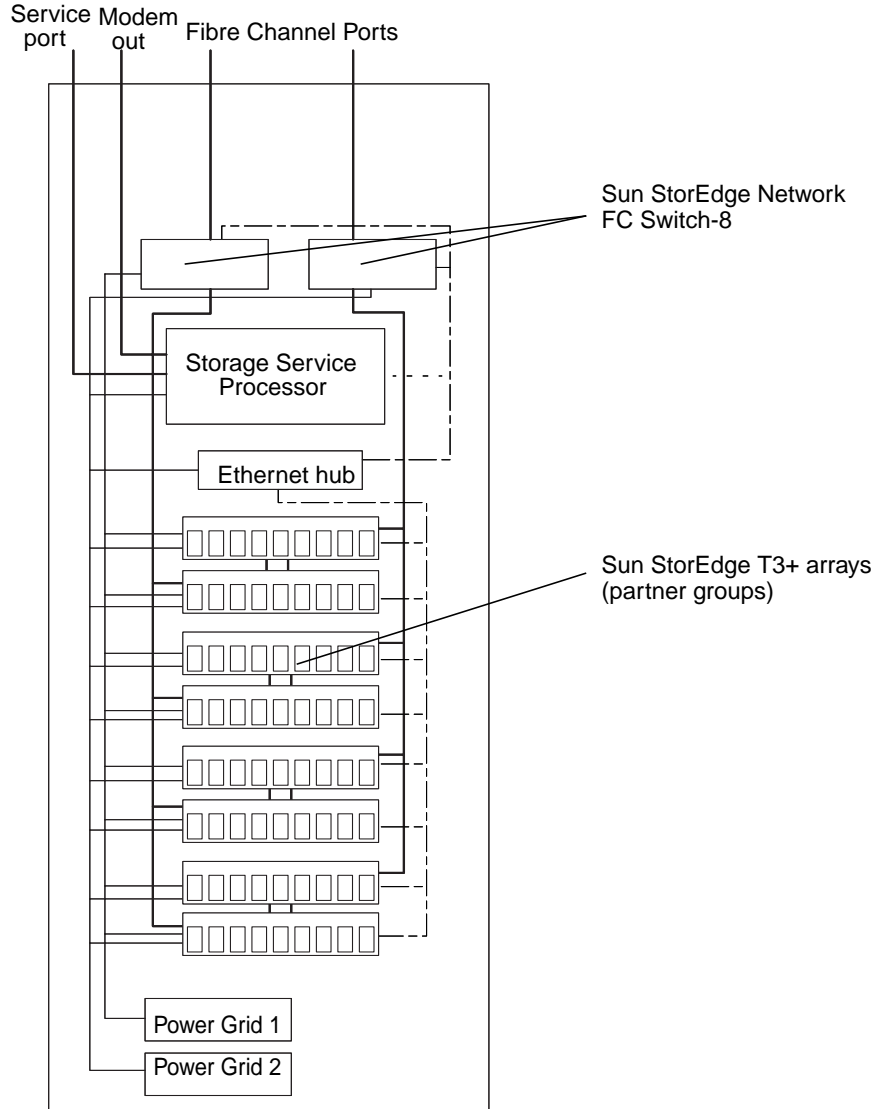
FIGURE 1-1   Sun StorEdge 3910 System

Sun StorEdge 3960 System

The Sun StorEdge 3960 system targets the enterprise DAS market. The product uses two Sun StorEdge Network FC Switch-16 switches as the host interface and can support up to four Sun StorEdge T3+ array partner groups in one cabinet. By adding a Sun StorEdge 3960 Expansion Cabinet, the Sun StorEdge 3960 system supports up to nine Sun StorEdge T3+ array partner groups. FIGURE 1-2 shows the Sun StorEdge 3960 system.
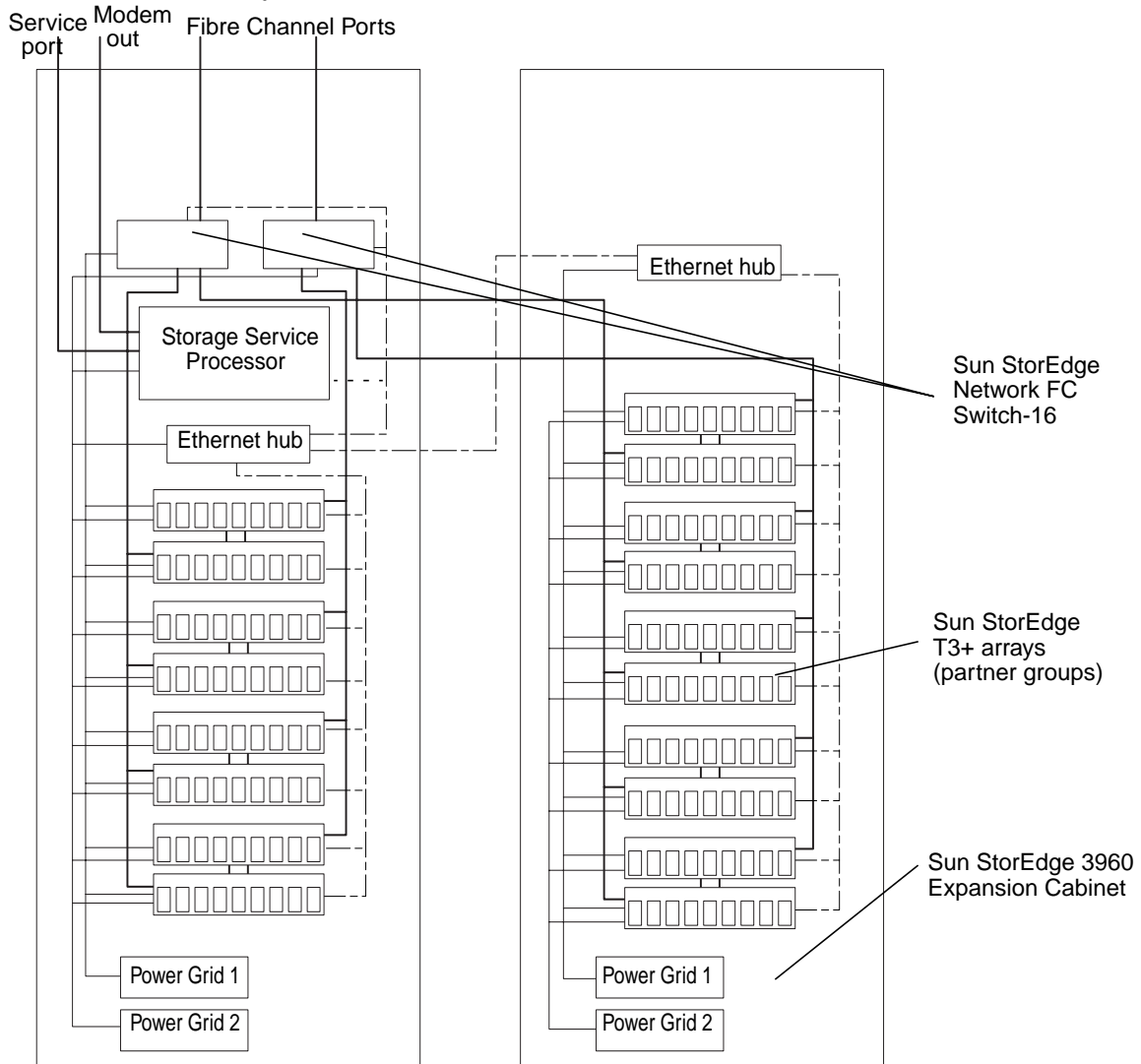
FIGURE 1-2   Sun StorEdge 3960 System

Sun StorEdge 6910 System

The Sun StorEdge 6910 system targets the midrange SAN market. The system uses two Sun StorEdge Network FC Switch-8 switches as the host interface and can support up to three Sun StorEdge T3+ partner groups. FIGURE 1-3 shows the Sun StorEdge 6910 system.
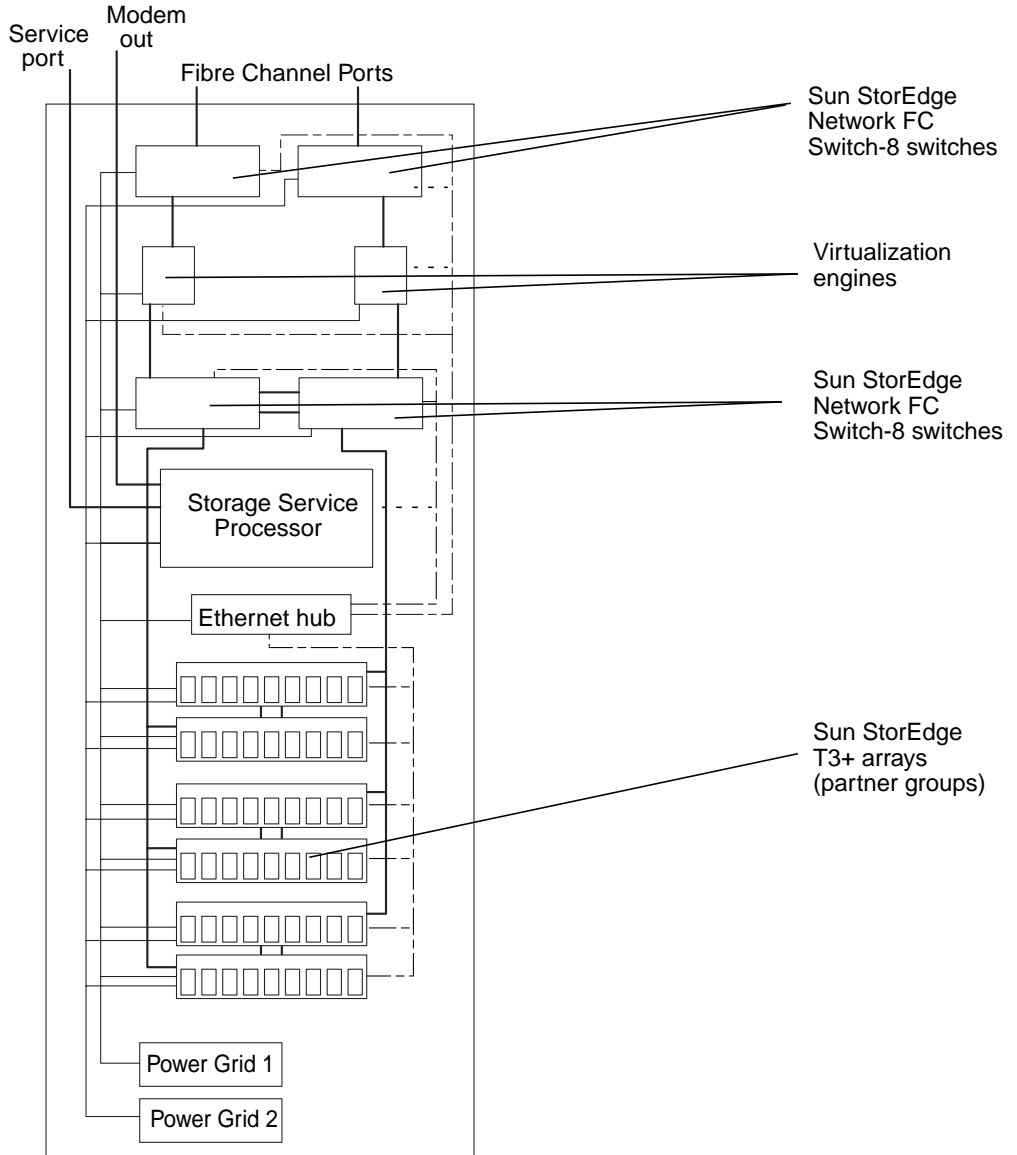
FIGURE 1-3   Sun StorEdge 6910 System

Sun StorEdge 6960 System

The Sun StorEdge 6960 system targets the enterprise SAN environment. The system uses two Sun StorEdge Network FC Switch-16 switches as the host interface and can support up to three Sun StorEdge T3+ array partner groups in one cabinet. By adding a Sun StorEdge 6960 expansion cabinet, the system supports up to eight Sun StorEdge T3+ array partner groups. FIGURE 1-4 shows the Sun StorEdge 6960 system.
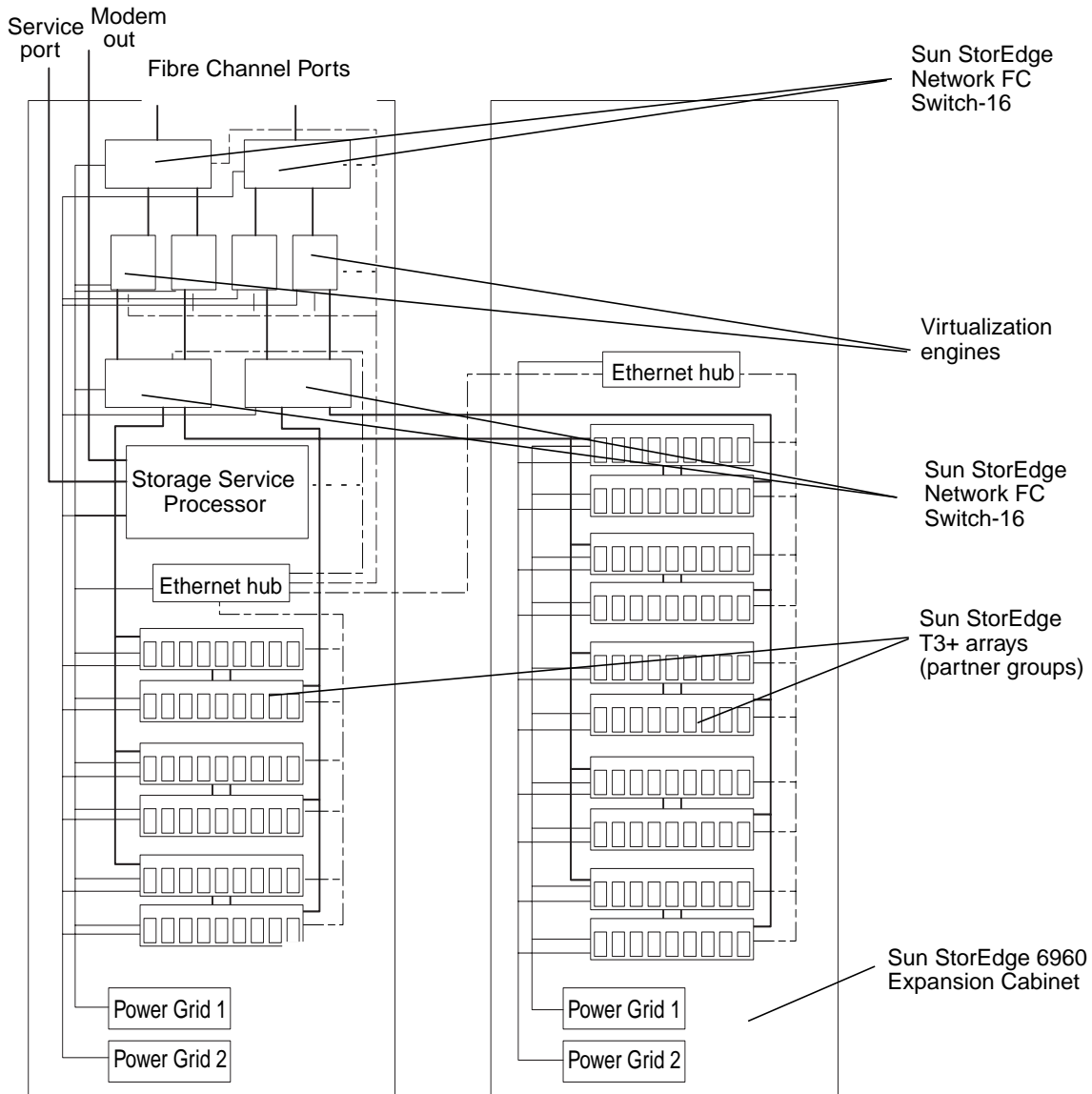
FIGURE 1-4   Sun StorEdge 6960 System

Architecture

The basic architecture of the Sun StorEdge 3900 series DAS configuration is shown in
FIGURE 1-5.
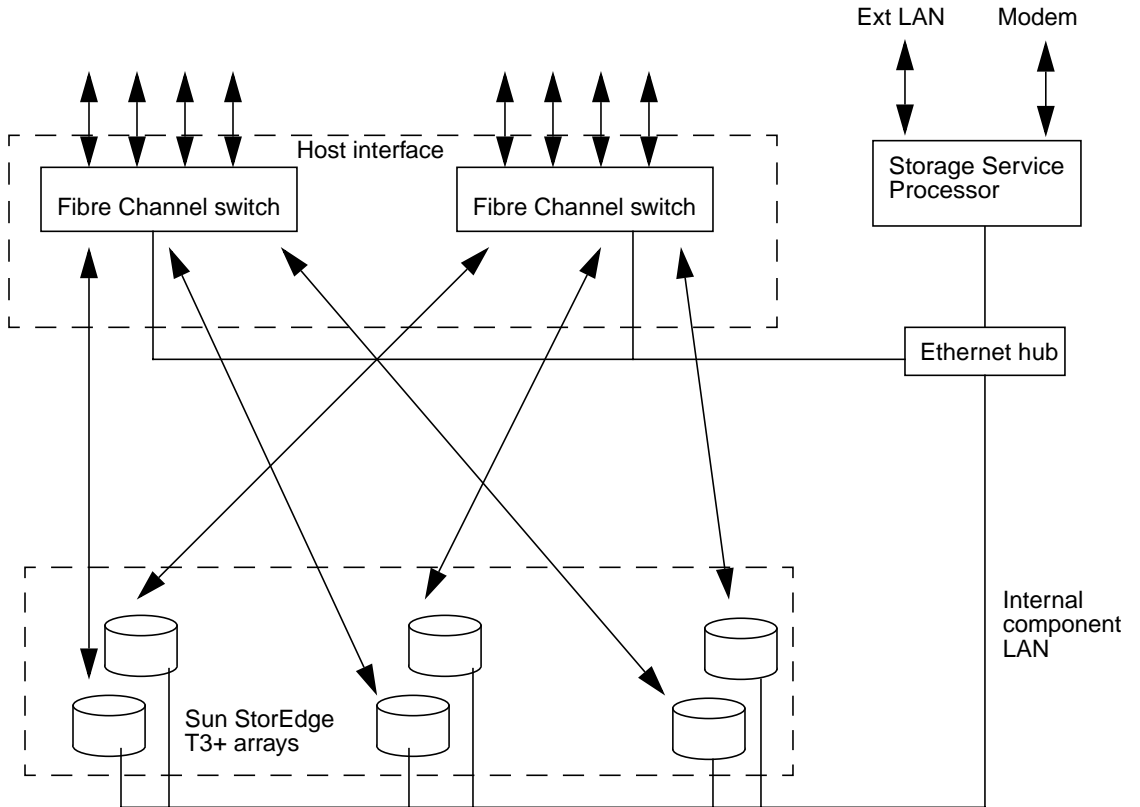
FIGURE 1-5   Basic Sun StorEdge 3900 Series Architecture

The basic architecture of the Sun StorEdge 6900 series SAN configuration is shown in FIGURE 1-6.
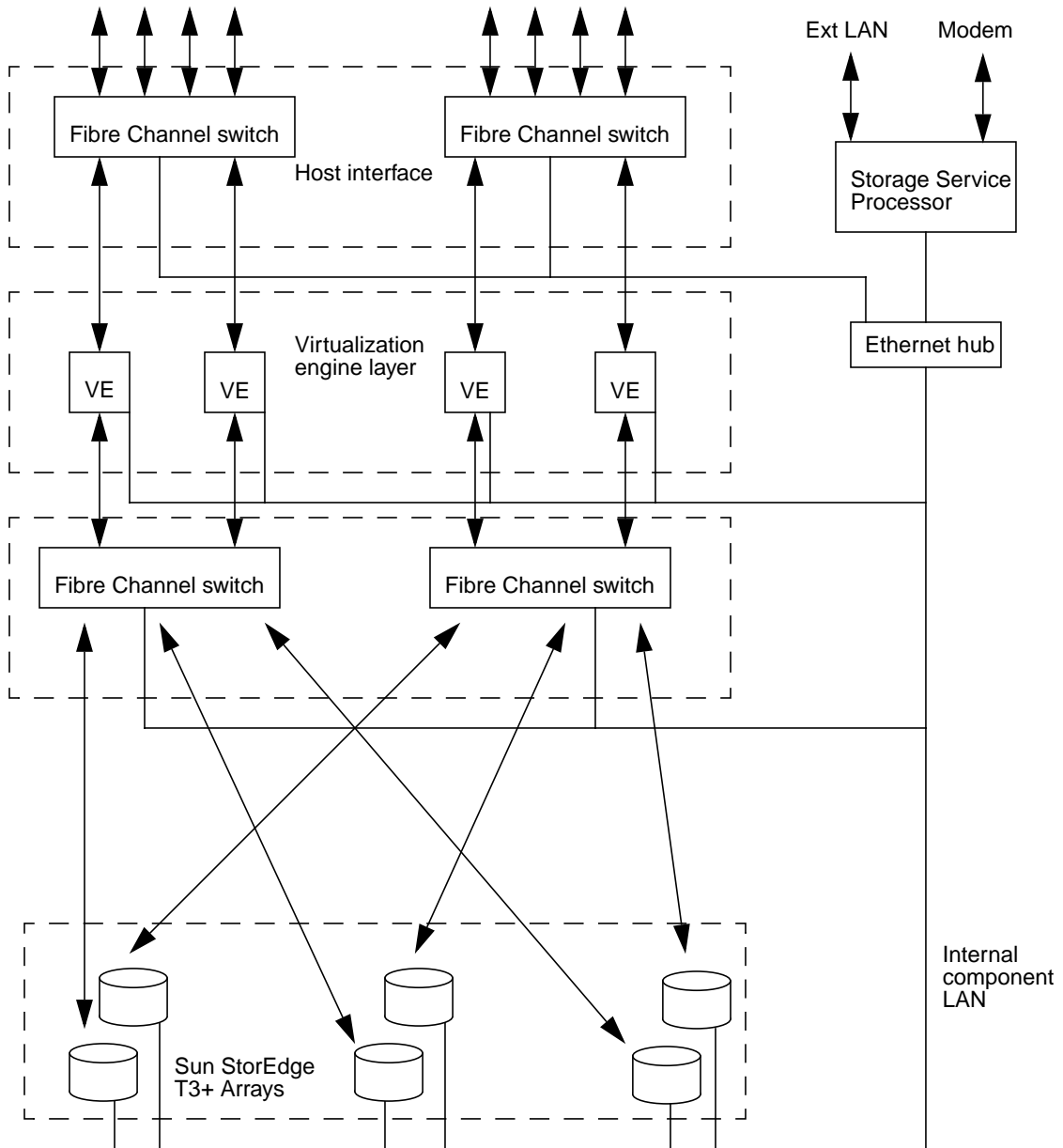
FIGURE 1-6   Basic Sun StorEdge 6900 Series Architecture

System-Level Support Information

The supported Sun StorEdge 3900 and 6900 series subsystems are shown in TABLE 1-1.

TABLE 1-1 Sun StorEdge 3900 and 6900 Series System-Level Configurations

Systems	Bandwidth	Capacity	Maximum LUNs	LUN Masking	Host Connectivity
Sun StorEdge 3910 system (DAS)	800 Mbytes/sec maximum	648 Gbytes to 5.2 Tbytes	16 (2 per Sun StorEdge T3+ array)	No	1-to-4 Redundant Pairs
Sun StorEdge 3960 system (DAS)	1400 Mbytes/sec maximum	648 Gbytes to 11.7 Tbytes	36 (2 per Sun StorEdge T3+ array)	No	1-to-7 Redundant Pairs
Sun StorEdge 6910 system (SAN)	200 Mbytes/sec maximum	648 Gbytes to 3.9 Tbytes	512	Yes	1-to-7 Redundant Pairs
Sun StorEdge 6960 system (SAN)	400 Mbytes/sec maximum	648 Gbytes to 10.4 Tbytes	1024	Yes	1-to-14 Redundant Pairs

Features

The features of the Sun StorEdge 3900 and 6900 series storage subsystems are given in the following subsections:

- "Sun StorEdge 3900 and 6900 Series Common Features" on page 9
- "Sun StorEdge 3900 Series Features" on page 11
- "Sun StorEdge 6900 Series Features" on page 11

Sun StorEdge 3900 and 6900 Series Common Features

The following are features available on both the Sun StorEdge 3900 and 6900 series:

- **Installation**—The Sun StorEdge 3900 and 6900 series are delivered as minimum-setup-required storage subsystems. The Sun StorEdge T3+ array partner group logical units (LUNs) are preconfigured at the factory.

- **RAID Striped Data with Standby Hot Spare**—Internal Sun StorEdge T3+ array LUNs are preconfigured as RAID 5 (8 drives, plus a standby hot spare). Configuration tools are provided on the Service Processor that enable internal configuration of the Sun StorEdge T3+ arrays to be changed to a limited set of configurations. Preconfigured LUNs comprising 36-Gbyte disk drives are 236 Gbytes each, while preconfigured LUNs comprising 73-Gbyte disk drives provide 477 Gbytes each.

- **Bandwidth**—All of the storage subsystems use Fibre Channel technology to provide the best available bandwidth. Current FC technology offers 1.06 Gbit/second transfers (~ 80 Mbytes/second average). The actual bandwidth delivered might be less, depending on the configuration.

- **Capacity**—The storage subsystems that have 36-Gbyte disk drives offer a minimum of 648 Gbytes and a maximum of 1.9 to 5.8 Tbytes of disk space, depending on the model selected. The subsystem has a footprint no larger than 12.29 square feet.

  The storage subsystems that have 73-Gbyte disk drives offer a minimum of 1.3 Tbytes and a maximum of 3.9 to 11.7 Tbytes of disk space, depending on the model selected. The subsystem has a footprint no larger than 12.29 square feet.

- **Data Path Redundancy**—All of the storage subsystems provide full data path redundancy with no data path component as a single point of failure, offering 24x7 data availability. Redundant components include the Fibre Channel switches, Sun StorEdge T3+ array storage bricks, virtualization engines (on Sun StorEdge 6900 series only), and dual Power Distribution Units (PDUs).

- **Host Managed Multipathing**—All of the storage subsystems present two physical I/O paths to devices on each host. Host software is required to manage the I/O utilization of the presented I/O paths. Such software includes, but is not limited to, either Sun StorEdge Traffic Manager (MPxIO) software or VERITAS Dynamic Multi-Pathing (VxDMP).

- **Host Support**—The Sun StorEdge 3900 and 6900 series support the following:
  - Solaris 8 07/01 and later releases (all Sun StorEdge 3900 and 6900 series systems)
  - Sun Cluster 3.*n* (all Sun StorEdge 3900 and 6900 series systems)
  - Windows NT Enterprise Edition 4.0, Service Pack 6
  - Windows 2000 Server and Windows 2000 Advanced Server, Service Pack 2

- **Local or Remote Serviceability**—All solution subsystems include a Service Processor. Support for the Remote Support System (RSS) is built into the Service Processor. All Sun StorEdge 3900 and 6900 series subsystems support Sun StorEdge Remote Response software. Support for onsite enterprise service through Ethernet connection into the Service Processor is included.

- **Hot Swappable FRUs**—All solution subsystems use hot-swappable field-replaceable units (FRUs), where available. The FRUs include power supplies, cooling units, disk drives, and RAID controllers. The Service Processor is a FRU.

Sun StorEdge 3900 Series Features

The following are features available on the Sun StorEdge 3900 series:

- **Multiple HBA Support**—The Sun StorEdge 3900 series DAS solution subsystems can be configured to provide from 1 to 7 HBA connections per switch (a minimum of two connections per host) concurrently. The Sun StorEdge 3910 system can support from 1 to 4 HBAs per switch, while the Sun StorEdge 3960 can support from 1 to 7 HBAs per switch.

- **Host Connect Support**—The Sun StorEdge 3900 series support the host connection as a Fibre Channel switch F Port. The LUNs presented are accessible as Fabric devices. SAN solution subsystem models support the host connection as a Fibre Channel switch F Port. Virtual LUNs (VLUNs) presented are accessible as Fabric devices, as defined by the Sun StorEdge Network FC Switch-8 or Switch-16 switch rules. Support for an NT server requires the SL port on the Fibre Channel switch.

Sun StorEdge 6900 Series Features

The following are features available on the Sun StorEdge 6900 series:

- **LUN Carving and Masking** - The ability to carve the underlying Sun StorEdge T3+ array LUNs into small VLUNs for increased device support and customized storage usage is provided in the Sun StorEdge 6900 series subsystems.

- **Host Connect Support** - The Sun StorEdge 6900 series SAN solutions support the host connect as a Fibre Channel F port. VLUNs presented are accessible as Fibre Channel devices, as defined by the Sun StorEdge Network FC Switch-8 and Switch-16 switch rules.

- **Multiple HBA Support**—The Sun StorEdge 6900 series SAN solution subsystems can be configured to provide from 1 to 14 connections to the host for HBAs. The Sun StorEdge 6910 can have from 1 to 7 redundant HBA connections (a minimum of two connections per host) concurrently. The Sun StorEdge 6910 system can support from 1 to 4 HBAs per switch, while the Sun StorEdge 6960 can support from 1 to 7 HBAs per switch.

Component Descriptions

This chapter offers an overview of the components of the Sun StorEdge 3900 and 6900 series storage subsystems. This overview includes a listing of the hardware and software used by the storage subsystems.

This chapter is organized as follows:

- "Hardware Component Descriptions" on page 13
- "Software Component Descriptions" on page 17

Hardware Component Descriptions

The hardware building blocks for the Sun StorEdge 3900 and 6900 series include:

- Storage Service Processor
- Virtualization engine (Sun StorEdge 6900 series only)
- Customer management connection
- Storage devices
- Ethernet hub
- Fibre Channel switches
- Sun StorEdge expansion cabinet

Storage Service Processor

The Storage Service Processor is a Netra™ X1 server. The Netra is delivered as part of the Sun StorEdge 3900 and 6900 series and provides a 500-MHz, 64-bit UltraSPARC™ processor, 512 Mbytes of memory, and a 40-Gbyte IDE internal drive.

The Storage Service Processor is responsible for the following:

- Monitoring the components in the Sun StorEdge 3900 and 6900 series.
- Fault isolation, verification, and notification of a FRU that is failing.
- Some limited non-mission critical-configuration functions including configuration of the Sun StorEdge T3+ arrays, virtualization engine, and Fibre Channel switches.
- Serves as the service portal to all components in the Sun StorEdge 3900 or 6900 series subsystems.

Every Storage Service Processor is configured with the same hardware and software components to ensure ease of replacement. All Storage Service Processors can support the Sun StorEdge Remote Response option if the necessary hardware and software are added.

Any single Storage Service Processor can become the collection point for other geographically local Storage Service Processors, which is referred to as the master Storage Service Processor.

Virtualization Engines

The virtualization engines are a pair of routers used when building a SAN environment for the Sun StorEdge 6900 series subsystem. There is one pair of virtualization engines in the Sun StorEdge 6910 system and there are two pairs of virtualization engines in the Sun StorEdge 6960 system.

The virtualization engine provides the following functions:

- LUN carving, or creating smaller virtual drives from physical LUNs
- LUN masking, which restricts host HBA access to the virtual LUNs

The virtualization engine supports the multipathing functionality of the Sun StorEdge T3+ array. That is, each unit in the Sun StorEdge 6910 system provides physical access to all of the underlying Sun StorEdge T3+ arrays. Each virtualization engine in the Sun StorEdge 6960 system provides physical access to half of the underlying Sun StorEdge T3+ array partner groups. The virtualization engine pairs offer two I/O paths to individual StorEdge T3+ arrays.

Virtual and physical device map synchronization is used by the virtualization engine. If a virtualization engine fails, the second virtualization engine of the pair maintains the I/O availability. All virtualization engine pairs use a single device mapping of physical-to-virtual devices. A change in the physical or virtual mapping results in a re-synchronization of the device mappings throughout the virtualization engine pairs. To accomplish the synchronization, each virtualization engine pair is connected to the other virtualization engine through a redundant pair of Fibre Channel switch T-ports.

Customer-Management Connection

The customer-management connection is a dedicated Ethernet connection provided on each Storage Service Processor that connects to the designated master Sun StorEdge 3900 and 6900 series storage subsystem. The master Storage Service Processor is used to collect status data from each Sun StorEdge 3900 and 6900 series machine using the LAN. The master Storage Service Processor then reports the status data used by the Storage Service Processor that is equipped with Sun StorEdge Remote Response software.

Customers can alternatively choose to do one or more of the following:

■ Use their management LAN to support network traffic other than that reported by the Sun StorEdge Remote Response software.

■ Provide a private LAN to isolate the service traffic from customer traffic.

■ Supply a secure router to isolate the customer LAN from the Service Processor LAN.

Storage Devices

The Sun StorEdge T3+ array, both the 36-Gbyte and 73-Gbyte versions, provides backend data storage. In factory-configured basic configurations, the Sun StorEdge T3+ arrays are configured with two LUNs per partner group or one LUN per physical unit. Each LUN is a full-capacity RAID 5 (8 disks) volume with a segment size of 16 Kbytes and is configured with a standby hot spare. Additional utilities are provided on the Storage Service Processor that enable Sun-trained personnel to reconfigure the Sun StorEdge T3+ array LUNs to meet workload performance requirements.

The RAID levels supported by the Sun StorEdge T3+ array in the Sun StorEdge 3900 and 6900 series configurations are:

■ RAID 1 - Each data block in a RAID 1 volume is mirrored on two physical drives. If one of the mirrored pair fails, the data from the other drive is used. Because the data is mirrored in a RAID 1 configuration, the volume has only half the capacity of the assigned drives. For example, if you create a 4-drive RAID 1 volume with 36-Gbyte drives, the resulting data capacity is 4 x 36 ∕ 2 = 72 Gbytes.

■ RAID 5 - In a RAID 5 configuration, data is striped across the drives in the volumes in segments, with parity information being striped across the drives, as well. Because of this parity, if a single drive fails, data can be recovered from the remaining drives. Two drive failures cause all data to be lost. A RAID 5 volume has the data capacity of all the drives in the logical unit, less one. For example, a 5-drive RAID 5 volume with 73-Gbyte drives has a capacity of (5—1) x 73 = 292 Gbytes.

Ethernet Hub

The Sun StorEdge 3900 and 6900 series uses an Ethernet hub as the backbone for the internal service network. The allocation of Ethernet ports is as follows:

- 1 - Service Processor (per subsystem)
- 1 - For each Fibre Channel switch
- 1 - For each virtualization engine
- 2 - For each Sun StorEdge T3+ array partner group
- 1 - For the Ethernet hub that is installed in the second Sun StorEdge Expansion Cabinet in the Sun StorEdge 3960 and 6960 systems

Fibre Channel Switches

The Sun StorEdge Network FC Switch-8 or Switch-16 switch provides cable consolidation and increased connectivity. The Sun StorEdge Network FC Switch-8 and Switch-16 switches are used for the internal data interconnection infrastructure.

The switches are paired to provide redundancy. Two switches are used in each Sun StorEdge 3900 series storage subsystem and four switches are used in each Sun StorEdge 6900 series storage subsystem. Each switch is connected, through Ethernet, to the service network for management and service from the Service Processor.

These switches can be monitored through the SANSurfer GUI, which is available on the Storage Service Processor.

These switches are configured using the configuration utilities, which are discussed in "Configuration Utilities" on page 18.

Sun StorEdge Expansion Cabinet

The Sun StorEdge 3900 and 6900 series are packaged in the Sun StorEdge Expansion Cabinet, which is used for several other Sun products. This provides a consistent look and feel. The customer accessible areas of a storage subsystem are clearly labeled. Service-accessible areas of the storage subsystem will be clearly labeled as such. All physical configurations will be completed by Sun-trained personnel. Non-Sun-service trained customers will have significantly limited access to the physical layout of the storage subsystem.

Software Component Descriptions

The software included in the Sun StorEdge 3900 and 6900 series storage subsystems are:

- Solaris 8 operating environment
- Sun StorEdge Remote Response (to support optional service)
- Configuration utilities
- Storage Automated Diagnostic Environment
- SANSurfer
- Explorer data collection utility

Note – The software packaged with the Sun StorEdge 3900 and 6900 series storage subsystem is not meant for use on the host servers.

Solaris 8

The Solaris 8 10/01 operating environment is installed on the Storage Service Processor.

Sun StorEdge Remote Response

Optionally, you can add the Sun StorEdge Remote Response capability to your Sun StorEdge 3900 and 6900 series. Sun StorEdge Remote Response provides "phone home" capability and dial-back diagnostics. This enables Sun storage experts to remotely troubleshoot, diagnose, and service Sun StorEdge T3+ arrays and switches.

The features of Sun StorEdge Remote Response include:

- Fast response and reaction to alerts and alarms
- Remote troubleshooting, diagnosis, and repair
- Increased system availability
- Reduced cost of ownership

Configuration Utilities

The configuration utilities are a collection of commands that enable Sun service personnel to perform maintenance on the components of the Sun StorEdge 3900 and 6900 series subsystems.

The configuration utilities can be accessed using:

- Menu-driven character user interface
- Command line
- Sun StorEdge Resource Suite configuration service graphical user interface

These utilities enable you to:

- Configure, check, and display information about the attached Sun StorEdge T3+ partner groups
- Configure, check, and display information about the attached Sun switches
- Configure, check, and display information about the attached virtualization engines
- Determine storage subsystem type and model number
- View detailed configuration utility messages in the log file

Storage Automated Diagnostic Environment

The Storage Automated Diagnostic Environment is a combination of Network Storage Agent 2.x, Stortools™ 4.x, and the configuration graphical user interface into a single utility.

For detailed information, refer to the *Storage Automated Diagnostic Environment User's Guide*, part number 816-3142-10.

Diagnostics

The diagnostic package extends SunVTS™ for Sun StorEdge Fibre Channel products and aids Sun service personnel and Sun authorized service providers in troubleshooting the Sun StorEdge network FC switches, Sun StorEdge T3+ arrays, and other Sun StorEdge hardware on Solaris 8 platforms.

Caution – Do not run the configuration utilities at the same time as diagnostics.

Note – Because the Storage Service Processor has no access to the data path, the only diagnostic tests that function are the ones for the Sun StorEdge Network FC Switch-8 and Switch-16 switches.

Storage Automated Diagnostic Environment Agent

The Storage Automated Diagnostic Environment Agent is a server-based online health and diagnostic monitoring tool for storage area network (SAN) devices and direct-attached storage devices. It can be configured to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the storage devices.

The Storage Automated Diagnostic Environment Agent remotely monitors Sun network storage devices. The Storage Automated Diagnostic Environment Agent can monitor host message files for errors in order to obtain status information about each device being monitored when run on the customer's host.

The primary features of the Storage Automated Diagnostic Environment Agent are:

- Health monitoring and fault detection - Reports on conditions that can impact the availability and operation of the storage devices.
- Alert notification - Automatically sends event notifications to system administrators and other designated parties if the path exists.
- Telemetry stream - Sends out events and information to Sun that facilitate improved service and improved products (if configured).
- Lightweight - The Storage Automated Diagnostic Environment Agent requires minimal resources in terms of disk space, compute cycles, and virtual memory footprint.
- Modular architecture - Easy plug-in support for additional devices and functions.

Configuration User Interface

The configuration user interface provides a web-based graphical user interface that enables administrators to perform configuration of the Sun StorEdge 3900 and 6900 series.

All the functionality that is available from the "Configuration Utilities" on page 18 is available from the Sun StorEdge Resource Suite configuration service.

From the web browser you can configure the virtualization engine, Sun StorEdge T3+ storage arrays, and Sun StorEdge network FC switches.
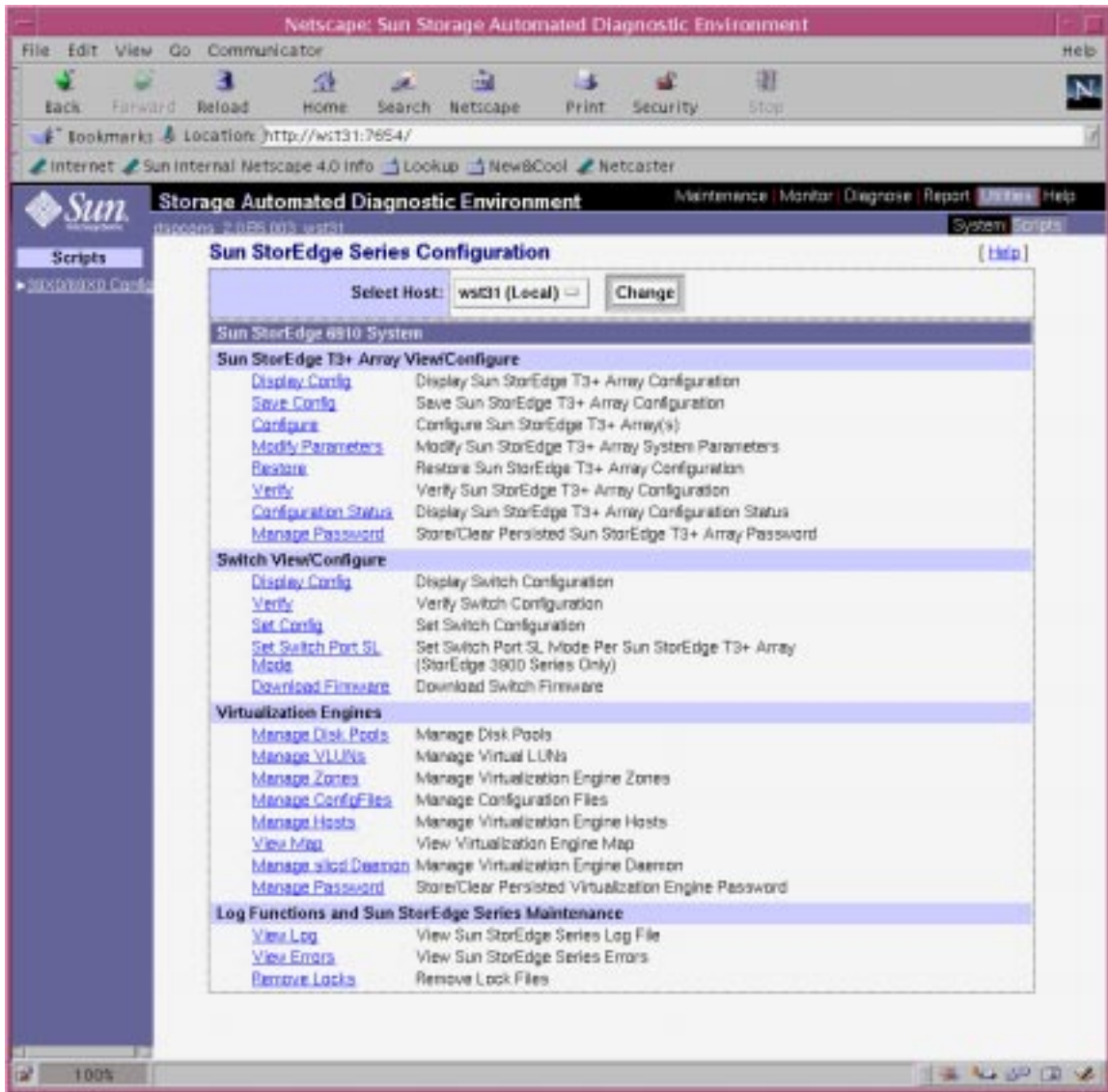
FIGURE 2-1 Configuration Utilities User Interface

For detailed instructions on starting and using the Storage Automated Diagnostic Environment, refer to the *Storage Automated Diagnostic Environment User's Guide.*

SANSurfer

SANSurfer is a graphical user interface (GUI) that enables you to monitor switch products connected to Sun servers. Each GUI window monitors a different aspect of the Sun StorEdge Network FC Switch-8 or Switch-16 or Fibre Channel configuration. SANSurfer enables you to perform the following procedures.

- Display multiple fabrics.
- Associate the switch management interface with its IP network configuration parameters.
- View the Fibre Channel connection.
- View hardware and firmware version information for the selected chassis.
- View Switch Names and World Wide Names (WWNs).
- View port addresses on the selected chassis.

The SANSurfer Help menu contains information about the product and a complete online help guide.

Explorer Data Collection Utility

The explorer data collection utility compiles information about the operating system that is installed on the Storage Service Processor along with information about the Sun StorEdge network FC switches and the Sun StorEdge T3+ arrays. The information is used for troubleshooting purposes. All information is stored in a `tar`(1) file that can be sent to Sun service for evaluation.

Default Configurations and Settings

This chapter presents information about the default Sun StorEdge 3900 and 6900 series configurations. The information includes all settings for the virtualization engine, Sun StorEdge T3 + arrays, Ethernet addresses, and Sun StorEdge Network FC switches.

This chapter is organized as follows:

Sun StorEdge 3900 and 6900 Series Layout

FIGURE 3-1 shows the layout (rear view) of the hardware components in the Sun StorEdge 3960 system. The Sun StorEdge 3910 has the same layout, without the expansion cabinet.

Ethernet hub		Ethernet hub
blank		
sw1a	Switches	blank
sw1b		
blank		
(sp0)	Storage Service Processor	t3be4
t3b3		t3be3
t3b2	Sun StorEdge T3+ Arrays	t3be2
t3b1		t3be1
t3b0		t3be0
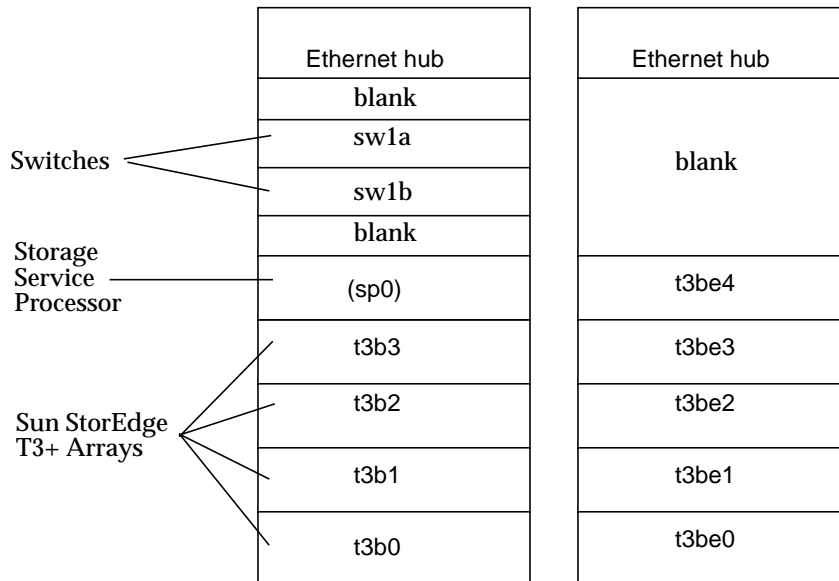
FIGURE 3-1   Rear View of the Sun StorEdge 3960 System

FIGURE 3-2 shows the layout (rear view) of the hardware components in the Sun StorEdge 6960 system. The Sun StorEdge 6910 has the same layout, without the expansion cabinet and without the additional virtualization engine pair (that is v2a and v2b).

	Ethernet hub				Ethernet hub
Switches	sw1a				blank
	sw1b				
Virtualization Engines	v1a	v2a	v1b	v2b	
Switches	sw2a				
	sw2b				
	blank				
Storage Service Processor	(sp0)				t3be4
Sun StorEdge T3+ Arrays	t3b3				t3be3
	t3b2				t3be2
	t3b1				t3be1
	t3b0				t3be0
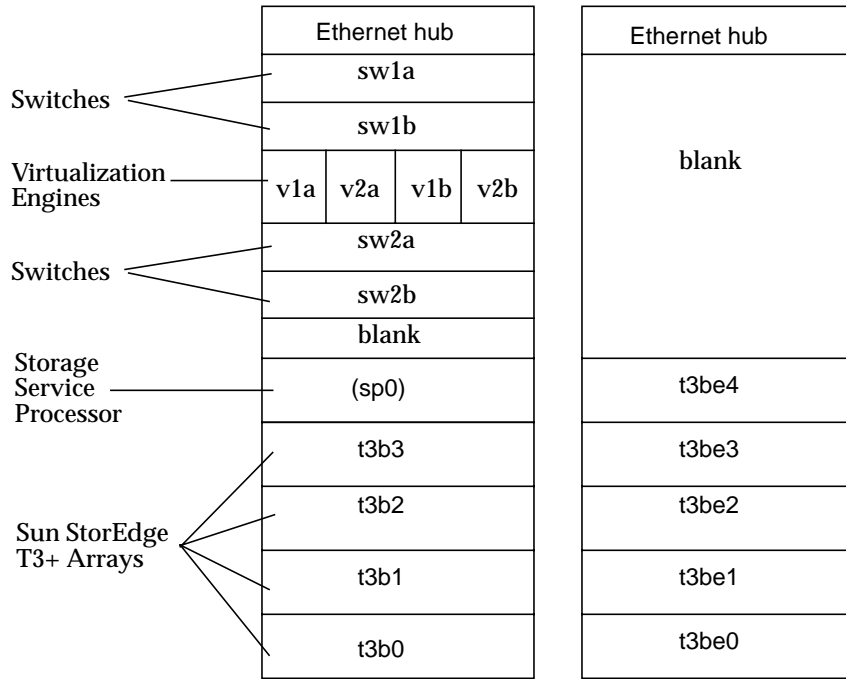
FIGURE 3-2   Rear View of the Sun StorEdge 6960 System

Virtualization Engine Settings

The standard settings for the virtualization engine are given in TABLE 3-1.

TABLE 3-1   Standard Virtualization Engine Settings

Standard Virtualization Engine Settings		
Device Side Settings		
	Operating mode:	Pt-to-pt mode
	UID reporting scheme:	Port
Host Side Settings		
	Operating mode:	Pt-to-pt mode
	LUN mapping mode:	Direct LUN mapping
	Command queue depth:	0
	HS/DS UID distinguish:	Enable
	UID reporting scheme:	Port
Ethernet		
	Subnet mask:	255.255.255.0
	Default gateway:	192.168.0.1
	IP address:	v1a - 192.168.0.20 v1b - 192.168.0.21 v2a - 192.168.0.22 v2b - 192.168.0.23
	Server port number (5000-65535):	**25000**
SV Management Programs		
	Router management program access is:	Enabled
	Host WWN authentications are:	1. Unassigned 2. Unassigned
	Host IP authentications are:	1. 255.255.255.255 2. 255.255.255.255
	Other router's IP is:	$n.n.n.n$[1]
	Password Protection is Disabled[2]	
	Password is Invalid[2]	

1 - The other router's IP address is based on Virtualization Engine pairs. `v1a` and `v1b` are a pair and so are `v2a` and `v2b`. The value that must be entered is the IP address of the other router in the pair. For instance, if you are setting up the `v1a` you enter the IP address of `v1b`.

2- The password selections do not set the password for telnet(1) or `ftp`(1). These passwords are set by the Ethernet setting.

The Sun StorEdge 6910 system default settings are shown in TABLE 3-2.

TABLE 3-2   Sun StorEdge 6910 System Defaults

Sun StorEdge 6910 Default System - One Virtualization Engine Map (`v1a`, `v1b` Virtualization Engine Pair)		
Disk Pool	**Number of VLUNs**	**VLUN Size (73-Gbytes/36-Gbytes drives)**
t3b00	1	477-Gbytes/236-Gbytes
t3b01	1	477-Gbytes/236-Gbytes
t3b10	1	477-Gbytes/236-Gbytes
t3b11	1	477-Gbytes/236-Gbytes
t3b20	1	477-Gbytes/236-Gbytes
t3b21	1	477-Gbytes/236-Gbytes

The Sun StorEdge 6960 system default settings are given in TABLE 3-3.

TABLE 3-3   Sun StorEdge 6960 System Defaults

Sun StorEdge 6960 System - Two Virtualization Engine Maps		
(`v1a`, `v1b` **Virtualization Engine Pair**)		
Disk Pool	**Number of VLUNs**	**VLUN Size (73-Gbytes/36-Gbytes drives)**
t3b00	1	477-Gbytes/236-Gbytes
t3b01	1	477-Gbytes/236-Gbytes
t3b20	1	477-Gbytes/236-Gbytes
t3b21	1	477-Gbytes/236-Gbytes
t3be10	1	477-Gbytes/236-Gbytes
t3be11	1	477-Gbytes/236-Gbytes
t3be30	1	477-Gbytes/236-Gbytes
t3be31	1	477-Gbytes/236-Gbytes
(`v2a`, `v2b` **Virtualization Engine Pair**)		
Disk Pool	**Number of VLUNs**	**VLUN Size (73-Gbytes/36-Gbytes drives)**
t3b10	1	477-Gbytes/236-Gbytes
t3b11	1	477-Gbytes/236-Gbytes

TABLE 3-3   Sun StorEdge 6960 System Defaults

Sun StorEdge 6960 System - Two Virtualization Engine Maps		
(v1a, v1b **Virtualization Engine Pair**)		
Disk Pool	**Number of VLUNs**	**VLUN Size (73-Gbytes/36-Gbytes drives)**
t3be00	1	477-Gbytes/236-Gbytes
t3be01	1	477-Gbytes/236-Gbytes
t3be20	1	477-Gbytes/236-Gbytes
t3be21	1	477-Gbytes/236-Gbytes
t3be40	1	477-Gbytes/236-Gbytes
t3be41	1	477-Gbytes/236-Gbytes

Note – The default disk pool and VLUN assignments are one disk pool per Sun StorEdge T3+ array LUN, named by using the Sun StorEdge T3+ array host name with a number (0 or 1) appended. A single VLUN is carved from each disk pool equivalent to the size of the Sun StorEdge T3+ array LUN. This assumes that a full complement of Sun StorEdge T3+ arrays is configured as RAID 5. This description applies to both the Sun StorEdge 6910 system and the Sun StorEdge 6960 system.

Sun StorEdge T3+ Array Settings

The supported configurations for the Sun StorEdge T3+ arrays are given in TABLE 3-4.

TABLE 3-4   Sun StorEdge T3+ Array Configuration Types

Element	Default DAS Configuration[1]	Default SAN Configuration	DAS/SAN Option 1	DAS/SAN Option 2
Hot Spare	Yes	Yes	Yes	Yes
Block Size	16 Kbytes	16 Kbytes	16 Kbytes, 32 Kbytes, 64 Kbytes	16 Kbytes, 32 Kbytes, 64 Kbytes
Cache	`auto`	`auto`	`auto`	`auto`
Mirror	`auto`	`auto`	`auto`	`auto`
Multiplexing Support (`mp_support`[2])	Sun StorEdge Traffic Manager (`mpxio`)	Read/write (`rw`)	Read/write (`rw`; DAS/SAN) or Sun StorEdge Traffic Manager (`mpxio`) (DAS only)	Read/Write (`rw`; DAS/SAN) or Sun StorEdge Traffic Manager (`mpxio`) (DAS only)
Read Ahead (`rd_ahead`[3])	`off`	`off`	`off` **or** `on`	`off` **or** `on`
Recon Rate	`medium`	`medium`	`medium`	`medium`
RAID Type	5	5	1 or 5	1 and 5
LUNs/Partner Pair	2	2	2 or 4	4[‡]

1—All Sun StorEdge 3900 series storage subsystems ship from Sun in the default DAS configuration

2—Multiplexing support in SAN configurations must be set to `rw`.

3—Read ahead is typically set to off in random access environments. This delivers better overall cache performance.

‡—In this configuration, one LUN per Sun StorEdge T3+ array, two LUNs per array are used by the RAID 1 devices. One LUN per Sun StorEdge T3+ array, two LUNs per array are used by the RAID 5 devices. The configuration utility assigns three physical drives to the RAID 1 device and assigns the remaining five physical drives to the RAID 5 device. The ninth physical drive is always the hot spare.

The Sun StorEdge T3+ array target IDs and host names are shown in TABLE 3-5.

TABLE 3-5 Sun StorEdge T3+ Array Target ID and Host Name

Sun StorEdge T3+ Array	Target ID	Host Name
t3b0	0, 1	t3b0
t3b1	2, 3	t3b1
t3b2	4, 5	t3b2
t3b3	6, 7	t3b3
t3be0	8, 9	t3be0
t3be1	10, 11	t3be1
t3be2	12, 13	t3be2
t3be3	14, 15	t3be3
t3be4	16, 17	t3be4

The Sun StorEdge T3+ command configuration settings are given in TABLE 3-6.

TABLE 3-6 Sun StorEdge T3+ Array Set Command Configuration Settings

Parameter	Default Value
bootmode	auto
bootdelay	3
sn	*nnnnnn*
ip	see TABLE 3-16
netmask	255.255.255.0
gateway	192.168.0.1
tftphost	0.0.0.0
tftpfile	<NULL>
hostname	See TABLE 3-5
vendor	0310
model	501-5710-02(51)
revision	0200
logto	*

TABLE 3-6   Sun StorEdge T3+ Array Set Command Configuration Settings

Parameter	Default Value
loglevel	3
rarp	on
mac	*n:n:n:n:n:n*

The command configuration settings for the Sun StorEdge T3+ array system list are given in TABLE 3-7.

TABLE 3-7   Sun StorEdge T3+ Array System List Command Configuration Settings

Parameter	Default Value
blocksize	16 Kbytes
cache	auto
mirror	auto
mp_support	mpxio for DAS default rw for SAN default
rd_ahead	off
recon_rate	med
sys memsize	128 Mbytes
cache memsize	1024 Mbytes
naca	off

The Sun StorEdge T3+ array miscellaneous configuration parameters are shown in TABLE 3-8.

TABLE 3-8   Sun StorEdge T3+ Array Miscellaneous Configuration Parameters

Parameter	Default Value
vol init	rate = 16
vol verify	rate = 1
port host	sun

Sun StorEdge T3+ Array `syslog.conf` Configuration

To ensure that the Storage Service Processor is aware of the condition of each Sun StorEdge T3+ array tray within these storage subsystems, the arrays are configured to send their `syslog.conf` information back to the Storage Service Processor.

The information that is placed in each Sun StorEdge T3+ array is as follows:

```
# syslog.conf
# facility.level action

# messages to local syslog file
*.info  /syslog

# messages to syslogd on another host
*.notice        @192.168.0.1

# messages sent as SNMP traps

# messages sent as HTTP pushes
*.info  | http_push
```

Sun StorEdge Network FC Switch Settings

This subsection presents a series of tables that provide information about the default settings for the Sun StorEdge Network FC Switch-8 and Switch-16 switches. This information includes the following:

- Sun StorEdge Network FC Switch-8 and Switch-16 Parameters
- Sun StorEdge 3910 System Switch Configuration
- Sun StorEdge 3960 System Switch Configuration
- Sun StorEdge 6910 System Switch Configuration
- Sun StorEdge 6960 System Switch Configuration

The Sun StorEdge Network FC Switch-8 and Switch-16 parameters are given in TABLE 3-9.

TABLE 3-9   Sun StorEdge Network FC Switch-8 and Switch-16 Parameters

Field	Value
chassis_stage_type	IO/T (I/O transfer mode)
port admin mode	online (for each port)
HW	1003
CHASSIS TYPE	A8 (8-port switch) A16 (16-port switch)
PROM	30300
FLASH	30462
CHASSIS NUMBER[1]	1 (sw1a) 2 (sw1b) 3 (sw2a) 4 (sw2b)
Fabric ID	1
edtov	2560
mfstov	0
ratov	5000
rttov	100
Netmask	255.255.255.0
ARP Timeout	30000
Gateway	192.168.0.1
SNMP Trap Address	localhost
SNMP Location	Undefined
SNMP Contact	Undefined
Chassis Mode	1 online
Port MFS Mode	0 off

1- The default values can be overridden when you are in a SAN environment with multiple Sun StorEdge 6900 series systems.

The default Sun StorEdge 3910 system switch configuration is given in TABLE 3-10.

TABLE 3-10 Sun StorEdge 3910 System Switch Configuration

sw1a	sw1b
Four Hard Zones	Four Hard Zones
Zone 1	**Zone 1**
Port 1 = TL (t3b0)	Port 1 = TL (t3b0 altmaster)
Port 2 = F (host #1a)	Port 2 = F (host #1b)
Zone 2	**Zone 2**
Port 3 = TL (t3b1)	Port 3 = TL (t3b1 altmaster)
Port 4 = F (host #2a)	Port 4 = F (host #2b)
Zone 3	**Zone 3**
Port 5 = TL (t3b2)	Port 5 = TL (t3b2 altmaster)
Port 6 = F (host #3a)	Port 6 = F (host #3b)
Zone 4	**Zone 4**
Port 7 = TL (t3b3)	Port 7 = TL (t3b3 altmaster)
Port 8 = F (host #4a)	Port 8 = F (host #4b)

The default Sun StorEdge 3960 system switch configuration is given in TABLE 3-11.

TABLE 3-11 Sun StorEdge 3960 System Switch Configuration

sw1a	sw1b
Seven Hard Zones	Seven Hard Zones
Zone 1	**Zone 1**
Port 1 = TL (t3b0)	Port 1 = TL (t3b0 altmaster)
Port 2 = F (host #1a)	Port 2 = F (host #1b)
Zone 2	**Zone 2**
Port 3 = TL (t3b1)	Port 3 = TL (t3b1 altmaster)
Port 4 = F (host #2a)	Port 4 = F (host #2b)
Zone 3	**Zone 3**
Port 5 = TL (t3b2)	Port 5 = TL (t3b2 altmaster)
Port 6 = F (host #3a)	Port 6 = F (host #3b)
Zone 4	**Zone 4**

TABLE 3-11   Sun StorEdge 3960 System Switch Configuration

sw1a	sw1b
Port 7 = TL (t3b3)	Port 7 = TL (t3b3 altmaster)
Port 8 = F (host #4a)	Port 8 = F (host #4b)
Zone 5	**Zone 5**
Port 9 = TL (t3be0)	Port 9 = TL (t3be0 altmaster)
Port 10 = (host #5a)	Port 10 = F (host #5b)
Zone 6	**Zone 6**
Port 11 = TL (t3be1)	Port 11 = TL (t3be1 altmaster)
Port 13 = TL (t3be3)	Port 13 = TL (t3be3 altmaster)
Port 12 = F (host #6a)	Port 12 = F (host #6b)
Zone 7	**Zone 7**
Port 15 = TL (t3be2)	Port 15 = TL (t3be2 altmaster)
Port 16 = TL (t3be4)	Port 16 = TL (t3be4 altmaster)
Port 14 = F (host #7a)	Port 14 = F (host #7b)

The default Sun StorEdge 6910 system switch configurations are given in TABLE 3-12 and TABLE 3-13.

TABLE 3-12   Sun StorEdge 6910 System Switch Configuration

sw1a	sw1b
Single Hard Zone	Single Hard Zone
Port 1 = F (v1a host side)	Port 1 = F (v1b host side)
Port 2 = F (host #1a)	Port 2 = F (host #1b)
Port 3 = F (host #2a)	Port 3 = F (host #2b)
Port 4 = F (host #3a)	Port 4 = F (host #3b)
Port 5 = F (host #4a)	Port 5 = F (host #4b)
Port 6 = F (host #5a)	Port 6 = F (host #5b)
Port 7 = F (host #6a)	Port 7 = F (host #6b)
Port 8 = F (host #7a)	Port 8 = F (host #7b)

TABLE 3-13   Sun StorEdge 6910 System Configuration (Continued)

sw2a	sw2b
Single Hard Zone	Single Hard Zone
Port 1 = F (v1a device side)	Port 1 = F (v1b device side)
Port 2 = TL (t3b0)	Port 2 = TL (t3b0 altmaster)
Port 3 = TL (t3b1)	Port 3 = TL (t3b1 altmaster)
Port 4 = TL (t3b2)	Port 4 = TL (t3b2 altmaster)
Port 5, 6 = UNUSED	Port 5, 6 = UNUSED
Port 7 = T (sw2b port 7)	Port 7 = T (sw2a port 7)
Port 8 = T (sw2b port 8)	Port 8 = T (sw2a port 8)

The default Sun StorEdge 6960 system switch configurations are given in TABLE 3-14 and TABLE 3-15.

TABLE 3-14   Sun StorEdge 6960 System Configuration

sw1a	sw1b
Single Hard Zone	Single Hard Zone
Port 1 = F (v1a host side)	Port 1 = F (v1b host side)
Port 2 = F (host #1a)	Port 2 = F (host #1b)
Port 3 = F (host #2a)	Port 3 = F (host #2b)
Port 4 = F (host #3a)	Port 4 = F (host #3b)
Port 5 = F (host #4a)	Port 5 = F (host #4b)
Port 6 = F (host #5a)	Port 6 = F (host #5b)
Port 7 = F (host #6a)	Port 7 = F (host #6b)
Port 8 = F (host #7a)	Port 8 = F (host #7b)
Port 9 = F (v2a host side)	Port 9 = F (v2b host side)
Port 10 = F (host #8a)	Port 10 = F (host #8b)
Port 11 = F (host #9a)	Port 11 = F (host #9b)
Port 12 = F (host #10a)	Port 12 = F (host #10b)
Port 13 = F (host #11a)	Port 13 = F (host #11b)
Port 14 = F (host #12a)	Port 14 = F (host #12b)
Port 15 = F (host #13a)	Port 15 = F (host #13b)
Port 16 = F (host #14a)	Port 16 = F (host #14b)

TABLE 3-15 Sun StorEdge 6960 System Switch Configuration (Continued)

sw2a	sw2b
Two Hard Zones	Two Hard Zones
Zone 1	**Zone 1**
Port 1 = F (v1a device side)	Port 1 = F (v1b device side)
Port 2 = TL (t3b0)	Port 2 = TL (t3b0 altmaster)
Port 3 = TL (t3b2)	Port 3= TL (t3b2 altmaster)
Port 4 = TL (t3be1)	Port 4 = TL (t3be1 altmaster)
Port 5 = TL (t3be3)	Port 5 = TL (t3be3 altmaster)
Port 6 = UNUSED	Port 6 = UNUSED
Port 7 = T (sw2b port 7)	Port 7 = T (sw2a port 7)
Port 8 = T (sw2b port 8)	Port 8 = T (sw2a port 8)
Zone 2	**Zone 2**
Port 9 = F (v2a device side)	Port 9 = F (v2b device side)
Port 10 = TL (t3b1)	Port 10 = TL (t3b1 altmaster)
Port 11 = TL (t3be0)	Port 11 = TL (t3be0 altmaster)
Port 12 = TL (t3be2)	Port 12 = TL (t3be2 altmaster)
Port 13 = TL (t3be4)	Port 13 = TL (t3be4 altmaster)
Port 14 = UNUSED	Port 14 = UNUSED
Port 15 = T (sw2b port 15)	Port 15 = T (sw2a port 15)
Port 16 = T (sw2b port 16)	Port 16 = T (sw2a port 16)

Ethernet Address Settings

The Ethernet addressing configurations are given in TABLE 3-16.

TABLE 3-16 Ethernet Addressing Configurations

IP Address	Designator	Description
127.0.0.1	localhost	Standard UNIX loopback
10.0.0.10	msp0	Master Storage Service Processor
10.0.0.3	ntc0	Network terminal concentrator

TABLE 3-16 Ethernet Addressing Configurations

IP Address	Designator	Description
10.0.0.11	ssp1	Reserved
10.0.0.12	ssp2	Reserved
10.0.0.13	ssp3	Reserved
10.0.0.14	ssp4	Reserved
10.0.0.15	ssp5	Reserved
10.0.0.16	ssp6	Reserved
10.0.0.17	ssp7	Reserved
10.0.0.2	mgmt0	Management station
192.168.0.1	sp0	dmfe 1 Ethernet port log host
192.168.0.20	v1a	Virtualization engine
192.168.0.21	v1b	Virtualization engine
192.168.0.22	v2a	Virtualization engine (Sun StorEdge 6960 system only)
192.168.0.23	v2b	Virtualization engine (Sun StorEdge 6960 system only)
192.168.0.30	sw1a	Sun StorEdge Network FC Switch-8 or Switch-16 port
192.168.0.31	sw1b	Sun StorEdge Network FC Switch-8 or Switch-16 port
192.168.0.32	sw2a	Sun StorEdge Network FC Switch-8 or Switch-16 port (SAN only)
192.168.0.33	sw2b	Sun StorEdge Network FC Switch-8 or Switch-16 port (SAN only)
192.168.0.40	t3b0	Sun StorEdge T3+ array
192.168.0.41	t3b1	Sun StorEdge T3+ array
192.168.0.42	t3b2	Sun StorEdge T3+ array
192.168.0.43	t3b3	Sun StorEdge T3+ array (DAS configuration only)
192.168.0.50	t3be0	Sun StorEdge T3+ array (expansion configuration)
192.168.0.51	t3be1	Sun StorEdge T3+ array (expansion configuration)
192.168.0.52	t3be2	Sun StorEdge T3+ array (expansion configuration)
192.168.0.53	t3be3	Sun StorEdge T3+ array (expansion configuration)
192.168.0.54	t3be4	Sun StorEdge T3+ array (expansion configuration)

CHAPTER **4**

Configuration Features

This chapter describes the features associated with each of the supported Sun StorEdge 3900 and 6900 series configurations.

This chapter is organized as follows:

- "Standalone With No Remote Service" on page 39
- "Multiple Units With No Remote Service" on page 40
- "Remote Service to a Single Unit With No Host Connection" on page 41
- "Remote Service to Multiple Units With No Host Connection" on page 42

Standalone With No Remote Service

A standalone Sun StorEdge 3900 or 6900 series storage subsystem can be configured with no remote service.

In a standalone configuration with no remote service option, the Storage Service Processor must be configured as a master service processor.

Supported features in this configuration are:

- Storage Automated Diagnostic Environment
- Management of components using the "Configuration Utilities" on page 45
- Local/host access to monitoring, component management, and alerts
- One customer IP addresses required to enable communication with the customer's internal LANs

Multiple Units With No Remote Service

This configuration provides no remote services but does give the customer a collection of Storage Service Processors.

It is recommended that the first Storage Service Processor be configured as the master Storage Service Processor. If it can not be determined which is the first Storage Service Processor, one should be selected by agreement of the customer and Sun service engineer.
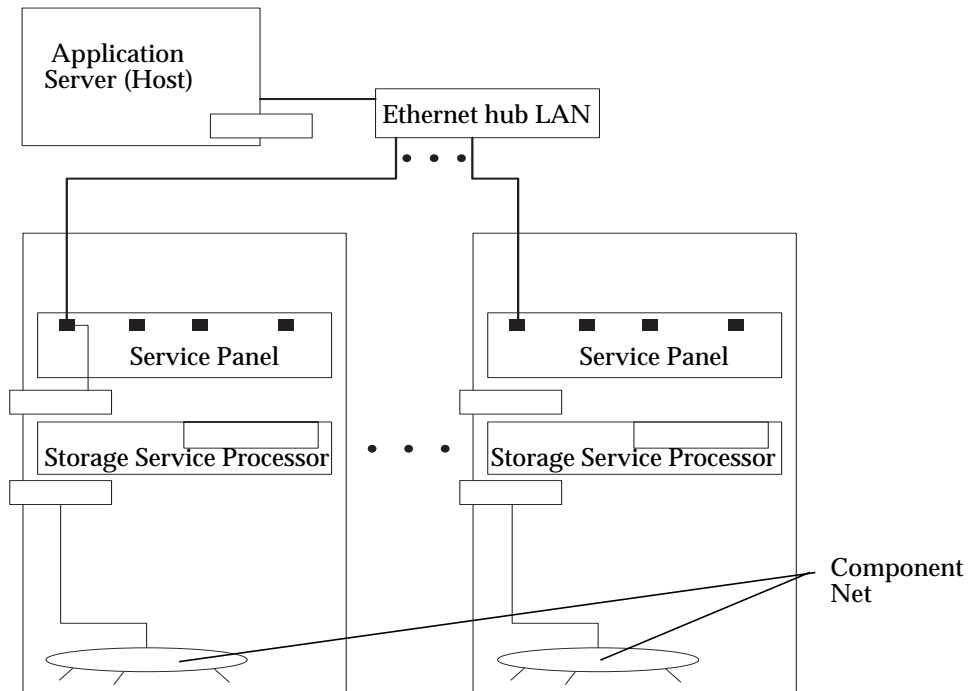
FIGURE 4-1   Multiple Units Without the Sun StorEdge Remote Response Option

Note – Without remote connection, the Ethernet hub can be used in place of routers.

The following are supported features in this configuration:

■ Storage Automated Diagnostic Environment

■ Management of components using the "Configuration Utilities" on page 45

■ Local/host access to monitoring, component management, and alerts

- Host-based diagnostic/monitoring agents (for example, topology)
- Aggregation of Storage Service Processors
- Multiple customer IP addresses required (one per Storage Service Processor)

Remote Service to a Single Unit With No Host Connection

This configuration offers remote service to a single Storage Service Processor. There is no aggregation of Storage Server Processors. This configuration does not support connection to a customer host.

In any configuration implementing remote service, the Storage Service Processor attached to port 2 of the network terminal concentrator is the master Storage Service Processor.
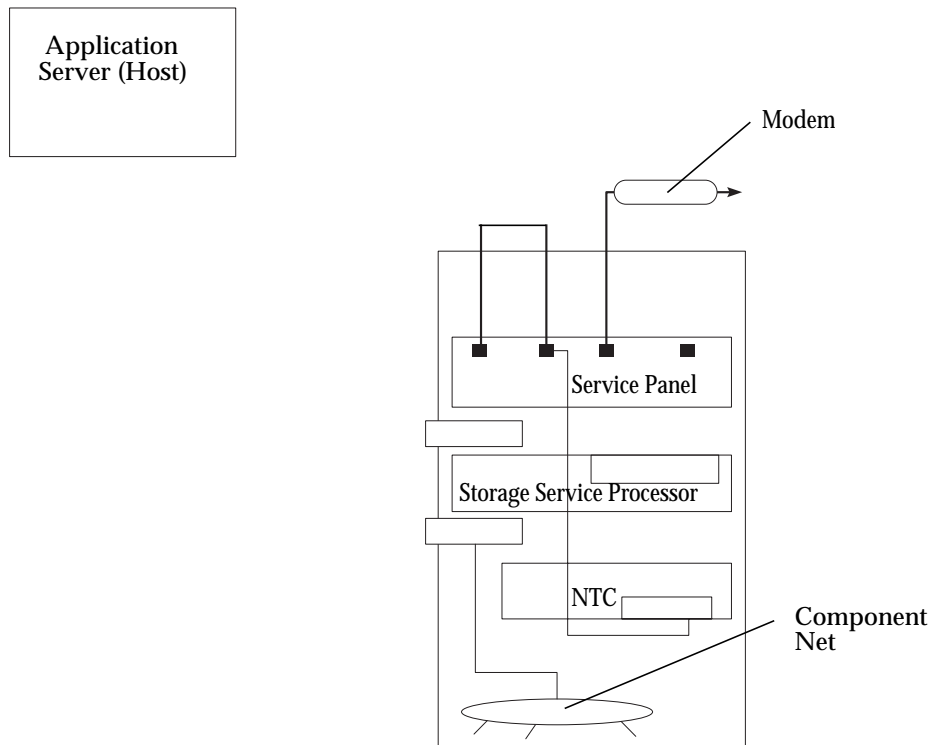
FIGURE 4-2   Remote Service to a Single Unit With No Host

Supported features in this configuration are:

- Storage Automated Diagnostic Environment
- Management of components using the "Configuration Utilities" on page 45
- Remote services (access to StorTools and Network Storage Agent)
- Product telemetry data stream
- Storage Service Processor serviceability using the console connection (NTC)
- Telco rollover cable for connecting to components (NTC)

Remote Service to Multiple Units With No Host Connection

This configuration offers remote service to multiple Storage Service Processor in the configuration. No connection to the host is used.

In any configuration implementing remote service, the Storage Service Processor attached to port 2 of the network terminal concentrator is the master Storage Service Processor.
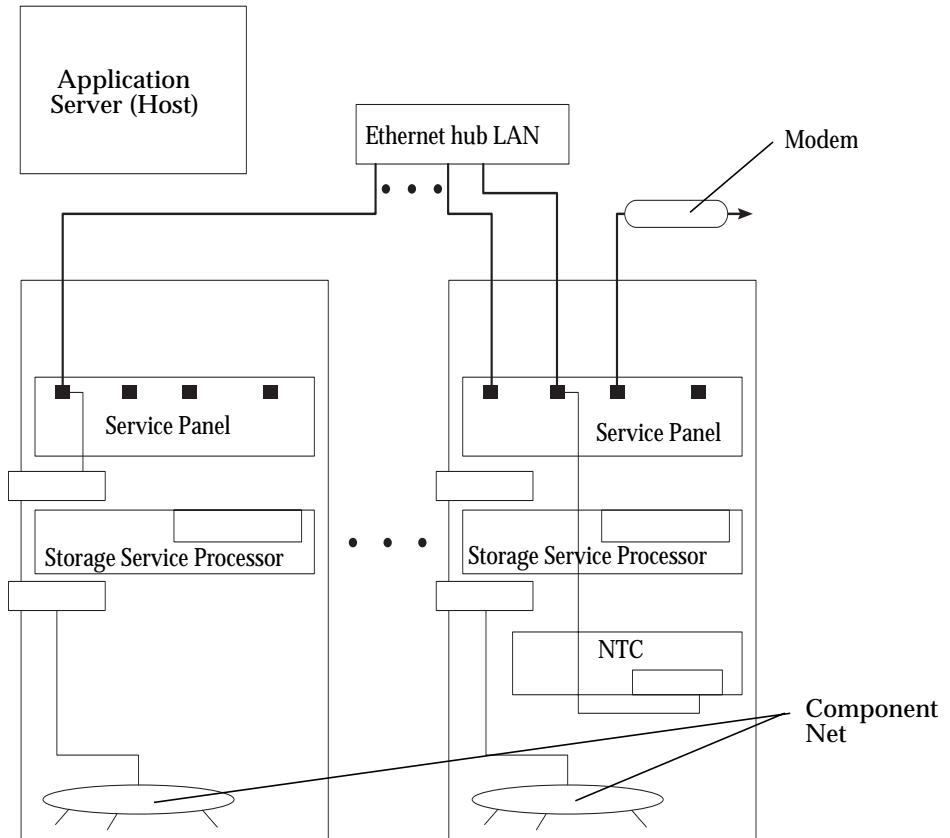
FIGURE 4-3 Remote Service to Multiple Units With No Host Connection

Supported features in this configuration are:

- Storage Automated Diagnostic Environment
- Management of components using the "Configuration Utilities" on page 45
- Remote services (access to StorTools, Network Storage Agent, and alerts)
- Product telemetry data stream
- Storage Service Processor serviceability using the console connection (NTC)
- Telco rollover cable for connecting to components (NTC)
- Aggregation of Storage Service Processors

Configuration Utilities

This chapter gives instructions for using the command utilities that configure the various components of the Sun StorEdge 3900 and 6900 series storage subsystems.

This chapter is organized as follows:

- "Overview" on page 45
- "Menu-Driven Interface" on page 46
- "Command Line Interface" on page 75

Overview

You can use any of the following interfaces to access the configuration utilities:

- Menu-driven character user interface
- Command line
- Configuration graphical user interface

There are five major functional categories:

- Switch configuration
- Sun StorEdge T3+ array configuration
- Virtualization engine configuration
- Log viewing
- Error viewing

Menu-Driven Interface

The menu-driven character user interface to the configuration utility is accessed using the `runsecfg`(1M) command. This utility enables you to:

- Configure, check, and display information about the attached Sun StorEdge T3+ partner groups.
- Configure, check, and display information about the attached Sun switches.
- Configure, check, and display information about the attached virtualization engines.
- Determine storage subsystem type and model number.
- View detailed configuration utility messages in the log file.
- View error log.

Caution – Do not run the Configuration Utilities at the same time you are using the Storage Automated Diagnostic Environment diagnostics software.

When started, `runsecfg` displays the following menu:

```
# runsecfg

Determining cabinet type...

MAIN MENU - SUN StorEdge 6960 SYSTEM CONFIGURATION TOOL

1) T3+ Configuration Utility
2) Switch Configuration Utility
3) Virtualization Engine Configuration Utility
4) View Logs
5) View Errors
6) Exit
Select option above:>
```

Note – If you have a Sun StorEdge 3900 series, you will not see the choice for the Virtualization Engine Configuration Utility.

Sun StorEdge T3+ Array Main Menu

The Sun StorEdge T3+ array main menu presents the following choices. Note that you are first prompted for the Sun StorEdge T3+ array password if one is set.

```
Retrieving list of available Sun StorEdge T3+ Array(s).........

Checking and validating PASSWD env variable for Sun StorEdge T3+
Array .........

Please enter the Sun StorEdge T3+ Array password : password

Validating Sun StorEdge T3+ Array password ........

Sun StorEdge T3+ Array MAIN MENU

1) Display Sun StorEdge T3+ Array Configuration
2) Save Sun StorEdge T3+ Array Configuration
3) Configure Sun StorEdge T3+ Array
4) Restore Sun StorEdge T3+ Array Configuration
5) Verify Sun StorEdge T3+ Array Configuration
6) Modify Sun StorEdge T3+ Array Sys Parameters
7) Display Sun StorEdge T3+ Array(s) Configuration Status
8) Help
9) Return
Select option above:>
```

■ **Display Sun StorEdge T3+ Array Configuration**—Reads and displays configuration information for the specified Sun StorEdge T3+ array partner group. It includes output from the following Sun StorEdge T3+ array commands:

  ■ `ver`
  ■ `sys list`
  ■ `vol list`
  ■ `vol stat`
  ■ `port list`
  ■ `port listmap`
  ■ `fru stat`

When you select this option, you can select from a list of the Sun StorEdge T3+
array partner groups or select all partner groups, for example:

```
Busy Sun StorEdge T3+ Array(s)
------------------------------
NOTE : Currently NO Sun StorEdge T3+ Array(s) are being
configured/restored.

AVAILABLE Sun StorEdge T3+ Array(s)

1) t3b0
2) t3b1
3) ALL
4) Return
Select option above:> 2

 t3b1  Properties.......
VERSION :-

        T3B Release 2.00 2001/07/12 19:35:12 (192.168.0.41)
        Copyright (C) 1997-2001 Sun Microsystems, Inc.
        All Rights Reserved.


SYSTEM LISTING :-

        blocksize            : 16k
        cache                : auto
        mirror               : auto
        mp_support           : rw
        naca                 : on
        rd_ahead             : off
        recon_rate           : med
        sys memsize          : 128 MBytes
        cache memsize        : 1024 MBytes

LUN LIST :-

        volume          capacity   raid   data      standby
        vol1            512.3 GB    5     u1d1-8    u1d9
        vol2            512.3 GB    5     u2d1-8    u2d9
. . .
```

- **Save Sun StorEdge T3+ Array Configuration**—Updates the Sun StorEdge T3+ array snapshot file after reading the array configuration. This information is saved on the Storage Service Processor to be reused if needed, for example:

```
Busy Sun StorEdge T3+ Array(s)
------------------------------
NOTE : Currently NO Sun StorEdge T3+ Array(s) are being
configured/restored.

AVAILABLE Sun StorEdge T3+ Array(s)

1) t3b0
2) t3b1
3) ALL
4) Return
Select option above:> 2

Backing up Sun StorEdge T3+ Array configuration parameters to
Service Processor .....

Checking : t3b1  configuration.......
t3b1 Configuration matches with Standard config 1

Saving : t3b1  Properties.......
```

When you select this option, you can select from a list of the Sun StorEdge T3+ array partner groups or select all partner groups.

- **Configure Sun StorEdge T3+ Array**—Steps you through a series of submenus that enable you to reconfigure Sun StorEdge T3+ arrays. After successful update of the configuration, the information is saved to the snapshot file. Supported RAID types include: RAID 1, RAID 5, and RAID 1/RAID 5. In the RAID 1/RAID5 mixed RAID types, each Sun StorEdge T3+ array in the group has a RAID 1 device consisting of three physical drives and a RAID 5 device consisting of five physical drives, plus a spare.

When you select this option, you can select from a list of the Sun StorEdge T3+ array partner groups or select all partner groups.

```
AVAILABLE Sun StorEdge T3+ Array(s)
1) t3b0
2) t3b1
3) ALL
4) Return
Select option above:> 1

1) Default Config
2) Custom Config
3) Return to Sun StorEdge T3+ Array Menu
Select option above (t3b0):> 2

Sun StorEdge T3+ Array CONFIGURATION OPTION MENU
1) Raid 1
2) Raid 5
3) Raid 1 and Raid 5
4) Help
5) Return to Sun StorEdge T3+ Array Menu
Select configuration option above (t3b0):> 1

Sun StorEdge T3+ Array LUN OPTION MENU
1) 2
2) 4
3) Return to Sun StorEdge T3+ Array Menu
Select number of luns option above (t3b0):> 2

Sun StorEdge T3+ Array BLOCK SIZE OPTION MENU
1) 16k
2) 32k
3) 64k
4) Return to Sun StorEdge T3+ Array Menu
Select block size option above (t3b0):> 1

Sun StorEdge T3+ Array READ AHEAD OPTION MENU
1) on
2) off
3) Return to Sun StorEdge T3+ Array Menu
Select read ahead option above (t3b0):> 1

WARNING : You are about to destroy all the data on this Sun StorEdge
T3+ Array - t3b0 !!
Do you want to continue ?[yY] :
```

- **Restore Sun StorEdge T3+ Array Configuration**—Restores the Sun StorEdge T3+ array configuration with the static saved configuration from the snapshot file. This is a function that might be needed in the event you lose a LUN or you must replace a Sun StorEdge T3+ array.

  When you select this option you can select from a list of the Sun StorEdge T3+ array partner groups or select all partner groups.

```
Busy Sun StorEdge T3+ Array(s)
------------------------------
NOTE : Currently NO Sun StorEdge T3+ Array(s) are being configured/
restored.

AVAILABLE Sun StorEdge T3+ Array(s)

1) t3b0
2) t3b1
3) ALL
4) Return
Select option above:> 2

Sun StorEdge T3+ Array RESTORE LUN OPTION MENU

1) Lun 1
2) Lun 2
3) All Luns
4) Return to Sun StorEdge T3+ Array Menu
Select lun(s) to restore (t3b1):> 1

NOTE:
The restore option may destroy data on the lun(s) based on results
of the check operation. Do you want to FORCE a destructive
recreation of lun(s) even if the selected configuration is the same
as the saved configuration ?[y|n] : n

Sun StorEdge T3+ Array - t3b1  is being restored now.

NOTICE: This will take a minimum of approximately 2 hours!
Please view /var/adm/log/SEcfglog for more details and progress.
Please execute 'View Errors' from the main menu to view errors
encountered.

After completion of t3b1 restoration,it will be available for
'Verify Sun StorEdge T3+ Array Configuration'.
```

- **Verify Sun StorEdge T3+ Array Configuration**—Verifies that the current Sun StorEdge T3+ array configuration is the same as the most recently saved version of the configuration in the snapshot file.

When you select this option, you can select from a list of the Sun StorEdge T3+ array partner groups or select all partner groups, for example:

```
Busy Sun StorEdge T3+ Array(s)
------------------------------
NOTE : Currently NO Sun StorEdge T3+ Array(s) are being configured/
restored.

AVAILABLE Sun StorEdge T3+ Array(s)

1) t3b0
2) t3b1
3) ALL
4) Return
Select option above:> 2

Checking : t3b1  Configuration.......

                Checking command ver                    :   PASS
                Checking command vol stat               :   PASS
                Checking command port list              :   PASS
                Checking command port listmap           :   PASS
                Checking command sys list               :   PASS
```

You are returned to the Main Menu.

■ **Modify Sun StorEdge T3+ Array Sys Parameters**—Enables changing the read ahead (`rd_ahead`) parameter on both the Sun StorEdge 3900 or 6900 series subsystems. On the Sun StorEdge 3900 series subsystems, you can also change the `naca` and `mp_support` parameters.

```
AVAILABLE Sun StorEdge T3+ Array(s)

1) t3b0
2) t3b1
3) ALL
4) Return
Select option above:> 1

Do you want to modify the read ahead option [y|n] : y

Sun StorEdge T3+ Array READ AHEAD OPTION MENU

1) on
2) off
3) Return to Sun StorEdge T3+ Array Menu
Select read ahead option above (t3b0 Sun StorEdge T3+ Array(s)):> 2

Modifying t3b0 system parameters

Setting read_ahead flag to off

Current t3b0 system parameters  :-

         blocksize            : 16k
         cache                : auto
         mirror               : auto
         mp_support           : rw
         naca                 : off
         rd_ahead             : off
         recon_rate           : med
         sys memsize          : 128 MBytes
         cache memsize        : 1024 MBytes
```

■ **Display Sun StorEdge T3+ Array(s) Configuration Status**—Displays the name of the Sun StorEdge T3+ arrays that are being configured or restored. If none are being configured or restored, the following message is displayed and you are returned to the Main Menu.

```
Currently NO Sun StorEdge T3+ Arrays are being configured or
restored.
```

- **Help**—Displays information that explains all the options.
- **Return**—Returns you to the Main Menu.

Sun StorEdge Network FC Switch Main Menu

Note – Cascaded switches are supported in a SAN environment, but the `runsecfg` utility cannot configure switches outside of the Sun StorEdge 6900 series cabinet. Instead you must use the SANSurfer utility to create the appropriate hard zone and to set unique chassis IDs on the other switches.

The Switch Main Menu presents the following options:

```
SWITCH MAIN MENU

1) Display Switch Configuration
2) Verify Switch Configuration
3) Set Switch Configuration
4) Download Switch Flash
5) Set Switch Port SL Mode Per Sun StorEdge T3+ Array
6) Help
7) Return
Select option above:>
```

- **Display Switch Config**—Displays the specified switch's configuration including the following:
  - IP address configuration
  - Number of ports
  - Version information
  - Port status and type
  - Zones

When you select this option, you can select from a list of the Sun StorEdge network FC switches or select all switches, for example:

```
AVAILABLE SWITCHES
1) sw1a
2) sw1b
3) sw2a
4) sw2b
5) ALL
6) Return
Select option above:>
```

You will see the sw2a and sw2b switches if you are running the runsecfg command from a Sun StorEdge 6900 series.

Selecting a switch returns all the configuration information about that switch, for example:

```
Select option above:> 1

SWITCH: sw1a

Number of Ports:        8
IP Address:     192.168.0.30

************************
IP Address Configuration
************************

Net IP Address:         192.168.0.30
Net Mask:               255.255.255.0
Broadcast:              0.0.0.0
Gateway:                192.168.0.1
Address Discovery:      RARP
ArpTimeOut:             30000

*******************
Version Information
*******************

HW:             1003
PROM:           30300
FLASH:          30462
CHASSIS TYPE:   A8
CHASSIS NUMBER: 1
Fabric Id:      1
WWN:            100000c0dd009c54
MAC:            00c0dd009c53
...
```

- **Verify Switch Config**—Verifies that the configuration of the specified switch matches the predefined static configuration for that switch based on the cabinet type (Sun StorEdge 3900 series or Sun StorEdge 6900 series).

When you select this option, you can select from a list of the Sun StorEdge FC Network Switches or select all switches.

```
AVAILABLE SWITCHES
1) sw1a
2) sw1b
3) sw2a
4) sw2b
5) ALL
6) Return
Select option above:> 1
PASSED verification on switch sw1a, no differences found.
```

- **Set Switch Config**—Configures the specified switch to a predefined static configuration based on cabinet type and location (top or bottom switch for Sun StorEdge 6900 series subsystems). For cascaded SAN environments you may override the default values for hard zone IDs and chassis IDs. The following is example output:

```
WARNING: Modifying the switch configuration may disrupt traffic.
Do you want to continue? [y n] y

AVAILABLE SWITCHES
1) sw1a
2) sw1b
3) sw2a
4) sw2b
5) ALL
6) Return
Select option above:> 1

Do you want to override the default zone number (1) [y|n] : n

Default chassis id = 1. Do you want to override the default chassis
id [y|n] : n

Configuring switch sw1a to default configuration...
 setupswitch: sw1a INFO, switch FLASH VERSION is 30462.
PASSED verification on switch sw1a, no differences found.
 setupswitch: sw1a INFO All switch settings properly set.
```

An example of a predefined configuration follows.

```
Sun StorEdge 3910 system (DAS)

 Basic
     2 switches, same configuration
     8 port switch
     IP addresses (192.168.0.30, 192.168.0.31)
     gateway IP address (192.168.0.1)
     associated switch names (sw1a, sw1b)
     associated chassis ids (1, 2)

 Port/Zone Settings
     Four Hard Zones
     8 PORT
     ZONE 1
       Ports 1 = TL (t3b0 attach)
       Ports 2 = F (Host attach)
     ZONE 2
       Ports 3 = TL (t3b1 attach)
       Ports 4 = F (Host attach)
     ZONE 3
       Ports 5 = TL (t3b2 attach)
       Ports 6 = F (Host attach)
     ZONE 4
       Ports 7 = TL (t3b3 attach)
       Ports 8 = F (Host attach)
```

■ **Set Switch Port SL Mode Per Sun StorEdge T3+ Array**—Sets the switch ports associated with the specified Sun StorEdge T3+ array to SL mode. If on is selected, it sets all ports in the corresponding zone on each switch to SL mode. If off is specified, it clears the SL mode and sets the ports back to the predefined configuration.

This option is available for the Sun StorEdge 3900 series subsystems only. The last two zones on a Sun StorEdge 3960 system contains two Sun StorEdge T3+ arrays that can not be separated.

```
Available Port Settings

1) SL Mode
2) Default Modes (F and TL)
3) Return
Select option above:> 2

 Retrieving list of available Sun StorEdge T3+ Array(s).........

AVAILABLE Sun StorEdge T3+ Array(s)

1) t3b0
2) t3b1
3) Return
Select option above:> 2

Setting ports associated with T3+ t3b1 back to default config.
Setting port 3 on sw1a to TL mode
Setting port 4 on sw1a to F mode
Setting port 3 on sw1b to TL mode
Setting port 4 on sw1b to F mode
```

- **Download Switch Flash**—Downloads the flash code to the Sun StorEdge Network FC Switch-8 or Switch-16 switch and resets it. The flash code is automatically loaded from the appropriate file from the /usr/opt/SUNWsmgr/flash directory unless an alternate file is specified at the prompt. The currently released flash revision is 30462.

  If you want to use another flash version, you are given the option to enter the path to that version when you select this option:

```
Do you want to use the default flash file version 30462 ? [y|n]:y
```

- **Help**—Displays information that explains all the options.
- **Return**—Returns you to the Main Menu.

Virtualization Engine Main Menu

The virtualization engine main menu presents the following options:

```
Determining the virtualization engine pairs on the system ......

 VIRTUALIZATION ENGINE MAIN MENU

1) Manage VLUNs
2) Manage Virtualization Engine Zones
3) Manage Configuration Files
4) Manage Virtualization Engine Hosts
5) Help
6) Return
Select option above:>
```

■ **Manage VLUNs**—Enables you to create and remove VLUNs. The options on the
  submenus include:

```
 MANAGE VLUNs MENU

1) Create VLUNs
2) Remove VLUNs
3) View Virtualization Engine Map
4) Help
5) Return
Select VLUN option above:>
```

- **Create VLUNs**—Enables you to create VLUNs. You are presented with a listing of the available virtualization engine pairs, for example:

```
BUSY VIRTUALIZATION ENGINE PAIRS
--------------------------------
NOTE : Currently NO virtualization engine pair(s) are being
configured.

AVAILABLE VIRTUALIZATION ENGINE PAIRS
1) v1
2) v2
3) Return
Select option above:> 2

DISK POOLS (free space)
1) t3b10(474.2GB)
2) t3b11(477.2GB)
3) Return
Select option above:> 1

NOTE : Creation of each VLUN can take up to 1 minute.

Please enter the number of VLUN(s) that need to be created: 2
Please enter the size in GB for each VLUN (1 GB increments): 2
Do you want to specify the zones ? [y|n]: n
Do you want to specify a name for the VLUN ? [y|n]: y
Please enter a name for the VLUN (There is a max length of 10 chars
including a unique id prefix that will be added automatically):test

This functionality requires a check that T3+ physical lun is
mounted.

Please enter the Sun StorEdge T3+ Array password: password

Creating VLUN(s) on v2 ........

Checking that associated T3+ physical lun is mounted...
VLUN T16387 : Created successfully in diskpool t3b10 with name
1test.
VLUN T16388 : Created successfully in diskpool t3b10 with name
2test.

NOTE: Updating map, v2 will be unavailable until completed.

WARNING: VLUNs just created were not added to any zones.
         This should be done to avoid data corruption.
         Refer to addtovezone command.
```

- **Remove VLUNs**—Enables you to remove VLUNs that have been created on the virtualization engine pairs, for example:

```
BUSY VIRTUALIZATION ENGINE PAIRS
--------------------------------
NOTE : Currently NO virtualization engine pair(s) are being
configured.

AVAILABLE VIRTUALIZATION ENGINE PAIRS
1) v1
2) v2
3) Return
Select option above:> 2

DISK POOLS (free space)
1) t3b10(470.2GB)
2) t3b11(477.2GB)
3) Return
Select option above:> 1

AVAILABLE VLUN TARGET ID(s)
1) T16384(1test)
2) T16385(2test)
3) T16386(redtest)
4) T16387(bluetest)
5) T16388(greentest)
6) Return
Select option above:> 4

Do you want to specify a range of target ids [y|n]: y

Please enter the end target id from the above VLUN list (i.e.
T16384): T16388

Removing VLUN(s) ........

VLUN T16387 : Removed successfully from v2.
VLUN T16388 : Removed successfully from v2.
NOTE: Updating map, v2 will be unavailable until completed.
```

■ **Manage Virtualization Engine Zones**—Presents the following options:

```
 MANAGE ZONES MENU

1) Create Virtualization Engine Zone
2) Add Components to Virtualization Engine Zone
3) Delete Components from Virtualization Engine Zone
4) Remove Virtualization Engine Zone
5) View Virtualization Engine Map
6) Help
7) Return
Select zone option above:>
```

- **Create Virtualization Engine Zones**—Enables you to create a virtualization engine zone. You are presented the following submenus, for example:

```
BUSY VIRTUALIZATION ENGINE PAIRS
--------------------------------
NOTE : Currently NO virtualization engine pair(s) are being
configured.

AVAILABLE VIRTUALIZATION ENGINE PAIRS

1) v1
2) v2
3) Return
Select option above:> 2

AVAILABLE VIRTUALIZATION ENGINE INITIATORS

1) I00001
2) I00002
3) Return
Select option above:> 1

AVAILABLE WWN NUMBERS

1) 210000E08B04E70F
2) Return
Select option above:> 1

Please enter the zone name (Recommendation : host_channelID , Note
: There is a max length of 15 chars for the zone name): ztest

Creating Virtualization Engine zone ........
HBA alias ztest : Created successfully.
Zone ztest : Created successfully on v2 initiator I00001.
NOTE: Updating map, v2 will be unavailable until completed.
```

- **Add Components to Virtualization Engine Zones**—Add additional components to an existing virtualization engine zone. You are presented with the following submenus, for example:

```
AVAILABLE VIRTUALIZATION ENGINE INITIATORS

1) I00001
2) I00002
3) Return
Select option above:> 1

AVAILABLE ZONES FOR I00001

1) zone1
2) Return
Select option above:> 1

Do you want to add to secondary zone ?[y|n]: y

AVAILABLE ZONES FOR I00002

1) zone2
2) Return
Select option above:> 1

AVAILABLE VLUN TARGET ID(s)

1) T16384(1test1)
2) T16385(2test1)
3) Return
Select option above:> 1

Do you want to specify a range of target ids [y|n]: y

Please enter the end target id from the above VLUN list (i.e.
T16384): T16385

Adding components to Virtualization Engine zone ........

VLUN T16384 : Added successfully to zone zone1.
VLUN T16384 : Added successfully to zone zone2.
VLUN T16385 : Added successfully to zone zone1.
VLUN T16385 : Added successfully to zone zone2.
NOTE: Updating map, v1 will be unavailable until completed.
```

- **Delete Components from Virtualization Engine Zones** —Remove components from an existing virtualization engine zone. You are presented with the following submenus, for example:

```
AVAILABLE VIRTUALIZATION ENGINE INITIATORS

1) I00001
2) I00002
3) Return
Select option above:> 1

AVAILABLE ZONES FOR I00001

1) zone1
2) Return
Select option above:> 1

Do you want to delete from secondary zone too?[y|n]: n

AVAILABLE VLUN TARGET ID(s)

1) T16384(1test1)
2) T16385(2test1)
3) Return
Select option above:> 1

Do you want to specify a range of target ids [y|n]: n

Deleting components from Virtualization Engine zone ........

VLUN T16384 : Deleted successfully from zone zone1.
NOTE: Updating map, v1 will be unavailable until completed.
```

- **Remove Virtualization Engine Zone**—You can remove an entire virtualization engine zone using this option, for example:

```
AVAILABLE VIRTUALIZATION ENGINE INITIATORS

1) I00001
2) I00002
3) Return
Select option above:> 1


AVAILABLE ZONES FOR I00001

1) zone1
2) rmzone
3) Return
Select option above:> 2


Removing Virtualization Engine zone ........

Zone rmzone : Removed successfully from v1 initiator I00001.
NOTE: Updating map, v1 will be unavailable until completed.
HBA alias rmzone : Cleared successfully.
```

- **View Virtualization Engine Map**—Displays the current saved configuration map of the specified virtualization engine (see page 71 for example output).
- **Manage Virtualization Engine Hosts**—Presents the following options:

```
 MANAGE VIRTUALIZATION ENGINE HOSTS MENU

1) Verify Virtualization Engine Hosts
2) Setup Virtualization Engine Hosts
3) Return
Select option above:>
```

- **Verify Virtualization Engine Hosts**—Verifies the specified virtualization engine host is properly configured, for example:

```
AVAILABLE VIRTUALIZATION ENGINE HOSTS

1) v1a
2) v1b
3) ALL
4) Return
Select option above:> 1


Checking for VEPASSWD env variable ......


v1a login success


Verifying Virtualization Engine host v1a........


Reading v1a configuration
Router Management config
        Host side WWN Authentications are set properly
        Host IP Authentications are set properly
        other VEHOST IP is set properly
Device side configuration
        Operating Mode is set properly
        UID reporting scheme is set properly
Host side configuration
        Host side Operating Mode is set properly
        LUN Mapping Mode is set properly
        Command Queue Depth is set properly
        UID distinguish is set properly
        UID reporting scheme is set properly
Network Configuration
        IP set properly
        Sub net mask is properly
        Default gateway set properly
        Server port number is set properly
v1a configuration check passed

Virtualization Engine host v1a verified successfully.
```

- **Setup Virtualization Engine Hosts**—Sets up the virtualization engine host, for example:

```
AVAILABLE VIRTUALIZATION ENGINE HOSTS

1) v1a
2) v1b
3) ALL
4) Return
Select option above:> 2


Checking for VEPASSWD env variable ......


v1a login success


Verifying Virtualization Engine host v1b........


Reading v1b configuration
Router Management config
        Host side WWN Authentications are set properly
        Host IP Authentications are set properly
        other VEHOST IP is set properly
Device side configuration
        Operating Mode is set properly
        UID reporting scheme is set properly
Host side configuration
        Host side Operating Mode is set properly
        LUN Mapping Mode is set properly
        Command Queue Depth is set properly
        UID distinguish is set properly
        UID reporting scheme is set properly
Network Configuration
        IP set properly
        Sub net mask is properly
        Default gateway set properly
        Server port number is set properly
v1b configuration check passed

Virtualization Engine host v1b verified successfully. Setup is not
required.
```

■ **Manage Configuration Files**—Gives you the following options:

```
 MANAGE CONFIGURATION FILES MENU

1) Display Virtualization Engine Map
2) Save Virtualization Engine Map
3) Verify Virtualization Engine Map
4) Help
5) Return
Select configuration option above:>
```

- **Display Virtualization Engine Map**—Displays the current configuration of the specified virtualization engine, for example:

```
Do you want to poll from live system (time consuming) or view from the file
[l|f]: f
VIRTUAL LUN SUMMARY

Diskpool  VLUN Serial      MP Drive   VLUN     VLUN      Size     Slic Zones
          Number           Target     Target   Name      GB
-----------------------------------------------------------------------------
t3b00     6257334F3030364D T49156     T16384   VDRV000   477.0    zone1,zone2
t3b01     6257334F3030364E T49157     T16385   VDRV001   477.0    zone1,zone2
t3b10     6257334F3030364F T49152     T16386   VDRV002   9.0
t3b10     6257334F30303650 T49152     T16387   VDRV003   9.0
...
*****
DISKPOOL SUMMARY
Diskpool  RAID  MP Drive  Size   Free Space  T3+ Active      Number of
                Target    GB     GB          Path WWN        VLUNs
-----------------------------------------------------------------------------
t3b00     5     T49156    477.2    0.2       50020F2300002E60    1
t3b01     5     T49157    477.2    0.2       50020F230000ACFC    1
t3b10     1     T49152    272.7  254.7       50020F2300000970    2
...
*****
MULTIPATH DRIVE SUMMARY
Diskpool  MP Drive  T3+ Active        Controller Serial
          Target    Path WWN                Number
--------------------------------------------------------------
t3b00     T49156    50020F2300002E60  60020F2000002E60
t3b01     T49157    50020F230000ACFC  60020F2000002E60
t3b10     T49152    50020F2300000970  60020F2000000970
...
*****
VIRTUALIZATION ENGINE SUMMARY
Initiator  UID              VE Host  Online  Revision  Number of SLIC Zones
-----------------------------------------------------------------------------
I00001     290000602200418A v1a      Yes     08.14               2
I00002     290000602200420C v1b      Yes     08.14               2
*****
ZONE SUMMARY
Zone Name       HBA WWN           Initiator  Online  Number of VLUNs
------------------------------------------------------------------
zone1           210000E08B04465C  I00001     Yes       2
zoneA           210000E08B042E80  I00001     Yes       0
Undefined       210100E08B24AA55  I00001     Yes       0
...
```

- **Save Virtualization Engine Map**—Saves the current configuration of the specified virtualization engine, for example:

```
 MANAGE CONFIGURATION FILES MENU

1) Display Virtualization Engine Map
2) Save Virtualization Engine Map
3) Verify Virtualization Engine Map
4) Help
5) Return
Select configuration option above:> 2

Saving Virtualization Engine map for v1........

Virtualization Engine map for v1 saved successfully.
```

- **Verify Virtualization Engine Map**—Verifies that the live configuration of the specified virtualization engine matches the saved configuration, for example:

```
 MANAGE CONFIGURATION FILES MENU

1) Display Virtualization Engine Map
2) Save Virtualization Engine Map
3) Verify Virtualization Engine Map
4) Help
5) Return
Select configuration option above:> 3

Verifying Virtualization Engine map for v1........

 checkvemap: VE map v1 verification complete: PASS.

Virtualization Engine map for v1 verified successfully.
```

- **Help**—Displays information that explains all the options.
- **Return**—Returns you to the Main Menu.

View Log Option

The View Log option on the Main Menu enables you to look at all the log entries or just the most recent 50 lines. The log contains messages about the configuration actions taken, for example:

```
...
Thu Nov 8 08:47:54 MST 2001 checkt3config: t3b0 EXIT: .
Thu Nov 8 08:52:07 MST 2001 showswitch: sw1a ENTER.
Thu Nov 8 08:52:08 MST 2001 showswitch: sw1a EXIT.
...
```

View Errors Option

The View Errors option on the Main Menu enables you to look at error messages. The View Errors menu presents the following options:

```
VIEW ERRORS MENU

1) All Errors
2) Today's Errors
3) Specific Date Errors
4) Return
Select option above:>
```

- **All Errors**—Displays all the errors that have been recorded.

- **Today's Errors**—Displays the errors that have been recorded since midnight in your time zone, for example:

```
VIEW ERRORS MENU

1) All Errors
2) Today's Errors
3) Specific Date Errors
4) Return
Select option above:> 2

TODAY's ERRORS
------------------

Mon Jan 7 09:25:31 MST 2002 modifyt3config: t3b2 ERROR : While executing created
iskpools command /opt/SUNWsecfg/bin/creatediskpools: 29174 Terminated.
Mon Jan 7 09:25:30 MST 2002 modifyt3config: t3b0 ERROR : While executing created
iskpools command /opt/SUNWsecfg/bin/creatediskpools: 29574 Terminated.
Mon Jan 7 09:25:30 MST 2002 modifyt3config: t3b1 ERROR : While executing created
iskpools command /opt/SUNWsecfg/bin/creatediskpools: 28757 Terminated.
Mon Jan 7 09:29:29 MST 2002 checkslicd: ERROR Specified daemon for VE pair v1 wa
s not found.
Mon Jan 7 09:29:30 MST 2002 checkslicd: ERROR Specified daemon for VE pair v1 wa
s not found.
```

- **Specific Date Errors**—Enables you to specify a date.

```
VIEW ERRORS MENU

1) All Errors
2) Today's Errors
3) Specific Date Errors
4) Return
Select option above:> 3

Please enter first three characters of the month name :(Ex- : Nov) :Jan

Please enter the day of the month :(Ex- : 8 or 15) :9

Please enter the year (4 digit format) :(Ex- : 2001 or 2002) :2002

Wed Jan 9 14:46:42 MST 2002 rmdiskpools: v1 ERROR, Unable to remove mpdrive T491
52 from diskpool t3b00. VE command exited with error 2.
```

Command Line Interface

You might prefer to run the configuration utilities from the command line rather than use the character user interface. The utilities for the maintenance of these components in the Sun StorEdge 3900 and 6900 series storage subsystems are given in the following subsections:

- Storage Service Processor Global Commands
- Storage Service Processor Sun StorEdge T3+ Array Commands
- Storage Service Processor Switch Commands
- Storage Service Processor Virtualization Engine Commands

Storage Service Processor Global Commands

The following are general utilities used to manage the Sun StorEdge 3900 and 6900 series storage subsystems.

The global Storage Service Processor commands are described briefly here. For a complete description of a command and its function, refer to the individual man(1) pages.

- `checkdefaultconfig`(1M) - Checks all switches, virtualization engines, and Sun StorEdge T3+ arrays in the Sun StorEdge 3900 and 6900 series subsystem against factory-set configurations or the latest snapshot files.

- `getcabinet`(1M) - Gets the cabinet configuration type for a Sun StorEdge 3900 or 6900 series configuration. The cabinet configuration type is based on the components discovered in the cabinet. The types of cabinets returned are 3910, 3960, 6910, and 6960.

- `getipaddr`(1M) - Gets and returns the IP address of a component.

- `listavailable`(1M) - Provides a list of the available component names from the `/etc/hosts` file for each Sun StorEdge 3900 or 6900 series storage subsystem. The list varies, based on the system that is queried. Components that are offline or busy are not listed.

- `removelocks`(1M) - Removes all the configuration lock files. If the processes are active, the locks will not be removed.

- `runsecfg`(1M) - The menu-driven character user interface to the configuration utility is accessed using the `runsecfg` command. Refer to "Menu-Driven Interface" on page 46 for detailed information.

- `setdefaultconfig`(1M) - Sets all switches, virtualization engines, and Sun StorEdge T3+ arrays in the Sun StorEdge 3900 or 6900 series storage subsystem to the default configurations.

Caution – All data is destroyed when the `setdefaultconfig` command is executed.

- `showerrors`(1M) - Displays errors logged into the `/var/adm/log/SEcfglog` log file.
- `showlogs`(1M) - Displays either the complete log file or the number of lines specified from the file, which is located in `/var/adm/log/SEcfglog`.

Storage Service Processor Sun StorEdge T3+ Array Commands

The commands in this subsection are used to manage the Sun StorEdge T3+ arrays that are attached to the Sun StorEdge 3900 and 6900 series storage subsystems.

These utilities use a `PASSWD` environment variable as the Sun StorEdge T3+ array password for `telnet`(1) session login. If this environment variable is not set, the utility tries to log in without a password.

Note – If your passwords on the Sun StorEdge T3+ array are null, do not set this variable. Also, only use this variable if you use the same password for each Sun StorEdge T3+ array.

```
msp0# PASSWD=password
msp0# export PASSWD
```

If the environment variable is not set to the Sun StorEdge T3+ password, the command fails.

The commands to configure the Sun StorEdge T3+ array are described briefly here. For a complete description of a command and its function, refer to the individual `man`(1) pages.

- `checkt3config`(1M) - Checks the current Sun StorEdge T3+ array configuration with the previously saved configuration. This checking is done by running the Sun StorEdge T3+ array commands `ver`, `vol list`, `vol stat`, `port list`, `port listmap`, `sys list`, and `fru stat` and comparing the output with the previously stored configuration information. Any changes to the information are reported.

- `modifyt3config`(1M) - Configures Sun StorEdge T3+ arrays to user-specified options and updates the configuration snapshot file.
- `modifyt3params`(1M) - modifies the parameters of the Sun StorEdge T3+ arrays. This command does not alter existing LUN configurations.
- `restoret3config`(1M) - Restores Sun StorEdge T3+ array configurations with static saved configurations from the snapshot file. This functionality might be needed in case of loss of LUNs or the replacement of Sun StorEdge T3+ arrays. The Sun StorEdge T3+ array configuration is restored to the previously saved configuration.

  By default, this utility compares the existing configuration with the saved one. If they are identical, the saved configuration is not restored. If the configuration is the same but the LUNs are in an unmounted state, the command will attempt to mount the LUNs. If no checks with the saved configuration are needed, you must specify the `-f` (force) option.

Caution – If a LUN is not mounted, `restoret3config` performs a mount on that LUN. However, if any of the RAID configuration information is different, you might lose data. To avoid this, run the `checkt3config` command to verify that the RAID configuration has not changed before using the `restoret3config` command.

- `savet3config`(1M) - Writes the latest information from the Sun StorEdge T3+ array into the snapshot file.
- `showt3`(1M) - Reads and displays information from Sun StorEdge T3+ arrays. `showt3` uses some Sun StorEdge T3+ internal commands to obtain information. The Sun StorEdge T3+ commands include `vol list`, `vol stat`, `port list`, and `port listmap`.

Storage Service Processor Switch Commands

The following are utilities used to manage the Sun StorEdge network FC Switch-8 and Switch-16 switches that are used in Sun StorEdge 3900 and 6900 series storage subsystems.

For a complete description of a command and its function, refer to the individual `man`(1) pages.

- `checkswitch`(1M) - Verifies that the current configuration on the switch matches the predefined static configuration based on cabinet type and switch location.
- `setswitchflash`(1M) - Downloads the flash code to the Sun StorEdge Network FC Switch-8 or Switch-16 switch and resets it. The flash code is automatically loaded from the appropriate file from the `/usr/opt/SUNWsmgr/flash` directory unless an alternate file is specified with the `-f` option.

- setswitchsl(1M) - Given a Sun StorEdge T3+ array name setswitchsl configures all switch ports in the associated zone on both switches (down both paths) to be SL mode. This command can also be used to return ports to the default setting. This command is valid only on Sun StorEdge 3900 series subsystems.

- setupswitch(1M) - Configures a switch with predefined static configuration information, based on the type of Sun StorEdge 3900 or 6900 series configuration.

- showswitch(1M) - Displays configuration information about a switch. The information includes the following:

  - IP address configuration

  - Version

  - Port status and type

  - Zones

Storage Service Processor Virtualization Engine Commands

The Sun StorEdge 6900 series configuration utilities discussed in this subsection are used to change the configuration of the virtualization engine. The configuration utilities can be accessed by the menu-driven interface or individually.

After the StorEdge 6900 series systems are powered on and tested, the default settings of the virtualization engine can be changed to meet the SAN environment in which the system is installed.

Some of these utilities use a VEPASSWD environment variable as the virtualization engine password for telnet(1) session login. The commands that use the VEPASSWD variable include checkve(1M), resetsandb(1M), resetve(1M), setupve(1M), and restorevemap(1M). If this environment variable is not set, these utilities try to log in without a password.

Note – If your passwords on the virtualization engines are null, do not set this variable. Also, only use this variable if you use the same password for each virtualization engine.

```
msp0# VEPASSWD=password
msp0# export VEPASSWD
```

If the environment variable is not set to the virtualization engine password, the command fails.

The commands to configure the virtualization engine are described briefly here. For a complete description of a command and its function, refer to the individual man(1) pages.

- addtovezone(1M) - Adds a VLUN to the virtualization engine name, initiator, and zone name specified.

- checkslicd(1M) - Verifies that the slicd daemon is running and communicating with the virtualization engine

- checkve(1M) - Checks the parameter settings of the virtualization engine. The parameter settings include the Ethernet settings, host side settings, device side settings, and SV management programs.

- checkvemap(1M) - Verifies that the live configuration of the virtualization engine matches the saved configuration for that virtualization engine.

- creatediskpools(1M) - Creates disk pools that map to physical LUNs on the specified Sun StorEdge T3+ array. These disk pools can then be used to create VLUNs. This command is typically called by the modifyt3config command and not run directly by the user.

- createvezone(1M) - Creates an HBA alias and zone of the same name for the virtualization engine, initiator, and WWN specified.

- createvlun(1M) - Creates VLUNs for the virtualization engine, disk pool, size, and number specified.

- delfromvezone(1M) - Removes a VLUN from the zone specified by the virtualization engine, initiator, and zone name specified.

- getdpspace(1M) - Returns the available space in the disk pool in Gbytes.

- listve(1M) - Returns a list of the specified virtualization engine components that are found by querying the system.

- listvemap(1M) - Returns a list of the specified virtualization engine components from the configuration map file. This command provides better performance than the listve command, if the virtualization engine map file is up to date.

- resetsandb(1M) - Clears the SAN databases on the virtualization engines and resets both engines.

- resetve(1M) - Resets the specified virtualization engine.

- restorevemap(1M) - Restores the configuration from the saved map file to the specified virtualization engine.

- rmdiskpools(1M) - Removes disk pools and all VLUNs in the disk pool for the specified Sun StorEdge T3+ array LUNs. This command is typically used when you are performing a reconfiguration of the Sun StorEdge T3+ array. This command is typically called by the modifyt3config command and not run directly by the user.

- rmvezone(1M) - Removes the zone for the virtualization engine, initiator, and zone name specified.

- `rmvlun`(1M) - Removes the VLUN for the virtualization engine, disk pool, and VLUN target ID specified.
- `savet3map`(1M) - Records all Sun StorEdge T3+ array configuration information in a file that can be used by the virtualization engine.
- `savevemap`(1M) - Saves the current configuration of the specified virtualization engine in a map file.
- `setupve`(1M) - Sets the parameters to the default values for the specified virtualization engine. The parameter settings include the Ethernet, host side settings, device side settings, and SV management programs.
- `showvemap`(1M) - Displays the current configuration saved in the map file for the specified virtualization engine.
- `startslicd`(1M) - Starts the `slicd` daemon on the Storage Service Processor of the Sun StorEdge 6900 series storage subsystem. The `slicd` provides the communication channel between the virtualization engines and the Sun StorEdge 6900 series subsystems.

Fault Detection and Isolation Overview

This chapter provides a brief overview of the functionality provided when using the Storage Automated Diagnostic Environment software to perform fault detection and isolation on the Sun StorEdge 3900 and 6900 series subsystems.

For detailed instructions on configuring and using the Storage Automated Diagnostic Environment, refer to the *Storage Automated Diagnostic Environment User's Guide.*

This chapter is organized as follows:

- "Monitoring" on page 81
- "Fault Detection" on page 82
- "Fault Isolation" on page 83

Monitoring

If the customer's host is part of the configuration, monitoring of the individual components is done by Storage Automated Diagnostic Environment through the out-of-band paths connected directly to the host server.

Out-of-band refers to the connections and devices that are not in the data path. The Storage Service Processor does not have access to the data that is stored on the Sun StorEdge 3900 and 6900 series storage subsystems.

Fault Detection

The Storage Automated Diagnostic Environment software running on the Storage Service Processor collects and evaluates information about devices out-of-band to all storage devices in the Sun StorEdge 3900 and 6900 series cabinet.

One way in which the Storage Service Processor can have access to the in-band diagnostic information is to have a Storage Automated Diagnostic Environment software running on the customer host that relays information to the Storage Service Processor so that it can send the information to Sun service for monitoring purposes.

Local Monitoring

The Storage Automated Diagnostic Environment software has the ability to be configured to send alerts and events to a mail(1) address or even a pager address.

Customers not interested in remote monitoring or not concerned about security may choose to allow local monitoring of the Sun StorEdge 3900 and 6900 series products only. In this case, the customer has two choices:

- Allow the Storage Service Processor to be connected to their management LAN and have access to one or more of their host servers.
- Provide a standalone workstation to be connected to the Storage Service Processor as a dedicated resource that will be staffed 24 hours a day, 7 days a week.

If you already have a license for Sun Remote Services NetConnect service (SRS), you can choose that method to pass alerts and event status messages to Sun. In that situation, the Storage Automated Diagnostic Environment software is configured as a slave on the Storage Service Processor. The master system running Storage Automated Diagnostic Environment software is located on the host where SRS is running. The slave sends all of its alert and event traffic over the customer's management LAN to the SRS host server for shipment to Sun. The master system running the Storage Automated Diagnostic Environment software is optionally configured to send email or pager messages locally.

If the customer uses the management LAN connection without host SRS support, the Storage Automated Diagnostic Environment software can be set up to send email or pager message notification when an alert or event occurs. To use this service, the customer must allow access to a host server containing email or pager message service. The Storage Automated Diagnostic Environment software on the Storage Service Processor is then configured as a slave and send all of its alert and event traffic to the master system running the Storage Automated Diagnostic Environment software on the customer's host server. The master system is responsible for forwarding the traffic through the specified medium.

If you do not want any connection between the Storage Service Processor and the host servers, a dedicated workstation can be attached to the Storage Service Processor. The Storage Automated Diagnostic Environment software on the Storage Service Processor configured as a master sends the messages to that resource. That solution requires you to do both of the following:

■ Provide a full-time person to monitor the workstation

■ Report serviceable action items to Sun in a timely manner to comply with the service contract

Remote Monitoring

Fault detection, using the Sun StorEdge Remote Response service, is enabled through the Storage Automated Diagnostic Environment provider function. The Storage Automated Diagnostic Environment events and alarms are the result of configuring polling devices to be monitored. The polling results are generated when changes to the state and status of these devices are detected.

Events and alarms are sent through a preconfigured modem to servers that receive them. Based on several conditions, such as type and severity, a support person might be paged. The Sun StorEdge Remote Response service offering is enabled in the Storage Automated Diagnostic Environment software using the provider function in the maintenance section of the administration GUI.   When enabled, the service phones events to Sun and alerts the Sun StorEdge Remote Response solution centers by way of `uucp`(1) though the modems.

Fault Isolation

The remote diagnostics capabilities of the Storage Automated Diagnostic Environment software are limited to running the Sun StorEdge Network FC Switch-8 and Switch-16 `switchtest`(1M) when only the service processor is available.

The diagnostic capabilities of the service processor are not affected by having the remote connection, because access to the console connection of the Storage Service Processor is possible. The diagnostics for the Storage Service Processor must pass the power-on self-test (POST) and successfully boot the Solaris operating environment. The POST diagnostics are monitored using remote access to the Storage Service Processor console.

Storage Service Processor Software Setup Instructions

This chapter gives step-by-step instructions for setting up the software on the Storage Service Processor in the Sun StorEdge 3900 and 6900 series. All Storage Service Processors are configured in the factory as a Master Storage Service Processor (MSP), which gives them the primary role of aggregating multiple Storage Service Processors into one administrative point as well as controlling the alerts and forwarding them to the designated service providers.

If you only have one Sun StorEdge 3900 or 6900 series system, it is not necessary to make any changes to the hostname or IP address.

The IP addressing of the aggregation of Storage Service Processors is dictated by the `/etc/inet/hosts` file. The default settings in that file for all Storage Service Processors that Sun ships with the IP address set to `10.0.0.10` and the name `msp0`

This chapter is organized as follows:

- "To Make a Connection to the Storage Service Processor from an Onsite System" on page 86
- "To Make a Connection to the Storage Service Processor from a Remote System" on page 86
- "To Set the Host Name" on page 87
- "To Set the IP Address" on page 90
- "To Set the Date and Timezone" on page 91
- "To Verify the Configuration" on page 91
- "To Attach a Sun StorEdge 3900 or 6900 Series to a LAN" on page 92

▼ To Make a Connection to the Storage Service Processor from an Onsite System

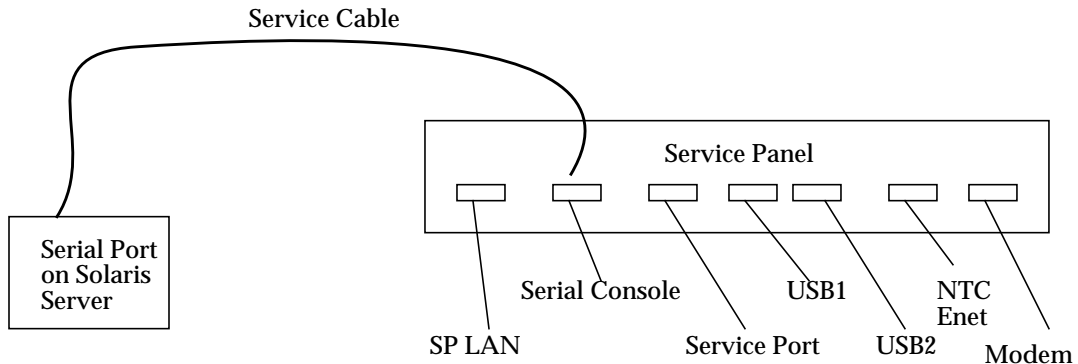**1. Connect one end of the service cable (part number 530-2093-01) onto the Serial Console Port of the Service Panel.**

Service Cable

```
Serial Port
on Solaris
Server
```

Service Panel

SP LAN

Serial Console

Service Port

USB1

USB2

NTC
Enet

Modem

FIGURE 7-1   Connecting the Service Cable to a Solaris Service

2. Connect the other end to an available serial port on your onsite Solaris system.

Note – The DB9 (part number 530-3100-01) and DB25 (part number 530-2889-03) adapters, shipped with each unit, are used to make this connection.

3. From the onsite system establish a connection to the Storage Service Processor.

The commands used to make the connection will vary depending on the onsite system. For example, from a Solaris server you could type:

```
# tip -9600 /dev/ttyX
Connected
```

Once the connection is made, press Return.

▼ To Make a Connection to the Storage Service Processor from a Remote System

1. Establish a remote connection to the site through the Sun StorEdge Remote Response modem.

> **Note –** There is no remote service capabilities if the site has not purchased the Sun StorEdge Remote Response optional software.

2. **Connect one end of the service cable (part number 530-2093-01) onto the Service Port of the Service Panel on the Sun StorEdge 3900 or 6900 series subsystem that is connected to the modem.**

3. **Connect the other end of the service cable (part number 530-2093-01) to the Serial Console Port of the Service Panel on the Sun StorEdge 3900 or 6900 series subsystem that is to be remotely configured.**

4. **Log into the Storage Service Processor that is attached to the modem and make a** tip**(1) connection to** /dev/ttyb**.**

```
# tip -9600 /dev/ttyb
Connected
```

Once the connection is made, press Return.

▼ To Set the Host Name

Setting the hostname of a Storage Service Processor is necessary in only two situations:

- You have purchased multiple cabinets to be installed in the same geographical vicinity with no requirements for administrative access.
- You require that the Storage Service Processors be part of your management LAN and accessible through your infrastructure. In order to do this there are two items to consider:
  - Which naming service is being used for your intranet infrastructure.

    The Storage Service Processor boots the Solaris 8 operating environment, so it is important that you have the necessary expertise to manage the network. You must also be knowledgeable about using the sys-unconfig(1M) utility. Additional information in available from the Solaris administration guides.
  - Whether or not you are using the Sun StorEdge Remote Response software.

    If the installation is to take advantage of the Sun StorEdge Remote Response service and maintain your access to the tools required to manage to the storage solution, the balance between remote access and security is a consideration.

1. **Make a connection to the Storage Service Processor.**

- If you have the Sun StorEdge Remote Response option install, refer to "To Make a Connection to the Storage Service Processor from a Remote System" on page 86 for instructions.

- If you are connecting from an system that is at the save location, refer to "To Make a Connection to the Storage Service Processor from an Onsite System" on page 86 for instructions.

2. **Log into the Storage Service Processor and make a** `tip`**(1) connection to** `/dev/ttyb`**.**

```
# tip -9600 /dev/ttyb
```

Once the connection is made, press Return.

3. **Log in as root.**

```
msp0 console login: root
Password: password
```

4. **If necessary, change the host name entry in each of the following files:**

■ `/etc/inet/hosts`

```
# Internet host table

127.0.0.1 localhost
#
10.0.0.10 msp0.localdomain     msp0  loghost #Master Service Processor

10.0.0.3  ntc0                 # Network Terminal Concentrator
10.0.0.11 ssp1.localdomain ssp1  # Slave Service Processor
10.0.0.12 ssp2.localdomain ssp2  # Slave Service Processor
10.0.0.13 ssp3.localdomain ssp3  # Slave Service Processor
#
192.168.0.1   sp0             # dmfe1 Ethernet Port
#
192.168.0.20  v1a             # Vicom Virtual Engine
192.168.0.21  v1b             # Vicom Virtual Engine
192.168.0.22  v2a             # Vicom Virtual Engine
192.168.0.23  v2b             # Vicom Virtual Engine
#
192.168.0.30  sw1a            # SAN FC Switch (8 / 16 port)
192.168.0.31  sw1b            # SAN FC Switch (8 / 16 port)
192.168.0.32  sw2a            # SAN FC Switch (8 / 16 port)
192.168.0.33  sw2b            # SAN FC Switch (8 / 16 port)
#
192.168.0.40  t3b0            # T3+
192.168.0.41  t3b1            # T3+
192.168.0.42  t3b2            # T3+
192.168.0.43  t3b3            # T3+
#
192.168.0.50  t3be0           # T3+ (Expansion)
192.168.0.51  t3be1           # T3+ (Expansion)
192.168.0.52  t3be2           # T3+ (Expansion)
192.168.0.53  t3be3           # T3+ (Expansion)
192.168.0.54  t3be4           # T3+ (Expansion)
```

Note – The `/etc/inet/hosts` file entry for your host name must include the IP address of your host and the word `loghost` at the end of the line.

■ `/etc/nodename`

```
ssp1
```

■ `/etc/hostname.dmfe0`

```
ssp1
```

■ `/etc/net/ticlts/hosts`

```
#ident "@(#)hosts  1.2  92/07/14 SMI"  /* SVr4.0 1.2  */
# RPC Hosts
ssp1.localdomain     ssp1.localdomain
```

■ `/etc/net/ticots/hosts`

```
#ident "@(#)hosts  1.2  92/07/14 SMI"  /* SVr4.0 1.2  */
# RPC Hosts
ssp1.localdomain     ssp1.localdomain
```

■ `/etc/net/ticotsord/hosts`

```
#ident "@(#)hosts  1.2  92/07/14 SMI"  /* SVr4.0 1.2  */
# RPC Hosts
ssp1.localdomain     ssp1.localdomain
```

5. **Reboot the Storage Service Processor, for example:**

```
# /usr/sbin/reboot
```

▼ To Set the IP Address

1. **Make a connection to the Storage Service Processor.**
   ■ If you have the Sun StorEdge Remote Response option install, refer to "To Make a Connection to the Storage Service Processor from a Remote System" on page 86 for instructions.
   ■ If you are connecting from an system that is at the save location, refer to "To Make a Connection to the Storage Service Processor from an Onsite System" on page 86 for instructions.

2. **Change the `/etc/inet/hosts` file so that the Storage Service Processor entry reflects the correct IP address. See the `hosts`(4) man page for details.**

▼ To Set the Date and Timezone

The date and time zone are initially set during the Solaris installation. You can change the date by using the date(1) command and change the time zone by editing the /etc/TIMEZONE file, which sets the TZ variable. See the TIMEZONE(4) man page for details.

▼ To Verify the Configuration

Once the Storage Service Processor reboots, you should verify the changes.

■ The console login prompt should reflect the proper name for the Storage Service Processor, for example:

```
ssp1 Console Login:
```

■ Use the ifconfig(1M) command to verify the IP address information, for example:

```
ssp1: root# /usr/sbin/ifconfig -a
lo0: flags=1000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4> mtu 8232 index 1
        inet 127.0.0.1 netmask ff000000
dmfe0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 2
        inet 10.0.0.11 netmask ff000000 broadcast 10.255.255.255
        ether 1:2:34:56:7:89
dmfe1: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 3
        inet 192.168.0.1 netmask ffffff00 broadcast 192.168.0.255
        ether 1:2:34:56:7:89
ssp1: root#
```

■ Use the uname(1) command to verify the name associated with the Storage Service Processor, for example:

```
ssp1: root# /bin/uname -n
ssp1
```

■ Plug the network cable connection (part number 530-1871-04) into the Storage Service Procesor LAN port on the front of the Service Panel and test the network by entering the following:

```
ssp1: root# ping msp0
msp0 is alive
```

▼ To Attach a Sun StorEdge 3900 or 6900 Series to a LAN

There can be many considerations when connecting a Sun StorEdge 3900 or 6900 series subsystem to the customer's LAN. These instructions assume:

■ The Storage Automated Diagnostic Environment is configured properly and functioning.

■ None of the system files on the Storage Service Processor have been altered since the Sun StorEdge 3900 or 6900 series subsystem arrived.

■ Sun trained personnel are performing these steps and understand how Solaris communicates on a network.

■ The customer is using the NIS naming service.

1. **Type:**

```
# /usr/sbin/sys-unconfig
```

2. **Refer to the Solaris 8 System Administration Collection for detailed instructions on configuring your internet.**

Sun StorEdge 3900 and 6900 Series Setup Instructions

This chapter provides a listing of the tasks that should be performed when setting up Sun StorEdge 3900 and 6900 series systems.

This chapter is organized as follows:

- "Sun StorEdge 3900 and 6900 Series Setup" on page 93
- "To Configure a Sun StorEdge 3900 Series" on page 93
- "To Configure a Sun StorEdge 6900 Series" on page 94

Sun StorEdge 3900 and 6900 Series Setup

Both the Sun StorEdge 3900 and 6900 series are delivered with the same configuration of all Sun StorEdge T3+ array partner groups, as defined in Chapter 3. The first step in configuring the 3900 or 6900 series is to determine if the default configuration is appropriate for the expected workload.

The Sun StorEdge T3+ array partner groups can be reconfigured using the configuration utilities as described in Chapter 5.

▼ To Configure a Sun StorEdge 3900 Series

The following is a list of the tasks that should be performed when setting up a Sun StorEdge 3900 series.

1. Connect the FC HBA pairs to the Sun StorEdge 3900 series switches. Plug both HBAs in a redundant pair into the same port on both switches to establish connectivity to both ports on the Sun StorEdge T3+ array partner group.

2. Determine the appropriate setting for the switch port. For example, Solaris servers should connect to the default F port setting (see Chapter 11), while an NT server will require an SL port (see Chapter 12).

3. Determine what multipathing software the host will be using. Solaris servers using Sun StorEdge Traffic Manager will use the default Sun StorEdge T3+ array `mp_support` system parameter, and no additional changes are necessary. Systems using VERITAS DMP will require the Sun StorEdge T3+ array `mp_support` system parameter be changed to `rw`. This can be accomplished by running the `modifyt3params`(1M) command on the service processor.

▼ To Configure a Sun StorEdge 6900 Series

Configuring the Sun StorEdge 6900 series is a multiple step process. The Sun StorEdge 6900 series enables the user to carve the underlying storage LUN into several smaller devices called VLUNs. To prevent data corruption, the Sun StorEdge 6900 series uses a security feature called LUN masking to present a set of VLUNs to only the specified HBAs.

LUN masking is enabled by creating virtualization engine zones that contain both HBA and VLUN devices. For redundancy, it is recommended that each attached host have a minimum of two HBA connections to the Sun StorEdge 6900 series, and to enable host-based mutlipathing (for example, Sun StorEdge Traffic Manager) using the redundant HBA pair. Each VLUN presented to the host is added to virtualziation engine zones associated with both HBAs, and the host sees the VLUNs down both channels.

The following is a list of the tasks that should be performed when setting up a Sun StorEdge 6900 series.

1. At initial installation, attach all FC HBA pairs to the Sun StorEdge 6900 series switches (one HBA per switch in the redundant pair).

2. After all HBAs are attached and the LEDs on the switch indicate they are online, run the command:

```
# /opt/SUNWsecfg/bin/savevemap -n [v1|v2]
```

If you are using the GUI, select Sun StorEdge Series Config, then go to Manage Config Files, and select Save Virtualization Engine Map. Once the virtualization engine maps are saved, the HBAs are available to set up zoning (LUN masking).

3. On each host attached to the Sun StorEdge 6900 series, determine the WWN for each channel (see Chapter 11).

4. Create a virtualization engine zone for each HBA (see Chapter 5). Through the `runsecfg`(1M) menu, select Virtualization Engine Configuration Utility, then select Manage Virtualization Engine Zones, and finally Create Virtualization Engine Zone for each initiator associated with the virtualization engine pairs. When an initiator is selected, a list of available HBAs are displayed. Select one from the list, match it to the correct host and channel, and enter a name for the virtualization engine zone.

5. After the virtualization engine zones have been created, create VLUNs and assign them to the virtualization engine zones associated with the redundant HBAs from a host (see Chapter 5 and Chapter 11). Through the `runsecfg` menu, first select Virtualization Engine Configuration Utility, then Manage VLUNs, and finally Create VLUNs. Then select the diskpool from which to create the VLUNs, specify the number and size of VLUNs, and choose one zone from each virtualization engine initiator to assign the new VLUNs.

Note – You must select two zones at this point. If you do not have two HBAs to present the VLUNs, do not specify zones. Create the VLUNs first, then use the Manage Virtualization Engine Zones, Add Components to Virtualization Engine Zone `runsecfg` options to add VLUNs to only one virtualization engine zone.

After each step, the virutalization engine pair will be unavailable for configuration for a few minutes while the configuration details are saved.

Repair and Replacement

This chapter contains the software instructions for repair and replacement of field replaceable units (FRUs) in the Sun StorEdge 3900 and 6900 series storage subsystems.

This chapter is organized as follows:

- "Field Replaceable Units" on page 97
- "To Replace the Ethernet Hub" on page 98
- "To Replace a Sun StorEdge FC Switch" on page 98
- "To Replace a Sun StorEdge T3+ Array" on page 99
- "To Replace the Storage Service Processor With Remote Response Installed" on page 102
- "To Replace the Storage Service Processor Without Remote Response Installed" on page 104
- "To Service the Storage Service Processor" on page 105
- "To Replace a Virtualization Engine" on page 106

Field Replaceable Units

All components of the Sun StorEdge 3900 and 6900 series storage subsystems are FRUs:

- Ethernet hub
- Sun StorEdge Network FC Switch-8 and Switch-16 switches
- Storage Service Processor (Netra)
- Virtualization Engine

Most parts of the Sun StorEdge T3+ arrays can be changed while the systems are in service. The hot-swappable parts include disk drives, the power supply, the controller, and the interconnect card (loop card). It is not possible to replace the midplane in the field.

▼ To Replace the Ethernet Hub

Refer to the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual* for instructions.

▼ To Replace a Sun StorEdge FC Switch

1. **Identify which Sun StorEdge Network FC Switch-8 or Switch-16 switch must be replaced.**

Note – Verify that the hosts connected to this switch have switched their path over to the other switch.

---

2. **Unplug the GBIC from the ports on the defective switch and note the port numbers.**

3. **Turn off the defective switch.**

4. **Remove the defective switch.**

Refer to the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual* for instructions.

5. **Identify the new media access control (MAC) address for the switch.**

The MAC address for the Sun StorEdge Network FC Switch-8 or Switch-16 switches is a 12-digit number that is printed on a label attached to the back of the switch.

6. **Change the MAC address in the** `/etc/ethers` **file on the Storage Service Processor to that of the new switch. See the** `ethers`**(4) man page for details. For example:**

```
8:0:20:7d:93:7e switch-name
```

7. **Ensure that the RARP daemon (`in.rarpd`(1M)) is running on the Storage Service Processor.**

```
msp0# ps -eaf | grep rarpd
root     317   314   0     Sep 28 ?         0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

If the daemon is not running, start it with the following command:

```
msp0# /usr/sbin/in.rarpd dmfe 1
```

8. **Plug the GBIC into the ports on the new switch.**

Make sure you use the same ports you noted in Step 2.

9. **Install and turn on the new switch.**

10. **Log into the Storage Service Processor and start the `runsecfg`(1M) menu-driven character user interface.**

11. **Select Switch Configuration Utility from the Main Menu.**

12. **Select the Download Switch Flash option from the main switch submenu.**

13. **Select the switch host name that you replaced from the switch selection list.**

14. **When returned to the main switch submenu, select the Set Switch Config option.**

15. **Select the switch host name that you replaced.**

16. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

17. **Bring up Storage Automated Diagnostic Environment and replace the old switch name with the new one.**

Refer to the *Storage Automated Diagnostic Environment User's Guide* for detailed instructions on device discovery.

▼ To Replace a Sun StorEdge T3+ Array

For additional information about Sun StorEdge T3+ array replacement, refer to the *Sun StorEdge T3 and T3+ Array Installation, Operation, and Service* manual and the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual.*

1. **Determine which Sun StorEdge T3+ array should be replaced.**

2. **Turn off the partner group and disconnect the interconnect cables.**

   Refer to the *Sun StorEdge T3 and T3+ Array Installation, Operation, and Service* manual for information on disconnecting the cables.

3. **Remove the defective Sun StorEdge T3+ array. If it is the alternate in the partner group, skip to Step 7.**

4. **Identify the new MAC address for the Sun StorEdge T3+ array.**

   The MAC address of the Sun StorEdge T3+ array can be found on a card inside the front cover of the device.

5. **Change the MAC address from the defective Sun StorEdge T3+ array to the replacement Sun StorEdge T3+ array in the** `/etc/ethers` **file on the Storage Service Processor. See the** `ethers`**(4) man page for details. For example:**

   ```
   8:0:20:7d:93:7e  Sun-StorEdge-T3+-name
   ```

6. **Ensure that the RARP daemon (**`in.rarpd`**(1M)) is running on the Storage Service Processor.**

```
msp0# /bin/ps -eaf | grep rarpd
root     317   314   0     Sep 28 ?          0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

   If the daemon is not running, start it with the following command:

   ```
   msp0# /usr/sbin/in.rarpd dmfe 1
   ```

7. **Install the new Sun StorEdge T3+ array and turn on the partner group.**

8. **Use** `telnet` **to open a session with one Sun StorEdge T3+ array.**

   ```
   # /bin/telnet t3b0
   login: root
   Password: <Return>
   T3B Release 2.00 2001/07/12 19:35:12 (192.168.0.1)
   Copyright (C) 1997-2001 Sun Microsystems, Inc.
   All Rights Reserved.
   ```

9. **Type:**

```
:/:<1> .ftp 192.168.0.1
login: cmdadm
Password: password
> get /opt/SUNWsecfg/etc/syslog.conf /etc/syslog.conf
> quit
```

10. **Log into the Storage Service Processor and access the** `runsecfg`**(1M) menu-driven character user interface.**

11. **Select T3+ Configuration Utility from the Main Menu.**

12. **Select the Restore T3+ Config option.**

13. **Select the Sun StorEdge T3+ host name you replaced.**

14. **Select the All option to restore all Sun StorEdge T3+ array LUNs on that partner group.**

15. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

16. **Bring up Storage Automated Diagnostic Environment and replace the old Sun StorEdge T3+ array name with the new one.**

   Refer to the *Storage Automated Diagnostic Environment User's Guide* for detailed instructions on Sun StorEdge T3+ array discovery.

Replacing the Storage Service Processor

The procedure you use to replace the Storage Service Processor depends on whether you have the Sun StorEdge Remote Response option installed on the system.

▼ To Replace the Storage Service Processor With Remote Response Installed

1. **If possible, verify the host name of the Storage Service Processor that is being replaced.**

   Make a note of the host name.

   ```
   msp0# /bin/uname -n
   msp0
   msp0#
   ```

2. **Replace the defective Storage Service Processor.**

   Refer to the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual* for instructions.

3. **Establish a connection to the Storage Service Processor.**

   Depending on your configuration, refer to either "To Make a Connection to the Storage Service Processor from an Onsite System" on page 86 or "To Make a Connection to the Storage Service Processor from a Remote System" on page 86 for instructions.

4. **Login as root:**

   ```
   Console login: root
   Password: password
   ```

5. **Change all references of the host name to the name returned in Step 1 into the following files:**
   - `/etc/nodename`
   - `/etc/hostname.dmfe0`
   - `/etc/net/ticlts/hosts`
   - `/etc/net/ticots/hosts`
   - `/etc/net/ticotsord/hosts`
   - `/etc/inet/hosts`

6. **Change the Storage Service Processor LAN entry in the** `/etc/netmasks` **file so that it matches your** *local-IP-address*. **See the** `netmasks`**(4) man page for details.**

7. **Add the appropriate entries for the Sun StorEdge Network FC Switch-8 or Switch-16 switch, virtualization engines, and the Sun StorEdge T3+ arrays into the** `/etc/ethers` **file. See the** `ethers`**(4) man page for details.**

8. **Change the root password.**

9. **Set the** /etc/TIMEZONE **file to the desired timezone. A typical line from the** /etc/timezone **file appears as follows:**

```
US/Eastern        East.Sun.COM  # Sun East Coast
```

See the timezone(4) man page for details.

10. **Reboot the Storage Service Processor.**

```
msp0# /etc/reboot
```

11. **Attach the Storage Service Processor** dmfe 1 **port to the Ethernet hub on the Sun StorEdge 3900 or 6900 series LAN.**

12. **Reconnect all remaining cables.**

13. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

14. **Bring up Storage Automated Diagnostic Environment and replace the old Storage Service Processor name with the new one.**

Refer to the *Storage Automated Diagnostic Environment User's Guide* for detailed instructions on Storage Service Processor discovery.

15. **Notify the Remote Solutions Support Center that you have replaced the Storage Service Processor.**

The support center will reload all necessary configuration files and verify that the correct version of software is loaded.

▼ To Replace the Storage Service Processor Without Remote Response Installed

1. If possible, verify the host name of the Storage Service Processor that is being replaced.

Make a note of the host name.

```
msp0# uname -n
msp0
msp0#
```

2. Replace the defective Storage Service Processor.

Refer to the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual* for instructions.

3. Establish a connection to the Storage Service Processor.

Depending on your configuration, refer to either "To Make a Connection to the Storage Service Processor from an Onsite System" on page 86 or "To Make a Connection to the Storage Service Processor from a Remote System" on page 86 for instructions.

4. Log in as root:

```
console login: root
```

5. Change all references of the host name to the name returned in Step 1 into the following files.
   - `/etc/nodename`
   - `/etc/hostname.dmfe0`
   - `/etc/net/ticlts/hosts`
   - `/etc/net/ticots/hosts`
   - `/etc/net/ticotsord/hosts`
   - `/etc/inet/hosts`

6. Change the Storage Service Processor LAN entry in the `/etc/netmasks` **file so that it matches your** *local-IP-address*. **See the** `netmasks`**(4) man page for details.**

7. Add the appropriate entries for the Sun StorEdge Network FC Switch-8 or Switch-16 switch, virtualization engines, and the Sun StorEdge T3+ arrays into the `/etc/ethers` **file.**

8. Change the root password.

9. **Set the** `/etc/TIMEZONE` **file to the desired timezone. A typical line from the** `/etc/timezone` **file appears as follows:**

```
US/Eastern        East.Sun.COM  # Sun East Coast
```

See the `timezone`(4) man page for details.

10. **Reboot the Storage Service Processor.**

```
msp0# /etc/reboot
```

11. **Attach the Storage Service Processor** `dmfe 1` **port to the Ethernet hub on the Sun StorEdge 3900 or 6900 series LAN.**

12. **Reconnect all remaining cables.**

13. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

14. **Bring up Storage Automated Diagnostic Environment and replace the old Storage Service Processor name with the new one.**

Refer to the *Storage Automated Diagnostic Environment User's Guide* for detailed instructions on Storage Service Processor discovery.

15. **Type:**

```
msp0# /opt/SUNWsecfg/bin/savet3config -n all
msp0# /opt/SUNWsecfg/bin/savevemap -n [v1,v2]
```

▼ To Service the Storage Service Processor

If you must log into the Storage Service Processor that has the Sun StorEdge Remote Response option installed and enabled, you need to respond to the one-time passwords in everything (OPIE) security challenge.

Instructions for replacing the Storage Service Processor can be found in the *Sun StorEdge Hardware Installation and Service Manual* (part number 816-3244-10).

The following procedure gives the instructions for responding to the challenge. This procedure is mandatory each time you log into a Storage Service Processor.

1. **Connect to the Storage Service Processor using** `telnet`**(1).**

```
# /bin/telnet 10.n.n.n
Trying 10.0.0.10...
Connected to 10.0.0.10.
Escape character is '^]'.
```

2. **Log in as root.**

```
login: cmdadm
Password: password
```

3. **The OPIE security software will generate a challenge code, for example:**

```
Challenge: 494 ms3219
```

4. **Call the Sun Solution Center at 1-800-USA-4SUN and provide them with the Radiance case number and challenge code. The Sun Solution Center representative will supply the appropriate response code.**

5. **Enter the response provided by the Sun Solution Center, for example:**

```
Response: response_provided
```

6. **Become root:**

```
msp0# su -
Password: password
```

7. **You can proceed with the typical** `telnet`**(1) session and service the Storage Service Processor.**

▼ To Replace a Virtualization Engine

1. **Replace the defective virtualization engine with the replacement.**

   Refer to the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual* for instructions.

2. **Log into the Storage Service Processor.**

3. **Identify the MAC address for the new virtualization engine and replace the entry for the failed virtualization engine in the** /etc/ethers **file on the Storage Service Processor. See the** ethers**(4) man page for details, for example:**

```
8:0:20:7d:93:7e virtualization-engine-name
```

4. **Ensure that the RARP daemon (**in.rarpd**(1M)) is running on the Storage Service Processor.**

```
msp0# /bin/ps -eaf | grep rarpd
root    317   314   0     Sep 28 ?        0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

If the daemon is not running, start it with the following command:

```
msp0# /usr/sbin/in.rarpd dmfe 1
```

5. **Ensure there is no traffic on the virtualization engine pairs or on the switches and type:**

```
msp0# /opt/SUNEsecfg/flib/setveport -v virtualization-engine-name -d
```

6. **Power on the new virtualization engine.**

7. **Log into the new virtualization engine. The name is** v1a**,** v1b**,** v2a**, or** v2b**.**

8. **Connect with the replaced virtualization engine using** `telnet`**(1). Select option 9 from the main menu, then enter a Q and a Y, for instance:**

```
telnet v1a
Trying 192.168.0.20...
Connected to v1a.
Escape character is '^]'.
Connection to the Vicom SAN router has been established.
Enter password:
Password accepted!
User Service Utility Key Assignments:

'?': Show User Service Utility Key Assignments Menu
'1': Show VPD
'2': Show LUN Map
'3': Download SVE Microcode from Local Computer
'4': View/Change Response to SV Management Programs
'5': Clear Error Log
'6': View/Change Interface Configuration
'9': Clear SAN database
'B': Reboot Router
'Q': Quit Serial Port Service Utility
9
...
Q
...
Y
```

9. **Set the virtualization parameters to the default settings. Type:**

```
# /opt/SUNWsecfg/bin/setupve -n virtualization-engine-name
```

10. **Wait 30 seconds and type the following to verify that the settings are correct:**

```
# /opt/SUNWsecfg/bin/checkve -n virtualization-engine-name
```

11. **Type the following commands:**

```
# /opt/SUNWsecfg/flib/setveport -v virtualization-engine-name -e
# /opt/SUNWsecfg/bin/resetve -n virtualization-engine-name
# /opt/SUNWsecfg/bin/showvemap -n virtualization-engine-pairname -l
```

The showvemap(1M) command displays the Initiator Summary. You can obtain the numbers for the replaced virtualization engine and the new virtualization engine from this file. The new virtualization engine has no defined zones. The zones are displayed in the Zone Summary with "undefined" for all zone names associated with the new virtualization engine.

12. **If zones were defined in the replaced virtualization engine, type:**

```
# /opt/SUNWsecfg/bin/restorevemap -n vepair -z \
     -c old-virtualization-engine-number -d new-virtualization-engine-number
```

13. **This command imports the zone data in to the new virtualization engine.**

14. **Type the following to display a snapshot of the virtualization engine map.**

```
# /opt/SUNWsecfg/bin/showvemap -n virtualization-engine-pairname -l
```

Verify that the new virtualization engine map has the zones properly defined.

15. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

Field Upgrades and Additions

This chapter contains the software instructions for upgrades and additions that can be made to the Sun StorEdge 3900 and 6900 series storage subsystems in the field.

This chapter is organized as follows:

- "Adding a Cabinet in the Field" on page 111
- "Adding a Sun StorEdge T3+ Array" on page 114
- "To Upgrade the Sun StorEdge T3+ Array Firmware" on page 116
- "To Upgrade the Sun StorEdge FC Switch Firmware" on page 117
- "To Upgrade the Virtualization Engine Firmware" on page 117

Note – You cannot upgrade a Sun StorEdge 3910 to a dual-cabinet Sun StorEdge 3960 system in the field. Also, you cannot upgrade a Sun StorEdge 6910 to a dual-cabinet Sun StorEdge 6960 system in the field.

▼ Adding a Cabinet in the Field

If you purchased a Sun StorEdge 3960 or 6960 system without the second cabinet, you can add the second cabinet in the field by using these instructions.

The names of the Sun StorEdge T3+ arrays in the second cabinet are shown in
FIGURE 10-1.

First Cabinet	Second Cabinet
Ethernet hub	Ethernet hub
blank	
sw1a	blank
sw1b	
blank	
(sp0)	t3be4
t3b3	t3be3
t3b2	t3be2
t3b1	t3be1
t3b0	t3be0

Switches — sw1a, sw1b

Storage Service Processor — (sp0)

Sun StorEdge T3+ Arrays — t3b3, t3b2, t3b1, t3b0
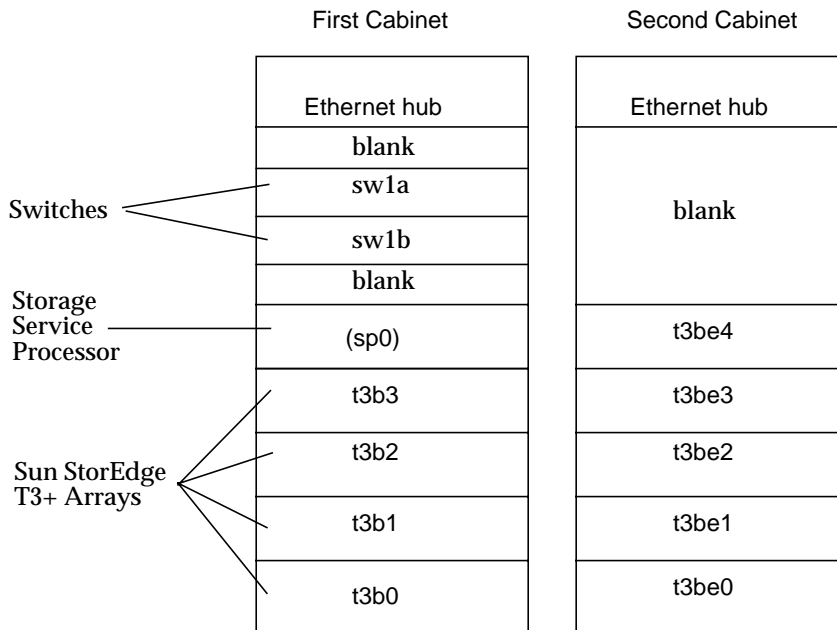
FIGURE 10-1 Sun StorEdge T3+ Array Naming in a Sun StorEdge 3900 Series
Configuration

1. **Refer to the** *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service
   Manual* **for instructions on setting up the second cabinet and connecting the
   cables.**

2. **Identify the MAC address for the new Sun StorEdge T3+ array in the second
   cabinet.**

   The MAC address of the Sun StorEdge T3+ array can be found on a card inside the
   front cover of the device.

3. **Log into the Storage Service Processor.**

   Refer to "To Service the Storage Service Processor" on page 105 for instructions on
   logging into the Storage Service Processor.

4. **Incorporate the new MAC address into the** `/etc/ethers` **file on the Storage
   Service Processor. See the** `ethers`(**4**) **man page for details, for example:**

```
8:0:20:7d:93:7e  array-name
```

5. **Ensure that the RARP daemon (**`in.rarpd`**(1M)) is running on the Storage Service Processor.**

```
msp0# ps -eaf | grep rarpd
root     317   314   0     Sep 28 ?        0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

If the daemon is not running, start it with the following command:

```
msp0# /usr/sbin/in.rarpd dmfe 1
```

6. **Reset the Sun StorEdge T3+ array in order to see the new IP address.**

7. **Use** `telnet`**(1) to open a session with the new Sun StorEdge T3+ array.**

```
# /bin/telnet t3bx
login: root
Password: Return
T3B Release 2.00 2001/07/12 19:35:12 (192.168.209.243)
Copyright (C) 1997-2001 Sun Microsystems, Inc.
All Rights Reserved.
```

8. **Type:**

```
:/:<1> .ftp 192.168.0.1
login: cmdadm
Password: password
> get /opt/SUNWsecfg/etc/syslog.conf /etc/syslog.conf
> quit
```

On a Sun StorEdge 3960 system, do the following:

9. **Set the environment variable for the Sun StorEdge T3+ array password,** `PASSWD`**.**

10. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

11. **Bring up Storage Automated Diagnostic Environment and rediscover the new cabinet.**

    Refer to the *Storage Automated Diagnostic Environment User's Guide* for detailed instructions on discovery.

12. **Type:**

    ```
    # /opt/SUNWsecfg/bin/savet3config -n ALL
    ```

    If you want to change the default configuration of the Sun StorEdge T3+ array from RAID 5 with two LUNs, continue with Step 13 through Step 19.

13. **Log into the Storage Service Processor and use the** `runsecfg`**(1M) command to start the character user interface.**

14. **Select T3+ Configuration Utility from the Main Menu.**

15. **When prompted, enter the password for the Sun StorEdge T3+ array. Press Return if no password has been set.**

16. **Select the Configure T3+ option.**

17. **Select the Sun StorEdge T3+ host name that you added.**

18. **Select the Default or Custom option to configure the new Sun StorEdge T3+ array.**

    Note – This step takes 2—10 hours depending on the configuration of the Sun StorEdge T3+ array.

    ---

19. **Type:**

    ```
    msp0# /opt/SUNWstade/bin/config_solution
    ```

▼ Adding a Sun StorEdge T3+ Array

For additional information about upgrading a Sun StorEdge T3+ array, refer to the *Sun StorEdge T3 and T3+ Array Installation, Operation, and Service Manual* and the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual.*

1. **Determine which Sun StorEdge T3+ array you are adding.**

    This refers to the position it occupies in the Sun StorEdge expansion cabinet.

2. **Identify the MAC address for the new Sun StorEdge T3+ array.**

   The MAC address of the Sun StorEdge T3+ array can be found on a card inside the front cover of the device.

3. **Log into the Storage Service Processor.**

   Refer to "To Service the Storage Service Processor" on page 105 for instructions on logging into the Storage Service Processor.

4. **Incorporate the new MAC address into the** `/etc/ethers` **file on the Storage Service Processor. See the** `ethers(`**4) man page for details, for example:**

   ```
   8:0:20:7d:93:7e  array-name
   ```

5. **Ensure that the RARP daemon (**`in.rarpd`**(1M)) is running on the Storage Service Processor.**

```
msp0# ps -eaf | grep rarpd
root    317   314   0     Sep 28 ?        0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

   If the daemon is not running, start it with the following command:

   ```
   msp0# /usr/sbin/in.rarpd dmfe 1
   ```

6. **Install the new Sun StorEdge T3+ array and power up the partner group.**

7. **Use** `telnet` **to open a session with the new Sun StorEdge T3+ array.**

   ```
   # /bin/telnet t3bx
   login: root
   Password: Return
   T3B Release 2.00 2001/07/12 19:35:12 (192.168.209.243)
   Copyright (C) 1997-2001 Sun Microsystems, Inc.
   All Rights Reserved.
   ```

8. **Type:**

```
:/:<1> .ftp 192.168.0.1
login: cmdadm
Password: password
> get /opt/SUNWsecfg/etc/syslog.conf /etc/syslog.conf
> quit
```

9. **Log into the Storage Service Processor and use the** `runsecfg`**(1M) command to start the character user interface.**

10. **Select T3+ Configuration Utility from the main menu.**

11. **When prompted, enter the password for the Sun StorEdge T3+ array. Press Return if no password has been set.**

12. **Select the Configure T3+ option.**

13. **Select the Sun StorEdge T3+ host name that you added.**

14. **Select the Default or Custom option to configure the new Sun StorEdge T3+ array.**

15. **Type:**

```
msp0# /opt/SUNWstade/bin/config_solution
```

16. **Bring up Storage Automated Diagnostic Environment and discover the new Sun StorEdge T3+ array.**

    Refer to the *Storage Automated Diagnostic Environment User's Guide* for detailed instructions on discovery.

▼ To Upgrade the Sun StorEdge T3+ Array Firmware

1. **Log into the Storage Service Processor.**

   Refer to "To Service the Storage Service Processor" on page 105 for instructions on logging into the Storage Service Processor.

2. **Use the instructions in the** *Sun StorEdge T3 and T3+ Array Installation, Operation, and Service Manual* **to upgrade the firmware.**

   The procedures in that manual instruct you in the following:

   ■ Upgrading the Sun StorEdge T3+ array controller firmware

- Upgrading the interconnect card firmware
- Upgrading the disk drive firmware

3. **Update the Sun StorEdge T3+ array snapshot files on the Storage Service Processor by running the following command:**

```
# savet3config -n all
```

▼ To Upgrade the Sun StorEdge FC Switch Firmware

1. **Log into the Storage Service Processor.**

   Refer to "To Service the Storage Service Processor" on page 105 for instructions on logging into the Storage Service Processor.

2. **Type:**

```
# /opt/SUNWsecfg/bin/setswitchflash -s switch-name
```

▼ To Upgrade the Virtualization Engine Firmware

1. **Log into the Storage Service Processor.**

   Refer to "To Service the Storage Service Processor" on page 105 for instructions on logging into the Storage Service Processor.

2. **Stop I/O to the virtualization engine pair.**

3. **Use the virtualization engine** sdnld**(1M) command to download the firmware (microcode), for example:**

```
# /opt/svengine/sduc/sdnld  -d v1 \
        -f /opt/svengine/sdus/FCFC3SUN.ima -t i1
```

Note – The actual path and name of the new firmware may vary.

4. **The virtualization engine automatically reboots.**

5. **Repeat Step 3 on the second virtualization engine in the redundant pair.**

6. **The virtualization engine automatically reboots.**

7. **Verify the new virtualization engine code was updated, for example:**

```
# /opt/svengine/sduc/svpd -d v1 -t i1
```

8. **Resume I/O to the virtualization engine pair.**

Connecting to Solaris Servers

This chapter contains the software instructions for connecting Sun servers to the Sun StorEdge 3900 and 6900 series and tips about cascaded switch environments.

Solaris servers that connect to the Sun StorEdge 3900 and 6900 series must be running Solaris 8 10/01 operating environment.

This chapter is organized as follows:

- "To Set Up a Solaris Server" on page 119
- "To Configure the ssd.conf File" on page 122
- "To Configure the Sun StorEdge Traffic Manager" on page 124
- "To Match the Host WWN to the Device Channel and Create SLIC Zones for LUN Masking" on page 125
- "To Create VLUNs on the Sun StorEdge 6900 Series" on page 128
- "To Set Up Newly Created VLUNs" on page 129
- "To Set Up Multiple Zones and VLUNs Using a Script" on page 130
- "To Set Up VERITAS Volume Manager Support" on page 134
- "To Map VLUNs to Devices" on page 135
- "To Set Up Cascaded Switches on Sun StorEdge 6900 Series" on page 137

▼ To Set Up a Solaris Server

1. **Install the Solaris 8 10/01 operating environment.**

2. **Install the Solaris 8 recommended patch cluster.**

3. **Reboot the server.**

4. **Log into the following URL, download the** SUNWsan, SUNWcfpl, **and** SUNWcfplx
   packages, and install them:

   ```
   http://www.sun.com/storage/san
   ```

5. **Install the following patches:**
   - 111847-03
   - 111413-06
   - 111412-06
   - 111095-06
   - 111096-03
   - 111097-06
   - 111846-02
   - 111267-02
   - 110614-02

6. **Reboot the server.**

   Note – No error messages should be displayed during the reboot.

7. **Check the Qlogic drivers using the following command:**

   ```
   # modinfo | grep -i qlc
   46 1029ba3a  2d..... 1  qlc (SunFC Qlogic FCA v5.a-2-1.23)
   #
   ```

   You need to have at least the minimum version level of v5.a-2-1.23.

8. **Determine the Qlogic HBA Fcode:**

   ```
   # luxadm qlgc_s_download
   Found Path to 2 FC100/P,  Devices
   Opening Device: /devices/pci@a,2000/SUNW,qlc@2/fp@0,0:devctl
     Detected FCode Version:      ISP2200 FC-AL Host Adapter Driver: 1.13 01/03/05
   Opening Device: /devices/pci@b,2000/SUNW,qlc@2/fp@0,0:devctl
     Detected FCode Version:      ISP2200 FC-AL Host Adapter Driver: 1.13 01/03/05
   Complete
   #
   ```

   The revision level you must have for the FCode is 1.13. If you do not have the correct
   level, install patch 111853-01, which contains the 1.13 Qlogic FCode and the
   instructions on how to update the FCode on the HBAs.

9. Edit the `ssd.conf` file, using the instructions in "To Configure the ssd.conf File" on page 122.

10. If you are using Sun StorEdge Traffic Manager (MPxIO), edit the `scsi_vhci.conf` file, using the instructions in "To Configure the Sun StorEdge Traffic Manager" on page 124.

11. If you are using VERITAS Dynamic Multi-Pathing (VxDMP), refer to the VERITAS documentation for installation instructions.

12. Reboot the server.

13. Type:

```
# /usr/sbin/devfsadm -C
```

This command can take a few minutes to clean up the listed devices' classes.

14. Type:

```
# /usr/sbin/cfgadm -la
wst4# cfgadm -la
Ap_Id                          Type          Receptacle    Occupant      Condition
ac0:bank0                      memory        connected     configured    ok
ac0:bank1                      memory        empty         unconfigured  unknown
c0::dsk/c0t6d0                 CD-ROM        connected     configured    unknown
c6                             fc-fabric     connected     unconfigured  unknown
c6::2b00006022002145           disk          connected     unconfigured  unknown
c6::2b00006022004185           disk          connected     unconfigured  unknown
c6::210000e08b04e70f           unknown       connected     unconfigured  unknown
...
```

15. For each Fabric device, you need to run the following command:

```
# /usr/sbin/cfgadm -c configure cn
```

16. Install volume management software if you are using Solaris Volume Manager or VERITAS 3.2.

Note – Do not use the `metaset`(1M) feature of the Solaris Volume Manager with Sun StorEdge 6900 series systems.

> **Note –** If you are using VERITAS 3.2, you must install patches 111904-04 and
> 111909-04.

17. **Reboot the server.**

18. **Follow the instructions in "To Create VLUNs on the Sun StorEdge 6900 Series" on page 128.**

19. **Log into the Storage Service Processor from the Solaris server and verify that you have the correct version of the** `SUNWsesp` **package installed.**

    To determine the level of the software image on the Storage Service Processor:

```
msp0: root# pkginfo -l SUNWsesp
   PKGINST:  SUNWsesp
      NAME:  Network Storage Service Processor
  CATEGORY:  Diagnostics
      ARCH:  sparc
   VERSION:  1.0.1.001
   BASEDIR:  /opt
    VENDOR:  Sun Microsystems Computer Corporation
      DESC:  Network Storage Service Processor Specific Files
    PSTAMP:  Built by bplom@memphis on 01/11/02 17:27:50
  INSTDATE:  Jan 11 2002 19:12
    STATUS:  completely installed
     FILES:      26 installed pathnames
                  9 shared pathnames
                  8 directories
                  4 executables
                 32 blocks used (approx)
msp0: root#
```

▼ To Configure the `ssd.conf` File

On the server connected to the Sun StorEdge 6900 series, the `ssd`(7D) driver requires that properties be set in the `/kernel/drv/ssd.conf` file.

● **Add the following entry into the** `ssd.conf` **file, for instance:**

```
#ident    "@(#)ssd.conf 1.9    99/07/29 SMI"

ssd-config-list="SUN     SESS01", "sess-data";
sess-data=1,0x1d,10,0,60,36,60;
```

> **Note –** Use spaces between the SUN and SESS01 and a space after the comma.

The syntax for the entries in the ssd.conf file are as follows:

- The `ssd(7D)` driver looks for the property named `ssd-config-list`. The value of this property is a list of one or more duplets, where each duplet consists of two strings. The syntax is:

  `ssd-config-list = "`*vid + pid*`" , "`*data-property-name*`"`

  The "*vid + pid*" is the value returned in the device's inquiry data. The "*data-property-name*" is the name of the property which contains the configuration values for the specified *vid + pid*.

- The second entry line contains the node specification. A semicolon is used to terminate a node specification. Individual elements listed within the specification are separated by commas.

  data-property-name = version, flags, propn, propn, . . . ;

  The data-property-name is the name of the property which contains the configuration values for the specified *vid + pid*. The *flags* is a bit mask with a bit set for each property value that changed. The *propn* contains updated values for the node type.

▼ To Configure the Sun StorEdge Traffic Manager

1. **Edit the** `/kernel/drv/scsi_vhci.conf` **file to globally enable MPxIO:**

```
#
# Copyright (c) 2001 by Sun Microsystems, Inc.
# All rights reserved.
#
#pragma ident    "@(#)scsi_vhci.conf    1.2    01/07/12 SMI"
#
name="scsi_vhci" class="root";
#
# mpxio Global enable/disable configuration
# possible values are mpxio-disable="no" or mpxio-disable="yes"
#
mpxio-disable="no";
#
# Load Balancing global configuration
# possible values are load-balance="none" or load-balance="round-
robin"
#
# load-balance="round-robin";
```

Make the following change:

■ Change the `mpxio-disable` value to `no`.

2. **Perform a reconfiguration reboot, for example:**

```
# shutdown -y -i0
ok> boot -r
```

If you wanted to configure this on a per-channel or per-port basis, refer to the *Sun StorEdge Traffic Manager Software Installation and Configuration Guide* (part number 816-1420-10) for additional information.

▼ To Match the Host WWN to the Device Channel and Create SLIC Zones for LUN Masking

1. Enter the following script and name it `wwnscript.sh`**:**

```
#!/bin/sh


for i in `cfgadm |grep fc-fabric|awk '{print $1}'`;do
        dev="`cfgadm -lv $i|grep devices|awk '{print $6}'`"
        wwn="`luxadm -e dump_map $dev |grep 'Host Bus'|awk '{print $4}'`"
        echo "$i: $wwn"
done
```

The above script performs the following:

- Obtains the channel numbers for all the Fibre Channel HBAs running in Fabric mode, using the `cfgadm`(1M) command.
- Obtains the device name of each channel that it has discovered, using `cfgadm`.
- Obtains the WWN of that device using the `luxadm`(1M) command.

2. Make the script executable, for example:

```
# chmod 755 wwnscript.sh
```

3. **Type:**

```
# wwn-script.sh
c4: 210000e08b042f80
c5: 210000e08b041d80
c6: 210000e08b043080
c7: 210000e08b042e80
c8: 210100e08b24e70f
c9: 210000e08b04e70f
c10: 210100e08b24aa55
c11: 210000e08b04aa55
#
```

If this fails to report an HBA WWN, you can run the following command on the
Storage Service Processor to determine the HBA WWNs that are directly attached to
the internal Sun StorEdge 6900 series Fibre Channel switch, for example:

```
# /opt/SUNWsecfg/bin/showswitch -s sw1a
...
*********
Name Server
************

Port  Address  Type  PortWWN           Node WWN          FC-4 Types
----  -------  ----  ----------------  ----------------  --------
01    104000   N     2b0000602200418a  2a0000602200418a  SCSI_FCP
02    104100   N     210000e08b042e80  200000e08b042e80
03    104200   N     210000e08b04465c  200000e08b04465c
04    104300   N     210100e08b24aa55  200100e08b24aa55
...
#
```

The above output shows the virtualization engine WWN and the HBA WWNs.

4. **Run the** showvemap(1M) **command on the Storage Service Processor to see the virtualization engine summary, for example:**

```
sp0# /opt/SUNWsecfg/bin/showvemap -n v1 -f
...
VIRTUALIZATION ENGINE SUMMARY

Initiator  UID                VE Host  Online  Revision  Number of SLIC Zones
-----------------------------------------------------------------------------
I00001     290000602200418A   v1a      Yes     08.14                      2
I00002     290000602200420C   v1b      Yes     08.14                      2

*****
ZONE SUMMARY

Zone Name       HBA WWN           Initiator  Online  Number of VLUNs
------------------------------------------------------------------------
host1_c10       210100E08B24AA55  I00001     Yes            0
host2_c1        210000E08B04465C  I00001     Yes           20
Undefined       210000E08B042E80  I00001     Yes            0
host1_c8        210100E08B24E70F  I00002     Yes            0
host2_c2        210000E08B04435C  I00002     No            20
Undefined       210000E08B041D80  I00002     Yes            0
#
```

Match the HBA WWN for the Undefined zone from the showvemap output with the channel/WWN pair from the output of the script on the host. Use this information to create a VE zone for the HBA for LUN masking operations.

Run the showvemap command for each virtualization engine zone. If no HBAs show up under the ZONE SUMMARY, run the savevemap(1M) command.

```
# /opt/SUNWsecfg/bin/savevemap -n [v1,v2]
```

The virtualization engine SLIC zones can now be created for LUN masking.

5. **For the device channel, the WWN can be determined from the output in Step 3.**

The virtualization engine should see the Port WWN of the HBA. The line of output in **Step 3** that contains the text "Unknown Type, Host Bus Adapter" reports the WWN of the HBA associated with device channel.

6. **Use this channel/WWN combination to create HBA aliases and SLIC zones on the Sun StorEdge 6900 series.**

   Run the command showvemap on the Storage Service Processor, for example:

   ```
   # /opt/SUNWsecfg/bin/showvemap -n [v1,v2] -f
   ```

7. **Run the** runsecfg**(1M) command, for example:**

   ```
   # /opt/SUNWsecfg/bin/runsecfg
   ```

8. **Select the Virtualization Engine Configuration Utility option and then the Manage Virtualization Engine Zones option to set up a SLIC zone for each HBA.**

9. **Select the Manage VLUNs option from the VIRTUALIZATION ENGINE MAIN MENU to create and mask VLUNs.**

   Choose one zone from each Virtualization Engine initiator (total of two zones) associated with the same data host for the LUN masking operation. This will ensure the required two paths to each VLUN on the data host.

▼ To Create VLUNs on the Sun StorEdge 6900 Series

1. **Get the virtualization engine pair name using the** listvemap**(1M) command, for example:**

   ```
   # /opt/SUNWsecfg/bin/listvemap -r
   v1
   #
   ```

   If no virtualization engine names are returned, either the virtualization engine is not functioning or there is already an active configuration process.

2. **Get the name of the Sun StorEdge T3+ array disk pool using the** listvemap**(1M) command, for example:**

   ```
   # /opt/SUNWsecfg/bin/listvemap -d -n v1
   t3b00 t3b01
   #
   ```

In this example, the disk pool name would be `t3b00`.

3. **Get the primary zone name using the** `listvemap` **command, for example:**

```
# /opt/SUNWsecfg/bin/listvemap -z -n v1 -c I00001
labsys_c1
#
```

4. **Get the secondary zone name using the** `listvemap` **command, for example:**

```
# /opt/SUNWsecfg/bin/listvemap -z -n v1 -c I00002
labsys_c2
#
```

5. **Create the VLUN using the** `createvlun`**(1M) command, for example:**

```
# /opt/SUNWsecfg/bin/createvlun -n v1 -d t3b00 -l size -c number \
      -v vlun_name -z labsys_c1 -s labsys_c2 -V
```

- *size* is the size in Gbytes for each VLUN, in 1 Gbyte increments.
- *number* is the number of VLUNs to create.
- *vlun_name* is an optional user-defined descriptive suffix for the VLUN.

▼ To Set Up Newly Created VLUNs

1. **Configure the drive type using the** `format`**(1M) command.**

Note – Do not specify the drive type, let `format`(1M) autoconfigure.

---

2. **Label the drive using** `format`**.**

3. **Repartition the drive to meet your needs.**

The following script uses the format(1M) command to autoconfigure the drive type and label the drive:

```
#!/bin/sh
channel=$1
target=$2
if [ ! -n "${channel}" ]; then
    echo "usage:$0 channel [target]\n"
exit 1
fi

for dev in /dev/rdsk/${channel}${target}*s2 ; do
    if [ -c ${dev} ]; then
        dsk="`echo ${dev}|sed -e 's/rdsk/dsk/' -e 's/d[0-9]*s2//'`"
     grep ${dsk} /etc/vfstab > /dev/null
     INUSE1=$?
     grep ${dsk} /etc/mnttab > /dev/null
     INUSE2=$?
     if [ ${INUSE1} -eq 0 OR ${INUSE2} -eq 0 ]; then
        echo "Don't try to format/label channel $channel target $target"
        exit 1
     else
format ${dev} > /dev/null 2>&1 <<END
type
0
label
yes
quit
END
        if [ $? -eq 0  ]; then
                echo "Found ${dev}"
        fi
    fi
   fi
done
```

▼ To Set Up Multiple Zones and VLUNs Using a Script

Because the savevemap(1M) command must be run anytime the virtualization engine configuration changes and it requires some time, these instructions tell you how to write a script that will automate the procedure. The script creates all the virtualization engine zones and VLUNs.

This example script assumes you have a Sun StorEdge 6910 system with one pair of virtualization engines named v1.

1. **Ensure all of your hardware and cable connections.**

   You should be familiar with what host is attached to what path or channel (for proper creation of zones).

2. **Ensure the Sun StorEdge T3+ arrays have completed configuration, all physical LUNs are mounted, and associated disk pools have been created, for example:**

   ```
   # /opt/SUNWsecfg/bin/checkt3config -n ALL -v
   ```

   All the Sun StorEdge T3+ arrays should pass the above check.

3. **Run the** `showvemap`**(1M) command on the Storage Service Processor to see the virtualization engine summary, and check the disk pool summary, for example:s**

```
# /opt/SUNWsecfg/bin/showvemap -n v1 -f
DISKPOOL SUMMARY

Diskpool  RAID  MP Drive  Size   Free Space  T3+ Active      Number of
                Target    GB     GB          Path WWN        VLUNs
-----------------------------------------------------------------
t3b00     5     T49152    116.7  116.7       50020F230000063B      0
t3b01     5     T49153    116.7  116.7       50020F2300000616      0
t3b10     5     T49154    116.7  116.7       50020F2300000970      0
t3b11     5     T49155    116.7  116.7       50020F2300000996      0
t3b20     5     T49156    116.7  116.7       50020F23000006CD      0
t3b21     5     T49157    116.7  116.7       50020F230000091E      0
*****
VIRTUALIZATION ENGINE SUMMARY

Initiator  UID                VE Host  Online  Revision  Number of
                                                         SLIC Zones
-----------------------------------------------------------------
I00001     2900006022004185   v1a      Yes     08.12         0
I00002     2900006022004183   v1b      Yes     08.12         0

*****
ZONE SUMMARY

Zone Name       HBA WWN           Initiator  Number of VLUNs
-----------------------------------------------------------------
Undefined       210000E08B04E70F  I00001          0
Undefined       210000E08B042F80  I00001          0
Undefined       210000E08B04AA55  I00002          0
Undefined       210000E08B043080  I00002          0
#
```

Make a note of the HBA WWNs and you will know which remote host is cabled to each HBA, based on the `showvemap` output.

4. Create a script to perform the work.

The following example creates multiple zones and VLUNS with hard-coded values from the output of the `showvemap` commands show in Step 3.

```ksh
#!/bin/ksh
# Define wait/check function, if v1 now available for next config operation.
#
    wait_check () {
        avail_flag=1
        while [ ${avail_flag} -ne 0 ]; do
            sleep 10
            if [[ ! -f /opt/SUNWsecfg/etc/.v1.lock ]]; then
                avail_flag=0
            fi
        done
    }
#
# Create first zone
#
createvezone -n v1 -c I00001 -w 210000E08B04E70F -z host1_c1 -V
wait_check
createvezone -n v1 -c I00001 -w 210000E08B042F80 -z host2_c1 -V
wait_check
#... after all zones created then
#
# Create VLUNS, spread over disk pools and add to two zones each
#
createvlun -n v1 -d t3b00 -l 10 -c 11 -v host1db -z host1_c1 -s host1_c2 -V
wait_check
#
# Create VLUNs in next disk pool
#
createvlun -n v1 -d t3b01 -l 10 -c 11 -v host1acts -z host1_c1 -s host1_c2 -V
wait_check
#
# Create VLUNs for 2nd host
#
createvlun -n v1 -d t3b10 -l 10 -c 11 -v host2db -z host2_c1 -s host2_c2 -V
wait_check
#...
#etc
```

▼ To Set Up VERITAS Volume Manager Support

The following are required to support VERITAS on the Sun StorEdge 6900 series subsystems:

- VERITAS Volume Manager 3.2 Patch level 1 (minimum), which includes patch 111909-04 and 111904-04
- Perform the following steps:

1. **Follow the typical procedure to setup and install all hardware and software, including all needed patches.**

2. **Install the VERITAS 3.2 Volume Manager CD.**

3. **Install the VERITAS Volume Manager 3.2 Patch 01.**

4. **Add VERITAS Device Discovery Layer support for Sun StorEdge 6900 series, for example:**

```
# /usr/sbin/vxddladm addjbod vid=SUN pid=SESS01
```

5. **Use the** vxddladm**(1M) command to verify the virtualization engine is supported, for example:**

```
# /usr/sbin/vxddladm listjbod
VID    PID     Opcode  Page Code    Page Offset   SNO length
===========================================================
SUN    SESS01  18      -1           36            12
```

6. **Run the** vxinstall**(1M) command.**

Note – The vxddladm command must be run before executing the vxinstall.

---

7. **Reboot the system.**

8. **Verify devices are now working and multipathed. Sun StorEdge 6900 series devices are listed under the enclosure name Disk and device name takes the form** Disk_*nn*. **Devices under** Disk_*nn* **are multipathed disks. For example:**

```
# /usr/sbin/vxdmpadm listenclosure all
ENCLR_NAME          ENCLR_TYPE       ENCLR_SNO           STATUS
===========================================================
OTHER_DISKS     OTHER_DISKS     OTHER_DISKS         CONNECTED
Disk            Disk            DISKS               CONNECTED
```

9. **Verify disk and multipathing paths are recognized by using the** vxdmpadm **commands, for example:**

```
# /usr/sbin/vxdisk list
DEVICE     TYPE       DISK       GROUP        STATUS
Disk_0     sliced     disk04     rootdg       online
Disk_1     sliced     disk05     rootdg       online
Disk_2     sliced     disk06     rootdg       online
Disk_3     sliced     disk07     rootdg       online
Disk_4     sliced     disk08     rootdg       online
Disk_5     sliced     disk09     rootdg       online
Disk_6     sliced     disk10     rootdg       online
```

'

```
# /usr/opt/SUNWvxvm/vxdmpadm getdmpnode enclosure=Disk
NAME       STATE      ENCLR-TYPE   PATHS   ENBL  DSBL  ENCLR-NAME
=================================================================
Disk_0     ENABLED    Disk            2    2      0      Disk
Disk_1     ENABLED    Disk            2    2      0      Disk
Disk_2     ENABLED    Disk            2    2      0      Disk
Disk_3     ENABLED    Disk            2    2      0      Disk
Disk_4     ENABLED    Disk            2    2      0      Disk
Disk_5     ENABLED    Disk            2    2      0      Disk
Disk_6     ENABLED    Disk            2    2      0      Disk
...
#
```

▼ To Map VLUNs to Devices

If you are running Sun StorEdge Traffic Manager (MPxIO) or DMP, you may need to map devices back to a specific VLUN on the Sun StorEdge 6900 series. These instructions tell you how to determine the device name depending on whether you are using Sun StorEdge Traffic Manager or DMP.

To determine the device numbers for Sun StorEdge Traffic Manager:

1. **Obtain the VLUN serial number, which is the second 16 characters in the target ID, for example:**

```
# format
...
AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>  OSdsk28
          /ssm@0,0/pci@18,700000/pci@1/SUNW,isptwo@4/sd@0,0
       1. c9t290000602200419662573361303046Ad0 <SUN-SESS01-080C cyl 51198 alt
2 hd 16 sec 128>
          /scsi_vhci/ssd@g290000602200419662573361303046a
       2. c9t29000060220041966257336130304473d0 <SUN-SESS01-080C cyl 51198 alt
2 hd 16 sec 128>
...
```

2. **Match the VLUN serial number, (for example, `625733613030446a`)to the listing from the virtualization engine map on the Storage Service Processor. To obtain the virtualization engine map:**

```
# /opt/SUNWsecfg/bin/showvemap -n v1 -f
Diskpool   VLUN Serial      MP Drive   VLUN      VLUN      Size      Slic Zones
           Number           Target     Target    Name      GB
-------------------------------------------------------------------------------
t3b00      6257336130304473 T49152     T16384    1t3b00    50.0      zonea,zoneb
t3b00      625733613030446A T49152     T16385    2t3b00    50.0      zonea,zoneb
#
```

3. **Match the VLUN Target number, from Step 2, with the serial number from Step 1.**

To determine the device numbers for DMP:

1. Obtain the VLUN serial number from the `format`(1M) command, for example:

```
# format -e
...
AVAILABLE DISK SELECTIONS:
        0. c0t0d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>  OSdsk28
           /ssm@0,0/pci@18,700000/pci@1/SUNW,isptwo@4/sd@0,0
        1. c9t2B00006022004196d0 <SUN-SESS01-080C cyl 51198 alt 2
hd 16 sec 128>
           /scsi_vhci/ssd@g2900006022004196
        2. c9t2B00006022004196d0 <SUN-SESS01-080C cyl 51198 alt 2
hd 16 sec 128>
...
```

2. While using the format command, select a device and enter the `scsi` mode, for example:

```
scsi> inquiry

Inquiry:
   00 00 03 12 2b 00 00 02 53 55 4e 20 20 20 20 20    ....+...SUN
   53 45 53 53 30 31 20 20 20 20 20 20 20 20 20 20    SESS01
   30 38 30 43 62 57 33 61 30 30 44 73 30 30 30    080CbW3O003K000
...
```

The serial number (for example, `6257336130304473`) is returned by the `inquiry` command. The two devices that have the matching serial number are the redundant paths to the same VLUNs.

▼ To Set Up Cascaded Switches on Sun StorEdge 6900 Series

These steps must be performed on all Sun StorEdge 6900 series systems that reside in the same SAN environment.

1. Override the default chassis identifications for every additional Sun StorEdge 6900 series when you have more than one, for example:

```
# setupswitch -s switch_name -i chassis_id -v
```

The *switch-name* is the name defined in the `/etc/hosts` file. The *chassis-id* is a number in the range 1-to-63. The defaults are `sw1a` (1), `sw1b` (2), `sw2a` (3), `sw2b` (4).

The following are the commands that would be run on a second Sun StorEdge 6900 series in the SAN environment:

```
# setupswitch -s sw1a -i 5 -v
# setupswitch -s sw1b -i 6 -v
# setupswitch -s sw2a -i 7 -v
# setupswitch -s sw2b -i 8 -v
```

2. **If the cascaded switch has a hard zone of two, modify the hard zone front-end switches to correspond to the associated hard zone identification on the cascaded switch in the SAN to which it is connected, for example:**

```
# setupswitch -s switch_name -z zone_id -v
```

The *switch-name* is the name defined in the `/etc/hosts` file. The *zone-id* over rides the default hard zone number on the front end switch. This is useful for SAN environments with cascaded switches and existing zones. The Sun StorEdge 6910 system range is 1-to-8. The Sun StorEdge 6960 system range is 1-to-16. The default hard zone number for both is 1. This command is valid only on Sun StorEdge 6900 series switch `sw1a` and `sw1b`.

The following example commands would be executed on front-end switches of Sun StorEdge 6900 series systems in a SAN environment, where connection to cascaded switch is in pre-existing hard zone 2:

```
# setupswitch -s sw1a -z 2 -v
# setupswitch -s sw1b -z 2 -v
```

3. **Make modifications to the cascaded switch not inside the Sun StorEdge 6900 series.**

You must ensure the associated ports are in the same hard zone ID as that of the associated Sun StorEdge 6900 series and ensure its chassis ID is unique. These steps must be performed using the SANSurfer GUI.

Connecting to Servers Running NT

This chapter contains the software instructions for connecting NT and Windows 2000 servers to the Sun StorEdge 3900 and 6900 series in the field.

This chapter is organized as follows:

- "To Connect a Sun StorEdge 3900 Series to an NT Server" on page 139
- "To Connect a Sun StorEdge 6900 to an NT or Windows 2000 Server" on page 142
- "To Create VLUNs on the Sun StorEdge 6900 for Windows NT and Windows 2000" on page 145
- "To Set Up Newly Created VLUNs" on page 147

▼ To Connect a Sun StorEdge 3900 Series to an NT Server

The Sun StorEdge 3900 series supports Windows NT 4.0, Service Pack 6 or greater in either single path or dual path configurations. Dual path configurations utilize the Sun multipath failover driver 1.1 for Windows NT.

The Sun StorEdge 3900 series storage subsystems do not have the Sun StorEdge FC Network Switch-8 and Switch-16 switches in SL mode by default.

The important rules for setting up NT servers to a Sun StorEdge 3900 series are:

- Each NT server and the associated Sun StorEdge T3+ array partner groups must be in a dedicated Hard Zone that is in SL mode.
- There is a maximum of one NT server with one initiator allowed in this SL mode Hard Zone.
- The dedicated Hard Zone must operate completely in SL mode. That means the Sun StorEdge T3+ arrays and host posts must be set to SL mode.

1. **Set up Sun multipath failover driver for NT.**

   If you are going to use dual path instead of single path you must complete this step. Refer to the *Sun Multipath Failover Driver 1.0 for Windows NT User's Guide* (part number 806-7766-10) for detailed instructions on setting up the device driver on the server.

2. **Determine the level of the** `SUNWsecfg`, **for example:**

   ```
   # pkginfo -l SUNWsecfg
   ```

   If the `SUNWsecfg` package level is at baseline 1.13 or greater, use the following command to reconfigure the switches. You must run this command to change to SL mode on each Sun StorEdge T3+ array that is going to be connected to an NT server, for example:

   ```
   # cd /opt/SUNWsecfg/bin/setswitchsl -n t3name -s on
   ```

3. **Change the Sun StorEdge T3+ array into** `rw` **mode.**

   For each Sun StorEdge T3+ array partner group under dual path driver control you must run the `modifyt3params`(1M) command to set the `mp_support` mode to `rw`. (By default the Sun StorEdge T3+ arrays in the Sun StorEdge 3900 series are delivered in `mpxio` mode.)

   ```
   # /opt/SUNWsecfg/bin/modifyt3params -n t3name -m rw
   ```

4. **Connect the NT server to the available ports.**

5. **Reboot the NT server.**

   This must be done to make the recently configured LUNs visible to the Disk Administrator.

▼ To Connect a Sun StorEdge 3900 Series to a Windows 2000 Server

The Sun StorEdge 3900 series supports Windows 2000 Server and Windows 2000 Advanced Server, Service Pack 2 or greater in either single path configurations, only.

The Sun StorEdge 3900 series storage subsystems do not have the Sun StorEdge FC Network Switch-8 and Switch-16 switches in SL mode by default.

The important rules for setting up NT servers to a Sun StorEdge 3900 series are:

- Each Windows 2000 server and the associated Sun StorEdge T3+ array partner groups must be in a dedicated Hard Zone that is in SL mode.

- There is a maximum of one Windows 2000 server with one initiator allowed in this SL mode Hard Zone.

- The dedicated Hard Zone must operate completely in SL mode. That means the Sun StorEdge T3+ arrays and host posts must be set to SL mode.

Note – The Sun StorEdge 3900 series was built to provide dual redundancy of all data paths. But WIndows 2000 servers do not provide multipath support. Thus, you will not have the same redundancy as that offered from Windows NT and Solaris servers in this configuration.

---

1. **Determine the level of the** SUNWsecfg**, for example:**

```
# pkginfo -l SUNWsecfg
```

If the SUNWsecfg package level is at baseline 1.13 or greater, use the following command to reconfigure the switches. You must run this command to change to SL mode on each Sun StorEdge T3+ array that is going to be connected to an NT server, for example:

```
# cd /opt/SUNWsecfg/bin/setswitchsl -n t3name -s on
```

2. **You must** `telnet`**(1) to each Sun StorEdge T3+ array in the configuration and set the** `mp_support` **flag to** `none`, **for example:**

```
# telnet t3b0
Trying 192.168.0.40...
Connected to t3b0.
Escape character is '^]'.

Telnet session

Login: root
Password: password

T3B Release 2.00 2001/07/12 19:35:12 (192.168.0.40)
Copyright (C) 1997-2001 Sun Microsystems, Inc.
All Rights Reserved.

t3be0:/:<1>sys mp_support none
```

For each Sun StorEdge T3+ array partner group under dual path driver control you must run the `modifyt3params`(1M) command to set the `mp_support` mode to `none`. (By default the Sun StorEdge T3+ arrays in the Sun StorEdge 3900 series are delivered in `mpxio` mode.)

```
# /opt/SUNWsecfg/bin/modifyt3params -n t3name -m none
```

3. **Connect the NT server to the available ports.**

4. **Reboot the NT server.**

This must be done to make the recently configured LUNs visible to the Disk Administrator.

▼ To Connect a Sun StorEdge 6900 to an NT or Windows 2000 Server

The Sun StorEdge 6900 series supports both Windows NT Enterprise Edition 4.0, Service Pack 6 or greater and Windows 2000 server attachments in single-path configurations only. The Sun StorEdge 6900 series requires a Fabric connection to the Sun StorEdge FC Network switches.

1. **Ensure your host bus adapters (HBAs) are operating in Fabric mode and obtain the WWN for each HBA.**

The supported HBAs for the NT and Windows 2000 platforms are the Emulex LP8000 and Qlogic 2200. To obtain the WWNs for any of these HBAs, use the tools provided by the manufacturer or from the card's BIOS.

- **For Emulex use the LightPulse (`lputilnt.exe`) provided by Emulex. Select the Configuration Data and Region World Wide Name to obtain the WWN information. Alternatively, on the Emulex you can enter the card's BIOS when the NT system is booting. From there the WWN information can be obtained.**

- **To obtain the HBA WWNs for the Qlogic (2200 Series), use the QLView graphical user interface or the `qlconfig` utility. If you are using the QLView, use the HBA utility to check the HBAs and attached storage. The WWN is listed under the Device Information. Alternatively, you can also enter the card's BIOS when the NT system is booting. From there the WWN information can be obtained.**

You can also obtain the HBA WWN by running the following command on the Storage Service Processor to determine the HBA WWNs that are directly attached to the internal Sun StorEdge 6900 series Fibre Channel switch, for example:

```
# /opt/SUNWsecfg/bin/showswitch -s sw1a
...
*********
Name Server
************

Port  Address  Type  PortWWN           Node WWN          FC-4 Types
----  -------  ----  ----------------  ----------------  --------
01    104000   N     2b0000602200418a  2a0000602200418a  SCSI_FCP
02    104100   N     210000e08b042e80  200000e08b042e80
03    104200   N     210000e08b04465c  200000e08b04465c
04    104300   N     210100e08b24aa55  200100e08b24aa55
...
#
```

The above output shows the virtualization engine WWN and the HBA WWNs.

2. **Run the** `showvemap`**(1M) command on the Storage Service Processor to see the virtualization engine summary, for example:**

```
sp0# /opt/SUNWsecfg/bin/showvemap -n v1 -f
...
VIRTUALIZATION ENGINE SUMMARY

Initiator  UID                    VE Host  Online  Revision  Number of SLIC Zones
--------------------------------------------------------------------------------
I00001     290000602200418A  v1a      Yes     08.14                        2
I00002     290000602200420C  v1b      Yes     08.14                        2

*****
ZONE SUMMARY

Zone Name        HBA WWN             Initiator  Online  Number of VLUNs
-----------------------------------------------------------------------
host1_c10        210100E08B24AA55  I00001     Yes            0
host2_c1         210000E08B04465C  I00001     Yes           20
Undefined        210000E08B042E80  I00001     Yes            0
host1_c8         210100E08B24E70F  I00002     Yes            0
host2_c2         210000E08B04435C  I00002     No            20
Undefined        210000E08B041D80  I00002     Yes            0
#
```

Match the HBA WWN for the Undefined zone from the `showvemap` output with the channel/WWN pair from the output of the script on the host. Use this information to create a VE zone for the HBA for LUN masking operations.

Run the `showvemap` command for each virtualization engine zone. If no HBAs show up under the ZONE SUMMARY, run the `savevemap`(1M) command.

```
# /opt/SUNWsecfg/bin/savevemap -n [v1,v2]
```

The virtualization engine SLIC zones can now be created for LUN masking.

3. **For the device channel, the WWN can be determined from the output in Step 1.**

The virtualization engine should see the Port WWN of the HBA. The line of output in **Step 1** that contains the text "Unknown Type, Host Bus Adapter" reports the WWN of the HBA associated with device channel.

4. **Use this channel/WWN combination to create HBA aliases and SLIC zones on the Sun StorEdge 6900 series.**

Run the command showvemap on the Storage Service Processor, for example:

```
# /opt/SUNWsecfg/bin/showvemap -n [v1,v2] -f
```

5. **Run the** runsecfg**(1M) command, for example:**

```
# /opt/SUNWsecfg/bin/runsecfg
```

6. **Select the Virtualization Engine Configuration Utility option and then the Manage Virtualization Engine Zones option to set up a SLIC zone for each HBA.**

Note – This is only a single zone and not a dual path with two zones.

▼ To Create VLUNs on the Sun StorEdge 6900 for Windows NT and Windows 2000

1. **Get the virtualization engine pair name using the** listvemap**(1M) command, for example:**

```
# /opt/SUNWsecfg/bin/listvemap -r
v1
#
```

If no virtualization engine names are returned, either the virtualization engine is not functioning or there is already an active configuration process.

2. **Get the name of the Sun StorEdge T3+ array disk pool using the** listvemap**(1M) command, for example:**

```
# /opt/SUNWsecfg/bin/listvemap -d -n v1
t3b00 t3b01
#
```

In this example, the disk pool name would be t3b00.

3. **Get the primary zone name using the** `listvemap` **command, for example:**

```
# /opt/SUNWsecfg/bin/listvemap -z -n v1 -c I00001
labsys_c1
#
```

4. **Create the NT VLUNs using the** `createvlun`**(1M) command. Do not specify any zones.**

Note – Because there is no failover functionality on an NT server, you must create VLUNs with only a single path. That is, a single virtualization engine zone.

By default, `createvlun` expects two zones to be passed as arguments to be used for failover, but the command will allow none to be entered.

The following example entry creates five VLUNs that are 10 Gbytes each for use with NT. The descriptive tag suffix is `ntvlun`:

```
# /opt/SUNWsecfg/bin/createvlun -n v1 -d t3b00 -l 10 -c 5 -v ntvlun -V
VLUN T16384 : Created successfully in diskpool t3b00 with name 1ntlun
VLUN T16385 : Created successfully in diskpool t3b00 with name 2ntlun
VLUN T16386 : Created successfully in diskpool t3b00 with name 3ntlun
VLUN T16387 : Created successfully in diskpool t3b00 with name 4ntlun
VLUN T16388 : Created successfully in diskpool t3b00 with name 5ntlun
#
```

Ignore the following message:

```
WARNING: VLUNs just created were not added to any zones.
This should be done to avoid data corruption.
```

5. **Add the VLUNs into the single zone that corresponds to the path on the NT server, using the** `addtovezone`**(1M) command.**

The following example assumes a zone named `winnt_chan1`, which already exists and is associated with the path to the NT server.

```
# /opt/SUNWsecfg/bin/addtovezone -n v1 -v T16384 -z winnt_chan1 \
      -e T16388 -V
VLUN T16384 : Added successfully to zone winnt_chan1.
VLUN T16385 : Added successfully to zone winnt_chan1.
VLUN T16386 : Added successfully to zone winnt_chan1.
VLUN T16387 : Added successfully to zone winnt_chan1.
VLUN T16388 : Added successfully to zone winnt_chan1.
#
```

Caution – If you are changing other VLUN information using the `runsecfg` menu interface or the Storage Automated Diagnostic Environment GUI interface, these VLUNs will still show up as "available." To add into a second zone (since two paths to allow for failover is the recommendation), you must keep track of these NT VLUNs that have already been added into a single zone (that is, `showvemap -n v1 -f`), adding them into a second zone could cause data corruption problems.

▼ To Set Up Newly Created VLUNs

1. **Configure and partition disks using the Disk Administrator for NT or Storage Disk Manager for Windows 2000.**

   Refer to the Windows NT or Windows 2000 documentation for details.

Default Storage Subsystem Setup

This chapter shows the detailed step-by-step procedure for building a Sun StorEdge 3900 or 6900 series storage subsystem in the Sun factory.

This chapter is organized as follows:

> ⚠ **Caution –** Do not power on any of the devices until told to do so by the instructions.

▼ To Cable the Systems

● **Populate the Sun StorEdge Expansion Cabinet with the specified components.**

Use the instructions from the individual pieces of hardware to install them in the expansion cabinets.

If you are configuring a Sun StorEdge 3960 or 6960 system, you must connect all the cables in each of the Sun StorEdge Expansion Cabinets before proceeding with further instructions.

▼ To Install the Flash Image

This procedures tells you how to install the Solaris 8 flash image on the Storage Service Processor.

1. Power on the Ethernet hub and the Storage Service Processor.

2. From the ok **prompt, set the following variables.**

```
ok set-defaults
ok nvstore
```

3. Load the Web Start Flash image. Enter the following at the ok **prompt:**

```
ok boot net - install
Resetting ...
LOM event: +0h37m57s host reset

Sun Netra X1 (UltraSPARC-IIe 500MHz), No Keyboard
OpenBoot 4.0, 512 MB memory installed, Serial #50731832.
Ethernet address 0:3:ba:6:1b:38, Host ID: 83061b38.
...
The system is ready.

msp0 console login:
```

No further interaction is required until after the flash image is installed.

▼ To Set Up a Storage Service Processor

1. From a system that has an IP address of 10.0.0.*n* **(Storage Service Processor LAN), type:**

```
# xhost +
```

2. Run telnet**(1) to log into the Storage Service Processor as root using the default password.**

```
# telnet msp0
login: cmdadm
Password: password
```

3. **Become root:**

```
$ su -
Password: password
```

4. **Add the media access control (MAC) address of the switches, the Sun StorEdge T3+ arrays, and the virtualization engines to the** /etc/ethers **file.**

   You want to ensure that the identical host name entries are in the /etc/ethers file as are in the /etc/hosts file.

5. **Ensure that the RARP daemon is running on the Storage Service Processor.**

```
msp0# ps -eaf | grep rarpd
root    317    314    0      Sep 28 ?        0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

   If the daemon is not running, start it with the following command:

```
msp0# /usr/sbin/in.rarpd dmfe 1
```

6. **Set the password.**

   You must have the password set or the .ftp command for the Sun StorEdge T3+ array does not work.

7. **Type:**

```
msp0# #.
```

8. **Type:**

```
lom> break
ok boot
```

9. **End the** telnet **session.**

```
msp0# ~.
```

▼ To Set Up the Ethernet Hub

1. Connect all Ethernet component cables to the Ethernet hub.

2. Power on the Ethernet hub.

▼ To Set Up the Sun StorEdge Network FC Switch

1. Power on the Sun StorEdge Network FC Switch-8 or Switch-16 switch.

2. Use `ping`**(1) to verify that RARP has completed on the Sun StorEdge Network FC switch.**

```
# ping IP-address
IP-address is alive
```

3. Type:

```
# /opt/SUNWsecfg/bin/setswitchflash -s switch-name
```

4. Log into the Storage Service Processor and run `setupswitch`**(1M) for each switch. For instance:**

```
msp0# /opt/SUNWsecfg/bin/setupswitch -s sw1a
```

5. Identify the new media access control (MAC) address for the switch.

The MAC address for the Sun StorEdge Network FC Switch-8 or Switch-16 switches is a 12-digit number that is printed on a label attached to the back of the switch.

6. Change the MAC address in the `/etc/ethers` **file on the Storage Service Processor to that of the new switch. See the** `ethers`**(4) man page for details. For example:**

```
8:0:20:7d:93:7e switch-name
```

▼ To Set Up a Virtualization Engine

Note – Do not turn on the virtualization engine devices until instructed to do so.

---

1. **Log into the Storage Service Processor as root.**

2. **Update the** `/etc/ethers` **file with the MAC addresses of the virtualization engines.**

   You must add the MAC address and the host name of each virtualization engine in the configuration, for instance:

   ```
   0:60:22:n:n:n v1a
   0:60:22:n:n:n v1b
   0:60:22:n:n:n v2a
   0:60:22:n:n:n v2b
   ```

3. **Ensure that the RARP daemon is running on the Storage Service Processor.**

```
msp0# ps -eaf | grep rarpd
root    317   314   0    Sep 28 ?        0:00 /usr/sbin/in.rarpd dmfe 1
msp0#
```

   If the daemon is not running, start it with the following command:

   ```
   msp0# /usr/sbin/in.rarpd dmfe 1
   ```

4. **Refer to the hardware reference manual for instruction on connecting the virtualization engine. Then power on all the virtualization engines.**

5. **Use** `ping`**(1) to verify that the RARP daemon is running on each virtualization engine.**

   ```
   msp0# ping v1a
   msp0# ping v1b
   ...
   ```

6. **Ensure that the virtualization engines are at firmware level 8.014 or greater.**

7. **Set the virtualization parameters to the default settings. Type:**

```
# setupve -n virtualization-engine-name
```

8. **Wait 30 seconds and type the following to verify that the settings are correct:**

```
# checkve -n virtualization-engine-name
```

9. **Ensure that the following line is the only line of code that is *not* commented out in the** `/opt/svengine/sdus/svengine.cfg` **file on a Sun StorEdge 6910 system.**

```
v1 = {   internet_path = 192.168.0.20;   };
```

On the Sun StorEdge 6960 system, ensure that the following two lines are the only two lines of code that are not commented out in the `/opt/svengine/sdus/svengine.cfg` file.

```
v1 = {   internet_path = 192.168.0.20;   };
v2 = {   internet_path = 192.168.0.22;   };
```

▼ To Set Up a Sun StorEdge T3+ Array

1. **Power on all Sun StorEdge T3+ arrays.**

2. **Use** `ping`**(1) to verify that RARP has completed on the Sun StorEdge T3+ array.**

```
# ping IP-address
IP-address is alive
```

3. **Use** `telnet`**(1) to open a session with one Sun StorEdge T3+ array.**

```
# telnet t3b0
login: root
Password: Return
T3B Release 2.00 2001/07/12 19:35:12 (192.168.209.243)
Copyright (C) 1997-2001 Sun Microsystems, Inc.
All Rights Reserved.
```

4. **From the Sun StorEdge T3+ array, obtain a copy of the** `syslog.conf` **file that is shipped with the Sun StorEdge 3900 and 6900 series by typing:**

```
:/:<1> .ftp 192.168.0.1
login: cmdadm
Password: password
> get /opt/SUNWsecfg/etc/syslog.conf /etc/syslog.conf
> quit
```

5. **If you are going to run** `setdefaultconfig`**(1M), ignore this step.**

   Otherwise, for each Sun StorEdge T3+ array on a Sun StorEdge 3900 series, run the following command:

```
msp0# cd /opt/SUNWsecfg/bin
msp0# ./modifyt3config -n T3+name -r 5 -c 2 -a off -m mpxio -b 16k
```

   On a Sun StorEdge 6900 series system, use the following command:

```
msp0# cd /opt/SUNWsecfg/bin
msp0# ./modifyt3config -n T3+name -r 5 -c 2 -a off -m rw -b 16k
```

6. **Repeat Step 2, Step 3, Step 4, and Step 5 on each Sun StorEdge T3+ array.**

▼ To Set Up a Default Configuration

1. **Execute the** `setdefaultconfig`**(1M) command, which sets up and checks the default configuration.**

Caution – The `setdefaultconfig` command is only used by the Sun manufacturing factory. This command resets the Sun StorEdge 3900 and 6900 series subsystem to the default configuration. All existing data on the storage subsystem is erased when this command is executed.

```
msp0# cd /opt/SUNWsecfg/bin
msp0# ./setdefaultconfig
WARNING:

     This command will set all Sun StorEdge switches, T3+s, and virtualization
     engines found to their default configurations based on Sun StorEdge
     system type (3910, 3960, 6910 or 6960). T3+ partner groups will be
     set to RAID 5 with 2 luns, and all data will be destroyed.

     Are you sure you want to continue? [y n]y

     Checking/updating flash revision on switch: sw1a
     INFO: Flash revision on switch sw1a is already at release level 30462.
     Checking/updating flash revision on switch: sw1b
     INFO: Flash revision on switch sw1b is already at release level 30462.

     Setting up and validating configuration on switch: sw1a
     Setting up and validating configuration on switch: sw1b

     Configuring T3+s to default: t3b0
     Configuration for all T3+s will occur in the background in parallel.
     NOTICE: This will take a minimum of approximately 3 hours!
     Please view /var/adm/log/SEcfglog for more details and progress.
     Additional log information can be found in /tmp/nohupmodify.out.
     Started T3+ configuration at: Mon Dec 3 18:43:31 CST 2001

     Waiting for T3+ configurations to complete....
     When complete, all T3+s configurations will be checked for failures

     Checking T3+s for configuration failures: t3b0

     Checking : t3b0 Configuration.......

     Checking command ver : PASS
     Checking command vol stat : PASS
     Checking command port list : PASS
     Checking command port listmap : PASS
     Checking command sys list : PASS
msp0#
```

2. **Wait two to three hours and verify that the configuration is functioning properly.**
   You can follow the configuration by watching the `/var/adm/log/SEcfglog` file.

```
msp0# tail -f /var/adm/log/SEcfglog
```

3. **After** `setdefaultconfig` **completes, verify the configuration worked by typing:**

```
msp0# checkdefaultconfig
```

4. **Run the** `config_solution`**(1M) command.**

The `config_solution` command is used to create a snapshot of a Sun StorEdge 3900 and 6900 Series configuration during the manufacturing and upgrading of the Solution devices. `config_solution` creates the `/var/opt/DATA/Solution.golden` file, which lists the Sun StorEdge 3900 and 6900 series model, the date of creation, the devices, and the device attributes.

```
msp0# /opt/SUNWstade/bin/config_solution
sp0 / 192.168.0.1
v1a / 192.168.0.20
  -> accessing VE...
  -> found VE (v1 / 290000602200418a) .
  -> found VE (v1 / 290000602200420c) .

v1b / 192.168.0.21
v2a / 192.168.0.22
v2b / 192.168.0.23
sw1a / 192.168.0.30
  -> found Switch (100000c0dd009c54).
sw1b / 192.168.0.31
  -> found Switch (100000c0dd00b24e).
sw2a / 192.168.0.32
  -> found Switch (100000c0dd008f9d).
sw2b / 192.168.0.33
  -> found Switch (100000c0dd008d15).
t3b0 / 192.168.0.40
  -> accessing t3...
  -> found T3
...
 NO errors found!
--------------------------
   Configuration Summary
--------------------------
|  MODEL = 6910
|  Vicom = v1a
|  Switch= sw1a
|  Switch= sw1b
|  Switch= sw2a
|  Switch= sw2b
|  T3    = t3b0
|  T3    = t3b1
|  T3    = t3b2
--------------------------
Do you want to save this configuration [y/n]: y
msp0#
```

Glossary

disk pool   A group of drives from which virtual drives are created. The drives that make up the disk pool are called pool drives. Pool drives are a multipathed disk drive that corresponds to a Sun StorEdge T3+ array physical LUN.

Dynamic Multi-Pathing (VxDMP)   A VERITAS Volume Manager feature that provides an Alternate Pathing mechanism for rerouting data in the event of a controller failover.

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.

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).

Fibre Channel   A cost-effective gigabit communications link deployed across a wide range of hardware.

FC-AL   Fibre Channel-Arbitrated Loop. FC-AL is implemented as either a loop or a Fabric. A loop can contain up to 126 nodes, accessible through only one or two servers.

FRU   field-replaceable unit. An assembly that a manufacturer replaces on failure of an assembly component.

GBIC   Gigabit Interface Converter. A hot-swappable input/output device that plugs into a Gigabit Ethernet port or Fibre Channel.

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 do not communicate across defined Hard Zone boundaries.

HBA	host bus adapter. A controller board connecting the I/O expansion bus to the Fibre Channel subsystem.
hot spare	A drive in a RAID 1 or RAID 5 configuration that contains no data and acts as a standby in case another drive fails.
hot-swappable	The ability of a field-replaceable unit (FRU) to be removed and replaced while the system remains powered on and operational.
LUN	logical unit number. The major and minor device numbers make up the logical unit numbering sequence for a particular device connected to a computer.
LUN mapping	The ability to change the virtual LUN as presented to the server from storage. This enables such benefits as the ability of a server to boot from the SAN without requiring of a local disk drive. Each server requires LUN 0 to boot.
LUN masking	The characteristic that enables an administrator to dynamically map an HBA to a specified LUN. This provides an individual server or multiple servers access to an individual drive or to multiple drives, and prohibits unwanted server access to the same drives.
media access control (MAC) address	A unique address that identifies a storage location or a device.
network terminal concentrator	The network terminal concentrator (NTC) provides a modem connection point for the Sun StorEdge Remote Response software. The NTC facilitates a point-to-point protocol connection from a remote support and does not depend on the Storage Service Processor to complete a call.
OPIE	One-time passwords in everything. OPIE is a package derived from the Bellcore S/Key Version 1 distribution that secures a system against replay attacks.
Out-of-band	Refers to the connections and devices that are not in the data path. The Storage Service Processor does not have access to the data that is stored on the Sun StorEdge 3900 and 6900 series storage subsystems, thus this information is considered to be out-of-band.
partner group	A pair of interconnected controller units. Expansion units interconnected to the pair of controller units can also be part of the partner group.
N port	A Fibre Channel port in a point-to-point or Fabric connection.
redundant array of independent disks (RAID)	A utility in the Solaris operating environment that enables automatic assignment of the array IP address from the host.

reverse address resolution protocol (RARP)	A utility in the Solaris operating environment that enables automatic assignment of the array IP address from the host.
SCSI	Small Computer Systems Interface. An industry standard for connecting disk and tape devices to a workstation.
SES	SCSI Enclosure Services driver. An interface to SCSI Enclosure Services devices. These devices sense and monitor the physical conditions within an enclosure, as well as enable access to the status reporting and configuration features of the enclosure (such as indicator LEDs on the enclosure).
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.
SLIC	An acronym for Serial Loop IntraConnect. Often used to represent the virtualization engine.
Storage Service Processor LAN	An Ethernet LAN used to perform local management and service functions on the Storage Service Processor. It is also used to facilitate aggregation of telemetry data from multiple Storage Service Processors and can serve as the connection point to a customer's management LAN, through a router. By design, the Storage Service Processor LAN address is configured to be 10.0.*n.n*.
Virtualization engine zone	A zone can contain a single HBA and multiple VLUNs. See LUN masking.
Virtual LUN	A portion of a physical LUN, created by the virtualization engine, that is made available to a host. In text this is specified as VLUN.
Volume	Also called a logical unit number or LUN, a volume is one or more drives that can be grouped into a unit for data storage.
World wide name (WWN)	A number used to identify array volumes in both the array system and Solaris environment.
zone	A dedicated path between a LUN and the HBA to which it is mapped.
zoning	The act of mapping a LUN to an HBA.

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