Sun StorEdge™ 6320 System 1.0 Reference and Service Manual

Sun Microsystems, Inc.
4150 Network Circle
Santa Clara, CA 95054 U.S.A.
650-960-1300

Part No. 816-7879-10
May 2003, Revision A

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

Contents

Figures

Tables

Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book:

Caution – There is risk of personal injury and equipment damage. Follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Depending on the type of power switch your device has, one of the following symbols may be used:

On – Applies AC power to the system.

Off - Removes AC power from the system.

Standby – The On/Standby switch is in the standby position.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

Placement of a Sun Product

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Caution – The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection

Caution – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

The following caution applies only to devices with a Standby power switch:

Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Lithium Battery

Caution – On Sun CPU boards, there is a lithium battery molded into the real-time clock, SGS No. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, or MK48T08. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

Battery Pack

Caution – There is a sealed lead acid battery in Sun StorEdge FC-AL Switch units. Portable Energy Products No. TLC02V50. There is danger of explosion if the battery pack is mishandled or incorrectly replaced. Replace only with the same type of Sun Microsystems battery pack. Do not disassemble it or attempt to recharge it outside the system. Do not dispose of the battery in fire. Dispose of the battery properly in accordance with local regulations.

System Unit Cover

You must remove the cover of your Sun computer system unit to add cards, memory, or internal storage devices. Be sure to replace the top cover before powering on your computer system.

Caution – Do not operate Sun products without the top cover in place. Failure to take this precaution may result in personal injury and system damage.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD-ROM

Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:

Ein – Setzt das System unter Wechselstrom.

Aus – Unterbricht die Wechselstromzufuhr zum Gerät.

Wartezustand (Stand-by-Position) - Der Ein-/Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten

Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.

Achtung – Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70Db(A) oder weniger.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels

Achtung – Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.

Achtung – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.

Achtung – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:

Achtung – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie

Achtung – CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, oder MK48T08). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Batterien

Achtung – Die Geräte Sun StorEdge FC-AL Switch enthalten auslaufsichere Bleiakkumulatoren. Produkt-Nr. TLC02V50 für portable Stromversorgung. Werden bei der Behandlung oder beim Austausch der Batterie Fehler gemacht, besteht Explosionsgefahr. Batterie nur gegen Batterien gleichen Typs von Sun Microsystems austauschen. Nicht demontieren und nicht versuchen, die Batterie außerhalb des Geräts zu laden. Batterie nicht ins Feuer werfen. Ordnungsgemäß entsprechend den vor Ort geltenden Vorschriften entsorgen.

Gehäuseabdeckung

Sie müssen die obere Abdeckung Ihres Sun-Systems entfernen, um interne Komponenten wie Karten, Speicherchips oder Massenspeicher hinzuzufügen. Bringen Sie die obere Gehäuseabdeckung wieder an, bevor Sie Ihr System einschalten.

Achtung – Bei Betrieb des Systems ohne obere Abdeckung besteht die Gefahr von Stromschlag und Systemschäden.

Einhaltung der Richtlinien für Laser

Sun-Produkte, die mit Laser-Technologie arbeiten, entsprechen den Anforderungen der Laser Klasse 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD-ROM

Warnung – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchfhrung von Prozeduren, die von den hier beschriebenen abweichen, knnen gefhrliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés :

Attention: – risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

Attention: – surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.

Attention: – présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:

MARCHE – Votre système est sous tension (courant alternatif).

ARRET - Votre système est hors tension (courant alternatif).

VEILLEUSE – L'interrupteur Marche/Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun

Attention: – pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

Attention: – Le niveau de pression acoustique au poste de travail s'élève selon la norme DIN 45 635 section 1000, à 70 dB (A) ou moins.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Connexion du cordon d'alimentation.

Attention: – les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d'un conducteur neutre mis à la terre. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.

Attention: – tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.

Attention: – votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:

Attention: – le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium

Attention: – sur les cartes CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, ou MK48T08.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Bloc-batterie

Attention: – Les unités Sun StorEdge FC-AL Switch contiennent une batterie étanche au plomb (produits énergétiques portatifs n°TLC02V50). Il existe un risque d'explosion si ce bloc-batterie est manipulé de façon erronée ou mal mis en place. Ne remplacez ce bloc que par un bloc-batterie Sun Microsystems du même type. Ne le démontez pas et n'essayez pas de le recharger hors du système. Ne faites pas brûler la batterie mais mettez-la au rebut conformément aux réglementations locales en vigueur.

Couvercle

Pour ajouter des cartes, de la mémoire, ou des unités de stockage internes, vous devrez démonter le couvercle de l'unité système Sun. Ne pas oublier de remettre ce couvercle en place avant de mettre le système sous tension.

Attention: – il est dangereux de faire fonctionner un produit Sun sans le couvercle en place. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Conformité aux certifications Laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD-ROM

Attention: – L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:

Precaución – Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.

Precaución – Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.

Precaución – Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:

Encendido – Aplica la alimentación de CA al sistema.

Apagado - Elimina la alimentación de CA del sistema.

En espera – El interruptor de Encendido/En espera se ha colocado en la posición de En espera.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun

Precaución – Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamien-tos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

Precaución – De acuerdo con la norma DIN 45 635, Parte 1000, se admite un nivel de presión acústica para puestos de trabajo máximo de 70Db(A).

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica

Precaución – Los productos Sun están diseñados para trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.

Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.

Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":

Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio

Precaución – En las placas de CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, o MK48T08. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Paquete de pilas

Precaución – Las unidades Sun StorEdge FC-AL Switch contienen una pila de plomo sellada, Productos de energía portátil nº TLC02V50. Existe riesgo de estallido si el paquete de pilas se maneja sin cuidado o se sustituye de manera indebida. Las pilas sólo deben sustituirse por el mismo tipo de paquete de pilas de Sun Microsystems. No las desmonte ni intente recargarlas fuera del sistema. No arroje las pilas al fuego. Deséchelas siguiendo el método indicado por las disposiciones vigentes.

Tapa de la unidad del sistema

Debe quitar la tapa del sistema cuando sea necesario añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de cerrar la tapa superior antes de volver a encender el equipo.

Precaución – Es peligroso hacer funcionar los productos Sun sin la tapa superior colocada. El hecho de no tener en cuenta esta precaución puede ocasionar daños personales o perjudicar el funcionamiento del equipo.

Aviso de cumplimiento con requisitos de láser

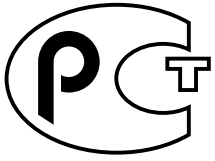
Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD-ROM

Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark



Nordic Lithium Battery Cautions

Norge

ADVARSEL – Litiumbatteri — Eksplosjonsfare.Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Sverige

VARNING – Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Danmark

ADVARSEL! – Litiumbatteri — Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Suomi

VAROITUS – Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Preface

The *Sun StorEdge 6320 System 1.0 Reference and Service Manual* gives a product overview, discusses all components, describes the utilities available for performing administrative tasks on the systems, and explains how to repair and replace the components.

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

How This Book Is Organized

This book contains the following chapters and appendix:

Chapter 1 introduces the Sun StorEdge™ 6320 system.

Chapter 2 offers an overview of the components in the Sun StorEdge 6320 system. This chapter discusses all the hardware and software that make up the storage subsystems.

Chapter 3 presents information about the default Sun StorEdge 6320 system. The information includes the Sun StorEdge 6320 system layout, all settings for the Sun StorEdge 6020 arrays, Sun StorEdge network Fibre Channel (FC) switches, and Ethernet addresses.

Chapter 4 describes the features associated with each of the supported Sun StorEdge 6320 system configurations.

Chapter 5 gives an overview and usage instructions for the Sun StorEdge Configuration Service that configure the various components that make up the Sun StorEdge 6320 system.

Chapter 6 contains a brief overview of the functionality provided by the Storage Automated Diagnostic Environment software that performs fault detection and isolation on the Sun StorEdge 6320 systems.

Chapter 7 describes the steps required to service the field-replaceable units (FRUs) in the system.

Chapter 8 presents general instructions about the placement of FRUs and how to install and remove FRUs from the system.

Chapter 9 gives instructions for the removal and replacement of FRUs in the Sun StorEdge Expansion Cabinets.

Chapter 10 discusses the removing and replacing the Ethernet hub.

Chapter 11 describes the procedures for removing and replacing the Sun StorEdge network FC switch-16 switches.

Chapter 12 gives instructions for removing and replacing Sun StorEdge 6020 arrays.

Appendix A contains a set of tables that list the cable labels for the Sun StorEdge 6320 system and the Sun StorEdge 6320 (switchless) system.

Using UNIX Commands

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

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

Typographic Conventions

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

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

Shell Prompts

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

Related Documentation

The following is a list of documents related to the Sun StorEdge 6320 system. For any document number with an *nn* suffix, use the most current release of the document.

Product	Title	Part Number
Late-breaking news	• *Sun StorEdge 6320 System 1.0 Release Notes*	816-7880-10
Sun StorEdge 6320 system information	• *Sun StorEdge 6320 System 1.0 Start Here Guide*	816-7875-10
	• *Sun StorEdge 6320 System 1.0 Installation Guide*	816-7878-10
	• *Sun StorEdge 6320 System 1.0 Regulatory and Safety Compliance Manual*	816-7876-10
	• *Sun StorEdge 6320 System 1.0 Site Preparation Guide*	816-7877-10
	• *Sun StorEdge 6000 Family Host Installation Software Guide*	817-1739-10
Sun StorEdge 6020 array information	• *Sun StorEdge 6020 and 6120 Arrays Start Here Guide*	817-0198-*nn*
	• *Sun StorEdge 6020 and 6120 Arrays Site Preparation Guide*	817-0960-*nn*
	• *Sun StorEdge 6020 and 6120 Arrays Regulatory and Safety Compliance Manual*	817-0961-*nn*
	• *Sun StorEdge 6020 and 6120 Arrays Installation Guide*	816-0199-*nn*
	• *Sun StorEdge 6020 and 6120 Arrays System Manual*	817-0200-*nn*
	• *Sun StorEdge 6020 and 6120 Arrays Release Notes*	817-0201-*nn*
Diagnostics	• *Storage Automated Diagnostic Environment 2.2 User's Guide -- Device Edition*	817-0822-*nn*
	• *Storage Automated Diagnostic Environment 2.2 Device Edition Release Notes*	817-0823-*nn*

Product	Title	Part Number
Sun StorEdge network FC switch-16 switch	• *Sun StorEdge SAN Foundation 2 Gbit FC Switch-8 and Switch-16 Guide to Documentation*	817-0061-*nn*
	• *Sun StorEdge SAN Foundation Release Notes*	817-0071-*nn*
	• *Sun StorEdge SAN Foundation Installation Guide*	817-0056-*nn*
	• *Sun StorEdge SAN Foundation Configuration Guide*	817-0057-*nn*
	• *Sun StorEdge SAN 4.0 Release Notes*	816-4472-*nn*
	• *Sun StorEdge SAN 4.0 Release Guide to Documentation*	816-4470-*nn*
	• *Sun StorEdge SAN 4.0 Release Installation Guide*	816-4469-*nn*
	• *Sun StorEdge SAN 4.0 Release Configuration Guide*	816-0830-*nn*
	• *Sun STorEdge SAN Foundation 4.2 Release Notes*	817-1246-*nn*
	• *SANbox2-16 Switch Management User's Manual*	
	• *SANbox2-16 Installer's/User's Manual*	
Expansion cabinet	• *Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067-*nn*
Storage Server Processor	• *Sun V100 Server User's Guide*	806-5980-*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`

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 the feedback:

Sun StorEdge 6320 System 1.0 Reference and Service Manual, part number 816-7879-10

CHAPTER 1

Introduction

The Sun StorEdge 6320 system is a complete preconfigured storage solution.

This chapter is organized as follows:

1.1 Overview of Sun StorEdge 6320 Systems

The Sun StorEdge 6320 system provides the following features:

- Support for 36.4 Gbyte, 73.4 Gbyte, or 146.8 Gbyte bidirectional, dual-ported Fibre Channel-Arbitrated Loop (FC-AL) disk drives
- Sun StorEdge Remote Response (SSRR) capability, which provides phone-home remote monitoring and support capability
- An embedded Storage Service Processor that provides the following:
  - Configuration of the Sun StorEdge 6020 arrays
  - A platform for firmware and software system upgrades
  - Continuous monitoring of components in the Sun StorEdge 6320 system (once the SSRR software is enabled)
  - Diagnostic tools to troubleshoot problems
- A maximum of 10 Sun StorEdge 6020 arrays (trays) in the base Sun StorEdge Expansion Cabinet
- A maximum of 22 Sun StorEdge 6020 arrays using the base cabinet and a second Sun StorEdge Expansion Cabinet

- Each Sun StorEdge 6020 array tray is configured with one RAID 5 storage pool plus one standby hot spare
- Installation, configuration, and support services (optionally available)
- Remote power cycle and reboot so you can securely power on and off the entire system
- Logical unit number (LUN) security access for the storage consolidation models
- Hot swapping of all field-replaceable units (FRUs)
- Cluster and simultaneous independent host attach support

1.1.1 Sun StorEdge 6320 System

The Sun StorEdge 6320 system can use two Sun StorEdge network FC switch-16 switches as the host interface and can support up to 10 Sun StorEdge 6020 trays in the first cabinet. By adding a second Sun StorEdge Expansion Cabinet, the Sun StorEdge 6320 system supports up to 12 additional Sun StorEdge 6020 trays (a total

of 22 trays). FIGURE 1-1 illustrates a representation of the Sun StorEdge 6320 system connections. For a cabinet representation of the Sun StorEdge 6320 system, refer to FIGURE 3-1.

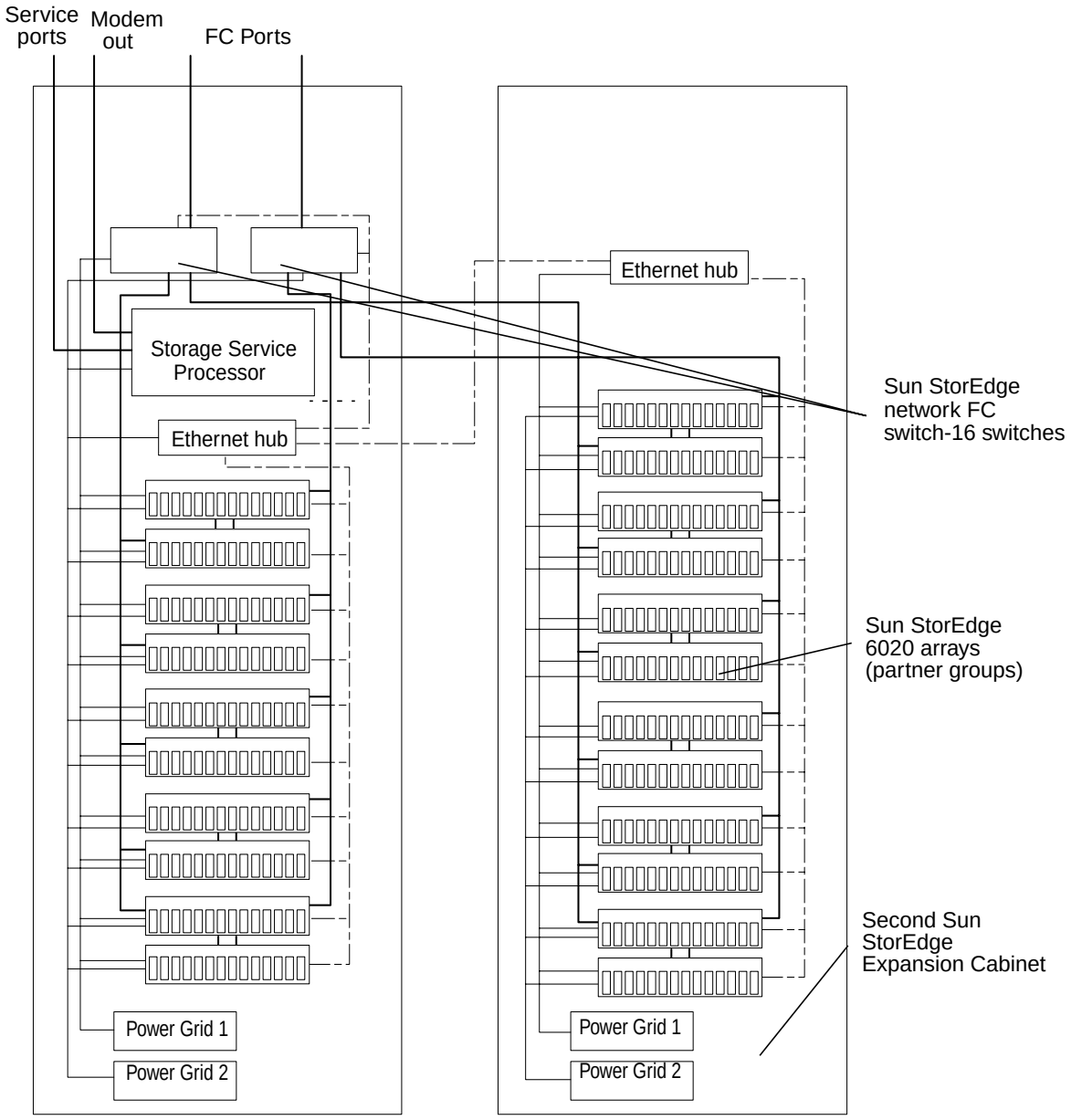


FIGURE 1-1 Sun StorEdge 6320 System

1.1.2 Sun StorEdge 6320 Switchless Systems

The Sun StorEdge 6320 systems are configured without built-in front-end switches. The Sun StorEdge 6320 switchless configuration system can be directly attached to your host. Alternatively, you can attach the system to an externally provided switch. Sun provides the following for switchless configurations:

- Prime input power cords (two each) for mounting a pair of third-party switches in the front end of a Sun StorEdge 6320 system cabinet.
- For the Sun StorEdge 6320 system, Sun provides FC cable connectivity for up to 22 Sun StorEdge 6020 trays.

With Sun StorEdge 6320 switchless systems, you are responsible for providing:

- All host FC cable connections
- An Ethernet cable connection between any third-party switches (if applicable) and a storage area network (SAN) maintenance console. The connection is used to monitor and perform diagnostic reporting.

Neither the customer-supplied switches or the Sun-installed front-end switches are monitored or diagnosable by the internal Storage Service Processor in the Sun StorEdge 6320 or 6320 switchless systems.

Note – The Sun-supplied and customer-supplied switches that are installed in a Sun StorEdge 6320 system cannot be connected to the internal local area network (LAN) of the system. All Fibre Channel switches must be managed from an outside Ethernet connection.

Brocade and McData switches that are on the Sun price list will be supported on the switchless Sun StorEdge 6320 switchless system under the Sun StorEdge SAN Foundation (rules for version 4.1 or greater).

McData switches are not currently supported by Enterprise Services unless they are part of a Sun StorEdge 9900 configuration. The switches in the SAN must be homogeneous (all Sun, all Brocade, or all McData).

1.2 System Architecture

The basic architecture of the Sun StorEdge 6320 system SAN configuration is shown in FIGURE 1-2. Note that the Fibre Channel switches are optional. If the switches are not present, the Sun StorEdge 6020 arrays connect directly to the SAN.

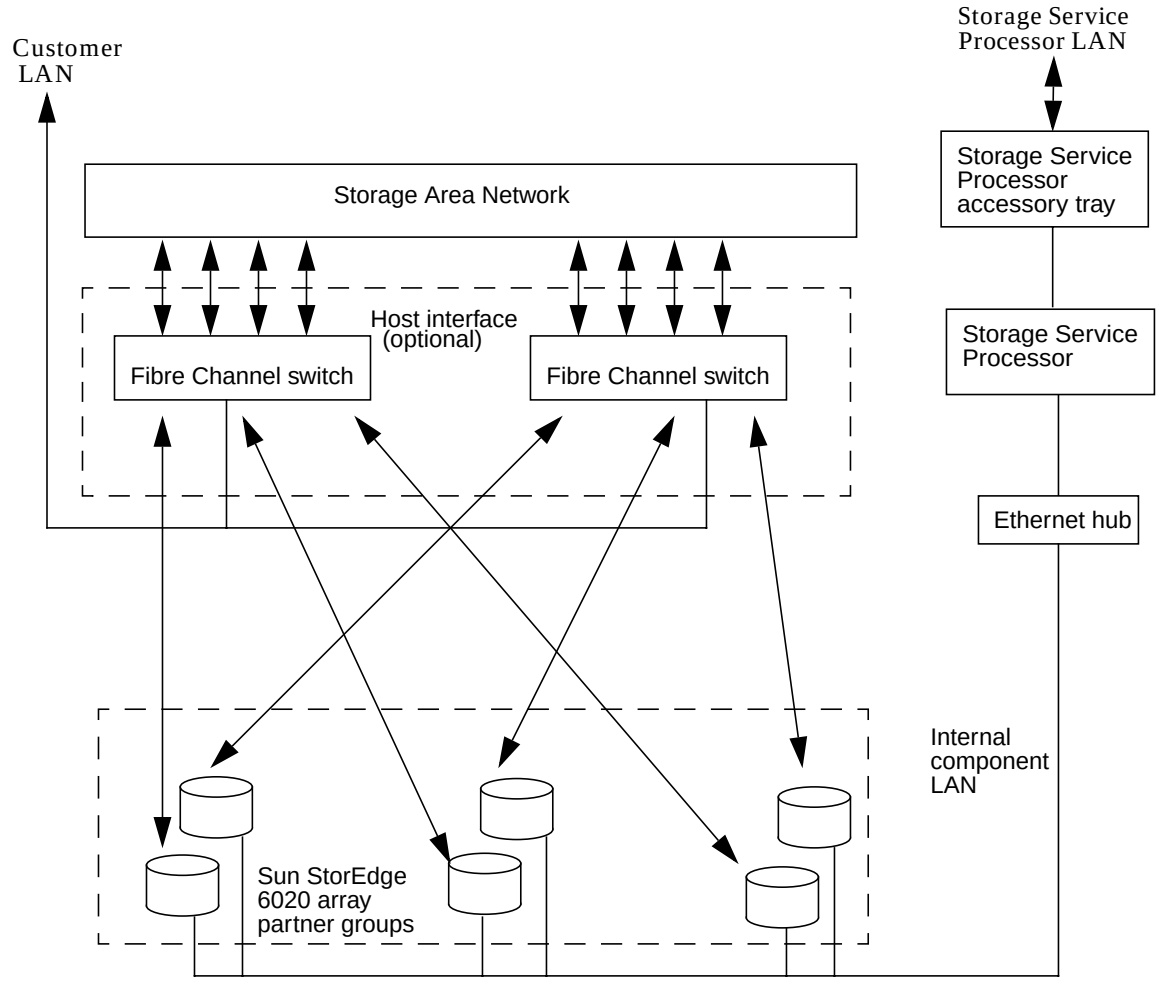


FIGURE 1-2 Basic Sun StorEdge 6320 System Architecture

1.3 System-Level Support Information

TABLE 1-1 shows Sun StorEdge 6320 system information.

TABLE 1-1 Sun StorEdge 6320 System-Level Configurations

System	Bandwidth[1]	Capacity[2]	Maximum Host Connectivity[3]	Maximum LUNs	LUN Masking
Sun StorEdge 6320 and 6320 switchless systems	4400 Mbytes/sec maximum	504 Gbytes to 45 Tbytes	5 (with integrated switches) 88 (with external switches)	704 (64 per Sun StorEdge 6020 array)	Yes

1 - Bandwidth is defined as the theoretical maximum using full-duplex Fibre Channel connections.
2 - Minimum capacity is calculated using 36 Gbyte drives and maximum capacity is calculated using 146.8 Gbyte drives. The available data capacity using default configurations are slightly lower due to capacity used for parity and hot spares.The minimum size is 10 Mbyte for all LUNs. The maximum size is 2 Tbyte for all LUNs.
3 - All host connections are redundant partner groups.

1.4 Sun StorEdge 6320 System Features

The following are features available on the Sun StorEdge 6320 system:

- **Installation** – The Sun StorEdge 6320 system requires minimal setup. The Sun StorEdge 6020 array units are preconfigured at the factory, eliminating the need to create storage pools. You can create volumes as required within allowed limits.
- **RAID Striped Data with Standby Hot Spare** – Internal Sun StorEdge 6020 arrays are preconfigured with RAID 5 storage pools at the factory. Each Sun StorEdge 6020 array is preconfigured in the factory with one RAID5 storage pool and one hot spare. The hot spare is located in slot 14. You can change to RAID 1 or RAID 0.
- **Volume Access Control** – The Sun StorEdge 6320 systems provides support for volume access control. Support for initiator groups and volume groups are provided. The Sun StorEdge 6020 arrays support a maximum of 64 volumes per storage array and provide support for initiator groups. The Sun StorEdge 6020 can be used to set volume access control properties for a group of host initiators.
- **Bandwidth** – The system uses Fibre Channel technology to provide the optimum bandwidth. The integrated front-end switches are 2 Gbit/second transfers that provide for 2 Gbit host connectivity.

- **Capacity** – The Sun StorEdge 6320 system supports 36 Gbyte, 73 Gbyte, and 146 Gbyte disk drives in the Sun StorEdge 6020 arrays. The supported capacity for the Sun StorEdge 6320 system is a minimum of 504 Gbytes and a maximum of 45 Tbytes. Mixed drive sizes are supported.

Note – If mixed drive sizes are used within a storage pool, the lowest drive size dictates the usable storage of each drive within that volume. For instance, if a volume of seven disks has six 146 Gbyte disks and one 36 Gbyte disk, all disks will be viewed as 36 Gbyte disks.

- **System Redundancy** – The systems provide full data path redundancy with no data path component as a single point of failure, offering 24x7 data availability. Redundant components include the Fibre Channel switches (if used), Sun StorEdge 6020 array, and dual power sequencers.
- **Host Managed Multipathing** – The system provides at least two full speed physical I/O paths to each host. The Sun StorEdge 6020 arrays provide two 2 Gbit physical I/O paths. Host software is required to manage the I/O multipathing and load balancing across these I/O paths. Such software includes, but is not limited to, either Sun StorEdge Traffic Manager software or VERITAS Dynamic Multi-Pathing (DMP).
- **Host Support** – The Sun StorEdge 6320 system supports the following minimal level operating systems. Refer to the latest version of the *Sun StorEdge 6320 System Release Notes* for the latest support information.
  - Solaris 8, Solaris 9, and later releases
  - Microsoft Windows NT Enterprise Edition 4.0, Service Pack 6
  - Microsoft Windows 2000 Server and Windows 2000 Advanced Server, Service Pack 2
  - Hewlett Packard HP-UX 11.i and HP-UX 11
  - IBM AIX 4.3.3 (32-bit), AIX 5.1 (32-bit and 64-bit)
  - RED HAT Linux 7.2
- **Software Support –** The Sun StorEdge 6320 system supports several software packages including the following:
  - Sun Cluster 3.0
  - Storage Automated Diagnostic Environment
  - SANbox2 Manager
- **Multiple Host Support** – Each Sun StorEdge 6020 array partner group supports up to 16 hosts. This enables the Sun StorEdge 6320 system to allow up to 176 hosts with Fibre Channel SAN zoning (this assumes the 2x2 configurations are used within the system). With integrated Fibre Channel switches, the Sun

StorEdge 6320 systems can provide for direct connectivity of five partner groups of hosts connections. Additional host connections can be achieved using external switches.

- **Local or Remote Serviceability** – The Sun StorEdge 6320 system includes a Storage Service Processor. Support for the Sun StorEdge Remote Response software is built into the Storage Service Processor. All configurations are Sun StorEdge Remote Response ready. Local serviceability and management is provided by IP Ethernet connectivity to the Storage Service Processor.
- **Hot-Swappable FRUs** – The Sun StorEdge 6320 systems use hot-swappable field-replaceable units (FRUs). The FRUs include power supplies and cooling units (PCU), batteries, disk drives, loop cards, and RAID controllers. The Storage Service Processor is a FRU. The FC switches, Storage Service Processor, and Ethernet hub can be replaced without rebooting the Sun StorEdge 6020 arrays. Not all FRUs can be replaced by customers. The Storage Service Processor, Storage Service Processor accessory tray, and the service panel must be replaced by Sun service personnel.
- **Switched and Switchless Configurations** – The Sun StorEdge 6320 systems provide both a switched and switchless configuration. The switched configuration is delivered with Sun StorEdge network FC switch-16 switches. A switchless version is supported. With switchless configurations you can use other front-end switches, can use external switches, or can directly connect to a data host without the use of a switch. Neither the internal or external switches are connected to the internal LAN. Instead, they must manage these switches from an outside Ethernet connection. Configurations without front-end switches enable connectivity to external SANs from any vendor and enable a large number of hosts on the SAN to access the exported LUNs.
- **Host Connect Support** – The Sun StorEdge 6320 system provides native fabric (F-port) host connectivity. Integrated switches also provide for larger host connectivity.
- **Remote Lights-Out Power Management** – The Sun StorEdge 6320 system supports remote lights out power management. Power sequencers and a universal serial bus relay are used to control the power sequencing. This enables users to remotely shut down the components in the system to save power. The power down shuts down most of the components in the subsystem. Only the Storage Service Processor and minimal other components are kept running to enable a subsequent remote power on operation. Power can be restored remotely at any time. The remote lights-out power management interface also provides capability to completely shut down the power to all the components. If power is completely shut down, it cannot be restored remotely.
- **Online Firmware Upgrades** – The Sun StorEdge 6320 system supports online firmware upgrade of most components. There is 100 percent data availability during the online firmware upgrade operation. Online upgrade is not supported on the the firmware of the individual disks.

- **Depopulated Drive Support** – The Sun StorEdge 6320 system supports having depopulated drive trays in the Sun StorEdge 6020 trays. Each drive tray can contain 7-to-14 drives. Slots without drives must have dummy drives inserted in them.
- **Storage Array Configurations** – The Sun StorEdge 6320 system supports attaching controller-less Sun StorEdge 6020 arrays to existing Sun StorEdge 6020 arrays that have controllers. These controller-less trays are referred to as expansion units. The naming convention used in configuration is "*controller* x *trays*" (controller by trays). A 2x2 configuration means there are two controllers and two trays. A 2x4 configuration means there are two controllers and four trays. The Sun StorEdge 6320 system supports the following configurations:
  - Sun StorEdge 6020 HA array with 2x2
  - Sun StorEdge 6020 HA array with 2x4
  - Sun StorEdge 6020 HA array, with 2x6
- **Other Support and Features** – Other support and features include:
  - Network Time Protocol (NTP)
  - Simple Network Management Protocol (SNMP)
  - Array-based Common Information Model (CIM) support
  - Sun Indicator Standard support (LED improvement on the enclosure)
  - Dynamic Host Configuration Protocol (DHCP)
  - Integration with Sun StorEdge Enterprise Storage Manager (ESM) software

The Sun StorEdge 6320 systems provide you with the following reliability, availability, and serviceability (RAS) features:

TABLE 1-2 RAS Features

Benefits	RAS Features
Serviceability	• Sun Installation Support standard support and enclosure chassis LED (Locator / Fault LED) • Sun Standard compliant field-replaceable unit identification (FRU ID) support • Security in the Storage Service Processor to isolate customer LAN • The battery is now a FRU. In previous products, the power supply plus the battery were the FRU.
Firmware reliability and failure analysis techniques	• Automatic firmware crash dump in exception scenarios • Engineering used internal management and diagnostics commands • Real time checkers (RTC) used to reduce panics in firmware • Improved firmware robustness

TABLE 1-2 RAS Features *(Continued)*

Benefits	RAS Features
Reliability	• Mechanical for easier insertion and extraction and better locking mechanisms for disks and other FRUs • Blind mate connectors to avoid bent pins on FRU insertion
Availability	• Enhanced temperature monitoring to shut down the system only when temperature thresholds are exceeded • Automated power cooling unit (PCU) adjusts fan speed based on the temperature monitoring • Improved battery recharge control to avoid missing battery recharge if a Sun StorEdge 6020 array was shut down during battery recharge cycles • Automated and online firmware upgrade and downgrades • Hardware integrated device electronics (IDE) interface to introduce cache saving procedures without adding battery cost as higher density enclosures are developed
Fault detection, fault isolation, and failure fencing	• Support for parity on RISC RAM hardware • Loop card with standard SSC100 management processor and VSC055 serial backplane controller provides better enclosure management • Faster and modular loop card serial communication protocol • Failure fencing (fault containment) in case of hardware failures • Automatic hardware bypass of the faulty drive should a drive cause loop disruptions • Hardware support that creates a diagnostics loop of disks for performing background tests • Temperature sensors for continuous threshold based temperature monitoring. The temperature sensors are located close to heat spots to provide accurate temperature measurements • Fibre Channel ECHO ELS support, which allows for both external echo tests (invoked from the Sun StorEdge 6020 array) and passive echo tests (invoked from the Fibre Channel switch) • External and internal loopback test support to test front-end controller and back-end Fibre Channel ports • Fibre Channel link status counters for threshold-based analysis of link error statistics

CHAPTER 2

Hardware and Software Descriptions

This chapter offers an overview of the components of the Sun StorEdge 6320 system. This overview lists the hardware and software used by the systems.

This chapter is organized as follows:

2.1 Hardware Descriptions

The hardware building blocks for the Sun StorEdge 6320 system include:

- Storage Service Processor
- Customer management connection
- Storage devices
- Ethernet hub
- FC switches
- Storage Service Processor accessory tray
- Sun StorEdge expansion cabinet

2.1.1 Storage Service Processor

The Storage Service Processor is a Sun Fire™ V100 server. The Sun Fire server provides a 550-MHz, 64-bit UltraSPARC® IIe processor, 512 Gbytes of memory, a 40-Gbyte IDE internal drive, a CD-ROM drive, and a universal serial bus (USB) flash disk to save the Storage Service Processor personality data.

The hot-swappable USB flash disk provides 16 Mbyte of removable storage. The USB flash disk enables you to restore the Storage Service Processor personality files (for example, `/etc/ethers`). The data can be restored in the event of a Storage Service Processor failure.

Every Storage Service Processor is configured with the same hardware and software components to ensure ease of replacement. All Storage Service Processors have built in hardware and software support for the Sun StorEdge Remote Response utility.

The Storage Service Processor supports health monitoring and fault mitigation independent of the customer's server. There is no data path connectivity, thus the unit is not a mission-critical component.

Customers use a web interface or a command-line interface to perform functions on the Storage Service Processor.

2.1.2 Customer Management Connection

The customer management connection is a dedicated Ethernet connection that connects to the designated Storage Service Processor. Each Storage Service Processor serves as the master for collecting data from its Sun StorEdge 6320 system. This connection is also referred to as the customer LAN. If more than one Sun StorEdge 6320 system is connected to the customer management connection, alert traffic will be passed across the LAN. The traffic consists of monitoring data that reflects the overall health as well as specific alerts that may occur within the Sun StorEdge 6320 system.

2.1.3 Storage Devices

The Sun StorEdge 6020 arrays provide backend data storage inside the Sun StorEdge 6320 system. Each Sun StorEdge 6020 array supports 36-Gbyte, 73-Gbyte, or 146-Gbyte disk drives.

In factory-configured systems, the Sun StorEdge 6020 arrays are configured with one storage pools per Sun StorEdge 6020 tray. Each tray contains a full-capacity RAID 5 (6 or 13 disks) storage pool with a segment size of 16 Kbytes and is configured with one standby hot spare.

Utilities are provided on the Storage Service Processor that enable users to reconfigure the Sun StorEdge 6020 arrays to meet workload performance requirements.

The following features are available on a Sun StorEdge 6320 system:

- Volume support – You can create up to 64 volumes (also called LUNs) from a storage pool per storage array.
- LUN access control – This restricts host HBA access to the volumes.

The RAID levels supported on the Sun StorEdge 6320 system configurations are:

- RAID 0 – A volume that arranges data across one or more components. Striping alternates equally-sized segments of data across two or more components, forming one logical storage unit. These segments are interleaved round-robin, so that the combined space is made alternately from each component, in effect, shuffled like a deck of cards. Striping enables multiple controllers to access data at the same time, which is also called parallel access. Parallel access can increase I/O throughput because all disks in the volume are busy most of the time servicing I/O requests.
- RAID 1 – This version of RAID 1 is considered to be RAID 1+0. Each data block in a RAID 1 volume is mirrored on two physical drives. If one of the mirrored pair fails, the data from the other drive is used. Because the data is mirrored in a RAID 1 configuration, the volume has only half the capacity of the assigned drives. For example, if you create a 4-drive RAID 1 volume with 36-Gbyte drives, the resulting data capacity is 4 x 36 / 2 = 72 Gbytes.
- RAID 5 – In a RAID 5 configuration, data is striped across the drives in the volumes in segments, with parity information being striped across the drives, as well. Because of this parity, if a single drive fails, data can be recovered from the remaining drives. Two drive failures in the same storage pool cause all data to be lost. A RAID 5 volume has the data capacity of all the drives in the logical unit, less one. For example, a five-drive RAID 5 volume with 73-Gbyte drives has a capacity of (5 - 1) x 73 = 292 Gbytes.

2.1.4 Ethernet Hub

The Sun StorEdge 6320 system uses an Ethernet hub as the backbone for the internal service network. The allocation of Ethernet ports is as follows:

- One for the Storage Service Processor (per system)
- Two for each Sun StorEdge 6020 array partner group
- One for the Ethernet hub that is installed in the second Sun StorEdge Expansion Cabinet in the Sun StorEdge 6320 or 6320 switchless systems (if the second cabinet is used)

2.1.5 Fibre Channel Switches

The Sun StorEdge network 2 Gbit Fibre Channel switch-16 switch provides cable consolidation and increased connectivity. The Sun StorEdge network FC switch-16 switches are used for the internal data interconnection infrastructure.

The switches are paired to provide data path redundancy. Two switches are used in each Sun StorEdge 6320 system.

These switches can be monitored through the SANbox2 Manager GUI.

These switches are configured using the Sun StorEdge Configuration Service software, which is installed on the customer's host. These are discussed in "Sun StorEdge Configuration Service Software" on page 2-6 and "Sun StorEdge Configuration Service Software" on page 5-1.

The Sun StorEdge 6320 switchless system will not have switches present.

2.1.6 Storage Service Processor Accessory Tray

The Storage Service Processor accessory tray is an enclosure that contains all the components necessary to support the Sun StorEdge Remote Response software. This enclosure simplifies serviceability, as the entire unit is a FRU.

The Storage Service Processor accessory tray contains the following:

- Serial Network Terminal Concentrator (NTC) used for remote serviceability support
- Ethernet router/firewall used to provide additional security to Sun from the customer management LAN
- Personal Computer Memory Card International Association (PCMCIA) compatible modem
- A single AC power supply used by all components in the tray

2.1.7 Sun StorEdge Expansion Cabinet

The Sun StorEdge 6320 system is packaged in the Sun StorEdge Expansion Cabinet, which is also used for several other Sun products. The customer-accessible areas of the system are clearly labeled. Service-accessible areas of the system are clearly labeled as such. All physical configurations will be completed by Sun-trained personnel. Customers not trained for service by Sun will have significantly limited access to the physical layout of the system.

2.2 Software Descriptions

The software included with the Sun StorEdge 6320 system is:

- Solaris 9 operating environment
- Sun StorEdge Configuration Service software (`sscs`(1M))

Additionally, the Sun StorEdge 6320 systems support several software packages, inlcuding the following:

- Sun StorEdge Remote Response software (to support optional service)
- Remote power management
- Storage Automated Diagnostic Environment
- SANbox2 Manager
- Sun StorEdge SAN Foundation software release support

Note – The software packaged with the Sun StorEdge 6320 system is not meant for use on the host servers.

2.2.1 Solaris 9 Operating Environment

A customized version of the Solaris 9 operating environment is installed on the Storage Service Processor.

2.2.2 Sun StorEdge Remote Response Software

The Sun StorEdge Remote Response software is included on all Sun StorEdge 6320 systems. Sun StorEdge Remote Response software provides “phone home” capability and dial-back access by Sun. This enables Sun storage experts to remotely troubleshoot, diagnose, and service the Sun StorEdge 6320 system.

The features of Sun StorEdge Remote Response service include:

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

2.2.3 Remote Power Management

The Sun StorEdge 6320 system is equipped with the hardware and software necessary to support a remote power on. When enabled, a system administrator can turn the power sequencer on and off either locally or remotely using the Sun StorEdge 6320 system's Sun StorEdge Configuration Service software.

The default mode for the Sun StorEdge 6320 system control management is for all Sun StorEdge 6320 system configurations to have the remote power on software disabled.

To use the remote power off mode, you must configure the cabinets for this operation. Once configured, the Storage Service Processor detects the presence of the relay board and enables two additional functions in the rack control management software. The modes are:

- Local power on (powering on the Sun StorEdge 6320 system at the system)
- Remote power on (powering on the system either locally or remotelly)

These modes are used to logically shut down the Sun StorEdge 6020 arrays and instruct the power sequencers to remove power from those components.

The configuration information for the lights-out setup is in the *Sun StorEdge 6320 Installation Guide*.

Note – During these modes, the Storage Service Processor and the Storage Service Processor accessory tray remain powered and active to provide control over the power relay board.

Note – Do not use the remote power-off mode when moving the cabinets to a different location. You must use the complete power-down procedure before moving the cabinets.

2.2.4 Sun StorEdge Configuration Service Software

The Sun StorEdge Configuration Service software enables you to configure and manage the Sun StorEdge 6320 systems. The software is available for use through a web-browser user interface (UI) and the command-line interface (CLI) `sscs`(1M).

The CLI provides a remote client command-line interface that enables you to invoke `sscs` commands to administer the Sun StorEdge 6320 system. This interface is not a `telnet`(1) session.

All software features are available through the UI and CLI; you can use either interface to manage your storage.

The `sscs` command provides volume and Storage Service Processor management for the Sun StorEdge 6020 arrays and Sun StorEdge 6300 systems. The `sscs` command enables you to manage volumes, storage pools, volume groups, initiator groups, storage trays, and the Storage Service Processor.

2.2.5 Storage Automated Diagnostic Environment 2.2

The Storage Automated Diagnostic Environment is a distributed online health and diagnostic monitoring tool used on the Sun StorEdge 6320 system. It can be configured to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the storage devices.

The Storage Automated Diagnostic Environment offers the following features:

- A common web-based user interface for device monitoring and diagnostics
- Distributed test invocation by means of lists or topology. You can run the tests through the Storage Automated Diagnostic Environment GUI or through the command-line interface (CLI).
- Topology grouping for multi-level hosts and components
- Revision updates
- Support for the Storage Service Processor and components of Sun StorEdge 6320 system
- Remote notification through Sun StorEdge Remote Response
- Role-based access
- Service utilities
- Encryption through a Secure Socket Layer (SSL) protocol to protect transmitted information.

2.2.5.1 Diagnostic Functionality

Diagnostic tests have been integrated into the Storage Automated Diagnostic Environment for device diagnostics and FRU isolation. Each test can be run individually from the command line or from the Storage Automated Diagnostic Environment user interface.

The Storage Automated Diagnostic Environment Diagnostic tests are described in the *Storage Automated Diagnostics Environment 2.2 System Edition User's Guide*.

2.2.6 SANbox2 Manager

The SANbox2 Manager software is supported on the Sun StorEdge 6320 systems.

SANbox2 Manager is a GUI consisting of menus, buttons, and windows that you can use to easily manage switches from a server running supported Solaris, Linux, or Windows operating systems. Using SANbox2 Manager, you can view and change network, switch, and port configuration for one or more fabrics concurrently.

SANbox2 Manager displays the most current fabric information. When a Fabric changes, the new fabric information is sent to the workstation and is reflected in the SANbox2 Manager window.

SANbox2 Manager enables you to perform the following procedures:

- Display multiple fabrics
- Associate the switch management interface with its IP network configuration parameters
- View the FC connection
- View hardware and firmware version information for the selected chassis
- View switch names and worldwide names (WWNs)
- View port addresses on the selected chassis

The SANbox2 Manager Help menu contains information about the product and a complete online help guide.

2.2.7 Sun StorEdge SAN Foundation Software Release Support

The Sun StorEdge SAN Foundation software (version 4.2 or later) is supported for the Sun StorEdge 6320 systems. The Sun StorEdge SAN Foundation release is Sun's latest full Fabric, open heterogeneous SAN featuring support for the following:

- Sun 2 Gbit HBAs and switches
- Sun StorEdge 6020 array
- Brocade SilkWorm 16-port 2 Gbit 3800 FC switch, SilkWorm 64-port, 2 Gbit 12000 Fibre Channel Core Fabric Switch, and Mcdata Intrepid 6064 Director
- Storage Automated Diagnostic Environment
- Sun StorEdge Diagnostic Expert software
- Sun StorEdge Enterprise Storage Manager 1.2 software
- Sun StorEdge Resource Manager Suite 6.0
- Sun StorEdge Availability Suite 3.1

- Sun StorEdge Traffic Manager
- Sun StorEdge Performance Suite
- Sun StorEdge Utilization Suite Software
- VERITAS file system (VxFS)
- VERITAS NetBackup
- VERITAS Volume Manager (VxVM)
- Solstice Backup
- Solaris Logical Volume Manager
- Support for open heterogeneous SANs with Fabric support for Linux, Windows NT 4.0, Windows 2000, HP/UX and IBM AIX based servers
- Support for large, complex SANs with support for up to 7 inter-switch hops, up to 64 switches, and both core Fabric switches and directors

CHAPTER 3

Default System Configurations and Settings

This chapter presents information about the default Sun StorEdge 6320 system configurations. The information includes all settings for the Sun StorEdge 6020 arrays, Sun StorEdge network Fibre Channel switches, and IP address settings.

This chapter is organized as follows:

3.1 Sun StorEdge 6320 System Layout

FIGURE 3-1 shows the layout (back view) of the hardware components in a Sun StorEdge 6320 system that has two cabinets. The Sun StorEdge 6320 switchless system has the same layout, without the FC switches (`sw1a` and `sw1b`).

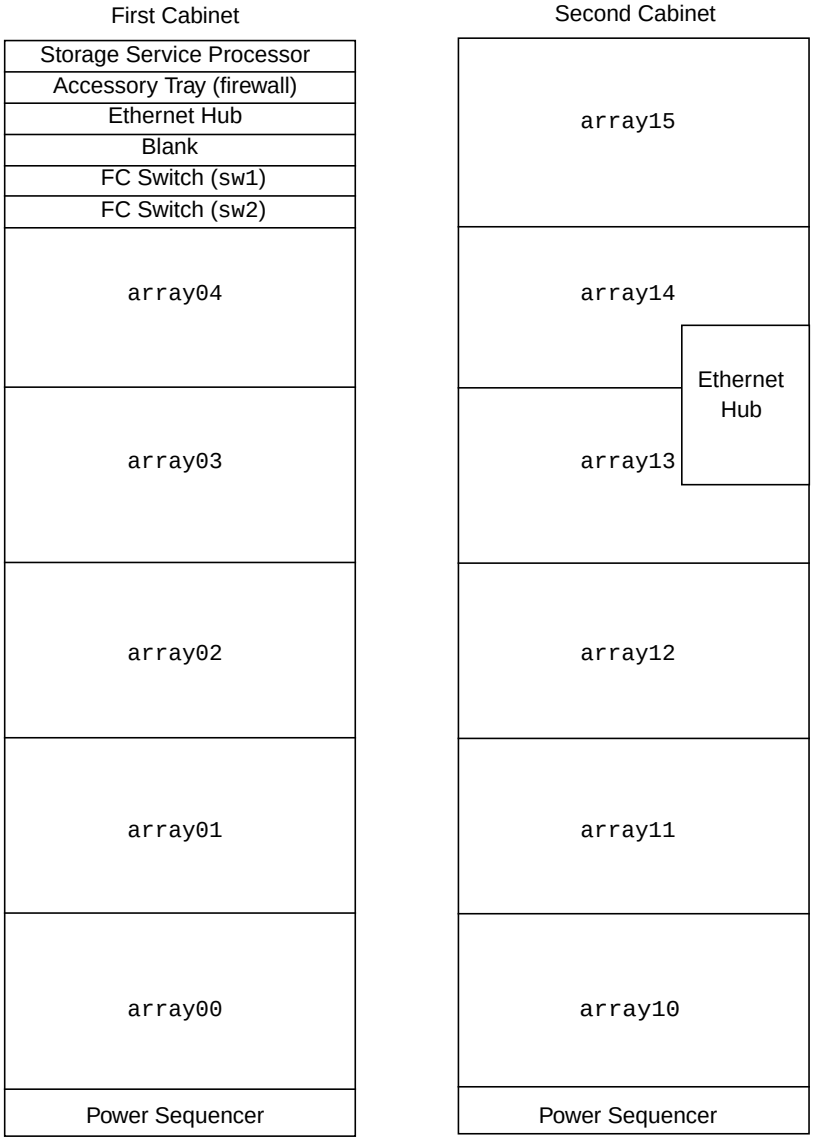


FIGURE 3-1 Back View of the Sun StorEdge 6320 System

3.2 Sun StorEdge 6020 Array and 6320 System Settings

The default supported configurations for the Sun StorEdge 6020 arrays and Sun StorEdge 6320 systems are shown in TABLE 3-1.

TABLE 3-1 Default Sun StorEdge 6020 Array and 6320 System Configuration Types

Element	Sun StorEdge 6020 and 6320 System[1]
Hot Spare (one per tray)	Yes
Block Size	16 Kbytes
Cache	`auto`
Mirror	`auto`
Failover Mode (`mp_support`)	Explicit LUN failover
Read Ahead (`rd_ahead`)	`on`
Recon Rate	`med`
RAID Type	5 (with hot spare)
Storage Pool / Tray	1
Configured Volumes / Trays[2]	0

1. All Sun StorEdge 6020 arrays ship from the factory in the specified default configuration.

2. All Sun StorEdge 6020 arrays are shipped with no LUNs configured. Volume slicing is always enabled and cannot be disabled. LUNs will be configured on the Sun StorEdge 6320 arrays at the customer site to meet the customer requirements.

The default Sun StorEdge 6020 array target IDs and host names are shown in TABLE 3-2. This information only applies if the Sun StorEdge 6320 system is being used in an arbitrated loop configuration. Fabric configurations do not use array target ID information.

TABLE 3-2 Default Sun StorEdge 6020 Array Target ID and Host Name

Sun StorEdge 6020 Array	Target ID	Host Name
array00	0, 1	`array00`
array01	2, 3	`array01`
array02	4, 5	`array02`
array03	6, 7	`array03`
array04	8, 9	`array04`
array10	10, 11	`array10`
array11	12, 13	`array11`
array12	14, 15	`array12`
array13	16, 17	`array13`
array14	18, 19	`array14`
array15	20, 21	`array15`

The Sun StorEdge 6020 array command configuration settings are given in TABLE 3-3.

TABLE 3-3 Sun StorEdge 6020 Array Set Command Configuration Settings

Parameter	Default Value
bootmode	auto
bootdelay	3
sn	*nnnnnn*
ip	See TABLE 3-8
netmask	255.255.255.0
gateway	0.0.0.0
tftphost	0.0.0.0
tftpfile	<NULL>
hostname	<NULL> for the Sun StorEdge 6020 arrays
vendor	0301

TABLE 3-3 Sun StorEdge 6020 Array Set Command Configuration Settings *(Continued)*

Parameter	Default Value
model	501-5710-00(50) (Can change with board revisions)
revision	300 (Can change with firmware revisions)
logto	*
loglevel	3
rarp	on
mac	*n*:*n*:*n*:*n*:*n*:*n*

The command configuration settings for the Sun StorEdge 6020 array system list are shown in TABLE 3-4.

TABLE 3-4 Sun StorEdge 6020 Array System List Command Configuration Settings

Parameter	Default Value
blocksize	16 Kbytes
cache	auto
mirror	auto
mp_support	`mpxio`
rd_ahead	on
recon_rate	med
sys_memsize	256 Mbytes
cache_memsize	1024 Mbytes
enable_volslice	on
fc_topology	auto
fc_speed	auto cable
loop1_split	auto
naca	off

The Sun StorEdge 6020 array miscellaneous configuration parameters are shown in TABLE 3-5.

TABLE 3-5 Sun StorEdge 6020 Array Miscellaneous Configuration Parameters

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

3.2.1 Sun StorEdge 6020 Array `syslog.conf` Configuration

To ensure that the Storage Service Processor monitors the condition of each Sun StorEdge 6020 array tray within the systems, the arrays are configured to send their `syslog.conf` information back to the Storage Service Processor.

The information that is placed in each Sun StorEdge 6020 array is shown in the following `/opt/T4_conf/etc/syslog.conf` file.

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

# messages to local syslog file
*.info  /syslog

# messages to syslogd on another host
*.notice        @192.168.0.2

# messages sent as SNMP traps

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

3.2.2 Sun StorEdge 6020 Battery Management Configuration File

The battery management daemon checks and updates the Sun StorEdge 6020 array battery status on a weekly basis. The `/etc/bat.conf` file specifies the time and day of the week that the battery daemon is launched. The file resides on the master enclosure of each group.

This file consists of the following required three data fields:

```
DAY 0
HOUR 2
MINUTE 0
```

Valid values for the three fields in the file are as follows:

DAY	0 = Sunday, 1 = Monday, 2 = Tuesday, 3 = Wednesday, 4 = Thursday, 5 = Friday, and 6 = Saturday
HOUR	0 to 23 (where 0 = midnight)
MINUTE	0 to 59

3.3 Sun StorEdge Network FC Switch Settings

This section presents a series of tables that provide information about the default settings for the Sun StorEdge network FC switch-16 switches that come factory installed in the Sun StorEdge 6320 system. The following information is included in this subsection:

- Sun StorEdge network FC switch-16 parameters
- Sun StorEdge 6320 system switch configuration

The Sun StorEdge network FC switch-16 parameters are given in TABLE 3-6.

TABLE 3-6 Sun StorEdge Network FC Switch-16 Parameters

Field	Value
Operational State	Online
Principal Switch Role	FALSE
Chassis Type	SANbox2 16-port switch
Flash	1.*n.n*
PROM Version	0.4.*n.n*
DOMAIN ID	1 (sw1) 2 (sw2)
Port Properties	
Port State	Online
1 Gbyte/2 Gbyte Transfer Rate	Auto-detect
Multi-frame Sequence (MFS) Bundling Enabled	FALSE
ExtCredit	0
TOVs	
edtov	2000
mfstov	0
ratov	10000
rttov	100
Network Properties	
IP Mask	255.255.255.0
Gateway Address	0.0.0.0
Discovery	Static
Security Enable	FALSE
SNMP	
Trap Authentication	FALSE
SNMP Location	<Undefined>
SNMP Contact	<Undefined>

The default Sun StorEdge 6320 system switch configuration is given in TABLE 3-7.

TABLE 3-7 Sun StorEdge 6320 System Switch Configuration

sw1	sw2
Port 0 = G-Port (Host#1a)	Port 0 = G-Port (Host#1b)
Port 1 = G-Port (Host#2a)	Port 1 = G-Port (Host#2b)
Port 2 = G-Port (Host#3a)	Port 2 = G-Port (Host#3b)
Port 3 = G-Port (Host#4a)	Port 3 = G-Port (Host#4b)
Port 4 = G-Port (Host#5a)	Port 4 = G-Port (Host#5b)
Port 5 = G-Port (array00 master)	Port 5 = G-Port (array00 altmaster)
Port 6 = G-Port (array01 master)	Port 6 = G-Port (array01 altmaster)
Port 7 = G-Port (array02 master)	Port 7 = G-Port (array02 altmaster)
Port 8 = G-Port (array03 master)	Port 8 = G-Port (array03 altmaster)
Port 9 = G-Port (array04 master)	Port 9 = G-Port (array04 altmaster)
Port 10 = G-Port (array10 master)	Port 10 = G-Port (array10 altmaster)
Port 11 = G-Port (array11 master)	Port 11 = G-Port (array11 altmaster)
Port 12 = G-Port (array12 master)	Port 12 = G-Port (array12 altmaster)
Port 13 = G-Port (array13 master)	Port 13 = G-Port (array13 altmaster)
Port 14 = G-Port (array14 master)	Port 14 = G-Port (array14 altmaster)
Port 15 = G-Port (array15 master)	Port 15 = G-Port (array15 altmaster)

3.4 IP Address Settings

The IP addressing configurations are given in TABLE 3-8.

TABLE 3-8 IP Addressing Configurations

IP Address	Designator	Description
127.0.0.1	`localhost`	Standard UNIX loopback
192.168.0.2	`sp`	dmfe 1 Ethernet port log host
192.168.0.40	`array00`	Lowest Sun StorEdge 6020 arrays in first cabinet
192.168.0.41	`array01`	Second Sun StorEdge 6020 arrays in first cabinet

TABLE 3-8 IP Addressing Configurations *(Continued)*

IP Address	Designator	Description
192.168.0.42	array02	Third Sun StorEdge 6020 arrays in first cabinet
192.168.0.43	array03	Fourth Sun StorEdge 6020 arrays in first cabinet
192.168.0.44	array04	Fifth Sun StorEdge 6020 arrays in first cabinet
192.168.0.50	array10	Lowest Sun StorEdge 6020 arrays in second cabinet
192.168.0.51	array11	Second Sun StorEdge 6020 arrays from bottom in second cabinet
192.168.0.52	array12	Third Sun StorEdge 6020 arrays from bottom in second cabinet
192.168.0.53	array13	Fourth Sun StorEdge 6020 arrays from bottom in second cabinet
192.168.0.54	array14	Fifth Sun StorEdge 6020 arrays from bottom in second cabinet
192.168.0.55	array15	Sixth Sun StorEdge 6020 arrays from bottom in second cabinet

The numbering scheme used to calculate the IP addresses depends on the Sun StorEdge 6320 system ID number. If the Sun StorEdge 6320 system firewall is 10.0.0.*n*, the Storage Service Processor IP address is 10.0.0.*n*+8, and the IP address for the Storage Service Processor accessory tray will be 10.0.0.*n*+1. The LAN IP addresses for the first eight Sun StorEdge 6320 systems shipped to the same site are listed in TABLE 3-9.

TABLE 3-9 Storage Service Processor LAN IP Addresses

IP Address	Designator	Description
10.0.0.242	new_firewall	Default factory address for the Sun StorEdge 6320 system firewall
10.0.0.243	new_ntc	Default factory address for the Network Terminal Concentrator (NTC), which is inside the Storage Service Processor accessory tray
10.0.0.250	new_sp new_sp.	Default factory address for the Storage Service Processor
10.0.0.2	sp0-firewall	First Sun StorEdge 6320 system firewall
10.0.0.3	sp0-ntc	First Storage Service Processor accessory tray (NTC)
10.0.0.10	sp0 sp0.	First Storage Service Processor
10.0.0.12	sp1-firewall	Second Sun StorEdge 6320 system firewall

TABLE 3-9 Storage Service Processor LAN IP Addresses *(Continued)*

IP Address	Designator	Description
10.0.0.13	sp1-ntc	Second Storage Service Processor accessory tray (NTC)
10.0.0.20	sp1 sp1.	Second Storage Service Processor
10.0.0.22	sp2-firewall	Third Sun StorEdge 6320 system firewall
10.0.0.23	sp2-ntc	Third Storage Service Processor accessory tray (NTC)
10.0.0.30	sp2 sp2.	Third Storage Service Processor
10.0.0.32	sp3-firewall	Fourth Sun StorEdge 6320 system firewall
10.0.0.33	sp3-ntc	Fourth Storage Service Processor accessory tray (NTC)
10.0.0.40	sp3 sp3.	Fourth Storage Service Processor
10.0.0.42	sp4-firewall	Fifth Sun StorEdge 6320 system firewall
10.0.0.43	sp4-ntc	Fifth Storage Service Processor accessory tray (NTC)
10.0.0.50	sp4 sp4.	Fifth Storage Service Processor
10.0.0.52	sp5-firewall	Sixth Sun StorEdge 6320 system firewall
10.0.0.53	sp5-ntc	Sixth Storage Service Processor accessory tray (NTC)
10.0.0.60	sp5 sp5.	Sixth Storage Service Processor
10.0.0.62	sp6-firewall	Seventh Sun StorEdge 6320 system firewall
10.0.0.63	sp6-ntc	Seventh Storage Service Processor accessory tray (NTC)
10.0.0.70	sp6 sp6.	Seventh Storage Service Processor
10.0.0.72	sp7-firewall	Eighth Sun StorEdge 6320 system firewall
10.0.0.73	sp7-ntc	Eighth Storage Service Processor accessory tray (NTC)
10.0.0.80	sp7 sp7.	Eighth Storage Service Processor

CHAPTER 4

Configuration Options and Supported Features

This chapter describes the features associated with the supported Sun StorEdge 6320 system configurations.

This chapter is organized as follows:

4.1 Standalone With No Remote Service

A standalone Sun StorEdge 6320 system can be configured with no remote service. In a standalone configuration with no remote service option, the Storage Service Processor must be configured as a master service processor.

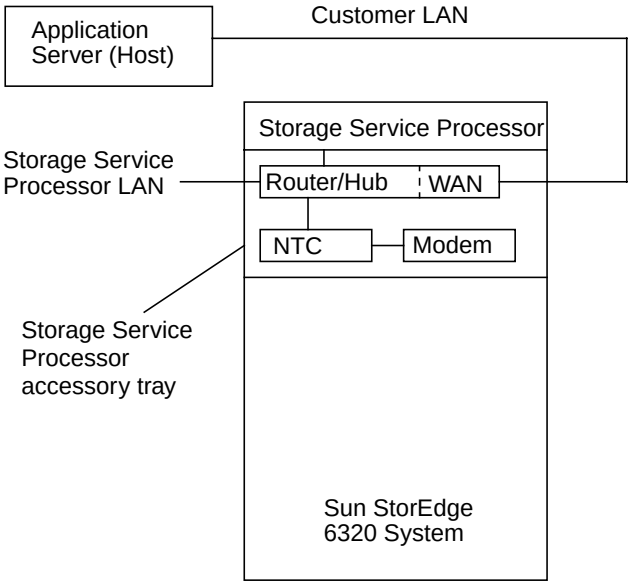


FIGURE 4-1 Standalone Sun StorEdge 6320 System With No Remote Service

The features supported in this configuration are:

- Storage Automated Diagnostic Environment
- Local or host access to monitoring, component management, and alerts
- One customer LAN address for each Sun StorEdge 6320 system
- Storage Service Processor serviceability using the console connection (NTC)
- Host access through the Storage Service Processor by way of one customer LAN address to the Storage Automated Diagnostic Environment software

4.2 Remote Service to a Single Unit

This configuration offers remote service to a single Sun StorEdge 6320 system.

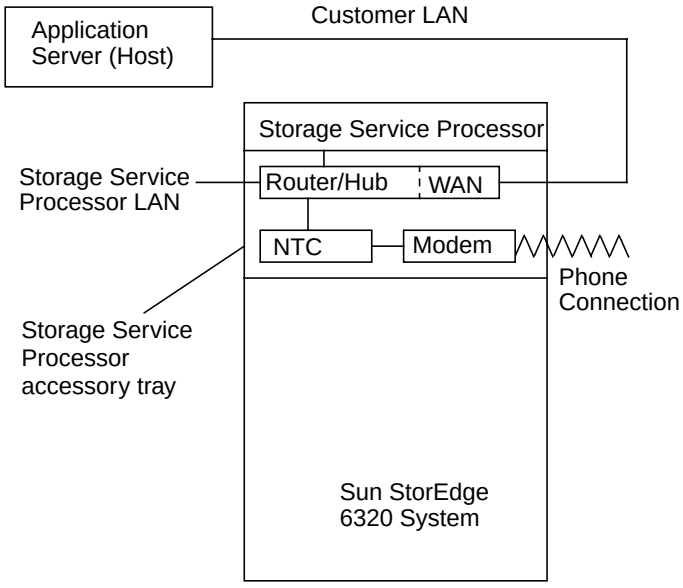


FIGURE 4-2 Remote Service to a Single Sun StorEdge 6320 System

For security reasons, inbound `telnet`(1) and `ftp`(1) connections to the Storage Service Processor have been disabled.

The features supported in this configuration are:

- Storage Automated Diagnostic Environment
- Remote services by phone connection
- Exported product telemetry data stream
- Storage Service Processor serviceability using the console connection (NTC)
- Host access through the Storage Service Processor by way of one customer LAN address to the Storage Automated Diagnostic Environment software

4.3 Remote Service to Multiple Units

This configuration offers remote service to multiple Storage Service Processors in the configuration. Aggregation is only supported on the Storage Service Processor LAN for remote connectivity purposes.

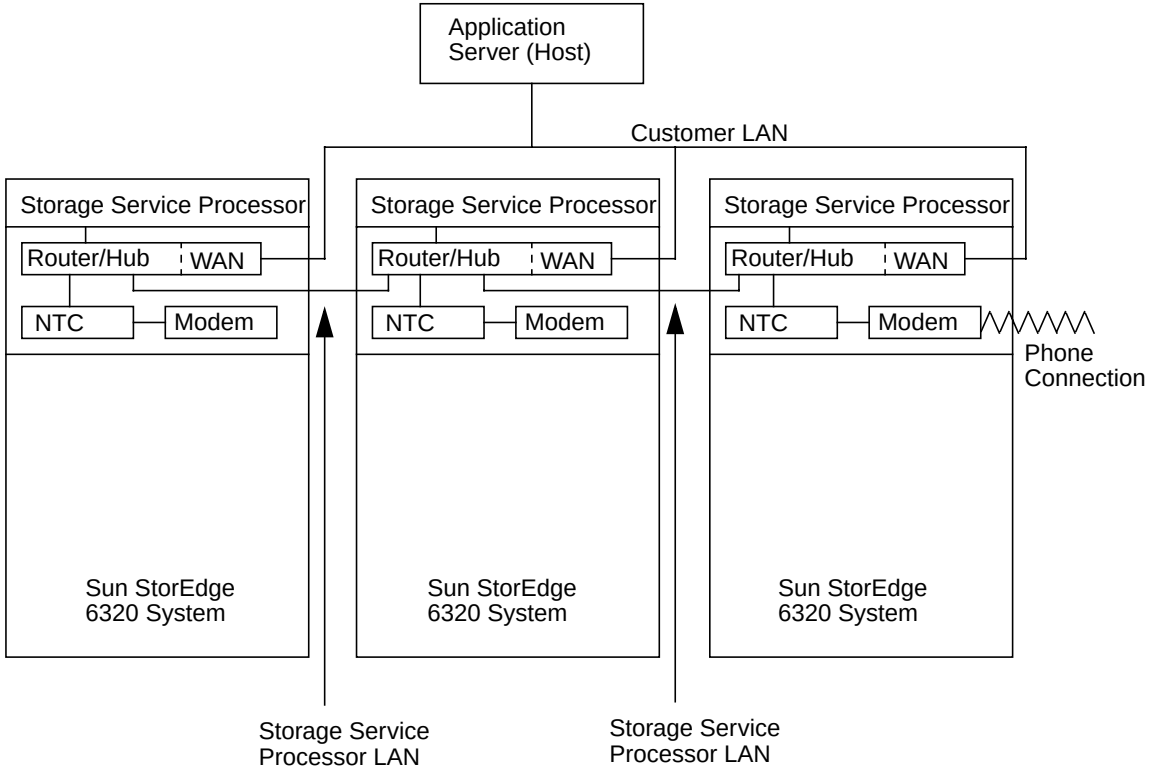


FIGURE 4-3 Remote Service to Multiple Sun StorEdge 6320 Systems

Supported features in this configuration are:

- Storage Automated Diagnostic Environment
- Remote services
- Exported product telemetry data stream
- Storage Service Processor serviceability using a NTC connection
- Host access through the Storage Service Processor by way of one customer LAN to address or Storage Service Processor LAN
- Aggregation of Storage Service Processors for remote service and alert/telemetry

CHAPTER 5

Sun StorEdge Configuration Service Software

This chapter provides instructions for using the configuration utilities to configure the various components of the Sun StorEdge 6320 systems.

This chapter is organized as follows:

5.1 Overview of the Software Interface

The Sun StorEdge Configuration Service software enables you to configure and manage the Sun StorEdge 6320 systems. The software is available for use through a web-browser user interface (UI) and the command-line interface (CLI) `sscs`. The software is the only supported customer management interface to the Sun StorEdge 6320 system.

All software features are available through the UI and CLI. You can use either interface to manage your storage. Using this software, you can:

- Manage users who can use the software
- Configure the network interface (customer LAN)
- Set the email contact address
- Manage the arrays
- Create initiators and optionally add initiators to a group
- Create initiator groups and add initiators to a group
- Create volume groups

- Create a volume, set the LUN number, and add it to a volume group
- Manage remote power operation

Note – The UI version of the software includes wizards that help simplify the tasks of creating volumes, volume groups, storage pools, and initiators.

5.2 Using the Web-Browser User Interface

Note – This chapter describes the basic features of the web-browser UI. The online help for the UI describes specific features in more detail.

You can log in to the UI through a web browser. The software is supported for the following browsers:

- Netscape Navigator™, minimum revision level 4.79 (Netscape version 6 or 7 is preferred)
- Microsoft Internet Explorer, minimum revision level 5.0

You can manage the Storage Service Processor, power sequencers, storage arrays, and related system network features through the UI . The UI also enables you to launch the Storage Automated Diagnostic Environment software application. This application provides fault management and health reporting for Sun storage devices.

You can access each page of the UI by clicking the labeled tab:

- “Logging In and Out of the UI” on page 5-3
- “Administering Users” on page 5-5
- “Array Management” on page 5-6
- “Administration” on page 5-6
- “Jobs” on page 5-7
- “Storage Access” on page 5-7
- “Tasks and Related Pages” on page 5-8

5.2.1 Logging In and Out of the UI

The following procedures describe how to log in and out of the user interface. Only users with passwords on the Storage Service Processor can log in. See TABLE 5-1 for the supported Storage Service Processor logins and default passwords.

TABLE 5-1 Default Storage Service Processor Users and Initial Passwords

User	Initial Password
admin	!admin
storage	!storage
guest	!guest

The UI supports both secure and non-secure connections through the following default ports:

- 9080 - Use this HTTP port for nonsecure access
- 9443 - Use this HTTPS port for secure access, especially if you are concerned about password security

5.2.1.1 Logging In

1. **Open a web browser such as Netscape Navigator.**
2. **Type one of the following URLs:**

   hostname is the name assigned to the wide area network port of the hub. For Sun StorEdge 6000 family configurations that include a Storage Service Processor, the default host name is new_sp.

   - For a non-secure HTTP server connection:

   http://*hostname***:9080/**

   - For a secure HTTPS server connection:

   https://*hostname***:9443/**

   The Login page is displayed.

3. **Log in as the admin:**

```
User Name: admin
Password: !admin
```

4. **Click Log In.**

The Array Management main menu page is displayed, as shown in FIGURE 5-1.

5.2.1.2 Logging Out

- **Click Log Out from any page in the UI.**

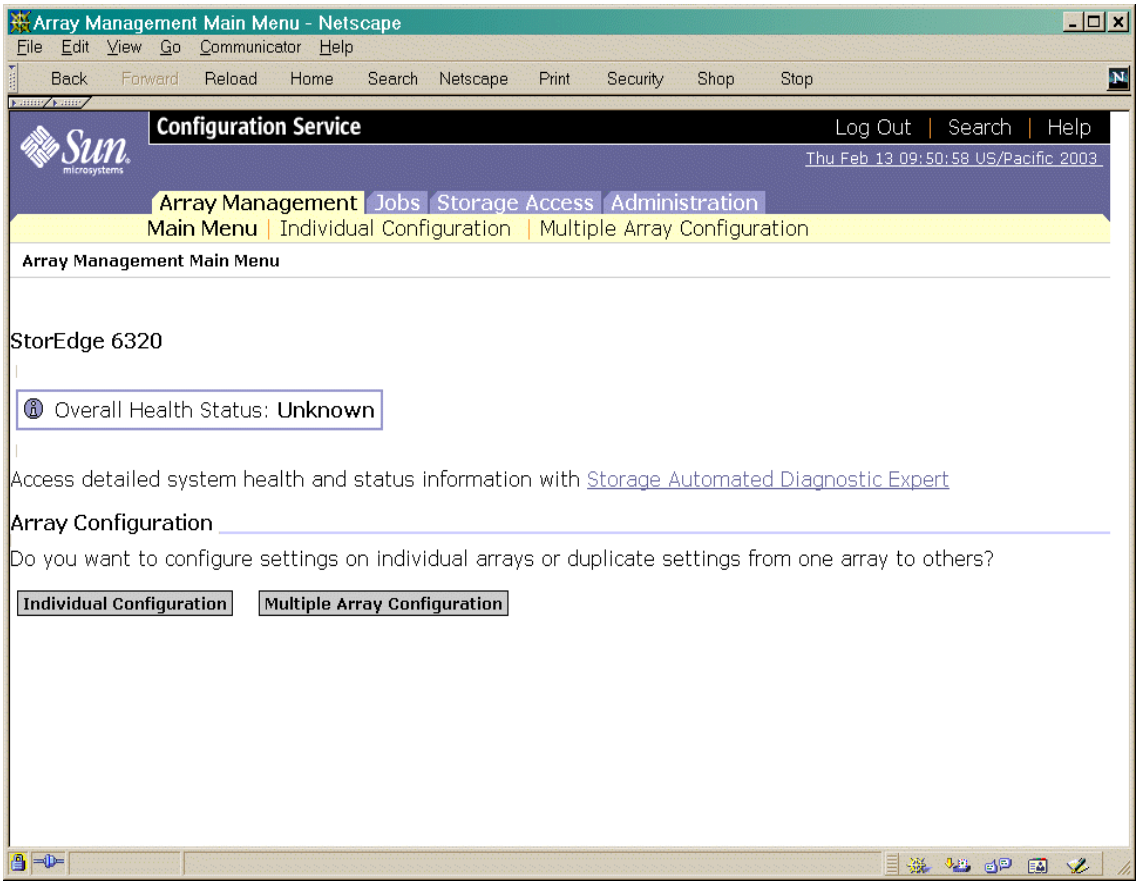


FIGURE 5-1 Array Management Main Menu Page

5.2.2 Administering Users

This section describes how to manage users and their access rights to the software.

The Sun StorEdge 6320 systems are configured with the three user accounts shown in TABLE 5-2. The UI and CLI enable you to set passwords for the accounts. As the `admin` user, you authorize users to access the software and system. The user accounts are as follows:

TABLE 5-2 User Accounts

User Account	Description
`admin`	An `admin` user has all administration privileges. The `admin` user can add, modify, and delete users and modify system attributes on the Administration page.
`storage`	A `storage` user can use most of the software features related to storage device configuration. The Administration page is not available to this user. This user can use the features available from the Array Management and Storage Access pages.
`guest`	A `guest` has read-only privileges and can view the information in the UI pages. This user cannot modify any settings or features.

The Passwords link on the Administration page enables you to set passwords for the three user accounts that are allowed to access the UI. Once added, a user can log in to the software using the `admin`, `storage`, or `guest` user name and password.

Note – See TABLE 5-1 for user account passwords.

5.2.2.1 Creating or Modifying a User Password

1. **Click the Passwords link on the Administration Page.**
2. **Type a new password in the Enter New Password and Confirm New Password fields for the user type you want.**
3. **Click Save.**

5.2.2.2 Managing Email Notification

The Notifications page displays a table that summarizes the categories of events that have occurred in the system. You can display details about an event by clicking a link in the Event Category column.

The page that is displayed enables you to manage the email notification list. The system sends event information, such as when volumes have been deleted, when storage pools are created, and so on, to users whose email address you enter.

5.2.3 Array Management

The Array Management main menu is the default page that is displayed after you log in to the software. From this page, you can:

- Configure specific storage arrays
- Configure multiple arrays by duplicating an existing array's settings to another array

This page also enables you to check detailed system and device health status by launching the Storage Automated Diagnostic Environment software.

5.2.4 Administration

The Administration page enables you to configure various settings for the Sun StorEdge 6300 family.

- General system settings, including power and boot (start up) options
- Network settings
- System time
- Passwords for the `admin`, `storage`, and `guest` users
- Firewall port filtering
- Email event notifications
- System logs of events and alarms
- System report of arrays and storage pools

Caution – When you change array settings, data found on any detected volumes is deleted. When you change an existing array profile, data found on any detected volumes is deleted. When you change an existing profile to a new profile, the existing profile's settings (such as cache settings) are copied to the new profile and the existing profile is deleted.

5.2.5 Jobs

The Jobs page displays jobs that the software is currently performing such as:

- Creating storage pools
- Creating volumes
- Duplicating tray characteristics

5.2.6 Storage Access

The Storage Access page shows a table of existing storage arrays that you can select to manage:

- Volume groups
- Initiators and initiator groups
- Array initiator groups, where you can import initiator groups from one array to another

The default view when this page is displayed is Individual Array Access Management. The page includes a Multiple Array Access Management link that enables you to export initiator groups from one array and import them to another array.

5.2.7 Tasks and Related Pages

TABLE 5-3 lists the tasks you can perform in the web-browser UI and the UI pages where you perform the task.

TABLE 5-3 Software Tasks and Related Web-Browser UI Pages

To Perform This Task	See This Page
Manage arrays: • Array details • Volume management • Storage pool management • Fibre Channel configuration	Array Management page, including the Individual Array Configuration and Multiple Array Configuration links
Display and manage information: • Jobs • Logs • Status reports	Jobs page Administration page
Manage storage access: • Volume groups • Initiators • Initiator groups	Storage Access page, including the Individual Array Access Management and Multiple Array Access Management links
Configure system settings: • General system settings, including power options • Network settings • System time • Passwords for the admin, storage, and guest users • Port filtering for the integrated firewall • Notifications for emailing events	Administration page, available only to the admin user.

5.3 Using the Command-Line Interface

This section describes the sscs command line and options. The sscs(1M) command enables you to perform the same software operations as those available on the web browser. Any changes made using this command are shown in the web-browser user interface when you refresh or reload the related page in your browser.

The sscs command has an inactivity timer of 30 minutes to address security concerns. If you don't issue any sscs commands for 30 minutes, the session is terminated. When you issue a command after the time out, you will be told to log in first.

This section is organized as follows:

5.3.1 Command Syntax and Usage Summary

The sscs command is the command-line interface (CLI) for the software. The sscs command enables you to manage the storage components in your array, such as initiators, volumes, and so on. These commands are the CLI equivalent of functions that are also available from the web-browser user interface.

Depending on your user name, you might not be able to execute all commands. The three users associated with the software permissions are `admin`, `storage`, and `guest` shown in TABLE 5-4.

TABLE 5-4 Supported User Accounts

User	Description
`admin`	An `admin` user has all administration privileges. The `admin` user can add, modify, and delete users and storage array components in the software.
`storage`	A `storage` user can use most of the software features related to storage device configuration. The Administration page is not available to this user.
`guest`	A `guest` has read-only privileges and can view the features of the software. The Administration page is not available to the `guest` user.

5.3.1.1 Displaying a List of Subcommands

- **Type:**

```
# sscs --help
```

5.3.1.2 Displaying a Usage Summary of the Subcommands

- **Type the following where *subcommand* is one of the subcommands shown in** TABLE 5-5.**:**

```
# sscs subcommand --help
```

5.3.1.3 Short and Long Option Names

Note – When you use a double hyphen option, do not type a space between the hyphens.

The sscs command can accept a short or long name for each option. A short name option requires a single hyphen (-). A long name option requires a double hyphen (--) in the command-line arguments tables, in this chapter, the short name option and the long name options are separated by a comma. In the following example you would use either the -a or the --array argument:

```
# sscs create { -a | --array } array-name initgroup group-name
```

5.3.1.4 sscs Subcommand Tables

TABLE 5-5 shows the sscs subcommands, sorted by alphabetical order. You can also refer to the sscs man page.

TABLE 5-5 sscs Subcommands Sorted Alphabetically

Subcommand	See This Section
add initgroup	“Adding an Initiator Group” on page 5-28
add -v *vol-name* volgroup	“Adding a Volume Group” on page 5-25
create initgroup	“Creating an Initiator Group” on page 5-27
create pool	“Creating a Storage Pool” on page 5-20
create volgroup	“Creating a Volume Group” on page 5-24
create volume	“Creating a Volume” on page 5-22
delete initgroup	“Deleting an Initiator Group” on page 5-28
delete pool	“Deleting a Storage Pool” on page 5-21
delete volgroup	“Deleting a Volume Group” on page 5-26
delete volume	“Deleting a Volume” on page 5-23
list array	“Listing Disk Arrays” on page 5-30
list date	“Listing the Date and Time” on page 5-30
list firewall	“Listing the Firewall” on page 5-30
list initgroup	“Listing the Initiator Group” on page 5-31
list initiator	“Listing the Initiator” on page 5-30
list jobs	“Listing the Jobs” on page 5-31
list log	“Listing the Log Messages” on page 5-31
list net	“Listing the Network Configuration” on page 5-32
list ntp	“Listing the Network Time Protocol” on page 5-33

TABLE 5-5 `sscs` Subcommands Sorted Alphabetically *(Continued)*

Subcommand	See This Section
`list pool`	"Listing the Storage Pools" on page 5-33
`list power`	"Listing the Power Status" on page 5-33
`list system`	"Listing the Storage Service Processor Information" on page 5-33
`list timezone`	"Listing the Time Zone" on page 5-34
`list tray`	"Listing the Storage Trays" on page 5-34
`list volgroup`	"Listing the Volume Groups" on page 5-34
`list volume`	"Listing the Volumes" on page 5-34
`login`	"Logging In" on page 5-13
`logout`	"Logging Out" on page 5-13
`modify array`	"Modifying the Sun StorEdge 6020 Arrays" on page 5-19
`modify date`	"Modifying the Date and Time" on page 5-16
`modify firewall`	"Modifying the Firewall" on page 5-17
`modify initiator`	"Modifying an Initiator" on page 5-27
`modify net`	"Modifying the Network Addresses" on page 5-15
`modify ntp`	"Modifying the Network Time Protocol Server" on page 15
`modify notification`	"Managing Email Notification" on page 5-14
`modify password`	"Creating or Modifying a User Password" on page 5-14
`modify pool`	"Modifying a Storage Pool" on page 5-21
`modify power`	"Powering the System" on page 5-18
`modify timezone`	"Modifying the Time Zone" on page 5-17
`modify volgroup`	"Modifying a Volume Group" on page 5-25
`modify volume`	"Modifying a Volume" on page 5-23
`remove -i` *wwn* `initgroup`	"Removing an Initiator from an Initiator Group" on page 5-29
`remove volgroup`	"Removing a Volume or an Initiator Group from a Volume Group" on page 5-26

5.3.2 Logging In and Out

The following commands enable you to log in to and out of `sscs`. Only users with passwords on the Storage Service Processor can log in; see TABLE 5-1 and "Administering Users" on page 5-13.

5.3.2.1 Logging In

The `sscs login` command-line syntax is shown below.

```
# sscs login {-u username -h hostname} [-f] [-s]
```

TABLE 5-6 describes the arguments associated with the `login` subcommand:

TABLE 5-6 `sscs login` Command-Line Arguments

Argument	Description
-u, --username *username*	Specifies the user name of `admin`, `storage`, or `guest`.
-h, --hostname *hostname*	Specifies the host name of the Storage Service Processor.
-f, --force	Forces a login to the Storage Service Processor if another user with the same user name is already logged in.
-s, --https	Log in using a secure HTTP connection.

5.3.2.2 Logging Out

- **Type**:

```
# sscs logout
```

5.3.3 Administering Users

This section describes how to use the `sscs` commands for administering the `admin`, `storage`, and `guest` users. When the administrator assigns passwords to users, users can perform functions according to their account privileges. See TABLE 5-1 for user account passwords. See TABLE 5-4 for a description of the user accounts and privileges.

5.3.3.1 Creating or Modifying a User Password

Use the following sscs arguments to create or modify the password for the user.

```
# sscs modify password
```

To create the password for the Storage Service Processor user accounts, enter the *username* and the command prompts you to enter a password. For example:

```
# sscs modify password username
password:
```

The valid user names are admin, storage, and guest.

5.3.3.2 Managing Email Notification

When a storage device alarm or event occurs, email is sent by the software to users designated by the administrator. These commands enable the administrator to manage this capability.

Modify or create an email notification. This address is the fully-qualified (user name and domain) address that the sscs command uses to send alarms, alerts, or other events. For example:

```
# sscs modify notification email-address
```

Where *email-address* is a fully-qualified email address.

You can list one or more email contact addresses configured for status alerts by using the list argument.

5.3.4 Configuring System Settings

The sscs commands described in the following subsection enables the administrator (admin) user to configure the Storage Service Processor settings.

5.3.4.1 Modifying the Network Addresses

Use this command to modify the network addresses of the Storage Service Processor. The `sscs modify net` command-line syntax is shown below.

```
# sscs modify -n ip-address {-d {on | off} | -i ip-address -g ip-address
  -m ip-address } net
```

TABLE 5-7 describes the arguments associated with the `modify net` subcommand.

TABLE 5-7 `sscs modify net` Command-Line Arguments

Argument	Description
`-n, --nameserver` *ip-address*	Specifies the domain name server (DNS) IP address.
`-d, --dhcp {on | off}`	Specifies `on` if the Storage Service Processor gets its network addresses from a DHCP server.
`-i, --ipaddress` *ip-address*	Specifies the Storage Service Processor IP address. Use if `-d, --dhcp` is `off`.
`-g, --gateway` *ip-address*	Specifies the gateway IP address. Use if `-d, --dhcp` is `off`.
`-m, --netmask` *ip-address*	Specifies the gateway IP address. Use if `-d, --dhcp` is `off`.

5.3.4.2 Modifying the Network Time Protocol Server

Use this command to modify or disable the Network Time Protocol (NTP) server IP address with the following arguments and options.

The sscs modify ntp command-line syntax is shown below:

```
# sscs modify [-d | -e ip-address] ntp [ip-address]
```

TABLE 5-8 describes the arguments associated with the `modify ntp` subcommand.

TABLE 5-8 `sscs modify ntp` Command-Line Arguments

Argument	Description
-d	Disable the use of the NTP server. The use of *ip-address* is optional in this case.
-e	Enable the use of the NTP server specified by the *ip-address* option. You must specify the server IP address.
ip-address	Specifies the NTP server IP address.

5.3.4.3 Modifying the Date and Time

Use this command to modify the date and time on the Storage Service Processor with the following arguments and options.

Note – To specify a four-digit year, use the *cc* and *yy* options

---

The `sscs` modify date command-line syntax is shown below.

```
# sscs modify -G { true | false} date [ [mmdd] HHMM | mmddHHMM
  [cc] yy [.SS] ]
```

TABLE 5-9 describes the arguments associated with the `modify date` subcommand.

TABLE 5-9 `sscs modify date` Command-Line Arguments

Argument	Description
`-G,--GMT {true | false}`	Specifies enable (true) or disable (false) for Greenwich Mean Time (GMT).
mmdd	Specifies the month and day number. For example, 0331 for March 31.
HHMM	Specifies the hour and minute. The hour number is based on a 24-hour clock; for example, 1:30 PM is 1330.
cc	Specifies the century minus one. For example, specify the twenty-first century as 20.
yy	Specifies the two-digit year number.
SS	Specifies the seconds of the hour.

5.3.4.4 Modifying the Time Zone

Use this command to set the time zone on the Storage Service Processor. The `sscs modify timezone` command-line syntax is shown below.

```
# sscs modify timezone timezone
```

timezone is a valid time zone of up to 128 characters long. The time zone information in the Solaris operating environment is found in the `/usr/share/lib/zoneinfo` file.

5.3.4.5 Modifying the Firewall

Use this command to set the firewall port options for application and user access. The `sscs modify firewall` command-line syntax is shown below.

```
# sscs modify [-r {open | close}] [-R {open | close}]
  [-s {open | close}] [-S) {open | close}] [-m {open | close} ]
  [-c {open | close}] [-h {open | close}] [-n) {open | close} ]
  [-p {open | close}] firewall
```

TABLE 5-10 describes the arguments associated with the `modify firewall` subcommand.

TABLE 5-10 `sscs modify firewall` Command-Line Arguments

Argument	Description
`-r,--array-management-http {open | close}`	Open or close the non-secure HTTP port on the Storage Service Processor.
`-R,--array-management-https {open | close}`	Open or close the secure HTTP port on the Storage Service Processor.
`-s,--service-http {open | close}`	Open or close the non-secure port on the Storage Service Processor for service personnel.
`-S,--service-https {open | close}`	Open or close the secure port on the Storage Service Processor for service personnel.
`-m,--snmp {open | close}`	Open or close the Simple Network Management Protocol port on the Storage Service Processor for third-party device management application access.
`-c,--cim-http {open | close}`	Open or close the Common Information Model port on the Storage Service Processor for CIM-compatible web-based management application access

TABLE 5-10 `sscs modify firewall` Command-Line Arguments

`-h,--ssh {open | close}`	Open or close the Secure Shell `tty` port on the Storage Service Processor for secure telnet access.
`-n,--ntp {open | close}`	Open or close the Network Time Protocol port on the Storage Service Processor for access to an NTP server.
`-p,--patchpro {open | close}`	Open or close the port on the Storage Service Processor to enable access to the Sun PatchPro web page, providing updates for firmware and software updates

5.3.4.6 Powering the System

Use this command to power down the system and arrays, or just the arrays. The `sscs modify power` command-line syntax is shown below.

```
# sscs modify power { on | off | down }
```

TABLE 5-11 describes the arguments associated with the `modify power` subcommand.

TABLE 5-11 `sscs modify power` Command-Line Arguments

Argument	Description
on	Specifies a power on or restore from a partial system shut down.
off	Specifies a full shut down, including the Storage Service Processor.
down	Specifies a partial system shut down; the Storage Service Processor remains powered on and the storage arrays are powered off.

5.3.5 Managing the Sun StorEdge 6020 Arrays

Use the `sscs` commands described in the following subsection to configure the Sun StorEdge 6020 array attributes and components.

Do not use spaces, commas, or special characters (?,*,!,@,%, or &) in the array or initiator group names.

Caution – When you change array settings, data found on any detected volumes is deleted. When you change an existing array profile, data found on any detected volumes is deleted. When you change an existing profile to a new profile, the existing profile's settings (such as cache settings) are copied to the new profile and the existing profile is deleted.

5.3.5.1 Modifying the Sun StorEdge 6020 Arrays

Use this command to modify the Sun Storage 6020 arrays. The `sscs modify array` command-line syntax is shown below.

```
# sscs modify [-s {16K | 32K | 64K}] [-c {auto | writebehind |
   writethrough | off}] [-r {on | off}] [-R {high | medium | low}]
   [-f {explicit | implicit}] [-p {auto | 1 | 2}] [-t {auto | loop |
   fabric_p2p}] [-d text] array array-name
```

TABLE 5-12 describes the arguments associated with the `modify array` subcommand.

TABLE 5-12 `sscs modify array` Command-Line Arguments

Argument	Description
`-s,--segment {16K | 32K | 64K}`	Specify a segment size of 16 Kbytes, 32 Kbytes, or 64 Kbytes.
`-c,--cache {auto | writebehind | writethrough | off}`	Specify the volume cache characteristics or disable the cache. Specify off for no read or write caching. • auto - use write-behind or write-through caching depending on I/O characteristics. • writebehind - All read and write operations are written to cache. • writethrough - data is written to cache and then to disk.
`-r,--readahead {on | off}`	Enable or disable the volume read-ahead cache.
`-R,--reconrate {high | medium | low}`	Specify the LUN reconstruction rate. Selecting high might impact system I/O performance; selecting low might increase system I/O performance.
`-f,--failover {explicit | implicit}`	Specify the LUN failover mode.

TABLE 5-12 `sscs modify array` Command-Line Arguments

Argument	Description
`-P,--fcportspeed {auto | 1 | 2}`	Specify the Fibre Channel port speed: auto, 1 Gbyte, or 2 Gbyte.
`-F,--fctopology {auto | loop | fabric_p2p}`	Specify the Fibre Channel topology for the array: auto, loop (arbitrated loop), or `fabric_p2p` (point-to-point).
`-d,--description` *text*	Type text describing the array, up to 16 characters long

5.3.6 Managing Storage Pools

Use the `sscs` commands described in these subsections to create and manage storage pools on the Sun StorEdge 6020 arrays. You can create and delete storage pools, place the storage in the pools online or offline, and configure related pool settings.

5.3.6.1 Creating a Storage Pool

Use this command to create a storage pool. After creating the pool, use the `create volume` subcommand to specify volumes and the `add` subcommand to add storage volumes to the pool. The `sscs create pool` command-line syntax is shown below.

```
# sscs create -a array-name -t trayid -d number -r {0 | 1 | 5} -s {0 | 1}
   pool pool-name
```

TABLE 5-13 describes the arguments associated with the `create pool` subcommand.

TABLE 5-13 `sscs create pool` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-t,--trayid` *trayid*	Specifies a disk tray identification name *trayid* up to 24 characters long.
`-d,--drives` *num*	Specifies the number of drives in the pool.

TABLE 5-13 `sscs create pool` Command-Line Arguments

Argument	Description
`-r,--raidlevel {0 | 1 | 5}`	Specifies RAID levels 0, 1, or 5.
`-s,--spare {0 | 1}`	Specifies if the pool contains a spare drive: specify `1` if the pool contains a spare, `0` if it does not contain a spare.
`pool` *pool-name*	Specifies a *pool-name* up to 12 characters long.

5.3.6.2 Modifying a Storage Pool

Use this command to modify the state of a storage pool, placing the pool storage online or offline. The `sscs modify pool` command-line syntax is shown below.

```
# sscs modify -a array-name -s {online | offline} pool pool-name
```

TABLE 5-14 describes the arguments associated with the `modify pool` subcommand.

TABLE 5-14 `sscs modify pool` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-s,--status online`	Place the pool online
`-s,--status offline`	Place the pool offline
`pool` *pool-name*	Specifies a *pool-name* up to 12 characters long.

5.3.6.3 Deleting a Storage Pool

Use this command to delete a storage pool that exists in a specified Sun StorEdge 6020 array. The `sscs delete pool` command-line syntax is shown below.

```
# sscs delete -a array-name pool pool-name
```

TABLE 5-15 describes the arguments associated with the `delete pool` subcommand.

TABLE 5-15 `sscs delete pool` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`pool` *pool-name*	Specifies a *pool-name* up to 12 characters long.

5.3.7 Managing Sun StorEdge 6020 Array Volumes

Use the `sscs` commands described in these subsections to create and manage volumes on the Sun StorEdge 6020 arrays. You can create, modify, and delete volumes.

Note – To add or remove a volume from a volume group, see "Managing Volume Groups" on page 5-24.

5.3.7.1 Creating a Volume

Use this command to create a volume on a specified Sun StorEdge 6020 array. The `sscs create volume` command-line syntax is shown below.

```
# sscs create -a array-name -p pool-name -s sizegb
   -P { none | readwrite | readonly} -n lun volume vol-name
```

TABLE 5-16 describes the arguments associated with the `create volume` subcommand.

TABLE 5-16 `sscs create volume` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-p,--pool` *pool-name*	Specifies the storage *pool-name* the volume belongs to. The *pool-name* can be up to 12 characters long.
`-s,--size` *size*`gb |` *size*`mb`	Specifies the volume *size* in gigabytes or megabytes. The minimum volume size is 10 Mbytes

TABLE 5-16 `sscs create volume` Command-Line Arguments

Argument	Description
`-P,--permissions none | readwrite | readonly`	Specifies the user access rights to this drive. The default setting is none.
`-n,--number` *lun*	Specify the logical unit number *lun* of the volume.
`volume` *vol-name*	*vol-name* can be up to 80 characters long.

5.3.7.2 Modifying a Volume

Use this command to modify a volume's attributes on a specified Sun StorEdge 6020 array. The `sscs modify volume` command-line syntax is shown below.

```
# sscs modify -a array-name -P { none | readwrite | readonly}
   volume vol-name
```

TABLE 5-17 describes the arguments associated with the `modify volume` subcommand.

TABLE 5-17 `sscs modify volume` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-P,--permissions none | readwrite | readonly`	Specifies the user access rights to this drive. The default setting is none.
`volume` *vol-name*	Specifies a *vol-name* up to 80 characters long.

5.3.7.3 Deleting a Volume

Use this command to delete a volume on a specified Sun StorEdge 6020 array. The `sscs delete volume` command-line syntax is shown below.

```
# sscs delete -a array-name volume vol-name
```

TABLE 5-18 describes the arguments associated with the `delete volume` subcommand.

TABLE 5-18 `sscs delete volume` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`volume` *vol-name*	Specifies a *vol-name* up to 80 characters long.

5.3.8 Managing Volume Groups

Use the `sscs` commands described in these subsections to manage volume groups on the Sun StorEdge 6020 arrays. You can create, add, modify, remove, and delete volume groups.

Note – To manage volumes, see "Managing Sun StorEdge 6020 Array Volumes" on page 5-22.

5.3.8.1 Creating a Volume Group

Use this command to create a volume group in a disk array. After creating the volume group, use the `create volume` subcommand to create volumes and the `add` subcommand to add volumes to the group. The `sscs create volgroup` command-line syntax is shown below.

```
# sscs create -a array-name volgroup volgroup-name
```

TABLE 5-19 describes the arguments associated with the `create volgroup` subcommand.

TABLE 5-19 `sscs create volgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`volgroup` *volgroup-name*	Specifies a *volgroup-name* up to 40 characters long.

5.3.8.2 Adding a Volume Group

Use this command to add a storage volume to the volume group in the array. The `sscs add volgroup` command-line syntax is shown below.

```
# sscs add -a array-name -v volume-name volgroup volgroup-name
```

TABLE 5-20 describes the arguments associated with the `add volgroup` subcommand.

TABLE 5-20 `sscs add volgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-v,--volume` *vol-name*	Specifies a *vol-name* up to 80 characters long.
`volgroup` *volgroup-name*	Specifies a *volgroup-name* up to 40 characters long.

5.3.8.3 Modifying a Volume Group

Use this command to associate an initiator group with a volume group and set group access rights to volumes in the group using the modify volume group arguments. The `sscs modify volgroup` command-line syntax is shown below.

```
# sscs modify -a array-name -i initgroup-name -P {none | readwrite | readonly}
  volgroup volgroup-name
```

TABLE 5-21 describes the arguments associated with the `sscs modify volgroup` command.

TABLE 5-21 `sscs modify volgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-i,--initgroup` *initgroup-name*	Specifies an *initgroup-name* up to 16 characters long.
`-P,--permissions none | readwrite | readonly`	Specifies the user access rights to this group. The default setting is none.
`volgroup` *volgroup-name*	Specifies a *volgroup-name* up to 40 characters long.

5.3.8.4 Removing a Volume or an Initiator Group from a Volume Group

Use this command to remove a volume or an initiator group from a volume group. The volume group must exist. The `sscs remove volgroup` command-line syntax is shown below.

```
# sscs remove -a array-name [-i initgroup-name | -v vol-name ]
   volgroup volgroup-name
```

TABLE 5-22 describes the arguments associated with the `remove volgroup` subcommand.

TABLE 5-22 `sscs remove volgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`-i,--initgroup` *initgroup-name*	Specifies an *initgroup-name* up to 16 characters long.
`-v,--volume` *vol-name*	Specifies a *vol-name* up to 80 characters long.
`volgroup` *volgroup-name*	Specifies a *volgroup-name* up to 40 characters long.

5.3.8.5 Deleting a Volume Group

Use this command to delete a volume group. The volume group must exist in the specified storage array. The `sscs delete volgroup` command-line syntax is shown below.

```
# sscs delete -a array-name volgroup volgroup-name
```

TABLE 5-23 describes the arguments associated with the `delete volgroup` subcommand.

TABLE 5-23 `sscs delete volgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`volgroup` *volgroup-name*	Specifies a *vol-name* up to 40 characters long.

5.3.9 Managing Initiators and Initiator Groups

Use the `sscs` commands described in these subsections to manage initiators and initiator groups in the Sun StorEdge 6020 arrays. You can modify, create, add, and delete initiators and initiator groups.

5.3.9.1 Modifying an Initiator

Use this command to modify or create the initiator device description. The `sscs modify initiator` command-line syntax is shown below.

```
# sscs modify -d text initiator wwn
```

TABLE 5-24 describes the arguments associated with the `modify initiator` subcommand.

TABLE 5-24 `sscs modify initiator` Command-Line Arguments

Argument	Description
`-d,--description` *text*	Specifies a text *description* up to 16 characters long.
`initiator` *wwn*	Specifies an initiator by worldwide ame (*wwn*).

5.3.9.2 Creating an Initiator Group

Use this command to create an initiator group in a specified disk array. Do not use spaces, commas, or special characters (?,*,!,@,%, or &) in the array or initiator group names. After creating the initiator group, use the `add` subcommand to add devices to it.

The `sscs create initgroup` command-line syntax is shown below.

```
# sscs create -a array-name initgroup initgroup-name
```

TABLE 5-25 describes the arguments associated with the `create initgroup` subcommand.

TABLE 5-25 `sscs create initgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`initgroup` *initgroup-name*	Specifies an initiator group by name. initgroup-name can be up to 16 characters long.

5.3.9.3 Adding an Initiator Group

Use this command to add one or more devices to the initiator group name in the initiator group. Specify the device by its worldwide name (WWN). The `sscs add initgroup` command-line syntax is shown below.

```
# sscs add -a array-name -i wwn1,wwn2,... initgroup initgroup-name
```

TABLE 5-26 describes the arguments associated with the `add initgroup` subcommand.

TABLE 5-26 `sscs add initgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specify an *array-name* up to 40 characters long.
`-i,--initiator` *wwn*	Specify the device by its WWN. The *wwn* can be up to 16 hex characters. For example, `-i 210000e08b047212`.
`initgroup` *initgroup-name*	Specifies an initiator group by name. The *initgroup-name* can be up to 16 characters long.

5.3.9.4 Deleting an Initiator Group

Use this command to delete the initiator group. The initiator group must exist in the specified array. The `sscs delete initgroup` command-line syntax is shown below.

```
# sscs delete -a array-name initgroup initgroup-name
```

TABLE 5-27 describes the arguments associated with the `delete initgroup` subcommand.

TABLE 5-27 `sscs delete initgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specifies an *array-name* up to 40 characters long.
`initgroup` *initgroup-name*	Specifies an initiator group by name. *initgroup-name* can be up to 16 characters long.

5.3.9.5 Removing an Initiator from an Initiator Group

Use this command to remove an initiator from an initiator group. The `sscs remove initgroup` command-line syntax is shown below.

```
# sscs remove -a array-name -i wwn initgrp initgroup-name
```

TABLE 5-28 describes the arguments associated with the `remove initgroup` subcommand.

TABLE 5-28 `sscs remove initgroup` Command-Line Arguments

Argument	Description
`-a,--array` *array-name*	Specify an *array-name* up to 40 characters long.
`-i,--initiator` *wwn*	Specify the device by its WWN. The *wwn* can be up to 16 hex characters. For example, `-i 210000e08b047212`.
`initgroup` *initgroup-name*	Specifies an initiator group by name. *initgroup-name* can be up to 16 characters long.

5.3.10 Displaying Jobs, Logs, System Setting, and Array Components

Use the `sscs` commands described in this subsections to list details about outstanding or completed jobs, log files, system settings, and array components.

5.3.10.1 Listing Disk Arrays

This command displays the details about one or more disk arrays. If you do not specify an *array-name*, the command lists the disk array names and status only. The `sscs list array` command-line syntax is shown below.

```
# sscs list array [array-name1, array-name2, ...]
```

5.3.10.2 Listing the Date and Time

This command displays the current date and time of the Storage Service Processor in the following format:

day month day-number hour:minute:second timezone year

For example, `Thu Aug 22 16:09:36 PDT 2002`.

The `sscs list date` command-line syntax is shown below.

```
# sscs list date
```

5.3.10.3 Listing the Firewall

This command displays current firewall port filter settings. The command lists the indicated port as open (allowing traffic) or closed (disallowing traffic). The `sscs list firewall` command-line syntax is shown below.

```
# sscs list firewall
```

5.3.10.4 Listing the Initiator

This command displays information about one or more initiators. If you do not specify a worldwide name (WWN), the command lists all initiators. The `sscs list initiator` command-line syntax is shown below.

```
# sscs list -a array-name initiator [wwn1, wwn2, ...]
```

5.3.10.5 Listing the Initiator Group

This command displays information about one or more initiator groups. The `sscs list initgroup` command-line syntax is shown below.

```
# sscs list -a array-name initgroup [wwn1, wwn2, ...]
```

5.3.10.6 Listing the Jobs

This command displays information about jobs by status (current (outstanding) or completed) or by job identification number. The command lists all jobs if you do not specify any options.The `sscs list jobs` command-line syntax is shown below.

```
# sscs list [-o,--outstanding [ true | false ] |
   -c,--completed [ true | false ] ] [-i,--job-id job-id] jobs
```

You specify **true** to display these jobs and specify **false** to prevent the job list from being displayed.

5.3.10.7 Listing the Log Messages

This command displays log messages for the software. If you do not specify any options, all log messages are displayed. The command lists all jobs if you do not specify any options.The `sscs list log` command-line syntax is shown below.

```
# sscs list [[-s | -f { [mmdd]HHMM | mmddHHMM[cc]] yy }[.SS] ]
   [-t number] log
```

TABLE 5-28 describes the arguments associated with the `list log` subcommand.

TABLE 5-29 `sscs list log` Command-Line Arguments

Argument	Description
`-s,--start` [*mmdd*]*HHMM* | *mmddHHMM*[*cc*]*yy* } [.SS]	Lists all log messages starting at the date specified by the date options. Use with the `-f,--finish` subcommand to specify a date range.
`-f,--finish` { [*mmdd*]*HHMM* | *mmddHHMM*[*cc*]*yy* } [.*SS*]	Lists all log messages ending at the date specified by the date options. Use with the `-s,--start` subcommand to specify a date range.
mmdd	Specifies the month and day number. For example, 0331 for March 31.
HHMM	Specifies the hour and minute. The hour number is based on a 24-hour clock; for example, 1:30 PM is 1330.
cc	Specifies the century minus one. For example, specify the twenty-first century as 20.
yy	Specifies the two-digit year number.
SS	Specifies the seconds of the hour.
`-t,--tail` *number*	Lists the most recent log messages as specified by *number*. For example, to list the last 100 messages, type: **sscs list -t 100 log**.

5.3.10.8 Listing the Network Configuration

This command displays the array or system network configuration information. The `sscs list net` command-line syntax is shown below.

```
# sscs list net
```

5.3.10.9 Listing the Notification

This command displays one or more email notification email addresses configured for status alerts. The `sscs list notification` command-line syntax is shown below.

```
# sscs list notification
```

5.3.10.10 Listing the Network Time Protocol

This command shows Network Time Protocol IP address. The `sscs list ntp` command-line syntax is shown below.

```
# sscs list ntp
```

5.3.10.11 Listing the Storage Pools

This command displays information about one or more storage pools. If you do not specify a pool name, the command shows all pool names. The `sscs list pool` command-line syntax is shown below.

```
# sscs list pool [pool-name1, poolname2,...]
```

5.3.10.12 Listing the Power Status

This command displays the power status for the array. The command shows the status of ON, UNKNOWN, or DOWN (DOWN indicates that the array is powered down). The `sscs list power` command-line syntax is shown below.

```
# sscs list power
```

5.3.10.13 Listing the Storage Service Processor Information

This command displays the system Storage Service Processor information, such as system ID, description, and vendor and model type. The `sscs list system` command-line syntax is shown below.

```
# sscs list system
```

5.3.10.14 Listing the Time Zone

This command displays the currently-configured time zone. The `sscs list timezone` command-line syntax is shown below.

```
# sscs list timezone
```

5.3.10.15 Listing the Storage Trays

This command displays information about one or more storage trays in the array. If you do not specify a *trayid*, the command shows all trays. The `sscs list tray` command-line syntax is shown below.

```
# sscs list [-a array-name] tray [trayid1, trayid2, . . .]
```

5.3.10.16 Listing the Volume Groups

This command displays information about one or more volume groups. If you do not specify a *volgroup-name*, the command shows all volume groups. The `sscs list volgroup` command-line syntax is shown below.

```
# sscs list [-a array-name] volgroup [volgroup-name1, volgroup-name2, . . .]
```

5.3.10.17 Listing the Volumes

This command displays information about one or more volumes. If you do not specify a *vol-name*, the command shows all volumes. The `sscs list volume` command-line syntax is shown below.

```
# sscs list [-a array-name] volume [vol-name1, vol-name2, . . .]
```

CHAPTER 6

Fault Detection and Isolation Overview

This chapter provides a brief overview of the functionality provided when using the Storage Automated Diagnostic Environment 2.2 software to perform fault detection and isolation on the Sun StorEdge 6320 systems.

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

This chapter is organized as follows:

6.1 Monitoring

If the customer's host is part of the configuration, the individual components are monitored by the Storage Automated Diagnostic Environment through the out-of-band paths connected directly to the host server. See the *Storage Automated Diagnostic Environment2.2 System Edition User's Guide* for additonal information.

Out-of-band refers to the connections and devices that are not in the data path. In this case, the Storage Service Processor does not have access to the data that is stored on the Sun StorEdge 6320 systems.

6.2 Fault Detection

The Storage Automated Diagnostic Environment software running on the Storage Service Processor collects and evaluates information through out-of-band management paths to all storage devices in the Sun StorEdge 6320 system.

One way in which the Storage Service Processor can have access to the in-band diagnostic information is to have the Storage Automated Diagnostic Environment software running on the customer host. The information collected by the Storage Automated Diagnostic Environment is relayed to the Storage Service Processor so that it can aggregate the host information with the device information and send the events to Sun service for monitoring purposes.

The Storage Automated Diagnostic Environment event and alarm notifications are the result of configuring polling devices to be monitored. The polling results are generated when changes to the state and status of these devices are detected.

6.2.1 Local Monitoring

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

If you are not interested in remote monitoring or are not concerned about security you can choose to enable local monitoring of the Sun StorEdge 6320 system only. In this case, you have two choices:

- Allow the Storage Service Processor to be connected to the management LAN which provides access to one or more host servers.
- Provide a standalone workstation to be connected to the Storage Service Processor as a dedicated resource to send alerts to predetermined staff 24 hours a day, 7 days a week.

If you already have a license for Sun StorEdge Remote Response service, you can choose that method to pass alerts and event status messages to Sun. In that situation, all Sun StorEdge 6320 systems that are grouped share the Sun StorEge Remote Response modem interface to send alerts to Sun. The master system running Storage Automated Diagnostic Environment software is located on the host where Sun StorEdge Remote Response is running. All grouped Sun StorEdge 6320 systems send all alert and event traffic over the customer's management LAN to the Sun StorEdge Remote Response host server for shipment to Sun. The master system running the Storage Automated Diagnostic Environment software is optionally configured to send email or pager messages locally.

If you use the management LAN connection without host Sun StorEdge Remote Response support, you can set up the Storage Automated Diagnostic Environment software can be set up to send email or pager message notification when an alert or event occurs. To use this service, you must allow access to a host server containing email or pager message service. The Storage Automated Diagnostic Environment software on the Storage Service Processor is then configured for a group of Sun StorEdge 6320 systems and routes all of its alert and event traffic to the shared modem on the customer's host server. The master system is responsible for forwarding the traffic through the specified medium.

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

- Provide a full-time person to monitor the workstation
- Report serviceable action items to Sun in a timely manner to comply with the service contract

6.2.2 Remote Monitoring

Fault detection, using the Sun StorEdge Remote Response service, is enabled through the Storage Automated Diagnostic Environment provider function.

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

The Sun Service center can dial into the system if necessary to perform corrective actions.

6.3 Fault Isolation

Fault isolation in the Sun StorEdge 6320 system is normally done using first-fault isolation techniques. For instance, if a disk drive failure occurs, a notification is immediately sent. In some cases diagnostics need to be executed and the Storage Automated Diagnostic Environment software provides diagnostics for the Sun StorEdge 6020 arrays including Volume Verification and loopback tests.

The diagnostics for the Storage Service Processor are monitored using remote access to the Storage Service Processor module.

6.4 Security

The Sun StorEdge Remote Response service provides remote monitoring and serviceability. Sun provides as safe an environment as possible for its Sun StorEdge Remote Response service through the use of security software installed on the Storage Service Processor.

Sun uses the secure shell (`ssh`(1)) command for the connection between the dial-up line and the Storage Service Processor, which adds encryption and some authentication. After access to the Storage Service Processor is established using PPP and CHAP, the OPIE authentication tool requires the user to call the SunService Center and answer a unique login challenge.

The SunService℠ center, after authenticating the caller, provides the authentication key to allow connection to the Storage Service Processor. When you access the Storage Service Processor through the Storage Automated Diagnostic Environment GUI, the GUI software contains an authentication process requiring a login and password that can be tuned for specific users to have specific capabilities. Secure Socket Layer (SSL) encryption is employed between the Storage Service Processor and the customer's network connection to prevent snooping. Through the Storage Automated Diagnostic Environment, port 7654 (exclusively managed by this software environment) and port 7443 (secure shell) are used.

If you activate the Sun StorEdge Remote Response service and want to access the Storage Service Processor through the local area network (LAN), you should implement your standard security procedures for the creation of a private network using modems that also has access into your LAN.

The following services are enabled on the Storage Service Processor:

- `tftp`(1)

- Reverse Address Resolution Protocol (RARP) (`in.rarpd`(1M))

The following services are disabled on the Storage Service Processor:

- `picld`(1M), the Platform Information and Control Library (PICL)
- `automount`(1M)
- Networked File System (NFS) server
- NFS client
- `telnet`(1)
- `ftp`(1)

Contact your Sun Service provider to activate the Sun StorEdge Remote Response service.

6.5 Connecting to the Storage Automated Diagnostic Environment

To open a non-secure connection to the Storage Automated Diagnostic Environment, use the following URL:

```
http://<system-ip>:7654
```

To open a secure connection, use the following URL:

```
https://<system-ip>:7443
```

The username and passwords are shared with the configuration software. You can use the `admin`, `storage`, and `guest` usernames that are discussed in Chapter 5 in the Storage Automated Diagnostic Environment.

CHAPTER 7

Preparing for Service

The Sun StorEdge 6320 system is preconfigured with all the FRUs installed as specified by the customer. This chapter describes the preparation required to service the FRUs in the system.

This chapter is organized as follows:

The tools and parts required are described in each FRU chapter.

7.1 Safety Requirements

- Ensure that the voltage and frequency of the power outlet to be used match the electrical rating labels on the system.
- Wear an antistatic wrist strap when handling any magnetic storage FRUs or system boards.
- Use only properly grounded power outlets.

Caution – You must read the *Sun StorEdge 6320 System Regulatory and Safety Compliance Manual* before beginning any procedure in this manual.

Caution – *Do not* make mechanical or electrical modifications to the system. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

7.2 Removing and Replacing the Front Door

During the process of removing and replacing a FRU, you might need to remove the front door of the Sun StorEdge 6320 system. This section describes how to remove and replace the front door of the system.

No tools are required to remove the front door.

7.2.1 Removing the Front Door

1. **Open the front screen door.**
2. **Reach inside the door and push down on the lever attached to the spring of the top hinge pin.**

   This causes the hinge pin to retract into the door.
3. **Tilt the door out from the top mounting bracket and lift up slightly.**
4. **Remove the door and set it aside.**

7.2.2 Replacing the Front Door

1. **Tilt the door and insert the bottom hinge pin with the outside hole of the bottom-left mounting bracket.**
2. **Reach inside the door and push down on the lever attached to the spring of the top hinge pin.**

   This causes the hinge pin to retract into the door.
3. **Align the top hinge pin with the outside hole of the top-left mounting bracket.**
4. **Release the lever.**

   The hinge pin extends into the mounting bracket.

7.3 Removing and Replacing a Side Panel

The tool required when removing or replacing the side panel is:

- 1/4-inch Allen wrench

7.3.1 Removing a Side Panel

- **Use an Allen wrench to loosen the four 1/4-inch shoulder screws that fasten the panel to the system, and then remove the panel from the system (**FIGURE 7-1**). Repeat step for each panel.**

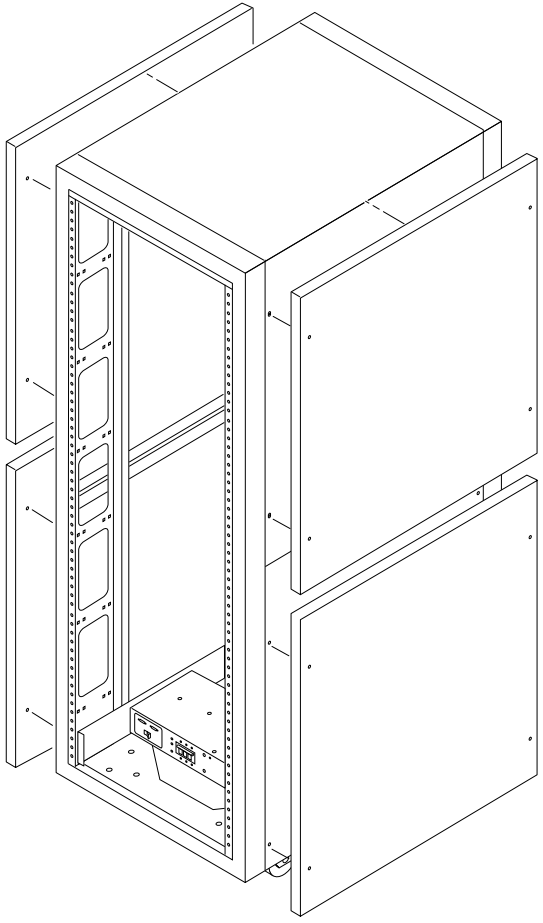


FIGURE 7-1 Removing and Replacing the Side Panels

7.3.2 Replacing the Side Panel

1. **Align the panel screw holes to the system screw holes.**
2. **Use an Allen wrench to tighten the four 1/4-inch shoulder screws to fasten the panel to the system (**FIGURE 7-1**).**

7.4 Opening the Back Door of the System

- **Open the back door of the expansion cabinet (**FIGURE 7-2**).**

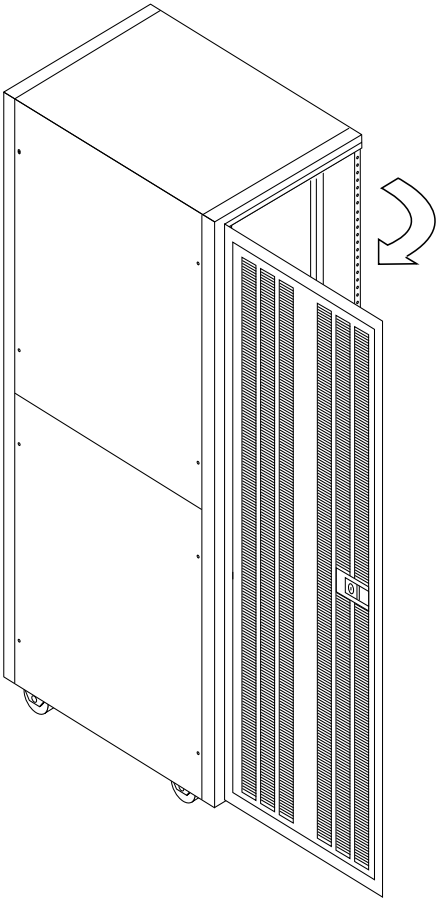


FIGURE 7-2 Opening the Back Door

CHAPTER 8

Removing and Replacing FRUs

Sun StorEdge 6320 systems are preconfigured with all the FRUs installed as specified by the customer. This chapter describes the general instructions about how to install and remove a FRU, the default configuration settings for the Sun StorEdge 6320 system, and the placement of the FRUs in the system.

Procedures to configure or modify the configuration of FRUs that have a software component are described in the chapter associated with the specific FRU.

Caution – FRUs in the system must be loaded from the bottom to the top to keep the system center of gravity as low as possible. When servicing the system, remove only one FRU from the system at a time. If possible, remove FRUs from top to bottom to prevent raising the system's center of gravity.

See FIGURE 8-1 and FIGURE 8-2 for the naming conventions and the placement of FRUs in the system.

This chapter is organized as follows:

8.1 Safety Requirements

- Ensure that the voltage and frequency of the power outlet to be used match the electrical rating labels on the system.
- Wear an antistatic wrist strap when handling any magnetic storage FRUs or system boards.
- Use only properly grounded power outlets.
- Installation and removal of some FRUs may require two or more people.

Caution – You must read both the *"Safety Agency Compliance Statements" on page -xvii* and the *Sun StorEdge 6320 System Regulatory and Safety Compliance Manual* before beginning any procedure in this manual.

Caution – *Do not* make mechanical or electrical modifications to the system. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

8.2 FRU Locations

The locations where FRUs can be mounted in the Sun StorEdge 6320 system are shown in FIGURE 8-1 and FIGURE 8-2. The locations are defined by the number of rack units (RU) occupied by a FRU or blank panel.

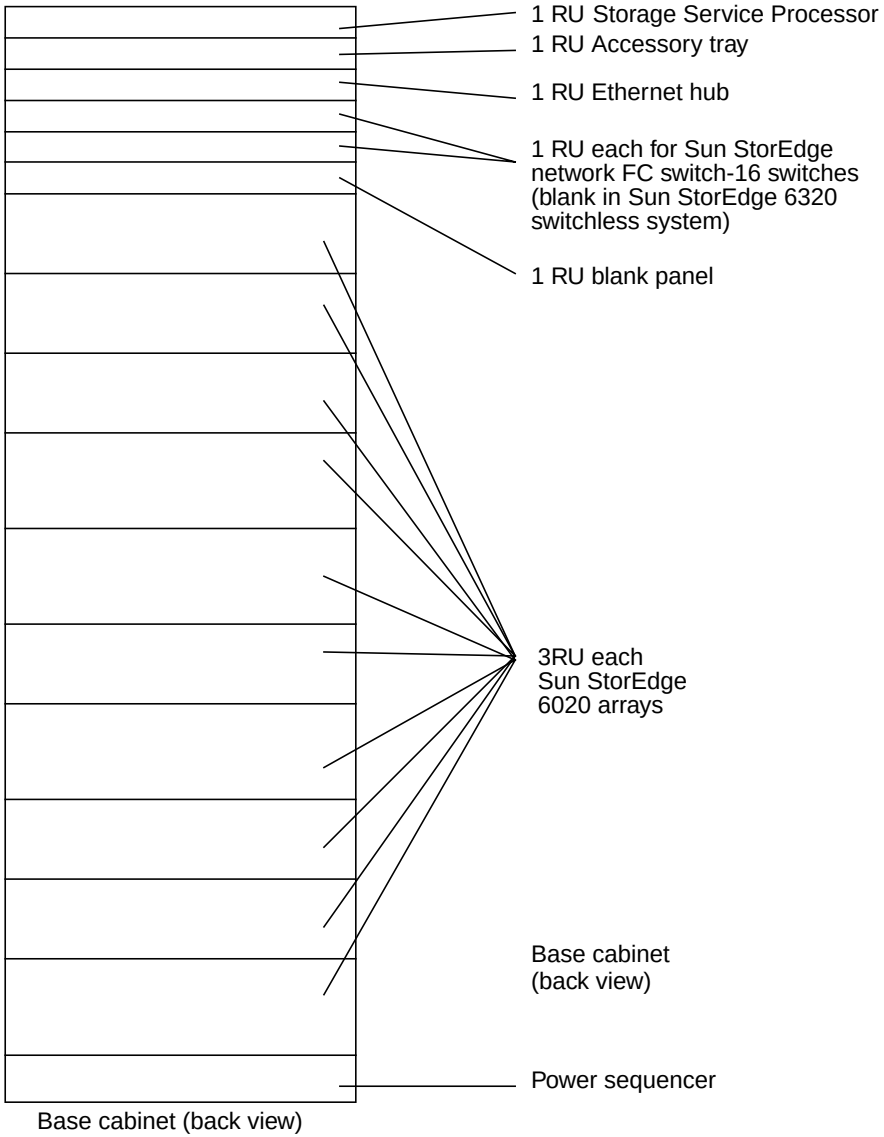


FIGURE 8-1 Sun StorEdge 6320 System FRU Placement

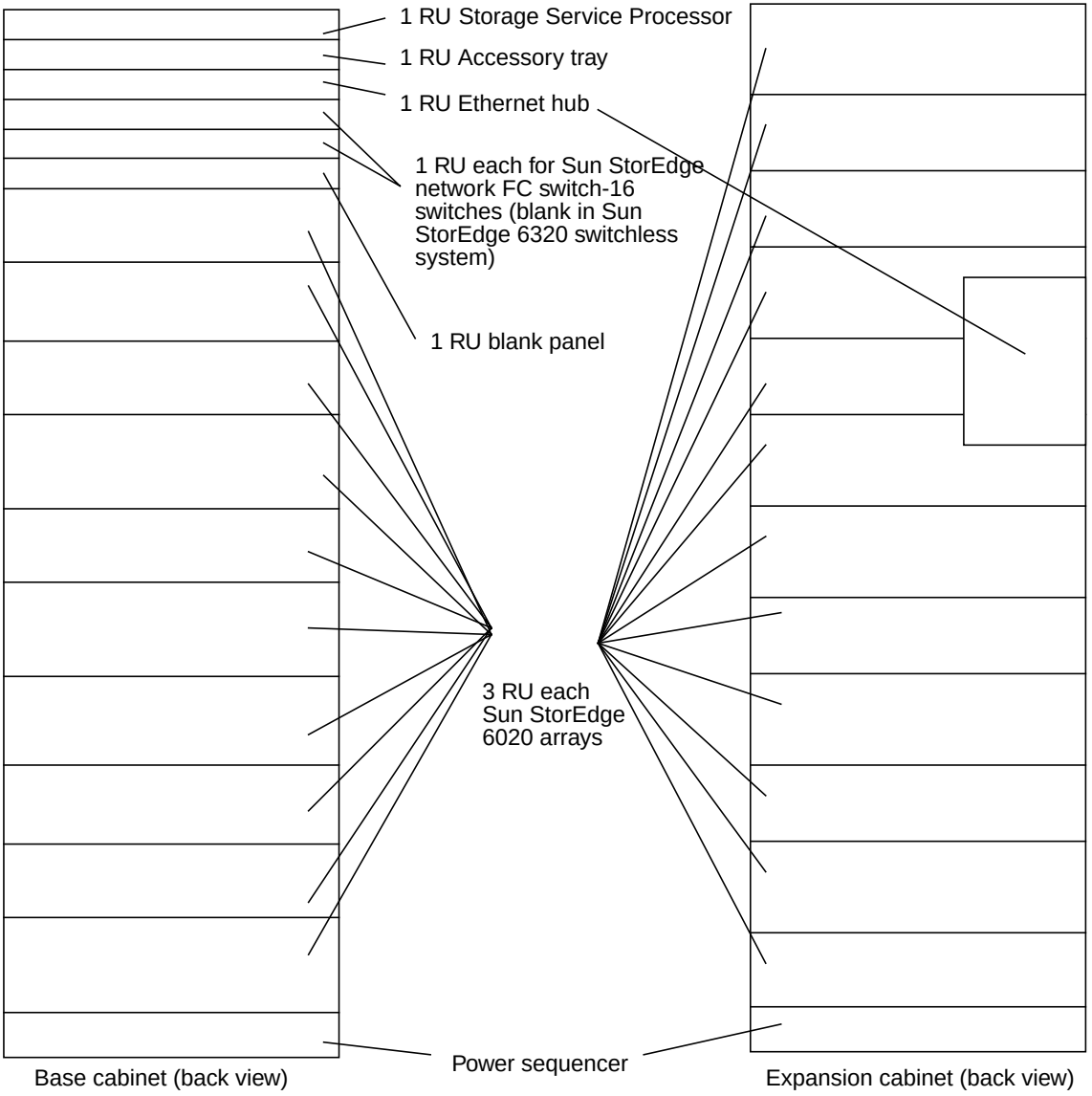


FIGURE 8-2 Sun StorEdge 6320 System FRU Locations

8.3 Installing and Removing a FRU

This section contains general instructions about installing a FRU in the Sun StorEdge 6320 system cabinet. The steps required to install a particular FRU are contained in the description of that FRU in subsequent chapters.

Required tools are:

- Slotted screwdriver
- No. 2 Phillips screwdriver
- 1/4-inch Allen wrench
- 9/32-inch nut driver

8.3.1 Opening the System to Access a FRU

1. **Remove the side panels, if necessary.**

   Refer to Section 7.3, “Removing and Replacing a Side Panel” on page 7-2 for a description of removing the side panels.

2. **Determine where you are going to install the FRU.**

   Refer to the system Section 8.2, “FRU Locations” on page 8-3.

3. **Open the back door of the Sun StorEdge 6320 system cabinet.**

4. **Remove the front door to install a FRU, if necessary.**

   Refer to Section 7.2, “Removing and Replacing the Front Door” on page 7-2.

5. **Remove the filler panel located where you will install the FRU (**FIGURE 8-3**).**

   a. **Use a No. 2 Phillips screwdriver to loosen the PEM fastener screws that attach the panel to the system. The screws will remain attached to the filler panel.**

   b. **Remove the filler panel and save it for future use.**

Note – To maintain proper airflow, make sure that you install filler panels over locations that do not have FRUs mounted.

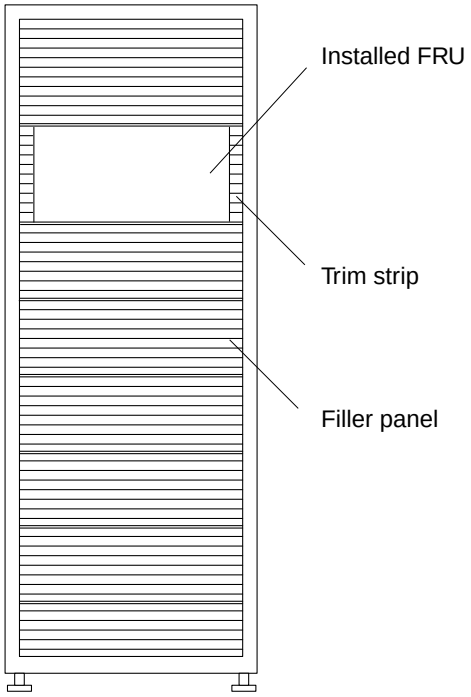


FIGURE 8-3 Filler Panel and Trim Strip Location

6. **If the system is not mounted to the floor, extend the stabilizer legs.**

   The stabilizer legs are located under the front of the system. Refer to the *Sun StorEdge 6320 System Installation Guide* for detailed instructions.

Caution – Always extend or retract the stabilizer legs as a pair. Make sure that the levelers have been adjusted before attempting to move the stabilizer legs.

7. **Install the FRU.**

   Refer to the section Section 8.2, “FRU Locations” on page 8-3.

8. **Route the power cables from the FRU to the power sequencer(s).**

   A system that is ordered without all possible FRUs installed has the power cables routed as shown in FIGURE 8-4.

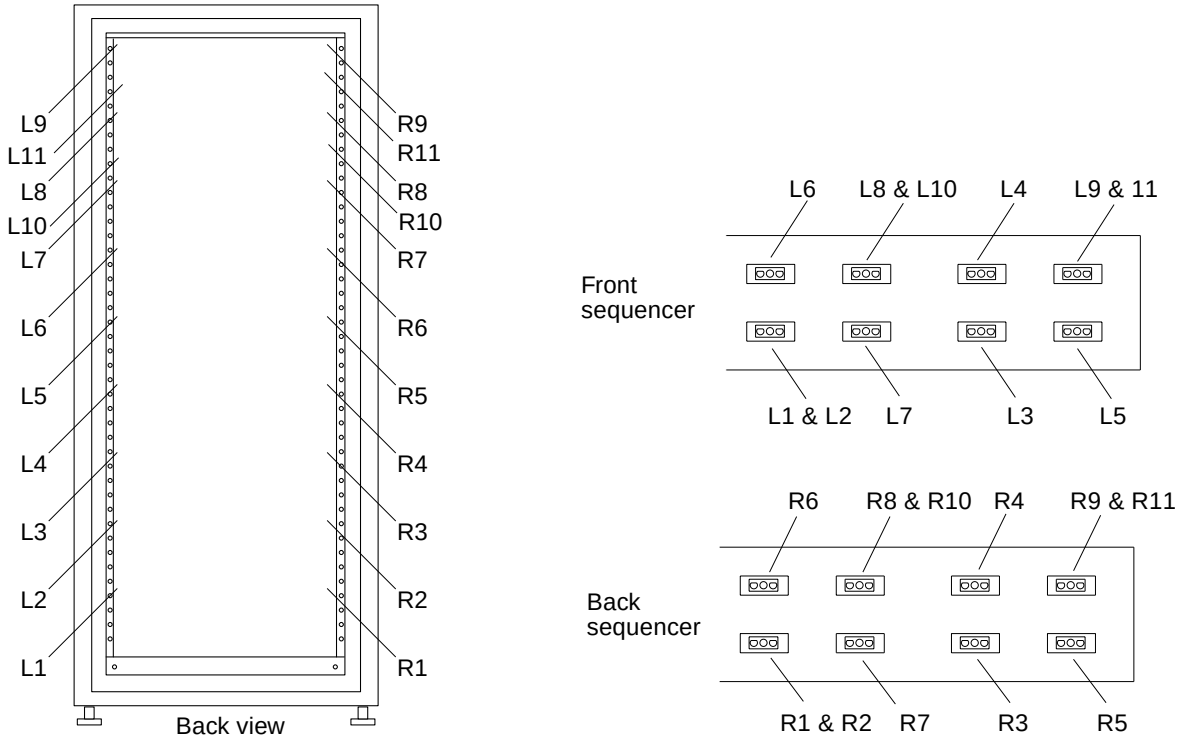


FIGURE 8-4 Power Cable Routing

Caution – Power cable routing can vary, depending on how the system is configured.

9. **Install the trim strips (**FIGURE 8-3**).**

   Use a No. 2 Phillips screwdriver to tighten the captive screws.

10. **If necessary, retract the stabilizer legs under the system.**

11. **If necessary, close the front screen door.**

    If you previously removed the door, refer to Section 7.2, “Removing and Replacing the Front Door” on page 7-2.

12. **Replace the side panels, if you removed them.**

    See Section 7.3, “Removing and Replacing a Side Panel” on page 7-2 for a description of replacing side panels.

8.3.2 Removing a FRU

Required tools are:

- Slotted screwdriver
- No. 2 Phillips screwdriver
- 1/4-inch Allen wrench

To remove a FRU:

1. **Remove the side panels, if necessary.**

   Refer to Section 7.3, “Removing and Replacing a Side Panel” on page 7-2 for a description of removing the side panels.

2. **For cabinets equipped with a front screen door, open the front screen door.**

   If it is necessary to remove the front door to remove a FRU, refer to Section 7.2, “Removing and Replacing the Front Door” on page 7-2.

3. **Remove the trim strips beside the FRU (**FIGURE 8-3**).**

   Use a No. 2 Phillips screwdriver to loosen the captive screws that attach the trim strips to the system.

   Save the trim strips for future use.

4. **If the system is not mounted to the floor, extend the stabilizer legs.**

   The stabilizer legs are located under the front of the system.

Caution – Always extend or retract the stabilizer legs as a pair. Make sure that the levelers have been adjusted before attempting to move the stabilizer legs.

5. **Remove the FRU.**

   Refer to Section 8.2, “FRU Locations” on page 8-3 for the location of FRUs in the system.

6. **If you are not replacing the FRU, install a filler panel over its previous location (**FIGURE 8-3**).**

   Use a No. 2 Phillips screwdriver to tighten the captive screws.

Note – To maintain proper airflow, make sure that you install filler panels over locations that do not have FRUs mounted.

7. **If necessary, retract the stabilizers under the system.**

8. **If necessary, close the front screen door.**

   If you previously removed the door, refer to Section 7.2, “Removing and Replacing the Front Door” on page 7-2.

9. **Replace the side panels, if you removed them.**

   See Section 7.3, “Removing and Replacing a Side Panel” on page 7-2 for a description of replacing the side panels.

CHAPTER 9

Servicing the Expansion Cabinet

This chapter describes the removal and replacement of FRUs in the Sun StorEdge Expansion Cabinets.

This chapter is organized as follows:

9.1 Servicing the Power Sequencer

This section describes the removal and replacement of the power sequencer. TABLE 9-1 shows the FRU associated with the power sequencer:

TABLE 9-1 Sun StorEdge Expansion Cabinet FRU List

FRU Description
Power sequencer

Required tools are:

- 1/4-inch slotted screwdriver
- No. 2 Phillips screwdriver

9.1.1 Removing the Power Sequencer

The power sequencer is hot swappable.

1. **Ensure that the power to the power sequencer that you are changing is off.**
   See the *Sun StorEdge 6320 System Installation Guide*.
2. **Disconnect the key switch adapter cable from the mating power supply connector at the back of the power sequencer (**FIGURE 9-1**).**

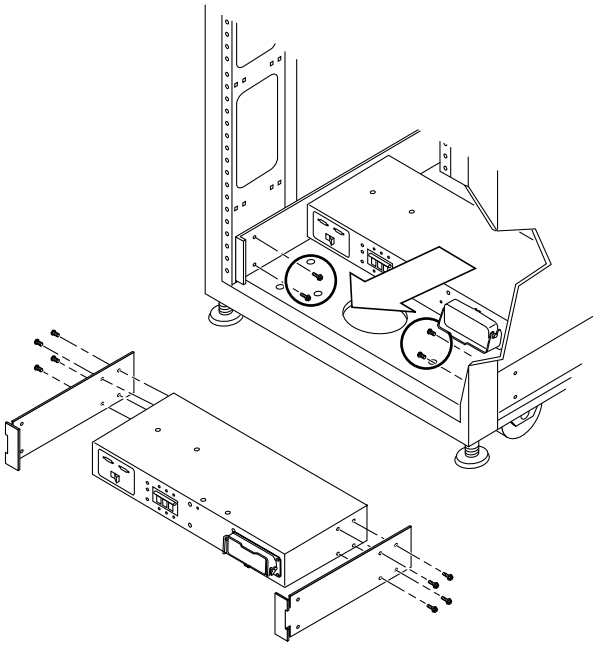


FIGURE 9-1 Removing the Power Sequencer

3. **Disconnect the AC power cable from the grounded outlet.**
4. **Disconnect the AC power cable from the power sequencer.**
   See Section 9.2.1, “Removing the AC Power Cable” on page 9-4.
5. **Disconnect the grounding strap from the power sequencer.**
6. **Using a No. 2 Phillips screwdriver, remove the screws that secure the sequencer to the chassis.**
7. **Label the power cables to identify their locations.**
8. **Disconnect all other power cables from the sequencer.**

9. **Remove remote power sequencer cable (P14/P15).**
10. **Remove the power sequencer from the Sun StorEdge 6320 system.**

9.1.2 Replacing the Power Sequencer

1. **Slide the power sequencer into the system (**FIGURE 9-1**).**
2. **Tighten the screws that secure the sequencer to the chassis.**
3. **Reconnect the grounding strap to the power sequencer.**
4. **Connect the AC power cable to the power sequencer.**
   See Section 9.2.2, “Replacing the AC Power Cable” on page 9-5.
5. **Connect all cables to the back of the power sequencer.**
6. **Connect the AC power cable to a grounded outlet.**
7. **Power on the power sequencer.**
   See the *Sun StorEdge 6320 System Installation Guide.*

9.2 Servicing the AC Power Cable

This subsection describes the removal and replacement of the AC power cable. TABLE 9-2 lists the FRUs associated with the power cable:

TABLE 9-2 AC Power Cable FRU List

FRU Description
Assembly, cable, rack AC input, international
Assembly, cable, rack AC input, domestic

No tools are required to remove or replace the power cable.

9.2.1 Removing the AC Power Cable

Caution – Ensure that the power to the power sequencer is off. See the *Sun StorEdge 6320 System Installation Guide* for a description of powering off the system.

1. **Disconnect the power cable from the grounded outlet.**
2. **Disconnect the AC power cable from the power connector on the power sequencer (**FIGURE 9-2**).**

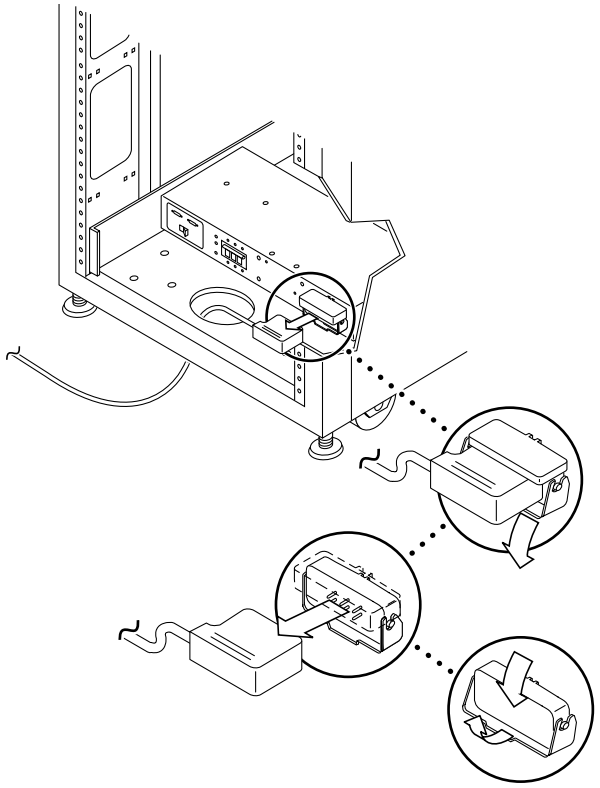


FIGURE 9-2 Disconnecting the AC Power Cable

9.2.2 Replacing the AC Power Cable

Caution – Be sure that the power to the power cord is off. See the *Sun StorEdge 6320 System Installation Guide* for a description of how to power off the system.

1. **Pull back the power connector cover (**FIGURE 9-2**).**

   Flip the cover latch open to access the connector.

2. **Connect the power cable to the power connector on the power sequencer.**
3. **Pull the latch over the power cable to secure it to the power connector.**
4. **Connect the power cable to a grounded outlet.**
5. **Power on the power sequencer.**

   See the *Sun StorEdge 6320 System Installation Guide* for a description of powering on the system.

9.3 Servicing the Key Switch

This section describes the removal and replacement of the key switch. TABLE 9-3 lists the FRU associated with the key switch:

TABLE 9-3 Key Switch FRU List

FRU Description
Key switch panel assembly

Required tools are:

- Needle-nose pliers
- 1/4-inch slotted screwdriver
- No. 2 Phillips screwdriver

9.3.1 Removing the Key Switch

Caution – Ensure that the power to the system is off. See the *Sun StorEdge 6320 System Installation Guide* for instructions about powering off the system.

1. **Disconnect the key switch cable connector from the adapter-cable connector near the back of the power sequencers (**FIGURE 9-3**).**

   The adapter cable remains connected to the power sequencer.

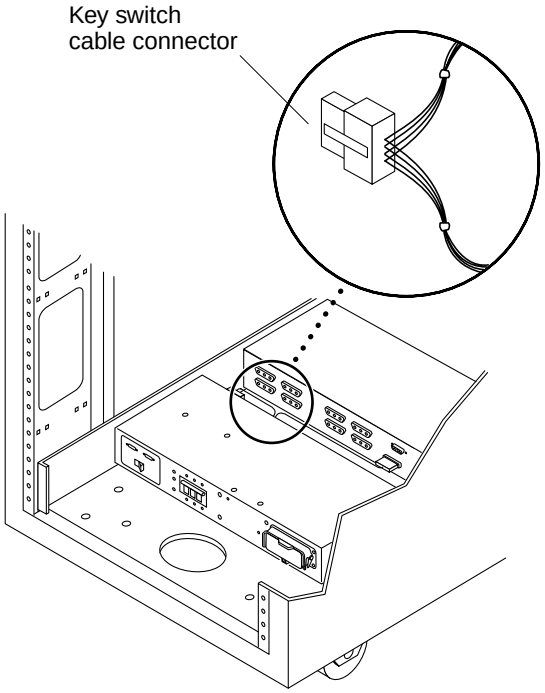


FIGURE 9-3 Key Switch Cable Connector Location

2. **Facing the back of the key switch on the inside of the system, use a pair of needle-nose pliers to slide out and remove the metal clip that secures the key switch to the system (**FIGURE 9-4**).**

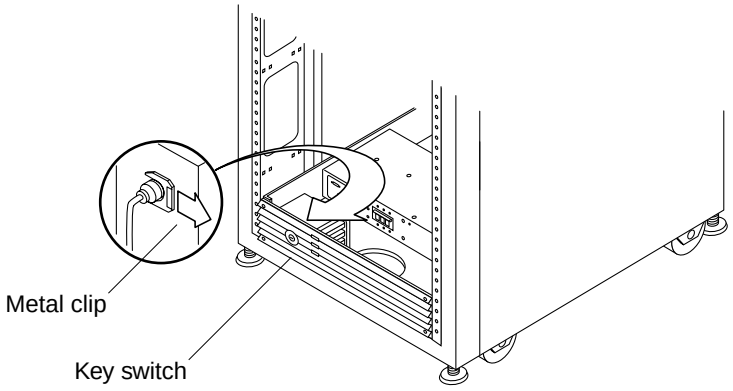


FIGURE 9-4 Removing and Replacing the Key Switch

3. **Pull the key switch out of the chassis opening.**

9.3.2 Replacing the Key Switch

1. **Insert the key switch into the panel opening.**
2. **Facing the back of the key switch on the inside of the system, slide the metal clip onto the notch of the key switch body to secure it in place (**FIGURE 9-4**).**

   Each screw secures a clamp on the frame that holds the cable in place.
3. **Connect the key switch cable connector to the adapter-cable connector near the back of the power sequencer (**FIGURE 9-3**).**
4. **Power on the system.**

   See the *Sun StorEdge 6320 System Installation Guide* for instructions about powering on the system.

9.4 Adding a Second Cabinet

Use the following procedure to add a second cabinet to a single Sun StorEdge 6320 system.

Note – The names of the Sun StorEdge 6020 arrays in the second cabinet are shown in FIGURE 3-1.

---

1. **Set up the second cabinet, connect the cables, and follow the remaining procedures for setting up the second cabinet as described in the** *Sun StorEdge 6320 System Installation Guide***.**

2. **Enter MAC address for the Sun StorEdge 6020 arrays into the Storage Automated Diagnostic Environment using the procedure in "Entering the MAC Address" on page 12-6**

Tip – Refer to *Sun StorEdge 6020 and 6120 Arrays Installation Guide* for instructions about how to locate the MAC address.

---

3. **Set passwords on all Sun StorEdge 6020 arrays that are in the new cabinet.**

   Use the instructions in the "Setting the Array Password" on page 12-8 to set the passwords.

4. **Create a updated inventory file using the Storage Automated Diagnostic Environment.**

   Instructions for this procedure are given in "Creating an Updated Inventory" on page 12-8.

CHAPTER 10

Servicing the Ethernet Hub

This chapter describes the removal and replacement of the Ethernet hub.

Note – Servicing the Ethernet hub in either the first or second cabinet does not affect customer I/O. No software action is required when you perform service on the Ethernet hubs.

This chapter is organized as follows:

10.1 Servicing the Ethernet Hub Overview

TABLE 10-1 lists the FRUs associated with the Ethernet hub:

TABLE 10-1 Ethernet Hub FRU List

FRU Description
Ethernet hub (with rackmount kit for first cabinet)
Ethernet hub (with rackmount kit for second cabinet)

Required tools are:

- No. 2 Phillips screwdriver
- 7/16-inch open end wrench
- Adjustable wrench

10.2 Removing the Ethernet Hub From the First Cabinet

1. **Open the front door of the system.**
2. **Remove as many of the filler panels as necessary to gain access to the Ethernet hub.**
3. **Disconnect the power cable from the Ethernet hub.**
4. **Remove the two Phillips screws holding the Ethernet Hub to the mounting rails.**
5. **Open the back door of the system.**
6. **Open the service panel.**

   The service panel is held shut by five PEM captive fastener screws.
7. **Ensure that all Ethernet cables are labeled and note the ports to which they are connected.**
8. **Moving from right to left, disconnect the cables.**
9. **Remove the two screws holding the back Ethernet hub mounting rails.**
10. **Go to the front of the system.**
11. **Remove the Ethernet hub by sliding it out of the front of the cabinet.**
12. **Remove the four screws (two per side) and three small screws holding the Ethernet hub to the center brackets.**

10.3 Replacing the Ethernet Hub in the First Cabinet

1. **Secure the new Ethernet hub to the mounting brackets with the seven screws.**
2. **From the front of the system, slide the Ethernet hub into the cabinet until it meets the stops.**
3. **Replace the two screws that attach the front of the Ethernet hub's mounting bracket to the cabinet.**
4. **Replace the two screws that attach the back of the Ethernet hub's mounting bracket to the cabinet.**
5. **Moving from left to right, reconnect the cables.**
6. **Reconnect the power cable to power on the Ethernet hub.**

   TABLE 3-8 shows the base IP addressing configuration of the Ethernet hub. See the procedure in this chapter for the configuration utilities used to modify the base addressing configuration.

7. **Close the service panel and lock it in place using the PEM fasteners.**
8. **Replace the filler panels in the front.**
9. **Close the front and back doors.**

10.4 Removing the Ethernet Hub from the Second Cabinet

FIGURE 10-1 illustrates the removal of the Ethernet hub from the second cabinet.

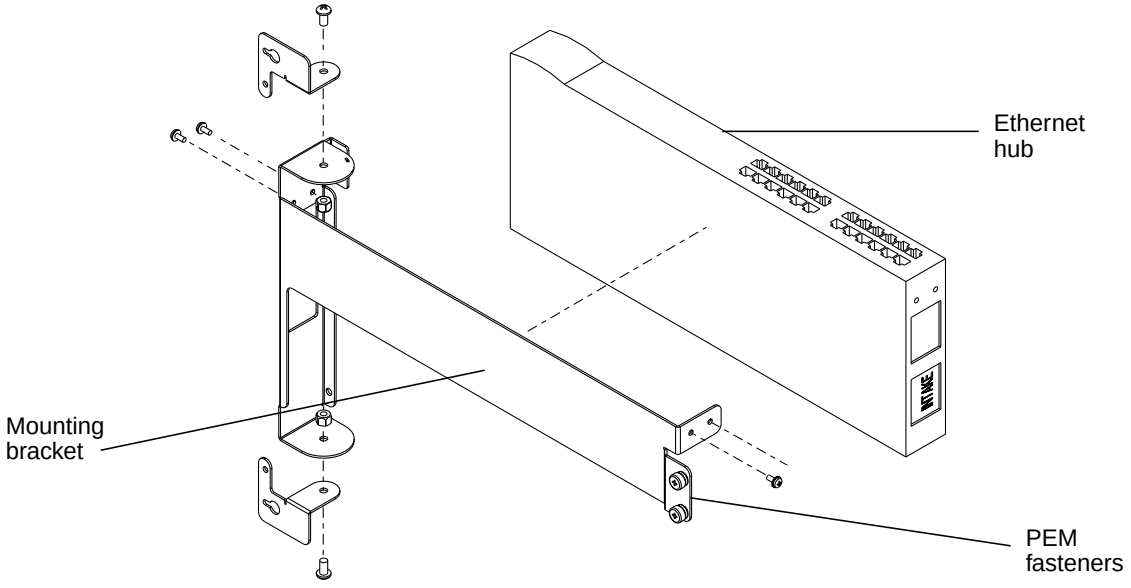


FIGURE 10-1 Ethernet Hub Removal from Second Cabinet

To remove the Ethernet hub from the second cabinet, follow these steps:

1. **Open the back door of the second cabinet.**
2. **Unscrew the two PEM fasteners on the right side of the Ethernet hub mounting bracket.**
3. **Swing open the mounting bracket.**
4. **Disconnect the power cable from the Ethernet hub.**
5. **Ensure that all Ethernet cables are labeled and note the ports to which they are connected.**
6. **Moving from right to left, disconnect the cables.**
7. **Unscrew the four screws (two on the left and two on the right) that secure the Ethernet hub to the mounting bracket.**

Note – Make sure you hold the Ethernet hub while removing the screws, as the unit will fall once all the screws are removed.

10.5 Replacing the Ethernet Hub in the Second Cabinet

1. **Hold the new Ethernet hub in place in the mounting bracket and secure the four screws (two on the left and two on the right).**
2. **Moving from right to left, connect the cables back into the appropriate connections on the Ethernet hub.**
3. **Connect the power cable into the Ethernet hub.**
4. **Swing the mounting bracket closed.**
5. **Secure the two PEM fasteners on the right side of the Ethernet hub mounting bracket.**
6. **Close the back door.**

10.6 Removing the Mounting Bracket in the Second Cabinet

These instructions tell how to remove the mounting bracket from the second cabinet should it become damaged or broken. FIGURE 10-1 provides an illustration of the mounting bracket.

1. **Open the back door.**
2. **Unscrew the two PEM fasteners on the right side of the Ethernet hub mounting bracket.**
3. **Swing open the mounting bracket.**
4. **Disconnect the power cable from the Ethernet hub.**
5. **Ensure that all Ethernet cables are labeled and note the ports to which they are connected.**

6. **Moving from right to left, disconnect the cables.**
7. **Unscrew the four screws that hold the mounting bracket to the Sun StorEdge Expansion Cabinet.**

Note – Make a note of the location where the mounting bracket was attached to the Sun StorEdge Expansion Cabinet.

---

8. **Unscrew the four screws (two on the left and two on the right) that secure the Ethernet hub to the mounting bracket.**

10.7 Replacing the Mounting Bracket in the Second Cabinet

1. **Assemble the new mounting bracket.**
2. **Connect the Ethernet hub to the new mounting bracket using the four screws (two on the left and two on the right).**
3. **Screw the mounting bracket to the Sun StorEdge Expansion Cabinet in the same location where the old bracket was connected.**
4. **Moving from left to right, reconnect all the cables to the Ethernet hub.**
5. **Connect the power cable into the Ethernet hub.**
6. **Close the mounting bracket and secure it with the two PEM fasteners.**
7. **Close the back door.**

CHAPTER 11

Servicing the Sun StorEdge Network FC Switch-16 Switches

This chapter provides the procedures for removing and replacing the Sun StorEdge network FC switch-16 switches.

This chapter contains the following sections:

11.1 Servicing a Sun StorEdge FC Switch

The following sections detail how to remove and replace the Sun StorEdge network FC switch-16 from the Sun StorEdge 6320 systems.

TABLE 11-1 lists the FRUs associated with the Sun StorEdge network FC switch-16 switches.

TABLE 11-1 Sun StorEdge Network FC Switch-16 FRU List

FRU Description
Sun StorEdge network FC switch-16 (with rackmount kit)
Standard Adapter Cable

The tool required is:

- No. 2 Phillips screwdriver

11.2 Removing a Sun StorEdge FC Switch

1. **Identify which Sun StorEdge network FC switch-16 switch must be replaced.**
2. **Verify that the hosts that were connected to this switch have their path changed to the other switch.**

Note – The Sun StorEdge network FC switch-16 switches are not hot swappable.

---

3. **Open the back door of the system.**
4. **Open the service panel.**
5. **Power off the switch to be removed.**

   There are two power supplies and both must be powered off.
6. **Disconnect the two power cables from the switch.**
7. **Remove the gigabit interface converters (GBICs) from the ports and make a note of the port numbers where the GBICs were inserted.**
8. **Unscrew the two keeper screws on the back of the Sun StorEdge network FC switch-16 switch.**
9. **Open the front door.**
10. **At the front of the system, remove the grill that covers the switch and set it aside.**
11. **Remove the two screws that connect the switch to the Sun StorEdge 6320 system.**
12. **Remove the switch by sliding it out the front of the cabinet.**
13. **Identify and note the media access control (MAC) address for the removed switch.**

    The MAC address for the Sun StorEdge network FC switch-16 switches is a 12-digit number that is printed on the label on the back of the switch.

11.3 Replacing a Sun StorEdge FC Switch

1. **Reinsert the GBICs into the new switch in the same port numbers they occupied on the removed switch.**

Note – Make certain you use the same ports you made a note of in Step 7 of Section 11.2, “Removing a Sun StorEdge FC Switch” on page 11-2.

---

2. **Identify and note the MAC address for the new switch and make a note of the address.**

   The MAC address for the FC switch is a 12-digit number that is printed on the label on the back of the FC switch.

3. **Slide the switch into the Sun StorEdge 6320 system.**

   See FIGURE 8-1 for the position of the switch.

4. **Replace the screws that connect the switch to the front of the cabinet.**
5. **Replace the grill that covers the switch.**
6. **Close the front door.**
7. **Reconnect the power cable to the switch.**
8. **Connect all FC cables into the GBIC.**
9. **Power on the FC switch.**
10. **Close the service panel.**
11. **Close the back door.**
12. **Set the switch IP address using the RARP or another method as documented in the Sun StorEdge network FC switch-16 documentation.**

CHAPTER 12

Servicing Sun StorEdge 6020 Arrays

This chapter provides the procedures for removing and replacing Sun StorEdge 6020 arrays.

For additional information about upgrading a Sun StorEdge 6020 array, refer to the *Sun StorEdge 6020 and 6120 Arrays System Manual.*

This chapter is organized as follows:

12.1 Servicing the Sun StorEdge 6020 Array Overview

The Sun StorEdge 6020 arrays contain from 2 to 6 disk trays, each of which have from 7 to 14 disk drives. The disk drives can have a capacity as high as 146 Gbytes. A disk tray is either a controller unit or an expansion unit. A controller unit includes a RAID controller.

The array includes 2-Gbyte per second Fibre Channel connectivity to hosts. Extensive reliability, availability, and serviceability features include redundant components, notification of failed components, and the ability to replace components while the unit is online.

You should have a copy of the following manuals available when performing procedures from this chapter:

- *Sun StorEdge 6020 and 6120 Arrays Installation Guide*
- *Sun StorEdge 6020 and 6120 Arrays System Manual*
- *Sun StorEdge 6320 System Installation Guide*
- *Storage Automated Diagnostic Environment 2.2 User's Guide—System Edition*
- Sun StorEdge Configuration Service software online help

TABLE 12-1 lists the FRUs associated with the Sun StorEdge 6020 arrays.

TABLE 12-1 Sun StorEdge 6020 Array FRU list

FRU Description
Sun StorEdge 6020 Array with midplane

Required tools are:

- No. 2 Phillips screwdriver
- Flashlight

12.2 Removing a Sun StorEdge 6020 Array

Note – This procedure assumes two service engineers are available at the site.

1. **Backup customer data from the array using the host-based software.**
2. **Open the back door of the Sun StorEdge 6320 system.**
3. **Note the MAC address of the Sun StorEdge 6020 array that is being removed.**

   The MAC address for the Sun StorEdge 6020 array is a 12-digit number that is printed on the label on the back of the array.

4. **On a server, bring up the Storage Automated Diagnostic Environment in your web browser.**

```
https://hostname:7443/
```

5. **Enter the user name and password.**

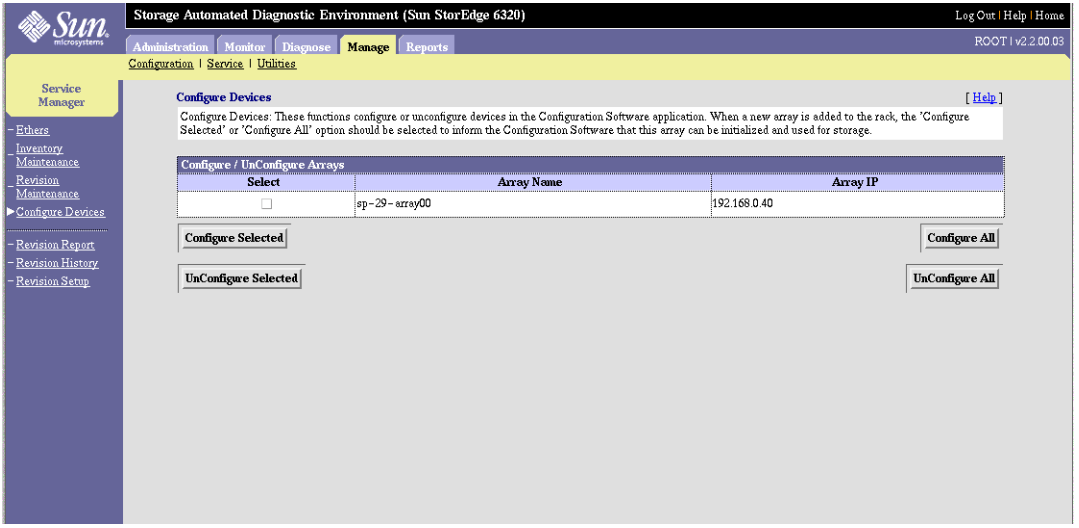
```
User Name: admin
Password: !admin
```

6. **Unconfigure the array that is being removed.**

   a. **From the Storage Automated Diagnostic Environment main window, click Manage.**

   b. **Click the Service link.**

   c. **From the left pane, click Configure Devices.**



   Select the checkbox that corresponds to the array that is being removed.

   d. **Click Unconfigure Selected.**

   A message is displayed confirming the device is now unconfigured.

12.2.1 Removing the Array

1. **Turn off the two circuit breakers on the array that is being removed.**

   The circuit breakers are on/off switches located on each side of the array.

2. **Remove the two power cables.**
3. **If a controller card is present, disconnect the Ethernet cable.**
4. **Disconnect the Ethernet cable from the keepers.**
5. **Disconnect and remove the two loop card cables from each side of the Sun StorEdge 6020 array.**
6. **Remove the four screws that secure the Sun StorEdge 6020 array to the side rails in the back.**
7. **Open the front door of the Sun StorEdge 6320 system.**
8. **Remove the trim strips from each side of the Sun StorEdge 6020 array.**
9. **Remove the four screws that attach the Sun StorEdge 6020 array to the Sun StorEdge 6320 system.**
10. **Using two people, slowly push the Sun StorEdge 6020 array from the back of the Sun StorEdge 6320 system.**

    The second person must be present to guide the array out from the front.

11. **Set the array on a table and remove the eight screws that hold the side rails on each side of the unit.**
12. **Remove all FRUs from the broken array that will to be used in the replacement Sun StorEdge 6020 array.**

    The replacement Sun StorEdge 6020 array might be delivered to the site without all the FRUs inside. Remove and save all the FRUs that will be reused. The five FRUs in a Sun StorEdge 6020 include:

    - All disk drives
    - Loop cards
    - Controller card
    - Power and cooling unit
    - Battery

12.3 Replacing a Sun StorEdge 6020 Array

The instructions for replacing a Sun StorEdge 6020 array are broken into the following subsections:

12.3.1 Preparing to Replace an Array

1. **Note the MAC address of the replacement (new) array.**

Tip – Refer to *Sun StorEdge 6020 and 6120 Arrays Installation Guide* for instructions about how to locate the MAC address.

---

2. **Set the new Sun StorEdge 6020 array on a table and attach the side rails using the eight screws provided.**
3. **Align the Sun StorEdge 6020 array's rails with the rails inside the Sun StorEdge 6320 system, and then push the array into the cabinet.**
4. **Reinstall the four screws that secure the array to the front of the Sun StorEdge 6320 system.**

Note – Use care when installing the screws, as the weight of the array can cause the screws to become cross-threaded.

---

5. **Reattach the trim strips using the two screws on each side of the Sun StorEdge 6020 array.**
6. **Close the front door of the Sun StorEdge 6320 system.**
7. **Open the back door of the Sun StorEdge 6320 system.**
8. **Replace the four screws that secure the Sun StorEdge 6020 array to the side rails in the back.**

12.3.2 Connecting the Cables

1. **Reconnect the two loop card cables on each side of the Sun StorEdge 6020 array.**
2. **Reconnect the Ethernet cable to the keepers.**

3. **Connect the Ethernet cable to the controller card if one is present in the array.**

4. **Connect the power cables and turn on the power supply circuit breakers.**

   All LEDs on the back of the Sun StorEdge 6020 array will flash as the power on self-tests are run by the unit. It will take 3-5 minutes for the Sun StorEdge 6020 array to completely power up. Wait until it has completely powered up before proceeding with this procedure.

5. **Close the back door of the Sun StorEdge 6320 system.**

12.3.3 Entering the MAC Address

1. **On a server, bring up the Storage Automated Diagnostic Environment in your web browser.**

```
https://hostname:7443/
```

2. **Enter the user name and password.**

```
User Name: admin
Password: !admin
```

3. **From the Storage Automated Diagnostic Environment main window, click Manage.**

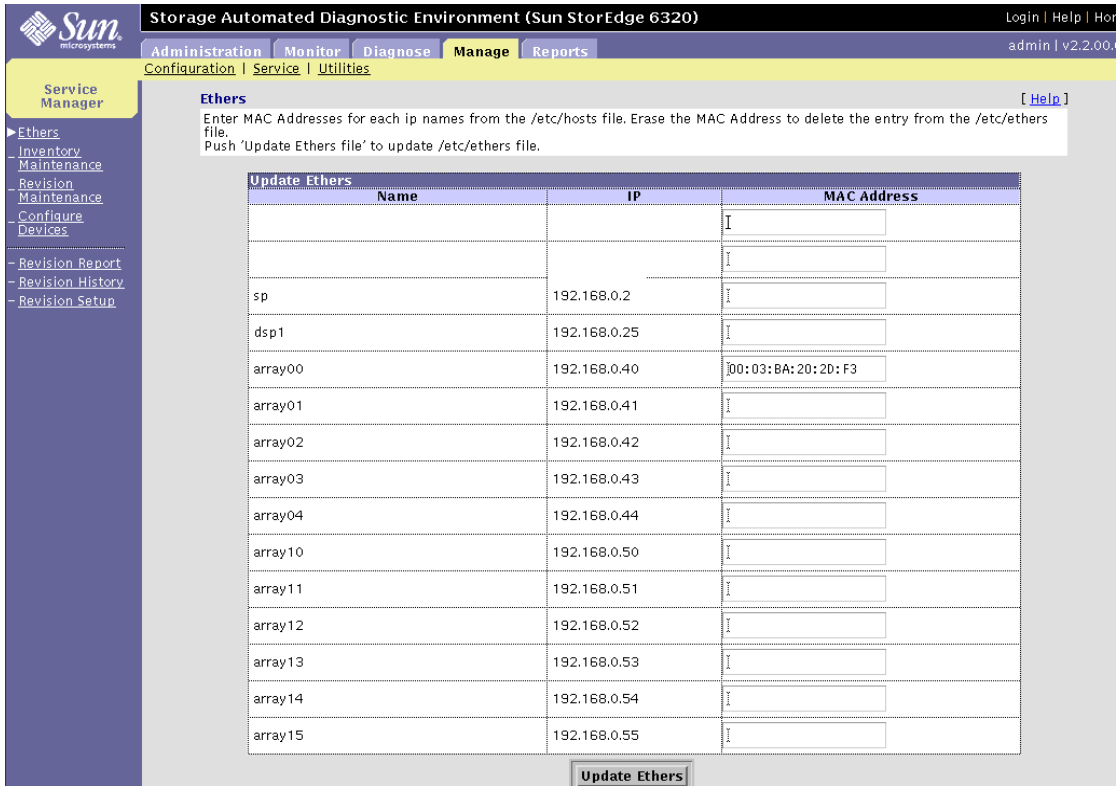
4. **Click the Service link.**

5. **From the left pane, click Ethers.**

   This will update the `/etc/ethers` file.

6. **Enter the MAC address for the replacement array and click on the Update Ethers button.**

Caution – Be sure to assign the MAC address for the Sun StorEdge 6020 arrays to the correct array position in the Sun StorEdge 6320 system. IP address assignments are listed in Chapter 3.



7. **Reboot the Sun StorEdge 6020 array to enable RARP to set the IP address.**

12.3.4 Setting the Array Password

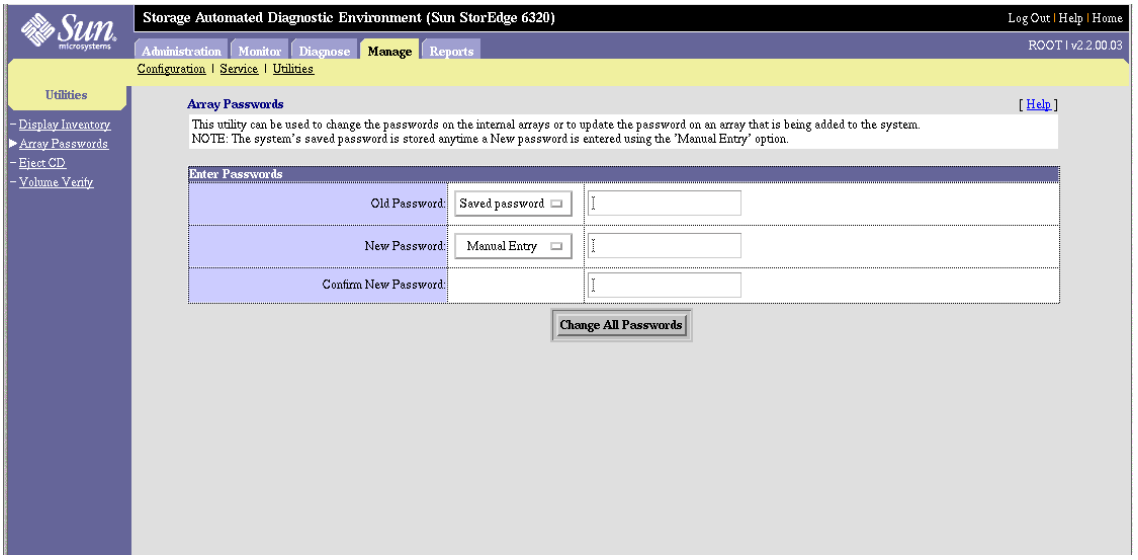
1. **From the Storage Automated Diagnostic Environment main window, click Manage.**

2. **Click the Utilities link.**

3. **Set the password.**

   Most Sun StorEdge 6020 arrays do not have a password set when delivered. Arrays that are not new should also have the password cleared.

   Leave the “Old Password” field blank if the array was delivered without a password. Change the “New Password” pulldown menu to be “Saved Password” and leave the field blank. The factory-set password will continue to be used for all arrays.



4. **Click Change All Passwords.**

12.3.5 Creating an Updated Inventory

1. **Create a new system inventory snapshot.**

   Select Manage → Service → Inventory Maintenance and click Generate New Inventory. Once the inventory is generated, click Save Inventory.

2. **Configure the Sun StorEdge 6020 array**

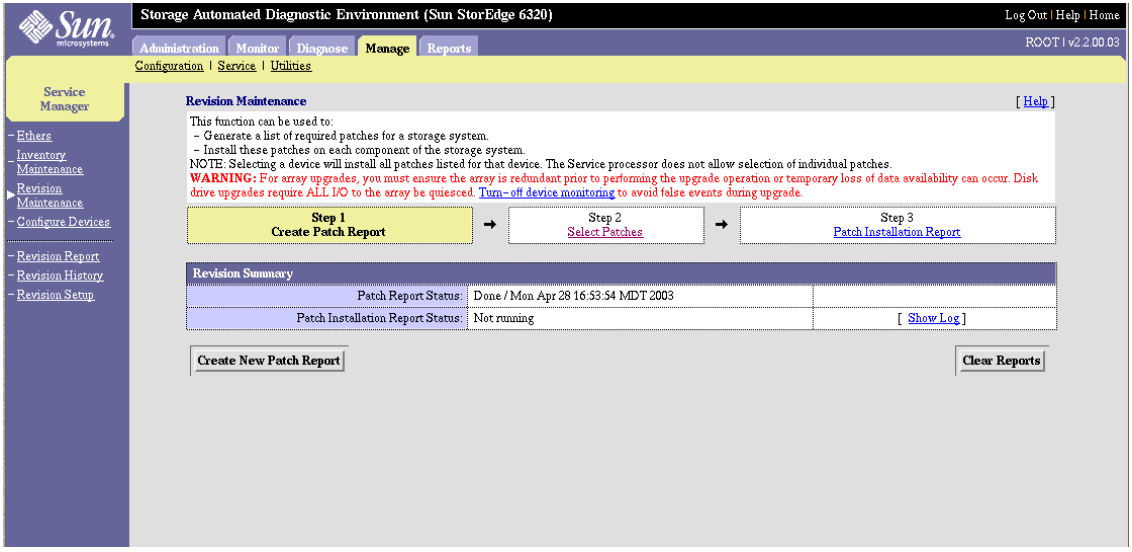
   Select Manage → Service → Configure Devices and click Configure All.

3. **Verify and fix the firmware revisions for the replacement array.**

   Select Manage → Service → Revision Maintenance and click Create Patch Report. This verifies the Sun StorEdge 6020 array has the most recent patches applied.

   Click Select Patches. Check to see if any of the patches are listed for the replacement array. The list is presented with the names of the arrays and which patches are needed. Select the patches that you want to apply. The Patch Installation Report generates a log of the changes that have been applied.

Note – The Revision Maintenance may require initial setup if this is the first time it has been used on your Sun StorEdge 6320 system. This is done through the Revision Setup portion of the Storage Automated Diagnostic Environment.



12.4 Adding a Disk to a Sun StorEdge 6020 Array

You can add from 1-to-7 drives at a time to a Sun StorEdge 6020 array. The only caveat is that if you add less that the full compliment of 7 drives, you use you last storage pool for the tray. That means you must backup and restore data when you decide to add additional disks at a later date.

For additional information on adding disks to the Sun StorEdge 6020 arrays, refer to Chapter 6 of the *Sun StorEdge 6020 and 6120 Arrays System Manual.*

1. **Remove the blank spacer from the Sun StorEdge 6020 array from the desired slot.**
2. **Insert the new disk and lock it in place.**

Note – You must wait one minute after inserting the new disk into the tray before proceeding to Step 3 to allow time for the system to update the internal states.

---

3. **On a server, bring up the Storage Automated Diagnostic Environment in your web browser.**

```
https://hostname:7443/
```

4. **Enter the user name and password.**

```
User Name: admin
Password: !admin
```

5. **Create a new system inventory snapshot.**

   Select Manage → Service → Inventory Maintenance and click Generate New Inventory. Once the inventory is generated, click Save Inventory.

Note – By generating a new inventory with the added disk, you can immediately see if the disk is recognized by the system.

12.5 Adding One or More Sun StorEdge 6020 Arrays

1. **Note the MAC address of the new array.**

   The MAC address for the Sun StorEdge 6020 array is a 12-digit number that is printed on the label on the back of the array.

Tip – Refer to *Sun StorEdge 6020 and 6120 Arrays Installation Guide* for instructions about how to locate the MAC address.

---

2. **Set the new Sun StorEdge 6020 array on a table and attach the side rails using the eight screws.**

3. **Align the Sun StorEdge 6020 array's rails with the rails inside the Sun StorEdge 6320 system and push the array into the cabinet.**

4. **Install the four screws that secure the array to the front of the Sun StorEdge 6320 system.**

Note – Use care when installing the screws as the weight of the array can cause the screws to become cross threaded.

---

5. **Attach the trim strips using the two screws on each side of the Sun StorEdge 6020 array.**

6. **Close the front door of the Sun StorEdge 6320 system.**

7. **Open the back door of the Sun StorEdge 6320 system.**

8. **Insert the four screws that secure the Sun StorEdge 6020 array to the side rails in the back of the Sun StorEdge 6320 system.**

9. **Connect the two loop card cables on each side of the Sun StorEdge 6020 array.**

10. **Connect the Ethernet cable to the keepers.**

11. **Connect the Ethernet cable to the controller card if one is present in the array.**

12. **Connect the Fibre Channel cables.**

13. **Connect the power cables and turn on the power supply circuit breakers.**

    All LEDs on the back of the Sun StorEdge 6020 array will flash as the power on self-tests are run by the unit. It will take 3-5 minutes for the Sun StorEdge 6020 array to completely power up. Wait until it has completely powered up before proceeding.

14. **Close the back door of the Sun StorEdge 6320 system.**

15. **On a server, bring up the Storage Automated Diagnostic Environment in your web browser.**

```
https://hostname:7443/
```

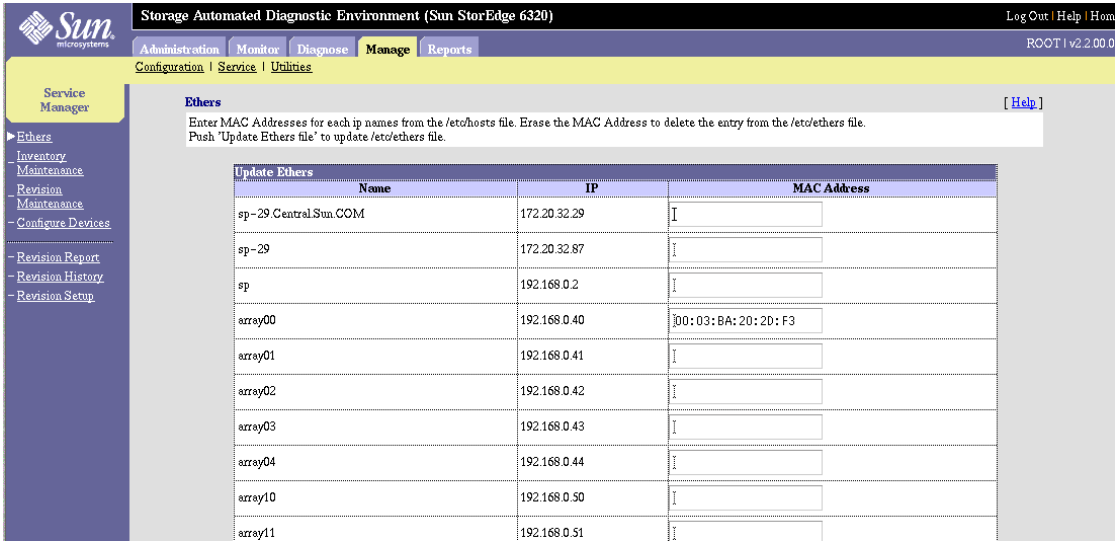
16. **Enter the user name and password.**

```
User Name: admin
Password: !admin
```

17. **Enter the MAC address for the replacement array.**

In the Storage Automated Diagnostic Environment Click on Manage → Service Manager → Ethers. Enter the MAC address for the replacement array. Click Update to apply the changes.

Caution – Be sure to assign the MAC address for the Sun StorEdge 6020 arrays to the correct array position in the Sun StorEdge 6320 system. IP address assignments are listed in Chapter 3.

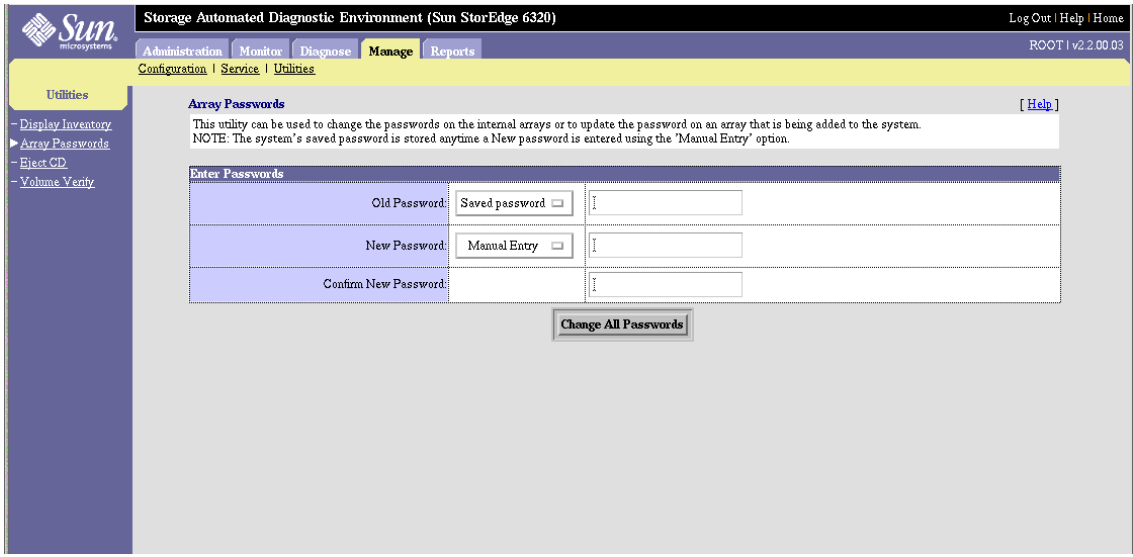


18. **Reboot the Sun StorEdge 6020 array to enable RARP to set the IP address.**

19. Set the password.

Most Sun StorEdge 6020 arrays do not have a password set when they are delivered. Arrays that are not new should also have the password cleared.

Leave the “Old Password” field blank if the array was delivered without a password. Change the “New Password” pulldown menu to be “Saved Password” and leave the field blank. The factory-set password will continue to be used for all arrays.



20. Create a new system inventory snapshot.

Select Manage → Service → Inventory Maintenance and click Generate New Inventory. Once the inventory is generated, click Save Inventory.

21. Configure the Sun StorEdge 6020 array

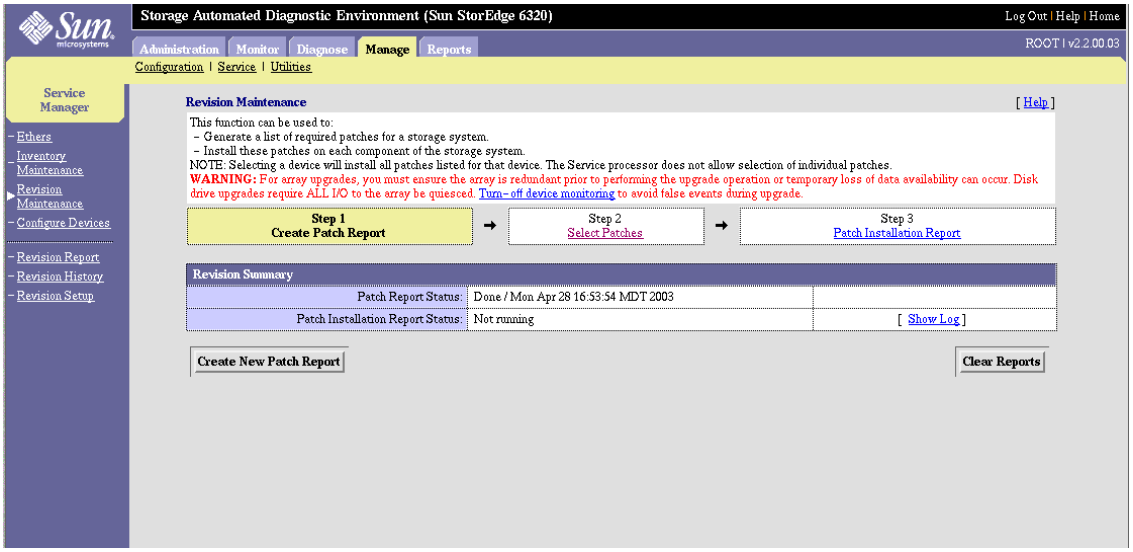
Select Manage → Service → Configure Devices” and click Configure All.

22. Verify and fix the firmware revisions for the replacement array.

Select Manage → Service → Revision Maintenance and click Create Patch Report. This verifies the Sun StorEdge 6020 array has the most recent patches applied.

Click Select Patches. Check to see if any of the patches are listed for the replacement array. The list is presented with the names of the arrays and which patches are needed. Select the patches that you want to apply. The Patch Installation Report generates a log of the changes that have been applied.

Note – The Revision Maintenance may require initial setup if this is the first time it has been used on your Sun StorEdge 6320 system. This is done through the Revision Setup portion of the Storage Automated Diagnostic Environment.



12.6 Replacing an Interconnect Loop Card

For the procedure to replace the interconnect loop card in a Sun StorEdge 6020 array, refer to Chapter 6 of the *Sun StorEdge 6020 and 6120 Arrays System Manual.*

12.7 Replacing a Sun StorEdge 6020 Array Controller Card

For the procedure to replace the controller card in a Sun StorEdge 6020 array, refer to Chapter 6 of the *Sun StorEdge 6020 and 6120 Arrays System Manual.*

12.8 Replacing the Power and Cooling Unit

For the procedure for replacing the power and cooling unit in a Sun StorEdge 6020 array, refer to Chapter 6 of the *Sun StorEdge 6020 and 6120 Arrays System Manual.*

12.9 Replacing the UPS Battery

For the procedure for replacing the UPS battery in a Sun StorEdge 6020 array, refer to Chapter 6 of the *Sun StorEdge 6020 and 6120 Arrays System Manual.*

APPENDIX **A**

Sun StorEdge 6320 Cable Labels

This appendix contains tables that list the cable labels for the Sun StorEdge 6320 system and the Sun StorEdge 6320 switchless system.

This appendix is organized as follows:

A.1 Sun StorEdge 6320 System RJ-45/RJ-45 Cabling

TABLE A-1 lists the RJ-45/RJ-45 cabling requirements for the primary cabinet of the Sun StorEdge 6320 system.

TABLE A-1 Sun StorEdge 6320 RJ-45/RJ-45 System Cabling Requirements

Ethernet Hub	Array	Label
Port 1	array0B	Hub 1 to array 0B
Port 2	array0D	Hub 2 to array 0D

TABLE A-1 Sun StorEdge 6320 RJ-45/RJ-45 System Cabling Requirements *(Continued)*

Port 3	array0F	Hub 3 to array 0F
Port 4	array0H	Hub 4 to array 0H
Port 5	array0J	Hub 5 to array 0J
Port 13	array0A	Hub 13 to array 0A
Port 14	array0C	Hub 14 to array 0C
Port 15	array0E	Hub 15 to array 0E
Port 16	array0G	Hub 16 to array 0G
Port 17	array0I	Hub 17 to array 0I
Ethernet Hub	**Storage Service Processor**	**Label**
Port 12	DMFE1 (net1)	Hub 12 to SSP (net1)
Ethernet Hub	**Patch Panel**	**Label**
Port 11	EnetA	Hub 11 to PP ENET A
Port 23	EnetB	Hub 23 to PP ENET B
SSP Accessory Tray	**Patch Panel**	**Label**
Serial Console	Serial Console	SSPAT SrlCnsl to PP SrlCnsl
Service Serial	Service Serial	SSPAT SrvSrl to PP SrvSrl
AUX	AUX	SSPAT Aux to PP Aux
User LAN	User LAN	SSPAT U-Lan to PP U-Lan
SP-LAN In	SP-LAN In	SSPAT SP-L-In to PP SP-L-In
SP-LAN Out	SP-LAN Out	SSPAT SP-L-Out to PP SP-L-Out
SSP Accessory Tray	**Storage Service Processor**	**Label**
SP ttya	TTYA (A LOM)	SP (A-LOM) to SSPAT TTYA
SP dmfe0	DMFE0 (net0)	SP (net0) to SSPAT DMFE0
SSP Accessory Tray	**SSP Accessory Tray**	**Label**
NTC ENET	NTC ENET	SSPAT NTC ENET to SSPAT NTC ENET
Switch	**Patch Panel**	**Label**
Enet port	FENET A	SW1 Enet to PP FENET A
Enet port	FENET B	SW2 Enet to PP FENET B

A.2 Second Expansion Cabinet RJ-45/RJ-45 Cabling

TABLE A-2 lists the RJ-45/RJ-45 cabling requirements for the second (expansion) cabinet attached to a Sun StorEdge 6320 system.

TABLE A-2 Sun StorEdge 6320 System RJ-45/RJ-45 Cabling Requirements (Second Cabinet)

Ethernet Hub	Array	Label
Port 1	array1B	Hub 1 to array1B
Port 2	array1D	Hub 2 to array1D
Port 3	array1F	Hub 3 to array1F
Port 4	array1H	Hub 4 to array1H
Port 5	array1J	Hub 5 to array1J
Port 6	array1L	Hub 6 to array1L
Port 13	array1A	Hub 13 to array1A
Port 14	array1C	Hub 14 to array1C
Port 15	array1E	Hub 15 to array1E
Port 16	array1G	Hub 16 to array1G
Port 17	array1I	Hub 17 to array1I
Port 18	array1K	Hub 18 to array1K
Ethernet Hub	**Patch Panel**	**Label**
Port 12	Enet A/B	Hub 12 to PP A/B

Note – Port 12 can be connected to either Enet A or Enet B.

A.3 Sun StorEdge 6320 System Switch Cabling

TABLE A-3 lists the Sun StorEdge 6320 system cabling requirements when Sun StorEdge network FC Switch-16 switches are installed in the system.

TABLE A-3 Sun StorEdge 6320 System Cabling Requirements for Switches

Switch 1 (SW1)	Patch Panel	Label	
Port0	1A	SW1 P0 to PP 1A	
Port1	2A	SW1 P1 to PP 2A	
Port2	3A	SW1 P2 to PP 3A	
Port3	4A	SW1 P3 to PP 4A	
Port4	5A	SW1 P4 to PP 5A	
Switch 1 (SW1)	**Array**	**Label**	
Port5	array00 (M)	SW1 P5 to array00 (M)	
Port6	array01 (M)	SW1 P6 to array01 (M)	
Port7	array02 (M)	SW1 P7 to array02 (M)	
Port8	array03 (M)	SW1 P8 to array03 (M)	
Port9	array04 (M)	SW1 P9 to array04 (M)	
Switch 1 (SW1)	**Patch Panel**	**Fanout End Label**	**MTP End Label**
Port10[1]	FC1A[1]	SW1 P10	PP FC1 A
Port11[1]		SW1 P11	
Port12[1]		SW1 P12	
Port13[1]		SW1 P13	
Port14[1]		SW1 P14	
Port15[1]		SW1 P15	
Switch 2 (SW2)	**Patch Panel**	**Label**	
Port0	1B	SW2 P0 to PP 1B	
Port1	2B	SW2 P1 to PP 2B	
Port2	3B	SW2 P2 to PP 3B	
Port3	4B	SW2 P3 to PP 4B	

TABLE A-3 Sun StorEdge 6320 System Cabling Requirements for Switches *(Continued)*

Port4	5B	SW2 P4 to PP 5B	
Switch 2 (SW2)	**Array**	**Label**	
Port5	array00 (A / M)	SW2 P5 to array00 (A / M)	
Port6	array01 (A / M)	SW2 P6 to array01 (A / M)	
Port7	array02 (A / M)	SW2 P7 to array02 (A / M)	
Port8	array03 (A / M)	SW2 P8 to array03 (A / M)	
Port9	array04 (A / M)	SW2 P9 to array04 (A / M)	
Switch 2 (SW2)	**Patch Panel**	**Fanout End Label**	**MTP End Label**
Port10[1]	FC1B[1]	SW2 P10	PP FC1 B
Port11[1]		SW2 P11	
Port12[1]		SW2 P12	
Port13[1]		SW2 P13	
Port14[1]		SW2 P14	
Port15[1]		SW2 P15	

1 - Denotes MTP to Fanout cable for both FC1B and FC1A.

A.4 Sun StorEdge 6320 System Without Switch Cabling

TABLE A-4 lists the Sun StorEdge 6320 system FC cabling requirements when switches are not present in the main cabinet.

TABLE A-4 Sun StorEdge 6320 System Cable Requirements Without Switches

Patch Panel	Array	Label
1A (back)	array00 (M)	array00 (M) to PP 1A (back)
2A (back)	array01 (M)	array01 (M) to PP 2A (back)
3A (back)	array02 (M)	array02 (M) to PP 3A (back)
4A (back)	array03 (M)	array03 (M) to PP 4A (back)
5A (back)	array04 (M)	array04 (M) to PP 5A (back)
1B (back)	array00 (A / M)	array00 (A / M) to PP 1B (back)

TABLE A-4 Sun StorEdge 6320 System Cable Requirements Without Switches *(Continued)*

2B (back)	array01 (A / M)	array01 A / (M) to PP 2B (back)	
3B (back)	array02 (A / M)	array02 (A / M) to PP 3B (back)	
4B (back)	array03 (A / M)	array03 (A / M) to PP 4B (back)	
5B (back)	array04 (A / M)	array04 (A / M) to PP 5B (back)	
Patch Panel	**Patch Panel**	**MTP End Label**	**Fanout End Label**
PP FC1 A (back)[1]	6A (back)	PP FC1A (back)	PP 6A (back)
	7A (back)		PP 7A (back)
	8A (back)		PP 8A (back)
	9A (back)		PP 9A (back)
	10A (back)		PP 10A (back)
	11A (back)		PP 11A (back)
PP FC1 B (back)[1]	6B (back)	PP FC1 B (back)	PP 6B (back)
	7B (back)		PP 7B (back)
	8B (back)		PP 8B (back)
	9B (back)		PP 9B (back)
	10B (back)		PP 10B (back)
	11B (back)		PP 11B (back)

1 - Denotes MTP to Fanout cable for both FC1B and FC1A.

A.5 Sun StorEdge 6320 System Expansion FC Cable Requirements

TABLE A-5 lists the Sun StorEdge 6320 system expansion cabinet FC cable requirements.

TABLE A-5 Sun StorEdge 6320 System Expansion FC Cable Requirement

Exp Patch Panel	Main Patch Panel	Label	
EXP FC1A	EXP FC1A	Main PP EXP FC1 A to Expansion PP EXP FC1 A	
EXP FC1B	EXP FC1B	Main PP EXP FC1 A to Expansion PP EXP FC1 A	
Exp Patch Panel	**Array**	**MTP End Label**	**Fanout End Label**
Expansion FC1A[1]	array10 (M)	PP Expansion FC1 A	array10 (M)
	array11 (M)		array11 (M)
	array12 (M)		array12 (M)
	array13 (M)		array13 (M)
	array14 (M)		array14 (M)
	array15 (M)		array15 (M)
Expansion FC1B[1]	array10 (A / M)	PP Expansion FC1 B	array10 (A / M)
	array11 (A / M)		array11 (A / M)
	array12 (A / M)		array12 (A / M)
	array13 (A / M)		array13 (A / M)
	array14 (A / M)		array14 (A / M)
	array15 (A / M)		array15 (A / M)

1 - Denotes MTP to Fanout cable for both FC1B and FC1A.

Note – In TABLE A-5, the EXP FC1A and EXP FC1B denote the MTP to fanout cable.

A.6 Sun StorEdge 6320 System Power Cable Requirements

TABLE A-6 lists the Sun StorEdge 6320 system power cable requirements.

TABLE A-6 Sun StorEdge 6320 System Power Cable Requirements

Front PS	**Patch Panel**	**Label**	
J14	Front Seq J14	J14 to PP Front Seq J14 In	
J15	Front Seq Out	J15 to PP Front Seq J15 Out	
Front PS	**Storage Service Processor**	**Label**	**Label**
J2[1]	SSP Power (Unused)	J2	J2 to SSP (Unused)
Front PS	**Switches**	**Label**	**Label**
J1[1]	SW1 Power	J1	J1 to SW1
	SW2 Power		J1 to SW2
Rear PS	**Patch Panel**	**Label**	
J14	Rear Seq J14	J14 to PP Rear Seq J14 In	
J15	Rear Seq Out	J15 to PP Rear Seq J15 Out	
Rear PS	**SSPAT/Ethernet Hub**	**Label**	**Label**
J2[1]	SSPAT Power	J1	J2 to SSPAT
	Hub Power		J2 to Hub
Rear PS	**Switches**	**Label**	**Label**
J1[1]	SW1 Power	J1	J1 to SW1
	SW2 Power		J1 to SW2
Front PS[2]	**Array**	**Rear PS[2]**	**Array**
J6	array0F	J6	array0F
J9	array0C	J9	array0C
J10	array0D	J10	array0D
J11	array0E	J11	array0E
J5[1]	array0A	J5[1]	array0A

TABLE A-6 Sun StorEdge 6320 System Power Cable Requirements *(Continued)*

	array0B		array0B
J8[1]	array0G	J8[1]	array0G
	array0H		array0H
J12[1]	array0I	J12[1]	array0I
	array0J		array0J

1 - Denotes Y cable.
2 - Denotes “no labels required.”

A.7 Sun StorEdge 6320 Expansion System Power Cable Requirements

TABLE A-7 lists the Sun StorEdge 6320 expansion system power cable requirements.

TABLE A-7 Sun StorEdge 6320 Expansion System Power Cable Requirements

Front PS	**Ethernet Hub**	**Label**		
J2	Hub Power	J2 to Hub		
Front PS	**Patch Panel**	**Label**		
J14	Front Seq J14	J14 to PP Front Seq J14 In		
J15	Front Seq Out	J15 to PP Front Seq J15 Out		
Rear PS	**Patch Panel**	**Label**		
J14	Rear Seq J14	J14 to PP Rear Seq J14 In		
J15	Rear Seq Out	J15 to PP Rear Seq J15 Out		
Front PS[2]	**Array**		**Rear PS[2]**	**Array**
J6	array1G		J6	array1G
J7	array1H		J7	array1H
J9	array1C		J9	array1C

TABLE A-7 Sun StorEdge 6320 Expansion System Power Cable Requirements *(Continued)*

J10	array1D	J10	array1D
J5[1]	array1A	J5[1]	array1A
	array1B		array1B
J8[1]	array1I	J8[1]	array1I
	array1J		array1J
J11[1]	array1E	J11[1]	array1E
	array1F		array1F
J12[1]	array1L	J12[1]	array1L
	array1K		array1K

1 - Denotes Y cable.
2 - Denotes “no labels required.”

A.8 Miscellaneous Cable Requirements

TABLE A-8 lists the miscellaneous Sun StorEdge 6320 system cable requirements.

TABLE A-8 Sun StorEdge 6320 Miscellaneous Cable Requirements

Main Rack - USB Cable Requirements	**Storage Service Processor**	**Patch Panel (Relay)**
	USB Port 1	Relay In
Main Rack RJ11/RJ11 Cable Requirements	**SSP Accessory Tray**	**Patch Panel**
	Phone	Phone

Glossary

Dynamic Multipathing (DMP) A VERITAS Volume Manager feature that provides an alternate pathing mechanism for rerouting data in the event of a controller failover.

F port On a Fibre Channel switch, a port that supports a point-to-point or Fabric connection.

Fabric A Fibre Channel network built around one or more switches. It is also common to refer to something as a "Fabric device" or being in "Fabric mode." When used in this context, it means a public device, capable of logging in to a Fabric and having public loop characteristics (as opposed to a private loop legacy device).

Fibre Channel A cost-effective gigabit communications link deployed across a wide range of hardware.

FC-AL Fibre Channel-Arbitrated Loop. A loop can contain up to 126 nodes, accessible through only one or two servers.

FRU field-replaceable unit. An assembly that a manufacturer replaces on failure of an assembly component.

GBIC Gigabit interface converter. A hot-swappable input/output device that connects in to a Gigabit Ethernet port or Fibre Channel.

Hard zones Hard zones enable the division of the Fabric (one or more switch chassis) into multiple Fabric-wide zones that define the ports that can communicate with each other.

HBA Host Bus Adapter. A controller board that connects the I/O expansion bus to other Fibre Channel components.

hot spare A drive in a RAID 1 or RAID 5 configuration that contains no data and acts as a standby in case another drive fails.

hot-swappable The ability of a field-replaceable unit (FRU) to be removed and replaced while the system remains powered on and operational.

LUN Logical Unit Number or logical unit. A system assigned number that allows host software to differentiate multiple logical units within the same system.

LUN mapping The process of changing the logical unit number that is presented from storage.

LUN masking The characteristic that enables an administrator to dynamically expose or hide logical units from specific HBA ports. This provides an individual server or multiple servers access to an individual logical unit or multiple logical units and prohibits unwanted server access to the same logical units.

MAC address Media access control. A unique address that identifies an Ethernet device.

NTC Network terminal concentrator. A modem connection point for the Sun StorEdge Remote Response software. The NTC facilitates a point-to-point protocol (PPP) connection from a remote support and does not depend on the Storage Service Processor to complete a call.

OPIE one-time passwords in everything. OPIE is a package derived from the Bellcore S/Key Version 1 distribution that secures a system against replay attacks.

out-of-band Refers to the connections that go over Ethernet and not Fibre Channel. This connection is not in the data path. The Storage Service Processor does not have access to the data that is stored on the Sun StorEdge 6320 system; thus this information is considered to be out-of-band.

N port A Fibre Channel port in a point-to-point or Fabric connection.

RAID Redundant array of independent disks. A configuration in which multiple drives are combined into a single virtual drive to improve performance and reliability.

RARP Reverse address resolution protocol. A protocol in the Solaris operating environment that enables automatic assignment of the array IP address from the host.

RU Rack unit.

SCSI Small Computer Systems Interface. An industry standard for connecting disk and tape devices to a host.

storage array One or more trays with at least one being a controller tray. All the trays are managed as a single unit.

storage pool A group of volumes that can be disks. From the volumes, you can create virtual drives.

Storage Service Processor LAN An Ethernet LAN used to perform local management and service functions on the Storage Service Processor. It also facilitates aggregation of telemetry data from multiple Storage Service Processors. By design, the Storage Service Processor LAN address is configured to be 10.0.0.*n*.

USB Universal Serial Bus. A standard bus type for many devices. USB devices are hot-swappable, meaning they can be connected and disconnected while computer is on. The Storage Service Processor uses a USB flash disk to store personality data about the Sun StorEdge 6320 system.

Volume Also called a logical unit number or LUN, a volume is one or more drives that can be grouped into a unit for data storage.

WWN Worldwide name. A number used to identify array volumes, Fibre Channel ports, or storage arrays.

zone A dedicated path between a device Fibre Channel port and a HBA port.

zoning The act of setting up a zone.

Index

N

O

P

R

S

U

W

Z