Sun StorEdge™ 6130 Array Getting Started Guide

Installation and Configuration

Sun Microsystems, Inc.
www.sun.com

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Contents

Figures

Tables

Preface

The *Sun StorEdge 6130 Array Getting Started Guide* is a combined installation, initial configuration, and getting started guide for the Sun StorEdge 6130 array. This guide describes how to install rackmounting rails, array modules, and management and configuration software.

Before You Read This Book

Before you begin to install the Sun StorEdge 6130 array, you must have already prepared the site as described in these books:

- *Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*
- *Sun StorEdge 6130 Array Site Preparation Guide*

How This Book Is Organized

Chapter 1 provides an overview of the Sun StorEdge 6130 array, management software, and installation process.

Chapter 2 describes how to install rackmounting rails, controller modules, and expansion cabinets in three Sun cabinets.

Chapter 3 describes array module power-on procedures.

Chapter 4 describes how to connect the management host and data hosts to enable access to the array.

Chapter 5 describes how to install the management software from CD.

Chapter 6 describes initial setup procedures for the management software.

Chapter 7 describes how to install the data host software.

Chapter 8 describes how to install the remote CLI client software.

Chapter 9 introduces you to the software and provides information for planning your storage configuration.

Appendix A provides worksheets to help you gather the information you need to complete the installation.

Appendix B describes how to set up a DHCP server.

Using UNIX Commands

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

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at `http://docs.sun.com`

Shell Prompts

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

Typographic Conventions

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

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

Related Documentation

Application	Title	Part Number
Site planning information	*Sun StorEdge 6130 Array Site Preparation Guide*	819-0033-*nn*
Regulatory and safety information	*Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*	819-0035-*nn*
Late-breaking information not included in the information set	*Sun StorEdge 6130 Array Release Notes*	819-0034-*nn*
Instructions for installing the Sun StorEdge Expansion cabinet	*Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067-*nn*
Instructions for installing the Sun Rack 900/1000 cabinets	*Sun Rack Installation Guide*	816-6386-*nn*
Instructions for installing the Sun Fire cabinet	*Sun Fire Cabinet Installation and Reference Manual*	806-2942-*nn*

Accessing Sun Documentation

You can obtain Sun network storage documentation at:

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

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http://www.sun.com/documentation

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

Sun StorEdge 6130 Array Getting Started Guide, part number 819-0032-04

CHAPTER 1

Overview

This chapter provides an overview of the Sun StorEdge 6130 array. It contains the following sections:

Product Overview

The Sun StorEdge 6130 array is a high-performance, enterprise-class, full 2 Gigabit per second (Gb/s) Fibre Channel solution that combines outstanding performance with the highest reliability, availability, flexibility, and manageability.

The Sun StorEdge 6130 array is modular, rackmountable and scalable from a single controller module (1x1) configuration to a maximum configuration of 1x8 with seven additional expansion modules behind one controller module (FIGURE 1-1).

This section contains an overview of the Sun StorEdge 6130 array hardware and software.

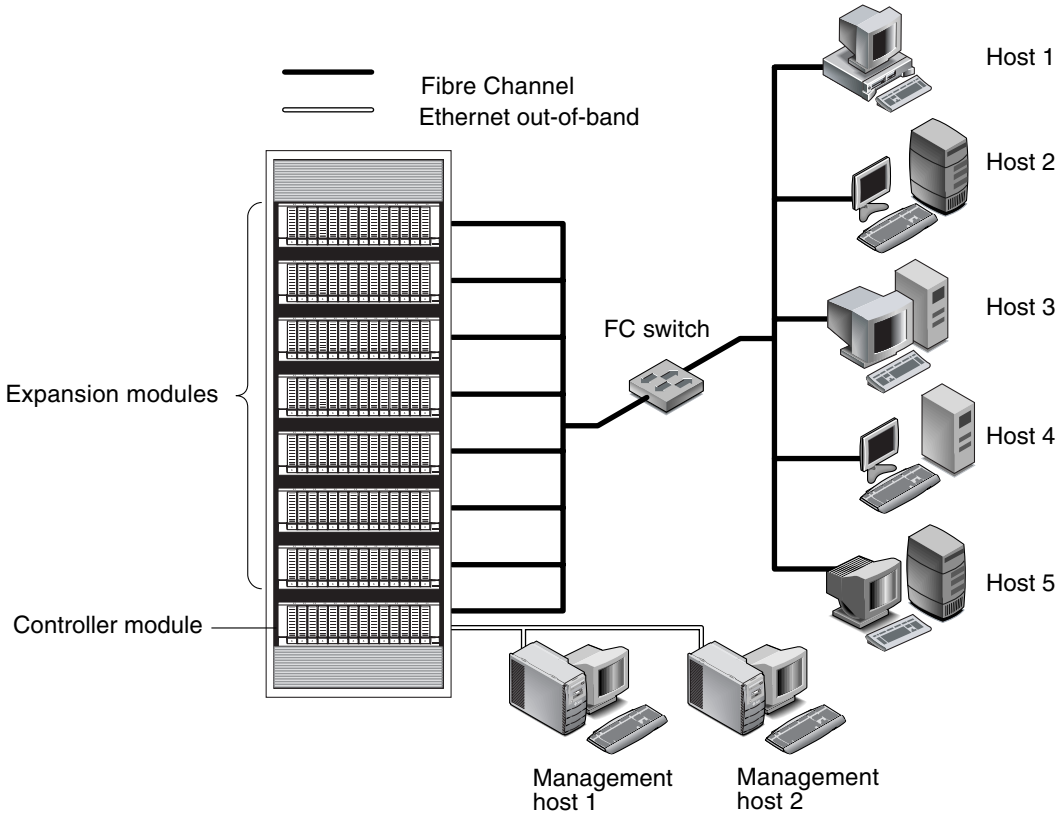

FIGURE 1-1 Sun StorEdge 6130 Array Product Overview

Hardware Overview

The Sun StorEdge 6130 array is a modular storage device that can scale from one controller module to an array with a maximum of eight modules, consisting of one controller module and seven expansion modules. Each controller or expansion module can contain 5 to 14 disk drives per module. The StorEdge 6130 arrays can be installed in the Sun StorEdge Expansion cabinet, Sun Fire System cabinet, and Sun Rack 900 /1000 cabinets.

This section describes the main components of the Sun StorEdge 6130 array controller and expansion modules.

Controller Module

A controller module contains two RAID controllers, which operate independently and provide failover capability for the management path. The controller module is configured for Fibre Channel (FC) disk drives and provides RAID functionality, caching, and disk storage.

TABLE 1-1 describes the controller module configuration.

TABLE 1-1 Sun StorEdge 6130 Array Controller Module

Description	Quantity
FC RAID controllers	2
FC 3.5-inch drives	5 - 14 per module
FC hard disk drives: 73G10K, 73G15K, 146G10K	
Ethernet ports for management host connections	2 (1 per controller)
2-Gbps FC host ports with SFPs	4 (2 per controller)
2-Gbps FC expansion ports	2 (1 per controller)
Power supplies	2
Fan assemblies	2

FIGURE 1-2 shows the components and indicators on the front of the controller module.

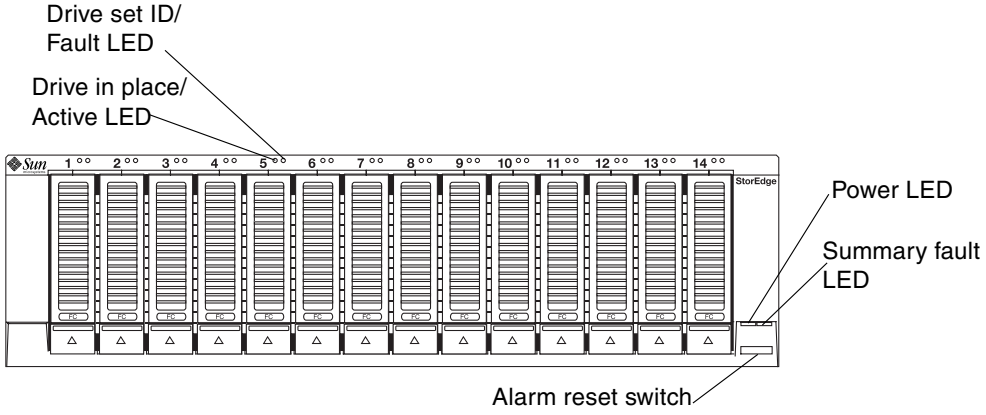

FIGURE 1-2 Controller Module (Front View)

TABLE 1-2 describes the LEDs and switches on the front of the controller module.

TABLE 1-2 Controller Module LEDs and Switches (Front)

LED/Switch	Description
Drive set ID/Fault LED	This LED is steady amber to indicate a drive fault and blinks amber to indicate drive position identification.
Drive in place/Active LED	This LED is steady green for each drive that is in place and blinks green to indicate disk activity.
Power LED	This LED is steady green when at least one power supply is installed and functional.
Summary fault LED	This LED is amber when a tray level fault occurs.
Alarm reset switch	This switch is used to silence the tray's audible alarm.

FIGURE 1-3 shows the ports, switches, and LEDs at the back of the controller module. You will use these during the installation procedure.

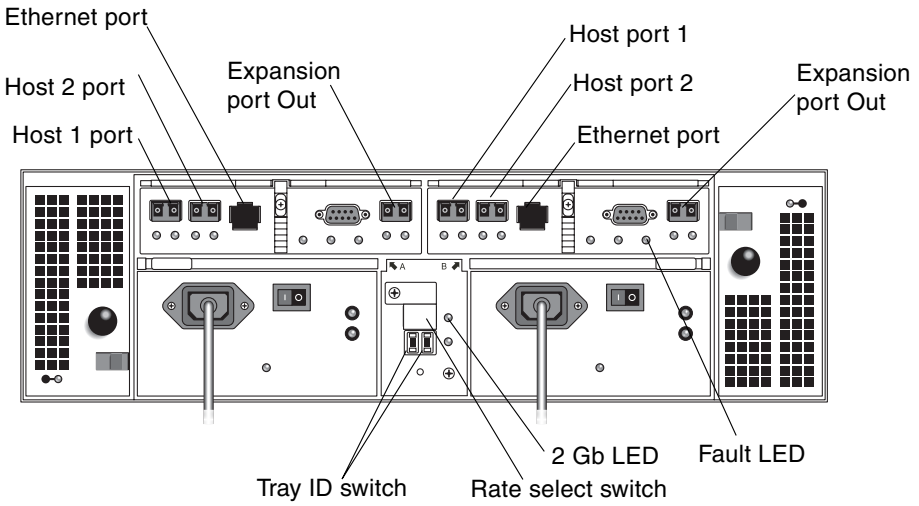

FIGURE 1-3 Controller Module (Back View)

TABLE 1-3 describes the ports, switches, and LEDs on the back of the controller module.

TABLE 1-3 Controller Module Ports, Switches, and LEDs (Back)

Ports/Switches/LEDs	Description
Host 1 and 2 ports	2-Gbit FC Small Form-factor Plug-in (SFP) ports used to connect to data hosts.
Ethernet ports	RJ-45 Ethernet port used for out-of-band management of the RAID controller. An internal Ethernet device provides standard 10 Mbits/second and 100 Mbits/second full-duplex connectivity.
Expansion ports (Out)	2-Gbit FC ports used to connect to the drive channel device and expansion modules.
Tray ID switch	A pair of rotary switches used to select the array's tray number. One switch sets the tens place, and the other sets the ones place.
Rate select switch	A toggle switch used to set the transfer rate of the FC disk drive loop to 1 Gbit/second or 2 Gbits/second.
2 Gb LED	This LED is green when the FC disk drive loops are operating at 2 Gbits/second. The LED is not lit when the FC disk drive loops are operating at 1 Gbit/second.
Fault LED	This LED is amber when a tray level fault exists.

Expansion Module

The expansion module provides for up to 14 additional FC or Serial Advanced Technology Attachment (SATA) drives. An expansion module is cabled directly to a controller module and cannot operate independently.

You cannot mix FC and SATA disk drives within the same expansion module. All drives within a single expansion module must be the same type, either all FC drives or all SATA drives.

FIGURE 1-4 shows the front and back views of the expansion module.

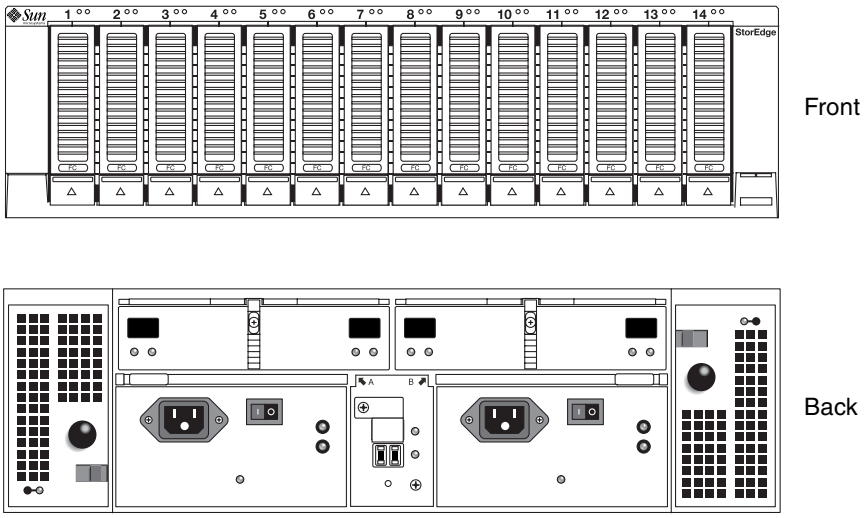

FIGURE 1-4 Expansion Module (Front and Back Views)

TABLE 1-4 describes the expansion module configuration.

TABLE 1-4 Sun StorEdge 6130 Array Expansion Module

Description		Quantity
FC or SATA 3.5-inch drives	FC hard disk drives: 73G10K, 73G15K, 146G10K SATA hard disk drives: 400G7.2	5 - 14
I/O module with In and Out expansion ports		2
Power supplies		2
Fan assemblies		2

Software Overview

The Sun StorEdge 6130 array software is delivered on CD and consists of the tools described in the following topics:

- "Management Software" on page 7
- "Remote CLI Client" on page 7

- "Monitoring and Diagnostic Software" on page 7
- "Data Host Software" on page 8

You specify the functionality you require, and the CD installs the necessary software.

Management Software

The Sun StorEdge 6130 array web-based management software is the primary interface for configuring and managing the array. The management software consists of a suite of tools that you install on an external management host. The management host must be a Sun workstation running the Solaris 8 or Solaris 9 Operating System (OS).

The management software enables the storage administrator to manage the Sun StorEdge 6130 array from any system with a web browser that is on the same network as the management host. For a list of supported browsers, see the *Sun StorEdge 6130 Array Release Notes*.

Remote CLI Client

You can also manage and configure storage for the Sun StorEdge 6130 array using the remote command line interface (CLI) client. The CLI provides the same control and monitoring capability as the web browser, and it is also scriptable for running frequently performed tasks.

The remote CLI client is available for Solaris OS and several other operating systems. See the *Sun StorEdge 6130 Array Release Notes* for a list of supported operating system platforms. For more information about the CLI commands, see the `sscs` man page.

Monitoring and Diagnostic Software

The Sun Storage Automated Diagnostic Environment is a monitoring and diagnostic tool for the array. You can configure the software to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the Sun StorEdge 6130 array.

The monitoring and diagnostic software can be accessed from a web browser or from the command line.

Data Host Software

The Sun StorEdge 6130 array data host software controls the data path between the data host and the array. The data host software consists of the following tools:

- Sun StorEdge SAN Foundation Software for managing the data path I/O connections between data hosts and the array. This software includes drivers and utilities that enable Solaris data hosts to connect to, monitor, and transfer data in a SAN.
- Sun StorEdge Traffic Manager software, which provides multipathing functionality and the ability to reliably communicate with the array's storage.

Data host software enables Solaris 8 and Solaris 9 workstations and other operating system platforms to communicate with the Sun StorEdge 6130 array. For a list of supported operating system platforms, see the *Sun StorEdge 6130 Array Release Notes*.

Data host software for Solaris is distributed on the Sun StorEdge 6130 Host Installation Software CD. See Chapter 7 for information about how to obtain the software for other operating systems from Sun's Download Center.

Overview of the Installation Process

Before you begin to install the array, you must do the following:

- Read the *Sun StorEdge 6130 Array Release Notes* for any late-breaking information related to the installation of the array.
- Prepare the site as described in these books:
  - *Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*
  - *Sun StorEdge 6130 Array Site Preparation Guide*

You can download the Sun StorEdge documentation from:

`http://www.sun.com/products-n-solutions/hardware/docs/Network Storage Solutions/Midrange/6130/index.html`

The following checklist (TABLE 1-5) outlines all of the tasks required for installing the Sun StorEdge 6130 array hardware and software and tells you where you can find detailed procedures. To ensure a successful installation, perform the tasks in the order in which they are presented.

TABLE 1-5 Sun StorEdge 6130 Array Installation Checklist

Step	Installation Task	Where to Find Procedure
1.	Unpack the cabinet and move it into position.	Unpacking guide attached to the outside of the shipping carton
2.	Install and secure the cabinet.	*Sun StorEdge Expansion Cabinet Installation and Service Manual*, *Sun Rack Installation Guide*, or *Sun Fire Cabinet Installation and Reference Manual*
3.	Unpack the rackmounting kit and check its contents.	"Preparing the Rackmount Kit" on page 12
4.	Unpack the array module box and check its contents.	"Preparing the Array Module" on page 13
5.	Prepare the cabinet for installation.	"Preparing the Cabinet" on page 13
6.	Attach the rails to the cabinet.	"Attaching the Rails to the Sun StorEdge Expansion or Sun Fire Cabinet" on page 14 or "Attaching the Rails to the Sun Rack 900/1000 Cabinet" on page 21
7.	Mount the controller module and expansion modules in the cabinet.	"Mounting Array Modules in the Cabinet" on page 27
8.	Attach the power cables.	"Connecting the Power Cables" on page 32
9.	Set the tray ID.	"Setting the Tray ID" on page 33
10.	Cable the controller module and expansion modules.	"Intermodule Cabling" on page 34
11.	Turn on the power and check the link rate.	"Powering On Array Modules" on page 44
12.	Connect the management host.	"Connecting the Management Host" on page 49
13.	Attach the host interface cables.	"Connecting Data Hosts" on page 50
14.	Install the management software.	"Running the Installation Script" on page 56
15.	Configure the controller module IP addresses.	"Configuring the IP Address of the Array" on page 58
16.	Start and log in to the management software.	"Starting the Software for the First Time" on page 67

TABLE 1-5 Sun StorEdge 6130 Array Installation Checklist *(Continued)*

Step	Installation Task	Where to Find Procedure
17.	Set initial array settings.	"Setting Up the Management Software" on page 73
18.	Set initial Storage Automated Diagnostic Environment settings.	"Setting Up the Sun Storage Automated Diagnostic Environment" on page 80
19.	Connect Sun Remote Services Net Connect.	"Connecting Sun SRS Net Connect 3.1" on page 82
20.	Install the data host software.	"Installing Data Host Software" on page 85
21.	Install the remote CLI software.	"Installing Remote Management Software" on page 91
22.	Start to configure your storage.	"Planning Your Storage Configuration" on page 95

CHAPTER 2

Installing Array Modules

Use the procedures in this chapter to install array modules in a cabinet. The number of modules you need to install depends on your overall storage requirements. You can install a maximum of eight, one controller module and up to seven expansion modules, in a Sun cabinet.

This chapter describes the process of installing Sun StorEdge 6130 array modules. It contains the following sections:

The installation procedures in this chapter require the following items:

- #2 Phillips screwdriver
- #3 Phillips screwdriver
- Antistatic protection

Caution – Electrostatic discharge can damage sensitive components. Touching the array or its components without using a proper ground might damage the equipment. To avoid damage, use proper antistatic protection before handling any components.

Preparing for the Installation

Use the following procedures to prepare for installation:

Preparing the Rackmount Kit

Unpack the rackmount kit and check the contents. The kit contains the following items.

CAM100 3RU Rail Kit:

- Left front (P/N 341-04443-01) and rear (P/N 341-0444) rails
- Right front (P/N 341-04445-01) and rear (P/N 341-0446) rails
- Mounting hardware as listed below:

Quantity	Type	Used With
8	8-32 (small) panhead screw	All Sun cabinets
8	10-32 (medium) panhead screw	Sun StorEdge Expansion cabinet or Sun Fire cabinet
12	Metric M6 (large) panhead screw	Sun Rack 900/1000 cabinet

Note – The kit may have extra screws.

The rails can be adjusted to fit the following Sun cabinets:

- Sun StorEdge Expansion cabinet
- Sun Fire cabinet
- Sun Rack 900/1000 cabinet

Preparing the Array Module

Caution – Two people are needed to lift and move the array module. Use care to avoid injury. An array can weigh up to 95 pounds (43 kg). Do not lift the front of the module; this can cause damage to the drives.

1. **Unpack the array module.**
2. **Check the contents of the box for the following items:**
   - Sun StorEdge 6130 array module (controller or expansion)
   - Ship kit for the controller module
     - Two 5-meter optical Fibre Channel (FC) cables for connecting the RAID controllers to your Storage Area Network (SAN) or host
     - Two 6-meter RJ45 -RJ45 Ethernet cables
     - Sun StorEdge 6130 Host Installation Software CD
     - *Sun StorEdge 6130 Array Getting Started Guide*
   - Ship kit for the expansion module
     - Two 2-meter copper FC cables
     - Documentation URL brochure

Preparing the Cabinet

Select the cabinet in which you will be installing the array. Be sure the cabinet is installed as described in the installation instructions provided with it.

1. **Stabilize the cabinet as described in the cabinet documentation.**
2. **If the cabinet has casters, make sure the casters are locked to prevent the cabinet from rolling.**
3. **Remove or open the top front panel.**
4. **Remove or open the vented back panel.**

Planning the Order of the Module Installation

Install the modules starting with the first controller module at the bottom of the cabinet. Next install the expansion modules for the first controller module. If room remains in the cabinet, repeat for the next controller and expansion modules.

Starting at the bottom distributes the weight correctly in the cabinet.

Attaching the Rails

Depending on the type of Sun cabinet you have, use one of the following procedures to attach the rails:

- Attaching the Rails to the Sun StorEdge Expansion or Sun Fire Cabinet
- Attaching the Rails to the Sun Rack 900/1000 Cabinet

Because this rail kit can be adapted for several cabinets, closely follow the procedures; they may require actions you have not previously taken.

Note – In this section, you will loosely hang the rails from screws you attach to the side walls, *before* connecting the rails to the front and back.

Attaching the Rails to the Sun StorEdge Expansion or Sun Fire Cabinet

The procedure for attaching the rails to the Sun StorEdge Expansion cabinet and Sun Fire cabinet are the same, with one exception. For the Sun Fire cabinet, the rail extensions are not required and the following procedure instructs you to remove the screws and the extension from each rail.

Note – All of the drawings show the Sun StorEdge Expansion cabinet.

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1. **Depending on the type of cabinet you have, do one of the following:**
   - For the Sun StorEdge Expansion cabinet, use the #2 Phillips screwdriver to loosen the side-rail screws. Adjust each rail to its maximum length (FIGURE 2-1).

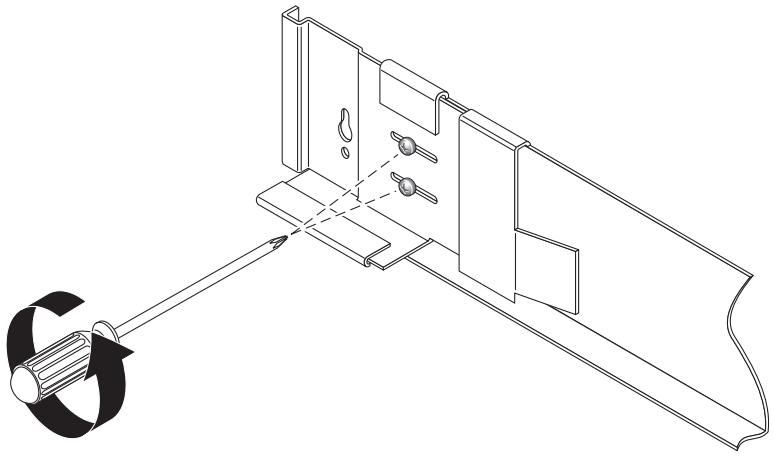

FIGURE 2-1 Loosening the Rail Screws to Adjust the Rail Length

- For the Sun Fire cabinet, use the #2 Phillips screwdriver to loosen and remove the side-rail screws. Remove the rail extension from the rail (FIGURE 2-2).

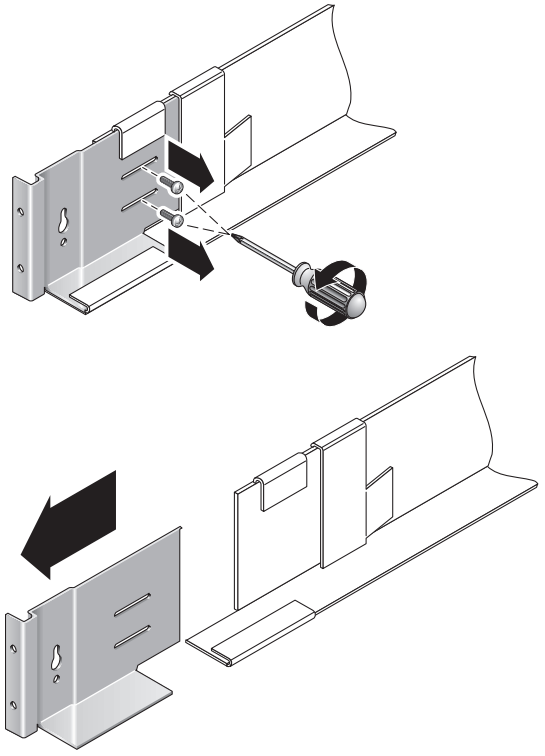

FIGURE 2-2 Removing the Rail Extension for the Sun Fire Cabinet

2. **Insert four 10-32 screws (two per side) in the front and back mounting holes of the cabinet (FIGURE 2-3). Do not tighten at this time. You will hang the side rails on these screws.**

   Use the numbered marks on the inside of the cabinet to be sure that all four screws are aligned and mounted at the same height. Use hole 10 for the first module and hole 19 for the second.

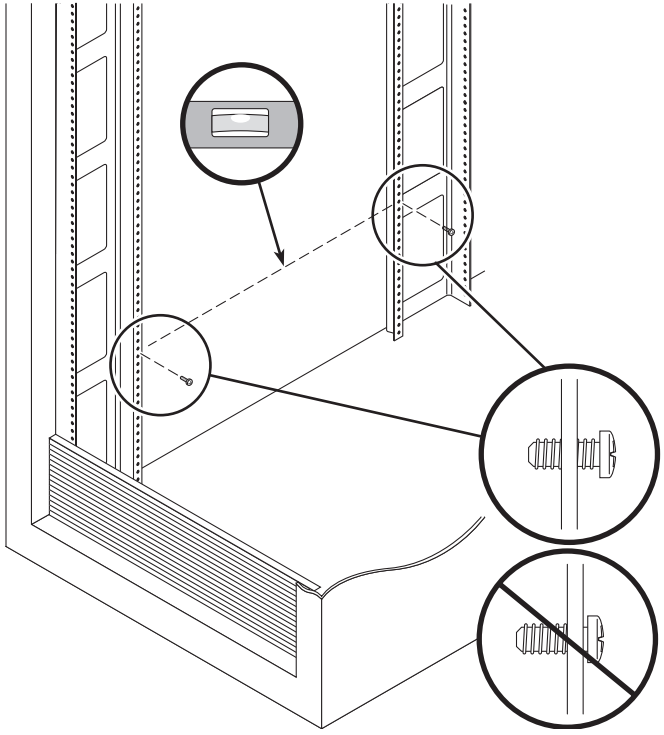

FIGURE 2-3 Inserting Screws in the Front and Back Cabinet Mounting Holes

3. **Hang the left rail by aligning the large slot of the left rail over the front and back screws and pull the rail down to position each screw in the smaller end of the slot (FIGURE 2-4). Repeat for the right rail.**

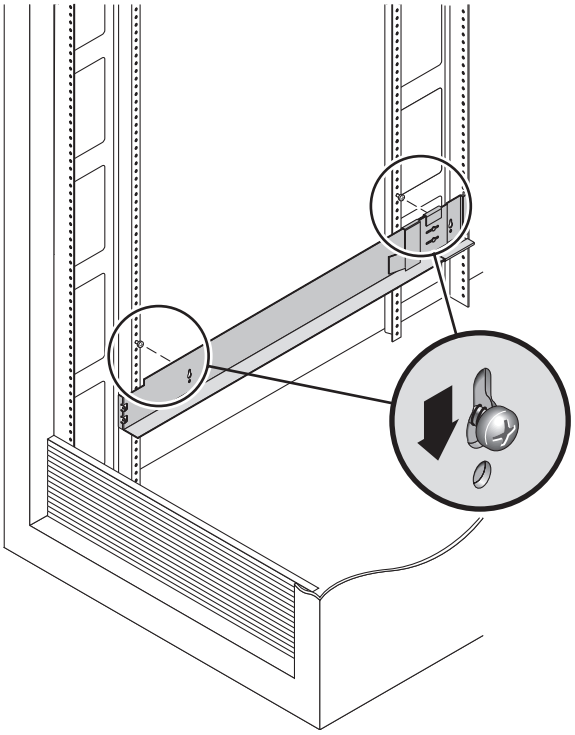

FIGURE 2-4 Aligning the Large Slot of the Left Rail

Note – You might have to move the mounting screws to a higher or lower mounting hole in the cabinet to get the rail holes to align with the cabinet mounting holes.

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4. **For the Sun StorEdge Expansion cabinet, adjust the length of each rail to fit the cabinet.**

5. **Using the #2 Phillips screwdriver, insert two 8-32 screws in the front of the left rail to secure the rail to the front of the cabinet (FIGURE 2-5). Repeat for the right rail.**

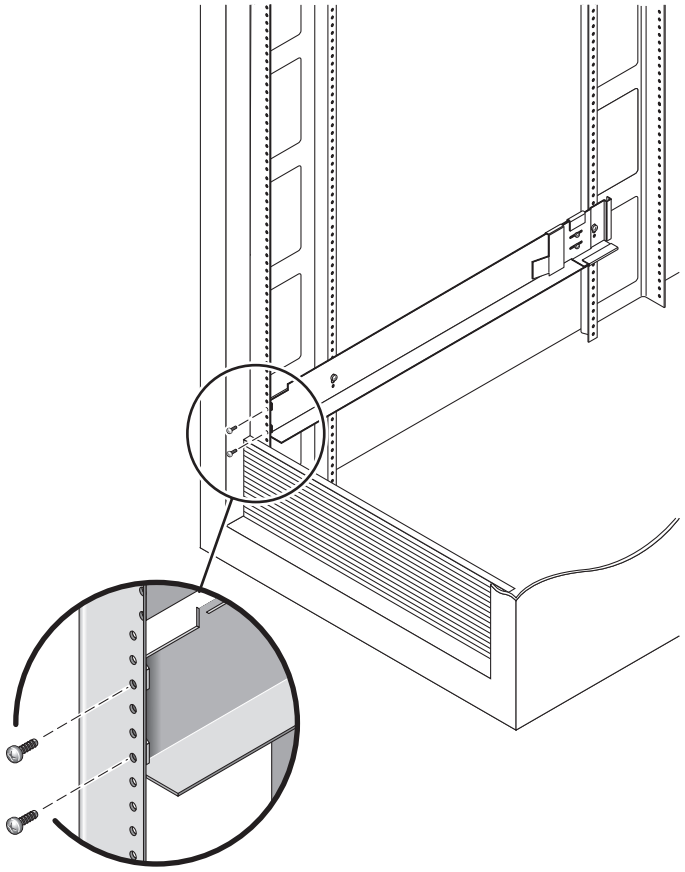


FIGURE 2-5 Securing the Front of the Left Rail to the Cabinet

6. **Using the #2 Phillips screwdriver, insert two 10-32 screws in the lower side mounting holes of the side rails (FIGURE 2-6). Use hole 8 for the first module and hole 11 for the second module. Repeat for the right rail.**

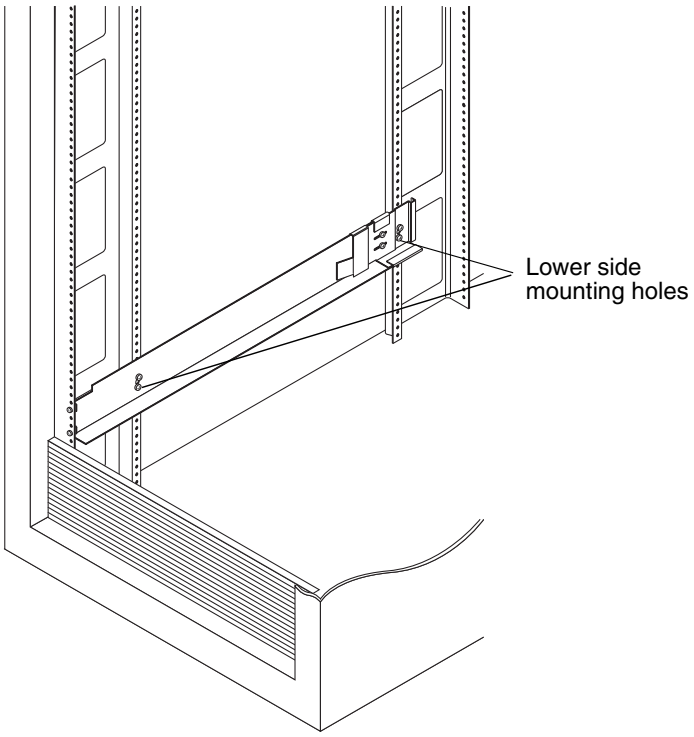


FIGURE 2-6 Inserting Screws in the Lower Side Mounting Holes of the Cabinet

7. **Tighten all screws on the left and right rails.**
   - For the Sun StorEdge Expansion cabinet, tighten the six screws on the left and right rails.
   - For the Sun Fire cabinet, tighten the four screws on the left and right rails.

Attaching the Rails to the Sun Rack 900/1000 Cabinet

1. **Using the #2 Phillips screwdriver, loosen the side-rail screws and adjust each rail to its maximum length (**FIGURE 2-7**).**

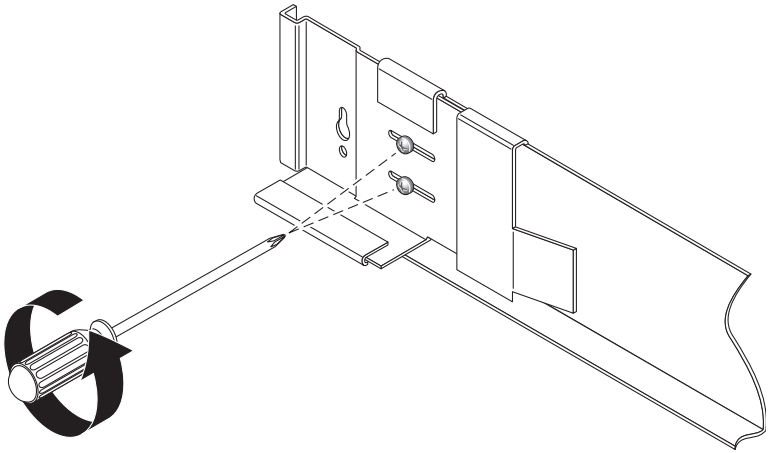


FIGURE 2-7 Loosening the Rail Screws to Adjust the Rail Length

2. **Align the front of the left rail with the rack-unit marks on the front of the cabinet (FIGURE 2-8). Repeat for the right rail.**

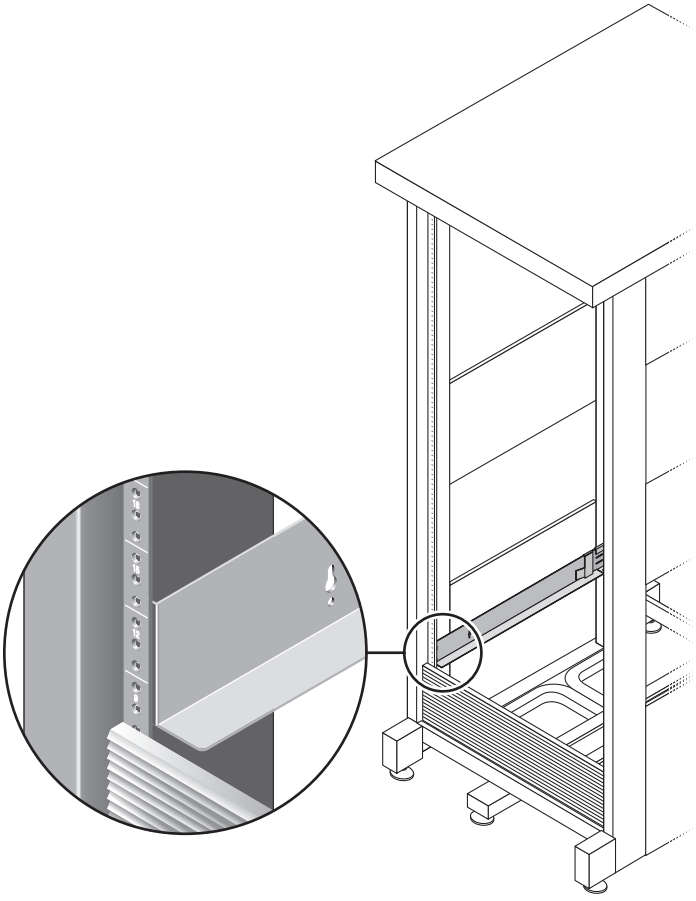


FIGURE 2-8 Aligning the Left Rail With the Rack-Unit Marks on the Front of the Sun Rack Cabinet

3. **Using the #2 Phillips screwdriver, insert and tighten two 8-32 screws to secure the the left rail to the front of the cabinet (FIGURE 2-9). Repeat for the right rail.**

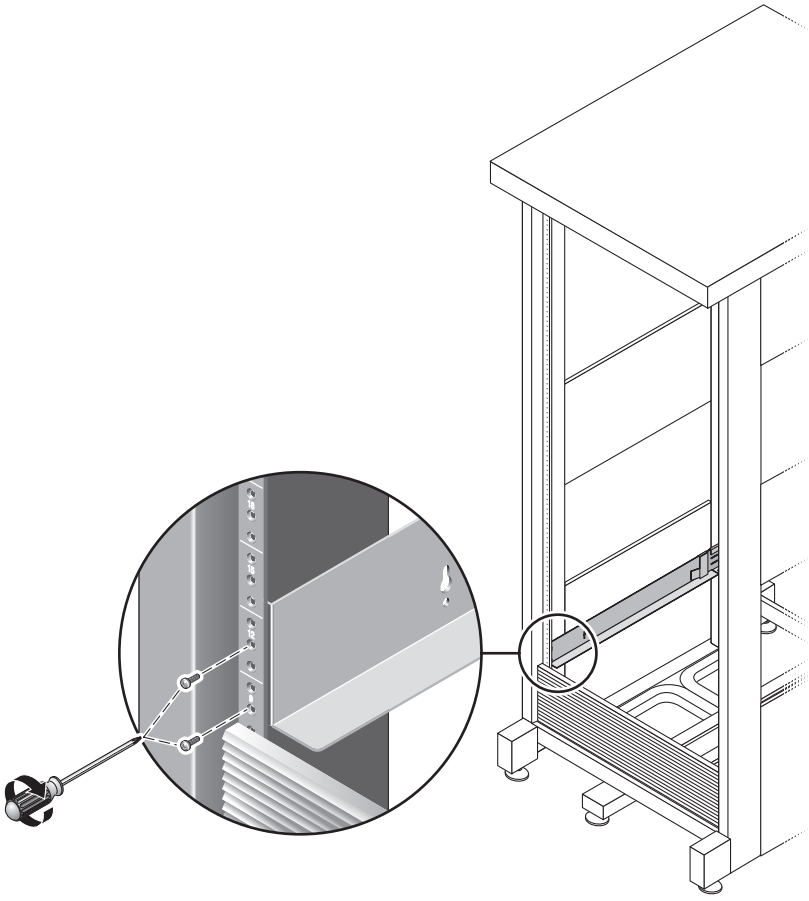


FIGURE 2-9 Securing the Left Rail to the Front of the Cabinet

4. **At the back of the cabinet, adjust the length of each rail as needed to fit the cabinet, and position the rail flange over the vertical rail (FIGURE 2-10).**

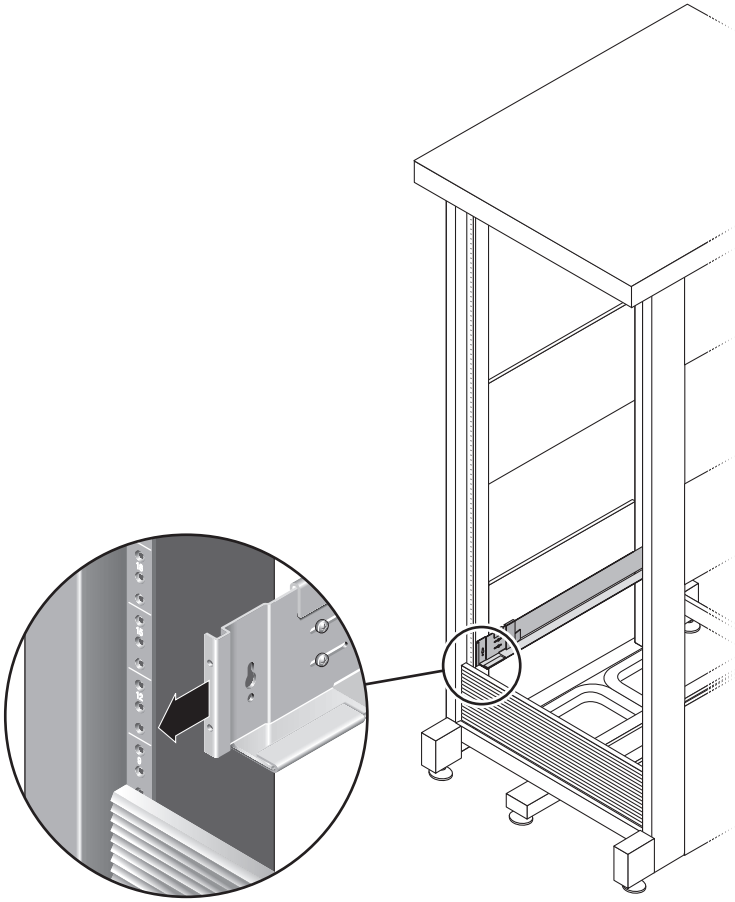


FIGURE 2-10 Adjusting the Length of the Right Rail at the Back of the Cabinet

5. **Using the #3 Phillips screwdriver, insert and tighten the M6 screws on each side at the back of the rail (FIGURE 2-11).**

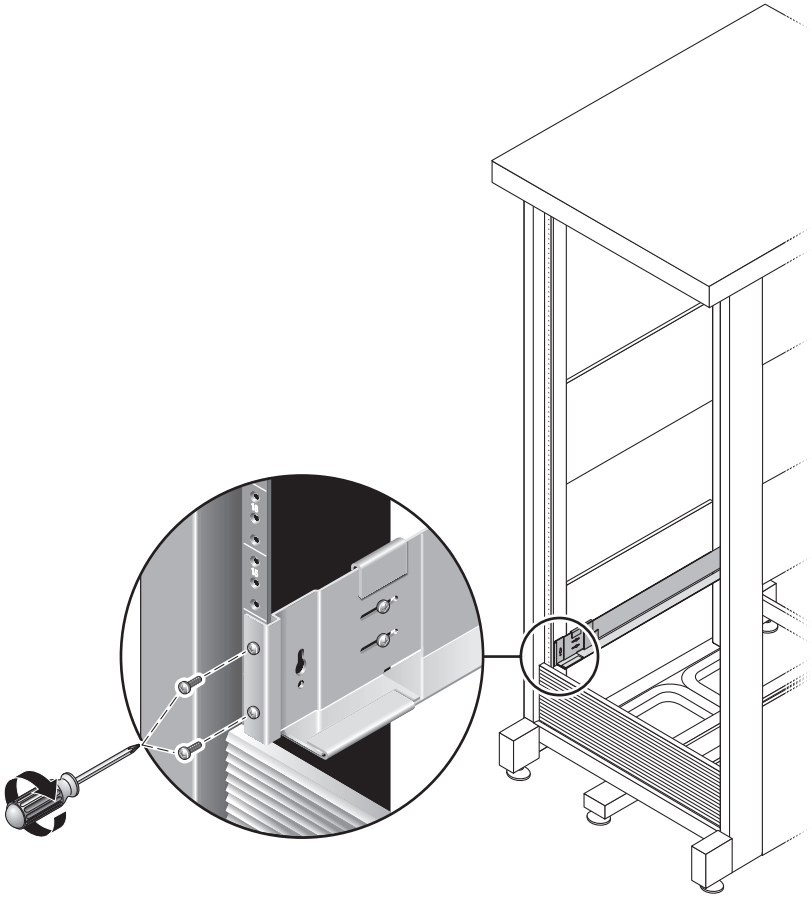


FIGURE 2-11 Securing the Right Rail to the Back of the Cabinet

6. **Using the #2 Phillips screwdriver, tighten the four adjusting screws (two on each side) toward the back of each rail (**FIGURE 2-12**).**

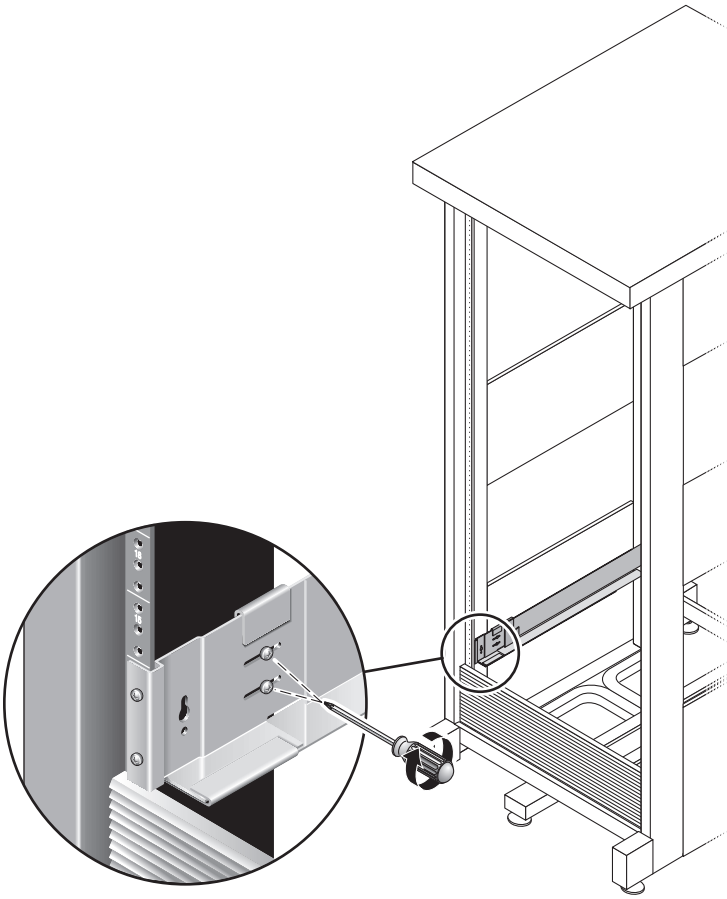


FIGURE 2-12 Tightening the Adjusting Screws

Mounting Array Modules in the Cabinet

Install the controller module in the first empty slot at the bottom of the cabinet. If you are installing expansion modules, continue installing the modules from the bottom up.

After installing each module, you must connect its power cables and set its tray ID.

Installing an Array Module

1. **Unsnap and remove the left and right end caps on the array to permit access to the screw mounting holes (**FIGURE 2-13**).**

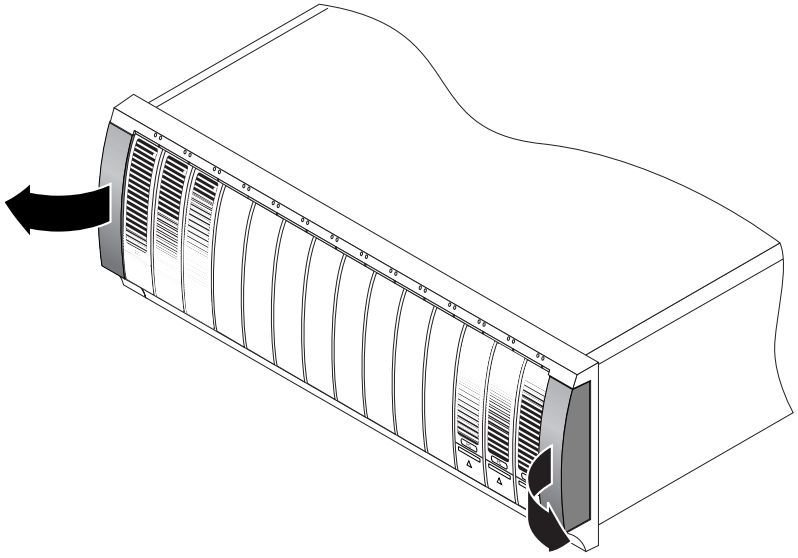


FIGURE 2-13 Removing the End Caps on the Array

2. **Using two people, one at each side of the array, carefully lift and rest the array on the bottom ledge of the left and right rails (**FIGURE 2-14**).**

Caution – Use care to avoid injury. An array can weigh up to 95 pounds (45 kg).

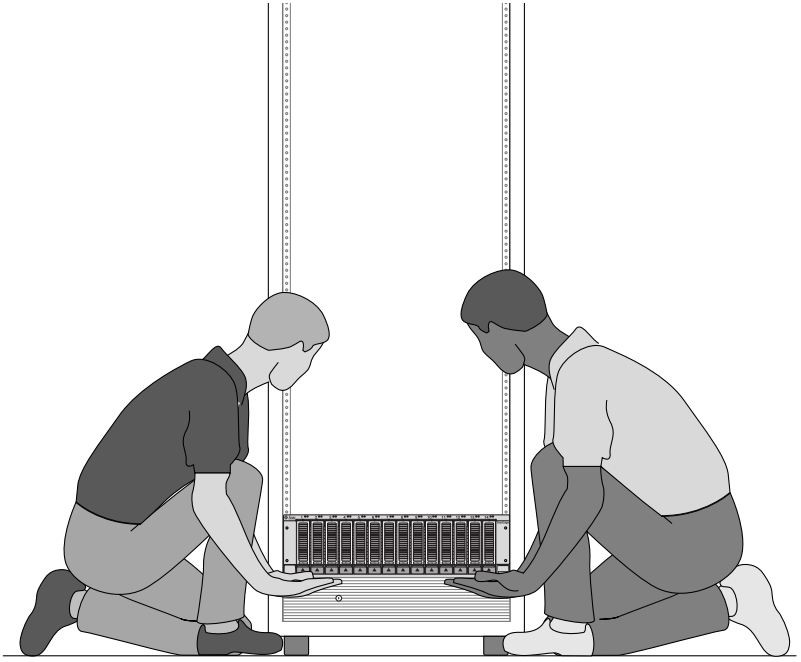


FIGURE 2-14 Positioning the Array Module in the Cabinet

3. **Carefully slide the array into the cabinet until the front flanges of the array touch the vertical face of the cabinet (**FIGURE 2-15**).**

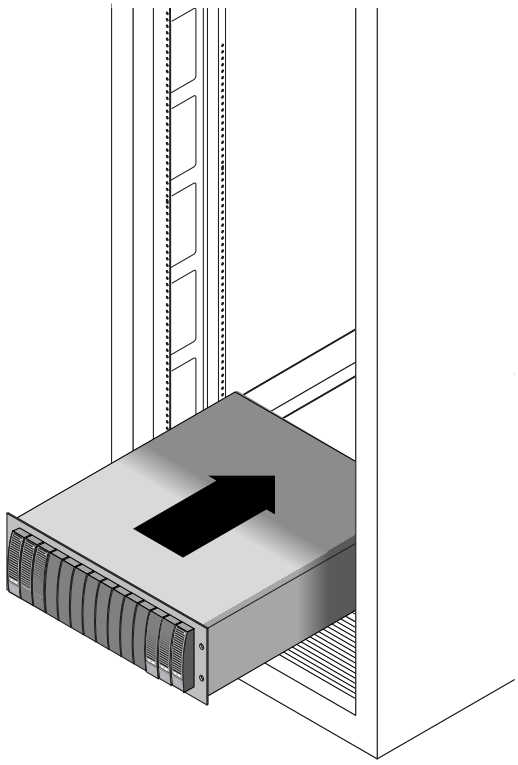


FIGURE 2-15 Sliding the Array Into the Cabinet

4. **Depending on the type of cabinet you have, do one of the following:**
   - For a Sun StorEdge Expansion or Sun Fire cabinet, use the #2 Phillips screwdriver to insert and tighten four 10-32 screws (two per side) to secure the array to the front of the cabinet (FIGURE 2-16).

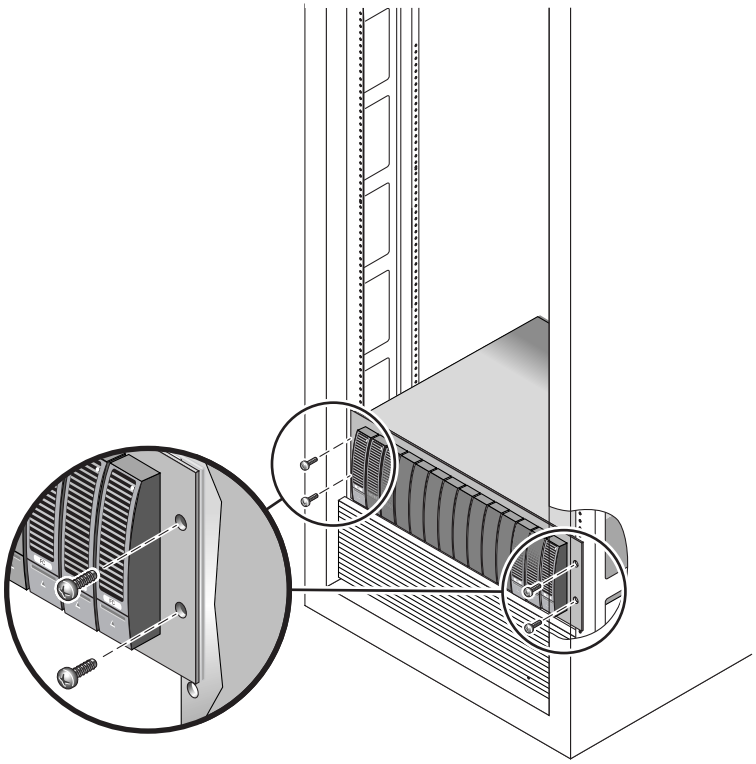


FIGURE 2-16 Securing the Array to the Front of a Sun StorEdge Expansion or Sun Fire Cabinet

- For a Sun Rack 900/1000 cabinet, use the #3 Phillips screwdriver to install and tighten four M6 screws (two per side) to secure the array to the front of the cabinet (FIGURE 2-17).

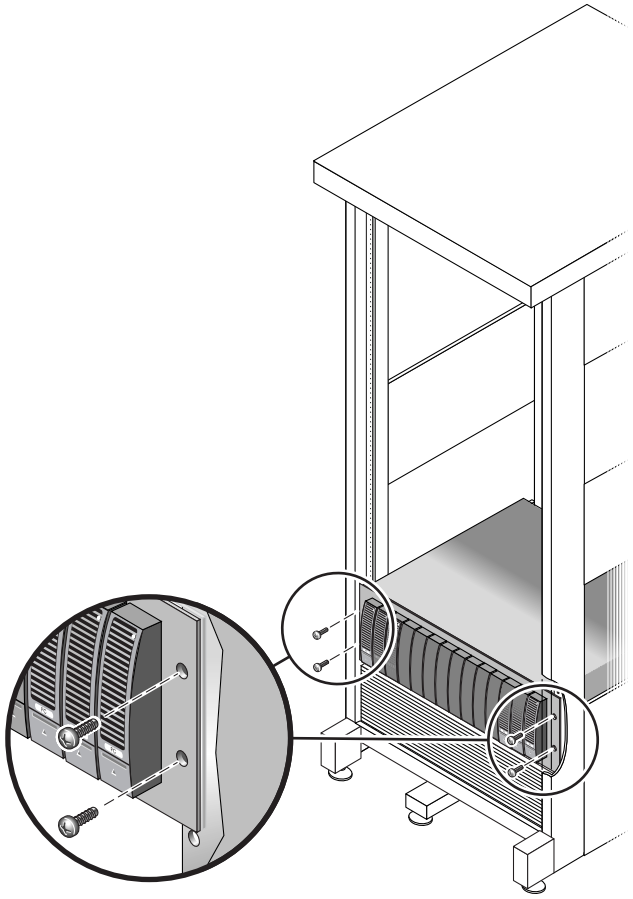


FIGURE 2-17 Securing the Array to the Front of a Sun Rack 900/1000 Cabinet

5. **Replace the left and right end caps to hide the front mounting screws.**

   The end caps snap onto the front bezel of the array module.

6. **At the back of the array module, install and tighten two 8-32 screws (one per side) to secure the back of the array to the cabinet (FIGURE 2-18).**

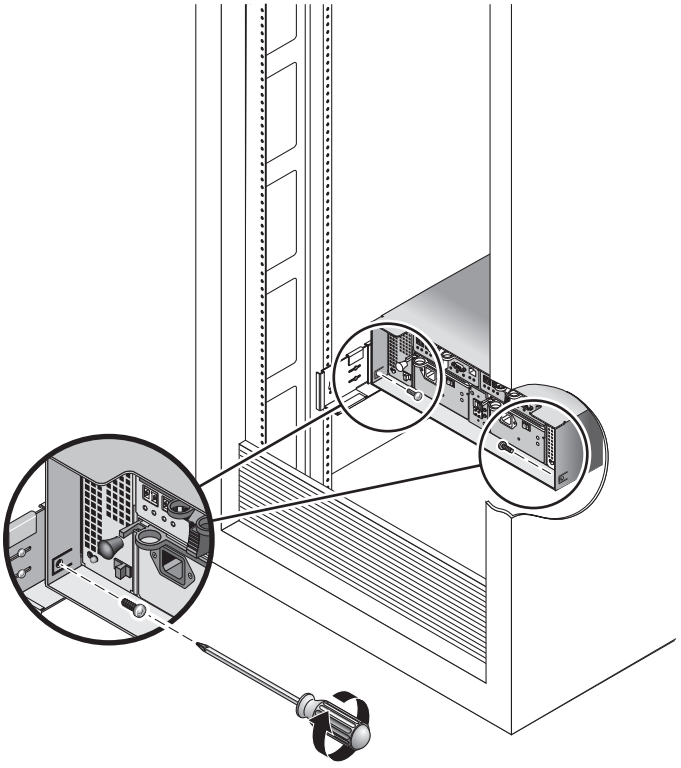


FIGURE 2-18 Securing the Array to the Back of the Cabinet

Connecting the Power Cables

1. **Turn off both power switches on each array module in the cabinet.**
2. **Connect each power supply in the array module to a separate power source in the cabinet.**
3. **Connect the primary power cables from the cabinet to the external power source.**

Note – Do not power on the array until you complete the procedures in this chapter. The power-on sequence is described in detail in Chapter 3.

Setting the Tray ID

You set the tray ID using the Tray ID switch at the back of the controller module. You must set the tray ID of each array module to a unique number from 00 to 76.

1. **Locate the Tray ID switch at the back of the controller module, between the two power supplies (**FIGURE 2-19**).**

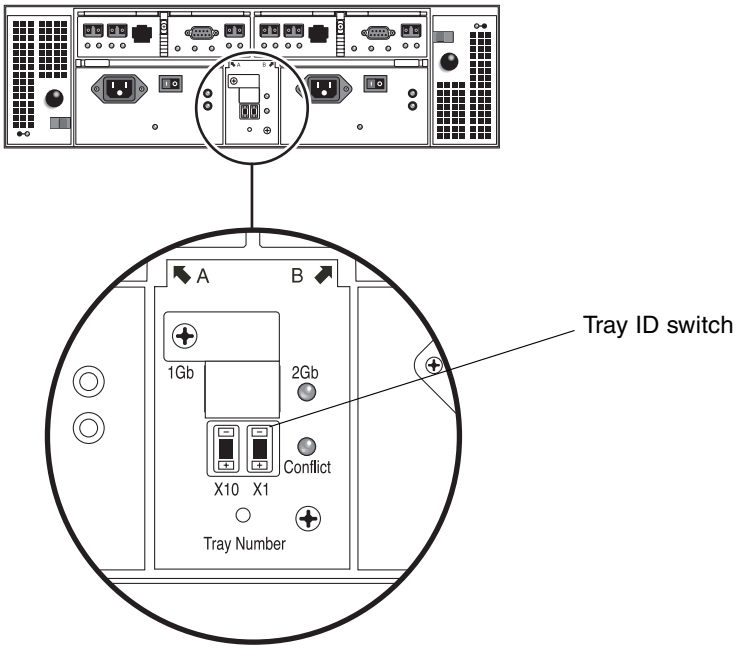


FIGURE 2-19 Tray ID Switch

2. **Use a pen tip to press the plus and minus buttons on the X10 and X1 switch to the appropriate setting.**

   The X10 switch at the left sets the tens place of the tray ID, and the X1 switch sets the ones place. For example, to set the tray ID to 11, set the X10 switch to 1 and the X1 switch to 1.

   By convention, tray ID 00 refers to the controller module. The first expansion module located above the controller module is tray ID 01. The second expansion module is tray ID 02. The tray ID increments by 01 for each expansion module installed in the cabinet.

   When you have finished installing all modules, connecting their power cables, and setting their tray IDs, you are ready to connect the controller array to the expansion modules as described in the next section.

Intermodule Cabling

This section describes how to cable a controller module to expansion modules for several different configurations. The controller module uses Controller A and Controller B expansion ports to connect to FC-AL ports at the back of an expansion module (FIGURE 2-20).

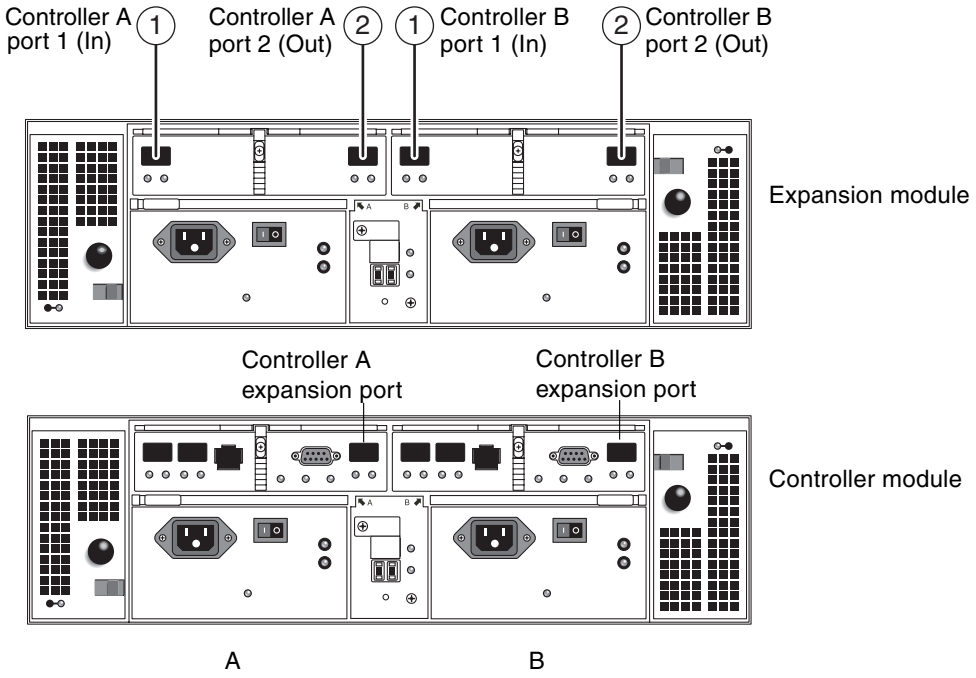


FIGURE 2-20 Expansion and Controller Module Ports

The configuration naming convention is “controllers x trays” where the first number is the controller module and the second is the total number of modules. For example, 1x1 is a standalone controller module, 1x2 is one controller module and one expansion module, and 1x8 is one controller module and 7 expansion modules (TABLE 2-1).

TABLE 2-1 Controller and Expansion Module Configurations

Configuration Identifier	Number of Controller Modules	Number of Expansion Modules
1x1	1	0
1x2	1	1
1x3	1	2
1x4	1	3
1x5	1	4
1x6	1	5
1x7	1	6
1x8	1	7

Use the following instructions to connect the dual-RAID controller module to one or more expansion modules. Interconnection cabling instructions are provided for 1x2, 1x3, 1x4, and 1x8 configurations. You can also use these instructions as a guide for cabling 1x5, 1x6, and 1x7 configurations.

Cabling a 1x2 Array Configuration

A 1x2 array configuration consists of one controller module and one expansion module. Two 2-meter copper FC cables are required (530-3327-01).

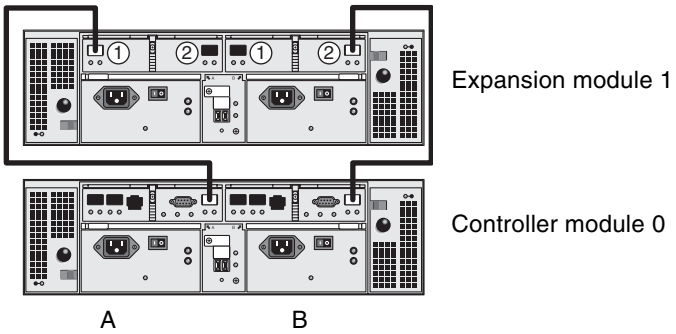


FIGURE 2-21 1x2 Array Configuration Cable Interconnection

1. **Locate the Controller A side and B side expansion ports at the back of the controller module (**FIGURE 2-20**).**
2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of the expansion module (**FIGURE 2-20**).**
3. **Connect one FC cable between the A side expansion port of the controller module and the A side port 1 of the expansion module (**FIGURE 2-21**).**
4. **Connect one FC cable between B side expansion port of the controller module and the B side port 2 of the expansion module (**FIGURE 2-21**).**

Note – The A side port 2 and B side port 1 of expansion module 1 remain empty.

Cabling a 1x3 Array Configuration

A 1x3 array configuration consists of one controller module and two expansion modules. Four 2-meter copper FC cables are required (530-3327-01).

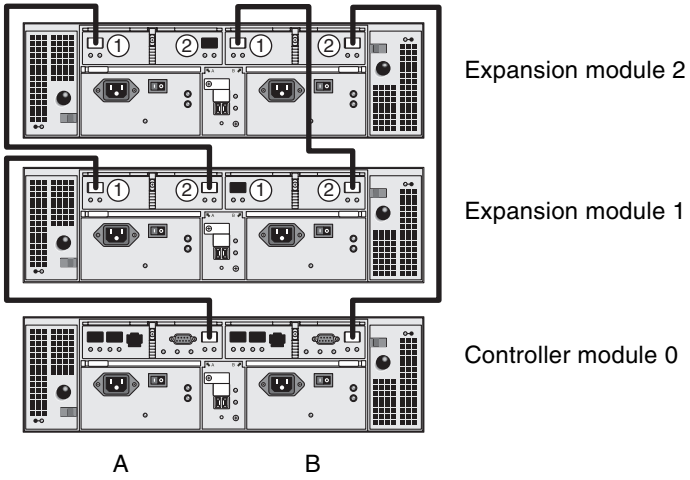


FIGURE 2-22 1x3 Array Configuration Cable Interconnection

1. **Locate the Controller A side and B side expansion ports at the back of the controller module (**FIGURE 2-20**).**
2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of each expansion module (**FIGURE 2-20**).**
3. **Connect one FC cable between the A side expansion port of controller module 0 and the A side port 1 of expansion module 1 (**FIGURE 2-22**).**
4. **Connect one FC cable between the A side port 2 of expansion module 1 and the A side port 1of expansion module 2 (**FIGURE 2-22**).**
5. **Connect one FC cable between the B side expansion port of controller module 0 and the B side port 2 of expansion module 2 (**FIGURE 2-22**).**
6. **Connect one FC cable between the B side port 1 of expansion module 2 and the B side port 2 of expansion module 1 (**FIGURE 2-22**).**

Note – The A side port 2 of expansion module 2 and the B side port 1 of expansion module 1 remain empty.

Cabling a 1x4 Array Configuration

A 1x4 array configuration consists of one controller module and three expansion modules. Six 2-meter copper FC cables are required (530-3327-01).

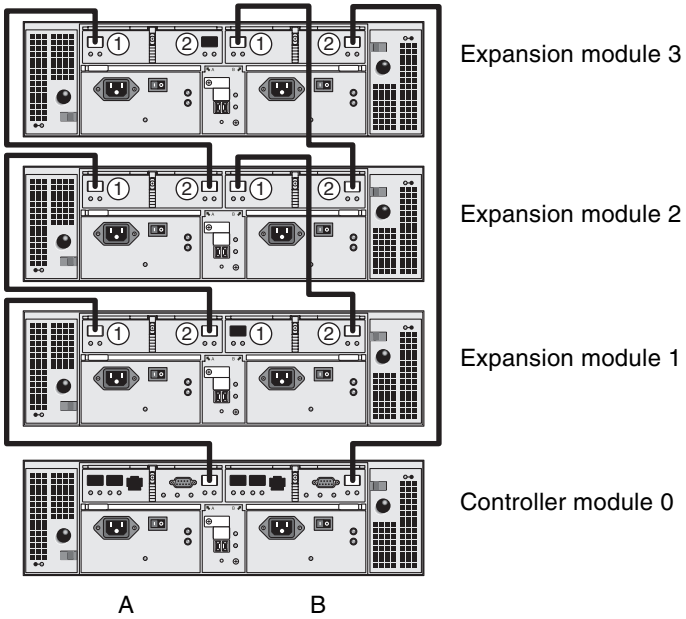


FIGURE 2-23 1x4 Array Configuration Cable Interconnection Cabling

1. **Locate the Controller A side and B side expansion ports at the back of the controller module (**FIGURE 2-20**).**
2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of each expansion module (**FIGURE 2-20**).**
3. **Connect one FC cable between the A side expansion port of controller module 0 and the A side port 1 of expansion module 1 (**FIGURE 2-23**).**
4. **Connect one FC cable between the A side port 2 of expansion module 1 and the A side port 1 of expansion module 2 (**FIGURE 2-23**).**
5. **Connect one FC cable between the A side port 2 of expansion module 2 and the A side expansion port 1 of expansion module 3 (**FIGURE 2-23**).**
6. **Connect one FC cable between the B side expansion port of controller module 0 and B side port 2 of expansion module 3 (**FIGURE 2-23**).**
7. **Connect one FC cable between the B side port 1 of expansion module 3 and the B side port 2 of expansion module 2 (**FIGURE 2-23**).**

8. **Connect one FC cable between the B side port 1 of expansion module 2 and the B side port 2 of expansion module 1 (**FIGURE 2-23**).**

Note – The A side port 2 of expansion module 3 and the B side port 1 of expansion module 1 remain empty.

Cabling a 1x8 Array Configuration

A 1x8 array configuration consists of one controller module and seven expansion modules. Fourteen 2-meter copper FC cables are required (530-3327-01).

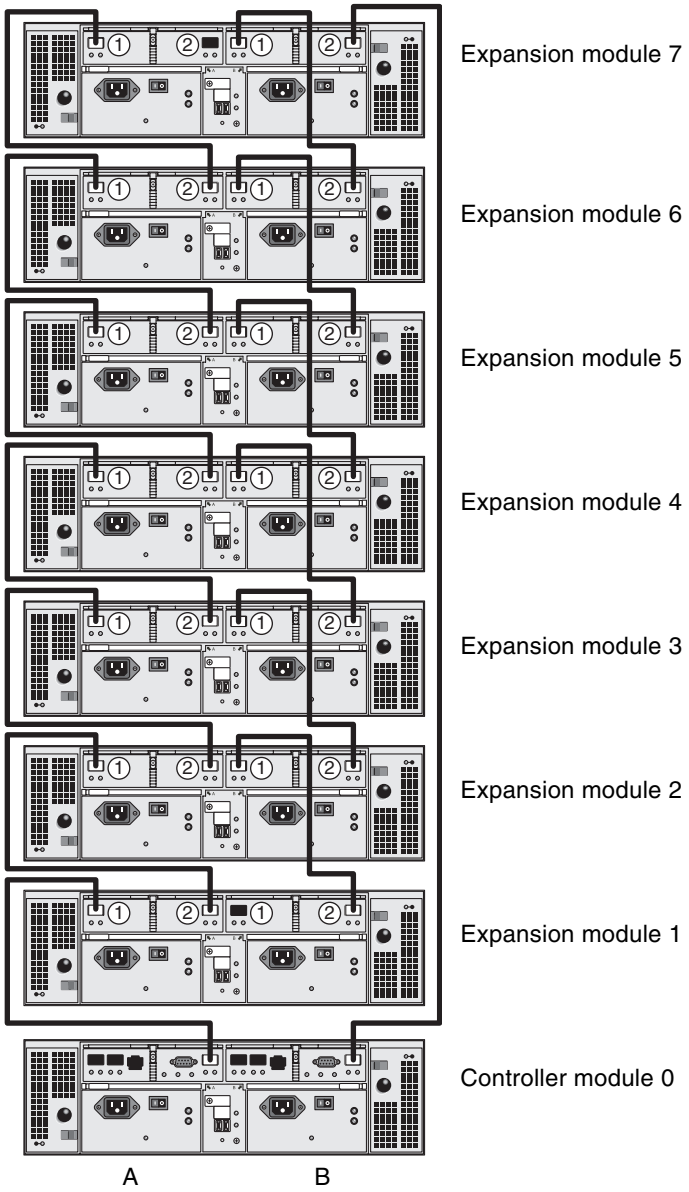


FIGURE 2-24 1x8 Array Configuration Cable Interconnection

1. **Locate the Controller A side and B side expansion ports at the back of the controller module (**FIGURE 2-20**).**

2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of each expansion module (**FIGURE 2-20**).**
3. **Connect one FC cable between the A side expansion port of controller module 0 and the A side port 1 of expansion module 1 (**FIGURE 2-24**).**
4. **Connect one FC cable between the A side port 2 of expansion module 1 and the A side port 1 of expansion module 2 (**FIGURE 2-24**).**
5. **Continue to connect one FC cable between the A side port 2 of each expansion module and the A side port 1 of the expansion module directly above it, until the A sides of all expansion modules are interconnected with FC cables (**FIGURE 2-24**).**
6. **Connect one FC cable between the B side expansion port of controller module 0 and the B side port 2 of expansion module 7 (**FIGURE 2-24**).**
7. **Connect one FC cable between the B side port 1 of expansion module 7 and the B side port 2 of expansion module 6 (**FIGURE 2-24**).**
8. **Continue to connect one FC cable between the B side port 1 of each expansion module and the B side port 2 of the expansion module directly below it, until the B sides of all expansion modules are interconnected with FC cables (**FIGURE 2-24**).**

Note – The A side port 2 of expansion module 7 and the B side port 1 of expansion module 1 remain empty.

Next Steps

After you cable all of the modules, you can power on the modules, as described in Chapter 3.

CHAPTER 3

Powering On and Setting the Link Rate

This chapter describes initial module power-on procedures. It contains the following sections:

Before Powering On

You can set up a Dynamic Host Configuration Protocol (DHCP) server to issue the IP address to each controller. If a DHCP server is not available, the controller module defaults to internal static IP addresses. (See "Configuring the IP Address of the Array" on page 58 for details.)

For instructions on how to set up the DHCP server, see "Configuring a DHCP Server" on page 113.

Powering On Array Modules

Use this procedure to turn power on for all modules installed in the cabinet.

1. **Turn off both power switches on each module that you want to connect to the cabinet's main power (FIGURE 3-1).**

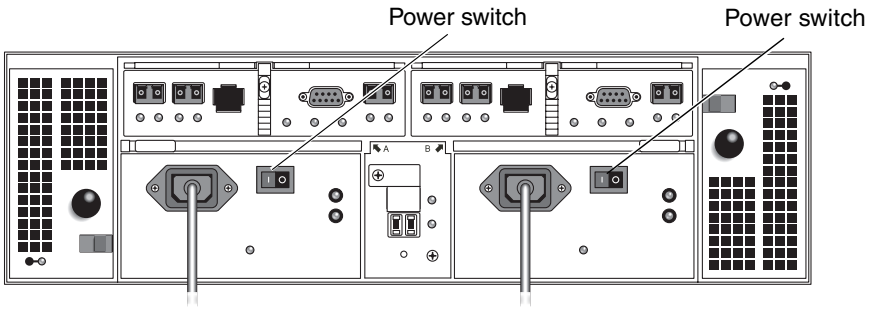


FIGURE 3-1 Array Module Power Connectors and Switches

2. **Connect the power cable for each module power supply to a separate power source in the cabinet.**
3. **Make sure the cabinet circuit breakers are turned off.**
4. **Connect the primary power cables from the cabinet to the external power source.**
5. **Turn on the cabinet circuit breakers.**
6. **Press the power switches at the back of each expansion module to the On position.**
7. **Press each power switch at the back of the controller module to the On position.**

   While the module powers up, the green and amber LEDs on the front and back of the module turn on and off intermittently. Depending on your configuration, it can take several minutes for the module to power up.

8. **Check the status of each module.**
   - After the LEDs stop blinking, check the LEDS on the front and back of the module. All the green LEDs should be on and the amber LEDs should be off.
   - If the LEDs are green, the power-on sequence is complete and no faults have been detected.

Checking the Link Rate LED

The link rate switch allows you to set the data transfer rate. The default setting is 2 gigabits (Gbits) per second.

1. **Locate the link rate switch at the back of the array, between the two power supplies (FIGURE 3-2).**

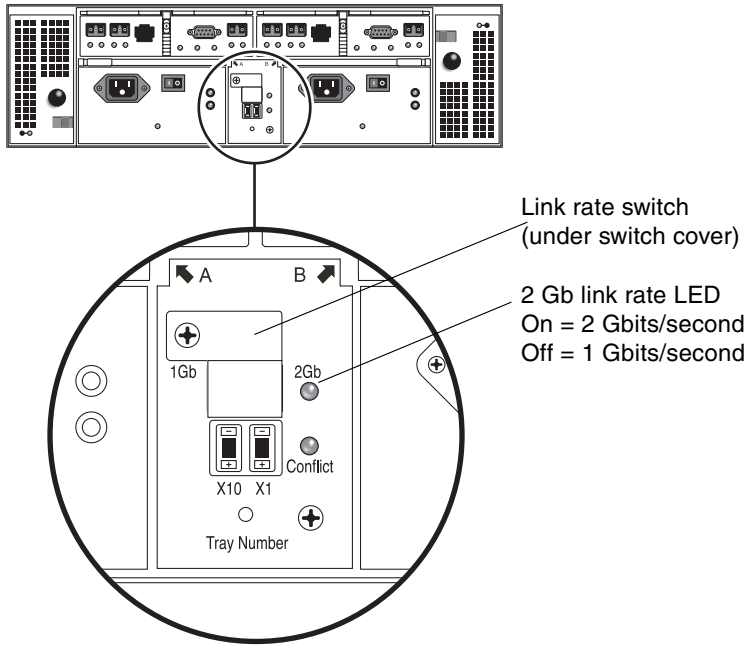


FIGURE 3-2 2 Gb Link Rate LED

- If the 2 Gb LED is lit, the link rate is already set to 2 Gbits per second.
- If the link rate LED is not lit, set the link rate to 2 Gbits per second as described in Step 2 through Step 4.

2. **Remove the screw and the switch cover.**

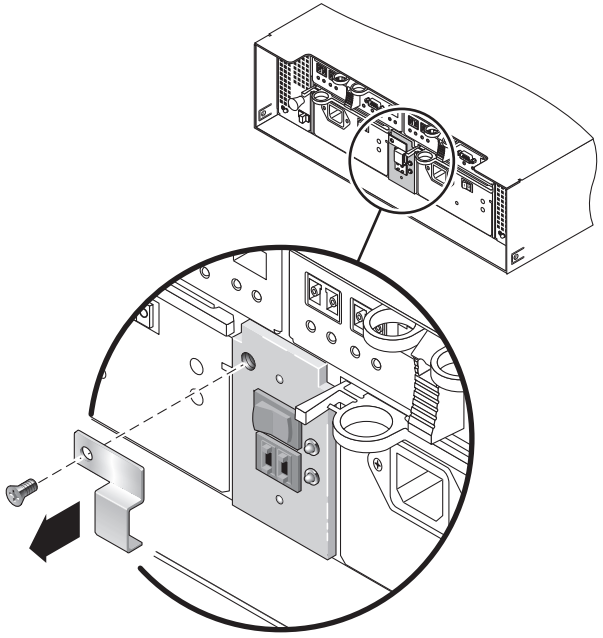


FIGURE 3-3 Accessing the Link Rate Switch

3. **Set the link rate to 2 Gb.**
4. **Replace the switch cover and tighten the screw to secure it.**

Powering Off the Array

The array rarely needs to be powered off. You remove power only when you plan to physically move the array to another location.

To power off the array, do the following:

1. **Stop all I/O from the hosts to the storage system.**
2. **Wait approximately 2 minutes until all disk drive LEDs have stopped flashing.**

   After the 2-minute period, data residing in cache is written to disk and the battery mechanisms are disengaged.

Note – If Media Scan is enabled (the default), the disk drive LEDs will continue to flash after the 2-minute period has elapsed. By waiting the 2-minute period, you ensure that the data residing in cache has been written to disk. The LED flash rate during a media scan is different than the flash rate of I/O.

3. **Press each power switch at the back of the controller module to the Off position.**
4. **Press the power switches at the back of each expansion module to the Off position.**

Next Steps

Now you are ready to connect the management host and data hosts, as described in Chapter 4.

CHAPTER 4

Connecting the Management Host and Data Hosts

This chapter describes Sun StorEdge 6130 array cable connections for hosts. It contains the following sections:

Connecting the Management Host

The management host directly manages Sun StorEdge 6130 arrays over an out-of-band network. This section describes how to connect the physical Ethernet and power cables to the management host.

Before You Begin

Before you begin to connect the management host, the Ethernet cables must be connected and routed to the installation site as described in the *Sun StorEdge 6130 Array Site Preparation Guide*.

Connecting the Ethernet Cables

1. **Locate the Ethernet ports for Controller A and Controller B at the back of the controller module (**FIGURE 4-1**).**

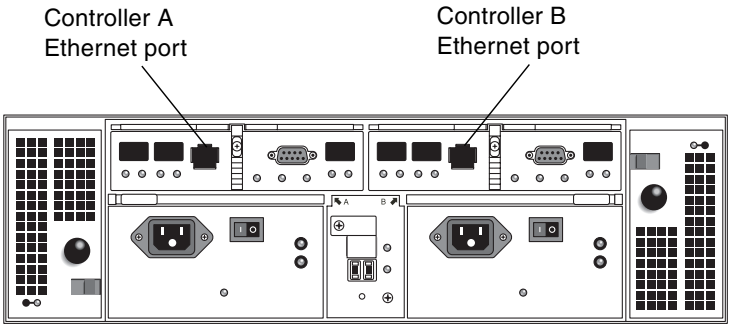


FIGURE 4-1 Ethernet Ports for Controller A and Controller B

2. **Connect an Ethernet cable to each Ethernet port.**
3. **Connect the other end of each Ethernet cable to your site LAN.**

Connecting Data Hosts

You can connect data hosts to access the Sun StorEdge 6130 array through Fibre Channel (FC) switches to the array or directly to the array.

Connecting Data Hosts Through External Fibre Channel Switches

You can connect the Sun StorEdge 6130 array to data hosts through external FC switches.

Before you connect data hosts, check that the following prerequisites have been met:

- The FC switch has been installed and configured as described in the vendor's installation documentation. (See the *Sun StorEdge 6130 Array Release Notes* for a list of supported switches.)
- Interface cables are connected and routed between the host bus adapters (HBAs), switches, and installation site.

- Fiber-optic cables (2-meter or required length) are available to connect the array to the FC switch.

1. **Locate the host ports (SFP transceivers) at the back of the controller module (FIGURE 4-2).**

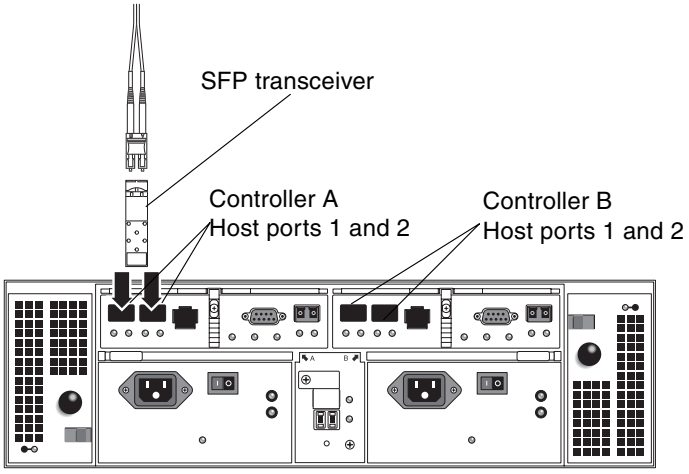


FIGURE 4-2 Host Connections

2. **Connect each fiber-optic cable to the host port of Controller A and Controller B.**

Caution – Fiber-optic cables are fragile. Do not bend, twist, fold, pinch, or step on the fiber-optic cables. Doing so can degrade performance or cause data loss.

---

3. **Connect the other end of each cable to the external FC switch (FIGURE 4-3). (Refer to the switch vendor's documentation for details.)**

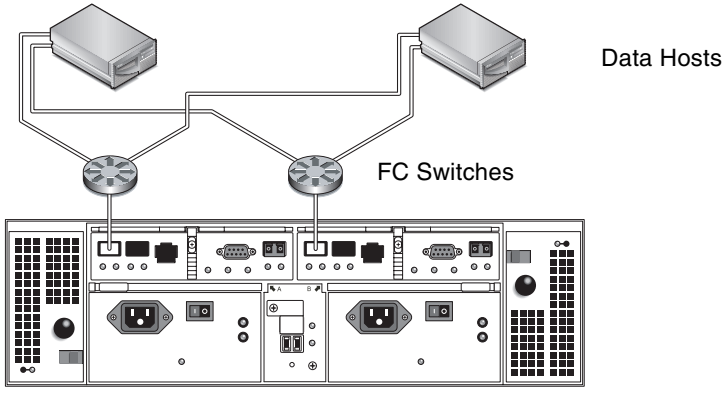


FIGURE 4-3 Connecting Data Hosts Through an FC Switch

4. **Connect the cables from the switch to the HBAs for each data host.**

Connecting Data Hosts Directly

A direct point-to-point connection is a physical connection in which the HBAs are cabled directly to the array's host connectors.

Before you connect data hosts directly to the array, check that the following prerequisites have been met:

- Interface cables are connected and routed between the HBAs and the installation site.
- Fiber-optic cables (2-meter or required length) are available to connect the array to the data host HBAs.

The Sun StorEdge 6130 array has four host connections, two per controller. To maintain redundancy, connect one data host to both Controller A and Controller B.

1. **Locate the host ports at the back of the controller module (**FIGURE 4-2**).**
2. **Connect a fiber-optic cable to each host port on Controller A and Controller B.**

Caution – Fiber-optic cables are fragile. Do not bend, twist, fold, pinch, or step on the fiber-optic cables. Doing so can degrade performance or cause data loss.

---

3. **Connect the other end of each fiber-optic cable to the HBAs (**FIGURE 4-4 **and** FIGURE 4-5**).**

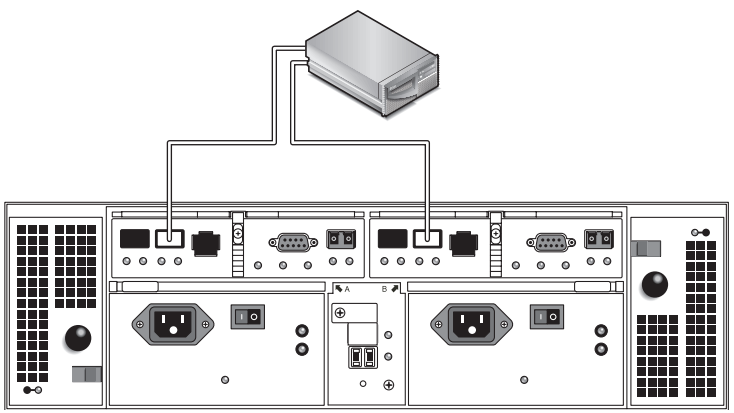


FIGURE 4-4 Direct Connection to a Single Host With Dual HBAs

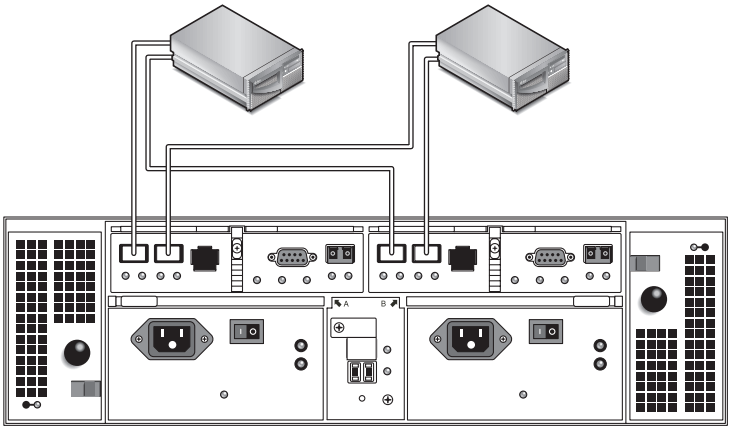


FIGURE 4-5 Direct Connection to Dual Hosts With Dual HBAs

Next Steps

After you have connected the management host and data hosts, you are ready to install the management and data host software as described in Chapter 5.

CHAPTER 5

Installing the Management Software

This chapter describes how to install the management software on the management host. It contains the following sections:

Before You Begin

The Sun StorEdge 6130 array is managed out-of-band by way of a standard Ethernet connection between the RAID controllers and your local area network (LAN).

The Sun StorEdge 6130 management software is distributed on the Sun StorEdge 6130 Host Installation Software CD that is shipped with the array. The management software consists of the following applications and tools:

- Sun Web Console, the user interface, and related components for the array management software
- Storage Automated Diagnostic Environment software (Enterprise Edition 2.4)
- Sun StorEdge SAN Foundation Kit (including the multipathing MPxIO driver)
- Array and drive firmware

Before you start the installation of the management software, check the machine for the following requirements:

- The operating system is Solaris 8 OS Update 4 or Solaris 9 OS for the SPARC platform.
- The root password of the management host is available (for running the installation script).

- 430 megabytes of disk space is available.
- Previous versions of the management software are not installed.
- Previous versions of the Storage Automated Diagnostic Environment or Sun StorEdge SAN Foundation software are not installed.
- Services (such as the Storage Automated Diagnostic Environment and Sun Web Console) are not running on the array's Ethernet ports.

The installation script verifies these requirements. If a requirement is not met, the script informs you or, in some cases, exits.

Note – If a version of Sun Web Console prior to 2.1 is installed on the management host, the script prompts you to upgrade to the current version. If you choose not to upgrade, the script will exit.

Running the Installation Script

Before you start the script, check that all of the requirements are met, as listed in "Before You Begin" on page 55.

1. **Log in to the Solaris OS as `root`.**
2. **Insert the host software installation CD into a local drive.**
3. **Change to the /`cdrom/cdrom0` directory:**

   ```
   cd /cdrom/cdrom0
   ```

4. **Start the installation script by typing:**

   ```
   ./install -n
   ```

   The `-n` option specifies a non-interactive installation. After choosing the software you want to install, you will not be prompted to press Return during the installation.

Header information appears, and then the following is displayed:

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

This script installs software for your Sun StorEdge 6130
storage system.


Software components included in this distribution:

        - Sun StorEdge 6130 Data Host Software
        - Sun StorEdge 6130 Management Host Software
        - Sun StorEdge 6130 Remote Management Host Software

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

Sun StorEdge 6130 Remote Management Host Software is a subset of
Sun StorEdge 6130 Management Host Software. You will not be
prompted whether to install the former if the latter is selected.

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

5. **Type `y` to continue the installation.**

   You are prompted to select the software package you want to install.

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

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

        Sun StorEdge[tm] 6130 Data Host Software [y/n] : n
        Sun StorEdge[tm] 6130 Management Host Software [y/n] : y
```

Note – You can also install the data host and management software on the same Solaris machine. If you choose to install the data host software on the management host, you must enable the multipathing software as described in "Enabling Multipathing Software" on page 88.

---

7. **At the following prompt, type `y` to confirm the software you selected.**

```
You have chosen to install the following components:


        Sun StorEdge[tm] 6130 Management Host Software

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

Installation of the management software takes approximately 25 minutes.

When the installation is complete, a confirmation of the packages you installed is displayed followed by the date and time that the installation finished and the name of the file containing the installation log. For example:

```
Finished at: Tue Aug 24 17:58:31 PDT 2004
Note: A log of this procedure has been saved to
/var/sadm/install/se6130/6130_Host_SW_install.log
```

8. **Eject the CD and remove it from the drive.**
9. **Reboot the management host.**

```
reboot -- -r
```

Configuring the IP Address of the Array

To configure the array's IP address you need to have an IP connection between the controller modules and a management host. You can configure the array with either a dynamic or a static IP address as described in the following sections:

- "Configuring Dynamic IP Addressing" on page 59
- "Configuring Static IP Addressing" on page 59
- "Configuring the IP Address on the Host" on page 62

Configuring Dynamic IP Addressing

Dynamic IP addresses for the array controller are assigned through a DHCP server. The dynamic IP address from a DHCP server will be used if BOOTP services are available. If you want to set up a DHCP server, refer to Appendix B for a description of how to configure BOOTP services in a Sun Solaris or Microsoft Windows environments.

Configuring Static IP Addressing

This section describes how to configure static IP addresses using an existing or temporary subnet.

If a DHCP server is not available, the array uses the following default internal IP addresses:

- `192.168.128.101` for Controller A
- `192.168.128.102` for Controller B

In order to change the controllers' default IP addresses to desired static IP addresses, first set up an Ethernet interface on the management host with an IP address of `192.168.128.100` (or any IP address on the `192.168.128.0` subnet, provided it does not conflict with the controller module's IP address). Then use one of the methods described in the following sections to establish the IP connectivity between the management host and the controller modules:

- "Connecting the Controller Module Directly to a Management Host" on page 59
- "Connecting the Controller Module to a Management Host Using an Ethernet Hub" on page 60
- "Connecting the Controller Module on an Existing Subnet" on page 60

Connecting the Controller Module Directly to a Management Host

Connect Controller A to a management host directly using a cross-over Ethernet cable.

Configure the Ethernet interface on the management host with a temporary IP address of `192.168.128.100`. After you have configured the desired static IP addresses of the controllers you can set the management host's IP back to the original IP address. For more information, see "Configuring the IP Address on the Host" on page 62.

Connecting the Controller Module to a Management Host Using an Ethernet Hub

Use RJ-45 Ethernet cables to connect both controllers to a management host using an Ethernet hub.

Configure the Ethernet interface on the management host with a temporary IP address of `192.168.128.100`. After you have configured the desired static IP addresses of the controllers, you can set the management host's IP configuration back to the original IP address. For more information, see "Configuring the IP Address on the Host" on page 62.

Connecting the Controller Module on an Existing Subnet

You can also configure the desired static IP address of the controllers by setting a temporary virtual subnet on an existing subnet.

To establish IP connectivity between the controller module and the management host on an existing subnet, you must configure the Ethernet switch to pass traffic for another subnet. For example, if your management host is on a subnet of `10.3.4.0`, the associated Ethernet switch for the subnet must also allow traffic from the subnet `192.168.128.0`.

Using this method is a three-part process, as described in the following sections:

1. **Setting up a Temporary Subnet on a Management Host**
2. **Assigning Static IP Addresses to the Controller Module**
3. **Deleting the Temporary Subnet**

Setting Up a Temporary Subnet on a Management Host

1. **To display the Ethernet ports that are in use on the server, type the following:**

   `ifconfig -a`

   The Ethernet ports that are in use are displayed, as shown in the following example:

```
lo0: flags=1000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4> mtu 8232
index 1
        inet 127.0.0.1 netmask ff000000
bge0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500
index 2
        inet 10.4.30.110 netmask ffffff00 broadcast 10.4.30.255
        ether 0:3:ba:32:4d:f1
```

2. **As `root`, configure a temporary virtual subnet, and type the following:**

   `# ifconfig <`*ethernet_port***`>:1 plumb`**

   `# ifconfig <`*ethernet_port*`>:1 192.168.128.100 up`

   For example:

   `# ifconfig bge0:1 plumb`

   `# ifconfig bge0:1 192.168.128.100 up`

3. **View the changes to verify that you have established IP connectivity between the management host and the array controllers:**

   `ipconfig -a`

   Now you are ready to configure the static IP addresses of the controllers, as described in the next "Assigning Static IP Addresses to the Controller Module" on page 61.

Assigning Static IP Addresses to the Controller Module

1. **To access the management software, open a web browser and enter the IP address of the management host using this format:**

   `https://`*management-host***`:6789`**

   management-host is the IP address of the machine where you installed the management software.

   The login page is displayed.

2. **Log in as `root` of the management host:**

   `login:` **`root`**

   `password:` *root_password*

   root_password is the root password of the machine where you installed the management software.

3. **From the Sun Web Console page, click Sun StorEdge 6130 Configuration Service.**

4. **Discover the array.**

   See "Discovering and Registering Arrays" on page 74 for instructions.

5. **Select the array you want to configure.**

6. **Click Administration.**

   The General Setup page is displayed.

7. **Enter the array name and default host type and then click OK.**

8. **Click Administration > Controllers.**

   The Controller Summary page is displayed.

9. **First for Controller A and then for Controller B, select Specify Network Configuration and then enter the IP address, gateway address, and the subnet. Click OK.**

   You may see an error message indicating contact has been lost with the array as a result of changing the IP address. You can ignore this message.

10. **Log out and log in again to the console.**

11. **On the Array Summary page, select the original array with the original IP address, and delete it to clear out the old IP address.**

12. **Click Auto Discover to have the management software find the array with the new IP address.**

13. **If you are configuring multiple arrays, clean the ARP table entry for each controller:**

    `arp -d` <*ip-address-controller-A*>
    `arp -d` <*ip-address-controller-B*>

Deleting the Temporary Subnet

After you have assigned static IP addresses to the controllers, you can delete the temporary subnet.

1. **Enter the following commands as** `root`**:**

   ```
   # ifconfig bge0:1 down
   # ifconfig bge0:1 unplumb
   ```

2. **View the changes:**

   ```
   ifconfig -a
   ```

Configuring the IP Address on the Host

The method you use to configure the IP address depends on the platform you are using. Follow the instructions for your platform:

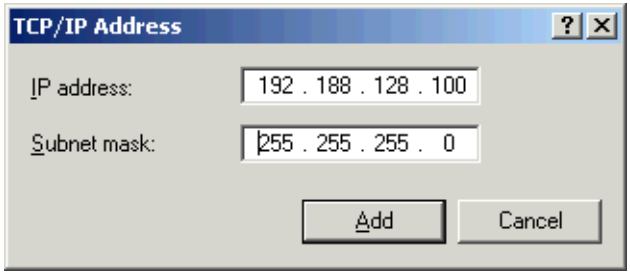
- Solaris Operating System
- Windows 2000 Advanced Server
- Windows Server 2003

Configuring the IP Address on the Management Host for the Solaris Operating System

For information about changing the IP address on a Solaris server, see the `ifconfig` man page.

Configuring the IP Address for Windows 2000 Advanced Server

1. **From the Control Panel, select Network and Dial-Up Connections.**
2. **Select Local Area Connection > Properties > Internet Protocol (TCP/IP).**
3. **Make sure that a static IP address is configured, and click Advanced.**
4. **In Advanced TCP/IP Settings, select the IP address you want to configure, and click Add directly below the IP addresses listing.**
5. **Type the IP address and subnet mask as shown in the following example:**



6. **Click Add.**

   The new IP address is added to the IP addresses listing.

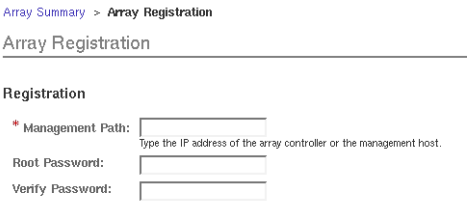
7. **Open a command window and try to ping the array, as shown in the following example:**

   > **`ping 192.188.128.101`**

   If the `ping` is unsuccessful, try rebooting the server and `ping` the array again.

8. **If the array is alive, log in to the Sun Web Console as `root` to add the IP address of the array.**
9. **Click Sun StorEdge 6130 Configuration Service, select the array, and click Register Array.**

10. **Enter the IP address for Controller A and click OK.**



The new IP address is added to the IP addresses listing.

Configuring the IP Address for Windows Server 2003

1. **From the Control Panel, select Network and Dial-Up Connections.**
2. **Select Local Area Connection > Properties > Internet Protocol (TCP/IP).**
3. **Make sure a static IP address is configured, and click Advanced.**
4. **In Advanced TCP/IP Settings, click Add directly below the IP addresses listing.**
5. **Type an IP address that is on the same subnet as Controller A (`192.168.128.101`) and Controller B (`192.168.128.102`).**

   For example, you can use `192.168.128.100` because it is on the same subnet and does not conflict with the controller IP addresses.
6. **Click Add.**

   The new IP address is added to the IP addresses listing.
7. **Log in to the Sun Web Console as `root` to register the array.**
8. **Click Sun StorEdge 6130 Configuration Service.**
9. **Click Auto Discovery.**
10. **If the array is not discovered, register the array manually:**

    a. **Click Register Array.**

    b. **Enter the IP address for Controller A and click OK.**

    The new IP address is added to the IP addresses listing.
11. **After the array is registered, open a command window and try to ping the array, as shown in the following example:**

    > **`ping 192.168.128.101`**

12. **Remove the temporary subnet you previously set up. See "Deleting the Temporary Subnet" on page 62.**

Next Steps

You are now ready to set up the management software, as described in Chapter 6.

CHAPTER 6

Setting Up the Management Software

This chapter provides an overview of the user interface and the steps required for first time you log in. It contains the following sections:

Starting the Software for the First Time

You can run the Sun StorEdge 6130 array software through a web browser graphical user interface (GUI) or a command-line interface (CLI). You access the GUI from a web browser on the management host that is connected to the site LAN.

This section describes the tasks for setting up the array and includes the following topics:

■ "Enabling Premium Features" on page 79

For more information about the management software, you can click the Help button at the top right corner of any window. The online help system is context sensitive and will display help for the current page. The help system also provides conceptual, procedural, and reference information. You can use the Table of Contents, Index, and Search tabs to locate help topics that contain information you are looking for.

Logging In to the Management Software

You can start the management software on any system that is connected to the user LAN.

1. **Open a supported browser.**

Tip – For information about supported web browsers, see the *Sun StorEdge 6130 Array Release Notes*.

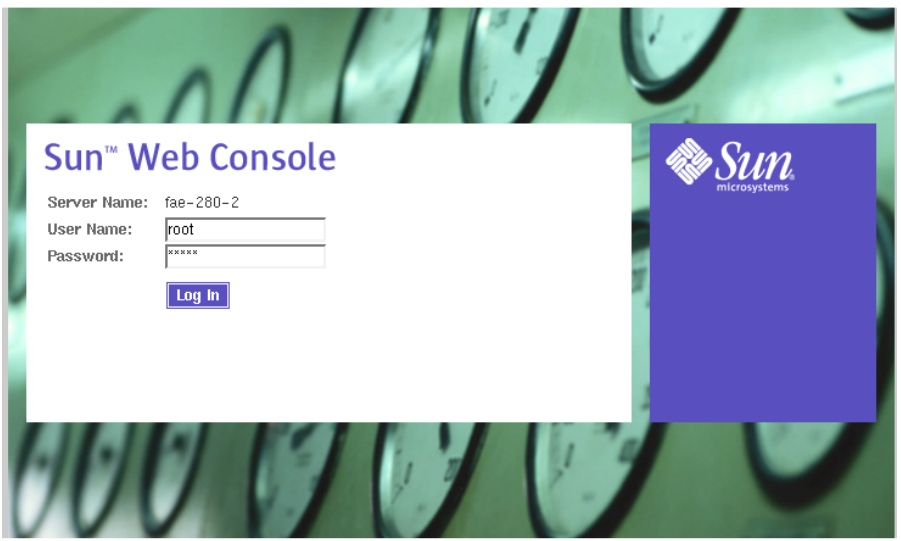
---

2. **Enter the IP address of the management host using this format:**

`https://`*management-host*`:6789`

management-host is the IP address of the machine where you installed the Sun StorEdge 6130 management software.

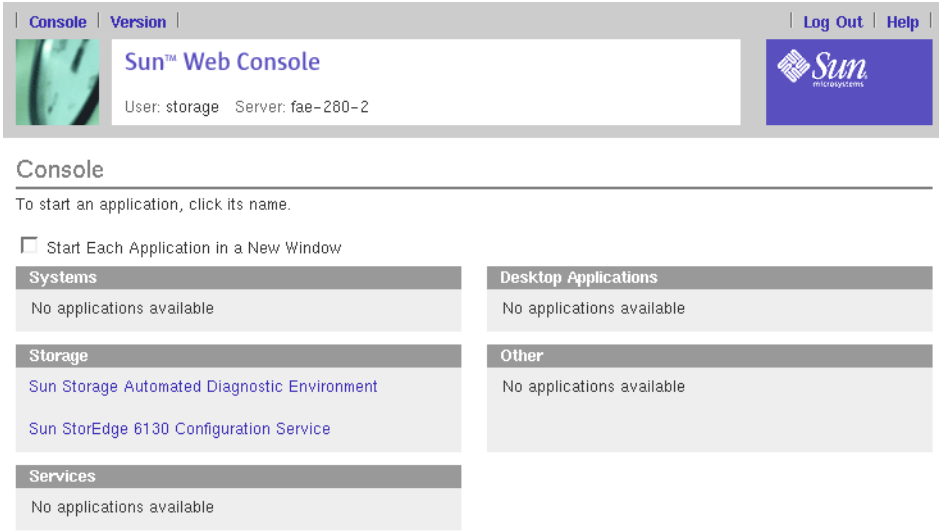
The login page is displayed:



3. **Enter `root` for the user name and the root password of the machine on which you installed the software.**

4. **Click Log In.**

   The Sun Web Console page is displayed:



   The Sun Web Console page provides two entry points:

   - Sun Storage Automated Diagnostic Environment
   - Sun StorEdge 6130 Configuration Service

   When you select one of the entry points, the appropriate page is displayed.

   At this point, you are logged in to the system. Before you begin configuring the system, you should become familiar with the components of the GUI and how to get help.

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

Navigating the User Interface

This section describes the GUI elements and navigation methods. It includes the following topics:

- "About the GUI Layout" on page 70
- "Getting Help" on page 73

About the GUI Layout

The Sun StorEdge 6130 array GUI is the main interface for the system (FIGURE 6-1).

This section describes the main elements of the GUI:

- Access buttons
- Quick status displays
- Navigational tabs
- Page content and actions

Access Buttons

The access buttons are located across the top of the web page and enable you to access some of the most common functions and displays.

FIGURE 6-1 Access Buttons

The access buttons have the following functions:

- **Console** returns you to the Sun Web Console page.
- **Version** displays version information.
- **Log Out** logs you out of the system and returns you to the Sun Web Console login page.
- **Help** opens the online help system.

Quick Status Displays

The quick status displays provide user role and server name information, as well as the status of current alarm.

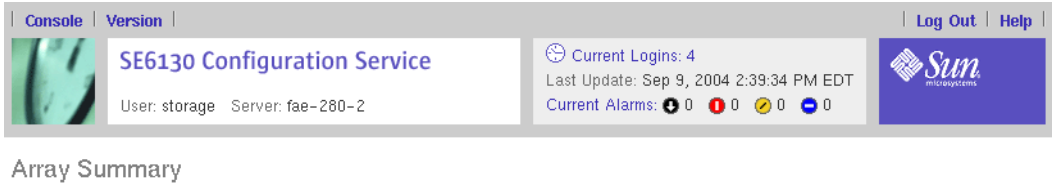


FIGURE 6-2 Quick Status Displays

The displays provide the following information:

- The display on the left shows the current user role and server name.
- The display on the right shows the current status of the system, including the number of current users logged in, date and time of the last software update, and current alarms.

For a description of the alarm symbols, see the online help. Click the Search tab and type `viewing alarms from the alarms tab`.

Navigational Tabs

You use the navigational tabs to move between web pages to view, configure, manage, and monitor the system.

FIGURE 6-3 Navigational Tabs: Sun StorEdge 6130 Configuration Service

FIGURE 6-4 Navigational Tabs: Sun Storage Automated Diagnostic Environment

Page Content and Actions

The content part of each page (FIGURE 6-5) displays system information and provides a method for performing actions that allow you to administer, manage, monitor, and service the system.

You can click links on each page to display more detailed information about a storage component or device. You can also use GUI elements such as icons, buttons, check boxes, and radio buttons to perform system administration and storage management tasks.

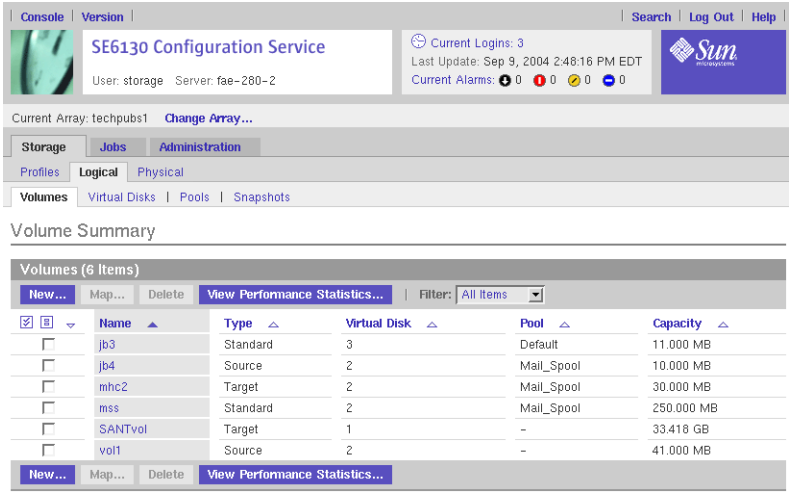


FIGURE 6-5 Page Content and Actions

TABLE 6-1 describes commonly used elements in the content part of the page.

TABLE 6-1 GUI Elements

Element	Description
	Sets the window to scroll or page through displayed data. Click this button to toggle between Page Through Data and Scroll Through Data.
	The column is sorted in ascending (A to Z) order. Click this button to toggle back to sort in descending order.
	The column in sorted in descending (Z to A) order. Click this button to toggle back to sort in ascending order.
	Selects all data currently displayed. Click this button to select all data.
	Deselects all selected data.

Getting Help

You can access the online help system by clicking the Help button at the top right corner of the page (FIGURE 6-6).

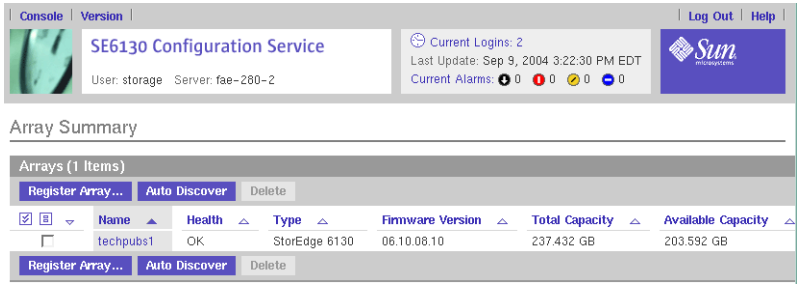
FIGURE 6-6 Help Button

The online help system is context sensitive and will display help for the current page. The help system also provides conceptual, procedural, and reference information. You can use the Table of Contents, Index, and Search tabs to locate help topics that contain information you are looking for.

Setting Up the Management Software

To set up the management software, start by selecting: Sun StorEdge 6130 Configuration Service from the Storage section of the Sun Web Console page.

The Array Summary page is displayed:



From here you can carry out the setup tasks described in the following subsections, including registering and naming arrays, setting the array local password, setting the system time, adding new users, and enabling premium features.

Discovering and Registering Arrays

If the management host is on the same subnet as the array, you can select Auto Discover to discover the array.

If the arrays are not on the same subnet as the management host, use Register Array to discover the array.

Auto Discovering an Array

Auto discovery is the process of finding arrays on a subnet.

1. **On the Array Summary page, Auto Discover to register the first array.**

   When you click Auto Discover, the management software detects the array you installed and adds it to the Array Summary page.

Note – It takes approximately 2 minutes for the software to discover each array.

---

2. **Verify that the array is added to the Array Summary page.**
3. **If the array does not appear on the Array Summary page, do one of the following:**
   - Check the array status using the `ping` command.
   - Check the hardware connections.

   If the array still does not appear, you can register the array manually as described in the next section.

Registering an Array Manually

If the array is not on the same subnet as the management host, use Register Array to discover an array.

1. **On the Array Summary page, click Register Array.**

   The Array Registration page is displayed:

2. **Enter the IP address or host name of either Controller A or Controller B.**

   The host name is the DNS name you assign to each controller.The management software will determine the IP address or host name of the other controller once communication with the array starts.

Note – The password of the array is not a required entry. Each array is shipped without a default password. You can give the array a password as described in "Setting the Array Password" on page 76.

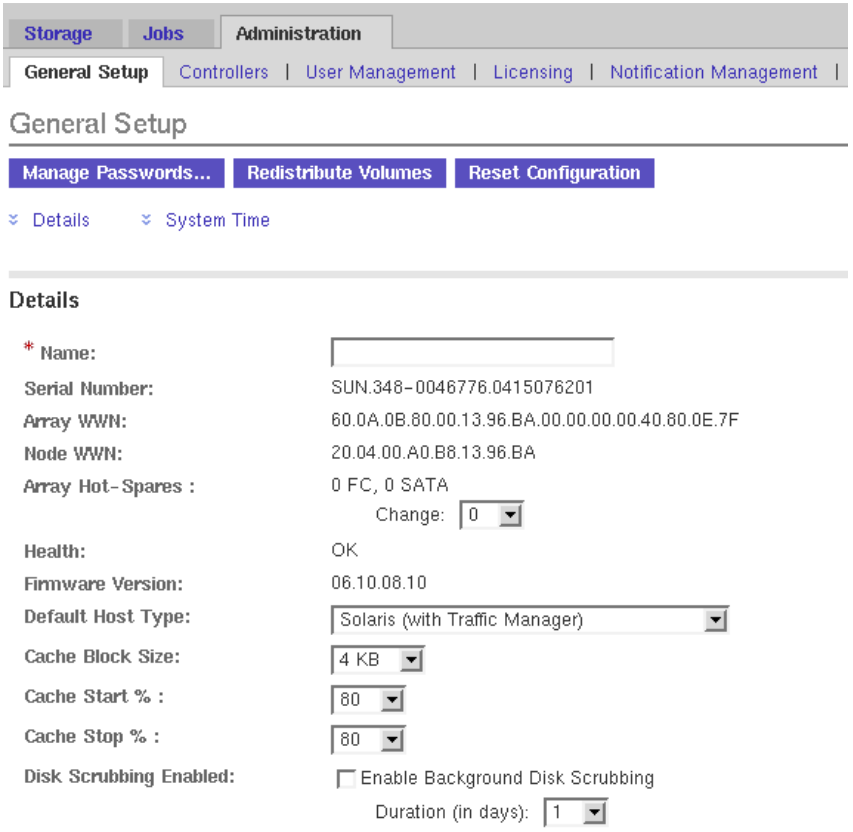
3. **Click OK.**
4. **Verify that the array is added to the Array Summary page.**

Naming an Array

Each array requires a unique name.

1. **On the Array Summary page, click the unnamed array.**
2. **Click the Administration tab.**

The General Setup page is displayed:



3. **In the Name field, enter a unique name consisting of up to 30 characters.**

   The General Setup page contains other features that you may decide to configure. See the online help for more information about the array hot spares, cache start and stop percentages, and disk scrubbing fields.

   Your next step is to set the array password while you are still on the General Setup page.

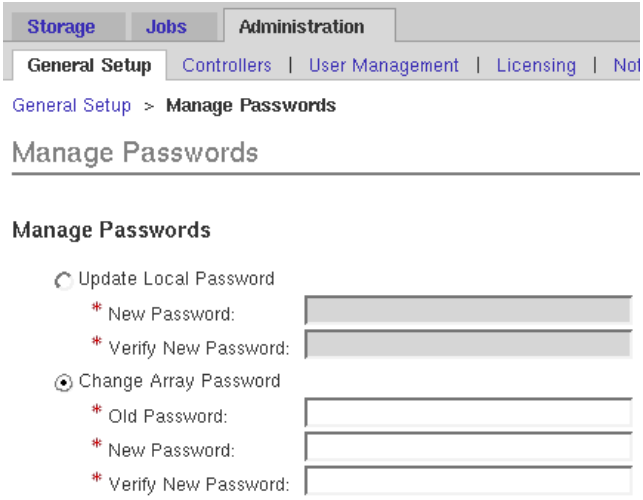
Setting the Array Password

A new Sun StorEdge 6130 array is shipped with a blank, or empty, password field. Sun recommends that you establish an array password during initial setup for security purposes.

To set the array password on a new array:

1. **On the General Setup page, click Manage Passwords.**

   The Manage Passwords page is displayed:



2. **Select Change Array Password.**

3. **Leave the Old Password field blank.**

   This is the only time you can leave this field blank, when you establish a password for a new array.

4. **Enter a new password consisting of up to 30 characters for the array.**

5. **Enter the password again to confirm the new password.**

6. **Click OK.**

   The General Setup page is displayed.

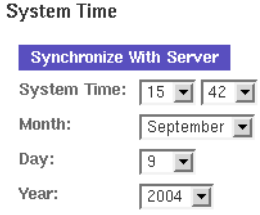
   The management software stores a copy of the array password, known as the local password, on the management host. The Update Local Password field is used only if the array password has been changed by another instance of the management software running on a different management host. For more information about the local password, see the online help.

Note – If you need to change the array password and you do not have the password that was set during installation, contact Sun Service to reset the array password.

Setting the System Time

You can also update the system time and date on the General Setup page. When you set the time and date for a selected array, the values are updated for all arrays in the system.

1. **On the General Setup page, scroll down to the System Time section:**



2. **Select the current hour and minute according to a 24-hour clock.**
3. **If the date is incorrect, change the month, day, and year to the current date.**
4. **Click OK to save your changes.**

   The General Setup page is refreshed, and `Success` is displayed at the top of the page.

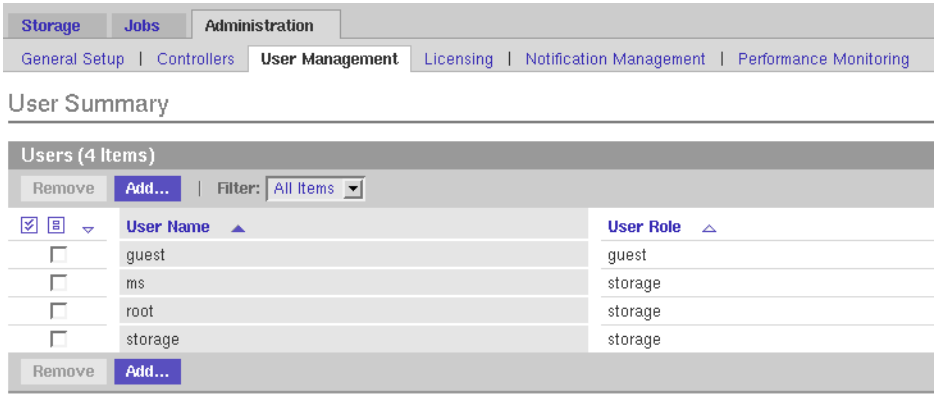
   For more information about the fields and buttons on the General Setup page that you can use after you set up your system, see the online help.

Adding New Users

Before you can add a user and assign that user a role, the user name must be defined in the Solaris Operating System `/etc/passwd` file or NIS.

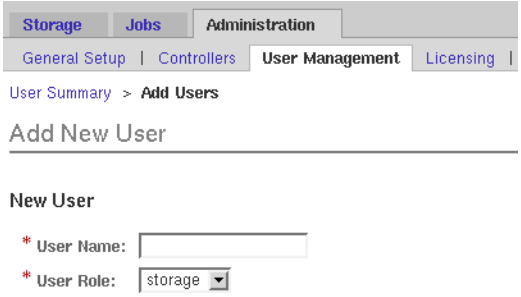
1. **To view a list of users, click Administration > User Management.**

   The User Summary page is displayed:



2. **To add a new user, click the Add button.**

   The Add New User page is displayed:



3. **In the User Name field, enter a valid user name.**

   The user name must be defined in the Solaris Operating System `/etc/passwd` file or NIS.

4. **From the User Role list, select the role you want to assign for this user.**

You can assign a user to one of the following user roles:

User Role	Description
`storage`	Provides full access to all administrative and storage functions and the ability to create, modify, and delete administrative and storage settings.
`guest`	Provides read-only access. A user assigned to the guest role cannot modify any administrative or storage settings.

5. **Click OK.**

   The User Summary page is displayed with a `Success` message, and the name is added to the list.

Enabling Premium Features

License certificates are issued when you purchase premium services. Refer to your license certificate and call the Sun License Center for license information. Refer to `http://www.sun.com/licensing` for your local Sun License Center phone number.

1. **Click the array for which you want to add a new license.**

   The Volume Summary page for that array is displayed.

2. **Click Administration > Licensing.**

   The Licensable Feature Summary page is displayed.

3. **Click Add License.**

   The Add License page is displayed.

4. **Select the type of license you want to add.**

5. **Enter the information provided to you by the Sun Licensing Center and click OK.**

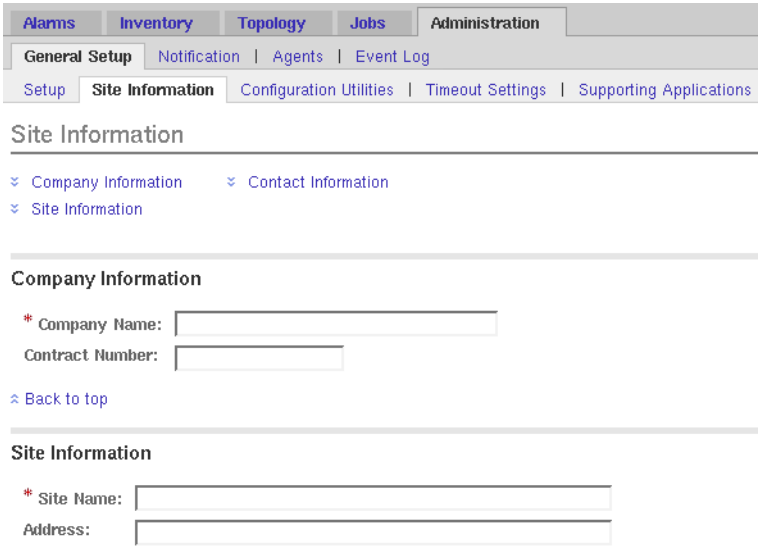
   The license is added to the Licensable Feature Summary page.

Setting Up the Sun Storage Automated Diagnostic Environment

The Sun Storage Automated Diagnostic Environment software enables you to manage your arrays and storage environment.

1. **From the Sun Web Console page, click Sun Storage Automated Diagnostic Environment.**

   The Site Information page is displayed:

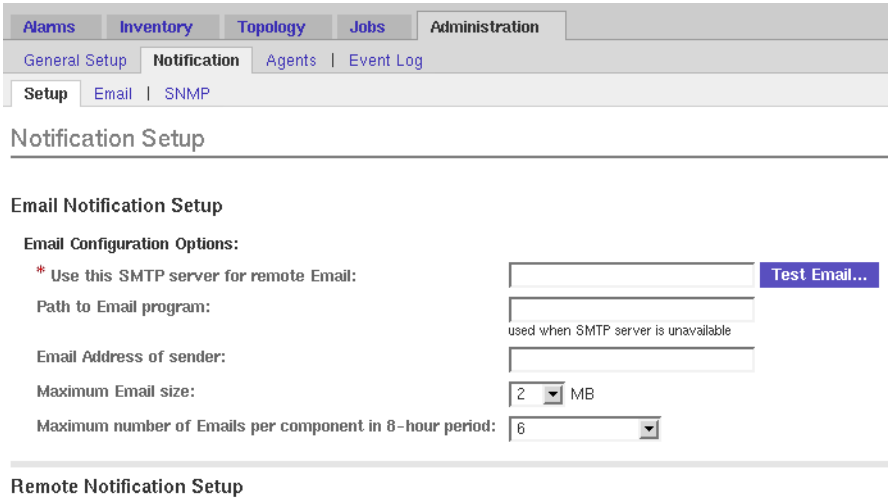


2. **Complete the required company and site information. Click OK.**

   Many parameters have default settings you can accept. If you need help on any of the fields, click the Help button.

3. **Click Administration > Notification.**

   The Notification Setup page is displayed:



4. **Enable local email.**

   a. **Enter the name of the SMTP server.**

      If the host running this software has the `sendmail` daemon running, you can enter `localhost` or the name of this host in the required field.

   b. **Click Save.**

   c. **Click Test Email to send a test email.**

      If you need help on any of the fields, click the Help button.

5. **Set up email notification.**

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

   b. **Click New.**

      Enter an email address for local notification. At least one address is required to begin monitoring events. You can customize emails to specific severity, event type, or product type.

   c. **Click Save.**

6. **Set up remote notifications to Sun Microsystems or an enterprise management application.**

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

      The Notification Setup page is displayed.

b. Select one or more providers.

Selections include SUNMC, SRS Net Connect, NSCC, and SNMP. If you need information about any field on the page, click Help.

c. Click Save.

7. Check the devices that have been discovered and their monitoring status.

a. Click Inventory.

The Devices page displays all of the devices that were discovered by the Sun StorEdge 6130 Configuration Service.

b. Verify that all of the expected hosts and devices are listed and that the monitoring status displays Monitored for each device.

8. Discover other supported devices such as SAN switches.

a. Click Discover on the Devices page.

The Discovery page is displayed.

b. Complete the fields on the Discovery page and click Start Discovery.

When the device discovery process is complete, the discovered devices are displayed on the Devices page.

9. Perform optional setup tasks.

- Confirm general setup information
- Add and activate agents
- Specify system timeout settings

For information about these setup tasks, see the online help.

Connecting Sun SRS Net Connect 3.1

The Sun Storage Automated Diagnostic Environment software uses Sun Remote Services (SRS) Net Connect software version 3.1 to send telemetry data to Sun. Download the software from Sun using the instructions at https://srsnetconnect3.sun.com.

Note – Do not download the Sun Storage Automated Diagnostic Environment software that is available from the Sun SRS Net Connect web site. This version is not configured for the Sun StorEdge 6130 array.

Next Steps

Now you are ready to install the data host software, as described in Chapter 7.

CHAPTER 7

Installing Data Host Software

This chapter describes how to install data host software on Solaris hosts and other operating system host platforms. It contains the following sections:

Data Host Software Overview

The Sun StorEdge 6130 array provides data path support for hosts running Solaris, Windows 2000, Windows Server 2003, Red Hat Linux, HP-UX, NetWare, and SGI IRIX operating systems.

Note – See the *Sun StorEdge 6130 Array Release Notes* for the operating system versions that are supported.

Preparing for Installation

Before installing the data host software, verify the following for each data host:

- Operating system and version are supported as described in the release notes.

- Host bus adapter (HBA) is installed and supported as described in the release notes.
- HBA firmware is at the required level as described in the release notes (HBA drivers are distributed through Sun's Download Center).
- Data hosts are cabled to the array as described in "Connecting Data Hosts" on page 50.

Note – See the *Sun StorEdge 6130 Array Release Notes* for a list of supported operating systems, patches, and HBAs.

Installing Data Host Software for Solaris Hosts

The Solaris data host software is distributed on the Sun StorEdge 6130 Host Installation Software CD.

The Solaris data host software installs the following packages:

- Sun StorEdge SAN Foundation software
- Storage Automated Diagnostic Environment software

Starting the Installation

1. **Log in to the Solaris OS as `root`.**
2. **Insert the Sun StorEdge 6130 Host Installation Software CD into a local drive.**
3. **Change to the `/cdrom/cdrom0` directory:**

   ```
   cd /cdrom/cdrom0
   ```

4. **Start the installation script by typing:**

   ```
   ./install -n
   ```

   The `-n` option specifies a non-interactive installation. After choosing the software you want to install, you will not be prompted to press Return during the installation.

Header information appears and then the following is displayed:

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

This script installs software for your Sun StorEdge 6130
storage system.

Software components included in this distribution:

        - Sun StorEdge 6130 Data Host Software
        - Sun StorEdge 6130 Management Host Software
        - Sun StorEdge 6130 Remote Management Host Software

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

Sun StorEdge 6130 Remote Management Host Software is a subset of
Sun StorEdge 6130 Management Host Software. You will not be
prompted whether to install the former if the latter is selected.

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

5. **Type** `y` **to continue the installation.**

   You are prompted to select the software package you want to install.

6. **To install the data host, type** `y`**,** `n`**, and then** `n` **as follows:**

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

        Sun StorEdge 6130 Data Host Software [y/n] : y
        Sun StorEdge 6130 Management Host Software [y/n] : n
      Sun StorEdge 6130 Remote Management Host Software [y/n] : n
```

7. **At the following prompt, type** `y` **to confirm the software you selected:**

```
You have chosen to install the following components:

        Sun StorEdge 6130 Data Host Software

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

When the installation is complete, a confirmation of the packages you installed is displayed.

If Sun StorEdge SAN Foundation patches were applied during the installation, you will be asked to reboot the host.

The date and time that the installation finished and the name of the file containing the installation log are also displayed, as shown in the following example:

```
Finished at: Tue Aug 24 17:58:31 PDT 2004
Note: A log of this procedure has been saved to
/var/sadm/install/se6130/6130_Host_SW_install.log
```

Enabling Multipathing Software

Sun StorEdge SAN Foundation software includes the Sun StorEdge Traffic Manager multipathing software:

1. **Open the** `/kernel/drv/scsi_vhci.conf` **file with a text editor.**
2. **Set** `mpxio-disable=no` **in the file.**
3. **Reboot the host:**

   `reboot -- -r`

Configuring the Data Host Agents

After installing the data host software, enter the following command to configure the Sun Storage Automated Diagnostic software agent on the data host and synchronize it with the master agent on the management host.

The management host software must be installed and the IP address defined before entering this command on the data host:

`/opt/SUNWstade/bin/ras_install`

Note – Only use the `ras_install` command on data hosts, never on the management host that contains the management software with the master agent.

The `ras_install` script displays. Enter the following options:

- **`S`** for the slave agent
- **`IP`** address of management host
- **`C`** to start the Agent cron

The following is the output from a sample `ras_install` script:

```
+---------------------------------+
| Installing the Package and Crons |
+---------------------------------+
? Are you installing a Master or a Slave Agent? (Enter M=master,S=
slave, E=Empty Master) [M/S/E]: (default=M) S

The address of the master must already be defined before a slave
can be installed.
If the master has not been installed yet, abort this install and
go install this package on the host that was selected to be the
master.

? Enter the IP Name/Address of the Master Host Agent 10.x.xx.xxx

- Testing communication with host '10.xx.xx.xxx' ..
- Communication successful.

- Starting the Storage A.D.E service (rasserv):

/opt/SUNWstade/rasserv/bin/apachectl startssl: ./rasserv started

- Setting up crons:
? Do you want to C=start or P=stop the Agent cron [C/P] : (default=
C) C

- cron installed.
- Testing access to rasserv (this test will timeout after 4 tries
of 10 secs):
- ping '10.x.xx.xxx' succeeded!
- 1/4 attempting to contact agent service...

- Contacted agent with hostid=xxcffxxx.
+-------------------------------+
| SUNWstade installed properly |
+-------------------------------+

- Sending monitored device-list to agent at 10.x.xx.xxx
-- diag-xxxx.Central.Sun.xxx already there
OK
```

Installing Data Host Software for Operating Systems Other Than Solaris

The data host software for Red Hat Linux, HP-UX, AIX, NetWare, and SGI hosts is available from the Sun Download Center (SDLC).

See the *Sun StorEdge 6130 Array Release Notes* for a list of supported operating systems, patches, and HBAs.

Downloading the Software

1. **To download the latest version of the software, g**o to:

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

2. **Select the link for the Sun StorEdge 6130 Array Host Installation software and click Download.**

3. **Log in using your SDLC user name and password.**

   If you have not already registered, click Register Now.

4. **Read and accept the license agreement.**

5. **Select the link for the data host platform that you want to install.**

6. **Save the install package to a temporary directory.**

7. **Uncompress and untar the install package.**

8. **When the download is finished, log out of the SDLC.**

Installing the Software

A `readme` file is provided as part of the installation package.

1. **To install the software, refer to the `readme` file for platform-specific instructions.**

2. **For any post-installation instructions, refer to the** *Sun StorEdge 6130 Array Release Notes***.**

CHAPTER 8

Installing Remote Management Software

This chapter describes how to install the remote CLI software on operating system platforms other than Solaris. It contains the following sections:

Remote CLI Client Overview

The remote command-line interface (CLI) client enables you to configure and monitor the array from hosts other than the management host. You can run commands interactively from a remote client, or write a script to automate certain administrative tasks.

The remote CLI client is available for Windows, Red Hat Linux, AIX, and HP-UX operating environments.

Note – See the *Sun StorEdge 6130 Array Release Notes* for the operating system versions that are supported.

For information about the remote CLI client commands, see the `sscs`(1M) man page.

Preparing for Installation

Before installing the data host software, verify the following for each data host:

- Operating system and version are supported as described in the release notes.
- Host bus adapter (HBA) is installed and supported as described in the release notes.
- HBA firmware is at the required level as described in the release notes (HBA drivers are distributed through Sun's Download Center).
- Data hosts are cabled to the array as described in "Connecting Data Hosts" on page 50.

Downloading the Software

The remote CLI client for operating systems other than Solaris is distributed from Sun's Download Center.

To download the software, follow these steps:

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

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

2. **Click the Sun StorEdge 6130 Host CLI Package for Non-Solaris software link.**
3. **Click Download to access the download window for all operating systems.**
4. **Log in using your customer user name and password.**
5. **Read the license agreement, click Accept, and then click Continue.**
6. **For the AIX, HP-UX, or Linux operating systems, follow these steps:**

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

      The web browser prompts you to download the file.

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

   c. **Save the installation package to a temporary working directory after you download it:**

 # cp *install_package*.**tar.Z /***directory*

install_package is the name of the compressed tar file. */directory* is the name of the directory name to which you want to copy the package.

d. Change to the temporary directory:

cd /*directory*

e. Uncompress the tar file.

f. Extract the contents:

tar -xvf *tar_file*.tar

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

---

7. For the Windows 2000 or Windows 2003 operating systems, follow these steps:

a. Click the file you want to download.

The web browser prompts you to download the file.

b. Download to any directory.

c. Unzip `Disk1.zip` using any supported zip program.

d. Save the unzipped folder to any directory.

Installing the Windows Remote CLI Client

1. Download the software for the Windows host as described in "Downloading the Software" on page 92.

2. Double-click `setup.exe`.

3. Read the license agreement and answer the licensing question.

If you accept the licensing agreement, the software is installed on the host.

4. From the Start menu, click Programs > Accessories > Command Prompt.

5. Add `c:\Program Files\Sun Microsystems\SSCS` to your command prompt path.

The remote CLI client is now installed, enabling you to enter `sscs` commands in the Command Prompt window. For information about the commands, see the `sscs`(1M) man page.

Installing the Red Hat Linux, HP-UX, and AIX Remote CLI Client

1. **Download the remote CLI software for the appropriate operating system as described in "Downloading the Software" on page 92.**
2. **Log in as superuser (`root`).**
3. **Remove any aliases created for the environment (for example, `cp="cp -i"`).**

   If aliases exist in the superuser environment or profile, the software installation and configuration might have unexpected results.

   For the Korn shell: `#` **`unalias -a`**

   For the C shell: `>` **`unalias *`**
4. **Verify that you have write permissions in `/opt`.**
5. **Run the install script by entering:**

   `./se6x20`
6. **Read the licensing agreement, click Accept, and then click Continue.**

   When you accept the licensing agreement, the software is installed in `/opt/se6x20` on the host.
7. **Add `/opt/se6x20/bin` to your path.**
8. **Enter `/opt/se6x20/bin/sscs` at the command line.**

   The remote CLI client is now installed. For information about the commands, see the `sscs`(1M) man page.

CHAPTER 9

Planning Your Storage Configuration

This chapter introduces you to the Sun StorEdge 6130 array storage components. It contains the following sections:

For more information about the concepts introduced in this chapter, see the appropriate topic in the online help.

Storage Array Configuration Components

The array management software provides access to both physical and logical storage components. The physical components include initiators, hosts, host groups, trays, and disks associated with a storage array. The logical components include volumes, virtual disks, pools, and snapshots.

TABLE 9-1 describes the physical and logical components of a storage array. For more information, see the online help.

TABLE 9-1 Sun StorEdge 6130 Storage Physical and Logical Components

Physical Components	
Host	A host represents a server, or data host, with one or more initiators that can store data on an array. You can define volume-to-LUN mappings to an individual host or assign a host to a host group.
Host group	A host group is a collection of one or more data hosts. You can map a host group to one or more volumes to enable the hosts in the group to share access to a volume.
Initiator	An initiator is a port on a Fibre Channel (FC) host bus adapter (HBA) that allows a host to gain access to the storage array. The initiator has a worldwide name (WWN) that is globally unique.
Tray	A tray is an array module that contains from 5 to 14 disk drives.
Disk	A disk is a non-volatile, randomly addressable, rewriteable data storage device. Physical disks are managed as a pool of storage space for creating volumes.
Logical Components	
Storage domains	A storage domain is a logical entity used to partition storage. A storage domain consists of one or more volumes that can be shared among hosts or host groups. Storage domains are a premium feature that require a right-to-use license.
Profile	A storage profile is a set of attributes that are used to create a storage pool. The system has a predefined set of storage profiles. You can choose a profile suitable for the application that is using the storage, or you can create a custom profile.
Pool	A storage pool is a collection of volumes with the same configuration. A storage pool is associated with a storage profile, which defines the storage properties and performance characteristics of a volume.
Virtual disk	A virtual disk is one or more physical disks that are configured with a given RAID level (or RAID set).
Volume	A volume is a container into which applications, databases, and file systems store data. Volumes are created from virtual disks, based on the characteristics of a storage pool. You map a volume to a host or host group.
Snapshot	A snapshot is a point-in-time copy of a primary volume. The snapshot can be mounted by an application and used for backup, application testing, or data mining without requiring you to take the primary volume offline. Snapshots are a premium feature that require a right-to-use license.

FIGURE 9-1 shows the relationship of logical and physical storage components.

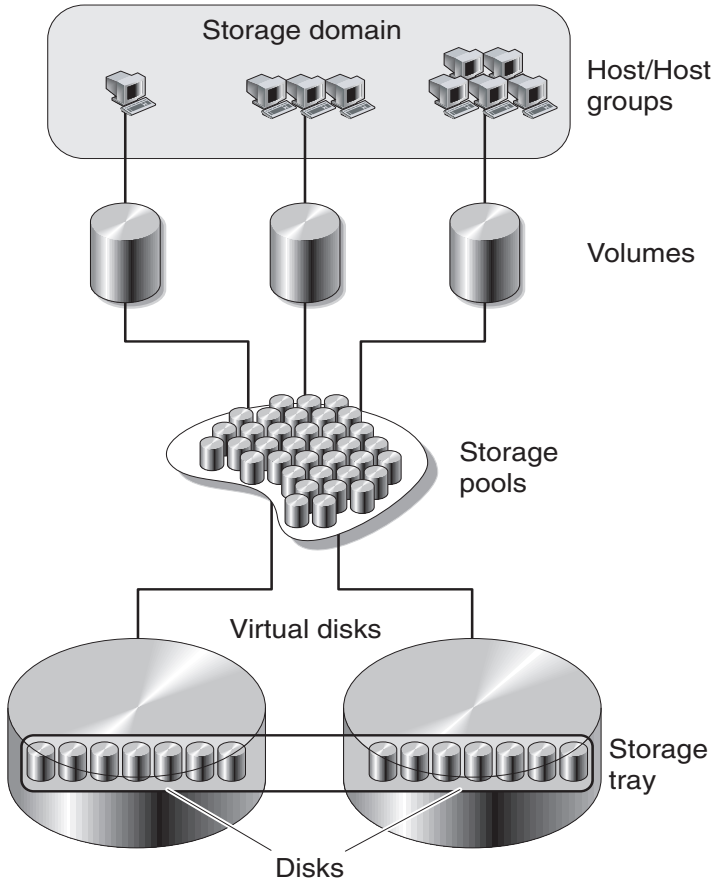


FIGURE 9-1 Logical and Physical Storage Components

Partitioning Storage Using Storage Domains

Storage domains enable you to partition storage, allowing hosts or host groups access to specific volumes. Hosts access volumes on the array through the physical host ports (or initiators) residing on host HBAs. Volume-to-LUN mapping allows you to specify the host or host group that can access a specific volume on your storage array. For more information about storage domains and LUN mapping, see the online help.

FIGURE 9-2 shows how storage domains can be used to partition storage. It depicts a storage array configured with three storage domains, Storage Domain 1, Storage Domain 2, and Storage Domain 3.

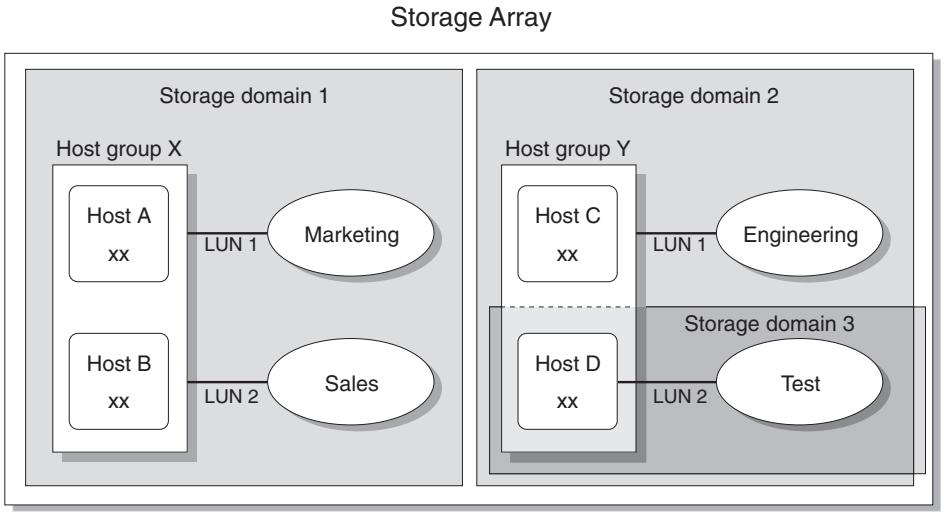


FIGURE 9-2 Storage Array With Three Domains

Storage Domain 1 consists of two volumes, Marketing and Sales, that are mapped to Host Group X. Host Group X contains two hosts, Host A and Host B. All initiators associated with Host A and Host B, within Host Group X, have access to volume Marketing by way of LUN ID 1, and to volume Sales by way of LUN ID 2.

Storage Domain 2 consists of one volume, Engineering, that is mapped to Host Group Y. Host Group Y contains two hosts, Host C and Host D. By virtue of being associated with any host within Host Group Y, all initiators associated with Host C and Host D have access to volume Engineering by way of LUN ID 1.

Storage Domain 3 consists of one volume, Test, that is mapped to Host D. All initiators associated with Host D have access to volume Test by way of LUN ID 2. Note that Host D is a member of Host Group Y; however, since volume Test is mapped directly to Host D and not to Host Group Y, Host D is the only member of Host Group Y that can access volume Test.

Note – LUN IDs must be unique within a storage domain.

Storage Configuration Considerations

When configuring a storage array, you need to determine how to organize and allocate the total storage capacity into volumes and share those volumes among your data hosts. As you plan your storage configuration, it is important that you consider the following requirements for your site:

- **Performance requirements** – You can optimize I/O activity by selecting a predefined storage profile with different characteristics or by creating a custom profile.
- **Access requirements** – You can use storage domains to organize and allocate storage so that only certain hosts have access to volumes. Volumes in a storage domain can be accessed only by host and host groups that are in the same storage domain. You can associate a storage domain with individual hosts or a host group.

The Sun StorEdge 6130 array software is configured with a default storage profile, storage pool, and storage domain:

- The default storage profile configures associated volumes to have a RAID-5 RAID level, 512-Kbyte segment size, enabled read-ahead mode, FC disk type, and a variable number of drives.
- The default storage pool uses the Default profile (RAID-5) and groups all volumes with the same storage characteristics, as defined by the storage profile.
- The default storage domain has no restrictions and allows all hosts and host groups to share access to the same volumes. If you want to restrict access to volumes from certain hosts, you should use storage domains.

You must plan your configuration to determine what storage profile and storage pool to use. For more information, see Planning Volumes in the online help.

Allocating Storage to Data Hosts

Before you create a volume, you should have a plan for how you want to allocate your storage. You should know the number of data hosts you are configuring and the storage capacity and performance needs of each data host.

The New Volume wizard guides you through the steps for creating a volume. When you create a volume, the wizard prompts you to enter or select the following information:

- Volume name and capacity

- A storage pool, which is associated with a storage profile
- The mode in which virtual disks will be created
- Optionally, a mapping from the volume to a host or host group

Configuring Storage on the Array

This section describes how to start to configure storage on the array. It guides you through the following steps:

- "Logging In" on page 100
- "Selecting a Profile" on page 101
- "Creating Hosts and Host Groups" on page 102
- "Creating an Initiator" on page 103
- "Creating a Storage Pool" on page 105
- "Creating a Volume and Mapping It to a Host or Host Group" on page 105

Logging In

1. **Open your browser and enter the IP address of the management host using this format:**

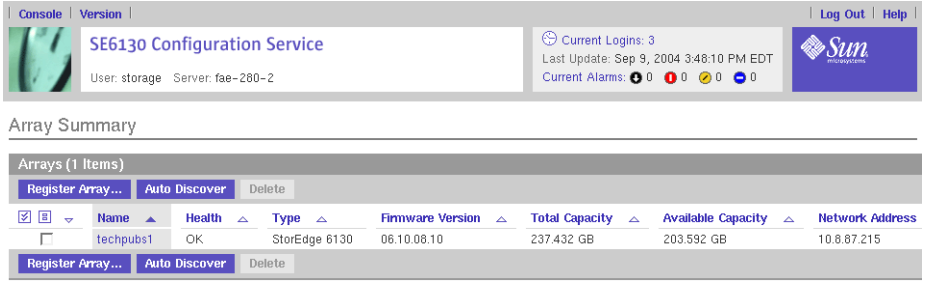
   `https://`*IP-address-management-host*`:6789`**

2. **Log in as a user with the `storage` role.**

   The Sun Web Console page is displayed.

3. **Click Sun StorEdge 6130 Configuration Service.**

   The Array Summary page is displayed.



Selecting a Profile

The Sun StorEdge 6130 array provides several storage profiles that meet most storage configuration requirements. If the Default storage profile does not meet your performance needs, you can select one of several other predefined profiles, or you can create a custom profile.

To view the predefined storage profiles:

1. **On the Array Summary page, click the array you want to configure.**

   The Volume Summary page is displayed.

2. **Click Storage > Profiles.**

   The Storage Profile Summary page is displayed.

   TABLE 9-2 describes the characteristics of the predefined storage profiles.

TABLE 9-2 Sun StorEdge 6130 Array Predefined Storage Profiles

Name	RAID Level	Segment Size	Read-Ahead Mode	Drive Type	Number of Drives
Default	RAID-5	512 KB	Enabled	FC	Variable
High Capacity Computing	RAID-5	512 KB	Enabled	SATA	Variable
High Performance Computing	RAID-5	512 KB	Enabled	FC	Variable
Mail Spooling	RAID-1	512 KB	Enabled	FC	Variable
NFS Mirroring	RAID-1	512 KB	Enabled	FC	Variable
NFS Striping	RAID-5	512 KB	Enabled	FC	Variable
Oracle DSS	RAID-5	512 KB	Enabled	FC	Variable
Oracle OLTP	RAID-5	512 KB	Enabled	FC	Variable
Oracle OLTP HA	RAID-1	512 KB	Enabled	FC	Variable
Random 1	RAID-1	512 KB	Enabled	FC	Variable
Sequential	RAID-5	512 KB	Enabled	FC	Variable
Sybase DSS	RAID-5	512 KB	Enabled	FC	Variable
Sybase OLTP	RAID-5	512 KB	Enabled	FC	Variable
Sybase OLTP HA	RAID-1	512 KB	Enabled	FC	Variable

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

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

Note – If you want to create a custom profile, click New on the Storage Profile Summary page. If you need information about any of the fields, click Help.

Creating Hosts and Host Groups

Host groups enable you to designate a collection of hosts that will share access to a volume. You can map volumes to a host group or to individual hosts that have a logical unit number (LUN).

If you have many hosts to create, you may find it easier to create the hosts first and then to add the hosts to a host group.

Creating Hosts

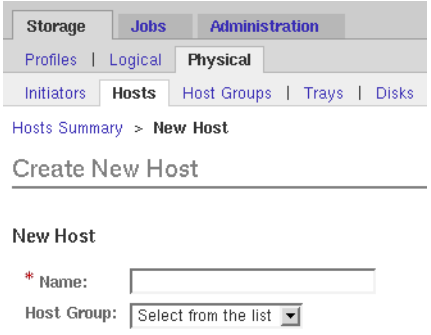
Follow these steps for each data host on your network that you want to add to a host group.

1. **Click Storage > Physical > Hosts.**

   The Host Summary page is displayed.

2. **Click New.**

   The Create New Host page is displayed.



3. **Type a name for the new host, using a maximum of 30 characters.**

   Use a name that will allow you to recognize the data host on your network.

4. **Click OK.**

   The host is created and added to the Host Summary page.

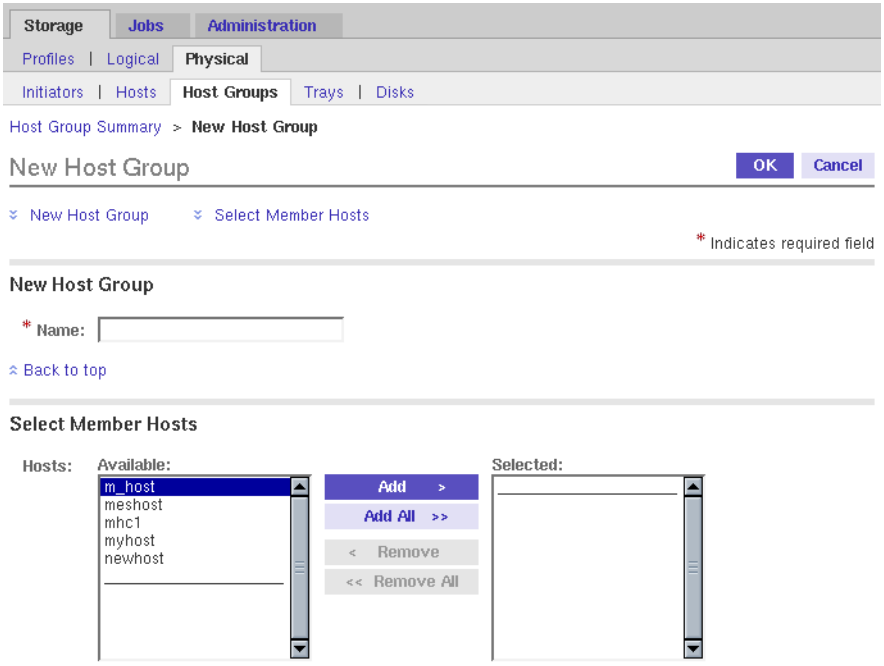
Creating a Host Group

1. **Click Storage > Physical > Host Groups.**

   The Host Group Summary page is displayed.

2. **Click New.**

   The New Host Group page is displayed.



3. **Enter a name for the new host group, using a maximum of 30 characters.**

4. **Double-click the names of the available hosts you want to add to the group. You can also click Select All or Remove All to add or remove all of the available hosts.**

5. **Click OK.**

   The new host group is created and added to the Host Group Summary page.

Creating an Initiator

To make storage available to a data host or host group, you create an initiator and associate it with a volume. An initiator is an FC port that is identified by a unique worldwide name (WWN) of a host bus adapter (HBA) installed on the data host.

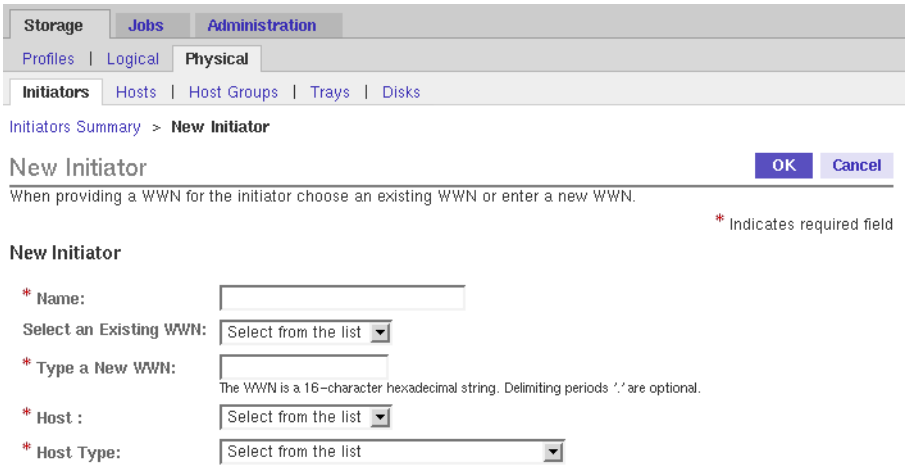
You will need the WWN for the initiator that you want to associate with a volume. If the data host was auto-discovered by the management software, you can get the WWN from Storage > Physical > Initiators.

1. **Click Storage > Physical > Initiators.**

   The Initiator Summary page is displayed.

2. **Click New.**

   The New Initiator page is displayed.



3. **Enter a name for the new initiator, using a maximum of 30 characters.**

4. **Select an existing WWN, or enter a new WWN.**

   If you enter the WWN, the delimiting colons (:) of the 16-character hexadecimal WWN are optional.

5. **Select the host name for the new initiator.**

6. **Select the host type for the new initiator.**

7. **Click OK.**

   The Initiator Summary page displays the initiator name, host name, host type, and WWN of the new initiator.

Creating a Storage Pool

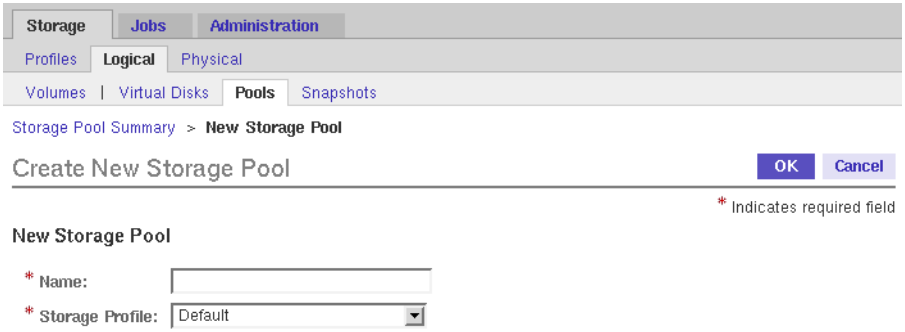
A storage pool is a collection of volumes with the same configuration.

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

   The Storage Pool Summary page is displayed.

2. **Click New.**

   The Create New Storage Pool page is displayed.



3. **Enter a name for the new storage pool, using a maximum of 30 characters.**

4. **Select Default or another predefined storage profile that meets your storage needs.**

   See "Selecting a Profile" on page 101.

5. **Click OK.**

   The new storage pool is displayed on the Storage Pool Summary page.

Creating a Volume and Mapping It to a Host or Host Group

A volume is a "container" into which applications, databases, and file systems can store data. A volume is created from virtual disks that are part of a storage pool. Based on your selections, the array automatically allocates storage from different disks to meet your volume configuration requirements.

The New Volume wizard guides you through the steps for creating a volume.

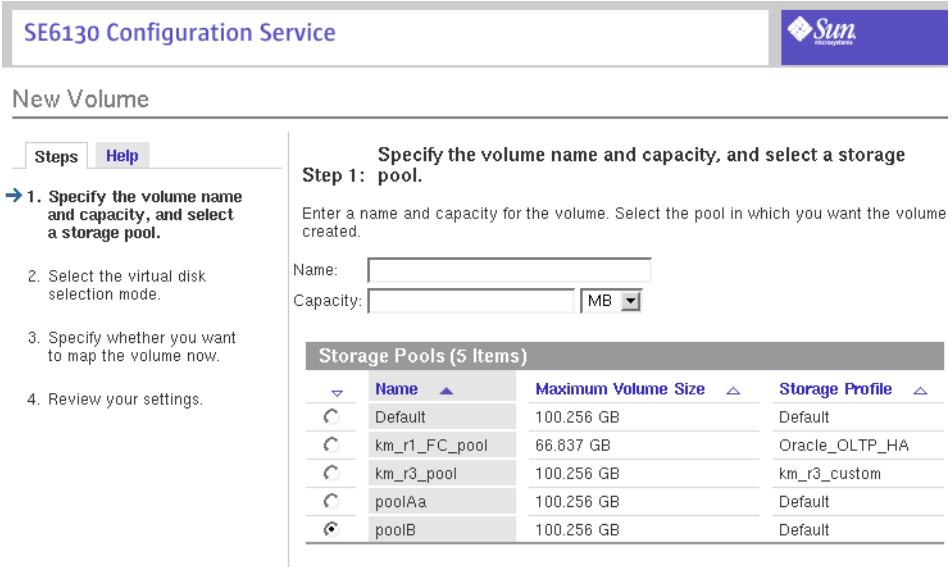
1. **Click Storage > Logical > Volumes.**

   The Volume Summary page is displayed.

2. **Click New.**

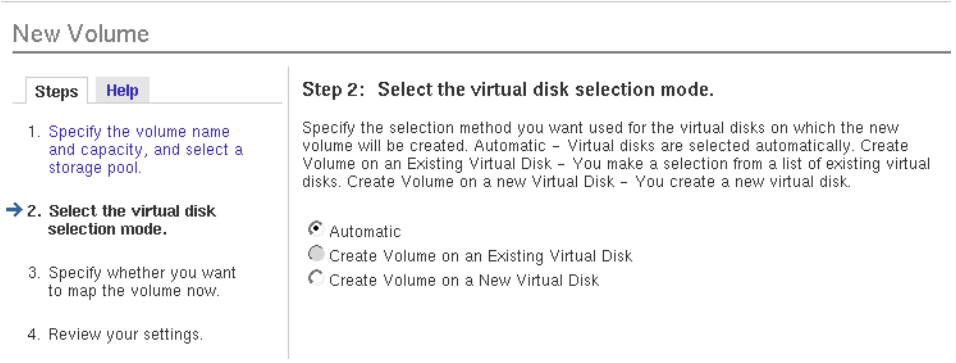
   The New Volume wizard is displayed.

3. **Enter a name, capacity, and select a storage pool for the new volume, and click Next.**



- The volume name can consist of a maximum of 30 characters.
- The volume capacity equals the amount of virtual disk space to be used.
- The storage pool you select is associated with a storage profile, which determines the volume's storage characteristics.

4. **Select the method you want to use to create a virtual disk, and click Next.**

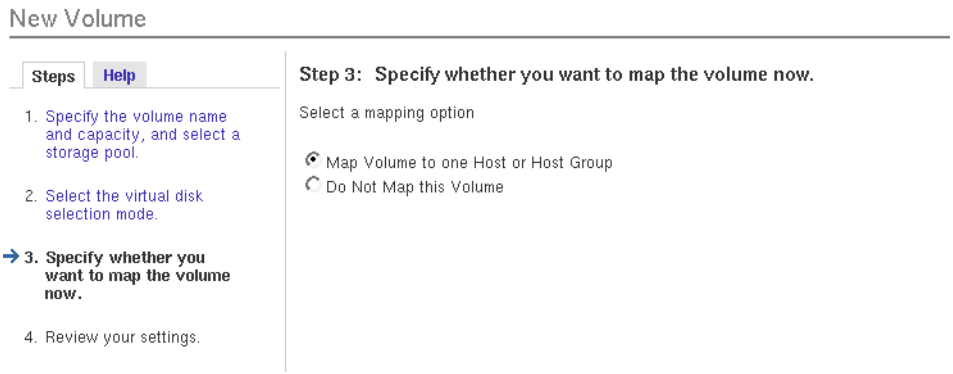


The options are:

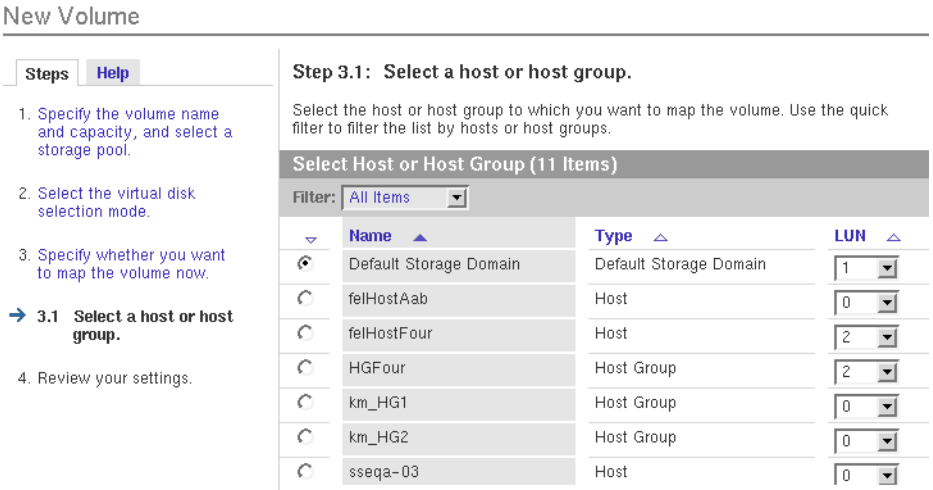
- **Automatic** – The software assigns the physical disks to be used based on the profile.
- **Create Volume on an Existing Virtual Disk** – You are prompted to select a virtual disk from a list of available virtual disks and their characteristics, including RAID level, capacity, and maximum volume size.
- **Create Volume on a New Virtual Disk** – You create a new virtual disk by specifying the number of physical disks, or by selecting from a list of available disks.

5. **Select Map Volume to one Host or Host Group and click Next to map the volume now.**

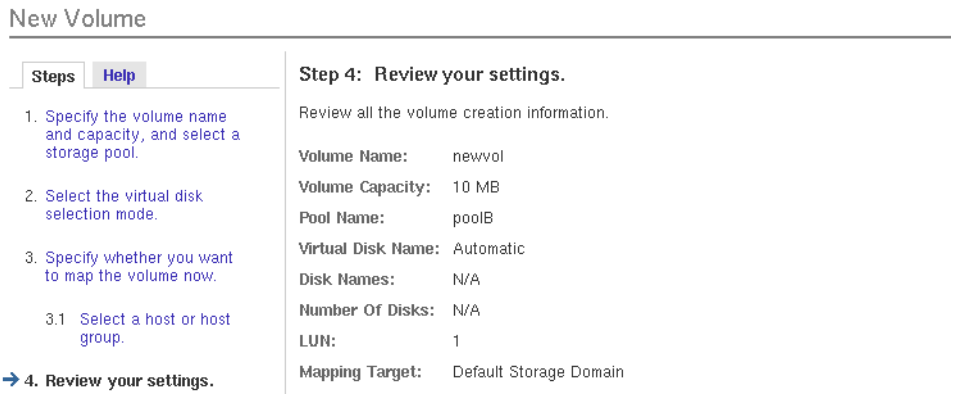
   If you select Do Not Map this Volume, you can map the volume after it is created. See the online help for more information about mapping a volume after a volume is created.



6. **Select the name of a host or host group to which you want to map the volume, and click Next.**



7. **Review your selections for this volume.**



8. **If the values are correct, click Finish.**

   If you want to change any selections, click Previous to go back to the step that you want to change, or click Cancel to start over.

   After you click Finish, the new volume is displayed on the Volume Summary page.

APPENDIX **A**

Configuration Worksheets

Use the worksheets in this appendix to help you collect the information that you will need to perform the installation. Two worksheets are provided:

TABLE A-1 lists the information you need to configure the array.

TABLE A-1 Sun StorEdge 6130 Array Configuration Worksheet

Controller A MAC address:	_____
Controller B MAC address:	_____
Controller A IP address:	_____
Controller B IP address:	_____
Management host IP address:	_____
Network mask:	_____
Name server domain name:	_____
IP address of the domain name server (DNS):	_____
Gateway IP address:	_____
Email notification address:	_____

TABLE A-2 lists the information you need to collect for each data host connected to the Sun StorEdge 6130 array.

TABLE A-2 Sun StorEdge 6130 Array Data Host Information

Host name	_____
Vendor:	_____
Model:	_____
Operating system:	_____
Patch/Service pack:	_____
Number of HBAs:	_____
HBA worldwide name (WWN):	_____
HBA model:	_____
HBA driver:	_____

APPENDIX **B**

Configuring a DHCP Server

This appendix describes how to configure BOOTP services in a Sun Solaris and Microsoft Windows environment. It contains the following sections:

Dynamic IP addresses are assigned through DHCP server BOOTP services.

Before You Begin

You need the controller's MAC address to configure the DHCP server. The MAC addresses are located on the bar code labels at the back of each RAID controller.

Setting Up a Solaris DHCP Server

The following procedure to an example showing how to set up a DHCP server with the BOOTP option for the Solaris 8 and Solaris 9 Operating Systems. Your environment may require different steps.

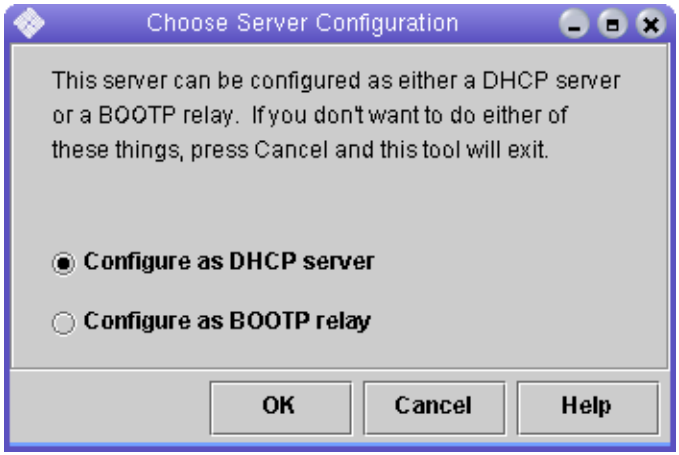
1. **Modify the `netmasks` line of the `/etc/nsswitch.conf` file as shown here:**

```
#netmasks:   nis [NOTFOUND=return] files
netmasks:   files nis [NOTFOUND=return]
```

2. **Start the DHCP wizard by entering the following command at the command line:**

/usr/sadm/admin/bin/dhcpmgr &

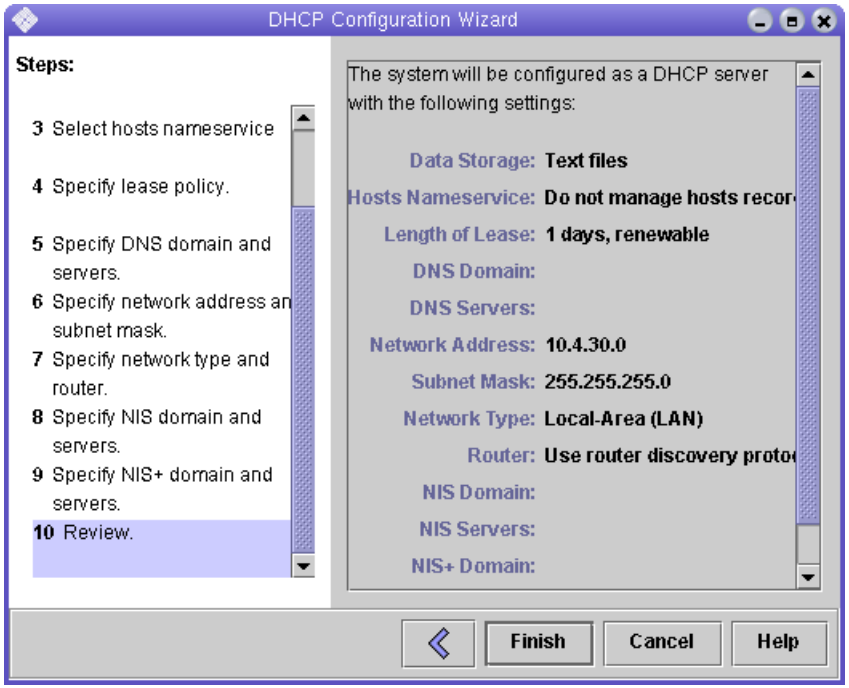
The following window is displayed:



The wizard will prompt you for information related to the configuration, network address, and subnet mask of the controller module. Select or enter the following information:

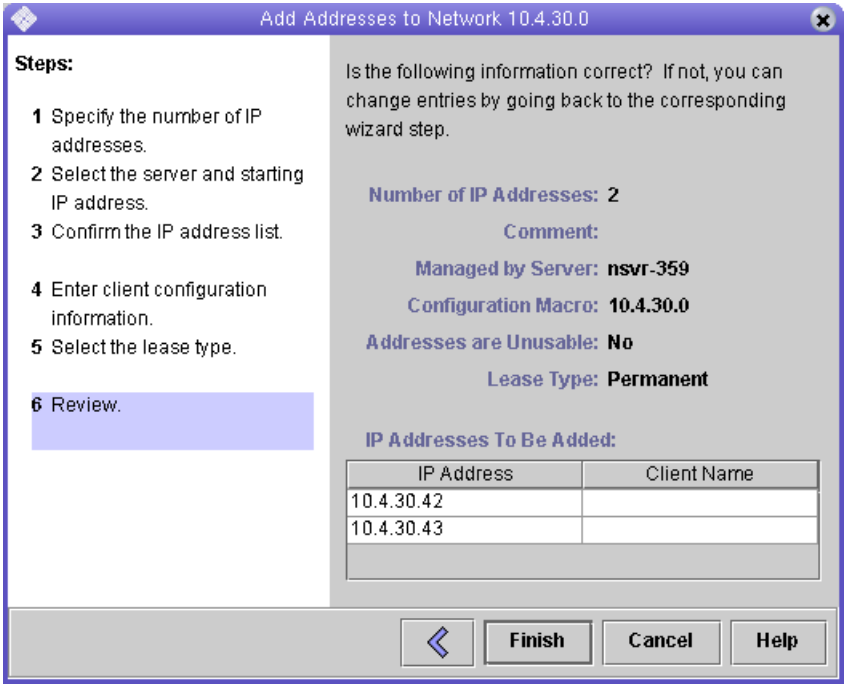
- Data storage format: **Text files**
- Nameservice to store host records: **Do not manage hosts records**
- Length of lease:
- Network Address: *Network address of Controller A*
- Subnet Mask: For example, `255.255.255.0`
- Network Type: **Local-Area (LAN)**
- Router: **Use router discovery protocol**

Your summary page should look similar to the following example:



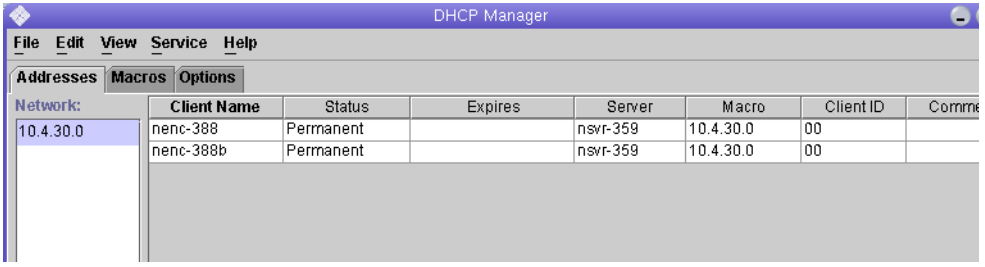
3. **Verify your configuration information and click Finish.**
4. **When you are prompted to configure addresses for the server, click Yes.**
   The Add Address to Network wizard is displayed.
5. **Enter the following information:**
   - Number of IP addresses
   - Name of managing server
   - Starting IP address
   - Configuration macro to be used for configuring the clients
   - Lease type

Your summary page should look similar to the following example:



6. **Verify your configuration information and click Finish.**

   The DHCP Manager displays the following:

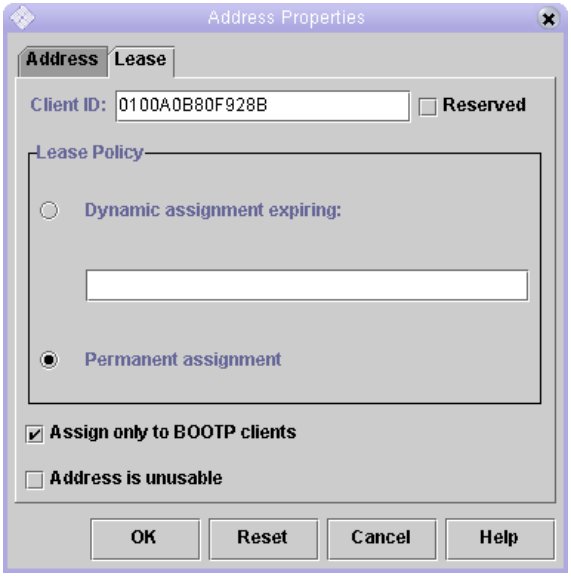


7. **In the Address Properties window, do the following for each RAID controller:**

   a. **In the Client ID field, enter `01` followed by the MAC address that is printed on the back of the RAID controller. For example:**

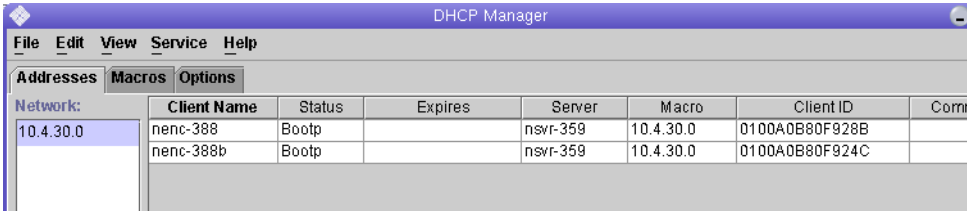
      `0100A0E80F924C`

b. **Toward the bottom of the window, select "Assign only to BOOTP clients."**



c. **Click OK.**

The DHCP manager updates the status and client ID, as shown in the following example:



8. **Go to Modify Service Options and do the following:**

   a. **Select Detect Duplicate IP addresses.**

   b. **Under BOOTP Compatibility, select Manual.**

   c. **Select Restart Server and click OK.**

   After the configuration process has finished, the DHCP server provides BOOTP services to the MAC address you entered for each RAID controller.

9. **To verify that the BOOTP service is running, go to Service > Restart.**

10. **After you power on the array, ping the address.**

    If the ping responds with '`alive`', the DHCP server BOOTP operation was successful.

Setting Up a Windows 2000 Advanced Server

Before you begin, make sure the following requirements are met:

- Windows 2000 server and the array are on the same subnet.
- IP addresses that are assigned to the RAID controllers do not conflict.
- The array is in BOOTP IP addressing mode (the default setting for a new array).
- The Windows 2000 Server setup CD is available.

The following procedure is an example showing how to set up DHCP with the BOOTP option on the Windows 2000 Advanced Server. Your environment may require different steps.

Installing the DHCP Server

To install DHCP server on Windows 2000 Advanced Server:

1. **From the Control Panel, go to Administrative Tools > Configure Your Server.**
2. **Select DHCP from the Networking drop-down menu on the left.**

   The wizard instructs you to use the Windows Components wizard to add the DHCP component.
3. **Start the Windows Components wizard and double-click Networking Services.**
4. **Select Dynamic Host Configuration Protocol (DHCP), click the check box to its left., and click OK.**

   The Windows Components Wizard is displayed.
5. **Click Next.**
6. **If Terminal Services Setup is displayed, select Remote administration mode. Click Next.**

   If your server has obtained an address from a DHCP server for its own address, a warning is displayed.

7. **Click OK to accept the warning.**

   Local Area Connection Properties is displayed.

8. **Assign a static IP address to the server, or click Server to keep DHCP addressing for the server. Click OK.**

9. **Click Finish to exit the Windows Components wizard.**

   The DHCP server is now installed. The next step is to configure the server.

Configuring the DHCP Server

To configure the DHCP server:

1. **From the Control Panel, go to Administrative Tools > Computer Management > Services and Application > DHCP.**

2. **From the Action menu, select New Scope.**

   The New Scope Wizard is displayed.

3. **Enter the following information as prompted:**
   - Scope name and description:
   - IP address range (for example, 192.168.0.170 to `192.168.0.171`)
   - Subnet mask (for example, `255.255.255.0`)
   - Add exclusions (do not exclude any IP addresses)
   - Lease duration (accept the default of 8 days)
   - Router (default gateway) of your subnet (for example, `192.168.0.1`)
   - Domain name, WINS server (these are not needed)
   - Activate Scope? (select Yes, I want to activate this scope now)

4. **Click Finish to exit the wizard.**

   The contents of the DHCP server are listed.

5. **Right-click Scope [***ipaddress***] *scope_name* and select Properties.**

6. **In the Scope Properties box, click the Advanced tab.**

7. **Select BOOTP only, set the lease duration to Unlimited, and click OK.**

8. **Right-click Reservations.**

   The Controller A Properties box is displayed.

9. **Enter the IP address and the MAC address for Controller A. Click Add.**

   The Controller B Properties box is displayed.

10. **Enter the IP address and the MAC address for Controller B. Click Add.**

    The controllers are added to the right of the Reservations listing.

11. **Right-click Scope [***ipaddress***] *scope_name* to disable the scope.**

12. **Click Yes to confirm disabling of the scope.**

13. **Right-click Scope and select Activate.**

    The DHCP server is now configured with the BOOTP option for the array network.

14. **Power on or power cycle the array modules.**

15. **Click Address Leases in the left pane to check the DHCP server leases.**

    The lease expiration displays the following status for each RAID controller.

    ```
    Reservation (active)
    ```

    If the lease expiration for the controllers is inactive, try refreshing the list. If the lease is still inactive, check the following;

    - Are the IP addresses allocated for BOOTP conflicting?
    - Were the correct MAC addresses added to the DHCP server for the array controllers?
    - Are the DHCP server and array on the same subnet?
    - Is the gateway configured correctly on the DHCP server? The RAID controllers can gain a lease and an IP address, but they cannot respond out of the subnet for the software if the gateway is not configured properly.
    - Are the RAID controllers set up for BOOTP access? It is possible that they were previously configured to have static IP addresses. You must be sure when you move an array that you change the array's IP addresses to IP addresses on the new subnet before setting up BOOTP services.