Sun StorEdge™ 6920 System Getting Started Guide

Installing and Configuring the System

Sun Microsystems, Inc.
www.sun.com

Part No. 819-0117-10
May 2005
Revision A

Submit comments about this document at: http://www.sun.com/hwdocs/feedback

Please
Recycle

Adobe PostScript

Preface

The *Sun StorEdge 6920 System Getting Started Guide* provides procedures for installing the Sun StorEdge™ 6920 system. This guide describes how to complete the initial setup of the system, power the system on and off, and connect the system to the data hosts on the storage area network (SAN) and to the management console on the local area network (LAN).

Before You Read This Book

Before you begin to install the Sun StorEdge 6920 system, you must prepare the installation site as described in these books:

- *Sun StorEdge 6920 System Regulatory and Safety Compliance Manual*
- *Sun StorEdge 6920 System Site Preparation Guide*

How This Book Is Organized

Chapter 1 contains an introduction to the Sun StorEdge 6920 system.

Chapter 2 describes pre-installation planning, safety, installation of the system cabinet, and system startup.

Chapter 3 describes the steps you must take to establish an initial connection to the system, run the setup utility, log in to the system, navigate the system, and use the wizards to configure storage on the system.

Chapter 4 explains how to cable data hosts to the system and how to install the required software. It also explains how to install remote management software and the remote scripting command-line interface (CLI).

Chapter 5 introduces you to Sun StorEdge 6920 system configuration concepts.

Chapter 6 provides instructions and guidelines for connecting external storage devices to the Sun StorEdge 6920 system.

Appendix A provides information about the Sun StorEdge Remote Response service.

Appendix B explains how to enable remote power management for the system.

Appendix C provides information about the expansion cabinet ship kit and the serial console interface.

Appendix D contains possible problems that you could encounter during the installation of the system and recommended actions you can take to correct a problem.

Appendix E has a worksheet that you can use to collect the information you will need during the system installation.

Using UNIX Commands

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

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

  `http://docs.sun.com`

Shell Prompts

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

Typographic Conventions

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. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

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

Sun StorEdge 6920 System Documentation

The following is a list of documents related to the Sun StorEdge 6920 system. For any document number with *nn* as a suffix, use the most current document.

Subject	Title	Part Number
Unpacking instructions attached to the shipping container	*Unpacking Guide*	816-6385-*nn*
Data services license information	*Sun StorEdge Storage Pool Manager Software for Non-Sun Systems, Version 1.0, Right to Use License*	819-2404-*nn*
	Sun StorEdge Data Mirroring Software, Version 1.0, Right to Use License	819-2335-*nn*
	Sun StorEdge Data Replicator-Synchronous Software, Version 1.0, Right to Use License	819-2336-*nn*
	Sun StorEdge Data Replicator-Asynchronous Software, Version 1.0, Right to Use License	819-2337-*nn*
System planning information	*Sun StorEdge 6920 System Site Preparation Guide*	819-0118-*nn*
System regulatory and safety information	*Sun StorEdge 6920 System Regulatory and Safety Compliance Manual*	819-0119-*nn*
Late-breaking information not included in the information set	*Sun StorEdge 6920 System Release Notes*	819-0120-*nn*

System overview information, as well as information on system configuration, maintenance, and basic troubleshooting, is covered in the online help included with the software. In addition, the `sscs`(1M) man page provides information about the commands used to manage storage using the command-line interface (CLI).

Related Documentation

The following documents provide detailed information, if needed, about related system components.

Product	Title	Part Number
Best practices	*Best Practices for Sun StorEdge 6920 System (Version 3.0.0)*	819-0122-*nn*
Sun Storage Automated Diagnostic Environment Enterprise Edition	*Sun Storage Automated Diagnostic Environment Enterprise Edition Release Notes Version 2.4*	819-0432-*nn*
SAN Foundation software	*Sun StorEdge SAN Foundation 4.4 Configuration Guide*	817-3672-*nn*
Traffic Manager software	*Sun StorEdge Traffic Manager 4.4 Software Release Notes For HP-UX, IBM AIX, Microsoft Windows 2000 and 2003, and Red Hat Enterprise Linux*	817-6275-*nn*
	Sun StorEdge Traffic Manager 4.4 Software User's Guide For IBM AIX, HP-UX, Microsoft Windows 2000 and 2003, and Red Hat Enterprise Linux	817-6270-*nn*
	Sun StorEdge Traffic Manager 4.4 Software Installation Guide For Red Hat Enterprise Linux	817-6271-*nn*
	Sun StorEdge Traffic Manager 4.4 Software Installation Guide For Microsoft Windows 2000 and 2003	817-6272-*nn*
	Sun StorEdge Traffic Manager 4.4 Software Installation Guide For IBM AIX	817-6273-*nn*
	Sun StorEdge Traffic Manager 4.4 Software Installation Guide For HP-UX 11.0 and 11i	817-6274-*nn*
Sun StorEdge network Fibre Channel switch-8 and switch-16	*Sun StorEdge Network 2Gb FC Switch-8 and Switch-16 FRU Installation*	817-0064-*nn*
	Sun StorEdge Network 2 Gb FC Switch-8 and Switch-16 Release Notes	817-0770-*nn*
	Sun StorEdge Network 2 Gb FC Switch-64 Release Notes	817-0977-*nn*
Sun StorEdge Brocade switch documentation	*Sun StorEdge Network 2 Gb Brocade SilkWorm 3200, 3800, and 12000 Switch 3.1/4.1 Firmware Guide to Documentation*	817-0062-*nn*
Sun StorEdge McData switch documentation	*Sun StorEdge Network 2 Gb McDATA Intrepid 6064 Director Guide to Documentation, Including Firmware 5.01.00*	817-0063-*nn*

Product	Title	Part Number
Expansion cabinet	*Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067-*nn*
Storage Service Processor	*Sun Fire V210 and V240 Server Administration Guide*	816-4826-*nn*
Solaris Operating System	*Solaris Handbook for Sun Peripherals*	816-4468-*nn*

Accessing Sun Documentation

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

http://www.sun.com/documentation

For Sun StorEdge 6920 system documentation, go to:

```
http://www.sun.com/products-n-
solutions/hardware/docs/Network_Storage_Solutions/Midrange/6920/
index.html
```

Related Third-Party Documentation

For installation instructions and other information about Brocade and McData Fibre Channel switches, refer to the product documentation provided by the vendor.

Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Contacting Sun Technical Support

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

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

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

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

Please include the title and part number of your document with your feedback:

Sun StorEdge 6920 System Getting Started Guide, part number 819-0117-10

Contents

Figures

Tables

CHAPTER 1

System Overview

This chapter describes the components and terminology of the Sun StorEdge 6920 system. It includes the following sections:

System Features

The Sun StorEdge 6920 system has a modular architecture with integrated system-wide manageability. The Sun StorEdge 6920 system features include:

- Storage virtualization and pooling to simplify storage management.
- Scaling and aggregation of both capacity and performance. System capacity scales from 504 GB to 65 TB, and capacity can be added while the system is online.
- Centralized management and monitoring using a browser interface and remote scripting client.
- High availability and failover capability through redundant hardware components.
- Serviceability of components that can be replaced while the system is online.
- Diagnostic monitoring to enhance reliability, availability, and serviceability (RAS) of the system through the Sun Storage Automated Diagnostic Environment.
- Remote monitoring, troubleshooting, and servicing by Sun personnel through Sun StorEdge Remote Response service.
- Virtualization of heterogeneous external storage to facilitate data migration from existing storage devices. You can also integrate capacity of existing storage devices with the Sun StorEdge 6920 system.

- Centralized data services including Sun StorEdge Storage Pool Manager, Sun StorEdge Data Snapshot, Sun StorEdge Data Mirror, and Sun StorEdge Data Replicator.

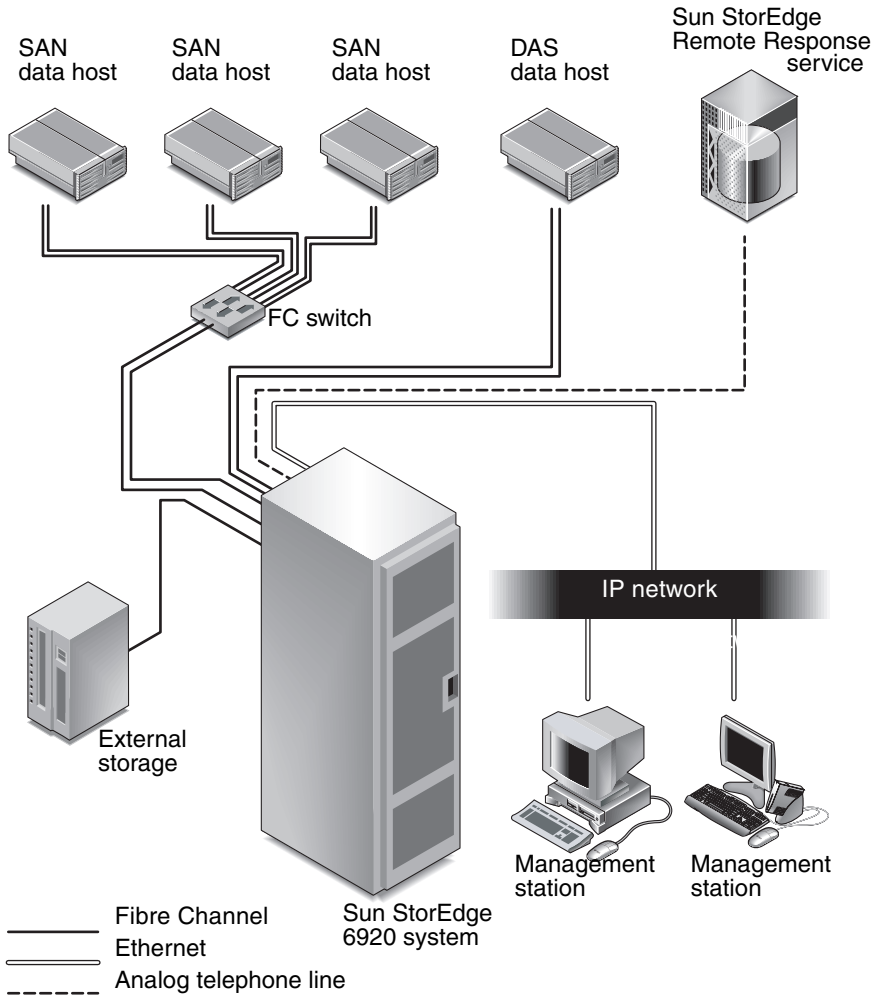


FIGURE 1-1 Sun StorEdge 6920 System Environment

Hardware Overview

The system base cabinet contains all of the hardware components for the system.

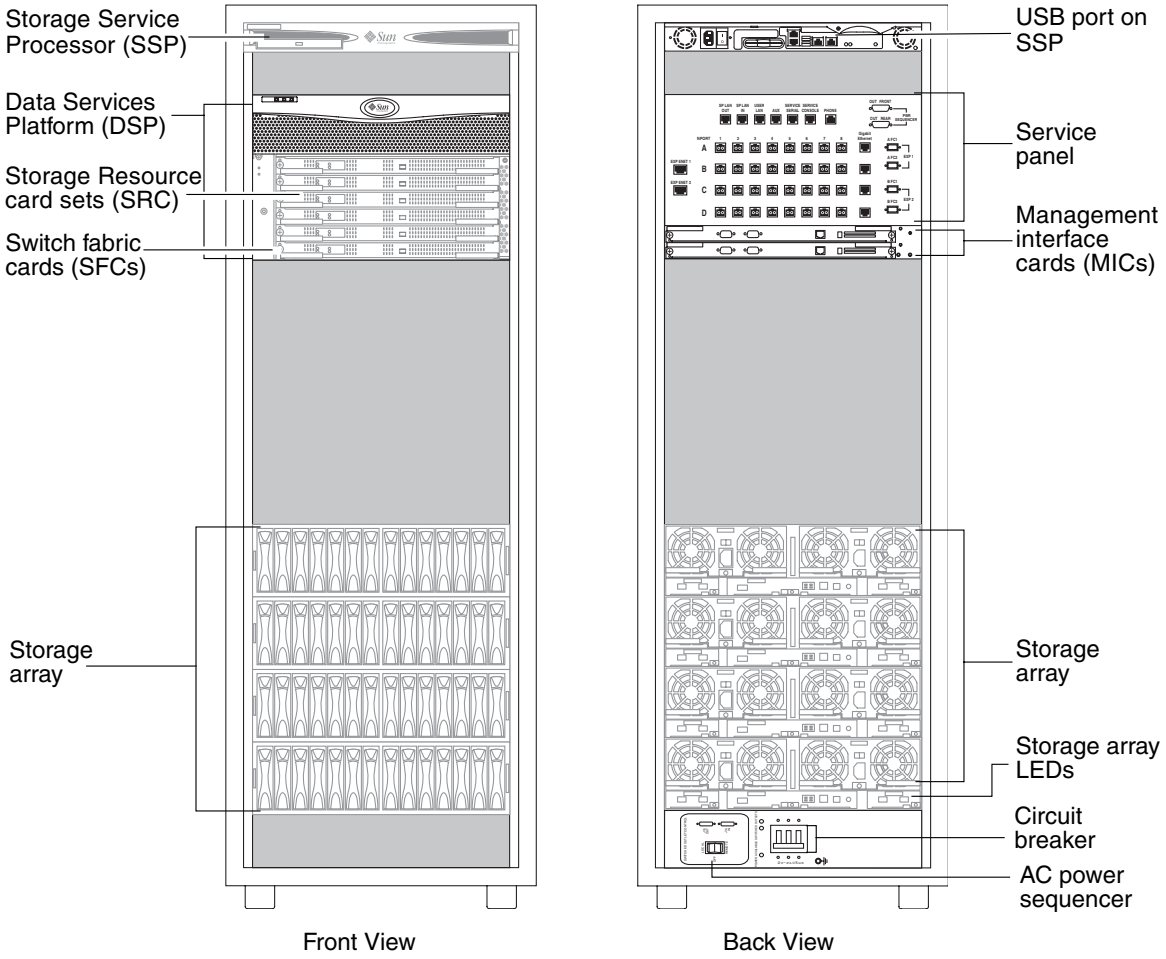


FIGURE 1-2 Sun StorEdge 6920 System Base Cabinet – Front and Back Views

TABLE 1-1 describes the Sun StorEdge 6920 system hardware components.

TABLE 1-1 System Hardware Components

Component	Description
Storage Service Processor (SSP)	The Storage Service Processor is a management host residing in the system's base cabinet. The management software arrives pre-installed on the Storage Service Processor. The Storage Service Processor is cabled to the service panel, allowing for easy serial and local area network (LAN) connections. All data host and external storage connections are made through the service panel. You do not connect directly to the Storage Service Processor.
Data Services Platform (DSP)	The DSP provides virtualization services for the storage devices in the system. The DSP houses redundant switch fabric cards (SFCs), storage resource cards (SRCs), storage I/O (SIO) cards, and management interface cards (MICs).
Storage resource card (SRC) sets	Storage resource card (SRC) sets handle packet processing for the DSP Fibre Channel (FC) interface. Each SRC set consists of a storage I/O (SIO) card and an SRC card. SIO cards provide the physical interface to storage arrays and data hosts. Each processor on an SRC card manages two adjacent ports on the SIO card.
Switch fabric cards (SFCs)	The switch fabric cards provide central data path switching functions for the DSP.
Storage I/O (SIO) cards	A board that provides the Fibre Channel and optionally, gigabit Ethernet ports for the Data Services Platform. This card is always paired with a storage resource card (SRC). The system supports two types of SIO cards. The SIO-8 card has eight FC ports and the SIO COMBO card has six FC ports and one gigabit Ethernet port. The FC ports provide the physical interface to arrays and data hosts. The gigabit Ethernet port provides connectivity for replicating data to another Sun StorEdge 6920 system located at a remote site.
Management interface cards (MICs)	Two management interface cards (MICs), located in the bottom two slots of the DSP, provide the system interface and management control functions for the DSP.
Storage arrays	The storage arrays make up the physical storage of the Sun StorEdge 6920 system. The individual disk trays in an array can contain 7 or 14 disk drives each.

TABLE 1-1 System Hardware Components *(Continued)*

Component	Description
Service panel	The service panel simplifies the cabling to the system. The Service Processor Panel and I/O panel provide the following connections: Service Processor Panel • Modem connection • LAN connections for management • Serial ports • AUX port to connect to the DSP management interface card (MIC), which provides management interface failover I/O panel • FC I/O connections for data hosts and external storage, and FC-based remote replication • Gigabit Ethernet connections for gigabit Ethernet-based remote replication • Power connections for expansion cabinet management • Ethernet and FC connections for expansion cabinets You connect cables to these accessible panel connections rather than to individual components of the system.
Storage Service Processor (SSP) accessory tray	The Storage Service Processor accessory tray provides a number of functions for the system, including: • Network terminal concentrator (NTC) • Router with a firewall • Modem to connect to the Sun StorEdge Remote Response service • Ethernet hub to manage internal network traffic
AC power sequencer panel	Each AC power sequencer, located at the lower front and back of the base cabinet, contain the power switch and AC circuit breaker.

From the front of the system's base cabinet, you can view the LEDs for the Storage Service Processor, Data Services Platform (DSP), and storage arrays. Each of the 14 Fibre Channel RAID disk drives has LEDs that indicate drive activity:

- If the LEDs are green, the drives are ready to send and receive I/O activity.
- If the LEDs are amber, there is a fault.
- If the LEDs are blue, you can safely remove the drive.

From the back of the base cabinet, you can access the service panel for cabling data hosts, storage area network (SAN), local area network (LAN), and external storage devices to the system. You can also access storage arrays and the DSP's field-replaceable units (FRUs) such as power and cooling units, array controllers, and management interface cards (MICs).

Depending on your configuration, your system can consist of only a base cabinet, or it can include one or two expansion cabinets.

For more information about hardware components, go to the online help system. Click the Search tab and enter **`hardware`**.

Storage Array Configurations

The storage array design is modular, with a variety of possible configurations. Each configuration option includes two controllers (also referred to as a controller pair) to provide redundancy and failover capabilities. Each storage array also has redundant Fibre Channel (FC) data paths and two power supplies with an integral battery backup system. In the event of a total power failure, each array has sufficient power from the batteries to shut down the system in an orderly fashion.

The system is available in three supported storage array configurations as described in TABLE 1-2.

TABLE 1-2 Storage Array Configuration Options

Option	Controllers x Trays	Number of Disk Drives	Minimum Capacity	Maximum Capacity
1	2 x 2	14 to 28	504 gigabytes	4 terabytes
2	2 x 4	28 to 56	1 terabyte	8 terabytes
3	2 x 6	42 to 84	1.5 terabytes	12 terabytes

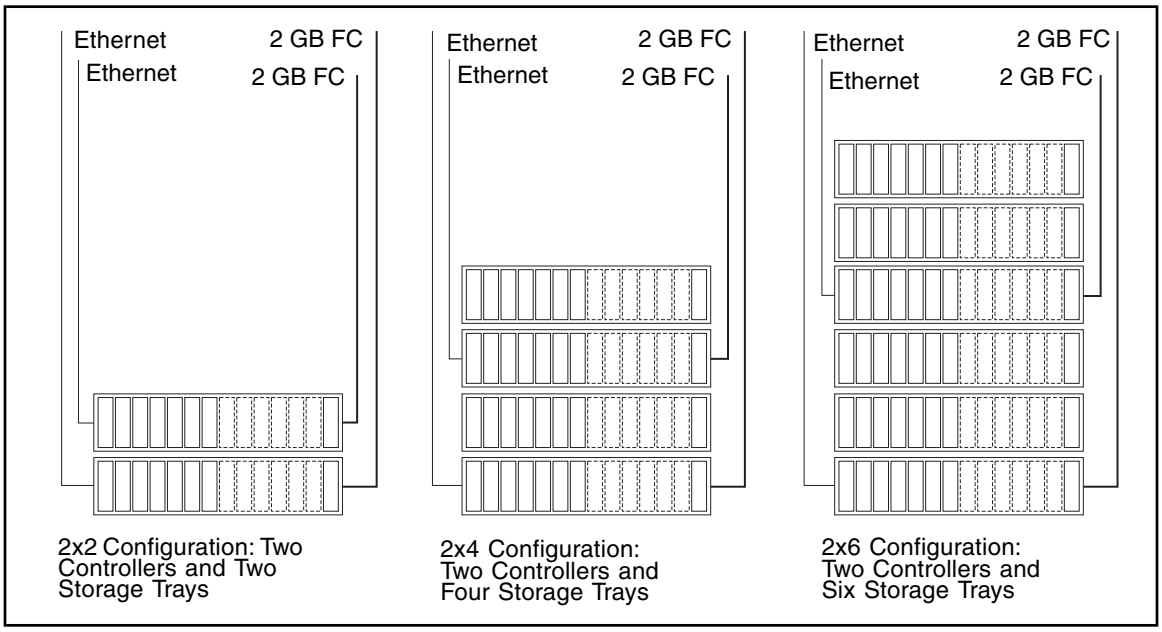


FIGURE 1-3 Storage Array Configuration Options

The configuration of the system is based on requirements for throughput, amount of storage, and economy. For example, if throughput is more important to you than economy, you might want your system to use the option 1 storage array configuration. In contrast, if the amount of storage is more important to you than throughput, the option 2 or 3 storage array configuration might be appropriate for your storage needs.

A controller tray contains disk drives and built-in RAID management hardware. An expansion tray contains disk drives only and is managed by a controller tray.

FC I/O connections on the service panel connect to the controller of each array in the base cabinet. This cabling is attached at the factory before the system is shipped.

For more information about array configurations, see the online help.

Internal and External Networks

The Sun StorEdge 6920 system incorporates three separate networks: The Storage Service Processor LAN, the internal component LAN, and the site LAN (TABLE 1-3).

TABLE 1-3 Internal and External LANs

Network	Description
Storage Service Processor LAN	The Storage Service Processor LAN is used by the Sun StorEdge Remote Response system to remotely monitor the Sun StorEdge 6920 service. When multiple Sun StorEdge 6920 systems (up to eight at the same site) are installed, the systems can share a single telephone line.
Internal Component LAN	The Storage Service Processor communicates with components that make up the system over this LAN. This network is not accessible from outside the system and is isolated from the data path. An Ethernet hub manages internal network traffic on the Sun StorEdge 6920 system.
Site LAN	This LAN connects to the customer's intranet (Ethernet LAN) through the User LAN port on the service panel. This network enables access to the system from a management host. A management host is used to configure, control, and monitor the system through a web browser or the remote scripting CLI client. A firewall is included in the router of the Storage Service Processor accessory tray between the site LAN and the Storage Service Processor LAN.

Note – In addition to the firewall supplied with the Sun StorEdge 6920 system, you can also use a site firewall implemented with your own corporate security policies. However, you cannot use your own firewall in place of the firewall supplied with the Sun StorEdge 6920 system.

External Storage Devices

In addition to its internal storage arrays, the Sun StorEdge 6920 system provides support for virtualization of data stored on external storage devices. Data stored on external storage devices can be preserved and added to the system as a legacy volume. You can also use external storage as a means of increasing storage capacity. In this case, the data on the external storage device is not preserved and the capacity is added to a storage pool as one virtual disk. You can also migrate data from an external storage device to a volume on the system by using data mirroring.

You can monitor the health of external storage devices by using the Sun Storage Automated Diagnostic Environment Enterprise Edition software, which is provided on the Host Installation Software CD.

For more information about support for external storage devices, see "Connecting External Storage Devices" on page 109 and the online help.

Expanding System Capacity

Your system is preconfigured at the factory based on the number of disks and capacity ordered. As your storage requirements increase, you can expand the capacity of your system by adding disks, trays, expansion cabinets, FC ports, and external storage devices. System components are available as field-replacement units (FRUs) and can be installed in the field. FRU installation instructions are available through the online Storage Automated Diagnostic Environment Service Advisor.

Software Overview

This section describes the following software used in the system:

User Interfaces

You can access the system using the two main interfaces to the system:

- A browser interface, the primary interface for configuring, managing, and monitoring the system
- A remote scripting command-line interface (CLI) client for remote management

The remote scripting CLI client provides the same control and monitoring capability as the browser interface, and it is also scriptable for running frequently performed tasks. If you want to configure storage from a remote management host, you can install the remote scripting CLI client on an external management host and then use the `sscs` commands to access the system. You can access the remote scripting CLI client from any management host that is connected to the User LAN port.

The remote scripting CLI client for the Solaris Operating System is provided on the Host Installation Software CD that is delivered with the system. Host software for other operating systems is available from the Sun Download Center (SDLC).

For information about installing the remote scripting CLI client, see Chapter 4. For information about managing the system using the CLI, see the `sscs`(1M) man page.

Resident Software

TABLE 1-4 describes the software that is pre-installed on the Sun StorEdge 6920 system.

TABLE 1-4 Resident (Pre-installed) System Software

Software	Description
System and storage management software	Provides configuration services through a centralized management tool.
System monitoring and diagnostic software	Provides a diagnostic monitoring tool for the system. It can be configured to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the Sun StorEdge 6920 system.
Revision analysis and maintenance software	Provides a tool for upgrading firmware revisions of all components resident in the system. It also keeps track of component firmware levels and firmware revisions.
Sun StorEdge Remote Response software	Connects to the Sun Service Center, allowing trained personnel to remotely monitor, troubleshoot, diagnose, and service the system. If the Sun Service Center determines that there is a problem, Sun will recommend and perform maintenance on the system.

Data Services Software

Sun StorEdge 6920 data services software helps the storage administrator to effectively manage data and provide critical data services for key applications in the data center. The following data services applications are available as optional licensed software.

Sun StorEdge Storage Pool Manager

The Sun StorEdge Storage Pool Manager software enables virtualization and pooling of storage assets across applications. Licensing for up to two terabytes of capacity is provided with the system. Additional right-to-use (RTU) licensing is required for use of larger capacities.

Sun StorEdge Data Snapshot

Sun StorEdge Data Snapshot software allows you to create point-in-time snapshot copies of a volume. The snapshot copies can be read/write–mounted by applications to secondary storage and used for backup, application testing, or data mining without the need for the primary storage to be taken offline. The right-to-use (RTU) license is issued per system and is based on the capacity of primary storage that will be snapped.

Sun StorEdge Data Mirror

Sun StorEdge Data Mirror software enables you to create local, independent read-and-write copies of data. Applications can access the mirrored data while other operations, such as backups, data recovery, and applications testing, occur in parallel without disrupting production application access. Licensing is based on the total capacity of the primary volumes that are being mirrored.

Sun StorEdge Data Replicator

Sun StorEdge Data Replicator software enables you to replicate data from one site to another. Replica sites can be located anywhere in the world and data can be transparently written to both primary and secondary sites simultaneously. The software includes a fast resynchronization feature that allows data to be synchronized quickly in the event of a link failure between sites, or at predetermined intervals. Licensing is based on the total capacity of the primary volumes that are being replicated.

Required Host Software

In addition to the software that is pre-installed on the system, there is additional software that must be installed on hosts for the system either to function properly or to gain additional functionality. This software is summarized in the following sections.

Solaris Host Software

The Host Installation Software CD that is packaged with the system includes a variety of Solaris host-based software for managing the Sun StorEdge 6920 system. You specify the functionality you require, and the CD installs the necessary software.

The software on the Host Installation Software CD includes:

- **Sun StorEdge SAN Foundation software** – Incorporates drivers and utilities that enable Solaris data hosts to connect to, monitor, and transfer data in a SAN.

  To enable multipathing functionality, each Solaris data host must have Sun StorEdge SAN Foundation software installed before it can reliably communicate with the system's storage. You may also choose to purchase VERITAS software, as described in "Additional Supported Software" on page 13, to enable Dynamic Multipathing (DMP).

- **Storage Automated Diagnostic Environment Enterprise Edition software** – Resides on an external management station to monitor devices in the SAN, including external storage devices connected to the Sun StorEdge 6920 system.
- **Sun StorEdge Remote Configuration CLI** – Enables Solaris hosts to remotely configure storage for the Sun StorEdge 6920 system.

Host Software for Other Operating Systems

Additional host software enables data hosts that run operating systems other than the Solaris OS to communicate with the Sun StorEdge 6920 system. For details about the supported operating systems and versions, see the *Sun StorEdge 6920 System Release Notes.*

This software consists of the following:

- **Sun StorEdge Traffic Manager Software** – Is required for hosts to make use of the Sun StorEdge 6920 system's storage. The Traffic Manager software incorporates kernel drivers and utilities that enable data hosts to connect to, monitor, and transfer data in a SAN. The Traffic Manager software is available for Microsoft Windows 2000, Microsoft Windows 2003, Red Hat Linux, HP-UX, and IBM AIX operating environments.
- **Sun StorEdge Remote Configuration CLI** – Enables hosts to remotely configure storage for the Sun StorEdge 6920 system. The remote scripting CLI client is available for Microsoft Windows 2000, Microsoft Windows 2003, Red Hat Linux, HP-UX, and IBM AIX operating environments.

You can download host software for operating systems other than Solaris OS from the Sun Download Center at:

`http://wwws.sun.com/software/download/sys_admin.html`

Go to the Download Center, select the Sun StorEdge 6920 system related software link, and follow the instructions to register and download the host software.

Additional Supported Software

The following host-based software is supported by the Sun StorEdge 6920 system:

- **Sun StorEdge Enterprise Storage Manager software** – SAN management software that helps you manage SAN environments, including the Sun StorEdge 6920 system, other Sun StorEdge storage systems, arrays, and heterogeneous hosts.
- **Sun StorEdge Availability Suite software** – Software that provides for remote mirroring and point-in-time copies of data.
- **Sun StorEdge Enterprise Backup Software** – Software that provides backup, recovery, and other services for a variety of operating environments.
- **Solstice DiskSuite** software (for the Solaris 8 Operating System) – Software that manages data and disk drives.
- **Solaris Volume Manager software (embedded in the Solaris 9 Operating System)** – Software that lets you manage large numbers of disks and the data on those disks.
- **Sun StorEdge QFS software** – Shared file system software that improves quality of service and utilization of SAN infrastructures.
- **Sun StorEdge SAM-FS software** – Storage and archive management software that automatically copies files from an online disk to archive media.
- **Sun Cluster software** – Software that extends the Solaris Operating System into a cluster operating environment, providing support for high availability, failover, and scalable services.

Supported Third-Party Software

The Sun StorEdge 6920 system is compatible with the following third-party applications:

- VERITAS NetBackup Server
- VERITAS NetBackup Enterprise Server
- VERITAS Volume Manager with Dynamic Multipathing (DMP) for Solaris
- VERITAS File System (VxFS) for Solaris
- VERITAS Volume Replicator for Solaris
- VERITAS Cluster Server (VCS)
- Legato NetWorker®

You can purchase any of this software and install it on hosts connected to the Sun StorEdge 6920 system. For a list of supported releases and versions, see the *Sun StorEdge 6920 System Release Notes*.

CHAPTER 2

Installing the System

This chapter explains how to install a Sun StorEdge base cabinet and one or two optional expansion cabinets. It also explains how to initially configure a newly installed system. It includes the following sections:

Preparing for Installation

Before you can begin to install the system, you need to make sure that you prepare the installation site, set up a DHCP server if you want to use dynamic IP addressing, check the contents of the ship kit, and review the installation task summary.

Preparing the Site

You must complete all of the installation preparation tasks described in the *Sun StorEdge 6920 System Site Preparation Guide*, including:

- Configuring two separate power drops
- Ensuring a convenient earth ground
- Having an external telephone line available for activation of the Sun StorEdge Remote Response service

---

Note – If you have not completed the requirements outlined in the *Sun StorEdge 6920 System Site Preparation Guide*, do not attempt to install the system. Your warranty might become void if you perform an improper installation.

Note – If you do not have a copy of the *Sun StorEdge 6920 System Site Preparation Guide*, you can download it from the Sun web site, as described in "Accessing Sun Documentation" on page viii.

Setting Up a DHCP Server

The Sun StorEdge 6920 system supports both dynamic and static IP addressing. Dynamic IP addressing requires a Dynamic Host Configuration Protocol (DHCP) server installed at your site and configured for the Sun StorEdge 6920 system.

If you want to use dynamic IP addressing, refer to the Solaris OS system administrator guide for information about configuring DHCP. When configuring DHCP for the Sun StorEdge 6920 system, binding must be persistent, not dynamic.

As an alternative, if you do not have a DHCP server, you can assign a static IP address to the system. If you are using fixed IP addressing, obtain an IP address from your network administrator.

Unpacking the System

The Sun StorEdge 6920 system and accessory ship kit are packaged together in one shipping carton. To unpack your system:

1. **Unpack the cabinet as described in the unpacking guide attached to the outside of the shipping carton.**
2. **Unpack the ship kit box that is attached to the side of the cabinet and check its contents (see** TABLE 2-1 **and** FIGURE 2-1**).**

TABLE 2-1 Contents of the Base Cabinet Ship Kit

Quantity	Item	Part Number
1	Hardware kit box containing: • 2 Allen wrenches for removing cabinet from shipping pallet • 2 keys (noncoated) for Standby/On key switch • 4 bolts (for stabilizer legs) • 12 hex bolts and washers	801859-*nnn*
1	*Sun StorEdge 6920 System Getting Started Guide*	819-0117-*nn*
n	Licensing envelope(s)	852-1735-*nn*
2	Keys (purple-coated) for front cabinet door	N/A
2	Keys (purple-coated) for back cabinet door	N/A
4	Floor-mounting brackets	N/A
2	Stabilizer legs	N/A
1	USB Flash Disk	370-5773-*nn*
1	Grounding cable	530-1619-*nn*
3	Ethernet cables RJ-45/RJ-45, 10M	530-2991-*nn*
2	Fibre Channel cables, LC/LC, 15M	537-1043-*nn*
1	Black bag containing the SSRR Global Telco adapter kit; includes country specific telephone adapters and telephone cord with 4-pin connectors	370-4900-*nn*
1	Adapter, RJ-45/DB25M	530-2889-*nn*
1	Adapter, RJ-45/DB9F	530-3100-*nn*

Two power cables (P/N 180-1954-*nn*) are located inside the base cabinet with one of the following connector types:

- NEMA L6-30P for 200V to 240V North American operation
- 32A single-phase IEC 309 connector for 220V to 240V international operation

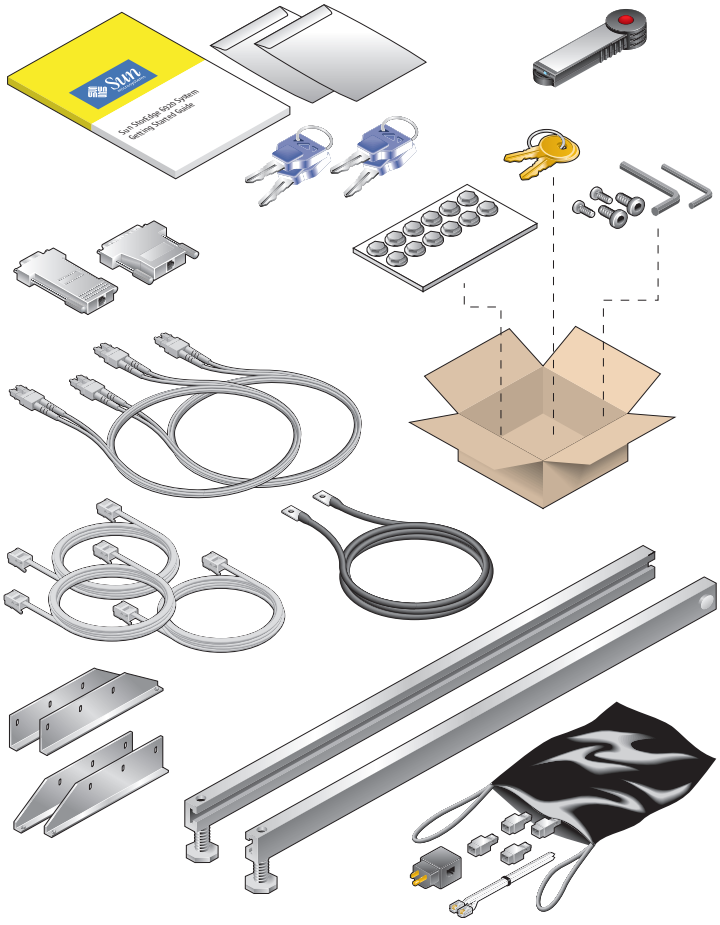


FIGURE 2-1 Contents of the Base Cabinet Ship Kit

3. **Locate the two Allen wrenches packed in the hardware kit box inside the ship kit. You need both wrenches to remove the cabinet from the shipping pallet.**

4. **Follow the instructions in the unpacking guide to remove the cabinet from the shipping pallet.**

Installation Task Summary

Use the following checklist as your guide to installing the Sun StorEdge 6920 system. To ensure a successful installation, perform the tasks in the order in which they are presented.

Task	Procedure	Where to Find Information
Installing and Initially Configuring the System		
	1. Position and stabilize the base cabinet.	"Installing the Base Cabinet" on page 21
	2. Connect optional expansion cabinet(s).	"Connecting Expansion Cabinets" on page 28
	3. Power on the system.	"Powering On the System" on page 33
	4. Install the USB flash disk.	"Installing the USB Flash Disk" on page 40
	5. Connect the serial cable to the Serial Console port.	"Establishing the Serial Connection" on page 42
	6. Configure network addresses and set the system time.	"Running the Initial Configuration Script" on page 44
	7. If you want to use dynamic IP addressing, set up and configure the DHCP server.	System administrator's guide for the server's operating system
Completing the System Configuration		
	8. Connect the system to the local area network.	"Connecting the System to the Network" on page 51
	9. Connect the system to the Sun StorEdge Remote Response service.	"Connecting the System to the Remote Response Service" on page 52
	10. Log in to the Java Web Console and start the management software.	"Starting the Management Software" on page 55
	11. Complete the initial configuration: • Configure system-wide settings. • Configure diagnostic and monitoring settings. • Set up expansion cabinet addresses (optional).	"Completing the Initial Configuration" on page 59
Connecting Data Hosts		
	12. Cable the data hosts and install the host software.	"Connecting Data Hosts" on page 67
	13. Install the data host software.	"Installing Host Software for Solaris OS Hosts" on page 74

Task	Procedure	Where to Find Information
	14. Set up the Storage Automated Diagnostic Environment.	"Starting the Storage Automated Diagnostic Environment Enterprise Edition" on page 84
Connecting External Storage Devices		
	15. Cable external storage devices.	"Connecting External Storage Devices" on page 109
Setting Up a Remote Management Host		
	16. Cable the management host and install the data host software on a remote host.	"Installing Remote Management Host Software" on page 81
	17. Set up Sun Storage Automated Diagnostic Environment Enterprise Edition.	*Sun Storage Automated Diagnostic Environment Enterprise Edition Release Notes Version 2.4*

Installing the Base Cabinet

This section covers the main requirements for installing the base cabinet:

Items You Need

TABLE 2-2 lists the items you need to complete the tasks in this section.

TABLE 2-2 Items You Need for Installing and Stabilizing the Base Cabinet

Quantity	Item	Location
4	Floor-mounting brackets OR	Base cabinet ship kit
2	Stabilizer legs	Base cabinet ship kit
4	Mounting screws for attaching the stabilizer legs	Hardware box packed in base cabinet ship kit
1	Leveling wrench	Attached to the inside back of the base cabinet
2	Keys for front cabinet door	Base cabinet ship kit
2	Keys for back cabinet door	Base cabinet ship kit
1	Phillips screwdriver	Customer supplied
1	Slotted screwdriver	Customer supplied
1	7/16-inch ratchet wrench for attaching floor-mounting brackets	Customer supplied
1	1/2-inch ratchet wrench for attaching floor-mounting brackets	Customer supplied

Moving and Positioning the Base Cabinet

You must install the Sun StorEdge 6920 system in accordance with the local safety codes and regulations. This section contains additional safety information for the local facility.

1. **Measure cabling distances to ensure that the supplied cable is adequate.**

   The grounding cable for the cabinet is 6.5 feet (~2 meters) long.

   Refer to the product specifications in the *Sun StorEdge 6920 System Site Preparation Guide* when you are determining where to place the cabinet.

2. **Move the base cabinet into position.**

Caution – A fully configured base cabinet weighs in excess of 1400 pounds (635 kg). Ensure that all surfaces this system will move over can withstand this load. Additionally, the cabinet is top heavy, even when you order the minimum configuration. Keep this in mind when moving the system.

The base cabinet has wheels. Plan to have two or three people available to move the cabinet into position, one to push the system off the pallet and onto the ramp, and the others to offer resistance so that the cabinet does not roll. Make sure there is adequate space in front of the cabinet to ensure that it will not roll into anything. Move the cabinet slowly and make sure the floor is free of objects and cables.

Caution – Never lift the system base cabinet by the cosmetic panel surfaces or pull it from the back. Instead, push the middle section of the cabinet to prevent it from tipping over. Use two or more people to move the cabinet safely: one in front to control the movement and one behind.

3. **Secure the base cabinet in position.**

   To minimize personnel injury in the event of a seismic occurrence, you should securely fasten the cabinet to a rigid structure extending from the floor to the ceiling or to the walls of the room in which you place the cabinet.

   Install the cabinet on a level surface. There are adjustable nonskid pads at each corner of the cabinet base. Extend these pads when the cabinet is installed to prevent the unit from rolling. *Do not use these pads to level the cabinet.*

4. **Ensure that the base cabinet has proper ventilation.**

   Air cools the cabinet from front to back. Air enters at the front, circulates through the system, and is expelled at both the top and back of the cabinet. Position the cabinet so as to ensure proper ventilation.

Caution – Do not block or cover the openings of the cabinet, and do not place it near a radiator or heat register.

Stabilizing the Base Cabinet

The floor-mounting brackets enable you to bolt the cabinet to the floor. If you do not install the floor-mounting brackets, then you must install the stabilizer legs. The stabilizer legs are extended to prevent the cabinet from tipping over when field-replaceable units (FRUs) are installed, removed, or serviced.

To stabilize the base cabinet, you must perform one of the following procedures:

- Adjust the leveling pads and install the stabilizer legs.
- Install the floor-mounting brackets.

Adjusting the Leveling Pads and Installing the Stabilizer Legs

Unless you are using the floor-mounting brackets, the four leveling pads must be lowered to the floor for the cabinet to meet the Underwriters Laboratories physical stability requirements.

The stabilizer legs help prevent the system from tipping over when field-replaceable units (FRUs) are serviced in the system. The stabilizer legs must be properly installed and set to be effective.

If you want to attach the system directly to the floor, skip to "Installing the Floor-Mounting Brackets" on page 26.

Adjusting the Leveling Pads

The leveling pads (screws) are located at each corner at the base of the cabinet (FIGURE 2-2).

1. **Open the back door of the base cabinet and remove the leveling wrench from the inside of the cabinet.**

   The wrench is attached to the left rack rail.

2. **Adjust the four leveling pads on the cabinet frame using the leveling wrench (FIGURE 2-2).**

   Ensure that the four pads press against the floor so that the cabinet does not move or rock in any direction.

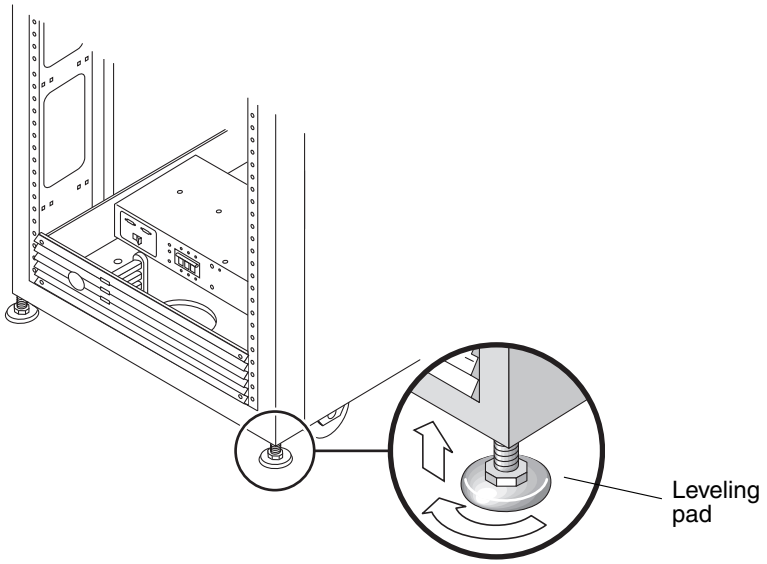


FIGURE 2-2 Leveling Pads

3. **Continue with the next section, "Installing the Stabilizer Legs" to help prevent the base cabinet from tipping over when field-replaceable units (FRUs) are serviced.**

Installing the Stabilizer Legs

Caution – Always extend the stabilizer legs before attempting to install new FRUs or to service FRUs in the system.

1. **Use a slotted screwdriver to loosen the securing screw on the right stabilizer leg (**FIGURE 2-3**).**
2. **Insert two mounting screws to each side of the cabinet (**FIGURE 2-3**).**

   One mounting screw is already in place.

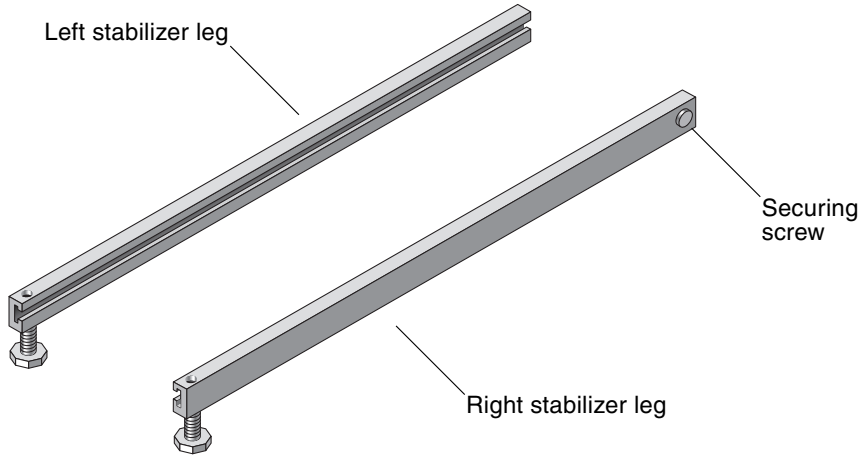


FIGURE 2-3 Stabilizer Legs

3. **Slide the right stabilizer leg over the three mounting screws at the bottom of the system cabinet (**FIGURE 2-4**) and fully extend it.**

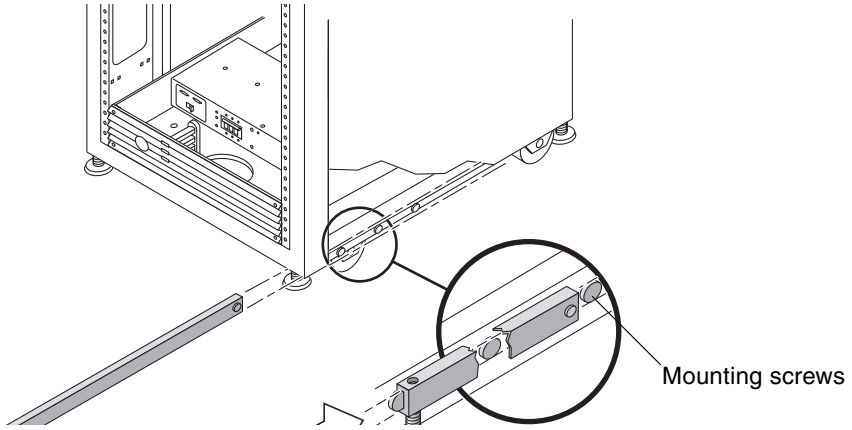


FIGURE 2-4 Installing the Right Stabilizer Leg

4. **Tighten the securing screw.**

   This prevents the stabilizer leg from falling off the mounting screws when it is extended.

5. **Repeat Step 1 through Step 4 for the left stabilizer leg.**

6. **Use the leveling wrench to adjust the feet on both stabilizer legs so that they touch the floor (**FIGURE 2-5**).**

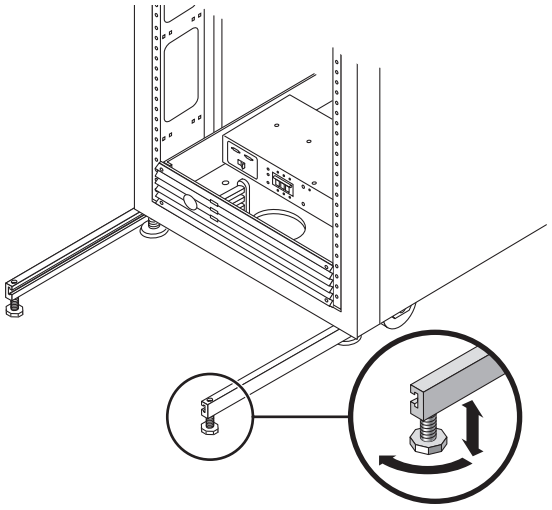


FIGURE 2-5 Adjusting the Leveling Pads on the Stabilizer Leg

7. **Slide both stabilizer legs under the system cabinet.**
8. **Close the back door.**

Installing the Floor-Mounting Brackets

Skip this section if you have installed the stabilizer legs and adjusted the leveling pads.

Use the four floor-mounting brackets to attach the system to the floor. The bolts to secure the floor-mounting brackets are included in the hardware kit box inside the ship kit.

Caution – Do not bolt the floor-mounting brackets to the deck plating of a raised (computer-room) floor, because this would result in an unstable mount.

Note – If you are installing the floor-mounting brackets over previously installed threaded rods, loosely attach the floor-mounting brackets to the rods and then to the system.

1. **Remove the mounting screws from the bottom right and left sides of the cabinet (**FIGURE 2-6**).**

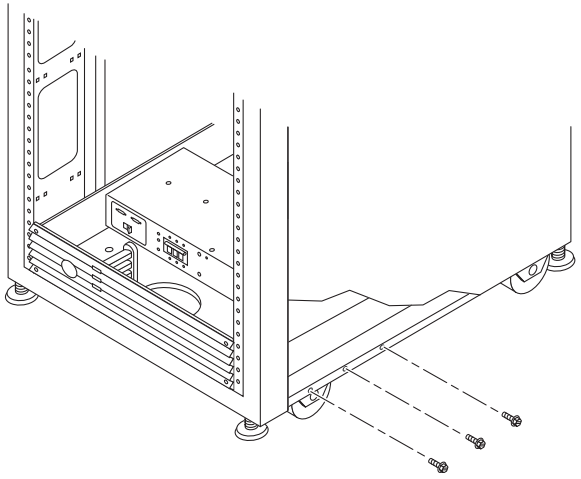


FIGURE 2-6 Removing the Mounting Screws

2. **Using a 7/16-inch ratchet wrench and the mounting screws you just removed, attach the right floor-mounting brackets to the front and back of the system (**FIGURE 2-7**).**

   Additional mounting screws, if needed, are packed in the ship kit.

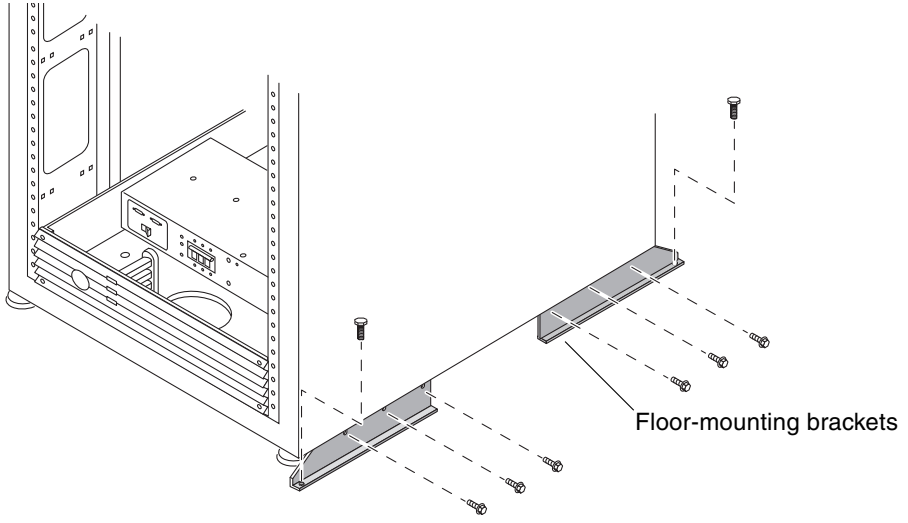


FIGURE 2-7 Attaching the Floor-Mounting Brackets

3. **Bolt the right floor-mounting brackets to the floor.**
4. **Repeat Step 1 through Step 3 for the left floor-mounting brackets.**

Connecting Expansion Cabinets

If you purchased a Sun StorEdge 6920 system with one or two expansion cabinets, follow the instructions in the following sections to connect the expansion cabinets to the base cabinet:

- "Items You Need" on page 28
- "Connecting the Fibre Channel Cables" on page 29
- "Connecting the Ethernet and Power Sequencer Cables" on page 31

Caution – You must connect the expansion cabinet before connecting power to the base cabinet.

Items You Need

TABLE 2-3 lists the items that are required for completing the tasks in this section:

TABLE 2-3 Items Required for Connecting an Expansion Cabinet

Quantity *	Item	Location	Part Number
2	10-meter cables to connect the base cabinet service panel to the expansion cabinet service panel	Expansion cabinet ship kit †	537-1060-*nn*

TABLE 2-3 Items Required for Connecting an Expansion Cabinet *(Continued)*

Quantity *	Item	Location	Part Number
1	10-meter Ethernet RJ-45/ RJ-45 crossover cable	Expansion cabinet ship kit	530-3138-*nn*
2	Power sequencer serial cables	Expansion cabinet ship kit	530-3210-*nn*
2	Power cables with one of the following connector types: • NEMA L6-30P for 200V to 240V North American operation • 32A, single-phase, IEC 309 connector for 220V to 240V international operation	Inside the expansion cabinet	595-4882-*nn*

* Quantity for each expansion cabinet.

† See Appendix C for a listing of the expansion cabinet ship kit contents.

Connecting the Fibre Channel Cables

The base cabinet service panel has two sets of Fibre Channel (FC) ports (EXP 1 and EXP 2) to connect to the expansion cabinets (see FIGURE 2-8). The expansion cabinet service panel has redundant FC ports (see FIGURE 2-9).

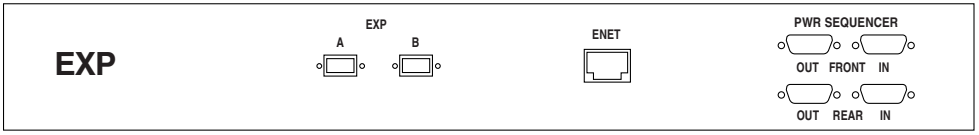


FIGURE 2-8 Expansion Cabinet Service Panel

Connect redundant Fibre Channel (FC) cables (part number 537-1060-01) as follows (see FIGURE 2-9):

- Connect port EXP 1 A FC1 of the base cabinet to port EXP A of the expansion cabinet 1 service panel.
- Connect port EXP 1 A FC2 of the base cabinet to port EXP B of the expansion cabinet 1 service panel.

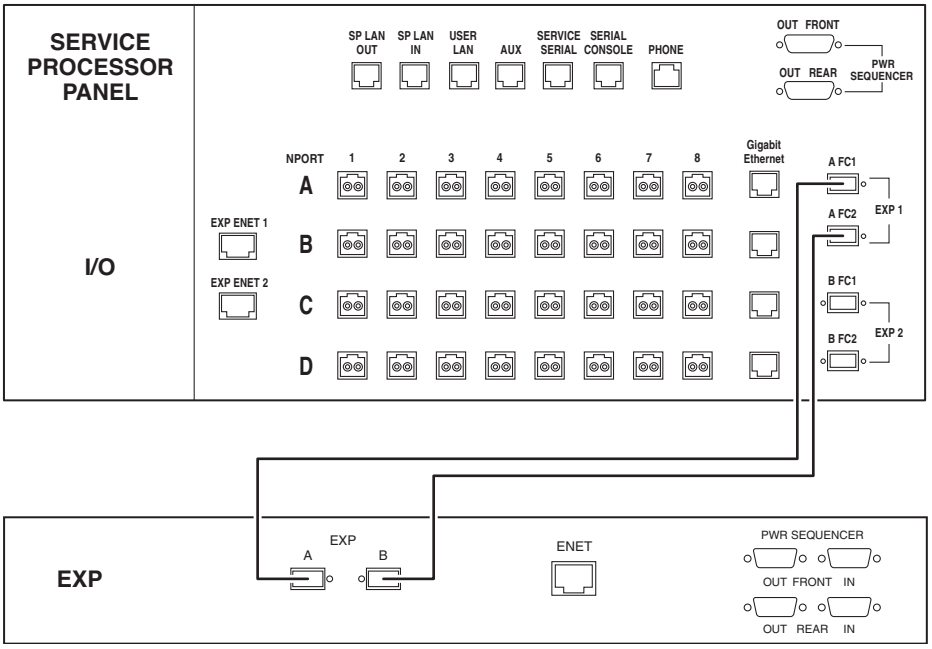


FIGURE 2-9 FC Cabling Between the Base Cabinet and Expansion Cabinet 1 Service Panels

Connecting the Base Cabinet to Expansion Cabinet 1 and Expansion Cabinet 2

Connect redundant Fibre Channel (FC) cables (part number 537-1060-01) as follows (see FIGURE 2-10):

- Connect port EXP 1 A FC1 of the base cabinet to port EXP A of the expansion cabinet 1 service panel.
- Connect port EXP 1 A FC2 of the base cabinet to port EXP B of the expansion cabinet 1 service panel.
- Connect port EXP 2 B FC1 of the base cabinet to port EXP A of the expansion cabinet 2 service panel.
- Connect port EXP 2 B FC2 of the base cabinet to port EXP B of the expansion cabinet 2 service panel.

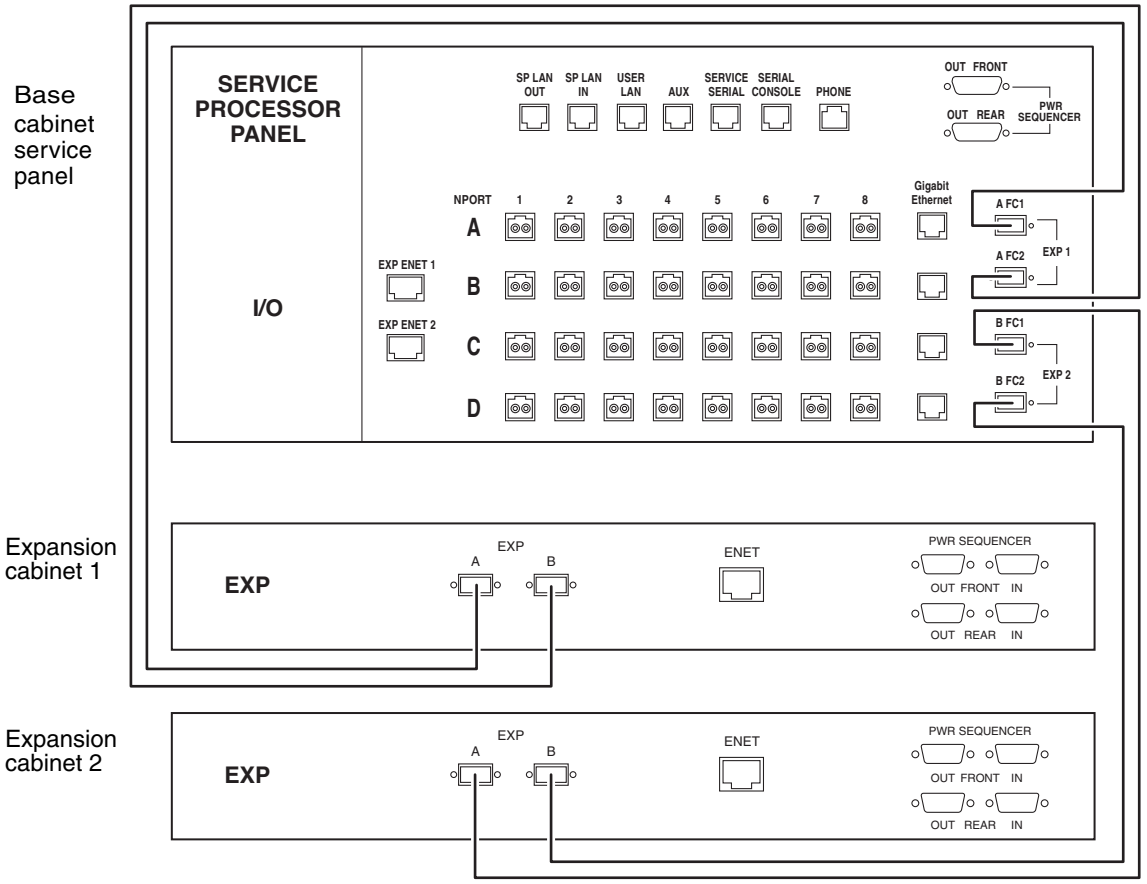


FIGURE 2-10 FC Cabling Between the Base Cabinet Service Panel, Expansion Cabinet 1, and Expansion Cabinet 2

Connecting the Ethernet and Power Sequencer Cables

To connect to one or two expansion cabinets, use one Ethernet cable (10M RJ-45/RJ-45 crossover, part number 530-3138-01) for each expansion cabinet as shown in FIGURE 2-11 or FIGURE 2-12.

If you are setting up the system to enable remote power management, you must also connect two or four power sequencer serial cables (part number 530-3210-01) between the base cabinet and one or both expansion cabinets as shown in FIGURE 2-11 or FIGURE 2-12.

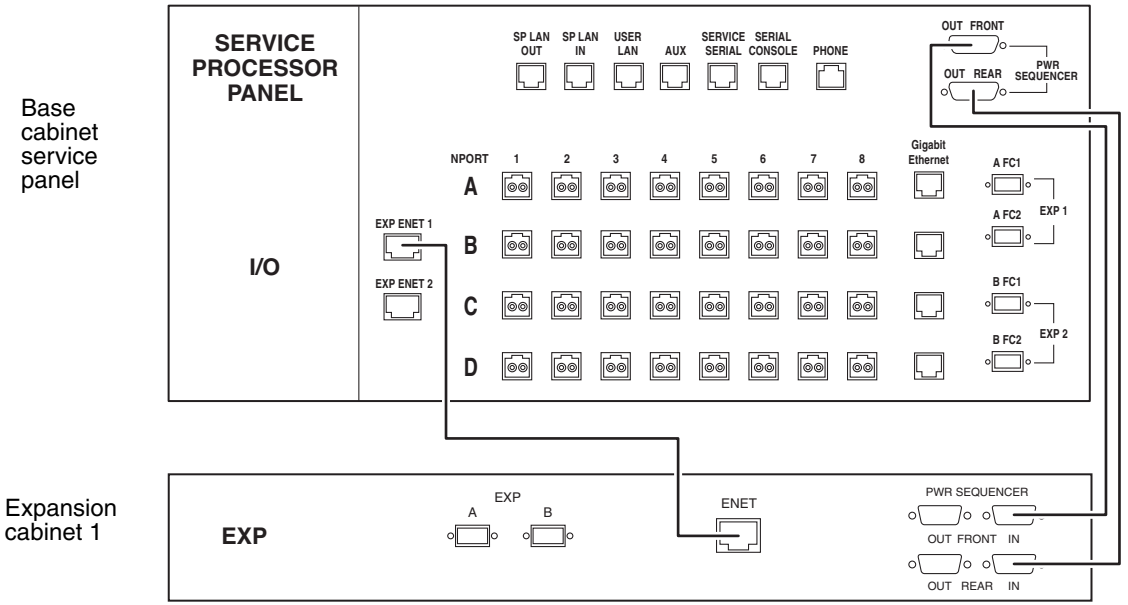


FIGURE 2-11 Ethernet and Power Sequencer Cabling Between the Base Cabinet and Expansion Cabinet 1 Service Panels

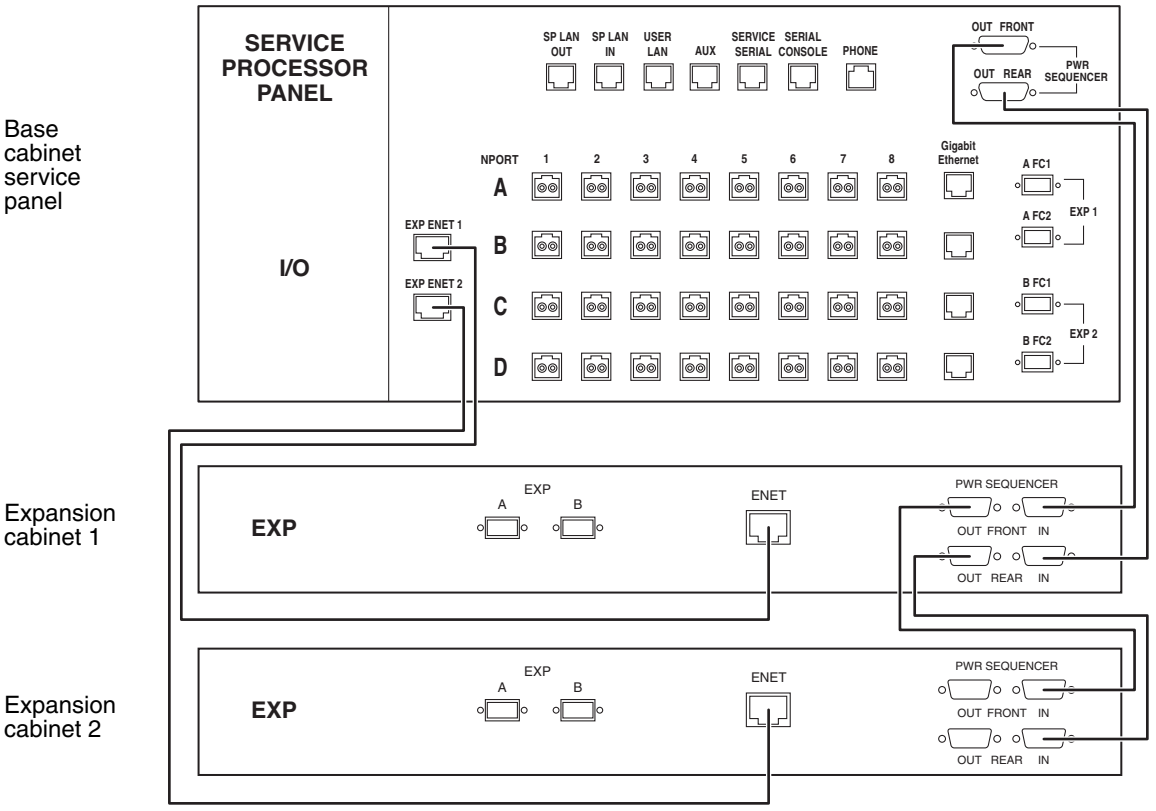


FIGURE 2-12 Ethernet and Power Sequencer Cabling Between the Base Cabinet Service Panel, Expansion Cabinet 1, and Expansion Cabinet 2

Powering On the System

This section covers the procedures for cabling and powering on the system for the first time. You must complete the following three procedures in consecutive order to correctly power on the system:

- "Connecting the Grounding Cable of the Base Cabinet" on page 34
- "Connecting the Power Cables" on page 36
- "Powering On the System" on page 39

Note – If you want to enable the system for lights-out management, which allows you to perform a remote partial system shutdown, go to "Preparing the System for Remote Power Management" on page 125.

Items You Need

TABLE 2-4 lists the items required for performing the tasks in this section.

TABLE 2-4 Items Required for Connecting Ground Cable and Power

Quantity	Item	Location	Part Number
2	Keys (noncoated) for the Standby/On key switch	Base cabinet ship kit	N/A
1	Grounding cable	Base cabinet ship kit	530-1619-*nn*
2	Power cables with one of the following connector types: • NEMA L6-30P for 200V to 240V North American operation • 32A, single-phase, IEC 309 connector for 220V to 240V international operation	Inside the back of the base cabinet.	180-1954-*nn*
1	Phillips screwdriver	Supplied by customer	N/A

Connecting the Grounding Cable of the Base Cabinet

You must connect the grounding cable to either a grounding post or something attached to a grounding post. The system is designed to work with single-phase power systems that have a grounded neutral conductor.

1. **Open the front and back doors of the base cabinet.**
2. **Insert a key into the Standby/On key switch at the bottom of the front panel (**FIGURE 2-13**).**

Note – The position of the key switch does not matter for local power-on and power-off operations (FIGURE 2-13). If you want to enable remote power management, set the key to the Standby position and refer to "Preparing the System for Remote Power Management" on page 125 for instructions.

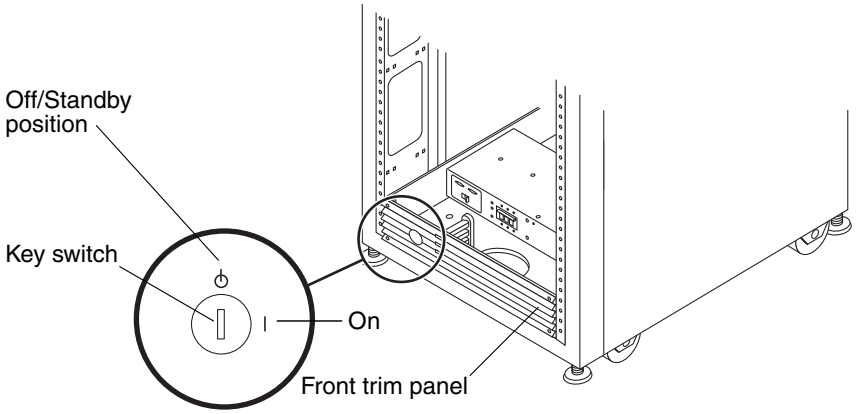


FIGURE 2-13 Location of the Key Switch on the Bottom Front Panel of the Base Cabinet

3. **Remove the front trim panel and set it aside.**
4. **Locate the 6.5-foot (~2-meter) grounding cable in the ship kit.**
5. **Attach one end of the grounding cable to the front AC power sequencer on the cabinet (**FIGURE 2-14**). Feed the cable through the opening at the bottom of the cabinet.**

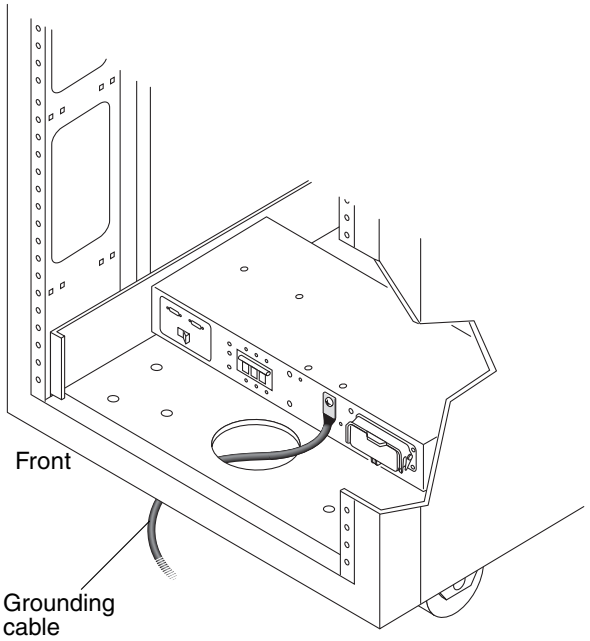


FIGURE 2-14 Attaching the Grounding Cable to the Front AC Power Sequencer

6. **Attach the other end of the grounding cable to either an external grounding post or something attached to a grounding post.**

   You are now ready to connect the power cables, as described in the next section.

Connecting the Power Cables

Caution – The system is designed to work with single-phase power systems that have a grounded neutral conductor. To reduce the risk of electric shock, do not connect the system to any other type of power system.

1. **Verify that the front and back AC power sequencer circuit breakers are both in the Off position (**FIGURE 2-15**).**
2. **Verify that the Local/Off/Remote switch is in the Remote position on each power sequencer (**FIGURE 2-15**).**

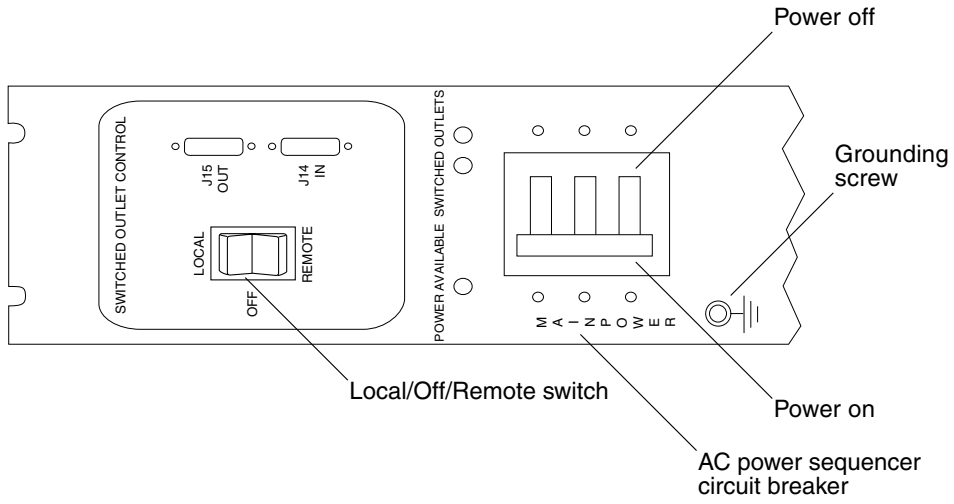


FIGURE 2-15 Rear Power Sequencer Control Panel

3. **Check the electrical ratings label on the serial number label attached to the power sequencer. Verify that the stated rating of each power sequencer matches the AC input voltage to the system (see "Power Sequencer Electrical Specifications" in the *Sun StorEdge 6920 System Site Preparation Guide).***

4. **Connect each power cable to the front and rear power sequencers** (FIGURE 2-16)**:**

   a. **Route each power cable directly through the opening in the base of the cabinet.**

   b. **Flip open the latch covers of each cable to access the connectors.**

   c. **Connect the female end of one power cable to the rear power sequencer connector.**

   d. **Connect the female end of the other power cable to the front power sequencer connector.**

   e. **Pull the latch covers over the power cables to secure them to the power sockets.**

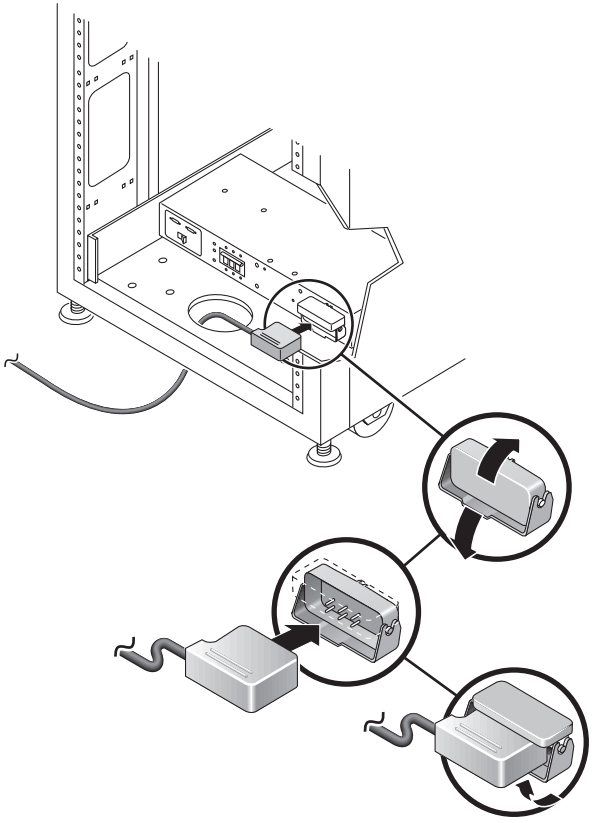


FIGURE 2-16 Connecting the Power Cables

5. **Connect the other end of each power cable to a grounded outlet.**

   One of the following connector types is provided on the power cables:

   - NEMA L6-30P for 200V to 240V North American operation
   - 32A, single-phase, IEC 309 connector for 220V to 240V international operation

Caution – To reduce the risk of electric shock, strictly observe all Caution and Note statements in the following procedure.

Note – If the appropriate mating receptacle is unavailable, the connector can be removed from the cable, and the cable can then be permanently connected to a dedicated branch circuit by a qualified electrician. Check local electrical codes for proper installation requirements.

After you have connected the power cables, you are ready to power on the system, as described in the next section.

Powering On the System

Caution – To avoid damage to internal circuits, do not connect or disconnect any cable while the FRU associated with the cable is powered on.

1. **Verify that the AC power cable of the system is connected to the correct AC outlet.**

Caution – Do not disconnect the AC power cable from the outlet when working on or in the system. This connection provides a grounding path that prevents damage from electrostatic discharge.

2. **At the front and back of the base cabinet, set the AC power sequencer circuit breakers to the On position (**FIGURE 2-15**).**
3. **Verify that the Power Available LED on both the front and back AC power sequencer panels are green.**
4. **Wait approximately one minute after the AC power sequencer circuit breakers are pressed on.**

   As soon as you connect AC power to the system, the Storage Service Processor powers on.
5. **At the front and back of the system, set the Local/Off/Remote switch to the Local position. If you want to enable the system for remote power managment, set the switch to the Remote position and see "Preparing the System for Remote Power Management" on page 125 for more information.**
6. **Verify that the Switched Outlet LEDs on the front and back AC power sequencer panels are green.**

   The system is now powered on.

Note – The Storage Service Processor and Storage Service Processor accessory tray are already powered on because they are connected to the unswitched power outlets.

7. **Replace the front trim panel at the bottom front of the cabinet.**
8. **Turn the key switch, located at the bottom of the front panel, to the On position (**FIGURE 2-13**).**

All three LEDs on the front AC power sequencer panel should be green (FIGURE 2-17).

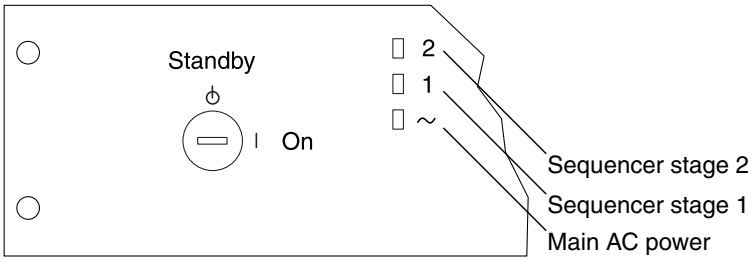


FIGURE 2-17 Front Sequencer Status Lights

If any of the LEDs are not green, refer to Appendix D.

Installing the USB Flash Disk

The Sun StorEdge 6920 system is packaged with a universal serial bus (USB) flash disk to back up the Storage Service Processor configuration files. In the event of a Storage Service Processor failure, field service personnel can use the flash disk to restore the original configuration on a replacement Storage Service Processor.

Items You Need

The flash disk provided with the system is one of the models described in the following table.

Quantity	Item	Location	Part Number
1	USB Flash Disk	Base cabinet ship kit	370-5773-*nn*
1	SimpleTech USB Flash Disk	Base cabinet ship kit	370-6016-*nn*

Note – Do not connect a USB flash disk with an image that you want to restore to a working Storage Service Processor or to any other USB port, because the image on the flash disk could be overwritten.

Note – The flash disk is formatted for the Solaris Operating System. Do not connect it to a PC, because the Microsoft Windows operating system will not recognize it and will ask if you want to format the disk.

1. **If the USB flash disk has a write protection switch, verify that it is set to the unlock (write-enabled) symbol.**

   The flash disk is write-enabled when the write protection switch is set to the unlock position (FIGURE 2-18).

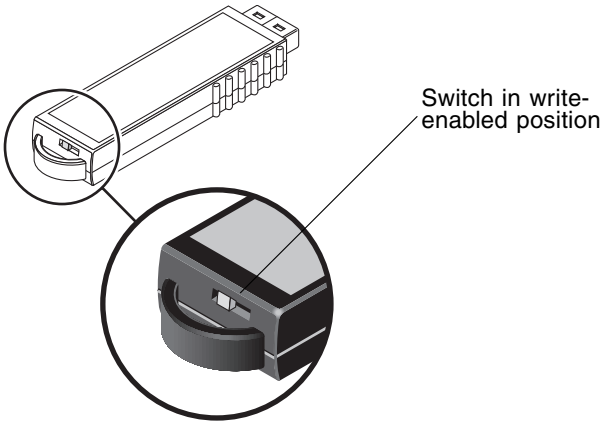


FIGURE 2-18 USB SANDisk Flash Disk Write Protection Switch

Note – If your flash disk is a different model, refer to the *Sun StorEdge 6920 System Release Notes* for details.

2. **At the back of the base cabinet, loosen the two thumb screws on the right side of the service panel and carefully swing open the service panel.**
3. **Remove the round protective cover from the disk.**
4. **Insert the USB flash disk into the USB port 0 on the back panel of the Storage Service Processor.**

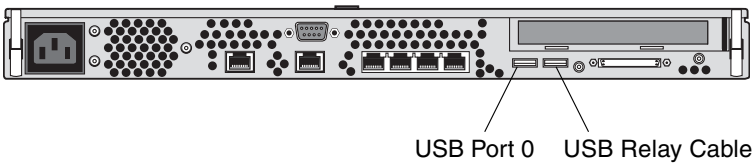


FIGURE 2-19 Storage Service Processor: USB Port 0

5. **To verify that the flash disk is installed correctly, look for a steady LED located at the top of the disk.**

Note – The LED is located on the top of the flash disk and might be difficult to see when it is installed.

---

6. **Close the service panel and tighten the two thumb screws.**

Establishing the Serial Connection

You configure the initial system by establishing a serial connection to the system and running the setup script.

The following items from the ship kit are required:

Quantity	Item	Location	Part Number
3	Ethernet 10M RJ-45/RJ-45 crossover cables	Base cabinet ship kit	530-2991-*nn*
1	Adapter, 25P, Sub-D, RJ-45, Female	Base cabinet ship kit	530-2889-*nn*
1	Adapter, RJ-45, DB9F	Base cabinet ship kit	530-3100-*nn*

1. **Locate the serial cables that came with the system.**
2. **If necessary, assemble the RJ-45 cable with the adapter that fits either the DB9 or the DB25 serial port of a laptop, terminal, or Solaris workstation. (See "Serial Console Port Interface" on page 148 for more information.)**

3. **Connect the serial cable from the Serial Console port on the service panel to your laptop, terminal, or workstation (FIGURE 2-20).**

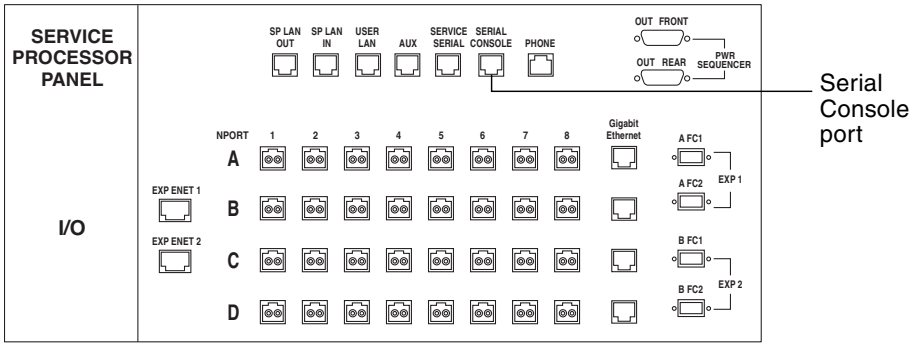


FIGURE 2-20 Serial Console Connection

4. **Configure the console settings:**

   - If you are using a Sun workstation, connect through the serial port using the `tip` command for the appropriate port. Serial port 1 corresponds to `/dev/ttya` and serial port 2 corresponds to `/dev/ttyb`. For example, the following command uses port 1.

     ```
     [3]user1: tip -9600 /dev/ttya
     connected
     ```

   - If you are using a terminal or a terminal emulation program, open a terminal window and configure the console settings as follows:

     ```
     Bits per Second: 9600
     Data Bits: 8
     Parity: None
     Stop Bits: 1
     Flow Control: None
     ```

Running the Initial Configuration Script

You establish the initial configuration of the Sun StorEdge 6920 system by logging in to the system through the serial connection from a Sun workstation, a PC, or another terminal type.

This procedure explains how to establish the serial connection, log in through the Serial Console port, and run the initial configuration script. This script guides you through the configuration steps for a new system.

Before you start the configuration script, collect the required system and network information using the "Information Collection Worksheet" on page 153 as your guide.

1. **Log in to the network terminal concentrator (NTC) using the following login name and password:**

```
login: rss
password: sun1rss
```

2. **Switch to the system's Storage Service Processor.**

```
ntc0: connect local port_2
```

3. **Press Return several times until the login prompt is displayed.**

```
new_sp console login:
```

4. **Log in to the console using the following login name and password:**

```
new_sp console login: setup
Password: !setup
```

When you log in as `setup`, the initial configuration utility script automatically runs.

5. **Select `Initial configuration` from the list of options by entering `1`.**

```
*********************************************
* StorEdge 6920 Initial Configuration Utility *
*********************************************

1. Initial configuration
2. Restore previously defined configuration
3. Unconfigure
4. Enable SW support for Lights Out Operation
5. Upgrade System
Your Choice: 1
```

6. **The script prompts you to enter a system ID from 0 to 7.**

   If this is the first Sun StorEdge 6920 system at your site, enter **0** or press Return. You can have a maximum of eight systems in one configuration (`sp0` through `sp7`). If more than one Sun StorEdge 6920 system is installed at your site, use the next highest number in sequence for each installed system.

```
*****************************************
* Initializing StorEdge 6x20 Configuration *
*****************************************

Initial configuration is setting up the id
and network parameters for your StorEdge 6x20.

Please enter the StorEdge 6x20 Id.
A valid value is a digit between 0 and 7.
Your Choice (0-7) [0]: 0
Checking for pre-existing  sp0
sp0 OK
```

Note – If you have multiple Sun StorEdge 6920 systems and want the Sun StorEdge Remote Response service to monitor the systems through a common telephone line, you must assign each Storage Service Processor a unique ID. The system containing the modem with the telephone line connection must be assigned a system ID of sp0. For more information about connecting multiple systems, see "Connecting Multiple Systems" on page 123.

---

7. **Select the dynamic host control protocol (DHCP) IP or fixed IP addressing option.**

   If you are using a DHCP server to assign the IP address, you are prompted to enter the nameserver IP address and domain name. When configuring DHCP, be sure that binding is persistent, not dynamic.

8. **If you do not have a DHCP server, enter** 2 **to configure a fixed (or static) IP address for the system.**

```
Network Settings:
--------------------
Do you wish to use DHCP or Fixed Network Addresses?
1. DHCP
2. Fixed
Your Choice [2]: 2
```

9. **If you selected Fixed, enter the following network settings. Press Return to accept the defaults.**

```
Please enter the IP Address for the StorEdge 6x20: 1x.x.xx.xx
Please enter the Gateway Address for the StorEdge 6x20 [1x.x.xx.x]:
<Return>
Please enter the Network Mask for the StorEdge 6x20
[255.255.255.0]: <Return>
Please enter the Nameserver IP Address for the StorEdge 6x20:
129.xxx.x.xx
Please enter the Nameserver Domain for the StorEdge 6x20: name.com
```

10. **If necessary, modify the time zone.**

    Enter **1** to select your time zone from a list, enter **2** and enter the time zone, or enter 3 if no changes are needed.

```
Current TZ =  GMT

Modify TZ?
------------
1. Select Timezone from list
2. Enter Timezone (if known - e.g. US/Mountain)
3. No Change.
Your Choice: 2
Enter Timezone (Example: US/Mountain): US/Eastern

Current date and time = Thu Nov 18 16:23:56 EST 2004
```

11. If necessary, modify the current date and time.

Enter **1** to change the date and time. Enter the date in *mm/dd/yyyy* format and enter the time in one of the formats shown in the following example:

```
Current date and time = Thu Nov 18 16:23:56 EST 2004

Modify Date and Time?
-----------------------
1. Change Date and Time
2. No Change.
Your Choice: 1
Please enter the date for the StorEdge 6x20 (mm/dd/yyyy):
02/09/2005
Please enter the time for the StorEdge 6x20 (hh:mm; hh 00-23, mm
00-59): 10:50
```

12. When prompted, verify the accuracy of your responses.

Enter **y** or press the Return key to start the automatic configuration.

If you enter **n,** you are prompted for the network configuration again. If you press Return at each question, your original answer is retained.

```
 System Settings
-----------------
StorEdge 6x20 Id                :  0

 Network Settings
------------------
Network Type                    :  Fixed
StorEdge IP Address             :  1x.x.xx.xx
StorEdge Gateway Address        :  1x.x.xx.x
StorEdge Network Mask           :  255.255.255.0
StorEdge NameServer Address     :  129.xxx.x.x
StorEdge Domain Name            :  east.nwst.com

 Date and Time Settings
------------------------
Date                            :  02/09/2005
Time                            :  10:50

************************************************************

Are all of the above settings correct? (Y/N) y
```

The following output is displayed.

```
****************************************
*                                      *
* Performing StorEdge 6x20 Configuration *
*                                      *
*   Estimated time to complete:  20:00   *
*                                      *
****************************************

Running step 1 of 11...
Updating time zone...
Updating system date and time...

New date and time: Wed Feb  9 10:50:00 EST 2005
syslog service starting.
Successfully Completed.

Running step 2 of 11...
Updating firewall configuration...
NOTE: Successful execution of this operation takes several
minutes.
Please be patient ...
100% Complete

Return Code (0) : Successful completion

Running step 3 of 11...
Updating SP network settings ...
Successfully Completed.

Running step 4 of 11...
Setting hostname and host files...
Successfully Completed.

Running step 5 of 11...
Updating file resolv.conf...
Successfully Completed.

Running step 6 of 11...
Restarting sendmail...
Successfully Completed.
```

```
Running step 7 of 11...
Restarting se6000...
100% Complete
Requesting WBEM And Tomcat Services To Be Restarted
Please Wait...
100% Complete
WBEM And Tomcat Services Have Been Restarted
100% Complete
Successfully Completed.

Running step 8 of 11...
Updating DSP configuration...
Sending output to nohup.out
100% Complete

Running step 9 of 11...
Updating Rasagent configuration...
Sending output to nohup.out
100% Complete

Running step 10 of 11...
Updating Crontab & logs...

Running step 11 of 11...
Updating NTC configuration...
NOTE: Successful execution of this operation takes several
minutes.
Please be patient...
100% Complete

NOTE:   The NTC Configuration was successful.  The NTC will be
      reinitialized in less than two minutes.  Please press "Enter"
       when prompted in order to proceed with configuration, then
log off.
       Disconnect from the NTC, and wait approximately two minutes
before reconnecting.  If the following network verification is
successful, you may begin other configuration tasks.

Successfully Completed.
```

```
|------------------------------------------------------------- |
| This system is for the use of authorized users only.         |
| Individuals using this computer system without authority, or in |
| excess of their authority, are subject to having all of their |
| activities on this system monitored and recorded by system   |
| personnel.                                                   |
|                                                              |
| In the course of monitoring individuals improperly using this |
| system, or in the course of system maintenance, the activities |
| of authorized users may also be monitored.                   |
|                                                              |
| Anyone using this system expressly consents to such monitoring |
| and is advised that if such monitoring reveals possible      |
| evidence of criminal activity, system personnel may provide the |
| evidence of such monitoring to law enforcement officials.    |
|------------------------------------------------------------- |

sp0 console login:
```

The initial configuration is complete when the console login prompt is displayed.

Note – If any alarms appear, you can clear them later as described in "Responding to Current Alarms" on page 63.

---

13. **Disconnect the serial connection. If you are connected through `tip`, disconnect from the serial connection by entering the following command:**

    `a ~.`

    The terminal session returns to the shell.

14. **Disconnect the serial cable from the Serial Console port.**

Connecting the System to the Network

When the system is connected to your local area network (LAN) through the User LAN port on the service panel, the system can be managed through a browser from any workstation on the network.

The firewall that connects to the User LAN port supports a half-duplex 10-Mbps network connection. Configure the port settings on your network switch or hub to an auto-negotiate setting. If for some reason you cannot use an auto-negotiate setting, set the network switch or hub to half duplex 10 Mbps.

To connect the system to your LAN:

1. **Locate the RJ-45 cable that is connected to your local area network.**
2. **Connect the RJ-45 cable to the User LAN port on the back of the service panel (**FIGURE 2-21**).**

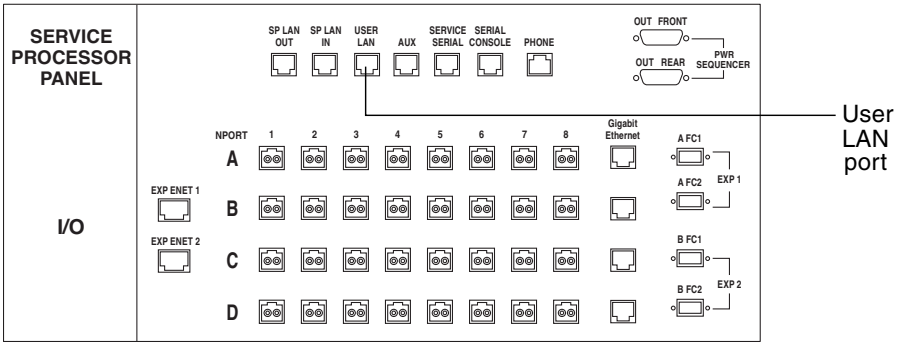


FIGURE 2-21 Local Area Network Connection

Connecting the System to the Remote Response Service

The Sun StorEdge Remote Response service provides remote monitoring of the Sun StorEdge 6920 system. When you activate this service, the Storage Service Processor continually monitors the messages sent to the system log by the software and firmware in the system subsystems. If a message contains an alert, the system contacts the Sun Service Center.

All of the hardware and software required for using the Sun StorEdge Remote Response service is included with the system. The modem installed in the base cabinet is qualified for use in most countries (see "Supported Country Listing" on page 121) with no modification required.

Note – If remote monitoring by means of the Sun StorEdge Remote Response service is not possible, configure RAS Telemetry for this system. The type of data sent includes information such as firmware levels, WWNs, serial numbers, event logs, and system uptime. Customer data is not sent. The telemetry data gathered allows Sun to know if your system requires implementation of a field information notice (FIN), field change order (FCO), or firmware upgrade. To set up encrypted email for RAS Telemetry, refer to the instructions in "Setting Site Information for Diagnostics and Monitoring" on page 60 to configure the Network Storage Command Center (NSCC) remote provider service.

To set up the remote response service at your site:

1. **Connect a dedicated analog telephone line with dial-out and dial-in capability. Connect the telephone line to the Phone port on the service panel of the base cabinet (**FIGURE 2-22**).**

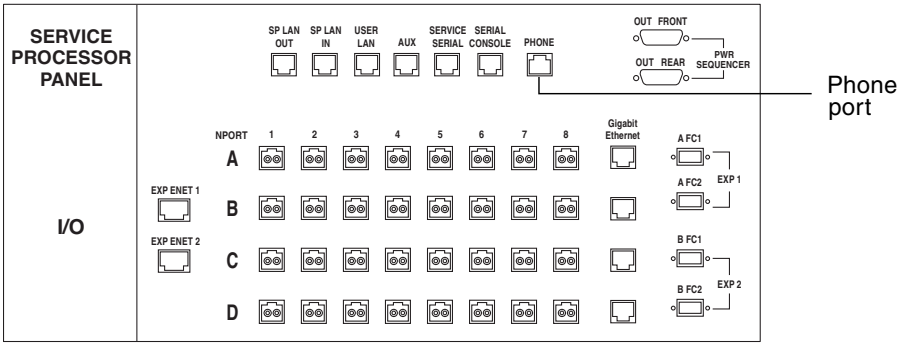


FIGURE 2-22 Remote Response Service Connection

Note – To install and configure an external modem, use the procedures in Sun Storage Automated Diagnostic Environment > Service Advisor > X-Options > Adding External Modem.

---

2. **Gather the information you need for activating the service, using the "Remote Response Service Worksheet" on page 122 as your guide.**

3. **To activate the remote service, contact your local Sun Service Center and ask for Sun StorEdge Remote Response installation activation.**

4. **Set up an SSRR notification provider, as described in "Setting Site Information for Diagnostics and Monitoring" on page 60.**

   If you want to connect multiple Sun StorEdge 6920 systems to share a single telephone line, you must first complete the installation and initial configuration of the first system. You can then connect additional Sun StorEdge 6920 systems, as described in "Connecting Multiple Systems" on page 123. If you want to connect the Sun StorEdge 6920 system to a Sun StorEdge 6320 system, contact the Sun Service Center.

Next Steps

At this point, you have completed the hardware installation and initial system configuration. The system is connected to the network, you have named the system, and you have set the correct date, time, and time zone.

You have also connected cables to the service panel for the Sun StorEdge Remote Response service, if applicable.

The next step is to log in to the system using a web browser and complete the initial configuration, as described in "Logging In and Completing the Initial Configuration" on page 55.

CHAPTER 3

Logging In and Completing the Initial Configuration

This chapter introduces you to the browser interface and describes how to complete the initial system configuration. It includes the following sections:

For detailed information about the procedures in this chapter, open the online help system by clicking the Help button.

Starting the Management Software

The system provides two interfaces for accessing the configuration and monitoring software:

- Browser interface for running the graphical interface on any host networked with the system. The web-based browser interface is the primary interface for configuring, managing, and monitoring the system.
- Remote scripting command-line interface (CLI) client, which enables you to run commands interactively from an out-of band management station, or write scripts to automate certain administrative tasks.

For information about setting up the remote scripting CLI client, see "Installing Remote Management Host Software" on page 81.

About User Roles

The type of user role you assign to users determines their level of system access. There are three types of user roles (TABLE 3-1).

TABLE 3-1 User Roles

User role	Default User Name	Default Password	Description
Administrative	`admin`	`!admin`	The administrative role has read/write privileges for system-wide administrative settings. For example, a user assigned the administrative role can modify users, licenses, and system attributes.
Storage	`storage`	`!storage`	The storage role has all administrative privileges plus read/write privileges for all storage configuration settings. For example, a storage user has all of the privileges of the administrative role plus full access to array configuration and monitoring.
Guest	`guest`	`!guest`	The guest role has read-only privileges and can only view certain information. A guest user cannot modify any settings or features.

Multiple users assigned to the administrative or storage roles can be logged in concurrently. However, because storage and administrative users have write privileges, there is a risk of one user's changes overwriting another user's previous changes. Therefore, you should develop policies about who can make changes and how to notify others.

For information on how to change the default password for the storage, admin, or guest roles, see "Changing Passwords" in the online help.

Logging In to the System

You can access the diagnostic environment and configuration software from a web browser on any host that has network connectivity to the system.

To log in to the system:

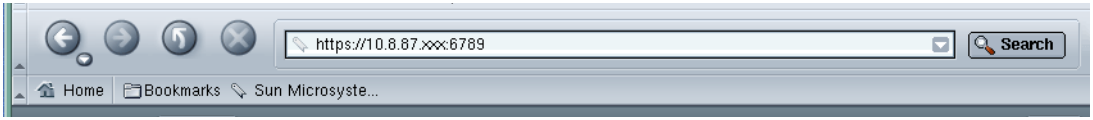
1. **Open a supported browser.**

Tip – For a list of supported web browsers, see the *Sun StorEdge 6920 System Release Notes*.

---

2. **Enter the IP address of the system in this format:** `https://IPaddress:6789`

   The *IPaddress* is the IP address of the Sun StorEdge 6920 system. (You assigned the IP address while running the setup script. See "Running the Initial Configuration Script" on page 44.)



The login page is displayed.

Note – "Server Name" is the name of the Storage Service Processor in the Sun StorEdge 6920 system and is in the form sp*n*, where *n* is the number entered in "Running the Initial Configuration Script" on page 44; for example, `sp1`.

---

3. **Enter the default storage user name and password:**

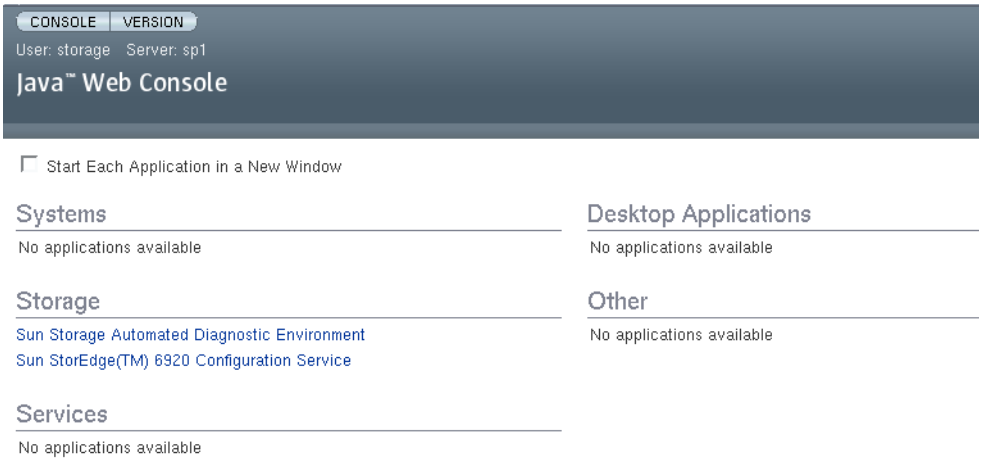
   User Name: **`storage`**

   Password: **`!storage`**

   For information about user role and passwords, see "About User Roles" on page 56.

4. **Click the Log In button.**

   The Java Web Console page is displayed.



   At this point, you are logged in to the system.

5. **You can select one of the following applications:**

   - Sun Storage Automated Diagnostic Environment
   - Sun StorEdge 6920 Configuration Service

   The system displays the appropriate web page, based on your selection.

Note – The connection closes automatically if there is no activity for 30 minutes.

Completing the Initial Configuration

After you log in to the system, the next step is to configure system-wide settings. Complete the following procedures in order to set the initial system information.

- "Configuring General Settings" on page 59
- "Setting Site Information for Diagnostics and Monitoring" on page 60

Configuring General Settings

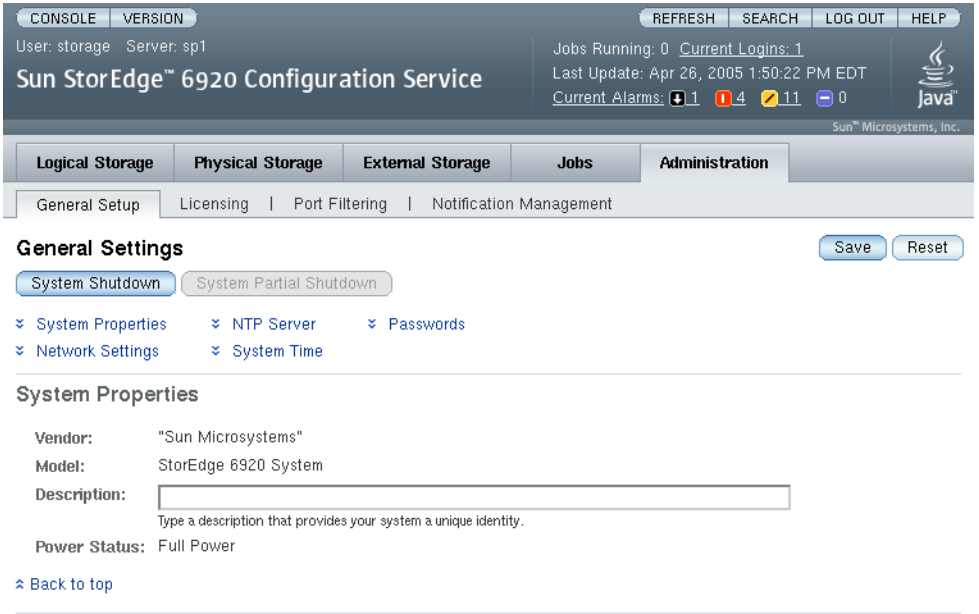
Use the General Settings page to add a system description, modify system network settings, update the system time, and change user passwords.

Note – You must log in as a storage user to configure system-wide settings.

---

1. **Click Sun StorEdge 6920 Configuration Service.**

   The system displays the General Settings page with the network and system settings you specified during the initial configuration (see "Running the Initial Configuration Script" on page 44).



2. **In the System Properties Description field, add a description that uniquely identifies your system.**
3. **Go to the Network Time Protocol (NTP) Server section and enter the IP address of your NTP server, which was provided by your network administrator.**

   If you do not have an NTP server at this site, check the Disable NTP check box.
4. **Go to the System Time section and update the System Time, Date, and Time Zone entries, if necessary.**
5. **Click Save at the bottom of the page.**

   You are now ready to configure the initial diagnostics and monitoring settings for the system.

Setting Site Information for Diagnostics and Monitoring

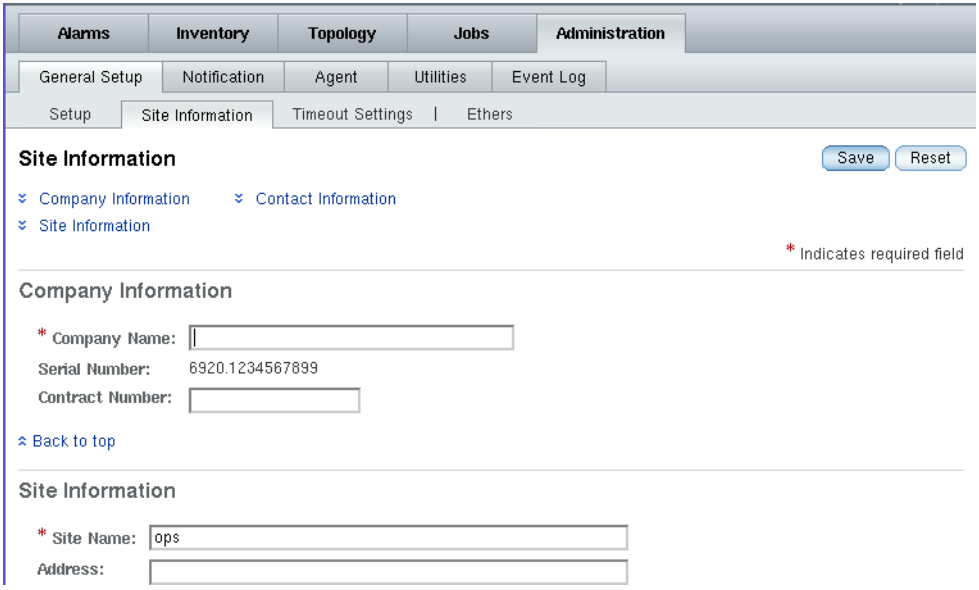
The monitoring and diagnostic software is preconfigured to recognize the hardware configuration of the system, but not specific information about your site. Before using the system, you must specify basic site and email notification information.

Note – You can be logged in as a storage or admin user to configure diagnostic and monitoring settings.

---

1. **Click Console to return to the Java Web Console page.**
2. **Click Sun Storage Automated Diagnostic Environment.**

   The Site Information page is displayed.



3. **Fill in all mandatory Site Information entries as denoted by red asterisks, and then click Save.**

   If you need a description of any of the fields, click the Help button on the Site Information page.

4. **To set up email or pager notifications:**

   a. **Click Administration > Notification > Email.**

      The Email Notification page is displayed.

   b. **Click New to add a new email or pager notification address.**

      The Add Email Notification Page is displayed.

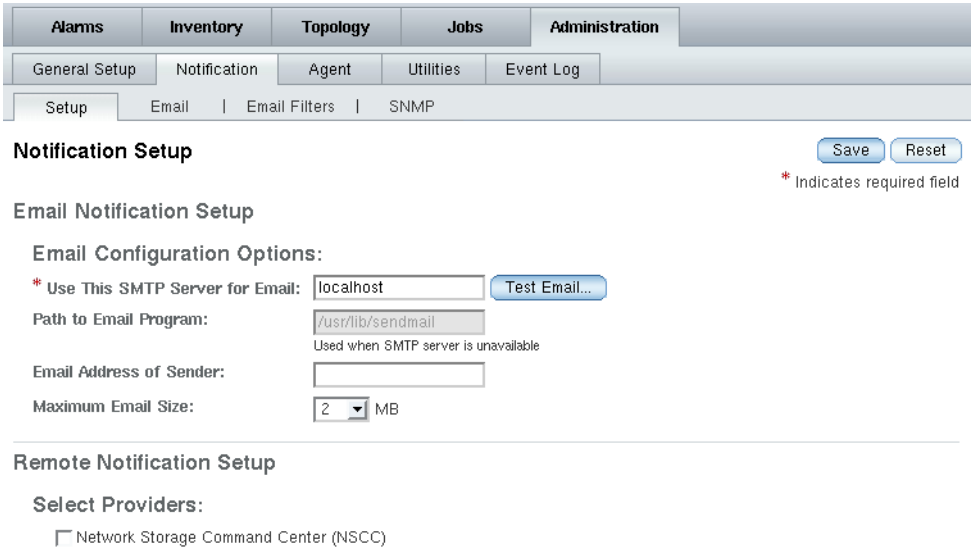
   c. **Enter each email or pager notification address you want to add, and click Save.**

      For information about the parameters on the Add Email Notification page, click the Help button on that page.

5. **To test a notification email address:**

   a. **Click Administration > Notification > Setup.**

      The Notification Setup page is displayed.



b. Enter the name of the SMTP server in the * Use this SMTP server for Email field. Click Test Email.

The Send Test Email page is displayed.

c. Fill in the *To field and type a brief message in the Message field.

d. Click Send.

A confirmation message appears if the test email is sent successfully.

e. Click Close to close the Send Test Email page.

6. To set up SNMP traps, click Administration > Notification > SNMP, and enter the following information:

a. Enter the IP name or address of the new SNMP recipient. You can provide information for up to five IP addresses.

b. Select the minimum alarm level for which SNMP notifications are to be sent to the SNMP recipient. The options are Down, Critical, Major, and Notice.

c. Click OK.

7. To enable remote notification:

a. Click Administration > Notification > Setup.

The Notification Setup page is displayed.

b. Select the check box for each remote notification provider you want to enable.

The Sun StorEdge 6920 system supports the following providers:

- **Network Storage Command Center (NSCC)** – Sends notifications by email to the Sun Network Storage Command Center (NSCC), which enables Sun to continually improve the product and its support through analysis of this data.
- **Sun StorEdge Remote Response** – Sends notifications to the Sun StorEdge Remote Response service.
- **SNMP Trap** – Sends SNMP traps (as configured in Step 6) to external management systems for all actionable events that occur during monitoring.

c. To activate the NSCC provider, enable or disable email encryption by clicking Yes or No.

d. To activate the Sun StorEdge Remote Response provider, enter the frequency (in hours) with which you want to check the communication link to the Sun StorEdge Remote Response provider. Typical values are 6, 12, and 24 hours.

e. Click Save.

A message indicates that the notification setup was saved.

Responding to Current Alarms

An alarm is generated if any problems occurred with the hardware during installation. To get information about any current alarms:

1. **Click Alarms > Summary.**

   The Alarm Summary page is displayed.

2. **Click the Details link to get more information about an alarm.**

   The Alarm Details provides alarm details, a probable cause, and a recommended action for the selected alarm.

3. **If you need help with any of the information on the page, click the Help button.**

Note – If you added an expansion cabinet, your next step is to set the IP addressess of the arrays. If you did not add an expansion cabinet, you can start to connect hosts to the service panel, as described in Chapter 4.

Setting the Expansion Cabinet Array Addresses

After you add an expansion cabinet to the Sun StorEdge 6920 system, you must identify the arrays to the system by setting the array addresses and updating the system inventory. Perform the following steps so that the arrays in the expansion cabinet are recognized by the system.

1. **If you are not already logged in, log in to the system as a storage user:**

   user name: `storage` **password:** `!storage`

2. **On the Java Web Console page, click Storage Automated Diagnostic Environment.**

   The system displays the Alarm Summary page.

3. **Click Administration > General Setup > Ethers.**

   The system displays the Ethers page, which lists the names and corresponding IP addresses of all standard and optional components that make up the Sun StorEdge 6920 system.

4. **Locate the MAC address of the master controller of each array in the expansion cabinet, and enter that MAC address in the appropriate MAC address field.**

   The MAC addresses are located on a sticker on the back panel of each controller tray in an array. The bottom tray in the array is the master controller of the array.

   The MAC addresses for the arrays in the expansion cabinet correspond to IP addresses `192.168.0.50` (starting with the array at the bottom of the expansion cabinet) through `192.168.0.55`.

5. **Click Save.**

   The system runs a script that associates the MAC address of each array with the corresponding IP address to identify the array to the system. A message appears after the Ether file has been updated.

6. **Power cycle the expansion cabinet.**

   To power cycle all arrays in the expansion cabinet, insert the key into the power sequencer in the front bottom of the expansion cabinet and turn the key to the Off position. When you do this, the array battery backup comes on and allows the write cache to flush. To determine that all arrays are completely shut down, verify that all LEDs on the back of all trays are turned off. After approximately 30 seconds, turn the key back to the On position to power on the expansion cabinet.

7. **Click Inventory.**

   The Rack Inventory page is displayed.

8. **In the Expansion Rack section, select Generate New Inventory.**

   The Generate Inventory page is displayed.

9. **Click Generate.**

   After the new inventory has been generated, check whether the list include all expected devices. If any devices are missing, repeat this procedure starting with Step 4.

10. **Click Save to save the new inventory.**

Next Steps

After you complete the steps in this chapter, you will have done the following:

- Entered the required system identification information
- Set up basic site and email notification information and notification providers for monitoring the system
- Entered the MAC addresses of arrays located in expansion cabinets, if applicable

Your next step is to connect data hosts to the service panel, as described in "Connecting Data Hosts" on page 67.

CHAPTER 4

Connecting Data Hosts

This chapter explains how to cable data hosts to the system and how to install the host software for data and management host stations. It contains the following sections:

Data Host Connectivity

The method you use to connect data hosts depends on how you plan to use the system. The Sun StorEdge 6920 system supports both storage area network (SAN) and direct attached storage (DAS) configurations for host-side server connections.

The main factors in choosing between a SAN or DAS configuration are the number of host bus adapter ports required, the number of Sun StorEdge 6920 system ports required, and the bandwidth required. All host bus adapters and software supported in the SAN are also supported in DAS configurations. You need to first understand the requirements of your application to determine which method to use. For information about DAS and SAN configurations, see the *Best Practices for the Sun StorEdge 6920 System* for guidelines.

Determining Your Configuration

Redundant Fibre Channel (FC) ports located on the service panel are available for data host or external storage connections. FC ports in rows A and paired with FC ports in row C, and FC ports in rows B are paired with FC ports in row D.

To determine which ports are active on your system, open the service panel and check the cards installed in the DSP chassis. DSP slots 1, 2, 3, and 4 correspond to rows A, B, C, and D (respectively) on the service panel.

Your system can have one of the configurations listed in TABLE 4-1.

TABLE 4-1 Sun StorEdge 6920 System Configurations

Configuration	Total Number of Ports/Port Type	Row / Ports Available for Data Host/ External Storage Connections	Row / Ports Reserved for Internal Storage
2 SIO-8/SRC sets	16 SC* FC	C 1, 2, 3, 4 D 1, 2, 3, 4	C 5, 6, 7, 8 D 5, 6, 7, 8
4 SIO-8/SRC sets	32 SC FC	A 1, 2, 3, 4 B 1, 2, 3, 4 C 1, 2, 3, 4 D 1, 2, 3, 4	A 5, 6, 7, 8 B 5, 6, 7, 8 C 5, 6, 7, 8 D 5, 6, 7, 8
2 SIO-8/SRC sets and 2 SIO COMBO/SRC sets	16 SC FC	A 1, 2, 3, 4 B 1, 2, 3, 4	A 5, 6, 7, 8 B 5, 6, 7, 8
	12 LC FC	A 1, 2, 3 B 1, 2, 3	A 4, 5, 6 B 4, 5, 6
	2 RJ-45 Gigabit Ethernet	C D	
2 SIO COMBO/SRC sets	12 LC FC	C 1, 2, 3 D 1, 2, 3	C 4, 5, 6 D 4, 5, 6
	2 RJ-45 Gigabit Ethernet	C D	
4 SIO COMBO cards/SRC sets	24 LC FC	A 1, 2, 3 B 1, 2, 3 C 1, 2, 3 D 1, 2, 3	A 4, 5, 6 B 4, 5, 6 C 4, 5, 6 D 4, 5, 6
	4 RJ-45 Gigabit Ethernet	A B C D	

* Connector used with a gigabit interface converter (GBIC) optical transceiver.

Note – If you want to install additional SAN/server and storage ports after you install the system, refer to the Sun Storage Automated Diagnostic Environment Service Advisor X-Options for more information and procedures.

FC Port Connections

FC Port connections are typically evenly allocated between SAN/server and internal storage. However, you can allocate additional ports for either host or internal storage connections, depending on the needs at your site. If you need additional ports for host connections, refer to "Selecting Ports for Additional Host Connections" on page 73 for guidelines. If you need additional ports for internal storage connections, refer to "Selecting Ports for Additional Storage Connections" on page 74 for guidelines.

SIO-8 Cards

The Sun StorEdge SIO-8 card has eight SC Fibre Channel (FC) ports. The FC ports are available for data host, internal storage, or external storage connectivity.

FIGURE 4-1 shows two SIO-8 cards installed in slots 3 and 4, and two MICs installed in slots 1 and 2 of the DSP.

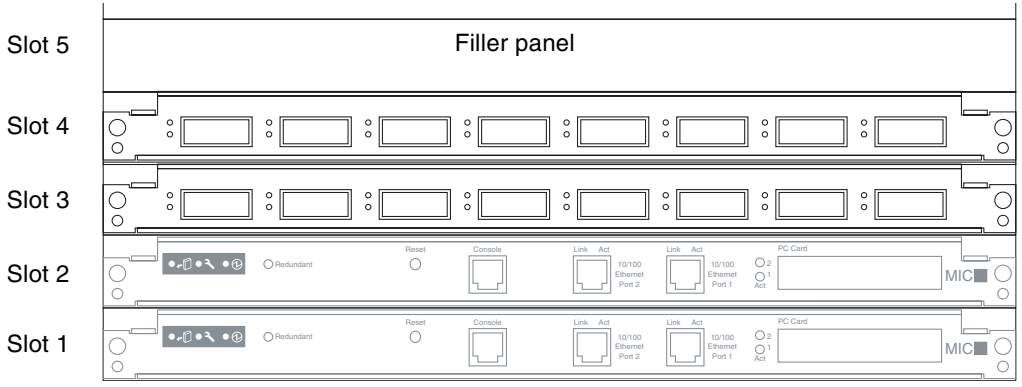


FIGURE 4-1 Two SIO-8 Cards

The SIO-8 card FC ports are standard connectors and required SC optical cables.

SIO COMBO Cards

The Sun StorEdge SIO COMBO card has six LC Fibre Channel (FC) ports and one RJ-45 Gigabit Ethernet port. The FC ports are available for data host, external storage, or FC-based remote replication connectivity. The Gigabit Ethernet port provides connectivity to a wide area network (WAN) for Ethernet-based remote replication. For information about remote replication, see the online help.

FIGURE 4-2 shows two SIO COMBO cards installed in slots 3 and 4, and two MICs installed in slots 1 and 2 of the DSP.

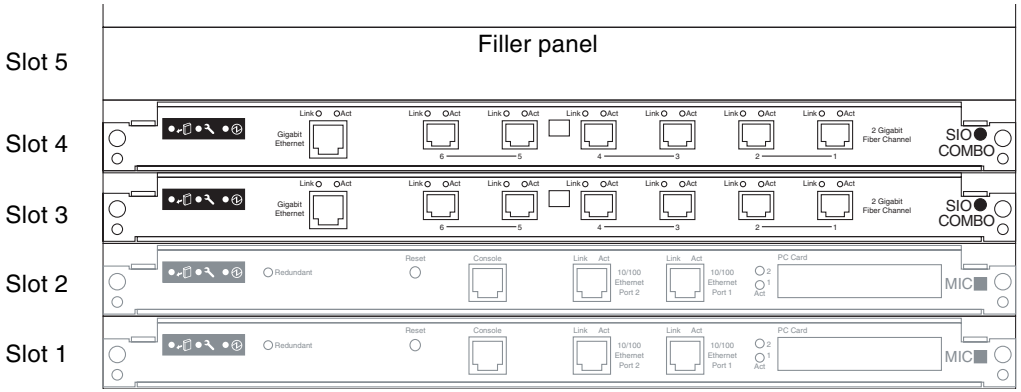


FIGURE 4-2 Two SIO COMBO Cards

The SIO COMBO card FC ports are small form-factor pluggable (SFP) connectors and require LC optical cables.

FIGURE 4-3 shows four SIO COMBO cards installed in slots 3, 4, 5, and 6 of the DSP. Two MICs are installed in slots 1 and 2.

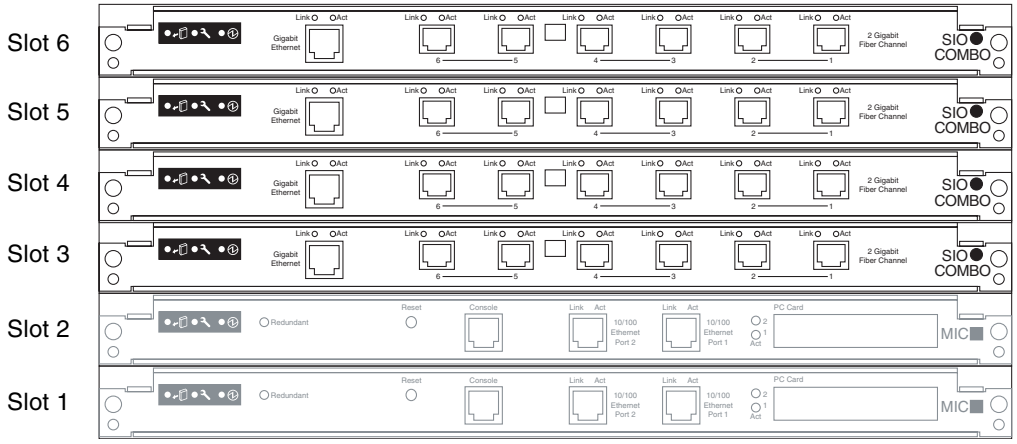


FIGURE 4-3 Four SIO COMBO Cards

Connecting Hosts to a SAN With Failover

FIGURE 4-4 shows a sample configuration of data hosts connected to the system through redundant SAN FC switches.

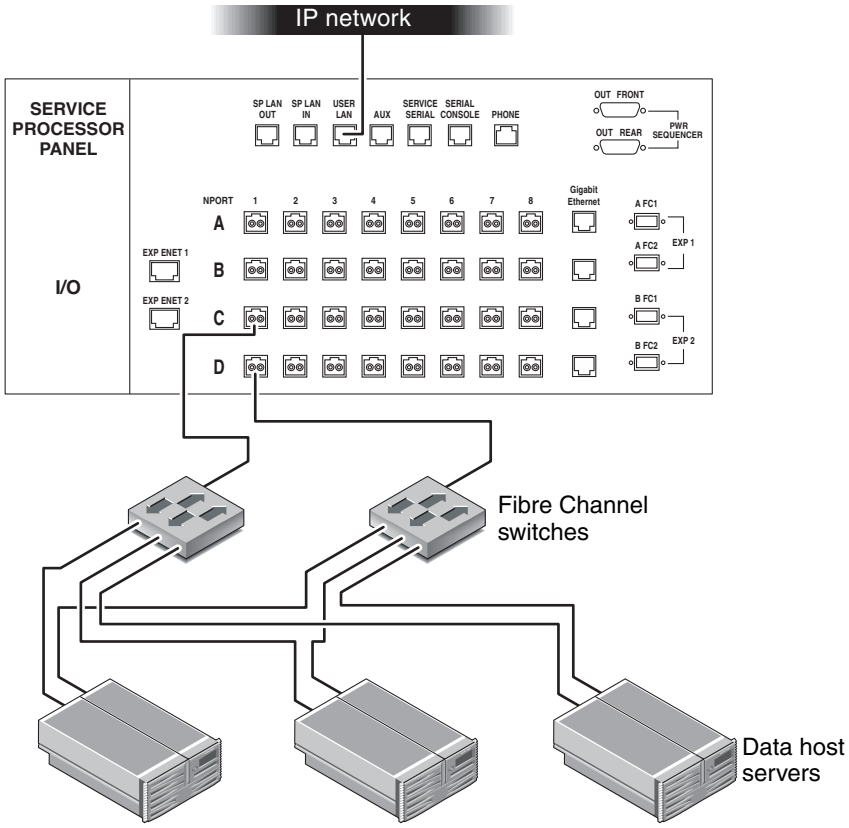


FIGURE 4-4 Connecting Hosts to a SAN With Failover

This example shows three data hosts connected to the system through redundant FC switches. Each host connects to a primary and alternate FC switch. The primary FC switch connects to port C/1. The secondary FC switch is connected to port D/1.

For more information about the allocation of I/O ports for SAN and DAS hosts, see the online help. For information about connecting external storage devices, see Chapter 6.

Connecting Hosts Directly With Failover

The Sun StorEdge 6920 system supports direct attached storage (DAS), allowing data hosts to connect directly to storage. FIGURE 4-5 shows an example of data hosts connected directly to the Sun StorEdge 6920 system.

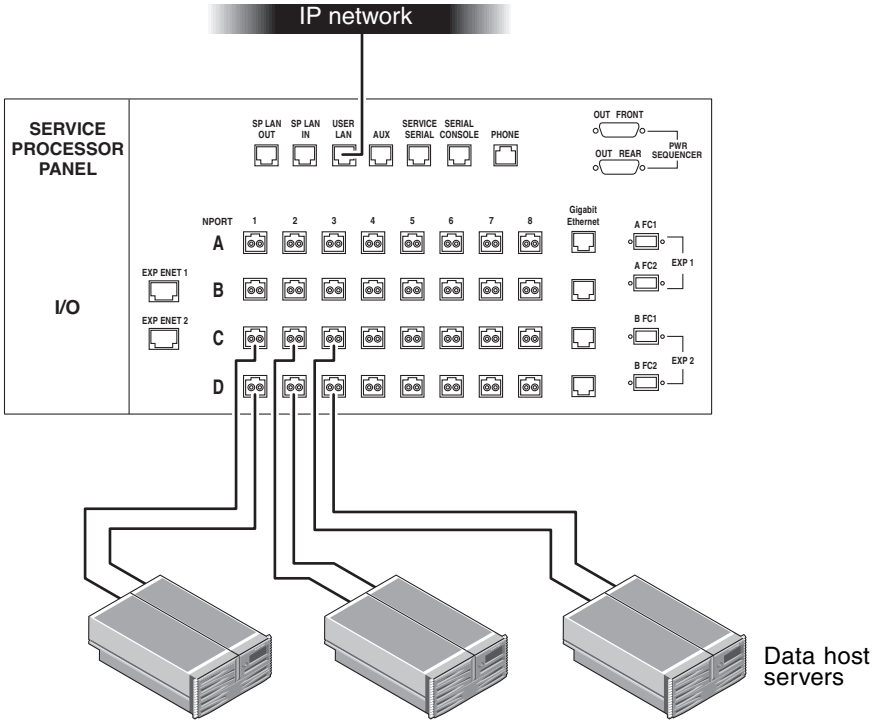


FIGURE 4-5 Connecting Hosts Directly

This example shows each data host connected directly to ports C/1 and D/1, C/2 and D/2, C/3 and D/3.

For information about connecting external storage devices, see Chapter 6.

Selecting Ports for Additional Host Connections

Ports in the columns on the service panel marked 1, 2, 3, and 4 are reserved for host or external storage connections. If you want to allocate more ports for host attachment, take additional ports from left to right and top to bottom.

For example, once you have used all ports in columns 1 through 4 (rows C and D of a two SIO-8 card configuration), add the next host connections to column 5 (rows C and D). If your system has a four SIO-8 card configuration, add the next host connections to column 5 (rows A and B), and then add the next connections to column 5 (rows C and D).

Note – You cannot use ports in column 8 of the service panel for host connections.

Note – If you allocate more ports to data hosts than to internal storage, you will need additional 1-meter LC-to-SC cables for each HBA port to physically connect the DSP to the service panel.

Selecting Ports for Additional Storage Connections

Ports in the columns on the service panel marked 8, 7, 6, and 5 are reserved for internal storage connections. If you want to allocate more ports for internal storage, take additional ports from right to left and top to bottom.

For example, once you have used all ports in columns 8 through 5 (rows C and D of a two SIO-8 card configuration), add the next internal storage connections to column 4 (rows C and D). If your system has a four SIO-8 card configuration, add the next internal storage connections to column 4 (rows A and B), and then add the next connections to column 4 (rows C and D).

Note – You cannot use ports in column 1 of the service panel for internal storage connections.

Installing Host Software for Solaris OS Hosts

The Sun StorEdge 6920 System Host Installation Software CD contains software for Solaris data and management host stations. When you run the installation script, you select the functionality you want to install, and the script installs the required packages. You can choose from the following options:

- Select `Sun StorEdge 6920 Data Host Software` to install Sun StorEdge SAN Foundation and Storage Automated Diagnostic Environment Enterprise Edition on a Solaris data host.

  Sun StorEdge SAN Foundation software incorporates kernel drivers and utilities that enable the data host to connect to, monitor, and transfer data on a SAN.

Storage Automated Diagnostic Environment Enterprise Edition is a distributed diagnostic monitoring tool for SAN devices, including data hosts and external storage devices connected to the Sun StorEdge 6920 system.You can configure the software to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the storage devices.

- Select `Sun StorEdge 6920 Remote Management Host Software` to install the remote scripting CLI client.

  The remote scripting CLI client provides access to the same configuration and monitoring tasks that you perform through the browser interface. You can also write scripts using the `sscs` commands to automate configuration and management tasks. You can install the remote scripting CLI client on a data host or an external management host. See the `sscs`(1M) man page for information about the remote scripting CLI commands.

  The remote scripting CLI client is also available for Windows, Red Hat Linux, AIX, and HP-UX operating environments (see "Installing the Remote Scripting CLI Client" on page 87).

Note – See the *Sun StorEdge 6920 System Release Notes* for the operating system versions that are supported.

Summary of the Installation Tasks

TABLE 4-2 provides a summary of the tasks for installing the host software.

TABLE 4-2 Installation Task Summary

Installation Steps	See This Section or Chapter
1. Check the data host system requirements.	"System Requirements" on page 76
2. Check for pre-existing versions of the software.	"Checking Pre-existing Versions of Software" on page 77
3. Install the data host software on Solaris OS data hosts.	"Installing Data Host Software for Solaris Hosts" on page 78
4. Install the remote management software on a Solaris host.	"Installing Remote Management Host Software" on page 81

TABLE 4-2 Installation Task Summary *(Continued)*

Installation Steps	See This Section or Chapter
5. Set up Storage Automated Diagnostic Environment Enterprise Edition.	"Starting the Storage Automated Diagnostic Environment Enterprise Edition" on page 84
6. Log in to the system using the remote scripting CLI client.	"Using the Remote Scripting CLI Client" on page 84
7. Download and install data host and remote management software for operating systems other than Solaris.	"Installing Host Software for Operating Systems Other Than Solaris OS" on page 86

System Requirements

TABLE 4-3 lists the hardware and software that must be set up and installed before you can install the data host software on a Solaris OS data host.

TABLE 4-3 Solaris OS Data Host Hardware and Software Requirements

Hardware Requirements	
Media Drive	A CD-ROM drive connected to the host machine where the software is to be installed.
Storage Arrays and Systems	A physical FC connection between the data host and the StorEdge 6920 system.
Disk and Memory Requirements	1 Gbyte of disk space (with at least 300 MB available in the root partition). 256 Mbytes of system memory (512 Mbytes or greater for best performance).
Software Requirements	
Operating Environments	Solaris OS 8, 9, and 10. The Host Installation Software CD includes all required OS patches.
Supporting Software	The Storage Automated Diagnostic Environment Enterprise Edition requires Perl version 5.006 for installation. Perl is open source software that you can download from: `http://www.perl.com/pub/language/info/software.html`
Web Browser (minimum version)	Netscape Navigator™ minimum version 7.0 or Microsoft Internet Explorer version 5.0 or Mozilla 1.2.1.

Checking Pre-existing Versions of Software

The installation script checks for the required versions of the following software packages and patches:

- SAN Foundation software version 4.4.3
- Sun Storage Automated Diagnostic Environment Enterprise Edition version 2.4
- Java™ SDK Environment version 1.4.2
- Sun Java Web Console version 2.2.3

If the installation script does not find the correct version of the required software, it either upgrades an existing version of the software, installs the required version of the software in a new location, or stops the installation process. Appropriate messages are provided at each step of the installation process informing you of the action being performed.

Checking the SAN Foundation Software

If the installation script finds an earlier version of SAN Foundation software, you must remove the current version of SAN software. The installation script installs the required version of SAN Foundation software and all required patches.

The SAN Foundation software and Java Web Console are embedded in the Solaris 10 OS. Therefore, when you install the data host software on a Solaris 10 platform, only the Storage Automated Environment Enterprise Edition software is installed.

Checking the Storage Automated Diagnostic Environment Enterprise Edition Software

If a data host is running Storage Automated Diagnostic Environment Enterprise Edition version 2.2 software or earlier, do the following before running the installation script:

- Remove the SUNWstade package and then remove the /var/opt/SUNWstade directory from the host.
- Check for and address any pending alarms or events. Removing the previous version does not affect the contents of the existing database. However, if there are any pending alarms or events, they might be lost.

If a data host is running Storage Automated Diagnostic Environment Enterprise Edition version 2.3 software or later, the installation script upgrades the currently installed version to version 2.4.

Checking the Java SDK Environment

The installation script checks for the Java SDK version 1.4.2 software, which is required by the remote scripting CLI client. If the required version is not found, the installation script installs Java SDK version 1.4.2 in /opt/se6000/java.

Before you run the installation script, check the version of Java SDK that is installed on the management station. If a version earlier than Java SDK version 1.4.2 is installed, refer to the online compatibility documentation at the following site for information about incompatibilities:

http://java.sun.com/j2se/1.4.2/compatibility.html

Installing Data Host Software for Solaris Hosts

You must install the software as superuser (root). If aliases exist in the superuser environment or profile, the software installation and configuration might have unexpected results. Remove any aliases created for the environment (for example, cp="cp -i") before you install or configure the software.

You can download the Sun StorEdge 6920 Host software for Solaris OS from the Sun Download Center or you can install it from the CD.

1. **Log in to a Solaris data host as superuser (root).**
2. **Remove any defined aliases for this user.**

```
# unalias -a
```

3. **Place the CD in the CD-ROM drive and start the Volume Manager daemon vold(1) (if needed).**

   If you downloaded the software from the Sun Download Center, and you uncompressed the tar file, go to the directory where you extracted the files, and then skip to step 5. If you are installing the software from the CD, continue with step 4.

```
# /etc/init.d/volmgt start
```

4. **Change to the root directory on the CD. For example:**

```
# cd /cdrom/cdrom0
```

5. **Start the `install.ksh` script.**

```
# ./install.ksh
```

The installation menu is displayed.

6. **Enter `y` to continue.**

```
                     Host Software Installation
                    ------------------------------

This script installs software for your Sun StorEdge 6920
storage system.

Software included in this distribution:

        - Sun StorEdge 6920 Data Host Software
        - Sun StorEdge 6920 Remote Management Host Software

You may install any or all of these software on your system.

Do you want to continue? [y/n] y
```

7. **To install the data host software, enter `y` at the prompt. When you are prompted to install the remote management software, enter `n`. Press Return after each choice.**

```
Do you want to install ....

Sun StorEdge 6920 Data Host Software [y/n] : y
Sun StorEdge 6920 Remote Management Host Software [y/n] : n
```

A confirmation displays the software package that will be installed.

8. **Enter `y` to confirm your selection.**

```
You have chosen to install:

        Sun StorEdge 6920 Data Host Software

Is this correct? [y/n] : y
```

The script checks for installed versions of the required software components, as shown in the following example:

```
Prechecks will be taking place

Prechecking Sun StorEdge SAN Foundation Software...

Prechecking TomCat ...

Prechecking Sun Web Console ...

Prechecking Java 2 Standard Edition ...

Precheck is completed.
```

The script displays the software packages that will be installed on your system, as shown in the following example:

```
Following software will be installed on your system:
        - Sun Web Console 2.2.3
        - Sun Storage Automated Diagnostic Environment BUI 2.4
        - Sun Storage Automated Diagnostic Environment CLI 2.4
        - Sun StorEdge SAN Foundation Software 4.4.3
Do you want to continue? [y/n] :
```

9. **Enter `y` to continue.**

   The script displays messages and status, as each software package and patch is installed.

   When the script finishes, the following is displayed:

```
You have installed the following components:

       Sun StorEdge 6920 Data Host Software - Success
```

   The script also displays the date and time that the installation finished and the path to the installation log.

10. **Eject the CD from the drive.**

Checking Log Files After the Installation

If you encountered any problems during installation:

- **Check the following files for messages related to the installation:**
  - `/var/sadm/install/se6920/6920_Host_SW_Install.log`

    This log contains installation, removal, configuration, error, or informational messages.
  - `/var/adm/messages`

    This log contains general system error and informational messages.

Enabling Multipathing Software

To enable the multipathing software on the data host, do the following:

1. **Open the** `/kernel/drv/scsi_vhci.conf` **file using a text editor.**
2. **Set** `mpxio-disable=no` **in the file to enable multipathing.**
3. **Save and close the file.**
4. **Reboot the host:**

   `reboot -- -r`

Installing Remote Management Host Software

The remote management software for Solaris is delivered on the Host Installation Software CD. To install the software on a management station:

1. **Log in to a Solaris station as superuser (root).**
2. **Remove any defined aliases for this user.**

```
# unalias -a
```

3. **Place the CD in the CD-ROM drive and start the Volume Manager daemon** `vold`**(1) (if needed).**

   If you downloaded the software from the Sun Download Center, and you uncompressed `tar` file, go to the directory where you extracted the files, and then skip to step 5. If you are installing the software from the CD, continue with step 4.

```
# /etc/init.d/volmgt start
```

4. **Change to the** `root` **directory. For example,**

```
# cd /cdrom/cdrom0
```

5. **Start the** `install.ksh` **script.**

```
# ./install.ksh
```

   The installation menu is displayed. Enter **y** to continue.

```
                      Host Software Installation
                      --------------------------

This script installs software for your Sun StorEdge 6920
storage system.

Software included in this distribution:

        - Sun StorEdge 6920 Data Host Software
        - Sun StorEdge 6920 Remote Management Host Software

You may install any or all of these software on your system.
Do you want to continue? [y/n] y
```

6. **To install only the remote management software, enter `n` and `y` as follows:**

```
Do you want to install ....

Sun StorEdge 6920 Data Host Software [y/n] : n
Sun StorEdge 6920 Remote Management Host Software [y/n] : y
```

A confirmation displays your selection, listing the packages that will be installed.

7. **Enter `y` to confirm your selection.**

```
You have chosen to install:

        Sun StorEdge 6920 Remote Management Host Software

Is this correct? [y/n] : y
```

The script checks for installed versions of the required software components, as shown in the following example:

```
Prechecks will be taking place

Prechecking Sun StorEdge 6920 Configuration Service CLI...

Prechecking Java 2 Standard Edition ...

Prechecking disk space for root partition ...

Precheck is completed.
```

The script displays the software that will be installed on your system.

8. **Enter `y` to continue.**

```
Following software will be installed on your system:
        - Sun StorEdge 6920 Configuration Service CLI 2.1
Do you want to continue? [y/n] : y
```

The script displays messages and status, as each software package and patch is installed.

When the script finishes, the following is displayed:

```
You have installed the following components:

       Sun StorEdge 6920 Remote Management Host Software - Success
```

The script also displays the date and time that the installation finished and the path to the installation log.

9. **Eject the CD from the drive.**

Starting the Storage Automated Diagnostic Environment Enterprise Edition

After you have successfully installed the software, refer to the *Sun Automated Diagnostic Environment Enterprise Edition Release Notes Version 2.4* for information about how to set up the application. Complete the steps in the following two sections of the release notes:

- Setting Up the Software With the CLI
- Setting Up the Software With the Browser Interface

Using the Remote Scripting CLI Client

After you download and install the remote scripting CLI client, you can access the system using any of the default user names (see "About User Roles" on page 56). This section explains how to log in to the system using the remote scripting CLI client.

Logging In to the System

Use the `/opt/se6920/cli/bin/sscs` command to perform the remote management operations. For further information about remote management operations, see the `sscs`(1M) man page.

- **Enter the following command in a terminal window:**

```
% sscs login -h SE-6920-SPname [-t] [-f] -u user
Password: !password
```

  - *SE-6920-SPname* is the Sun StorEdge 6920 system, *user* is one of the roles (admin, storage, or guest) on the *SE-6920-SPname* system, and *!password* is the default password for the user role (!admin, !storage, or !guest).
  - *SE-6920-SPname* is a configuration number ranging from SP0–SP7. You can also use `localhost` to access the default Storage Service Processor.

TABLE 4-4 describes the optional arguments associated with the `sscs login` command for the Sun StorEdge 6920 system.

TABLE 4-4 `sscs login` Command-Line Optional Arguments

Argument	Description
`-f`	Forces a login if another user with the same user name is already logged in. The duplicate user is then logged off.
`-t`	Log in using an HTTP connection.

The following example shows how to log in to the Storage Service Processor named SP2.

```
% sscs login -h SP2 -f -u admin
Password: !admin
```

Logging Out of the System

To log out of the system using the CLI, enter the following command:

```
# sscs logout
```

Installing Host Software for Operating Systems Other Than Solaris OS

To enable multipathing functionality, you must install Sun StorEdge Traffic Manager software on each data host before it can reliably communicate with the system's storage. This software incorporates kernel drivers and utilities that enable data hosts running operating systems other than Solaris OS to automatically or manually connect to, monitor, and manage transfer data flow in a SAN.

The following Sun StorEdge Traffic Manager software packages are available for download from the Sun Download Center:

- Sun StorEdge Traffic Manager for IBM AIX
- Sun StorEdge Traffic Manager for HP-UX
- Sun StorEdge Traffic Manager for Red Hat Linux
- Sun StorEdge Traffic Manager for Windows

You can access the software from:

`http://www.sun.com/software/download`

Patches are available from:

`http://sunsolve.sun.com`

Downloading the Multipathing Software

To download the multipathing software from the Sun Download Center:

1. **From the host on which you want to install the software, open a browser window and go to the download center by entering the following URL:**

   `http://www.sun.com/software/download/index.jsp`

2. **Select the Sun StorEdge Traffic Manager software link for the platform on which you are installing the software.**

3. **Click Download.**

4. **Log in.**

   If you have not already registered, do so and then log in.

5. **Click Accept and Continue on the Legal/License Agreement page.**

6. **Click the package you want to download.**

   The web browser prompts you to download the file.

7. **Save the package to a temporary working directory.**

   For example:

```
# cp SunTrafficManager5X.X.X.X.X.tar /directory
```

   where */directory* is a directory name in which to copy the package.

8. **Download the release notes.**

9. **Log out of the Sun Download Center.**

Installing the Remote Scripting CLI Client

In addition to the Solaris OS, the Sun StorEdge remote scripting CLI client is available for the operating systems listed in TABLE 4-5.

TABLE 4-5 Supported Operating System Other Than Solaris OS

Operating System	Package Name
IBM AIX	Sun StorEdge 6920 CLI Package for AIX
Red Hat Linux	Sun StorEdge 6920 CLI Package for Linux
HP-UX	Sun StorEdge 6920 CLI Package for HP-UX
Microsoft Windows 2000 Advanced Server	Sun StorEdge 6920 CLI Package for Windows

To download the latest Sun StorEdge 6920 host CLI packages for AIX, HP-UX, Linux, and Windows platforms:

1. **From the host on which you want to install the software, open a browser window and go to the Sun Download Center at:**

   `http://www.sun.com/software/download/index.jsp`

2. **Click the link for the Sun StorEdge 6920 Host CLI Package for non-Solaris hosts.**

3. **Click Download.**

4. **Log in.**

   If you have not already registered, do so and then log in.

5. **Click Accept and Continue on the Legal/License Agreement page.**

6. **For the AIX, HP-UX, or Linux operating systems, follow these steps:**

   a. **Click the package you want to download.**

      The web browser prompts you to download the file.

   b. **Download to any directory except** `/opt`**.**

   c. **Save the tar file to a temporary working directory.**

   For example:

```
# cp SE6000_cli.tar /directory
```

   where */directory* is a directory name in which to copy the package.

   d. **Change to the directory in which you saved the tar file.**

```
# cd /directory
```

   e. **Extract the contents of the tar file.**

```
# tar -xvf SE6000_cli.tar
```

Note – If `checksum` errors occur when you use a platform-specific `tar`, use the GNU version of `tar`.

---

7. **To install the client, enter:**

```
# ./se6000_cli_install
```

8. **Add /opt/se6x20/bin to your path.**

9. **For the Windows 2000 or Windows 2003 operating system, follow these steps:**

   a. **Click the file you want to download.**

      The web browser prompts you to download the file.

   b. **Download to any directory.**

   c. **Save the unzipped folder to any directory.**

d. Unzip `Disk1.zip` using any supported zip application.

e. Run the `setup` command to install the client.

Removing the Data Host Software

If you need to remove a Solaris data host from the system, you can use the `uninstall` script provided on the host CD to remove the software.

To uninstall the software from a data host, perform the following procedure.

1. **Log in to your machine as superuser (root).**
2. **Remove any defined aliases for this user as described in "Installing Data Host Software for Solaris Hosts" on page 78.**
3. **Run the `uninstall.ksh` script.**

```
# cd /cdrom/cdrom0
# ./uninstall.ksh
```

Follow any directions presented during the running of the script.

CHAPTER 5

Configuring Storage

This chapter introduces you to Sun StorEdge 6920 system configuration concepts. It includes the following sections:

Before You Begin

Your system is shipped with a default configuration that simplifies storage provisioning. The central point of configuration and management makes it easy to create volumes.

Before you begin to configure your system, you must have already planned your storage requirements and mapped out your configuration. The *Best Practices for the Sun StorEdge 6920 System* can help you plan and configure storage so that you avoid potential configuration problems.

You can use the default configuration that is shipped with the system, with only one storage domain, or divide the system into multiple smaller but fully functional private, secure storage domains.

Storage Configuration Concepts

The Sun StorEdge 6920 system consists of both physical and logical storage components.

Physical Storage Components

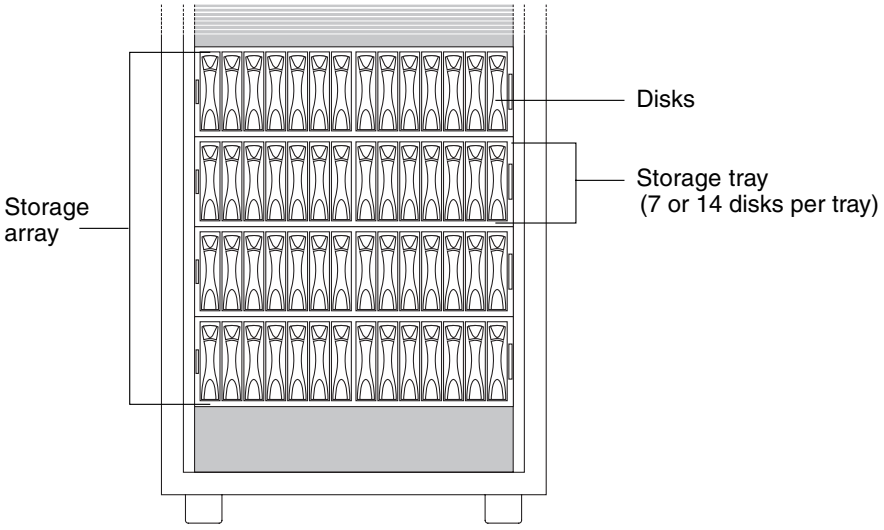
Physical components include storage arrays, storage trays, disks, host/initiators, and optionally, external storage devices. TABLE 5-1 describes the physical components of the system.

TABLE 5-1 Sun StorEdge 6920 System Physical Components

Physical Component	Description
Storage array	A storage array is made up of multiple disk drives that function as a single storage device. A high-availability array configuration includes two RAID controllers (also referred to as a controller pair) to provide redundancy and failover capabilities.
Storage tray	A storage tray is an enclosure that contains 7 or 14 disk drives. A storage tray with a RAID controller is a controller tray, and a storage without a controller is an expansion tray.
Disk	A disk is a non-volatile, rewriteable data storage device located within a storage tray. Physical disks are managed as a pool of storage space for creating volumes.
Initiator	An initiator is a system component that initiates an I/O operation over a Fibre Channel (FC) network. Each initiator known to the system is identified by its world wide name (WWN). If a host is connected to the system by two host bus adapters (HBAs), the host is identified as two physically, different initiators. However, with the use of multipathing functionality, the host appears logically as a single device. FC array logical unity number (LUN) masking and mapping uses initiator port identifiers to authenticate hosts.
External storage	An external storage device is a storage array that is connected physically to the system's service panel and located outside the system base or expansion cabinet. An external storage device is located outside the management path and presented to the system as LUNs. Because the storage is outside the management path, you must use the vendor's management software to configure the LUNs. You can: • Preserve the data on an external device by creating a legacy volume, and use the legacy volume as if it were any other volume on the system. • Increase storage capacity of the system. The external device is added to the system as a single volume. • Migrate data from an external storage device to the system's internal storage by using data mirroring.

FIGURE 5-1 Physical Storage Components

FIGURE 5-1 shows the physical storage components of the system.



Logical Storage Components

Logical components include storage domains, storage pools, virtual disks, volumes, and replication sets.

TABLE 5-2 describes the logical components of the system.

TABLE 5-2 Sun StorEdge 6920 System Logical Components

Logical Component	Description
Storage domain	A storage domain can be thought of as a secure container that holds a subset of the system's total storage resources. You can create multiple storage domains to securely partition the system's total set of storage resources. This allows you to organize multiple departments or applications into a single storage management infrastructure.
Storage pool	A storage pool is a container that groups physical disk capacity (abstracted as virtual disks in the browser interface) into a logical pool of available storage capacity. A storage pool's characteristics are defined by a storage profile. You can create multiple storage pools to segregate storage capacity for use in various types of applications (for example, high throughput and online transaction-processing applications).
Storage profile	A storage profile defines storage performance characteristics such as the RAID level, segment size, dedicated hot spare, and virtualization strategy. You can choose a predefined profile suitable for the application that is using the storage, or you can create a custom profile.
Virtual disk	A virtual disk is a collection of physical disks or a set of contiguous disk blocks that are grouped according to a RAID level. You can have a maximum of two virtual disks per internal storage tray.
Volume	A volume is a container into which applications, databases, and file systems store data. Volumes are created from storage pools and presented to hosts as LUNs. A volume can be created from a virtual disk supplied by a storage pool, or from an external LUN supplied by a storage pool.
Replication sets	Replication sets are pairs of volumes that exist on separate Sun StorEdge 6920 systems and that share identical copies of data. Replication sets provide the ability to implement disaster recovery and business continuance strategies.

FIGURE 5-2 shows the relationships of the logical components.

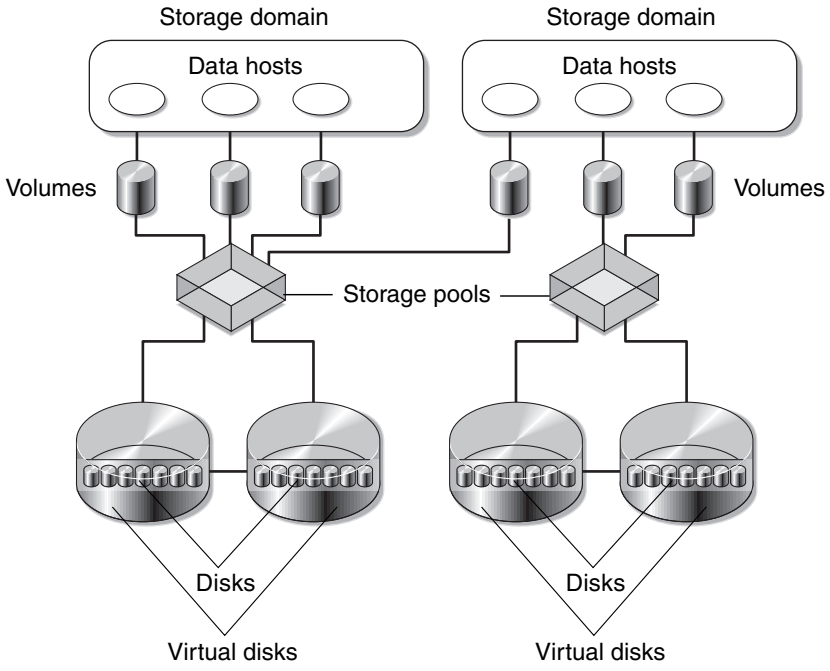


FIGURE 5-2 Relationships of Logical Storage Components

Storage Configuration Considerations

As you review your options and determine how to allocate storage appropriately for your site, consider the following:

- **Your site's security requirements** – By creating multiple storage domains, you segregate initiators. For example, you can have hosts that handle financial data store their data in a different domain from that of hosts that handle research data.
- **Your site's I/O requirements** – The default configuration uses the Default storage profile, with balanced access to storage. Depending on your needs, you can optimize I/O activity by selecting a storage profile with different characteristics or by creating a custom profile.
- **Your site's performance requirements** – In general, the number of host ports is equal to the number of storage ports. You can add more hosts to existing available ports, in combination with FC switches at the cost of reduced throughput per initiator. You can expand the number of ports by adding storage resource card (SRC) sets, up to a maximum of four. (For instructions on how to add an SRC set, use the Sun Storage Automated Diagnostic Environment > Service Advisor.)

Using the Default Configuration

Your system has a default configuration which you can use as is or change. Even if you use the default configuration, you must create volumes. This section describes the default configuration options and tells you how to create volumes.

Default Configuration Options

TABLE 5-3 describes the default configuration and provides options for configuring storage at your site.

TABLE 5-3 Default Storage Configuration and Configuration Options

Logical Component	Default Configuration	Configuration Options
Storage domains	All storage elements are initially located in one storage domain (DEFAULT), which can be accessed by all hosts (initiators). This storage domain contains the Default storage pool with its associated disks and virtual disks.	You can choose either of the following options: • Use the existing default configuration (as is). • Create a custom storage domain.
Storage profiles	The default storage domain uses the Default profile to specify its storage parameters. The default storage profile is: RAID level: RAID-5 Segment size: 64 Kbyte Read-ahead mode: On Number of drives: Variable Array type: Best Available Match: Bandwidth Number of disks: Variable Dedicated hot spare: No Virtualization strategy: Stripe Stripe size: 1 Mbyte	You can choose any of the following options: • Use the existing default configuration (as is). • Select one of the predefined storage profiles shipped with the system to create a new storage pool. • Create a custom storage profile.

TABLE 5-3 Default Storage Configuration and Configuration Options *(Continued)*

Logical Component	Default Configuration	Configuration Options
	Note: You cannot delete any of the predefined profiles, including the Default profile. Additionally, you cannot delete or modify a profile that is in use and already associated with a storage pool.	
Storage pools	All virtual disks are initially in one storage pool (Default).	You can choose either of the following options: • Use the existing default configuration (as is). • Create a new storage pool and reassign some of the virtual disks to the new storage pool.
Virtual disks	Virtual disks are preconfigured based on the number of drives ordered for your system. The virtual disks are configured as RAID-5. If an array has 7 drives per tray, all 7 drives are configured as a single RAID-5 virtual disk. If an array has 14 drives, the tray is configured as two RAID-5 virtual disks.	You can choose any of the following options: • Use the existing default configuration (as is). • Move an existing, unused virtual disk to a different storage pool that has similar attributes. • Delete an existing RAID-5 virtual disk and reconfigure the disks into a new virtual disk in another storage pool with a different storage profile.

If you decide not to use the system defaults, refer to "Changing the Default Configuration" on page 102.

Creating Volumes

If you decide to use the default configuration, you must create volumes within the Default storage pool and then assign each initiator in your environment to one of the volumes.

The New Volume wizard guides you through the steps to create and map a new volume. The New Volume wizard prompts you to:

- Enter a name and description for the new volume
- Select a storage domain in which you want to place the volume
- Specify the type of volume you want to create: single or mirrored volume
- Enter the capacity of the volume

- Reserve space for snapshots (optional)
- Map initiators to the volume (optional)

If you decide not to map the volume to a host initiator now, you can map a volume later using the Map Volume wizard from the Volume Detail page. For more information about creating volumes and mapping them to hosts, see the online help.

Before you start to create volumes, be sure you understand the system storage concepts described in "Storage Configuration Concepts" on page 92.

To create a volume:

1. **Log in to the system as a storage administrator from the Java Web Console login page:**

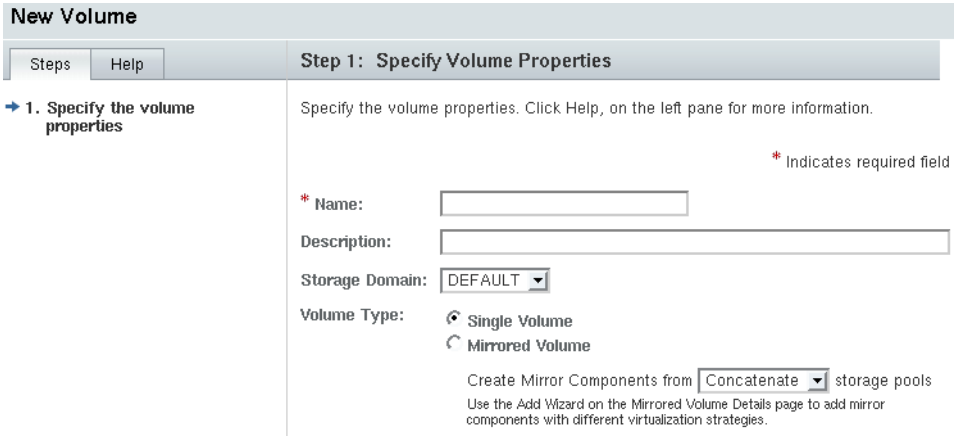
   user name: `storage` **password:** `!storage`

2. **Click Sun StorEdge 6920 Configuration Services.**

   The system displays the Volume Summary Page.

3. **Click New.**

   The system displays the New Volume wizard.



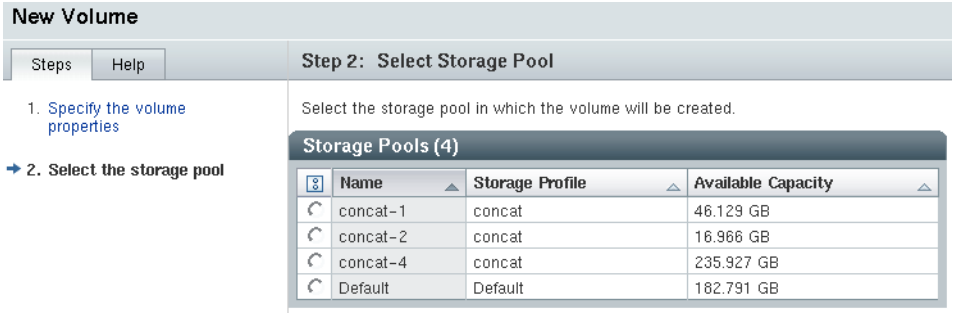
4. **Specify a name and a description for the new volume.**

   Click the Help tab for a list of valid characters you can use when naming a new volume name and specifying a description.

5. **Select the DEFAULT storage domain or another storage domain in which you want to place the volume.**

6. **Specify the type of volume you want to create, single or mirrored volume, and click Next.**

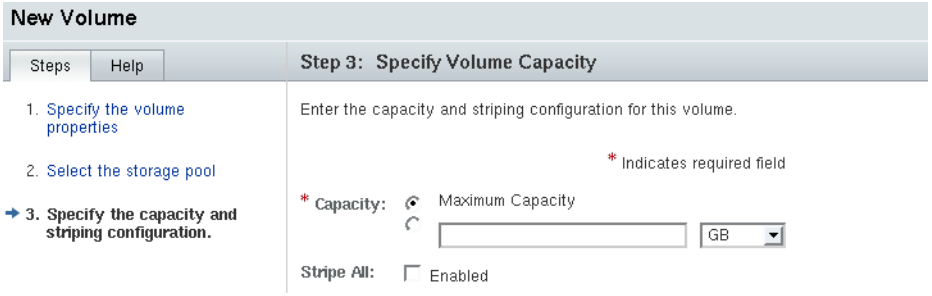
   The wizard prompts you to select a storage pool.



7. **Select a storage pool from which you want to create the volume, and click Next.**

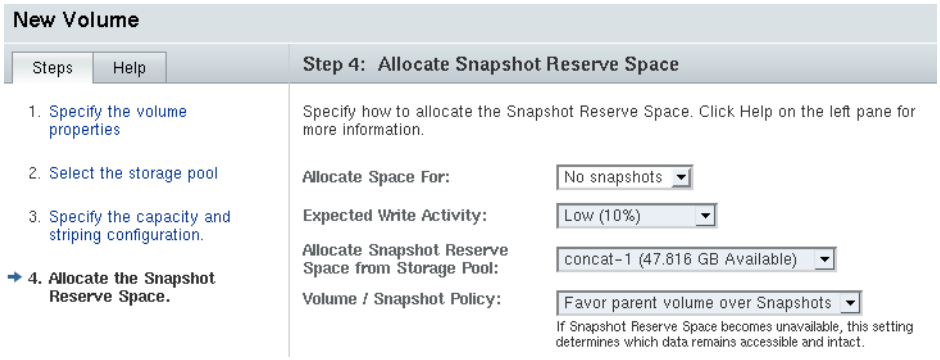
   The storage profile of the pool you select determines the volume's storage characteristics.

   The wizard prompts you to enter the capacity and striping configuration for this volume.



8. **Specify the volume capacity, whether to enable striping, and click Next.**

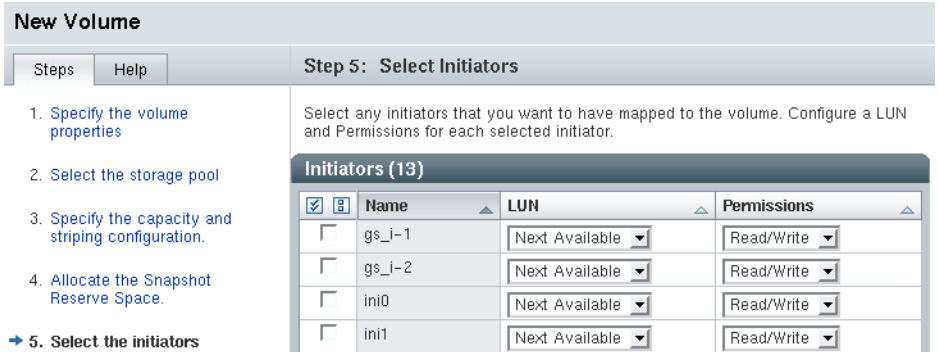
   The wizard prompts you to allocate snapshot reserve space for this volume.



9. **If needed, allocate space for snapshots for the new volume. Click Next.**

   The snapshot reserve space is determined by the number of snapshots and the write activity. Specify the number of snapshots (1 to 32) and the percentage of expected write activity (10%, 40%, 50%, 75%, or 100%). Specify the storage pool in which you want to reserve the space and the policy. For more information about allocating snapshot reserve space, see the online help and *Best Practices for the Sun StorEdge 6920 System*.

   The Select Initiators page is displayed.



10. **Select any initiators that you want to have mapped to the volume and select the LUN number and permissions for each mapping, and then click Next.**

    The system uses the LUN mapping storage management technique to selectively configure an area of storage so that it is available to a specific Fibre Channel (FC) device. LUN mapping matches FC targets or initiators inside the Sun StorEdge 6920 system to particular LUNs attached to the system, either directly attached or attached to a SAN. This technique makes a given LUN visible to a FC target or initiator while at the same time removing its visibility (or masking it) from another FC target or initiator.

11. **Review your selections for the new volume and click Finish.**

    The system creates the new volume and adds it to the system configuration. The new volume is displayed in the list on the Volume Summary page.

    For more information about creating volumes, go to the online help system by clicking the Help button. Click the Search tab and enter **`creating a volume`**.

Changing the Default Configuration

If you decide the default configuration does not meet your storage needs, you can:

- Optionally, create one or more storage domains.
- Choose a predefined storage profile or create a customer storage profile that defines the characteristics of your new storage pool.
- Create one or more storage pools.
- Remove virtual disks from the system DEFAULT storage pool and reassign those virtual disks to your new storage pool.
- Create volumes from your new storage pool.
- Map hosts to the new volumes within the appropriate storage domains.

Creating Storage Domains

If you determine that one storage domain does not meet the needs of your site, you can create additional storage domains. Each system supports from 1 to 64 storage domains. These storage domains create separate private, secure domains that can support multiple clients within one system.

You create a storage domain using the New Storage Domain wizard. You can specify the initiators that you want to assign to the storage domain, or you can map initiators later using the Map Volume wizard on the Volume Detail page.

To create a storage domain:

1. **Log in to the system as a storage administrator from the Java Web Console login page:**

   user name: `storage` **password:**`!storage`

2. **Click Sun StorEdge 6920 Configuration Service.**

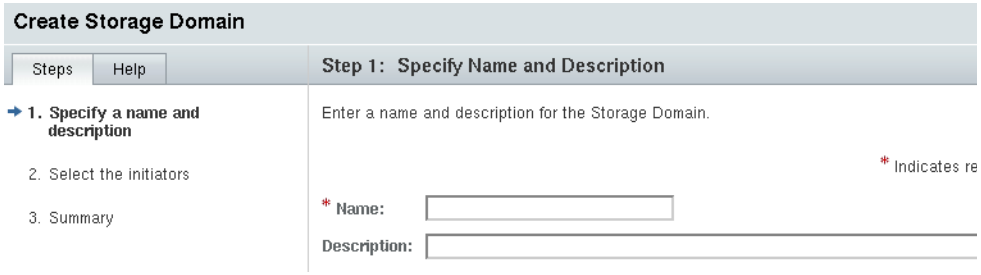
   The system displays the Volume Summary page.

3. **Click Logical Storage > Domains.**

   The Storage Domain Summary page is displayed.

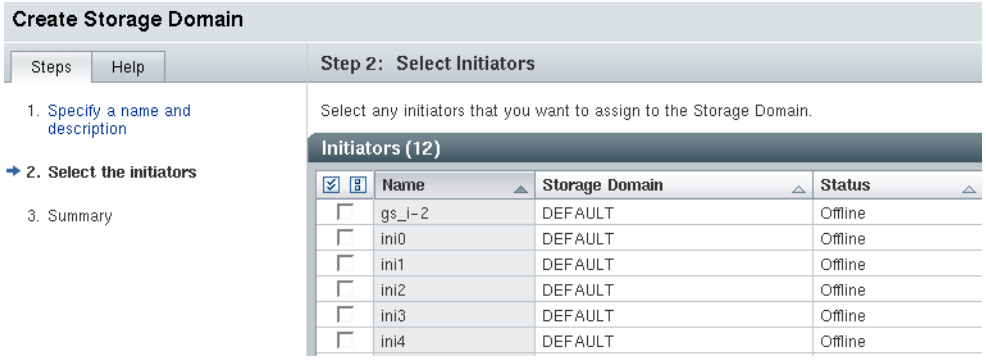
4. **Click New.**

   The Create Storage Domain wizard is displayed.



5. **Enter a name and description for the new domain, and click Next.**

   The wizard prompts you to select initiators that you want to assign to this storage domain.



6. **Select the initiators that you want to assign to the storage domain, and click Next.**

7. **Review the summary and click Finish.**

   The system creates the new storage domain and adds it to the system configuration. The new storage domain is displayed on the Storage Domain Summary page.

Selecting a Storage Profile

The system provides several storage profiles that meet most storage configuration requirements. If the Default storage profile does not meet the performance needs of your application, you can select one of several other predefined profiles, or you can create a custom profile.

To view the predefined storage profiles:

1. **Click Logical Storage > Profiles.**

   The Storage Profile Summary page is displayed.

TABLE 5-4 describes the characteristics of the predefined storage profiles.

TABLE 5-4 Predefined Storage Profiles

Name	RAID Level	Segment Size	Read-Ahead Mode	Virtualization Strategy
Default	RAID-5	64 KB	Enabled	Stripe
HPC (High Performance Computing)	RAID-5	64 KB	Enabled	Concatenate
Legacy	N/A	N/A	N/A	Legacy
MailSpooling	RAID-1	64 KB	Enabled	Stripe
NFS_Mirror	RAID-1	64 KB	Enabled	Stripe
NFS_Stripe	RAID-5	64 KB	Enabled	Stripe
Oracle_DSS	RAID-5	64 KB	Enabled	Stripe
Oracle_OLTP	RAID-5	32 KB	Enabled	Stripe
Oracle_OLTP_HA	RAID-1	32 KB	Enabled	Stripe
Random1	RAID-1	64 KB	Enabled	Stripe
Random5	RAID-5	64 KB	Enabled	Stripe
Sequential	RAID-5	64 KB	Enabled	Concatenate
Sybase_DSS	RAID-5	64 KB	Enabled	Stripe
Sybase_ OLTP	RAID-5	32 KB	Enabled	Stripe
Sybase_OLTP_HA	RAID-1	32 KB	Enabled	Stripe

The virtualization strategy is defined by the storage profile. For information about striped and concatenated virtualization strategies, see the online help.

2. **Select a profile that matches your storage requirements.**

   If you select a RAID-1 profile, you must first delete one or both default RAID-5 virtual disks, as described in "Deleting Virtual Disks" on page 105.

   You will need the name of the storage profile later, when you create a storage pool.

Note – If you want to create a custom profile, click New on the Storage Profile Summary page. The New Storage Profile wizard guides you through the steps to create a new storage profile.

Deleting Virtual Disks

When you delete a virtual disk, its disk drives become available for the construction of new virtual disks within a new storage pool.

Note – You cannot delete virtual disks that are in use.

You can delete a virtual disk in one of two ways:

1. **Click Logical Storage > Virtual Disks.**

   The Virtual Disk Summary page is displayed.

2. **Select the virtual disks that you want to delete, and click Delete.**

or

1. **Click Logical Storage > Virtual Disks.**

   The Virtual Disk Summary page is displayed.

2. **Click the virtual disk name that you want to delete.**

   The Virtual Disk Details page for the selected virtual disk is displayed.

3. **Click the Delete button.**

Moving Default Virtual Disks

To move the default RAID-5 virtual disk to a new storage pool:

1. **Click Logical Storage > Virtual Disks.**

   The Virtual Disk Summary page is displayed.

2. **Click the virtual disk you want to move.**

   The Virtual Disk Details page is displayed.

3. **Select an alternate storage pool from the pull-down list.**

   Storage pool choices are limited to storage pools that have compatible profiles. For example, you cannot move a RAID-5 virtual disk to a storage pool that was created with a RAID-1 storage profile.

4. **Click Save.**

   The Virtual Disk Summary page displays the name of the storage pool in which the virtual disk resides.

Creating a Storage Pool

The default configuration uses the Default storage pool, which consists of all the disks in the system. When you create a new storage pool, you assign specific disks to it, and then you create volumes.

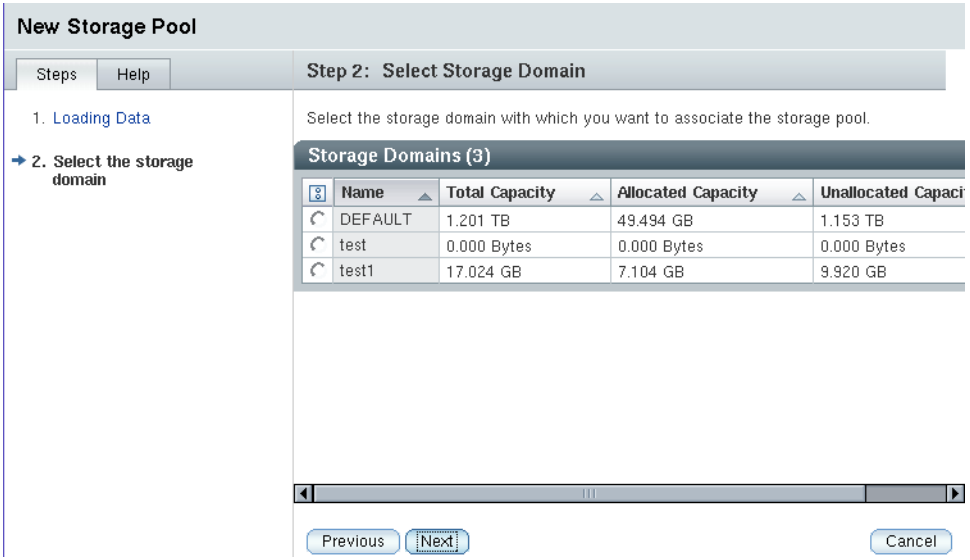
To create a new storage pool:

1. **Click Logical Storage > Pools.**

   The Storage Pool Summary page is displayed.

2. **Click New.**

   The New Storage Pool wizard is displayed.



3. **Select the storage domain with which you want to associate the storage pool, and click Next.**
4. **Specify a name and description for the storage pool and click Next.**
5. **Select a storage profile with which you want to associate the storage pool, and click Next.**
6. **Review the summary and click Finish.**

   The new storage pool is added to the Storage Pool Summary page.

CHAPTER 6

Connecting External Storage Devices

This chapter provides instructions and guidelines for connecting external storage devices to the Sun StorEdge 6920 system. It includes the following sections:

Supported Storage Devices

In addition to the system's internal storage arrays, you can attach external storage devices to the system. An external storage device is a physical disk or storage array that is connected to the system's service panel, either directly or through a Fibre Channel (FC) switch, and is located outside the system base or expansion cabinet.

The Sun StorEdge 6920 system supports both Sun storage devices and storage devices from other vendors. The external storage devices that are currently supported include:

- Sun StorEdge T3 array with 1 Gbyte cache
- Sun StorEdge 3510 array
- Sun StorEdge 3511 array
- Sun StorEdge 6120 array
- Sun StorEdge 6130 array
- Sun StorEdge 6320 system
- Sun StorEdge 9970 system

- Sun StorEdge 9980 system
- Sun StorEdge 9960 system
- Sun StorEdge 9910 system
- Sun StorEdge 3910/3960 systems (with Sun StorEdge T3 arrays with 1 Gbyte cache)
- Sun StorEdge 6910/6960 systems
- EMC CLARiion CX400 array
- EMC CLARiion CX700 array
- Hewlett Packard StorageWorks Enterprise Virtual Array 3000 (EVA3000)

See the *Sun StorEdge 6920 System Release Notes* for the latest list of supported storage devices.

Connecting Storage Devices to the System

You can connect an external storage device to the system to allow host access to its data and to increase storage capacity of the system. Attaching an external storage device to the system enables you to:

- Use Sun StorEdge 6920 data services on existing storage. Data stored on external storage devices is preserved and added to the system as a legacy volume. External data is exported from an external storage device's logical unit number (LUN) to a legacy volume in the system's internal storage.
- Increase the system's storage capacity by using an external storage device as raw storage. In this case, the data on the external storage device is not preserved and the capacity is added to a storage pool as one virtual disk.
- Migrate data from an external storage device to the system's internal storage by using data mirroring. For information about how to migrate external data to the system, see the online help.

Guidelines for Connecting External Storage Devices

External storage devices are located outside the management path and presented to the system as LUNs.

When you connect an external storage device to the system, follow these guidelines:

- Use the external storage device's native configuration tools to export at least one LUN to the system. To support multipath failover, the LUN must appear on two of the external storage device's controller ports.
- The exported LUN must be exclusive to the system and cannot be visible to another host.
- Connect the external storage device directly to the system's service panel or through redundant FC switches to the service panel.
- To ensure data reliability, create redundant data paths through direct or FC switch connections.
- If you connect an external storage device through FC switches, create zones so that each controller on the external storage device has an exclusive path to a single port on the system's service panel. You must ensure that a host is not mapped to the same LUN that is presented to the system. (Refer to the FC switch documentation for information about zoning.)
- A LUN cannot appear on more than two controller ports.
- You cannot connect more than one set of redundant switches or cascading switches to the system.

Cabling a Direct Connection With Failover

Direct connections with failover requires a dual-controller configuration on the external storage device. When cabling a direct connection to the system, connect the primary controller path to a primary FC port (row A or C) and the alternate controller path to an alternate FC port (row B or D) on the service panel.

Direct connections from the external storage device to the service panel require fiber optic interface cables.

1. **Configure the external storage device to export at least one LUN, as described in the documentation provided with the external storage device.**
2. **Connect one controller to a primary FC port and one controller to an alternate FC port.**

   The following example connects Controller 1 to primary port C/4 and Controller 2 to alternate port D/4.

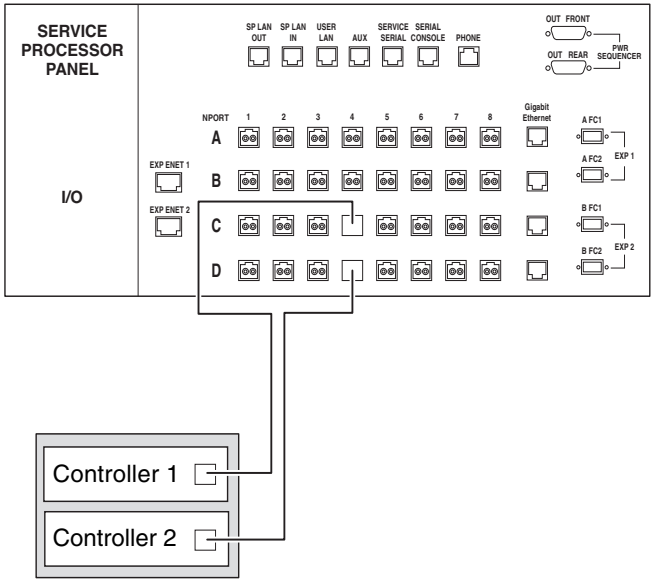


FIGURE 6-1 External Storage Device Connected Directly to the Service Panel

To determine which ports are available for connections, refer to "Determining Your Configuration" on page 68.

Cabling Dual FC Switches With Failover

You can connect an external storage device to the system through a set of redundant FC switches to support failover. Create zones on the switch so that each controller on the external storage device has an exclusive path to the system. Refer to the FC switch documentation for information about zoning.

1. **Configure the external storage device to export at least one LUN through dual controllers, as described in the documentation provided with the external storage device.**
2. **Connect one controller to ports on the primary FC switch that are in the same zone.**
3. **Connect the other controller to ports on the alternate FC switch that are in the same zone.**

   The following example shows Controller 1 on the external storage device connected to Zone A1 of the primary FC switch. Controller 2 is connected to Zone A2 of the alternate FC switch.

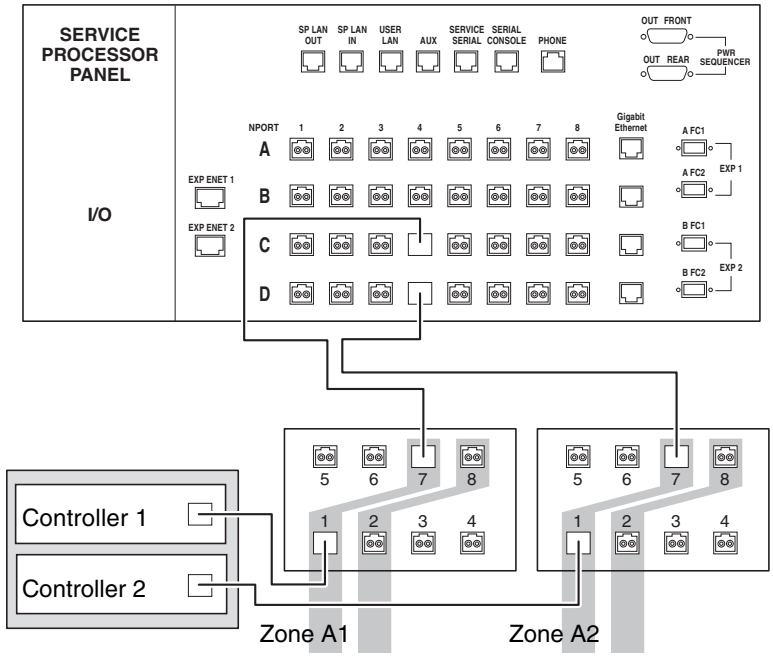


FIGURE 6-2 External Storage Devices Connected to Dual FC Switches

Importing External Storage

After the external device is physically connected to the system, you have three options for how to use the external storage device:

- Preserve the data by creating a legacy volume on the system.
- Migrate data from external storage to the system by creating a mirror component of the legacy volume, copying the legacy volume to a separate mirror component, and then breaking that mirror component to create an independent copy of the user data. (See Migrating Externally Stored Data in the online help for details.)
- Overwrite the data and use the external device as raw storage to increase system capacity.

Caution – When you use a device as raw storage, all of the existing data is destroyed. If any of the data needs to be saved, back up the data before starting this process.

This section introduces you to the Import External Storage wizard and guides you through the steps of creating a legacy volume. For more detailed information about managing external storage, see the online help.

Before You Create a Legacy Volume

A legacy volume is created from data that exists on a storage array that is external to the Sun StorEdge 6920 system. When you create a legacy volume, you can use it as if it were any other volume on the system.

A legacy volume consists of the external storage array's entire disk capacity and is presented to an application as a virtual storage volume.

Before creating a legacy volume, be sure the following requirements are met:

- The volume must be created from the Legacy storage pool or another storage pool that uses the Legacy profile.
- At least two virtual disks must be initialized from internal storage on the Sun StorEdge 6920 system to hold meta data.
- All LUNs exported from the external array must be used exclusively by the system. Allowing external hosts to have direct access to the exported LUNs could cause data corruption.

Creating a Legacy Volume and Mapping It to a Host

This section explains how to create a legacy volume from an external storage device using the Import External Storage wizard and how to map the legacy volume to a host.

1. **Open a browser and connect to the system by entering:**

   `https://`*IPaddress*`:6789`

2. **Log in as a storage user.**

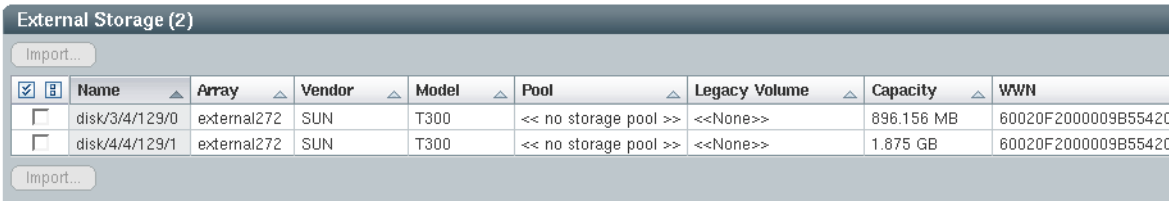
   User Name: **`storage`** Password: **`!storage`**

3. **Click Sun StorEdge 6920 Configuration Service.**

4. **Click External Storage.**

   The External Storage Summary is displayed.

External Storage Summary

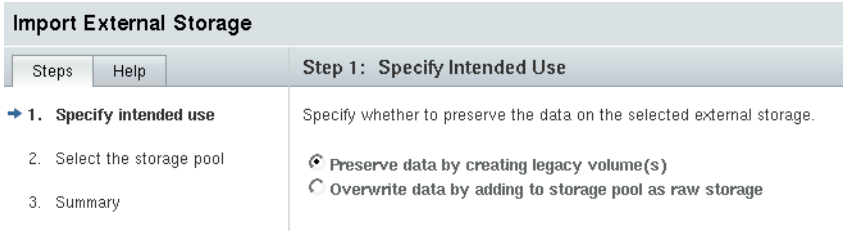


The LUNs that you exported from the external storage device are displayed as uninitialized virtual disks. An uninitialized virtual disk has four numbers as shown in this example: disk/3/4/129/0. The numbers identify the slot number of the I/O board in the DSP.

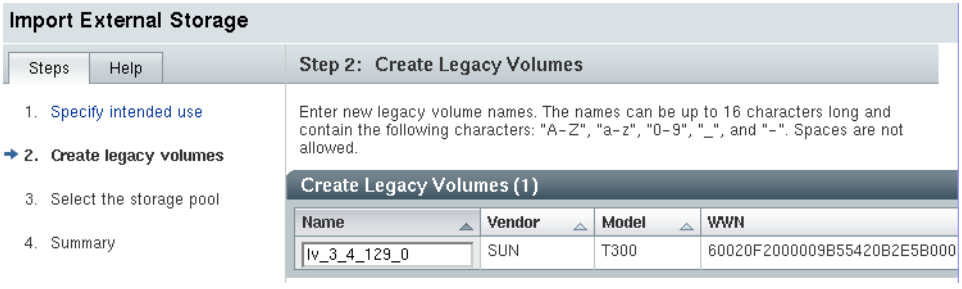
5. **Select the virtual disks and click Import.**

   The Import External Storage wizard is displayed.

6. **Select Yes to create a legacy volume, and click Next.**

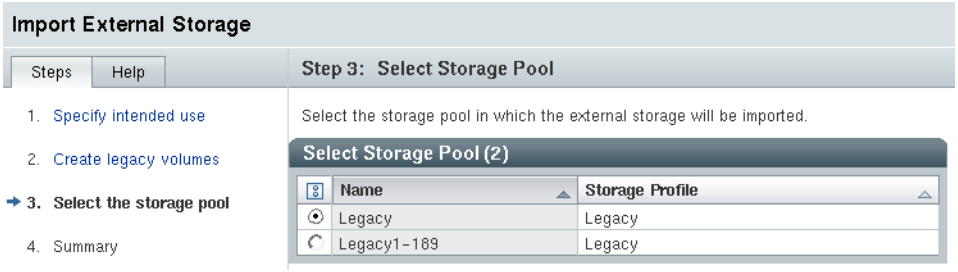


7. **Enter a name for the legacy volume, and click Next.**



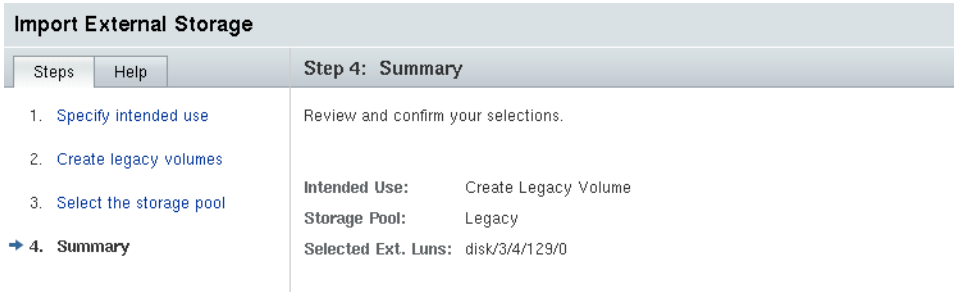
8. **Select the storage pool to which the virtual disks will be added, and click Next.**

   You can select the Legacy storage pool (the default) or a pool that you previously created using the Legacy profile. In this case, two storage pools are available, Legacy (the default) and Legacy1-189.



The wizard displays a summary of your selections.

9. **Review your selections and click Finish.**



The External Storage Summary page is displayed, and it confirms that the external storage LUN was successfully added to the Legacy storage pool.

10. **Click Logical Storage > Volumes.**

    The system designates the entire LUN on the external storage device as a legacy volume. The Volume Summary page displays information about each LUN including its name, array name, vendor, and model. It also shows you the storage pool to which the LUN is added, the total capacity, and the WWN of the external storage LUN.

11. **To map the legacy volume to one or more hosts, do the following:**

    a. **Click the volume to go to the Volume Details page.**

    b. **Click Map to open the Map Volume wizard.**

    c. **Follow the instructions to map the volume to one or more host initiators.**

Using Legacy Volumes

After you create a legacy volume, it can be managed as any other volume in the system. In addition to mapping a legacy volume to hosts, you can:

- Create a mirror of the legacy volume and migrate the data to internal storage
- Create volume snapshots of the legacy volume
- Create a replication set for the legacy volume

For information about data mirroring, volume snapshots, and data replication, see the online help.

Using External Storage as Raw Storage

You can expand the system's storage capacity by adding an exported LUN from an external device as raw storage. If you decide to use the external storage device as raw storage, none of the data is preserved. If necessary, back up the data before connecting the external storage device to the system. The attributes of the LUNs on the external storage device must be compatible with the storage pools in which you place the raw storage.

Before you begin this procedure, you need to know the name of the storage pool to which the virtual disks will be added. The storage profile that defines the storage pool characteristics must be compatible with the external storage device.

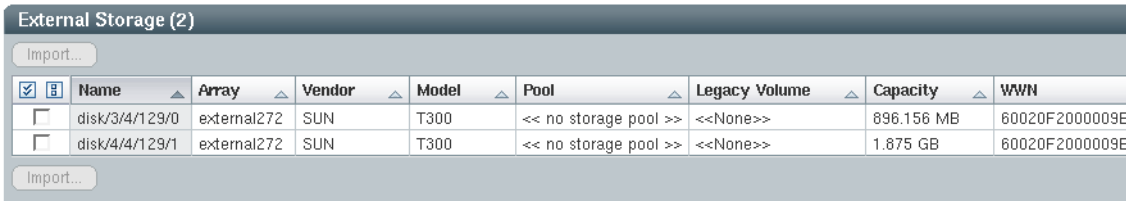
To designate external storage as raw storage:

1. **Click External Storage.**

   The External Storage Summary page is displayed.

2. **Select the name of the virtual disk that you want to manage.**

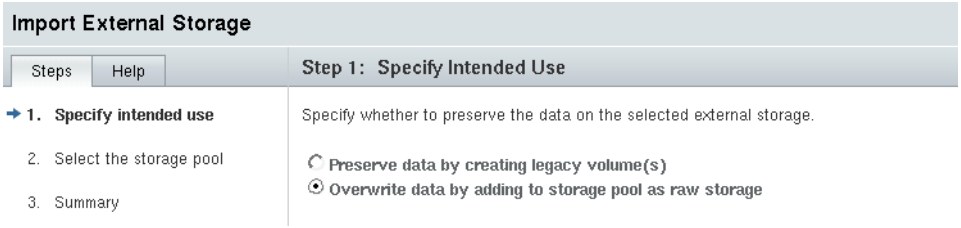
External Storage Summary



3. **Click Import.**

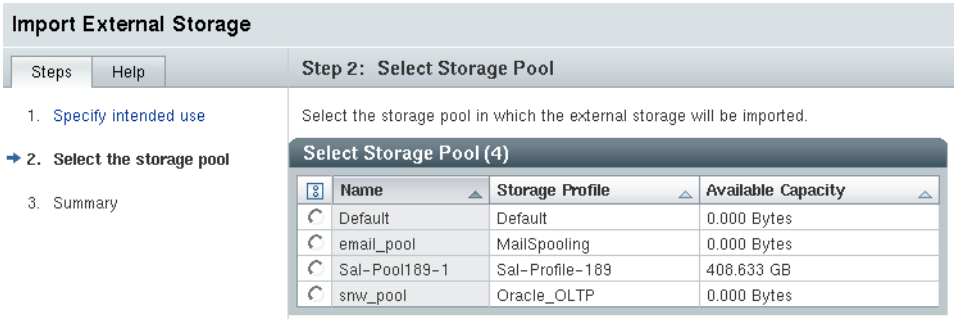
   The Import External Storage wizard is displayed.

4. **Select No, add to storage pool as raw storage, and click Next.**



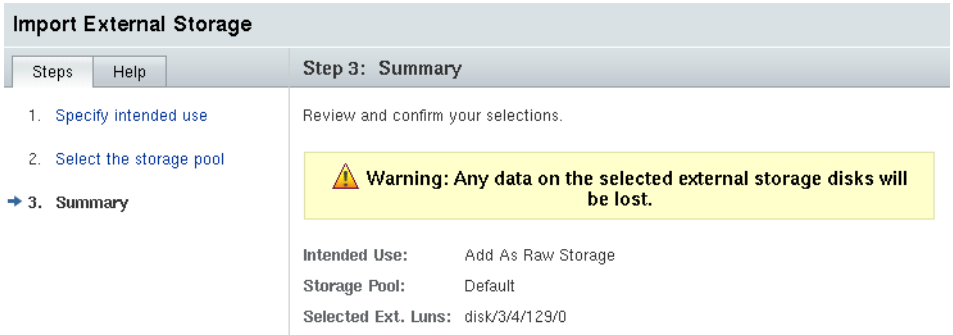
5. **Select the raw storage pool to which the virtual disks will be added, and click Next.**

Note – The attributes of the external storage device must be compatible with the profile of the storage pool you select. For example, you do not want to add RAID-1 external storage to a storage pool defined by the RAID-5 profile.



The wizard displays a summary of your selections.

6. **Review your selections and click Finish.**



The capacity of the external storage device is added to the selected storage pool.

For more information about external storage and how to migrate data from external storage, see the online help.

Monitoring External Storage

Use the Storage Automated Diagnostic Environment Enterprise Edition software, installed on a data host or management station, to monitor the health of external storage devices.

Storage Automated Diagnostic Environment Enterprise Edition is delivered on the Host Installation Software CD. For information about installing the software, see "Installing Host Software for Solaris OS Hosts" on page 74.

APPENDIX **A**

Remote Response Service

This appendix provides information about the Sun StorEdge Remote Response service. It contains the following sections:

Supported Country Listing

Following is a list of countries in which the Sun StorEdge Remote Response service is supported. If the country in which you are located is not listed, contact Sun or a licensed Sun reseller or service provider for assistance in setting up and activating the Sun StorEdge Remote Response service.

Supported countries are Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Italy, Japan, Malaysia, Mexico, The Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Romania, Russia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, U.K., and U.S.A.

Remote Response Service Worksheet

Before you call Sun to request service activation, gather the information listed in TABLE A-1. You should retain this information for future reference.

TABLE A-1 Sun StorEdge Remote Response Service Worksheet

Requirement	Information
Company name	
Site address	
Site state or province	
Site country	
Name of the contact person at the site	
Telephone number of the contact person at the site	
Telephone number of the dedicated analog telephone line	
Information about the configuration of the system at the site. For example, is there a firewall between the console and the system?	
Are there additional Sun StorEdge 6920 or 6320 systems sharing the dedicated phone line?	
How is the storage configured?	
How many and what types of hosts will be connected to the Sun StorEdge 6920 system?	
Serial numbers of all Sun StorEdge 6920 and 6320 systems at the site	

Connecting Multiple Systems

If multiple Sun StorEdge 6920 systems are installed at your site, you can connect the systems in a chain to share a single telephone line. A maximum of eight systems can be connected together to communicate with the Sun Service Center.

Note – It is important that you connect the Storage Service Processor to the Storage Service Processor LAN before configuring the system.

Connecting multiple systems to share a telephone line requires the following:

- The first system containing the modem must be installed and configured with a system ID of 0.
- The telephone line must be connected to the service panel of the first base cabinet.

Note – There can be only one `new_sp` (the default system name) on the Storage Service Processor LAN at any one time. Therefore, you must connect the Storage Service Processor LAN ports, run `setup`, and give the system a unique system ID for each system in the chain before connecting the next system.

Before you begin this procedure, contact your local Sun Service Center to request Sun StorEdge Remote Response installation service.

To connect a Sun StorEdge 6920 system to another system:

1. **Connect the SP LAN OUT port on the service panel of the base cabinet to the SP LAN IN port of the adjacent system.**
2. **Run `setup` as described in "Running the Initial Configuration Script" on page 44.**

   Be sure to give each system in the chain a unique system ID.
3. **If you want to connect another system, repeat the previous steps until each system in the chain is connected.**

   For information about connecting the Sun StorEdge 6920 system to a Sun StorEdge 6320 system, contact your local Sun Service Center.

APPENDIX **B**

Remote and Local Power Management

This appendix explains how to enable remote power management for the Sun StorEdge 6920 system. It includes the following sections:

Preparing the System for Remote Power Management

When the remote power-on and power-off feature is enabled, you can perform a partial system shutdown using the configuration management browser interface. When the system is in the partial shutdown state, the Storage Service Processor and the Storage Service Processor accessory tray remain powered on and active, to facilitate a future remote power-on operation.

Caution – Do not use the partial remote power-off sequence when moving the system. You must completely power off the system, as described in "Performing a Full System Shutdown" on page 140, before moving it.

The information in this section assumes you are installing the Sun StorEdge 6920 system for the first time and have not yet powered on the system.

Note – If you want to enable remote power management for a system that is operational, you must first perform a full system shutdown, as described in "Performing a Full System Shutdown" on page 140. After shutting down the system, you can enable the system for remote power management by completing the steps described in the following section.

Remote Power Management Checklist

The following checklist (TABLE B-1) summarizes the tasks required for setting up remote power management for the Sun StorEdge 6920 system. To ensure a successful installation, perform the tasks in the order in which they are presented.

TABLE B-1 Remote Power Management Checklist

Step	Task	Where to Find Procedure
1.	Gather required keys, cables, and tools.	"Items You Need" on page 127
2.	Place base cabinet and expansion cabinets, if applicable, in Standby mode. Remove front trim panel. Verify that circuit breakers in base cabinet and expansion cabinets, if applicable, are set to Off.	"Preparing the Cabinet" on page 128
3.	Connect DB9 cables to front and back sequencer connectors behind service panel.	"Connecting the Internal Power Sequencer Cables" on page 128
4.	Connect Ethernet and Power sequencer cables to expansion cabinets, if applicable.	"Connecting Ethernet and Power Sequencer Cables" on page 130
5.	Connect grounding cables.	"Connecting the Grounding Cable" on page 131

TABLE B-1 Remote Power Management Checklist *(Continued)*

Step	Task	Where to Find Procedure
6.	Connect power cables between base cabinet, expansion cabinets, if applicable, and AC power outlets.	"Connecting the Power Cables" on page 132
7.	Verify that AC power sequencer circuit breakers are off; set Local/Off/Remote switch to Remote. Set expansion cabinets AC power sequencer circuit breakers to On. Set base cabinet AC power sequencer circuit break to On.	"Powering On the System" on page 135
8.	Log in to the NTC through the serial connection, run `setup`, and select `Enable SW support for Lights Out Operation`.	"Enabling Support for Remote Power Management" on page 137

Items You Need

Before you begin to prepare the system for remote power management, gather the items listed in TABLE B-2.

TABLE B-2 Keys and Cables Required for Setting Up Remote Power Management

Quantity (per cabinet)	Part Number	Description
2	N/A	Keys for Local/Off/Standby key switch (in the base cabinet ship kit)
2	595-4881-*nn*	Power cables for use in U.S. and Canada 72-in. (185-cm) L6-30P OR
2	595-4882-*nn*	Power cables for international use 72-in. (185-cm) IEC 309
1	530-1619-*nn*	Grounding cable 78.74 in. (2-meter) (in the kit shipped with the system)
1	530-3138-*nn*	Ethernet cable 10M RJ-45/RJ-45 Rollover
2	530-3210-*nn*	Power sequencer cables 393.7 in. (10-meter) expansion cabinet DB9 to base cabinet DB9 cable

You also need a Phillips screwdriver for removing the front trim panel of the base cabinet.

Preparing the Cabinet

1. **Verify that the key switches, located at the bottom front of the base cabinet and any expansion cabinets (if applicable), are in the Standby position (**FIGURE B-1**).**

   Keys for this switch are packed in the base cabinet ship kit. If the key switch is not in the Standby position, insert the key and turn the key switch to Standby.

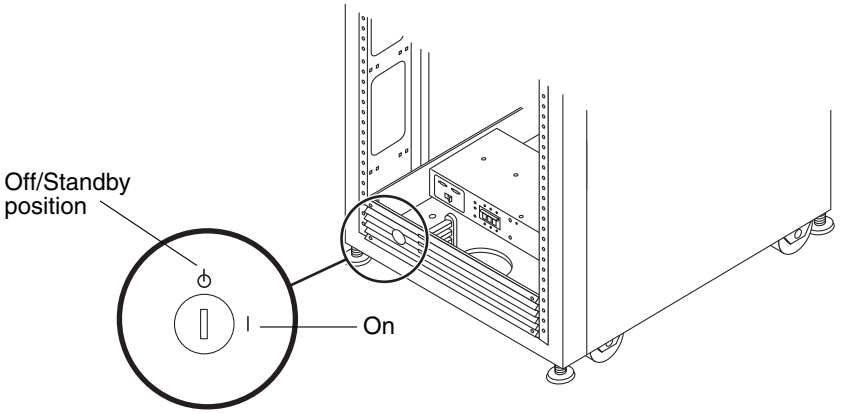


FIGURE B-1 Location of Key Switch on Bottom Front Panel (Standby Position)

2. **Open the front door and the back door of the base cabinet.**
3. **At the bottom on the base cabinet, loosen the four screws on the front trim panel and remove the panel. Set the panel aside.**
4. **Verify that both power sequencer circuit breakers in the base cabinet and expansion cabinet (if applicable) are in the Off position.**

Connecting the Internal Power Sequencer Cables

The front and back power sequencer cables are located behind the service panel. These cables enable the Storage Service Processor to recognize that the system is capable of a remote power-on and power-off sequence.

To connect the internal power sequencer cables, follow these steps:

1. **At the back of the base cabinet, loosen the thumbscrews holding the right side of the service panel, and swing the panel open.**

2. **Locate the two DB9 cables that are loosely tied off close to the relay panel on the back of the service panel. Connect the cable labeled J14 to PP Front Seq J14 In to the FRONT SEQ J14 connection, and the cable labeled J14 to PP Rear Seq J14 In to the REAR SEQ J14 connection on the back of the service panel (**FIGURE B-2**).**

   The other ends of these cables are already connected to the front and rear power sequencers.

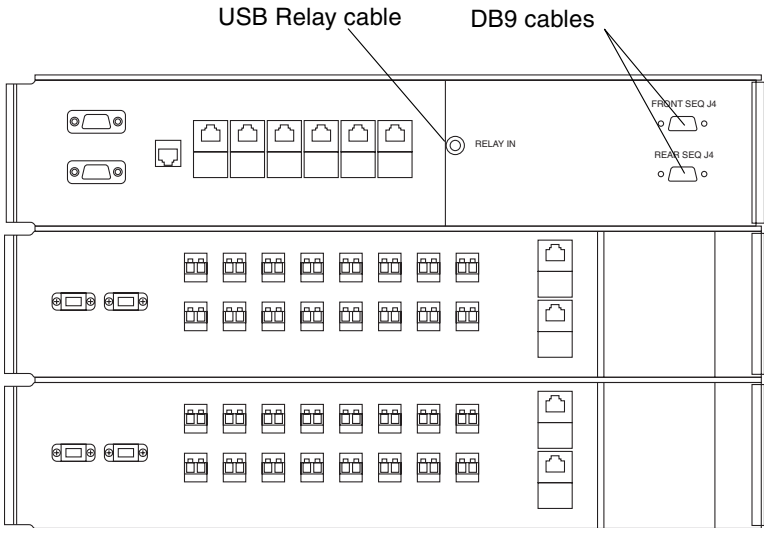


FIGURE B-2 Connections for the Front and Rear Power Sequencers on the Inside of the Base Cabinet Service Panel

3. **Locate the Relay USB cable at the back of the Storage Service Processor (see** FIGURE B-3**) and make sure it is connected to the USB Relay In connector at the back of the service panel.**

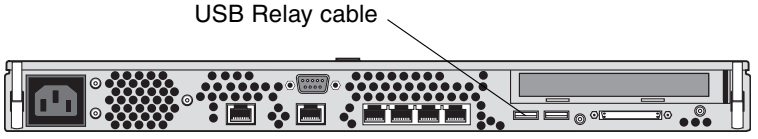


FIGURE B-3 Storage Service Processor: USB Relay Cable Connection

4. **Close the service panel and tighten the thumbscrews.**

Connecting Ethernet and Power Sequencer Cables

1. **If you are connecting one expansion cabinet, connect one Ethernet cable (10M RJ-45/RJ-45 Rollover, part number 530-3138-01) and two power sequencer serial cables (P/N 530-3210-01) between the base cabinet and expansion cabinet as shown in** FIGURE B-4**.**

   This connection allows the expansion cabinet to power on or power off when the base cabinet is powered on or powered off.

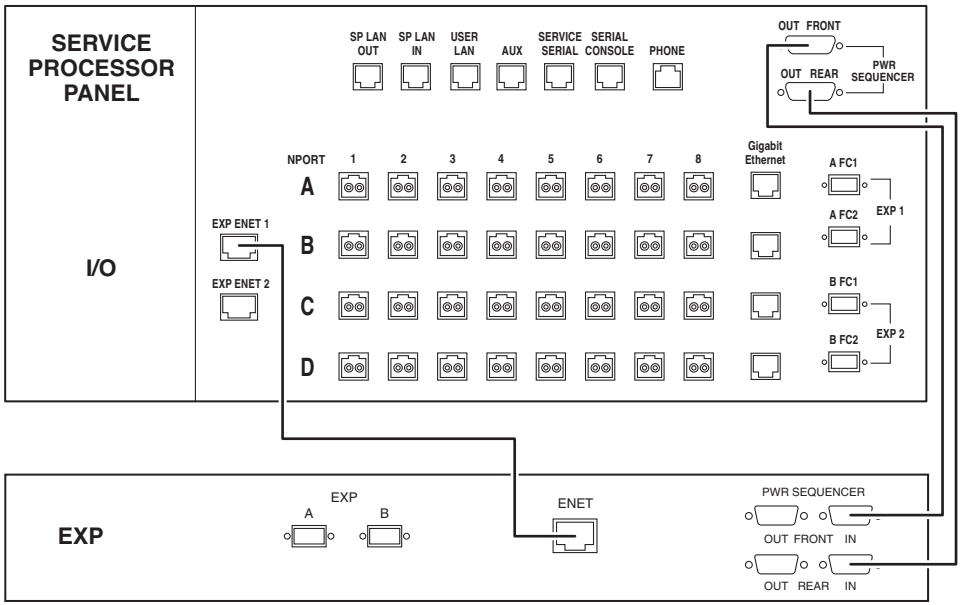


FIGURE B-4 Ethernet and Power Sequencer Cabling Between the Base Cabinet and Expansion Cabinet 1

2. **If you are connecting two expansion cabinets, connect two Ethernet cables and four power sequencer serial cables (P/N 530-3210-01) between the base cabinet and the two expansion cabinets as shown in** FIGURE B-5**.**

   This connection allows both expansion cabinets to power on or power off when the base cabinet is powered on or powered off.

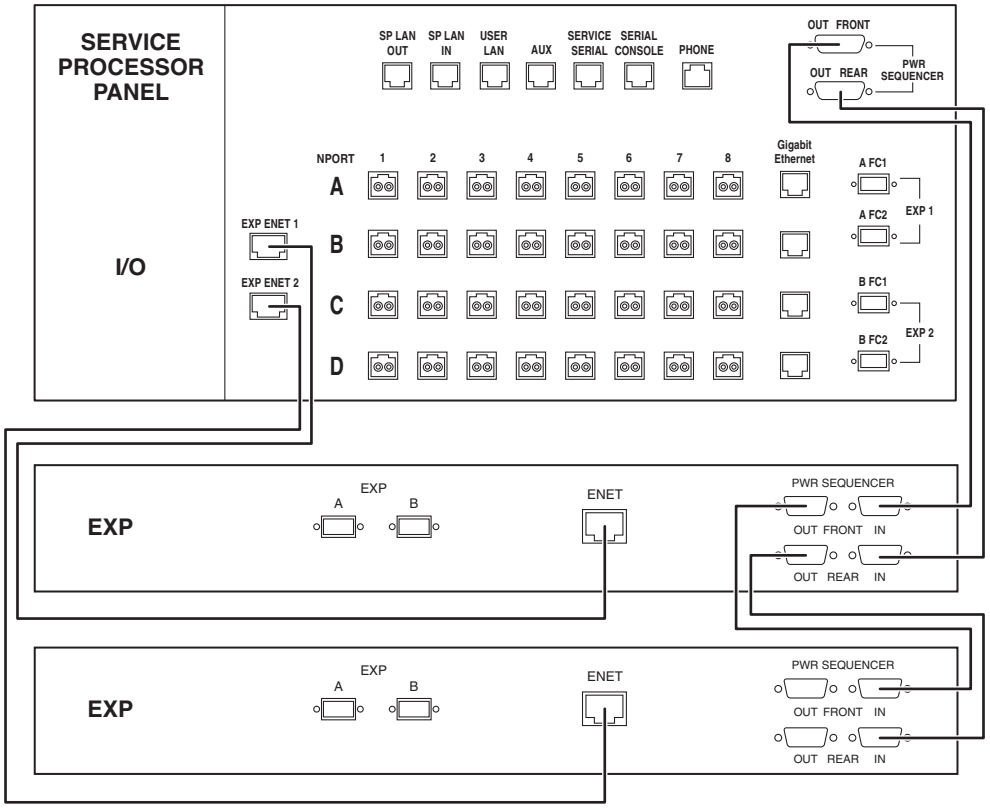


FIGURE B-5 Ethernet and Power Sequencer Cabling Between the Base Cabinet, Expansion Cabinet 1, and Expansion Cabinet 2

Connecting the Grounding Cable

The grounding conductor must be connected to either of the following:

- Earth ground at service equipment
- Supply transformer or motor-generator set (if supplied by a separately derived system)

The outlets in the vicinity of the unit must be of the grounding type. The grounding conductors for these outlets must be connected to earth ground.

To connect the grounding cable, follow these steps:

1. **Locate the grounding cable in the kit that was shipped with the system.**

2. **Attach one end of the grounding cable to the power sequencer on the base cabinet or on a cabinet that is grounded nearest to the cabinet.**

3. **Attach the other end of the grounding cable to the front power sequencer in the cabinet (**FIGURE B-6**).**

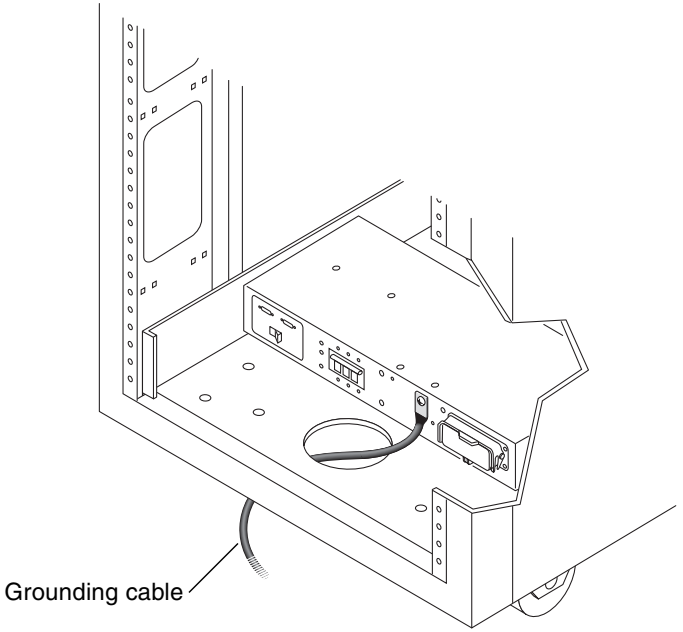


FIGURE B-6 Attaching the Grounding Cable to the Front Power Sequencer

---

Note – If you are installing a system with one or two expansion cabinets, do not attach the grounding cable from the expansion cabinet to the base cabinet. Instead, use a different grounding point for the expansion cabinet.

Connecting the Power Cables

Caution – The system is designed to work with single-phase power systems that have a grounded neutral conductor. To reduce the risk of electric shock, do not connect the system to any other type of power system.

To connect the power cables, follow these steps:

1. **Verify that the AC power sequencer circuit breaker is in the Off position (**FIGURE B-7**).**

2. **Verify that the Local/Off/Remote switch is in the Remote position of each power sequencer in the base cabinet and expansion cabinet (if applicable) (**FIGURE B-7**).**

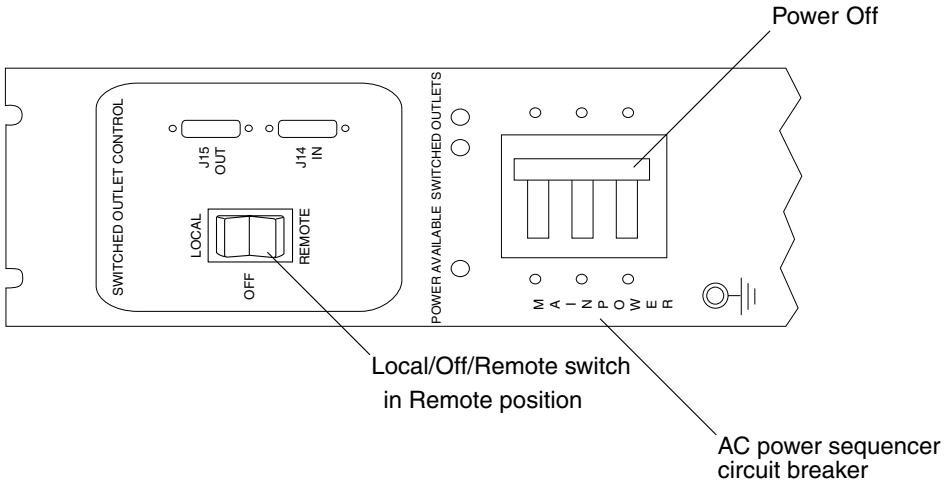


FIGURE B-7 Rear Power Sequencer Control Panel

3. **Check the electrical ratings label on the serial number label attached to the power sequencer. Verify that the stated rating of each power sequencer matches the AC input voltage to the system.**

   Refer to "Power Sequencer Electrical Specifications" in the *Sun StorEdge 6920 System Site Preparation Guide* for AC input voltage system requirements.

4. **Connect each power cable to the front and rear power sequencers of the base cabinet (**FIGURE B-8**):**

   a. **Route each power cable directly through the opening in the base of the cabinet.**

   b. **Flip open the latch covers of each cable to access the connectors.**

   c. **Connect the female end of one power cable to the rear power sequencer connector.**

   d. **Connect the female end of the other power cable to the front power sequencer connector.**

   e. **Pull the latch covers over the power cables to secure them to the power sockets.**

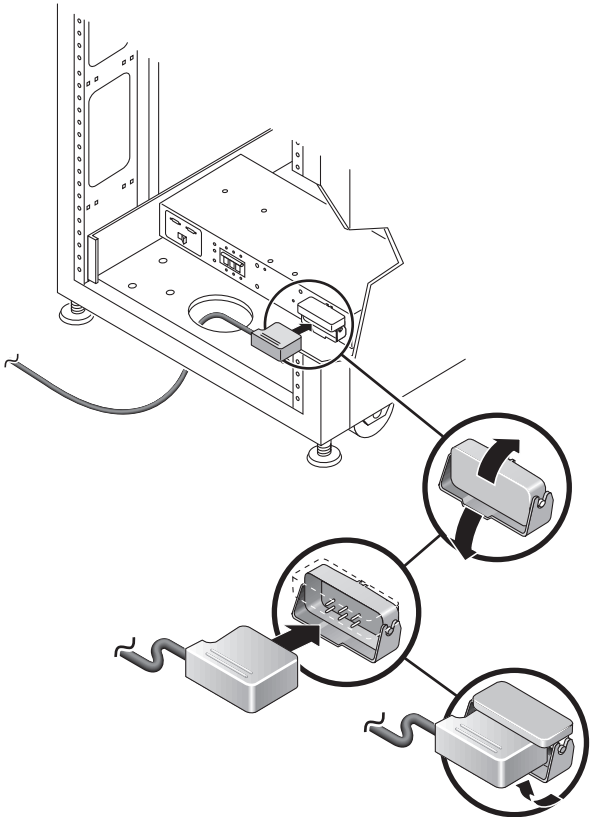


FIGURE B-8 Connecting the Power Cables

5. **Connect the other end of each power cable to a grounded outlet.**

   One of the following connector types is provided on the power cables:

   - NEMA L6-30P for 200V to 240V North American operation
   - 32A single-phase IEC 309 connector for 220V to 240V international operation

Caution – To reduce the risk of electric shock, strictly observe all Caution statements.

Note – If the appropriate mating receptacle is not available, the connector can be removed from the cable and the cable can then be permanently connected to a dedicated branch circuit by a qualified electrician. Check local electrical codes for proper installation requirements.

After you have connected the power cables, you are ready to power on the system, as described in the next section.

Powering On the System

The following steps allow the system to be powered on remotely.

Note – If you are powering on a Sun StorEdge 6920 system with one or two expansion cabinets attached, perform the power-on sequence for the expansion cabinet before powering on the base cabinet.

Caution – To avoid damage to internal circuits, do not connect or disconnect any cable while the FRU associated with the cable is powered on.

To prepare the system for remote power on, follow these steps:

1. **Open the front door if it is not already open.**
2. **Verify that the key switches located at the bottom front of the base cabinet and expansion cabinets (if applicable) are in the Standby position (**FIGURE B-9**).**

   Keys for this switch are packed in the kit that was shipped with your system. If the key switch is not in the Standby position, insert the key and turn the key switch to Standby.

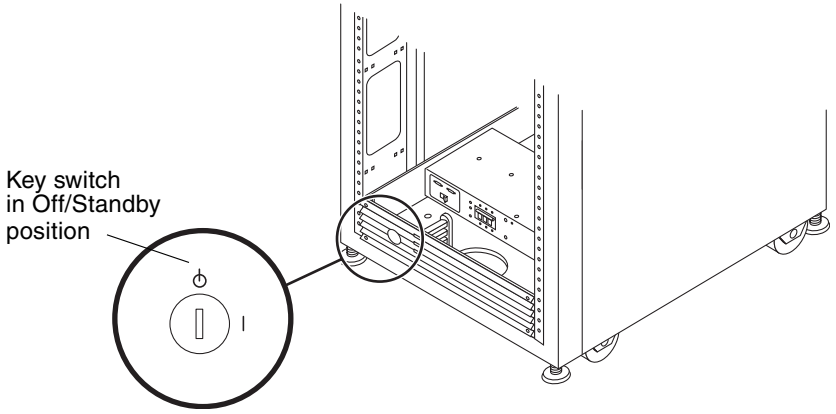


FIGURE B-9 Location of the Key Switch on the Bottom Front Panel

3. **Remove the front trim panel and set it aside, if you have not already done so.**

4. **At the bottom front and bottom back of the base cabinet and expansion cabinets (if applicable), press the AC power sequencer circuit breakers up to the Power Off position (FIGURE B-10).**

5. **At the bottom front and bottom back of the base cabinet and any expansion cabinets, verify that the Local/Off/Remote switch is in the Remote position (FIGURE B-10).**

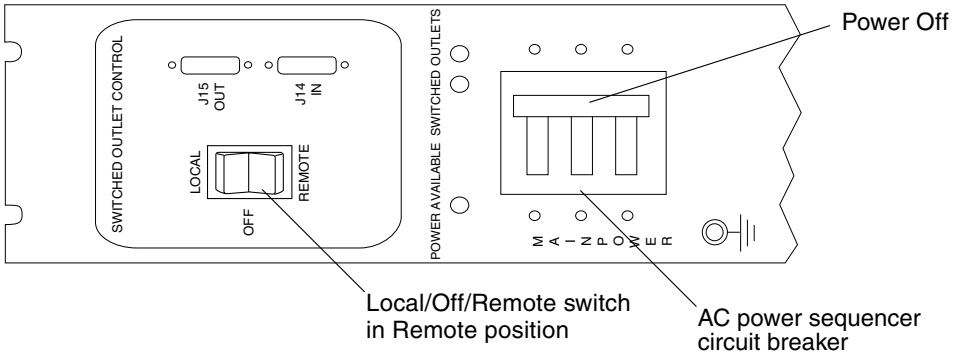


FIGURE B-10 AC Power Sequencer Control Panel: Power Off

6. **Verify that the AC power cables of the base cabinet and any expansion cabinets are connected to the correct AC outlets.**

Caution – Do not disconnect the AC power cable from the outlet while working on or in the base cabinet. This connection provides a grounding path that prevents damage from electrostatic discharge.

Caution – Never move the base cabinet when the system power is on or when the remote power-off procedure is used. Excessive movement can cause catastrophic disk drive failure. Always power the system off completely before you move it.

7. **If any expansion cabinets are connected to the base cabinet, press the AC power sequencer circuit breakers down to the Power On position.**

   Wait until the expansion cabinets complete their power-on sequence and all array component LEDs are in the green steady state.

8. **At the bottom front and bottom back of the base cabinet, press the AC power sequencer circuit breakers up to Power On position (FIGURE B-11).**

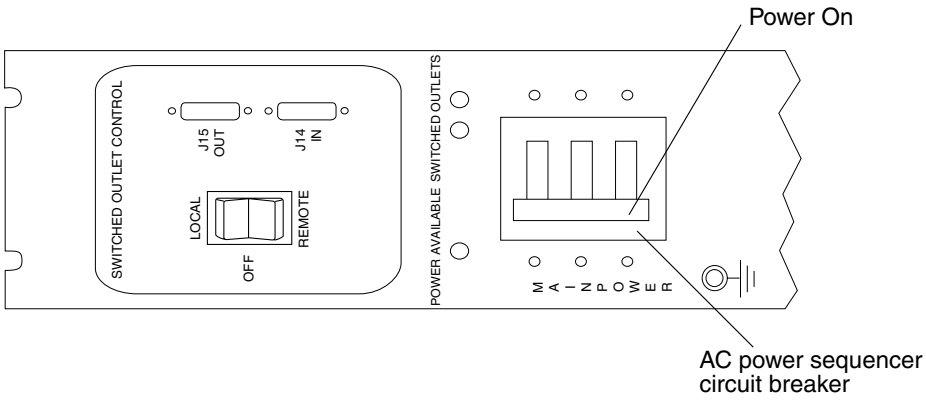


FIGURE B-11 AC Power Sequencer Control Panel: Power On

On the base cabinet, the Storage Service Processor, Storage Service Processor accessory tray, network terminal concentrator (NTC), firewall/router, and Ethernet hub are powered on because they are connected to the unswitched power outlets.

Note – To check the status of the rear power sequencer, open the back door of the expansion cabinets and look for the three green LEDs.

All components of the system should power on in an optimal state.

9. **Verify that all the components have only green LEDs lit.**

   It takes several minutes for the diagnostic and initialization process to be completed and for the LEDs to reach a steady state. If LEDs other than the green ones are lit, or if LEDs are not lit, see "Troubleshooting the Installation" on page 151 to troubleshoot any component that is not powered on.

10. **Replace the front trim panel and close the front and back cabinet doors.**

Enabling Support for Remote Power Management

To enable remote power management, perform these steps:

1. **Log in to the network terminal concentrator (NTC) using the following login name and password:**

```
login: rss
password: sun1rss
```

2. **Switch to the system's Storage Service Processor.**

```
ntc0: connect local port_2
```

3. **Press Return several times until the login prompt is displayed.**

```
new_sp console login:
```

4. **Log in to the console using the following login name and password:**

```
new_sp console login: setup
Password: !setup
```

When you log in as `setup`, the initial configuration utility script automatically runs.

5. **Select** `Enable SW support for Lights Out Operation` **from the list of options by entering** `4`**.**

```
*********************************************
* StorEdge 6920 Initial Configuration Utility *
*********************************************

1. Initial configuration
2. Restore previously defined configuration
3. Unconfigure
4. Enable SW support for Lights Out Operation
5. Upgrade System
Your Choice: 4
```

6. **Confirm the operation by entering** `y`**.**

The script logs you out and returns you to the Solaris prompt. The system is now operating and supports the remote power-off and power-on procedures.

7. **If you are installing the system for the first time, return to** **"Installing the USB Flash Disk" on page 40****.**

Performing a Partial System Shutdown

Before you power off the system, you must halt any I/O between host systems and the Sun StorEdge 6920 system.

Depending on the data host's operating system, you might need to:

- Exit the operating system
- Take the host system offline

Refer to the host operating system documentation for specific instructions.

Caution – Failure to stop I/O between host systems and the system can result in the loss of data.

When you partially power off the system, the system components in the base cabinet and expansion cabinets (if applicable) are in the following state:

- The Storage Service Processor remains powered on (base cabinet only). The system is now under lights-out management control.
- The Storage Service Processor accessory tray remains powered on (base cabinet only).
- All arrays are powered off completely. If the system includes one or two expansion cabinets, the arrays in the expansion cabinets are powered off.
- The Data Services Platform (DSP) is powered off.
- On all power sequencers, only the Power Available LED is lit.

Follow these steps to partially power off the system:

1. **Connect to the configuration management software with a web browser by entering:**

   https://*ipaddress***:6789/**

   where *ipaddress* is the IP address of the Storage Service Processor or external host where the software is installed.

   The Java Web Console login page is displayed.

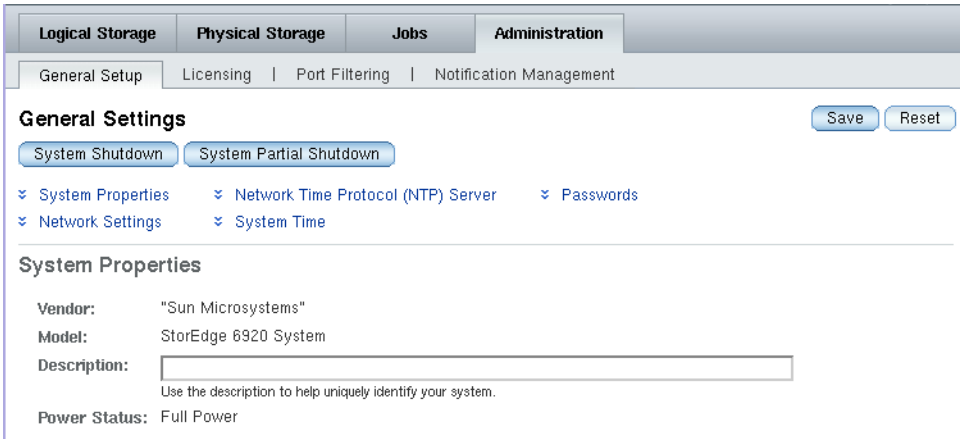
2. **Log in as a storage or admin user.**

   User name: `storage` **password:** `!storage`

   User name: `admin` **password:** `!admin`

3. **Click Sun StorEdge 6920 Configuration Service.**
4. **Click Administration > General Setup.**

   The General Settings page is displayed.



5. **Click the System Partial Shutdown button.**
6. **Click OK to confirm the partial shutdown.**

   The system is now partially shut down. Refer to "Performing a Partial System Shutdown" on page 139 for the state of each system component.

Performing a Full System Shutdown

When you perform a full system shutdown, you must go to the location of the system to manually restore power.

Before you power off the system, you must halt any I/O between host systems and the Sun StorEdge 6920 system.

Caution – Failure to stop I/O between host systems and the system can result in the loss of data.

When you power off the system from the browser interface, the system components in the base cabinet and expansion cabinets (if applicable) are in the following state:

- The Storage Service Processor is shut down.
- The Storage Service Processor accessory tray remains powered on.

- The array drives have spun down and LEDs are off.
- The array controller cards are powered off.
- The array trays have the green LED lit, indicating that the tray has power.
- The loop cards have the green LED lit, indicating that the loop cards have power.
- The power and cooling unit (PCU) fans are on.
- The PCUs, in the back of the arrays, have the blue LEDs lit, meaning that it is safe to remove them.
- All power sequencers have all three green LEDs lit, meaning that power is present.

To completely power off the system, do the following:

1. **Connect to the configuration management software with a web browser by entering:**

   https://*ipaddress***:6789/**

   where *ipaddress* is the IP address of the Storage Service Processor or external host where the software is installed.

2. **Log in as a storage or admin user.**

   User name: `storage` **password:** `!storage`

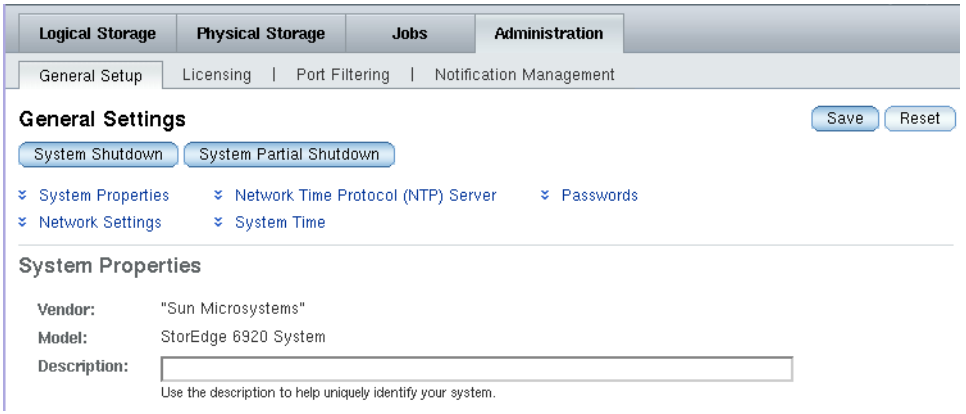
   User name: `admin` **password:** `!admin`

3. **Click Sun StorEdge 6920 Configuration Service.**

4. **Click Administration > General Setup.**

   The General Settings page is displayed.

5. **Click the System Shutdown button.**



6. **Click OK to confirm the full system shutdown.**

   The system displays the following message:

   ```
   The session was closed because system was shutdown.
   ```

7. **To remove the main power from the system, at the bottom front and bottom back of the base cabinet, press both AC power sequencer circuit breakers up to the Power Off position (**FIGURE B-12**).**

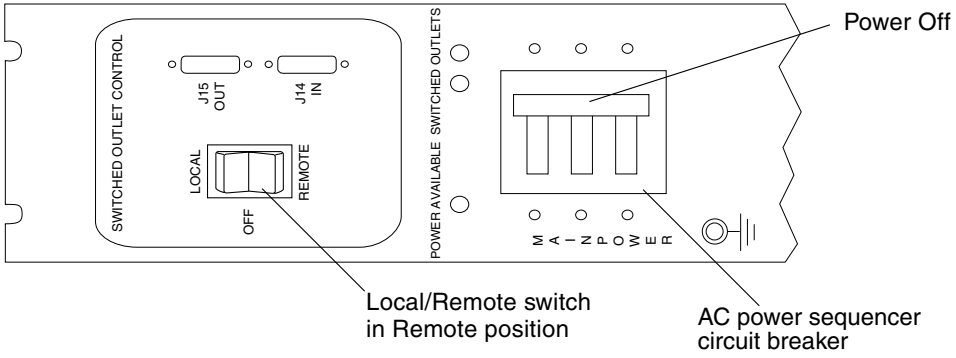


FIGURE B-12 AC Power Sequencer Control Panel: Power Off

8. **At the bottom front and bottom back of the expansion cabinets (if applicable), press the AC power sequencer circuit breakers down to the Power Off position.**

   The main power LEDs are shut off.

   The system is now completely shut down.

Restoring Power to the System

This section provides procedures for restoring the system after you power off the system. It includes the following sections:

Restoring Power to the System After a Partial System Shutdown

If the system has been powered off using the remote partial shutdown procedure, use the following procedure to restore power to the system.

1. **Connect to the configuration management software with a web browser by entering:**

   `https://`*ipaddress*`:6789/`**

   where *ipaddress* is the IP address of the Storage Service Processor or external host where the software is installed.

2. **Log in as a storage or admin user.**

   User name: `storage` **password:** `!storage`

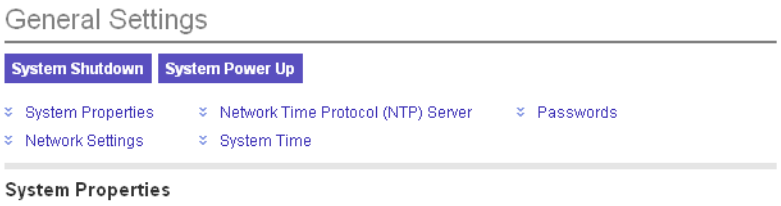
   User name: `admin` **password:** `!admin`

3. **Click Sun StorEdge 6920 Configuration Service.**

4. **Click Administration > General Setup.**

   The General Settings page is displayed.

5. **Click the System Power Up button.**



This selection activates the power sequencers in the base cabinet and any expansion cabines and causes the storage components to power on. The Switched Outlet LEDs are lit.

The system is now ready for operation.

Restoring Power to the System After a Full System Shutdown

If the system has been completely powered off using the full shutdown procedure, you must go to the system location to restore power.

1. **Open the front door and back door if they are not already open.**
2. **Verify that the key switches, located at the bottom front of the base cabinet and any expansion cabinets, are in the Standby position.**
3. **Remove the front trim panel from the base cabinet and set it aside if you have not already done so.**
4. **At the bottom front and bottom back of the base cabinet and any expansion cabinets, press the AC power sequencer circuit breakers up to the Power Off position.**
5. **Verify that the AC power cables of the base cabinet and any expansion cabinets are connected to the correct AC outlets.**
6. **At the bottom front and bottom back of the base cabinet and any expansion cabinets, verify that the Local/Off/Remote switch is in the Remote position.**
7. **If an expansion cabinet is connected to the base cabinet, press the AC power sequencer circuit breakers in the expansion cabinet down to the On position.**

   Wait until the expansion cabinet completes its power-on sequence and all array component LEDs are in the green steady state.
8. **At the bottom front and bottom back of the base cabinet, press the AC power sequencer circuit breakers to the On position.**

Note – The front-panel power sequencer bottom LED is lit only when the AC power sequencer circuit breakers for the front power supply are on.

Note – To check the status of the rear power sequencer, open the back door of the expansion cabinet and look for the three green LEDs.

---

9. **Wait approximately one minute after pressing the AC power sequencer circuit breakers on. At the back of the system, locate the power switch for the Storage Service Processor and press the switch off, and then on.**

   All components of the system power on in an optimal state.

10. **Verify that all the components have only green LEDs lit.**

    If LEDs other than green ones are lit, or if no LEDs are lit, see "Troubleshooting the Installation" on page 151 to troubleshoot any component that is not powered on.

11. **Replace the front trim panel and close the front and back doors.**

    The system is now powered on and operational.

APPENDIX C

System Ship Kit

This appendix contains information about the expansion cabinet and serial console interface. It includes the following sections:

See TABLE 2-1 in Chapter 2 for a content listing of the base cabinet ship kit.

Expansion Cabinet Ship Kit

One expansion cabinet ship kit is shipped with each expansion cabinet. Unpack the ship kit and verify the contents of the kit with the packing list. TABLE C-1 lists the contents of the expansion cabinet ship kit.

TABLE C-1 Expansion Cabinet Ship Kit

Quantity	FRU Description	Part Number
1	Hardware kit box containing: • 2 Allen wrenches for removing cabinet from shipping pallet • 2 keys (noncoated) for Standby/On key switch • 4 bolts (for stabilizer legs) • 12 hex bolts and washers	801859-*nnn*
2	Keys (purple-coated) for front cabinet door	N/A
2	Keys (purple-coated) for back cabinet door	N/A
4	Floor-mounting brackets	N/A
2	Stabilizer legs	N/A

TABLE C-1 Expansion Cabinet Ship Kit *(Continued)*

Quantity	FRU Description	Part Number
1	Grounding cable	530-1619-*nn*
3	Ethernet cables RJ-45/RJ-45, 10M	530-2991-*nn*
2	Fibre Channel cables, LC/LC, 15M	537-1043-*nn*
1	Adapter, RJ-45/DB25M	530-2889-*nn*
1	Adapter, RJ-45/DB9F	530-3100-*nn*
2	393.7-in. (10-meter) MPT/MPT base cabinet service panel to expansion cabinet service panel	537-1060-*nn*
1	10-meter Ethernet RJ-45/RJ-45 crossover cable	530-3138-*nn*

Two power cables (P/N 180-1954-*nn*) are located inside the expansion cabinet with one of the following connector types:

- NEMA L6-30P for 200V to 240V North American operation
- 32A single-phase IEC 309 connector for 220V to 240V international operation

Serial Console Port Interface

The Serial Console port requires an RJ-45 to DB-25 connector (part number 530-2889-*nn*), and a crossover RJ-45 to RJ-45 cable.

TABLE C-2 describes the pin assignments and signals that are relevant to an RJ-45 connector.

TABLE C-2 RJ-45 Connector Pin Assignments

Pin	Signal Description	Pin	Signal Description
1	Request To Send (RTS)	5	Ground
2	Data Terminal Ready (DTR)	6	Receive Data (RXD)
3	Transmit Data (TXD)	7	Data Carrier Detect (DCD)
4	Ground	8	Clear To Send (CTS)

TABLE C-3 describes the serial port connector and signals that are relevant to a DB-25 connector.

TABLE C-3 DB-25 Connector Pin Assignments

Pin Number	Function	I/O	Signal Description
1	None	None	No connection
2	TXD_A	O	Transmit Data
3	RXD_A	I	Receive Data
4	RTS_A	O	Ready To Send
5	CTS_A	I	Clear To Send
6	DSR_A	I	Data Set Ready
7	GND		Signal Ground
8	DCD_A	I	Data Carrier Detect
9, 10	None	None	No connection
11	DTR_B	O	Data Terminal Ready
12	DCD_B	I	Data Carrier Detect
13	CTS_B	I	Clear To Send
14	TXD_B	O	Transmit Data
15	TRXC_A	I	Transmit Clock
16	RXD_B	I	Receive Data
17	RXC_A	I	Receive Clock
18	RXC_B	I	Receive Clock
19	RTS_B	O	Ready To Send
20	DTR_A	O	Data Terminal Ready
21, 22, 23	None	None	No connection
24	TXC_A	O	Transmit Clock
25	TXC_B	O	Transmit Clock

If you want to connect the wiring yourself, translate the signals between the RJ-45 and DB-25 connectors according to the signals in TABLE C-4.

TABLE C-4 RJ-45 and DB-25 Signals

RJ-45	DB-25
1 - RTS	5 - CTS
2 - DTR	6 - DSR
3- TXD	3 - RXD
4 - GND	7 - GND
5 - RXD	7 - GND
6 - RXD	2 - TXD
7 - DCD	8 - DCD
8 - CTS	4 - RTS

APPENDIX **D**

Troubleshooting the Installation

This appendix contains possible problems that you could encounter during the installation of the system and recommended actions you can take to correct a problem.

Note – After you are logged in to the system, you can get more information about FRU fault detection and isolation, from the Storage Automated Diagnostic Environment.

TABLE D-1 lists problems that could occur during the installation and setup of the system, and it lists recommended corrective actions.

TABLE D-1 Installation Problems and Recommended Actions

Problem	Recommended Action
Component LED is not lit.	Verify that all power and data cables are properly installed and are in the right locations.
	Verify that all FC connections, cable adapters, and Gigabit Interface Converters (GBICs) are installed and secure.
	Verify that the power to the system is turned on.
Both switched outlet LEDs on AC power sequencer control panel are not lit.	Check the position of the key switch.
One switched outlet LED on AC power sequencer control panel is lit, but the other is not.	Check the status of the power sequencer for the LED that is not lit.

TABLE D-1 Installation Problems and Recommended Actions *(Continued)*

Problem	Recommended Action
Some FRUs have power and others do not.	Check the power-on switch on the FRUs that do not have power.
Disk drive or storage tray LED is amber.	Check the power switch at the back of the array. If the power switch is off, turn it on.
Test email fails during set up of Storage Automated Diagnostic Environment.	Verify that the SMTP server is configured properly.

APPENDIX **E**

Information Collection Worksheet

Before beginning the installation, prepare the site and gather the information that you will need to perform the installation.

Caution – The Sun StorEdge 6920 system uses the private network addresses `10.0.0.n` and `192.168.0.n`. Therefore, do not use these addresses when connecting directly to the Sun StorEdge 6920 system. If your network uses these addresses, ensure that they are behind a firewall as dictated by the network RFCs.

Use this worksheet to collect the information you will need during the system installation.

Sun StorEdge 6920 System Configuration Worksheet		
	Sun StorEdge 6920 system ID: (0–7)	_____
	Sun StorEdge 6920 system IP address:	_____
	Gateway IP address:	_____
	Sun StorEdge 6920 system network mask:	_____
	IP Address of the domain name service (DNS):	_____
	Name server domain name:	_____
	Email notification address:	_____
	Telephone number (analog phone line for remote monitoring):	_____
	Site address:	_____
	Host IP address (another host on your network):	_____
	Host bus adapter (HBA) WWNs:	_____

Glossary

Definitions obtained from the Storage Networking Industry Association (SNIA) Dictionary are indicated with "(SNIA)" at the end. For the complete SNIA Dictionary, go to www.snia.org/education/dictionary.

agent The component of the system monitoring and diagnostic software that collects health and asset information about the system.

alarm A type of event that requires service action. See also event.

array Multiple disk drives that function as a single storage device. A high-availability (HA) array configuration has multiple controller and expansion trays of disk drives. See also dedicated hot-spare and hot-spare.

array hot-spare A spare disk within an array that is used for failover when any of the active disks fail. See also dedicated hot-spare and hot-spare.

array type An internal storage array configuration that is defined by the number of controller units and the total number of storage trays. For example, a 2x4 storage array configuration consists of a total of four storage trays, two of which are controller trays.

asynchronous queue In the context of data replication, a queue used to store writes that are to be replicated to the remote site. After the writes have been put into the queue, the writes are acknowledged to the application and then forwarded to the remote site as network capabilities permit. The asynchronous queue is a persistent queue, so in the event of a disaster at the primary site, the data in the asynchronous queue is not lost.

asynchronous replication A form of data replication in which application write operations are written to the primary site and to the asynchronous queue on the primary site. The asynchronous queue forwards queued writes to the secondary site as network capabilities permit. The write operations to the primary site are confirmed, regardless of when, or whether, they are replicated successfully to the

secondary site. Deferring the secondary copy removes long-distance propagation delays from the I/O response time. See also synchronous replication.

autosynchronization An option enabled at the primary site that attempts to synchronize replication sets or consistency groups whenever a link is established. With autosynchronization, synchronization continues even if there are link errors, for example.

base cabinet The system's main cabinet, which contains a Data Services Platform (DSP), storage trays, a Storage Service Processor with a USB flash disk, a Storage Service Processor accessory tray, a service panel, and power distribution units (PDUs). The base cabinet is pre-wired with Ethernet, Fibre Channel, and power cables and can be connected to one or two expansion cabinets. See also expansion cabinet.

break To remove a mirror component from the mirror, voiding its relationship with the other mirror components. The broken mirror component becomes a standalone volume in the system, and synchronization with the other mirror components is not maintained. See also mirror component and split.

captive storage See internal storage.

combo card See storage I/O (SIO) card.

component See mirror component.

concatenation A storage allocation method in which sequential blocks on a disk are linked together to form a larger logical device. This method combines the storage potential of several physical devices. See also striping.

consistency group A collection of replication sets grouped together to ensure write order consistency across all the replication sets' primary volumes. An operation on a consistency group applies to all the replication sets within the consistency group, and consequently their volumes.

controller pair A pair of controller units that services a group of storage trays.

controller tray A storage tray with an installed RAID controller and up to 14 disk drives. In a Sun StorEdge 6920 system, a pair of controller trays is the smallest possible storage array configuration, the 2x2 array type. See also expansion tray.

controller unit The card that manages RAID functions and failover characteristics for an array.

control path The route used for communication of system management information, usually an out-of-band connection. See also out-of-band management.

copy on write A technique for maintaining a point in time copy of a collection of data by copying only data which is modified after the instant of replicate initiation. The original source data is used to satisfy read requests for both the source data itself and for the unmodified portion of the point in time copy. (SNIA) See also snapshot reserve space.

customer LAN See site LAN.

DAS See direct attached storage (DAS).

data host Any host that uses the system for storage. A data host can be connected directly to the system (direct attached storage, or DAS) or can be connected to an external switch that supports multiple data hosts (storage area network, or SAN).

data path The route taken by a data packet between a data host and the storage array. See also in-band management.

data replication A disaster recovery and business continuance method in which a primary volume at the local site and a secondary volume at a remote site contain the same data on an ongoing basis, thereby protecting user data.

Data Services Platform (DSP) The controller component of the Sun StorEdge 6920 system, which consolidates and virtualizes storage so that all storage in the system can be managed as a single scalable entity.

data striping See striping.

dedicated hot-spare A disk that serves as the hot-spare for one and only one virtual disk in a storage tray.

degraded The condition of a volume in which one or more input or output data paths are not operating properly. Although the redundant failover paths are still intact, a degraded volume holds no significant value for the storage configuration and should therefore probably be deleted from the system.

dependent copy See snapshot.

direct attached storage (DAS) A storage architecture in which the systems that store data are connected physically to storage elements.

disk A physical, non-volatile, rewritable data storage device. See also virtual disk.

domain See storage domain.

DSP See Data Services Platform (DSP).

electro-magnetic interference Radiated electro-magnetic signals that can interfere with the normal transmission of information.

EMI See electro-magnetic interference.

event Any condition reported by a device to the system monitoring agent. See also alarm.

expansion cabinet A cabinet, pre-wired with Ethernet, Fibre Channel, and power cables, connected to the base cabinet to increase storage capacity. A power management cable connects the service panels of the cabinets, and the Fibre Channel/Ethernet cable connects the I/O panels of the cabinets. See also base cabinet.

expansion tray A storage tray that has up to 14 disk drives, but does not have a RAID controller. This type of storage tray is used to expand the capacity of an array and must be attached to a controller tray to function. See also controller tray.

extend In the context of managing volumes, to increase a volume's capacity.

extent A set of contiguous blocks with consecutive logical addresses on a physical or virtual disk.

external storage A physical disk or storage array connected to the Sun StorEdge 6920 system located outside of the base or expansion cabinets.

fabric A Fibre Channel switch or two or more Fibre Channel switches interconnected in such a way that data can be physically transmitted between any two N_Ports on any of the switches. (SNIA)

failover and recovery The process of changing the data path automatically to an alternate path.

Fast Start operation An option of the suspend operation and the procedure in which a method such as a backup tape is used to copy data from the primary volume to the secondary volume. This procedure is used to avoid the initial step in which you send the primary volume's data over the physical link. For example, network bandwidth might justify a Fast Start procedure. See also resume operation and suspend operation.

fault signature analysis An algorithm applied by the diagnostic and monitoring software to a specific set of events that can be correlated by time and locality to a specific cause. Fault signature analysis assumes that the most significant event is the most probable cause and aggregates the remaining events underneath that event to improve the signal/noise ratio when a single probable cause might result in a multitude of events.

FC See Fibre Channel (FC).

FC port See Fibre Channel (FC) port.

FC switch See Fibre Channel (FC) switch.

Fibre Channel (FC) A set of standards for a serial I/O bus capable of transferring data between two ports at up to 100 MBytes/second, with standards proposals to go to higher speeds. Fibre Channel supports point to point, arbitrated loop, and switched topologies. Fibre Channel was completely developed through industry cooperation, unlike SCSI, which was developed by a vendor and submitted for standardization after the fact. (SNIA)

Fibre Channel (FC) port A port on the I/O panel that connects data hosts, external storage, or internal storage to the Sun StorEdge 6920 system. See also host port and storage port.

Fibre Channel (FC) switch A networking device that can send packets directly to a port associated with a given network address in a Fibre Channel storage area network (SAN). Fibre Channel switches can be used to expand the number of data host or external storage device connections. Each switch is managed by its own management software.

field-replaceable unit (FRU) An assembly component that is designed to be replaced on site, without the system having to be returned to the manufacturer for repair.

flash card or disk See USB flash disk.

force break To remove a mirror component (mirrored volume) from the mirror before the resilvering process is complete, causing the condition of its data to be degraded. Just as with a break operation, the mirror component for which you implement a force break becomes a standalone volume in the system; however, it is inaccessible and should probably be deleted. See also break, degraded, mirror component, and resilvering.

free The state of a volume that is not mapped to initiators.

FRU See field-replaceable unit (FRU).

FSA See fault signature analysis.

full synchronization A resume operation in which a complete volume-to-volume copy occurs. Unlike a normal resume operation, in which a copy of differences between the primary and secondary volumes occurs, a full synchronize operation copies the entire contents of the volume. The system performs a full synchronize operation the first time you resume data replication on a replication set. See resume operation and synchronization.

HBA See host bus adapter (HBA).

host bus adapter (HBA) An I/O adapter than connects a host I/O bus to a computer's memory system. (SNIA) See also initiator.

host port A port on the I/O panel that connects to a data host. See also storage port.

hot-spare The drive used by a controller to replace a failed disk. See also array hot-spare and dedicated hot-spare.

in-band management Transmission of a protocol other than the primary data protocol over the same medium as the primary data protocol. Management protocols are a common example of in-band transmission. (SNIA)

The Sun StorEdge 6920 system uses an in-band management path between hosts and the storage arrays to transport both data and management traffic. See also out-of-band management.

independent copy See mirror component and mirroring.

initiator A system component that initiates an I/O operation over a Fibre Channel (FC) network. If allowed by FC fabric zoning rules, each host connection within the FC network has the ability to initiate transactions with the storage array. Each host in the FC network represents a separate initiator, so if a host is connected to the system through two host bus adapters (HBAs), the system identifies two different initiators (similar to multi-homed, Ethernet-based hosts). In contrast, when multipathing is used in round-robin mode, multiple HBAs are grouped together, and the multipathing software identifies the group of HBAs as a single initiator.

internal storage An array physically housed in the Sun StorEdge 6920 system base cabinet, or expansion cabinet, and managed by the system management software. See also external storage.

I/O panel The portion of the service panel that provides Fibre Channel (FC) port connections for data hosts, internal and external storage, gigabit Ethernet ports for remote replication, power connections for up to two expansion cabinets, and Ethernet and FC connections for expansion cabinets. See also service panel and Service Processor panel.

IOPS A measure of transaction speed, representing the number of input and output transactions per second.

LAN See local area network (LAN).

legacy volume An entire LUN on an external storage array that you can use in specific ways as if it were any other local volume, while preserving the user data on that external storage array. You can apply the system's data services to a legacy volume, however, you cannot extend a legacy volume.

local area network (LAN) A communications infrastructure designed to use dedicated wiring over a limited distance (typically a diameter of less than five kilometers) to connect a large number of intercommunicating nodes.

logical unit number (LUN) The SCSI identifier of a logical unit with a target. (SNIA)

In the Sun StorEdge 6920 system, a LUN is the number that is associated with mapping of a volume to an initiator.

LUN See logical unit number (LUN).

LUN mapping The process by which volume permissions (read only, read/write, or none) are assigned to an initiator.

LUN masking The process by which a mapped initiator is filtered.

MAC address See media access control (MAC) address.

management host A host with an in-band and/or out-of-band network connection to the system that is used to manage the system. A management host can have monitoring software installed, such as a remote CLI package, Sun StorEdge Enterprise Storage Manager, Sun Storage Automated Diagnostic Environment (Enterprise Edition), or a third-party monitoring program. A management host can also be used to run management software on another machine through a network connection.

management interface card (MIC) The card on which the management software resides. Each Data Services Platform has two MICs, which operate in a master/alternate master mode.

management path See out-of-band management.

master agent In Sun Storage Automated Diagnostic Environment, Enterprise Edition, the primary health and monitoring agent designated by the user to act as the aggregation point for one or more slave agents. The responsibilities of the master agent include analyzing the events forwarded from the slave agents, generating alarm notification to local and remote recipients, and provisioning the user interface to the slave agents. See also master / alternate master and slave agent.

master / alternate master In Sun Storage Automated Diagnostic Environment, Enterprise Edition, a slave agent designated by the user to act as the temporary master agent if the master agent fails to send a heartbeat signal to the alternate master during a defined time period. The alternate master does not assume all the responsibilities of the master agent; it simply acts as the aggregation point for the remaining slave agents, collecting their events, until the master agent returns to active service. See also master agent and slave agent.

media access control (MAC) address The physical address identifying an Ethernet controller board. The MAC address, also called an Ethernet address, is set at the factory and must be mapped to the IP address of the device.

MIC See management interface card (MIC).

mirror A special type of volume in the Sun StorEdge 6920 system, consisting of up to four separate yet equal mirror components you can access independently (through the mirror) and use to track changes to and update your data set and manage your data migration strategy.

mirror component One of up to four individual copies of the same data set that constitute a mirror in the Sun StorEdge 6920 system. When you perform an action on a mirror component, the resilvering process synchronizes the mirror so that each component is an equal yet separate copy of the same data set. You can perform a variety of operations on a mirror component. See also break, force break, rejoin, reverse rejoin, resilvering, and split.

mirrored volume See mirror and mirror component.

mirroring A form of storage – also called RAID Level 1, independent copy, and real-time copy – whereby two or more independent, identical copies of data are maintained on separate media. Typical mirroring technologies enable the cloning of data sets to provide redundancy for a storage system. The Sun StorEdge 6920 system enables you to create and manipulate up to four equal mirror components for each mirror and to access each component individually in order to track changes to and preserve the integrity of your data. See also mirror and mirror component.

mirror log Area of the storage pool used to track the state of mirror components (such as resilvering progress) relative to the mirror as a whole.

multipathing A design for redundancy that provides at least two physical paths to a target.

Network Storage Command Center (NSCC) A repository and application comprised of a database and a browser-based user interface, designed and maintained by Sun, to collect and analyze health and performance data from supported storage devices.

non-captive storage See external storage.

NSCC See Network Storage Command Center (NSCC).

notification The process performed by the master agent when one or more events require fault reporting to a configured notification recipient such as a local email address, an SNMP port, or a remote service such as the Sun StorEdge Remote Response service. The master agent constructs the event and assembles the information necessary to transmit the event by way of the user-configured transport mechanism. The monitoring and diagnostic software supports notification of one or more notification recipients to satisfy the desired level of notification. Note: The Sun StorEdge 6920 array contains a single agent, which effectively acts as the master agent for the array.

original volume The starting point for a mirrored volume or data migration. In the context of mirroring, see also primary component.

out-of-band management Transmission of management information for Fibre Channel components outside of the Fibre Channel network, typically over an Ethernet network. (SNIA) The Sun StorEdge 6920 system is managed over an out-of-band network by way of an Ethernet connection between the service panel and the local area network (LAN). See also in-band management.

parallel monitoring A monitoring control that allows the agent to examine more than a single device in parallel during an agent polling cycle. The positive effect of increasing the value for this control beyond the default (1) is to speed up the monitoring of devices when a large population exists The negative effect of increasing the value of this control is that the agents will consume more memory and CPU cycles.

parent volume The volume for which a snapshot is taken. See also snapshot.

patch A software or firmware update for a storage device or device component.

PDU See power distribution unit (PDU).

point in time copy A fully usable copy of a defined collection of data that contains an image of the data as it appeared at a single point in time. The copy is considered to have logically occurred at that point in time, but implementations may perform part or all of the copy at other times (e.g., via database log replay or rollback) as long as the result is a consistent copy of the data as it appeared at that point in time. Implementations may restrict point in time copies to be read-only or may permit subsequent writes to the copy. (SNIA)

In the context of data replication, the storage system that houses the primary replication set, which is the remote counterpart of the secondary site. Also known as the local site copy. See also snapshot.

policy A rule or guideline that can result in an automatic response to a system event.

pool See storage pool.

power distribution unit (PDU) The assembly that provides power management for the system. The Sun StorEdge 6920 system provides two PDUs that enable the management software to control the distribution of power to system components for Lights-Out Management (LOM) and field-replaceable unit (FRU) service actions.

primary peer One of a pair of physically separate systems on which the primary replication set resides. The primary peer copies user data to its counterpart, which is the remote, secondary peer.

primary component The first component created to establish a mirrored volume. See also mirror, mirror component, and mirrored volume.

primary volume The volume that contains the original user data that the primary peer replicates to the secondary peer.

profile See storage profile.

provisioning The process of allocation and assignment of storage to hosts.

RAID An acronym for Redundant Array of Independent Disks, a family of techniques for managing multiple disks to deliver desirable cost, data availability, and performance characteristics to host environments. (SNIA)

real-time copy See mirroring.

reconstruction The process of rebuilding of lost data on a replacement disk after a disk failure.

rejoin To move a split mirror component back into the mirror such that, when the resilvering process is complete, the mirror component has been made identical to all other mirror components in the mirror. See also mirror component, reverse rejoin, and split.

remote scripting CLI client A command-line interface (CLI) that enables you to manage the system from a remote management host. The client communicates with the management software through a secure out-of-band interface, HTTPS, and provides the same control and monitoring capability as the browser interface. The client must be installed on a host that has network access to the system.

replication See data replication.

replication bitmap The bitmap that tracks changes to the primary volume. Writes issued to the primary peer are noted in the replication bitmap. The replication set at the secondary peer also includes a replication bitmap that tracks changes if a role reversal assigns the secondary volume the role of primary.

replication link A logical connection associated with a Gigabit Ethernet port that transports data and replication control commands between primary and secondary sites. The Gigabit Ethernet ports at both sites must be enabled for data replication and be configured with the remote site's IP information.

replication peer One of a pair of complimentary components that are on physically separate systems. For example, user data is copied to a remote system, which is the counterpart, or remote peer, of the system on which that user data resides.

replication set A local volume paired with reference to a single remote volume on a remote peer. A replication set works in conjunction with an identically configured replication set on the remote peer to provide an instance of replication. The local volume within a replication set is associated with a replication bitmap and, depending on the set's attributes, with an asynchronous queue.

resilvering The synchronization of mirror components such that, when the process is complete, the mirror comprises equal, independent copies of the same data set. Resilvering occurs when you have performed a rejoin or reverse rejoin operation on a mirror component.

resnap To create a snapshot again and replace the old with the new.

resume operation In the context of data replication, a synchronization operation to establish an identical copy of the primary volume's user data on the secondary volume. The data is synchronized when replication occurs. Synchronization can be initiated by either the user or the system. See also autosynchronization, suspend operation, and synchronization.

reverse rejoin To move a split mirror component back into the mirror such that, when the resilvering process is complete, all mirror components in the mirror have been made identical to the previously split mirror component. See also break, mirror component, rejoin, resilvering, and split.

reverse synchronization See role reversal.

revision analysis In Sun Storage Automated Diagnostic Environment, Enterprise Edition, the process of collecting the current revision information for the software and firmware elements of the system and comparing them against a set of acceptable levels. See also revision maintenance.

revision backout The removal of a patch update on a storage device or device component. See also revision upgrade.

revision maintenance A system process that combines performing revision analysis on the elements of the system and locating, acquiring, and installing the necessary deliverables to bring elements up to an acceptable revision level. See also revision analysis.

revision upgrade The installation of a patch update on a storage device or device component. See also revision backout.

role reversal In the context of data replication, a procedure in which the secondary host is assigned the role of primary host within an established replication set, and the primary volume is updated with the contents of the secondary volume. Role reversal is a failover technique used when the primary site fails and for disaster rehearsal.

rollback The process by which a volume's data is reset to become identical to a snapshot taken of that volume.

SAN See storage area network (SAN).

secondary peer One of a pair of physically separate systems on which the secondary replication set resides. The secondary peer is the recipient of user data from its counterpart, which is the primary peer.

secondary volume The remote counterpart of the primary volume. The secondary volume is the replicated copy of the primary volume. You can map or create a volume snapshot of a secondary volume. You cannot read from or write to a secondary volume unless it is in scoreboard mode or you change its role to primary.

Service Advisor A diagnostic tool component that provides tools and procedures for performing service on storage device.

service panel A group of input and output connections located at the back of the base cabinet that provides the cabling interface to both control path functions and data path functions. The service panel consists of the Service Processor panel and the I/O panel. See also I/O panel and Service Processor panel.

Service Processor panel The portion of the service panel that provides a modem connection, LAN connections, serial ports, and an AUX port for connection of the Data Services Platform (DSP) management interface card (MIC).

SFC See switch fabric card (SFC).

Simple Mail Transfer Protocol (SMTP) A protocol for sending e-mail messages between servers. Most e-mail systems that send mail over the Internet use SMTP to send messages from one server to another; the messages can then be retrieved with an email client using either Post Office Protocol (POP) or Internet Message Access Protocol (IMAP). In addition, SMTP is generally used to send messages from a mail client to a mail server. This is why you need to specify both the POP or IMAP server and the SMTP server when you configure your email application. (Webopedia)

Simple Network Management Protocol (SNMP) An IETF protocol for monitoring and managing systems and devices in a network. The data being monitored and managed is defined by a Management Information Base (MIB). The functions supported by the protocol are the request and retrieval of data, the setting or writing of data, and traps that signal the occurrence of events. (SNIA)

SIO card See storage I/O (SIO) card.

site LAN The local area network at your site. The system connects to your LAN through the USER LAN port on the service panel. When the system is connected to your LAN, the system can be managed through a browser from any host on the LAN.

slave agent In Sun Storage Automated Diagnostic Environment, Enterprise Edition, a health and monitoring agent that collects health and performance data from the devices it has been designated to monitor and forwards events to the master or alternate master agent for evaluation and notification processing. Slave agents cannot function completely without a master or alternate master agent. See also master agent and master / alternate master.

SMTP See Simple Mail Transfer Protocol (SMTP).

snapshot An instantaneous copy of volume data at a specific point in time. Snapshots are stored in snapshot reserve space on the (parent) volume for which they are taken.

snapshot reserve space Storage space, taken from a pool, where the system stores copies of the parent volume's original data before it is overwritten. See also storage pool.

split To separate a mirror component from the mirror, with the intent to rejoin it later. A split component is counted toward the limit of four mirror components per mirror and continues to be tracked by the system as part of the mirror. See also component, rejoin, reverse rejoin, and snapshot.

SRC See storage resource card (SRC).

SSRR See Sun StorEdge Remote Response service.

storage area network (SAN) An architecture in which the storage elements are connected to each other and to a server that is the access point for all systems that use the SAN to store data.

storage domain A secure container that holds a subset of the system's total storage resources. Multiple storage domains can be created to securely partition the system's total set of storage resources. This enables you to organize multiple departments or applications into a single storage management infrastructure.

storage I/O (SIO) card A card that provides the Fibre Channel (FC) ports for the Data Services Platform (DSP). This card is always paired with a storage resource card (SRC). The Sun StorEdge 6920 system supports two types of SIO cards. The SIO-8 card has eight FC ports and the SIO COMBO card has six FC ports and one Gigabit Ethernet port. See also storage resource card (SRC) set.

storage pool A container that groups physical disk capacity (abstracted as virtual disks in the browser interface) into a logical pool of available storage capacity. A storage pool's characteristics are defined by a storage profile. You can create multiple storage pools to segregate storage capacity for use in various types of applications (for example, high throughput and online transaction-processing applications).

storage port A port on the I/O panel that connects to internal storage. See also host port.

storage profile A defined set of storage performance characteristics such as RAID level, segment size, dedicated hot-spare, and virtualization strategy. You can choose a predefined profile suitable for the application that is using the storage, or you can create a custom profile.

storage resource card (SRC) A card that provides the storage processors for the Data Services Platform (DSP). An SRC is always paired with a storage I/O (SIO) card. See also storage I/O (SIO) card.

storage resource card (SRC) set Two cards in the Data Services Platform (DSP) that together provide the Fibre Channel (FC) and Gigabit Ethernet interfaces: the storage resource card (SRC) and the storage I/O (SIO) card. Two to four SRC sets can be installed in the DSP to provide the ports for connecting data hosts to the system. See also storage I/O (SIO) card.

Storage Service Processor (SSP) A management device integrated into the system that provides unified management access to system components, as well as local and remote management and maintenance. The Storage Service Processor also supports automatic upgrades of patches, firmware, and software.

Storage Service Processor (SSP) accessory tray The portion of the Storage Service Processor that contains a modem, router with a firewall, Ethernet hub, and network terminal concentrator (NTC).

storage tray An enclosure containing disks. A storage tray with a RAID controller is called a controller tray; a storage tray without a controller is called an expansion tray. See also controller tray and expansion tray.

store-and-forward See asynchronous replication

stripe size The number of blocks in a stripe. A striped array's stripe size is the stripe depth multiplied by the number of member extents. A parity RAID array's stripe size is the stripe depth multiplied by one less than the number of member extents. (SNIA) See also striping.

striping Short for data striping; also known as RAID Level 0 or RAID 0. A mapping technique in which fixed-size consecutive ranges of virtual disk data addresses are mapped to successive array members in a cyclic pattern. (SNIA) See also concatenation.

SunMC See Sun Management Center (SunMC).

Sun Management Center (SunMC) An element management system for monitoring and managing the Sun environment. Sun Management Center also integrates with the leading enterprise management software, including the Storage Automated Diagnostic Environment, to provide customers with a unified management infrastructure. The base package of Sun Management Center is free and provides hardware monitoring. Advanced applications (add-ons) extend the monitoring capability of the base package.

Sun StorEdge Remote Response service A remote support solution for Sun StorEdge series storage systems that proactively identifies operational anomalies to help prevent them from becoming business problems. Through around-the-clock monitoring, connectivity with Sun, and remote support, the Sun StorEdge Remote Response service helps maximize a storage system's availability.

suspend operation In the context of data replication, an operation in which replication set or consistency group activity is temporarily stopped, and an internal bitmap tracks write operations to the volume rather than sending the write operations over the physical link to the secondary volume. This method tracks write operations that have not been remotely copied while access to the secondary peer is interrupted or impaired. The software uses this replication bitmap to reestablish data replication through an optimized update synchronization rather than through a complete volume-to-volume copy. See also Fast Start operation and resume operation.

switch fabric card (SFC) A board that provides the central switching function for the Data Services Platform (DSP).

synchronization The act of aligning or making entries be equivalent at a specified point in time. (SNIA).

In the context of mirroring, see resilvering.

synchronous replication A replication technique in which data must be committed to storage at both the primary site and the secondary site before a write to the primary volume is acknowledged. See also asynchronous replication.

target The system component that receives a SCSI I/O command. (SNIA)

A target in the Sun StorEdge 6920 system can be an initiator or logical unit number (LUN).

thin-scripting client See remote scripting CLI client.

topology A graphical depiction of a storage network or storage system.

tray See storage tray.

USB flash disk A disk connected to the Storage Service Processor that stores system characteristics for the Storage Service Processor and Data Services Platform (DSP). The disk connects to the USB port on the Storage Service Processor.

virtual disk A set of disk blocks presented to an operating environment as a range of consecutively numbered logical blocks with disk-like storage and I/O semantics. The virtual disk is the disk array object that most closely resembles a physical disk from the operating environment's viewpoint. (SNIA)

In the Sun StorEdge 6920 system, the system itself is the operating environment.

virtualization The act of integrating one or more (back end) services or functions with additional (front end) functionality for the purpose of providing useful abstractions. Typically virtualization hides some of the back end complexity, or adds or integrates new functionality with existing back end services. Examples of virtualization are the aggregation of multiple instances of a service into one virtualized service, or to add security to an otherwise insecure service. Virtualization can be nested or applied to multiple layers of a system. (SNIA)

The Sun StorEdge 6920 system uses virtualization attributes to create and manage storage pools. See also concatenation and striping.

virtualization strategy Selection of the technique used when virtualizing data across multiple virtual disks. See also concatenation and striping.

volume A logically contiguous range of storage blocks allocated from a single pool and presented by a disk array as a logical unit number (LUN). A volume can span the physical devices that constitute the array, or it can be wholly contained within a single physical disk, depending on its virtualization strategy, size, and the internal array configuration. The array controller makes these details transparent to applications running on the attached server system.

World Wide Name (WWN) A unique identifier for a port, initiator, virtual disk, or volume, assigned by the system. The WWN of an object does not change throughout its lifetime and is never reused to name another object.

write order consistency Preservation of write ordering across all volumes in a consistency group or in replication sets.

write ordering The process by which write operations that are directed to the secondary volume occur in the same order as write operations to the primary volume.

WWN See World Wide Name (WWN).

zone A collection of Fibre Channel N_Ports and/or NL_Ports (that is, device ports) that are permitted to communicate with each other via the fabric. (SNIA)

zoning A method of subdividing a storage area network (SAN) into disjoint zones, or subsets of nodes on the network. SAN nodes outside a zone are invisible to nodes within the zone. With switched SANs, traffic within each zone can be physically isolated from traffic outside the zone. (SNIA) See also zone.

Index

E

F

N

O

P

R

S

T

U

V

W

Z