

Sun Storage Common Array Manager

Software Installation and Setup Guide

Version 6.7.x



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About This Guide

The *Sun Storage Common Array Manager Installation and Setup Guide* describes how to install Oracle's Sun Storage Common Array Manager software and how to perform initial configuration for RAID and JBOD open systems storage arrays. For help with installing the arrays, see the hardware installation guide for your array.

Note – If you find a URL link in this guide that does not work, refer to the latest *Sun Storage Common Array Manager Release Notes* for updated information. Due to Oracle's acquisition of Sun Microsystems, URLs included in this guide document might become obsolete.

Related Information

Sun Storage Common Array Manager software includes the following online documentation:

For information about	See
New features and known issues	<i>Sun Storage Common Array Manager Software Release Notes</i>
Basic steps for installing the software	<i>Sun Storage Common Array Manager Quick Start Guide</i>
Administration tasks	Online Help <i>Sun Storage Common Array Manager Administration Guide</i>
Troubleshooting information and hardware replacement procedures	Service Advisor launched from Sun Storage Common Array Manager

For information about	See
sscs command-line interface (CLI)	<i>Sun Storage Common Array Manager CLI Guide</i>
sscs syntax and description	sscs man page
Array installation	Hardware installation guide and Release Notes for your array

Documentation, Support, and Training

These web sites provide additional resources:

Sun Function	URL
Documentation	http://docs.sun.com/
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Sun Storage Common Array Manager Installation and Setup Guide, part number 821-1362-10.

Before You Install the Software

You need to do two things before you install Sun Storage Common Array Manager:

- [“Check System Requirements” on page 1](#)
- [“Decide On Typical or Custom Installation” on page 5](#)

Check System Requirements

You can install the management software on the platforms listed in [TABLE 1-1](#). See the *Sun Storage Common Array Manager Release Notes* for updated support information.

TABLE 1-1 Supported Platforms

Platform	Operating System
SPARC server or workstation	Solaris 9 OS, Solaris 10 U9 OS, OpenSolaris 2009.06
Windows servers	Windows 2003 SP2, Windows XP Professional SP3*, Windows 2008 SP2, Windows 2008 R2
x64 computer	Red Hat Linux 4.7, Red Hat Linux 5.4, SuSE Linux Enterprise Server 10 SP3, SuSE Linux Enterprise Server 11 SP1, Oracle Enterprise Linux 5.4, Oracle VM 2.2
x86 computer	Solaris 10 OS, OpenSolaris 2009.06, Oracle VM 2.2
IBM AIX**	3.5
HP-UX**	B.11.23

* Windows XP Pro is a management host only (no data path support). Windows XP Home Ed. is not supported.

** IBM AIX and HP-UX are remote scripting CLI platforms only.

Upgrading To a New Version

If you are upgrading to a new version of the management software, the install script searches the system for a previous version of the software and if present, updates and adds only those files that require change. Existing settings and other data are preserved.

Before you upgrade, do the following:

- Check for previously installed services, such as the Storage Automated Diagnostic Environment. Be sure the service is not performing a function on the array over the Ethernet port of either array controller.

Note – If a version of Oracle Java Web Console prior to 2.2.5 is installed, the script prompts you to upgrade to the current version of the Oracle Java Web Console. If you choose not to upgrade, the script exits and you cannot install the software.

Solaris OS and Linux

- Uninstall all versions of the Sun StorageTek Configuration Service management software prior to the Common Array Manager 5.0.1.1 release. Later versions do not have to be removed.

Windows OS

- Uninstall all versions of the Sun StorageTek Configuration Service management software prior to the Common Array Manager 5.1.0.10 release. Later versions do not have to be removed.

System Requirements

The installation script verifies these requirements. If a requirement is not met, the script informs you.

TABLE 1-2 System Requirements—Full Installation

OS	Total Space	Directory Space	RAM
Solaris OS and OpenSolaris OS	1070 megabytes	root – 5 megabytes /tmp – 190 megabytes /usr – 40 megabytes	1 GB (for browser interface use)

TABLE 1-2 System Requirements—Full Installation *(Continued)*

OS	Total Space	Directory Space	RAM
Linux	1000 megabytes	/var – 85 megabytes	512 MB
		/opt – 750 megabytes	
		root – 5 megabytes	
		/tmp – 100 megabytes	
		/usr – 245 megabytes	
		/var – 100 megabytes	
Windows	1175 megabytes	/opt – 550 megabytes	512 MB
		On system drive (usually C:)	

Note – These space requirements are for a full installation, including Oracle Java Web Console. If Oracle Java Web Console Version 3.02 and JDK are pre-installed on the system, the required space is smaller by approximately 150 megabytes.

About In-Band and Out-of-Band Management

By default, the management host communicates with RAID arrays out-of-band over Ethernet. The management host and the array controllers must have valid IP addresses. The IP addresses can be assigned dynamically through DHCP or you can assign static IP addresses. For information about dynamic and static IP addresses, see [“Configuring the IP Address of the RAID Array Controllers” on page 109](#).

You can configure in-band management to travel over the data path (using Fibre Channel, etc.) between data host and the array instead. You can configure in-band management either before beginning to configure the array or after registering the array using out-of-band management. For information about in-band management, see [“Configuring In-Band Management” on page 117](#).

Windows OS Requirements

If you are installing the management software on a Windows platform check the following:

- Check the Windows environment variable settings as detailed in the *Sun Storage Common Array Release Notes*.

- Be sure a file or directory named “%SystemDrive%\Program” does not exist. This file can prevent some applications from functioning properly. If it does exist, rename the file to “%SystemDrive%\Program1.”
- Open Storage management requires a hot-fix patch for Win2K3, # 943545 and a Win2K8 patch, # KB958387-v2-x64 (64-bit Win2008).
- Windows Installer 3.1 must be installed and the service packages listed in [TABLE 1-3](#) are required. If needed, download the files from the Microsoft Download site.

TABLE 1-3 Windows Service Pack Requirements

Windows OS	Required Service Pack Version
Windows 2003	SP1 or higher
Windows 2008	SP1
Windows XP	SP2 or higher

- Windows 2008 computer name must match the resolved network IP address name for the array management software to monitor the proxy host for JBOD arrays. Change the computer name and then restart Windows.

Microsoft Operations Manager (Optional)

Included with the Sun Storage Common Array Manager installation package and DVD is Microsoft Operations Manager 2005 (MOM), an IT services management tool. MOM is a separate application that integrates with Sun Storage Common Array Manager, and is delivered as a zip file with the other Sun Storage Common Array Manager installation files.

For further information regarding MOM, refer to the readme file included within the zip file.

Solaris OS Special Requirements

- **Solaris Zones**—Before you install the management software in a sparse-root zone, install Lockhart 3.1 with its L10N (Localization) packages in the global zone.
- **Solaris OS 10**—Do not attempt to run the Lockhart setup script when logged into the local zone. Either install Lockhart into a whole root zone or install/upgrade Lockhart in the global zone before installing the software into the local zone.

Decide On Typical or Custom Installation

Sun Storage Common Array Manager provides two installation options:

- Typical—select this option to install the full set of management services which include the following:

- Management host software with GUI
- Data host proxy agent
- Administrator host CLI client

[Chapter 2](#) describes the typical installation procedure. You can install the typical (full) version of the software on a data host connected to an array or on a central management server that communicates with the array via a proxy agent.

- Custom—select this option to install specific device plug-in packages. You can select from the following modules:

- Management Host Software—installs the Oracle Java Web Console and all core packages.
- Data Host Proxy Agent—installs only the core packages for JBOD devices.
- RAID Array Proxy Agent—installs only the core packages for RAID arrays.
- Administrator Host CLI Client—Installs only the remote CLI package. The remote CLI is used to communicate with a host that has the core software installed.

[Chapter 3](#) describes the custom installation procedures.

Installing the Typical Full Management Software

This chapter describes how to install the full management software package. Use these procedures if you are installing Sun Storage Common Array Manager for the first time or if you are upgrading to a new release of the software. For other installation options, go to [Chapter 3](#). This chapter includes the following topics:

- “Installing the Full Management Software” on page 7
- “Installation Command Summary” on page 10
- “Installation Files and Logs” on page 11

Installing the Full Management Software

You can install the full version of the Sun Storage Common Array Manager on a central management server or a data host.

- 1. Download the software from the web site or load it from the DVD.**

<http://www.oracle.com/us/products/servers-storage/storage/storage-software/031603.htm>

- 2. Unpack or unzip the package you downloaded and save the unpacked files to:**

`/install_dir/Host_Software_6.x.x.x`

If you load the software from DVD, the process unpacks the files for you.

- 3. Get the latest server patches from <http://sunsolve.sun.com>**

4. Start the installation script using the steps for your OS.

Solaris OS or Linux

- a. Open a shell or terminal window.
- b. Become superuser by typing `su`.
- c. Go to the directory containing the software you extracted.
`cd Host_Software_6.x.x.x`
- d. Run the `RunMe.bin` script.

The Welcome panel appears. Go to [Step 5](#) to continue.

OpenSolaris OS

- a. Open a shell or terminal window.
- b. Go to the directory containing the software you extracted.
`cd Host_Software_6.x.x.x`
- c. Run the `RunMe.bin` script using the `pfexec(1)` command:

Note – You must have the appropriate profile rights to run the `pfexec(1)` command.

```
pfexec ./RunMe.bin
```

The Welcome panel appears. Go to [Step 5](#) to continue.

Windows OS

- a. Log in as an Administrative user.
 - b. Open the folder containing the extracted software.
 - c. Double-click the `RunMe.bat` icon.
- The Welcome panel appears. Go to [Step 5](#) to continue.
5. Review the `README.txt` file for the latest information on the product and the installation process.
If the wizard screen is not displayed or if you receive an error message, recheck that the host requirements in [TABLE 1-2](#) are met.
 6. Click Next.
Summary information about the installation is displayed.

7. Click Next to display the license agreement screen.
8. Accept the license agreement, and click Next to display the Installation Type screen.
9. Select Typical to install the full management software on the management host, and click Next.
10. Review the software to be installed and click Install.

Note – The progress indicator reflects 50% for a significant portion of the installation process. This is the expected progress indication for the typical installation process.

When the installation is complete, the View Results screen is displayed.

For information on installation logs, refer to [“Reviewing the Installation Logs” on page 130](#).

11. Click Finish.
12. Configure the firewall on the management host to allow an exception for port 6789.

Some firewall programs prompt for your agreement to allow new programs to communicate through the firewall, and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.

TABLE 2-1 Incoming and Outgoing Port Requirements

Port	Port Number	Description
Incoming	TCP 6788	Console HTTP port that redirects to 6789
	TCP 6789	Console HTTPS port (see “Enabling Remote Access to Oracle Java Web Console” on page 21)
Outgoing	TCP 25	SMTP used for email event notification from FMS
	UDP 161	SNMP used for event notification traps from FMS
	TCP 2463	Use for RPC (remote procedure calls) with the arrays
Proxy Agent	8653	Open port only if you install the proxy agent

Installation Command Summary

TABLE 2-2 summarizes the commands you use to install the management software using the Installer or a CLI script.

TABLE 2-2 Installation Commands

Installation Task	Graphical User Interface	Command-Line Interface
Install the management software	RunMe.bin (Solaris, Linux)	RunMe.bin -c (Solaris, Linux)
	RunMe.bat (Windows)	RunMe.bat -c (Windows)
Uninstall the management software	uninstall	uninstall -c
Note: The Add/Remove Programs feature in Windows is supported. Stop all java.exe or javaw.exe applications running on Windows before starting the uninstaller.		
Force a complete cleanup and removal of an installation.	Not Available	uninstall -f

If you are using the Solaris OS or Linux operating system and a path is not defined, use `./` to run the commands (`./RunMe.bin`).

If you are using a Windows platform, if the command alone does not work, add `.\` to run the commands (`.\RunMe.bat`).

Installation Files and Logs

The following tables show the location of the files and logs for Sun Storage Common Array Manager by operating system.

TABLE 2-3 Solaris OS and OpenSolaris OS Software File Locations

File Type	Directory
Unpacked install files	/var/opt/CommonArrayManager/Host_Software_6.x.x.x/bin
Installation logs	/var/sadm/install/se6000
Sun copyright notice	/var/opt/CommonArrayManager/Host_Software_6.x.x.x/bin
ThirdPartyReadme.txt	/cdrom/cam-6.x.x.x-solaris/doc
Remote SSCS (CLI) directory	/opt/SUNWsesscs/cli/bin
Local CLI directory	/opt/SUNWstkcam/bin
Man page directory	/opt/SUNWsesscs/cli/man

TABLE 2-4 Linux Software File Locations

File Type	Directory
Unpacked install files	/var/opt/CommonArrayManager/Host_Software_6.x.x.x
Installation logs	/var/opt/cam
Remote SSCS (CLI) directory	/opt/sun/cam/se6x20/cli/bin/sscs
Local CLI directory	/opt/sun/cam/bin
Sun copyright notice	/var/opt/CommonArrayManager/Host_Software_6.x.x.x/bin
ThirdPartyReadme.txt	/cdrom/cam-6.x.x.x-linux/doc on the cd-rom
Man page directory	/opt/sun/cam/se6x20/cli/man/man1m/sscs.1m

Custom Installation Options

This chapter describes the custom and command-line interface (CLI) installation options.

- [“Installing the Management Host and Optional GUI” on page 13](#)
- [“Installing the Data Host Proxy Agent” on page 15](#)
- [“Installing the Administrator Host CLI Client” on page 19](#)
- [“Installing and Configuring the Software Using the CLI” on page 22](#)
- [“Using the CLI” on page 27](#)

Installing the Management Host and Optional GUI

This feature bundle creates a management station that contains the full set of Sun Storage Common Array Manager services, with the option to install the browser GUI interface. If you don't plan to use the browser interface, you can select this option and save disk space.

You can install the management host software locally on a data host connected to the array or on a central management server that communicates with the array via a proxy agent. It contains:

- Array management, monitoring and service capabilities
- Optional web browser interface
- Local and Remote CLIs
- Array firmware
- Multiple array management

During installation, you will be prompted to select the arrays installed for your site and the corresponding firmware.

1. Start the installation using the steps for your OS.

Solaris OS/Linux

- a. **Open a shell or terminal window.**
- b. **Go to the directory containing the software you extracted.**
- c. **Become superuser by typing `su`.**
- d. **Run the `RunMe.bin` script.**

Note – You can also use `RunMe.bin -s` (silent mode), to perform an unattended installation at the command line or from a script.

The Welcome panel appears. Go to [Step 2](#) to continue.

OpenSolaris OS

- a. **Open a shell or terminal window.**
- b. **Go to the directory containing the software you extracted.**
- c. **Run the `RunMe.bin` script using the `pfexec(1)` command:**

Note – You must have the appropriate profile rights to run the `pfexec(1)` command.

```
pfexec ./RunMe.bin
```

The Welcome panel appears. Go to [Step 2](#) to continue.

Windows OS

Prerequisite: You must have Windows OS Administrator privileges to install the software.

- a. **Open the folder containing the extracted software.**
- b. **Double-click the `RunMe.bat` icon.**

Note – You can also use `Runme.bat -s` (silent mode), to perform an unattended installation at the command line or from a script.

The Welcome panel appears. Go to [Step 2](#) to continue.

2. **From the Welcome panel, click Next.**
3. **Accept the license agreement and click Next.**
4. **Select Custom to reveal other installation options and click Next.**
5. **Select Management Host Software, and click Next.**
6. **Select the array types installed at your site, select Enable GUI if you want to install the browser interface, and then click Next.**
 - For JBOD arrays (e.g., J4500), select Storage Expansion Array (*version*)
 - For arrays with RAID controllers (e.g., 6180), select RAID Array (*version*)
7. **Review the software to be installed, and click Next to start the installation.**

Note – The progress indicator reflects 50% for a significant portion of the installation process.

When the installation is complete, the View Results screen is displayed.

For information on installation logs, refer to [“Reviewing the Installation Logs” on page 130](#).

8. **Click Finish.**
9. **Configure the firewall on the data host to allow an exception for port 6789.**

Since a proxy agent was not installed or activated with this installation option, there is no need to open port 8653.

Some firewall programs prompt for your agreement to allow new programs to communicate through the firewall, and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.

Installing the Data Host Proxy Agent

This feature bundle creates a compact, standalone installation that can be as little as 25MB in size. It installs all core packages on a data host attached to the array, automatically installs storage expansion (i.e., JBOD) array packages, and allows management of devices via the CLI. This option includes:

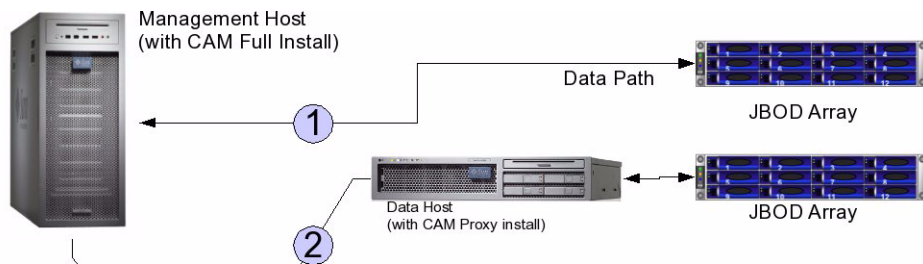
- Array management and monitoring capabilities
- A remote proxy agent
- Local CLI
- Single array management

With this option, a host can act as a proxy for the management host (this allows aggregation of information from multiple hosts as well as delegation to other hosts for firmware upgrades, access configuration changes, etc.).

Installing the Data Host Proxy Agent for JBODs

For each Storage Expansion Array (i.e., JBOD) to be managed, the Data Host Proxy Agent must be installed on each data host that accesses the device.

FIGURE 3-1 Data Host Proxy Agent Monitoring JBOD Arrays



-
- Full (typical) array management software installed on management host with in-band management connection
 - 1
 - 2 Data host proxy agent installed on data host with in-band management connection
-

1. Start the installation using the steps for your OS.

Solaris OS/Linux

- Open a shell or terminal window.
- Go to the directory containing the software you extracted.
- Become superuser by typing `su`.
- Run the `RunMe.bin` script.

The Welcome panel appears. Go to [Step 2](#) to continue.

OpenSolaris OS

- a. Open a shell or terminal window.
- b. Go to the directory containing the software you extracted.
- c. Run the `RunMe.bin` script using the `pfexec(1)` command:

Note – You must have the appropriate profile rights to run the `pfexec(1)` command.

```
pfexec ./RunMe.bin
```

The Welcome panel appears. Go to [Step 2](#) to continue.

Windows OS

Prerequisite: You must have Windows OS Administrator privileges to install the software.

- a. Open the folder containing the extracted software.
- b. Double-click the `RunMe.bat` icon.

The Welcome panel appears. Go to [Step 2](#) to continue.

2. From the Welcome panel, click Next.
3. Accept the license agreement and click Next.
4. Select Custom to reveal other installation options.
5. Select Data Host Proxy Agent to install the proxy agent on the data host, and click Next to proceed.
6. Review your selections, and click Install.

Note – During the software installation, the progress indicator reflects 0% for a significant portion of the installation process.

When the installation is complete, the View Results screen is displayed.

For information on installation logs, refer to [“Reviewing the Installation Logs” on page 130](#).

7. Click Finish.

8. Configure the firewall on each data host to allow an exception for port 8653 for the proxy agent.

Your firewall program might prompt you to allow new programs to communicate through the firewall, and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.

Installing the Data Host Proxy Agent for RAID Arrays

With this option, a host can act as a proxy for the management host (this allows aggregation of information from multiple hosts as well as delegation to other hosts for firmware upgrades, access configuration changes, etc.).

FIGURE 3-2 shows the Data Host Proxy Agent option installed on a data host that is also acting as a management host.

FIGURE 3-2 Using the Data Host Proxy Agent Option to Manage the Array

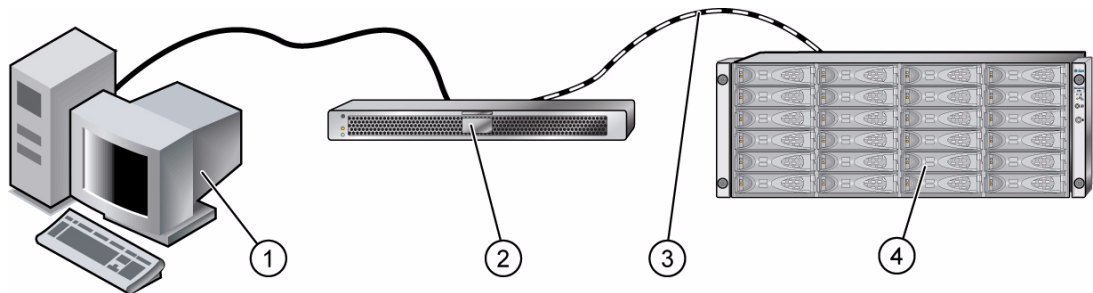


Figure Legend

-
- | | |
|---|---|
| 1 | Terminal session on host |
| 2 | Data Host with Data Host Proxy Agent installation and data to store |
| 3 | In-band connection |
| 4 | Supported array |
-

Remote Access via Proxy Agent

During installation, you will have the option to enable remote access to the array via a proxy agent. The proxy agent receives out-of band communication from the management software over Ethernet and delivers the information over an in-band connection between the data host and the array. Access is over HTTPS and port 8653.

If remote access is enabled, you will need to choose an access password (15 characters maximum). Be sure to remember this password, as it will be needed during array registration.

Note – Do not enable remote access if the management host is directly connected to the array.

Installing the Administrator Host CLI Client

This feature bundle installs a thin scripting client that connects via secure HTTP (HTTPS) to the management host (CLI only). The remote command-line interface (CLI) is used to communicate with a host that has Sun Storage Common Array Manager core software installed.

You can also manage and configure storage using the CLI. The CLI provides the same control and monitoring capability as the web browser, and it is scriptable for running frequently performed tasks.

FIGURE 3-3 Administrator Host CLI Client

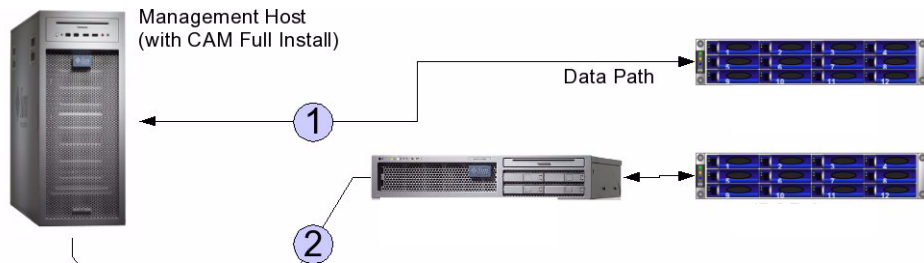


Figure Legend

-
- 1 Full (typical) array management software installed on management host
 - 2 Administrator Host CLI installed
-

The CLI is available by telnetting to the management host or from a remote CLI client that you install on the remote host. It is available for Solaris OS, Windows, Linux, and several other operating systems. See the *Sun Storage Common Array Manager Software Release Notes* for a list of supported operating system platforms.

For more information about CLI commands, see the `sscs` man page and the *Sun Storage Common Array Manager CLI Guide*.

Installing the Administrator Host CLI Software

1. Start the installation using the steps for your OS.

Solaris OS/Linux

- a. Open a shell or terminal window.
- b. Go to the directory containing the software you extracted.
- c. Become superuser by typing `su`.
- d. Run the `RunMe.bin` script.

The Welcome panel appears. Go to [Step 2](#) to continue.

OpenSolaris OS

- a. Open a shell or terminal window.
- b. Go to the directory containing the software you extracted.
- c. Run the `RunMe.bin` script using the `pfexec(1)` command:

Note – You must have the appropriate profile rights to run the `pfexec(1)` command.

```
pfexec ./RunMe.bin
```

The Welcome panel appears. Go to [Step 2](#) to continue.

Windows OS

Prerequisite: You must have Windows OS Administrator privileges to install the software.

- a. Open the folder containing the extracted software.
- b. Double-click the `RunMe.bat` icon.

The Welcome panel appears. Go to [Step 2](#) to continue.

2. From the Welcome panel, click Next.
3. Accept the license agreement and click Next.

4. Select **Custom** to reveal other installation options, and click **Next**.
5. Select **Administrator Host CLI Client**.
6. Click next to display the **Review Selections** screen.
7. To continue, click the **Install** button.

Note – During the software installation, the progress indicator reflects 50% for a significant portion of the installation process.

When the installation is complete, the **View Results** screen is displayed.

For information on installation logs, refer to [“Reviewing the Installation Logs” on page 130](#).

8. If you have no other installations, eject the DVD.
9. **Configure the firewall on administrator host and management host to allow an exception for ports 6789 and 8653.**

Some firewall programs prompt for your agreement to allow new programs to communicate through the firewall and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.

Enabling Remote Access to Oracle Java Web Console

Solaris OS 10 update 6 restricts port 6789 to listen to localhost only. To change this setting and enable remote access to the Oracle Java Web Console and the Sun Storage Common Array Manager, do the following:

1. **Become superuser or assume an equivalent role on the system where the console is running.**

Roles contain authorizations and privileged commands. For more information about roles, see *Configuring RBAC (Task Map)* in *System Administration Guide: Security Services*:

<http://docs.sun.com/app/docs/doc/816-4557/rbactask-15?a=view>

2. **Set a property to allow the console server to respond to network requests, refresh the service, and restart the console server.**

```
# svccfg -s svc:/system/webconsole setprop options/tcp_listen=true
# svcadm refresh svc:/system/webconsole:console
# /usr/sbin/smcwebserver restart
```

Installing and Configuring the Software Using the CLI

This section describes how to install Sun Storage Common Array Manager using a command-line interface script and other options for experience users.

Installing the Software Using a CLI (Solaris OS and OpenSolaris OS)

You can install the management software on a SPARC, X86, or X64 system running the Solaris Operating System or OpenSolaris.

If installing from the DVD, the array installation files and installers are provided in a compressed .bin file on the DVD. The process unpacks the contents of the file on the host and then proceeds with the installation.

If installing from a download, run `tar xvf filename` to unpack the file, then change to the `Host_Software_6.x.x.x` directory and begin the following procedure at [Step 3](#).

1. Log in to the host OS.

- Solaris OS—log in as root.
- OpenSolaris OS—log in with profile rights set to run the `pfexec(1)` command.

2. Insert the host software installation DVD into a drive on the management host.

If the compressed installation file does not appear in a directory window:

a. Change to the `/cdrom/cdrom0` directory:

```
cd /cdrom/cdrom0
```

b. Display the contents of the DVD:

```
ls -l
```

3. Review the `README.txt` file for the latest information on the product and the installation process.

4. To unpack the contents of the compressed installation file, enter the following command:

```
RunMe.bin -c
```

The files are unpacked in the default directory:

```
/var/opt/Common_Array_Manager
```

The `Host_Software_6.x.x.x` directory is unpacked into the default directory. To use a different directory, enter the following command:

```
RunMe.bin -c /path-to-new-directory
```

After a few moments, an InstallShield note will briefly display, then the software installer will begin automatically.

5. When prompted to proceed, press 1 for Next.

6. When prompted about the license agreement, read and accept the agreement by pressing 1 then Enter to select, 0 then Enter to confirm, and 1 then Enter to proceed.

7. When prompted to select the installation type, do one of the following:

- To install the entire software package on the management host, select Typical.
- To install the proxy agent and other software options on the data host, select Custom.

If you select Custom, you will be prompted to choose:

- Management Host Software
- Data Host Proxy Agent
- Administrator Host CLI Client

8. Continue following the prompts to install the software.

Note – During the software installation, the progress indicator reflects 50% for a significant portion of the installation process. This is the expected progress indication for the typical installation process.

When the installation is complete, the software installer Installation Summary screen is displayed.

9. Press Return to complete the installation.

10. Eject the DVD and remove it from the drive.

11. Configure the firewall on the management host, data host, and administrator host (if applicable).

- a. Set the firewall to allow an exception for port 6789. If you have a proxy agent or CLI-only installation, also allow an exception to port 8653.
- b. Some firewall programs prompt for your agreement to allow new programs to communicate through the firewall and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.

Installing the Software Using a CLI (Linux)

You can use a CLI script to install Sun Storage Common Array Manager with the same options as the GUI install wizard on a host system running the Red Hat or SUSE Linux Operating System.

If installing from the DVD, the array installation files and installers are provided in a compressed `.bin` file on the DVD. The process unpacks the contents of the file on the host and then proceeds with the installation.

If installing from a download, run `tar xvf filename` to unpack the file, then change to the `Host_Software_6.x.x.x` directory and begin the following procedure at [Step 3](#).

1. Log in to the management host Linux OS as `root`.
2. Insert the host software installation DVD into a drive on the management host.

If the compressed installation file does not appear in a directory window:

- a. Change to the `/media/cdrom` directory:

```
cd /media/cdrom
```

- b. Display the contents of the DVD:

```
ls -l
```

3. Review the `README.txt` file for the latest information on the product and the installation process.
4. To unpack the contents of the compressed installation file, enter the following command:

```
RunMe.bin -c
```

The files are unpacked in the default directory:

```
/var/opt/CommonArrayManager/Host_Software_6.x.x.x
```

The `Host_Software_6.x.x.x` directory is unpacked into the default directory. To use a different directory, enter the following command:

```
RunMe.bin -c /path-to-new-directory
```

After a few moments, an InstallShield note will briefly display, then the software installer will begin automatically.

5. When prompted to proceed, press `1` for Next.
6. When prompted about the license agreement, read and accept the agreement by pressing `1` then Enter to select, `0` then Enter to confirm, and `1` then Enter to proceed.
7. When prompted to select the installation type, do one of the following:
 - To install the entire software package on the management host, select Typical.

- To install the proxy agent and other software options on the data host, select Custom.

If you select Custom, you will be prompted to choose:

- Management Host Software
- Data Host Proxy Agent
- Administrator Host CLI Client

8. Continue following the prompts to install the software.

Note – During the software installation, the progress indicator reflects 50% for a significant portion of the installation process. This is the expected progress indication for the typical installation process.

When the installation is complete, the host software installer Installation Summary screen is displayed.

9. Press Return to complete the installation.

10. Eject the DVD and remove it from the drive.

11. Configure the firewall on the management host, data host, and administrator host (if applicable).

- a. Set the firewall to allow an exception for port 6789. If you have a proxy agent or CLI-only installation, also allow an exception to port 8653.
- b. Some firewall programs prompt for your agreement to allow new programs to communicate through the firewall and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.

Installing the Software Using a CLI (Windows)

You can use a CLI script to install the Common Array Manager software with the same options as the GUI install wizard on a system running Windows 2000, 2003, or XP.

The array installation files and installers are provided in a compressed file on the DVD. The process unpacks the contents of the file on the host and then proceeds with the installation.

Before you continue, check that all of the requirements are met, as listed in [“Check System Requirements” on page 1](#).

1. Log into Windows as Administrator.

2. Insert the host software installation DVD into a local drive.

If the compressed installation file does not appear in a directory window, access the DVD drive (example: D:).

3. Review the `README.txt` file for the latest information on the product and the installation process.

4. To unpack the contents of the compressed installation file in the default directory, enter the following command:

```
RunMe.bat -c
```

After a few moments, an InstallShield window will briefly display, then the software installer will begin automatically.

The files are unpacked in the default directory:

```
<system drive>:\Sun\CommonArrayManager\Host_Software_6.x.x.x
```

5. When prompted to proceed, press 1 for Next.

6. When prompted about the license agreement, read and accept the agreement by pressing 1 then Enter to select, 0 then Enter to confirm, and 1 then Enter to proceed.

7. When prompted to select the installation type, do one of the following:

- To install the entire software package on the management host, select Typical.
- To install the proxy agent and other software options on the data host, select Custom.

If you select Custom, you will be prompted to choose:

- Management Host Software
- Data Host Proxy Agent
- Administrator Host CLI Client

8. Continue following the prompts to install the software.

Note – During the software installation, the progress indicator reflects 0% for a significant portion of the installation process. This is the expected progress indication for the typical installation process.

When the installation is complete, the host software installer Installation Summary screen is displayed.

9. Press Return to complete the installation.

10. Eject the DVD and remove it from the drive.

11. **Configure the firewall on the management host, data host, and administrator host (if applicable).**
 - a. **Set the firewall to allow an exception for port 6789. If you have a proxy agent or CLI-only installation, also allow an exception to port 8653.**
 - b. **Some firewall programs prompt for your agreement to allow new programs to communicate through the firewall and set the port for you. Refer to your firewall documentation for instructions on how to open a port through the firewall.**
-

Using the CLI

The `sscs` command-line interface (CLI) performs the same control and monitoring functions available through the browser interface. It is the interface for scripting tasks.

There are two forms of the CLI:

- Local
- Remote

The only difference is that the local CLI requires a user to run the command as administrator from a shell on the management host. Because of this limitation, the login and logout commands aren't supported.

Both CLIs can manage any array that has been registered and added to the Common Array Manager inventory in the same way that the browser interface can manage any array in the inventory. The array type and array management path (in-band, out-of-band, proxy agents) has no limitations with local or remote CLI usage. Both CLIs manage the same arrays with the same command set.

Logging In and Out Using the CLI

The following explains how to log in to and out of a management host using the CLI. The options for accessing the CLI are presented in the next section.

There are different CLI directories for the remote and local CLIs.

1. Access the local CLI directory:

- Solaris OS, OpenSolaris OS—`/opt/SUNWstkcaml/bin`
- Linux—`/opt/sun/cam/bin`

- Windows—<system drive>:\Program Files\Sun\Common Array Manager\bin

2. Access the remote CLI directory:

- Solaris OS, OpenSolaris OS—/opt/SUNWsesscs/cli/bin
- Linux—/opt/sun/cam/se6x20/cli/bin/sscs
- Windows—<system drive>:\Program Files\Sun\Common Array Manager\Component\sscs\bin

3. Log into the remote CLI by typing the following command:

```
% sscs login -h cam-hostname -u username
```

where:

- *cam-hostname* is the management host machine where you installed the software.
- *username* is one of the defined users in the management host software. See [“Adding Users And Assigning Roles” on page 39](#).

Note – The local CLI on a data host does not require the login command. You will need the terminal window login to the host.

You can now use CLI commands to perform the same software operations as those available in the browser interface.

For more information about CLI commands, see:

- *Sun Storage Common Array Manager CLI Reference Guide*
- sscs man page
 - For Solaris OS, see the `sscs(1M)` man page, located in /opt/SUNWsesscs/cli/man.
 - For Linux, see the `sscs(1M)` man page, located in /opt/sun/cam/se6x20/cli/man/man1m/sscs.1m.
 - For Windows, see the CD doc directory.

Note – To locate the `sscs(1M)` man page, you must update your `MANPATH` variable or use the `-m` option with the `man` command.

4. Log out by typing the following command:

```
# sscs logout
```

Accessing the CLI Remotely

The local and remote CLIs can be accessed remotely through the full management workstation using:

- Terminal session at the management workstation

Navigate to the Local CLI directory to manage the arrays via the proxy agent.

- A Remote CLI Client from a remote host

This thin scripting client uses HTTPS to communicate with the management host. Login to the management host and navigate to the Local CLI directory to manage the arrays via the proxy agent.

- Telnet session from a remote host

Login to the management host and navigate to the Local CLI directory to manage the arrays via the proxy agent.

Using the CLI to Configure Arrays

Once Sun Storage Common Array Manager has been installed, initial configuration can be performed using either the browser GUI interface or the CLI. [Chapter 4](#) details these steps using the browser interface. If you are using the CLI, general steps and commands for initial configuration include:

- Providing the installation site information using:

```
modify site
```

- Registering with Auto Service Request (ASR) using:

```
register sun-connection
```

- Discovering and registering arrays using:

```
register storage-system
```

These commands, as well as other commands for configuring storage, are described in detail in the *Sun Storage Common Array Manager CLI Guide*.

Initial Array Set Up

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

- [“Setting Up Site and Array Information” on page 31](#)
- [“Registering Arrays” on page 33](#)
- [“Initial Array Administration” on page 35](#)
- [“Adding Users And Assigning Roles” on page 39](#)

Setting Up Site and Array Information

This section describes the operations you need to perform the first time you open the management software after installing it. The sections include:

- [“Starting the Array Management Software” on page 31](#)
- [“Providing Site Information” on page 32](#)
- [“Subscribing to Auto Service Request” on page 32](#)

Starting the Array Management Software

1. **Open a supported web browser.**

Note – For information about supported web browsers, see the *Sun Storage Common Array Manager Release Notes*.

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

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

cam-management-host is the IP address or host name of the host where you installed the Common Array Manager software.

3. Log in as root (Solaris) or administrator (Windows).

- For Solaris OS and Linux, `root` already exists for the machine on which you installed the software. Later, you may want to add a user accounts with the storage role, see [“Adding Users And Assigning Roles” on page 39](#).
- For Windows, you can initially login with any user account with Windows administrative privileges. Later, you may want to add a user accounts with the storage role. For more information about adding users and roles to Windows, see [“Adding New Users in Windows” on page 42](#).

4. Click Log In.

The Oracle Java Web Console page is displayed.

Note – The connection closes automatically if there is no activity for approximately 15 minutes.

5. From the Oracle Java Web Console page, select Sun Storage Common Array Manager from the Storage section of the Oracle Java Web Console page.

Providing Site Information

When you open the Common Array Manager after a first-time installation, the General Configuration page displays.

1. Enter the required site and contact information for your site.

The required fields are indicated by an asterisk: (*).

2. Click Save and Continue Setup.

Once you have saved the Site Information page, the Auto Service Request page displays during initial installations.

Subscribing to Auto Service Request

During the initial installation, the software prompts you to register with the Auto Service Request service by displaying the Auto Service Request (ASR) Setup page.

Auto Service Request (ASR) monitors the array system health and performance and automatically notifies the Sun Technical Support Center when critical events occur. Critical alarms generate an Auto Service Request case. The notifications enable Sun Service to respond faster and more accurately to critical on-site issues. You can select the Enroll Now button to enroll or the Decline button to defer enrollment.

For more information on Auto Service Request, see [“Setting Up Auto Service Request” on page 48](#).

To enroll with ASR during the installation, perform the following procedure on the Auto Service Request Setup page:

1. Provide the following information:

- Sun online account username and password
ASR is available to all customers with a current warranty or contract:
 - <http://www.sun.com/service/warranty/index.xml>
 - <http://www.sun.com/service/serviceplans/index.jsp>
- Type of internet connection to be used
- Direct connection to internet
- Connection using a http proxy server

2. To accept Auto Service Request, click OK.

The Test button enables you to verify that the email address provided with the Sun Online Account and array management software are communicating. You must enroll the array management software with ASR before using the Test button.

While ASR is enabled by default for all registered arrays, there are settings that must be configured to use ASR to monitor an array as described in [“Setting Up Auto Service Request” on page 48](#).

Further information regarding ASR can be found here:

<http://www.sun.com/service/asr/>

Registering Arrays

When you install the management software on a new workstation, the Storage System Summary page is displayed blank with no arrays listed.

To register an array, launch the Array Registration wizard to either search the subnet for arrays that are not already registered or manually register an array.

The registration wizard will automatically discover arrays that are on the same network as the management host, or you can point the wizard to the array if it is not on the same network as the management host.

1. **From the Storage Systems Summary page, click Register.**
2. **Select the Discovery and Authentication Method and click Next.**

Note – The discovery process can take as much as five minutes per array.

a. To scan for unregistered arrays and specify a password, select Scan the local network and Enter password for the discovery.

For J4000, F5100, and Sun Blade 6000 Array Families, use this option for a central management host and enter the proxy agent password.

If each proxy agent has a different password, only the array with a proxy agent using that password will be discovered. You may want to set up a common proxy agent password.

b. To manually register an array, select Enter IP address or hostname and Enter password for the discovery.

For the J4000, F5100, and Sun Blade 6000 Array Families, enter the IP address, host name, or localhost name of the proxy agent and the proxy agent password.

For all other arrays, enter the IP address or hostname of the array controller and the array password.

c. To scan for unregistered arrays that use a default password, select Scan the local network and Use the default password.

For other IP configured arrays, such as the Sun Storage 6000 Array series, use this method to discover arrays that use the default password set at the factory.

Note – The password of the array is not a required entry. The array is shipped with a blank password by default. This field is used only if the array being registered is one that was previously managed and had a set password. To give the array a password, see [“Setting an Array Password” on page 37](#).

With the scanning discovery method, the wizard then finds the array you defined and any unregistered arrays on the subnet and adds them to the Storage System Summary page.

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

3. Select the arrays you want to monitor, and click Finish.

The Results page displays a message indicating one of the following:

- the array was successfully registered with the software.
- the array's firmware does not match the firmware baseline. To install the firmware, see ["Installing the Baseline Firmware" on page 35](#).

4. Click Close.

You remove an array from the management software by unregistering the array. For information about how to unregister an array, see the Online Help.

Initial Array Administration

Use the Administration page associated with each array to perform the following tasks:

- ["Installing the Baseline Firmware" on page 35](#)
- ["Setting an Array Password" on page 37](#)
- ["Naming an Array" on page 38](#)
- ["Setting the System Time" on page 38](#)
- ["Creating a Hot-Spare Drive" on page 38](#)

The Administration page has other properties that you can modify later for each array. See the Online Help for more information about each field.

Installing the Baseline Firmware

New arrays come with the firmware installed. As updates to the firmware are released or you add expansion trays to any 6000 series array, you need to install the new firmware. For optimal performance, the firmware on all arrays should be at the level of the current firmware baseline.

Note – Refer to the *Sun Storage Common Array Manager Baseline Firmware* document for the latest release-specific firmware information.

1. Check the release notes for any release-specific upgrade requirements.

Upgrades to the J4000, F5100, and Sun Blade 6000 Blade Families firmware (SAS I/O modules and disks) require an offline upgrade (stop all I/O activity to the array).

2. Be sure the array is not in a degraded state.

If it is degraded, the firmware upgrade attempt might fail and damage the array. Resolve the critical alarms before continuing the upgrade. If the array is degraded only because it is not at the baseline, the upgrade can be performed.

3. Resolve any alarms.

Alarms can be checked in the Oracle Java Web Console masthead or in the Alarms Summary link in the Navigation Tree on the left. Use Service Advisor to fix any alarms.

Note – For 6xxx, FlexLine, and 25xx arrays, both controllers must be attached to the network and be accessible by the host.

4. (Optional) If you are upgrading firmware for the F5100, determine the master expander location before you begin the upgrade.

a. Go to Storage Summary, F5100, FRUs.

The Health Details for the selected F5100 chassis lists the location, name, status, host information for each F5100 expander.

b. Note the location of the master expander listed for “Chassis Master Expander Location.”

5. From the Storage System Summary page, select the array for which the firmware needs to be installed/upgraded.

Note – You can only upgrade one array in the J4000, F5100, and Sun Blade 6000 Array Families at a time.

Note – For 6xxx, FlexLine, and 25xx arrays, both controllers must be attached to the network and be accessible by the host.

6. Click Install Firmware Baseline.

The upgrade process analyzes the selected arrays to determine the current firmware versions installed and displays a recommended action.

7. In the Action field, specify the type of upgrade, and click Next.

Note – To ensure a stable firmware installation, you can choose to select “Install baseline, no disks” to update the array controller or Expander/SIM firmware first. After verifying the baseline firmware is updated correctly, restart the Wizard to update the disk drive firmware.

8. If the array password is valid, click Next.

For the J4000, F5100, and Sun Blade 6000 Array Families, for arrays registered through a remote proxy, the registration validates the proxy agent password entered during the software installation. No password is verified for local in-band arrays.

9. Review the current installation action, and click Finish.

All management operations must be stopped before the installation begins. If you are installing disk firmware, all disk I/O must be stopped.

10. When the upgrade is complete, click Close.

11. If you chose to upgrade only the array controller or expander/SIM firmware first, repeat firmware installation for the disks.

For more information about array firmware, see the Online Help.

Setting an Array Password

A new Sun Storage array is shipped with a blank, or empty, password field. Sun recommends that you establish an array password during initial setup for security purposes. The password prevents other management hosts from unauthorized access to the configuration of the array.

1. On the Administration 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 Administration page is redisplayed.

The management software stores an encrypted copy of the array password, known as the local password, on the management host

Naming an Array

Each array requires a unique name to be identified on the subnet.

1. **In the Name field on the Administration page, enter a unique name consisting of up to 30 characters.**
2. **Click Save.**

Setting the System Time

When you set the system time and date for a selected array, the values are updated for all arrays registered with this management software.

There are two ways in which you can update the system time and date:

- Click Synchronize with Server to synchronize the time on the array with your management host
- Set the time manually

To set the time manually:

1. **On the Administration 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 Save to save your changes.**

The Administration page is refreshed, and a Success message is displayed at the top of the page.

For more information about the fields and buttons on the Administration page that you can use after you set up your system, see the Online Help.

Creating a Hot-Spare Drive

Hot spare drives are used by a controller to replace a disk that has failed. The management software can automatically assign a hot-spare drive, balance the request for spares across all trays within the array, and ensure that the hot-spare drive is of the same type as the other disks in the same tray.

1. **From the Array Hot-Spares menu on the Administration page, select the number of hot-spares that you want to assign to this array.**

2. Click Save.

The management software assigns the specified number of hot-spares, balancing the selection among trays within the array.

Refer to the Online Help for more information about assigning and unassigning hot-spare drives.

Adding Users And Assigning Roles

To use the Common Array Management software, users and roles must be defined on the host and assigned in the array management software. Make sure the following user names are defined on your systems:

- `root` (or an administrative user for Windows)
- `storage`
- `guest`

Note – By default, the `root` user does not exist in OpenSolaris and is not recommended. Therefore, it is recommended to either 1) create `storage` and/or `guest` accounts on your OpenSolaris host for use with the array management software, or 2) assign roles to all existing users who will use the management software.

User names must be a currently defined user on the management host.

Roles assign privileges to users. Two roles (`storage` and `guest`) are defined in the array management software.

- **Storage role**

Assigns a user write permission and access to all of the software features related to array configuration and management.

- **Guest role**

Assigns a user read permission but restricts the ability to manage the array.

By default, the array management software automatically assigns roles to:

- `root` users in Solaris and Linux
- Administrator users in Windows
- `storage` and `guest` user names if defined on the host

For all other users, you assign roles to users in the array management software.

TABLE 4-1 describes the user names and user role functions and the requirements for each.

TABLE 4-1 User Names and User Roles

User Role/Group	Description	User Name	Required Password
storage (initial administrator)	Use the root or administrative user name to initially add other users. A storage user can use all of the software features related to array configuration and management.	Solaris - root OpenSolaris OS - administrative rights. Linux - root Windows - administrator user, including root if so set up.	Root or administrator password on the management host
storage	A storage user can use all of the software features related to array configuration and management.	Currently defined user on the management host	The same password used to log into the host
guest	A guest user has read-only privileges and can only view information. This user cannot modify any settings or features.	Currently defined user on the management host	The same password used to log into the host

Setting up users and roles is described in the following sections:

- [“Using Administrative Roles to Initially Log In” on page 40](#)
- [“Adding New Users to Hosts” on page 40](#)
- [“Adding New Users and Assigning Roles” on page 41](#)
- [“Adding New Users in Windows” on page 42](#)

Using Administrative Roles to Initially Log In

The first time that you access the array management software, you sign in as an administrative user defined on the management host:

- root in Solaris or Linux.
- Administrator user in Windows.

By default, the administrative user has the storage role. The administrative user can add users and assign roles to them.

Adding New Users to Hosts

User names in the array management software must be currently defined users on the host.

To add new users to hosts running Solaris or Linux OS, consult the system administration documentation.

To add new users to hosts running Windows, refer to [“Adding New Users in Windows” on page 42](#).

To share a user name for storage administration, add the following user names to your hosts:

- storage
- guest

Once these user names are added to the host, by default they are assigned the storage and guest roles.

Adding New Users and Assigning Roles

This section describes how to add new users and assign them the storage or guest role in Sun Storage Common Array Manager. The users must first be defined on the host. For users (other than the administrative user) to access the array management software, roles must be assigned to those users in the software.

You do not have to complete this step for users automatically assigned a role by the array management software:

- root user in Solaris and Linux
- Administrator users in Windows
- storage and guest user names defined on the host

1. To view the list of defined users, choose General Configuration > User Management in the navigation pane.

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 defined on this host.

4. From the User Role list, select the storage or guest role you want to assign to this user.

5. Click OK.

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

Newly added users can log into the Oracle Java Web Console to access the array management software with the same password that they use to log into the system.

Adding New Users in Windows

This section provides the information you need to create users in Windows and assign them to groups for privileges.

Note – The steps are an example and may differ in your Windows software.

Adding an Administrator User

These instructions show you an example of how to configure an administrative user in standard Windows XP. Other versions of Windows software may vary slightly. Consult the Windows documentation.

Note – Administrative user names for Windows cannot have a space character.

Adding an Administrative User in Windows

1. Click **Start** and select **Administrative Tools -> Computer Management**.
The Computer Management window displays.
2. In the Computer Management window, select **Local Users and Groups > Users**.
3. Right click and select **New User**.
4. Enter a username in the **User name** box (`root` is used as an example).
5. Create a password and confirm it.
6. Uncheck the box labeled **User must change password at next login**.
7. Check **Password never expires**.
8. Click **Create**.
9. From the Computer Management window, select **Users**, right click on `root`, and select **Properties**.
10. In the Properties windows, select the **Member Of** tab, and click **Add**.

11. In the Select Groups window, enter Administrators for the object name and click Check Names.

The system displays the *computer-name*\Administrator group in the box labeled “Enter the object names to select.”

12. Click OK.

The root Properties window shows that *root* is a member of Users and the Administrators groups. The root user now has Windows Administrator privileges and is automatically assigned the *storage* role in the array management software.

Adding Non-Administrator Users in Windows

To add non-Administrator users, follow the same steps as “[Adding an Administrator User](#)” on page 42, but define groups called *storage* and *guest* and add the user name to one of those groups instead of the Administrator group.

When done, check the Properties window of the user name and Member of tab to verify that the user is assigned to Users and to the *storage* or *guest* Group.

Proceed to assign the user name the *storage* or *guest* role in the array management software, as described in “[Adding New Users and Assigning Roles](#)” on page 41.

Best Practices - User Roles and Names

- To share a user name for storage administration, add the following user names to your systems:
 - *storage*
 - *guest*

Once these user names are added to the system, by default they are assigned the *storage* and *guest* roles.

- Administrative user names for Windows cannot have a space character.
- To have a common administrative role across all platforms, you can add a user name of *root* with administrative privileges on the Windows system.
- Make rules for multiple users with storage roles.

Multiple instances of the same user name can be logged in concurrently. However, because users with the *storage* user role have write privileges, there is a risk that the changes of one logged-in user will overwrite previous changes of another logged-in user. Therefore, you should develop policies about who can make changes and how to notify others.

Setting Up Array Monitoring

This chapter provides an overview of the array monitoring features. It contains the following sections:

- [“Setting Up Notification for Fault Management” on page 45](#)
- [“Configuring Array Health Monitoring” on page 46](#)
- [“Setting Up Auto Service Request” on page 48](#)

Setting Up Notification for Fault Management

The fault management features of Sun Storage Common Array Manager enables you to monitor and diagnose your arrays and storage environment. Alarm notification can be provided by:

- Email notification
- Simple Network Management Protocol (SNMP) traps

You can also set up Auto Service Request as described in [“Setting Up Auto Service Request” on page 48](#).

- 1. In the navigation pane, under General Configuration, choose Notification.**

The Notification Setup page is displayed:

- 2. Enable local email.**

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

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

- b. Specify the other optional parameters, as desired.
- c. If you have changed or entered any parameters, click **Save**.
- d. (Optional) Click **Test Local Email** to test your local email setup by sending a test email.

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

3. Set up local email notification recipients.

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

The Email Notification page is displayed.

- b. Click **New**.

The Add Email Notification page is displayed.

- c. 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.

- d. Click **Save**.

4. (Optional) Set up remote notifications by SNMP traps to an enterprise management application.

- a. Select **SNMP** as the provider.

- b. Click **Save**.

5. Perform optional fault management setup tasks:

- Confirm administration information.
- Add and activate agents.
- Specify system timeout settings.

Configuring Array Health Monitoring

To enable array health monitoring, you must configure the Fault Management Service (FMS) agent, which probes devices. Events are generated with content, such as probable cause and recommended action, to help facilitate isolation to a single field-replaceable unit (FRU).

You must also enable array health monitoring for each array you want monitored.

Configuring the FMS Agent

1. In the navigation pane, expand **General Configuration**, and select **General Health Monitoring**.
2. From the **General Health Monitoring Setup** page, select the types of arrays that you want to monitor from the **Categories to Monitor** field. Use the shift key to select more than one array type.
3. Specify how often you want to monitor the arrays by selecting a value in the **Monitoring Frequency** field.
4. Specify the maximum number of arrays to monitor concurrently by selecting a value in the **Maximum Monitoring Thread** field.
5. In the **Timeout Setting** section, set the agent timeout settings.

The default timeout settings are appropriate for most storage area network (SAN) devices. However, network latencies, I/O loads, and other device and network characteristics may require that you customize these settings to meet your configuration requirements. Click in the value field for the parameter and enter the new value.

6. When all required changes are complete, click **Save**.

The configuration is saved.

Enabling Health Monitoring for an Array

1. In the navigation pane, select an array for which you want to display or edit the health monitoring status.
2. Click **Array Health Monitoring**
The following **Array Health Monitoring Setup** page is displayed.
3. For the array to be monitored, ensure that the monitoring agent is active and that the **Device Category Monitored** is set to **Yes**. If not, go to [“Configuring Array Health Monitoring” on page 46](#)
4. Select the checkbox next to **Health Monitoring** to enable health monitoring for this array; deselect the checkbox to disable health monitoring for the array.
5. Click **Save**.

Setting Up Auto Service Request

During the initial storage array set-up process, Sun Storage Common Array Manager prompts you to enroll with the Auto Service Request service by displaying the Auto Service Request (ASR) Setup page. This page continues to display until you either fill out the page and click OK, or click Decline to either decline or defer ASR service enrollment.

To set up the array for Auto Service Request, perform the procedures outlined in the following sections:

- “About Auto Service Requests (ASR)” on page 48
- “Subscribing to and Editing Properties of Auto Service Request” on page 51
- “Unregistering From Auto Service Request Service” on page 52
- “Configuring Auto Service Request for an Array” on page 52
- “Testing Auto Service Request Registration” on page 51

About Auto Service Requests (ASR)

Auto Service Request (ASR) monitors the array system’s health and performance and automatically notifies the Sun Technical Support Center when critical events occur. Critical alarms generate an Auto Service Request case. The notifications enable Sun Service to respond faster and more accurately to critical on-site issues.

The Common Array Manager provides the interface to activate Auto Service Request on behalf of the devices it manages. It also provides the fault telemetry to notify the Sun service database of fault events on those devices.

To use ASR, you must provide Sun online account information to enroll Sun Storage Common Array Manager to participate in the ASR service. After you enroll the array management software with ASR, you can choose which arrays you want to be monitored and enable them individually.

ASR uses SSL security and leverages Sun online account credentials to authenticate transactions. The service levels are based on contract level and response times of the connected devices.

ASR is available to all customers with a current warranty or contract:

- <http://www.sun.com/service/warranty/index.xml>
- <http://www.sun.com/service/serviceplans/index.jsp>

The service runs continuously from activation until the end of the warranty or contract period.

Event Information Collected Using Auto Service Requests (ASR)

Only the event information listed in the following table is collected. Your stored data is not read and remains secure.

The event information is sent by secure connection to <https://cns-services.sun.com>.

TABLE 5-1 Event Information Collected by ASR

Information	Purpose
Activation Event	Static information collected for purpose of client registration and entitlement.
Heart Beat Event	Dynamic pulse information periodically collected to establish whether a device is capable of connecting.
Alarm Event	Critical events trigger Auto Service Request and generate a case. Additional events are collected to provide context for existing or imminent cases.

Client Security

To configure firewalls, you will need information about the security aspects of communication between components in the client environment. Port 443 must be open to the URLs in the following table.

TABLE 5-2 depicts the data collected for case creation, used to determine entitlement.

TABLE 5-2 Data Collected for Case Creation

Data Collected	Destination URL	Port and Description
Activation event	Client Registration: https://inv-cs.sun.com/SCRK/ClientRegistrationV1_1_0 Agent Registration: https://inv-cs.sun.com/ProductRegistrationService/agent/ Product Registration: https://inv-cs.sun.com/ProductRegistrationService/scrk/ Case Generation: https://cns-services.sun.com/ServiceInformation/ServiceInformation	Port 443; Static Data collected for purpose of registration and entitlement.
Heartbeat event	Case Generation: https://cns-services.sun.com/ServiceInformation/ServiceInformation	Port 443; Dynamic data periodically collected to establish a device is capable of connecting. Sent every 6 hours.
Audit event	Case Generation: https://cns-services.sun.com/ServiceInformation/ServiceInformation	Event type = daily Port 443; Dynamic configuration data collected and sent every seven days.
Alert event	Case Generation: https://cns-services.sun.com/ServiceInformation/ServiceInformation	Event type = audit Port 443; Potential case-generating events are sent via the secure transport to trigger case generation.
Note - Not all events generate cases; some represent information collected to provide context for already existing cases.		Event type = alert

Subscribing to and Editing Properties of Auto Service Request

During the initial Sun Storage Common Array Manager set-up process, the array management software prompts you to enroll with the Auto Service Request service by displaying the Auto Service Request (ASR) Setup page. This page continues to display until you either fill out the page and click OK, or click Decline to either decline or defer ASR service registration.

To enroll with ASR after the initial set-up, use the following procedure.

Registering With the Auto Service Request Service

1. Click Sun Storage Common Array Manager.

The navigation pane and the Storage System Summary page are displayed.

2. In the navigation pane, expand General Configuration and choose Auto Service Request.

The Auto Service Request Setup page displays.

3. Provide the following information:

- Sun online account username and password
- Type of Internet connection to be used

4. Click Enroll Now.

See the Online Help for a description of the fields and buttons on the Auto Service Request page.

Testing Auto Service Request Registration

You can test the Auto Service Request service connection to ensure that the email address specified in the Sun online account and the array management software are communicating. The software must be enrolled with the Auto Service Request service before testing.

1. From the navigation page, expand General Configuration and choose Auto Service Request.

2. From the Auto Service Request (ASR) Setup page, click Test ASR.

The Sun Online Account service will send a confirmation email to the email address on record for your Sun Online Account. If you do not receive a confirmation email within approximately 30 minutes, contact the Sun Online Account personnel.

Unregistering From Auto Service Request Service

When you unregister from Auto Service Request service, ASR will stop sending telemetry data to Sun about your system.

- 1. In the navigation pane, expand General Configuration and choose Auto Service Request.**
- 2. From the Auto Service Request Setup page, click Unregister.**

Configuring Auto Service Request for an Array

After registering with ASR, you can choose which arrays to monitor using ASR. In order for an array to be monitored using ASR, the following settings must be in effect:

- The health monitoring agent must be active.
- Health monitoring must be enabled for the array type.
- Health monitoring must be enabled for this array.
- ASR must be enabled for this array.

While ASR is enabled by default for all registered arrays, the following settings must be configured to use ASR to monitor an array:

- 1. In the navigation pane, expand the array you want to monitor using ASR, and click Array Health Monitoring.**
The Array Health Monitoring Setup page is displayed.
- 2. In the Health Monitoring section, ensure that the Health Monitoring Agent Active and the Device Category Monitored fields are set to Yes. If either are set to No, go to the General Health Monitoring Setup page and change the settings.**
- 3. In the Monitoring this Array section, the checkbox next to both Health Monitoring and Auto Service Request are selected by default. If monitoring is not desired, deselect the Auto Service Request checkbox.**
- 4. Click OK.**

Configuring RAID Storage

This chapter introduces you to the Sun Storage Common Array Manager storage components. It contains the following sections:

- [“Storage Array Configuration Components” on page 53](#)
- [“Partitioning Storage Using Storage Domains” on page 55](#)
- [“Best Practices - Storage Configuration” on page 58](#)
- [“Configuring RAID Storage” on page 59](#)
- [“Enabling Premium Features” on page 59](#)
- [“Configuring Basic Storage” on page 60](#)
- [“Planning Storage Allocation” on page 61](#)
- [“Using the New Volume Wizard to Create and Map Volumes” on page 65](#)

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 configures both physical and logical storage components. The components of a storage array configuration are as follows.

- **Initiator**—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 World Wide Name (WWN) that is globally unique.
- **Host**—A data host, or server with one or more initiators, that stores its data on arrays. You can define volume-to-logical unit number (LUN) mappings to an individual host or assign a host to a host group.

- **Host group**—A collection of hosts that share access to the same volumes.
- **Storage domain**—A logical entity used to partition storage. You need to purchase a license for the number of domains you need, depending on your array.
- **Storage profile**—A defined set of characteristics for a storage pool. You can choose from the set of preconfigured profiles or create a new one.
- **Storage pool**—A collection of volumes that share a profile defining a common configuration.
- **Volumes**—A division of a storage pool, consisting of virtual disks, representing the storage space that is used by the data hosts in the environment.
- **Disk**—A non-volatile, randomly addressable, rewriteable data storage device. Physical disks are managed as a pool of storage space for creating volumes.
- **Virtual disks**—Also called a redundant array of independent disks (RAID) set, a collection of locations in the memory of more than one physical disk. The storage array handles a virtual disk as if it were an actual disk.
- **Tray**—An enclosure that contains a varying number of disks, depending on your array.

In addition to the basic elements of your storage configuration covered in this guide, you can add advanced, premium features to your configuration. These features require the purchase of licenses. The following premium features are described in the Online Help and user guide:

- **Snapshots** are copies of the data in a volume. They offer a high-availability alternative to backups because you do not need to take the array offline to create the snapshot, and you can store the snapshots in less space than the original data.
- **Volume copies** are copies of the complete contents of one data volume that are located on another data volume on the same array.
- **Replication sets** are the association between primary and secondary volumes. The secondary volume contains a complete copy of the data on the primary volume. The data replication software continuously replicates the data between volumes in a replication set.

Partitioning Storage Using Storage Domains

Storage domains, also called sets or storage partitions, enable you to partition storage to allow hosts or host groups access to specific volumes. Data hosts, such as a data base server, initiate data to store in volumes through the physical host ports (or initiators), residing on host HBAs. Volume-to-LUN mapping enables you to specify the host or host group that can access a specific volume on your storage array.

Note – Storage domains for LUN-mapping require the purchase and activation of a license. (Exception - the Sun StorEdge 6130 array includes some free storage domains to start.) The role of the free default domain is discussed below.

There is a free default domain with limited functions noted below. But to map specific initiators to specific volumes, you need to activate a premium license for a storage domain. Usually your need for premium licenses will be determined at the time you order your array.

About the Default Domain

A non-premium, default storage domain exists to include the following:

- All host groups and hosts that are not explicitly mapped to a volume.
- All volumes that have a default volume-to-LUN mapping assigned.
- All unmapped, automatically detected initiators.

Any volumes within the default storage domain can be accessed by all hosts and host groups within that storage domain.

Note the following concerning default domains:

- LUN-mapping cannot be configured.
- Initiators are created but remain in the default domain until mapped.
- Hosts and host groups can be created but have no valid purpose without a storage domain.

About Premium Storage Domains

Premium storage domains define a volume-to-logical unit number (LUN) mapping, which will allow you to specify the host or host group that will have access to a particular volume in your storage array. The storage domain designates that only the selected host or host group has access to that particular volume through the assigned LUN.

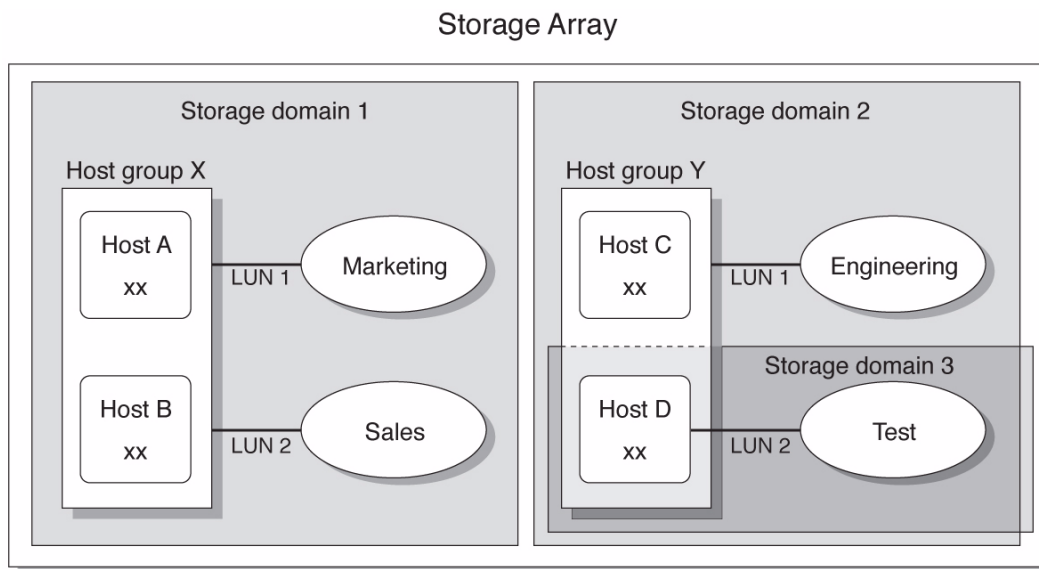
When the storage domain consists of a volume mapped to a host group, it can enable hosts with different operating systems (heterogeneous hosts), to share access to a storage volume. A host within a host group can be mapped separately to a different volume.

A storage domain can contain up to 256 volumes. A volume can be included in only one storage domain and each LUN, from 0 to 255, can only be used once per storage domain.

Note – Not all operating systems support up to 256 LUN IDs. See the documentation for your operating system for more information.

FIGURE 6-1 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 6-1 Storage Array With Three Domains and Four Data Hosts



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.

For more information about storage domains and LUN mapping, see the Online Help.

Best Practices - Storage Configuration

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 hosts and host groups that are in the same storage domain. You can associate a storage domain with individual hosts or with a host group.
- **Combination of redundancy with performance**—To maximize both performance and redundancy, a combination of RAID levels is necessary. The data striping provided by RAID 0 is a cost-effective way to create high levels of performance in a disk array, and having multiple copies of data through data mirroring provided by RAID 1 is the best way to create redundancy. By combining RAID 1 with RAID 0, you can take advantage of both features.

To combine disk mirroring with disk striping, configure RAID 1 with more than four drives. The firmware automatically creates a RAID 1+0 virtual disk.

- **Storage defaults**—The default storage profile, storage pool, and storage domain are configured as follows:
 - The default storage profile configures associated volumes with a RAID-5 level, default 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 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 and not the default domain.
- **Using profiles and pools**—You must plan your configuration to determine what storage profile and storage pool to use. For more information, see Planning Volumes and related topics in the Online Help.

Configuring RAID Storage

This section describes how to configure basic storage for RAID arrays. It guides you through the following tasks:

TABLE 6-1 RAID Array Configuration

Task	See Section
Activate premium licenses	“Enabling Premium Features” on page 59
Review the concepts you will need to plan your storage.	“Storage Array Configuration Components” on page 53
Plan whether you want the default storage or custom storage capabilities.	“Planning Storage Allocation” on page 61
Configure the storage using the New Volume Wizard and related functions.	“Using the New Volume Wizard to Create and Map Volumes” on page 65

Use the planning worksheets in [Appendix A](#) as you gather data for your configuration. For more information about the configuration introduced in this section, see the appropriate topic in the Online Help.

Enabling Premium Features

License certificates are issued when you purchase premium services and contain instructions for obtaining license information.

Premium features that are available with Sun Storage Common Array Manager include:

- Storage Domains
- Volume Copy
- Volume Snapshot
- Data Replication

Refer to your license certificate and contact the Licensing Center for license key information. Direct all license inquiries to licensecodes_ww@oracle.com.

Note – Adding Storage Domains Licenses to Partition Storage.
If you want to create storage domains to partition storage with other than the default domain, you must activate the storage domain licenses.

Adding a License and Enable a Premium Feature

1. From the Storage Systems Summary page, expand an array and select Administration.
2. **Expand Administration and choose Licensing.**
3. **From the Licensable Feature Summary page, click Add License.**
4. **From the Add License page, select the type of license you want to add, and specify the version number and key digest supplied by Sun.**
5. Click OK.

Configuring Basic Storage

The New Volume wizard, available from the Volume Summary page, guides you through the steps for creating a volume and other basic storage configuration.

Note – If you only use the default domain and do not activate premium storage domains, all hosts in the domain will have access to the volume and you will not be able to change the default domain's storage characteristics in the wizard.

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.
Unless you create new pools, only the default pool with the default RAID-5 profile will be available.
- The mode in which virtual disks will be created (automatically or other options).
- Optionally, a mapping from the volume to a host or host group and LUN to partition storage.

You can also map to the default domain.

Before beginning the New Volume wizard in [“Using the New Volume Wizard to Create and Map Volumes” on page 65](#), review the next section to decide if there are non-default storage elements that you want to configure. If so, you can either configure the elements before you begin the New Volume wizard or you can open a second browser window and configure them as you need to during the wizard.

Planning Storage Allocation

Before you create a volume, you should plan the allocation of your storage. Before using the New Volume wizard, review the following topics:

- [“Selecting Additional Profiles” on page 61](#)
- [“Creating Storage Pools” on page 62](#)
- [“About Hosts and Host Groups” on page 63](#)
- [“Creating Initiators to Assign to Hosts” on page 64](#)

Before using the New Volume wizard, you should know

- If you want to define default RAID characteristics with the default pool and its RAID-5 profile.

If so, you can select the defaults in the wizard.

If not, you will need to define a new pool as described in [“Creating Storage Pools” on page 62](#) and assign it a pre-defined or new profile, as described in [“Selecting Additional Profiles” on page 61](#).

- Whether you will partition storage through storage domains.

If so, you need to activate the domain licenses as described in [“Enabling Premium Features” on page 59](#). Then you need to define hosts or host groups before or after the New Volume wizard as described in [“About Hosts and Host Groups” on page 63](#). Otherwise you will be using the default domain.

- How you will configure the storage capacity from initiators between volumes, hosts and host groups.

Selecting Additional Profiles

Sun Storage Common Array Manager provides several storage profiles that meet most storage configuration requirements. By default, the New Volume wizard will allow you to select a default pool with its default profile of RAID-5 characteristics. The profiles that display are specific to the model of the array and the drives it supports.

Profiles are selected from pools. If the default profile does not meet your performance needs, before entering the New Volume wizard, you can create a pool and select one of several other predefined profiles, or you can create a custom profile.

Viewing the Predefined Storage Profiles:

1. **Click Sun Storage Common Array Manager.**

The navigation pane and the Storage System Summary page are displayed.

2. **In the navigation pane, expand the array you want to work with and choose Profiles.**

The Storage Profile Summary page displays the predefined storage profiles for the selected array.

For example, the Oracle_VxFS storage profile supports RAID-5, 512 KB segment size, read-ahead mode enabled, SAS drive type, and four drives. Refer to the Online Help for a description of the predefined storage profiles provided with the software.

3. **file 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 Storage Pools

A storage pool is a collection of volumes with the same configuration. By default, you can select a pool with a default profile of RAID-5 characteristics. You can create new pools and assign other profiles to them.

1. **In the navigation pane, under the array you want to work with, choose 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. **Enter a description of the new storage pool.**

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

For information about the characteristics of the predefined storage profiles, see the Online Help.

6. **Click OK.**

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

About Hosts and Host Groups

By default, the New Volume wizard assigns a default storage domain if no other hosts or host groups have been created.

Most storage users will want to create additional storage domains and host groups to partition storage. You typically create host groups to group hosts that share the same storage characteristics and so that they can share access to a volume.

You can map volumes to a host group or to individual hosts that have a LUN.

You can create the host and host groups either before or after the New Volume wizard. (If afterwards, you will have to manually complete the steps equivalent to the New Volume wizard to configure initiators for each host, assign hosts to host groups, if needed, and complete the volume-to-LUN-mapping.)

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.

Note – LUN-mapping requires a storage domain license. Hosts and host groups can be created without a storage domain license but have no valid purpose without a storage domain.

Creating Hosts

1. **In the navigation pane, under the array you want to work with, expand Physical Devices and choose Hosts.**
2. From the Host Summary page, **click New.**
3. **In the Create New Host page, 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. (Optional) If host groups have already been created, assign the new host directly to a host group.
5. Click OK.

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

Creating a Host Group

1. In the navigation pane, under the array you want to work with, choose **Physical Devices > 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 Initiators to Assign to Hosts

To make non-default storage available to a data host or host group, you create an initiator and associate it with a host. An initiator is an FC port that is identified by a unique WWN of an HBA installed on the data host.

1. In the navigation pane, under the array you want to work with, choose **Physical Devices > 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. Specify a new WWN for the initiator, or select an existing WWN from the drop-down list of unassigned WWNs.

If you specify a new 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.

Using the New Volume Wizard to Create and Map Volumes

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.

As mentioned in [“Planning Storage Allocation” on page 61](#), you may want to configure new profiles, pools, host, host-groups, or initiators before or during the wizard if the defaults do not match your storage needs.

When you are ready to begin, the New Volume wizard guides you through the steps for creating a volume.

Creating Volumes Using the New Volume Wizard

1. **In the navigation pane, under the array you want to work with, choose Volumes.**

The Volume Summary page is displayed.

2. **Click New.**

The New Volume wizard is displayed.

Note – After the initial installation, you will be unable to select New if there is not enough disk space for a new volume or if no existing virtual disks match the selected profile.

3. **Enter a name and capacity for the volume, and select the storage pool with which you want it to be associated.**
 - The storage pool you select is associated with a storage profile, which determines the volume’s storage characteristics.

- Only the default pool with a default RAID-5 profile will display until you create new pools.
- The volume name can consist of a maximum of 30 characters.
- The volume capacity equals the amount of virtual disk space to be used.

4. Click Next.

You are prompted to select the method by which virtual disks will be selected:

5. Select the method you want to use to create a virtual disk:

- Automatic– The software assigns the physical disks to be used based on the profile.
- Create Volume on an Existing Virtual Disk– Follow the wizard steps to select virtual disks.
- Create Volume on a New Virtual Disk– Follow the wizard steps to specify disks.

6. Follow the rest of the wizard to configure the virtual disks.

You are prompted to map the volume to a host or host group and to select a LUN. If you have not created additional hosts or host groups, only the default storage domain will display. You map the volume to new hosts or host groups later.

7. Select a host or host group select a LUN number.

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

About Volumes and the Default Domain or Partitioned Storage Domains

After the New Volume wizard completes, your volumes will belong to:

- The default domain if you did not activate premium storage domains.
All hosts in the domain will have access to the volume and you will not be able to change storage characteristics within the domain.
- A storage domain that partitions storage and allows you to define the storage characteristics such as the profile.

SAS Domain Access Configuration

This chapter describes how to configure SAS access configuration for JBOD and open systems arrays. It contains the following sections:

- [“About SAS Domains” on page 67](#)
- [“Using Access Configuration Features” on page 69](#)
- [“SAS Access Configuration Summary” on page 81](#)
- [“Configuring SAS Access Configuration” on page 83](#)
- [“Managing the Access Configuration Password” on page 90](#)
- [“Changing the SAS Access Configuration State” on page 91](#)
- [“Troubleshooting Access Configuration” on page 91](#)

About SAS Domains

Serial attached SCSI (SAS) domain access configuration enables you to configure data hosts to access a specified group of storage devices. Sun Storage Common Array Manager SAS access configuration provides the traffic segregation, resource flexibility, controlled resource sharing, protection, and topology control functionality required to manage SAS-based systems.

By default, SAS access configuration is disabled, which means all hosts can access all disks.

Sun Storage Common Array Manager provides SAS access configuration management for:

- J4200—a JBOD (Just-a-Bunch-Of-Disks) array enclosing 12 SAS or SATA drives. You can provide up to a maximum of 48 drives by daisy chaining four enclosures. Three 4-lane SAS ports are provided for HBA initiators.

- J4400—a JBOD array enclosing up to 24 SAS or SATA drives. You can connect up to eight J4400 arrays to a 2-port HBA. Alternatively, you can daisy chain two groups of four J4400 arrays, with each group connected to a separate HBA port. Three 4-lane SAS ports are provided for HBA initiators.
- J4500—a JBOD array enclosing 48 SATA drives. It contains SAS expanders, switching circuits that can connect disks in complex patterns. The J4500 has four SAS expanders configured in two sets (each set containing an outside and inside expander) that provide a primary and secondary (redundant) path to all 48 SATA disks.
- F5100—a storage server with four expanders providing four independent SAS domains. Each expander has 20 Flash DIMM disk modules (FMods) and four 4-lane 3GB SAS ports, for a total of 80 FMods and 16 ports. (Note that multipathing to each fabric is not supported. See the F5100 Flash Array documentation for more information.)

You should become familiar with the following terms and concepts before configuring SAS access configuration.

TABLE 7-1 SAS Access Configuration Terms

Concept	Description
SAS Domain	A SAS domain is a group of SAS expander devices and end devices that are physically connected. When SAS expanders are connected, they form one SAS domain.
Expander Devices	An expander is a physical device with ports to connect devices. SAS access configuration is implemented in expander devices in one or more arrays. The expander devices controls which physical connections (PHYs) can be made between end devices. Expanders may be connected to each other via inter-expander links to form a cascade or daisy-chain.
End Devices	End devices are at ends relative to the expander. They are both initiating devices (host initiators on servers) and storage target devices such as disks or FMods.
Ports and PHYs	A PHY is a single SAS physical connection. The supported arrays have x4 SAS ports requiring 4 PHYs. All PHYs in a port have the same PHY information.

FIGURE 7-1 illustrates the physical components using the Sun Storage J4500 Array as an example.

FIGURE 7-1 SAS Domain Configured for the Sun Storage J4500 Array

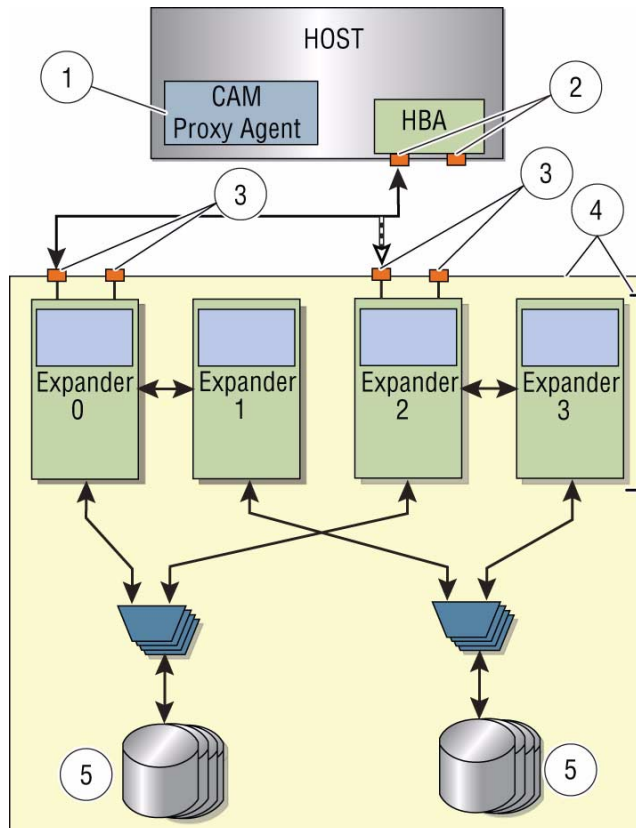


Figure Legend

- | | |
|----------------------------|---|
| 1 CAM Proxy Agent | 4 SAS expanders (primary and secondary) |
| 2 Initiators (end devices) | 5 SATA disks (end devices) |
| 3 SAS ports | |

Using Access Configuration Features

Sun Storage Common Array Manager provides support for Access Configuration (SAS zoning) of the Sun Storage F5100 Flash Array and Sun Storage J4000 Array Series (J4200, J4400, and J4500). Through Access Configuration, you can assign each

host its own storage resources. Accomplished on a per host SAS port, per target level, access configuration offers the following benefits: storage resource segregation, controlled resource sharing, protection, and topology control.



Caution – The Sun Blade 6000 Disk Module will present a folder in the navigation tree titled “SAS Domains,” even though access configuration is not supported by this storage module for this release. Do not attempt to modify any SAS domain settings for this module.

This section describes the following:

- [“About Configuring Access \(or Zoning\)” on page 70](#)
- [“System Requirements for Access Configuration” on page 70](#)
- [“Access Configuration Guidelines” on page 71](#)

About Configuring Access (or Zoning)

You can design each connected SAS port to have exclusive ownership over a specific set of targets in a single array or across cascaded arrays.

The dual SAS fabric design of the J4x00 arrays is initially seen as two separately configured (zoned) SAS domains. In a clustered or multipath situation, where you want two hosts to have access to the same disks for failover, each domain must be configured identically in the array management software for each side of the multipath connection or cluster. The array management software provides zoning templates for common configurations, as well as the ability to import and export user-defined templates.

The Sun Storage F5100 Flash Array consists of four independent fabrics. See the array’s documentation for more information.

Note – For F5100 arrays, the array management software will aggregate the four independent domains into a single unified view when a management host, or a management host with additional proxy agents, have visibility to each domain.

System Requirements for Access Configuration

Access Configuration features requires a supported LSI-based HBA, such as:

- SG-XPCIE8SAS-E-Z: 8-port PCIe HBA
- SG-XPCIE8SAS-EB-Z: 8-port PCIe ExpressModule for Storage Blades

Note – Sun Storage Common Array Manager also supports JBOD management via the 8-port PCIe RAID HBA (SGXPCIESAS-R-EXT-Z). However, this HBA is not supported in an Access Configuration environment.

For more information, refer to the documentation included with the HBA used.

Access Configuration Guidelines

Use the following guidelines when configuring access for array storage resources, as appropriate for your installation. Examples are given for initial configuration (with or without multipath failover) and adding array storage to an existing configured array.

Note – Sun Storage Common Array Manager automatically saves the current SAS domain settings. This will allow you to revert back to functional settings in the event of mis-configuration, or when an array component, such as a SIM card or controller module, containing Access Configuration (zoning) information is replaced.

This section describes the following:

- [“About SAS Multipathing” on page 72](#)
- [“About SATA Affiliation Conflicts” on page 92](#)
- [“Cascading J4x00 Arrays Using the Browser Interface” on page 72](#)
- [“Configuring Multiple Host Access for a J4x00 Array” on page 80](#)

Note – If pre-configured disks with data exist, back up your data before you use Access Configuration features. Verify that no host-to-disk I/O will take place during Access Configuration (zoning) operations.



Caution – For Linux hosts: newly added (or removed) targets (that is, disks or FMods) due to changes in Access Configuration or the addition of new storage can potentially cause the host to hang or panic due to known Linux kernel issues. Rebooting the host should solve this problem.

About SAS Multipathing

Note – The Sun Storage F5100 Flash Array does not support multipathing or clustering.

You can use the Sun Storage J4x00 array in a serial-attached SCSI (SAS) multipathing configuration to provide fault tolerant connectivity to storage. Although J4x00 arrays use single port SATA drives, the I/O circuitry provides a redundant data path to each disk port if the connections to the drives use independent controller paths (i.e., SIM0 and SIM1 for J4200/J4400 arrays and SAS A and B for the J4500 arrays).

Using the multipathing feature of the SAS protocol, the J4x00 can be configured to provide a redundant data path from host to disk. When used in conjunction with RAID and clustered server configurations, multipathing can help increase the availability of your J4x00 storage.

Note – The J4500 array is not supported in a clustering configuration.

The J4x00 multipathing supports active-active and active-passive operation, as follows:

- During an active-active operation, a host can communicate with a hard disk by two different paths.
- During an active-passive operation, a host can communicate with a hard disk using only one path. Should that path become unavailable, a failover occurs where the host begins using the path in the other SAS domain (or fabric) to communicate with the hard disk.
- Operating system-specific driver software controls the multipathing capability (active-active or active-passive). You enable, disable, and configure multipathing through the server's operating system software.

Cascading J4x00 Arrays Using the Browser Interface

Note – Sun Storage F5100 Flash Arrays do not support cascading between individual domains or between F5100 arrays.

There are three sets of steps required to cascade (or add) a J4x00 array to an existing J4x00 series array from the browser interface.

If multiple arrays are to be cascaded, add them one at a time, using the following procedures:

- “Preparing Existing Arrays Prior to Cascading Additional Storage” on page 73
- “Preparing New Arrays for Cascading (Adding Storage Capacity)” on page 73
- “Cascading the New Array to the Existing Storage” on page 75

Preparing Existing Arrays Prior to Cascading Additional Storage

This procedure takes you through the steps required to disable the Access Configuration state for existing arrays, in preparation for cascading additional arrays.

1. Create a backup of all existing data.

This is a precautionary step.

2. From the Access Configuration page, check the SAS addresses, write down the SAS port WWN's and associated drives for each domain, and then perform an Export operation for each.

Prior to re-cabling, you must record the SAS port WWN and the desired associated targets. The configuration will need to be recreated because the SAS port might be attached to a different array in the cascade or different ports on an array.

3. Unregister related arrays in the array management software:

a. From the navigation pane, select Storage Systems.

The Storage System Summary page is displayed.

b. Select the checkbox to the left of the array and click Remove.

c. Click OK.

Proxy hosts for un-registered arrays will automatically be removed as well.

Preparing New Arrays for Cascading (Adding Storage Capacity)

Before cascading can occur, all arrays that will be cascaded as new or additional storage must be prepared using this procedure.

1. Specify ports for each array: Connect both sides of the new array (SIM0/SIM1 for J4200/J4400 arrays or SAS A/SAS B for J4500 arrays) directly to a server running a full installation.

The array must not be cascaded to another J4x00 array at this time.

2. Log into the management host by entering the address: <https://host-name:6789>

where *host-name* is the DNS name of the server connected to the array

3. From the Storage System Summary Page, click Register and then register the attached array (following the instructions in the wizard), using the host name or host IP address of the data host in the Registration window.
4. Expand the Array tree for the server until the Access Configuration screen for the first SAS Domain appears.



Caution – Be sure you have selected the appropriate array before going to [Step 5](#). The Reset to Default procedure clears existing zoning configurations.

Typically, new arrays will not have a password set. If you assigned a password for the array's Access Configuration, you will need it to perform [Step 5](#). If the previous password is not known, you can clear it using the methods specified in your J4200, J4400, F5100, or J4500 documentation.

5. For each SAS domain of the array, go to SAS Domains >Administration > Cascade Storage for the selected SAS domain, and click Prepare Storage.

Cascade Storage

Prepare Storage
Synchronize Cascade

First Expander Attached to Host: 500163600004347f

Cascade the storage by performing the above options. Prepare Storage option initializes the storage to get ready to attach it to another storage. Synchroniz synchronizes Access Configurations in the merged SAS domains after cascading the storages. Note that Prepare Storage will remove all Access Configur domain. If cascading is canceled, Reset to Default must be performed to resume Access Configuration on the SAS domain.

Note – The CLI equivalent command is
`sscs modify -p,--prepare-cascade sas-domain <sas-domain-name>` command

6. Unregister all arrays to be cascaded from the array management software:

- a. From the navigation pane, select Storage Systems.

The Storage System Summary page is displayed.

- b. Select the checkbox to the left of the array and click Remove.

Storage System Summary

To manage a Storage System, click on its name below. To register and manage additional Storage Systems available on your network, click on the Register button below.

Storage Systems (1)							
Register... Remove Install Firmware Baseline...							
<input checked="" type="checkbox"/>	Name	Health	Type	Firmware Version	Total Capacity	Available Capacity	Network Address
<input checked="" type="checkbox"/>	J4200-1c	Degraded	J4200	3A53	546.911 GB	N/A	10.9.178.48 (in-band)
Register... Remove Install Firmware Baseline...							

c. Click OK.

7. Disconnect the array from the server, and then disconnect AC power to the array.

Cascading the New Array to the Existing Storage

Prerequisite: If any SAS ports from any attached hosts are not seen, verify that multipathing is disabled on those hosts. In addition, a reboot might be necessary to force an attached host to register its SAS ports with the storage arrays.

1. Disconnect all other attached hosts so your configuration resembles:

- [FIGURE 7-2](#) for J4500 arrays (attach to SAS-A and SAS-B)
- [FIGURE 7-3](#) for J4200/J4400 arrays (attach to SIM0 and SIM1)

2. Connect the new array in cascade fashion to the existing J4x00 array(s).

In [FIGURE 7-2](#) and [FIGURE 7-3](#), Array 1 is either an existing or a new storage array. Array 2 is a new array which is attached to the primary array management server.

Note – This configuration differs from the configuration that will be used during normal operation. This configuration is temporary but required in order to synchronize the settings between the old array(s) and the new array being cascaded.

FIGURE 7-2 Temporary Cabling of J4500 for Initialization of the Cascade

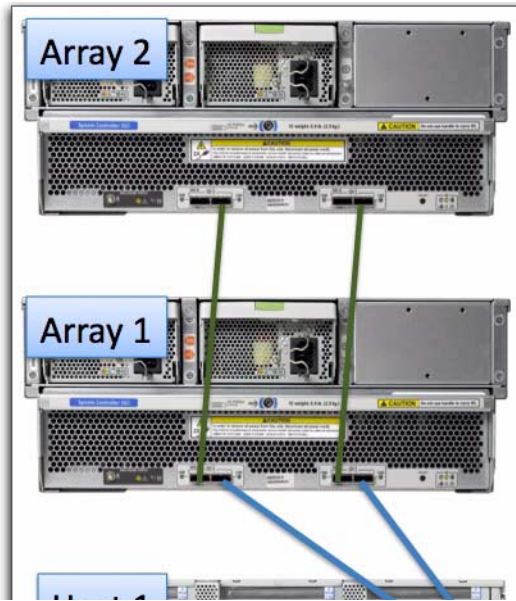
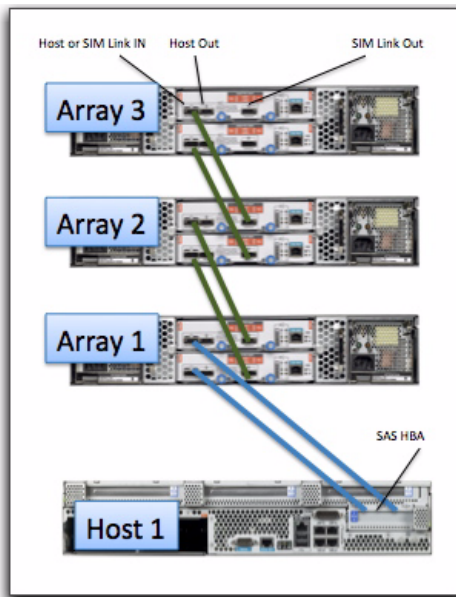


FIGURE 7-3 Temporary Cabling of J4200/J4400 Arrays for Initialization of the Cascade



3. Power on all arrays by reconnecting AC power.

The new array might take a few minutes to be recognized by the server's HBA.

4. From the Storage System Summary page, register the newly cascaded array configuration.

All attached arrays should be found. If they are not, perform a host reboot (i.e., Full reboot reconfigure on Solaris) and attempt the registration again.

5. Synchronize the password for the selected SAS Domain with the current and newly attached arrays.

- a. From the Administration page for the selected SAS domain, select "Change Password in the Array Registration Database."
- b. Enter your desired (or existing) password
- c. Click Save.

Note – If the existing (primary) JBOD had a zoning password set before cascading: After re-discovering the JBOD cascade and before performing Synchronize Cascade, you must update the zoning password in the array database for the aggregated SAS domain with the zoning password of the primary array(s). To do this, select the third option for Zoning Password Management from the SAS Domain Administration page. This step is necessary because a new SAS domain database file is created for the aggregated SAS domain and the new SAS domain database file does not contain the zoning password.

6. Go to SAS Domains > Administration > Cascade Storage for the first SAS domain, and click Synchronize Cascade.

This synchronizes the zoning permission tables and initializes the connections between the arrays.

Note – The CLI equivalent command is:

`sscs modify -y,--synch-cascade sas-domain <sas-domain-name> command`

7. Attach additional hosts and change cabling from the primary array management server (host) as shown in cabling diagrams for your particular array.

When you have completed [Step 7](#), all the arrays in the cascade should be discovered and the access configuration for all domains will be in the "disabled" state.

Note – See [FIGURE 7-4](#) and [FIGURE 7-5](#) for the initial cascading setup for J4500 arrays.

Important Notes

- Access configuration information will be retained for any host connections that do not need to be moved in order to properly cable the cascaded configuration. Any host connections that must be moved to new array ports (or ports on the new array) must have access configuration manually recreated for that SAS port.
- For additional cabling instructions, see the appropriate documentation: *Sun Storage J4500 Array System Overview*, *Sun Storage J4200/J4400 Array Hardware Installation Guide*, or other user documentation for your particular arrays.
- Disk drives should not be used by more than one host path unless multipathing is planned. Drives in an array (especially SATA drives) should not be shared by more than one host unless clustering software is being used.
- For information about clustering J4200/J4400 arrays, search for Sun Cluster 3.2 Release Notes and related information at <http://www.sun.com/documentation>. Sun Storage J4500 and F5100 Flash arrays are not supported in a clustering configuration.

FIGURE 7-4 shows an example of how two hosts attach to two J4500 arrays. Refer to your user documentation for cabling instructions for your particular array.

FIGURE 7-4 Recommended Cascading Configuration for J4500 Array

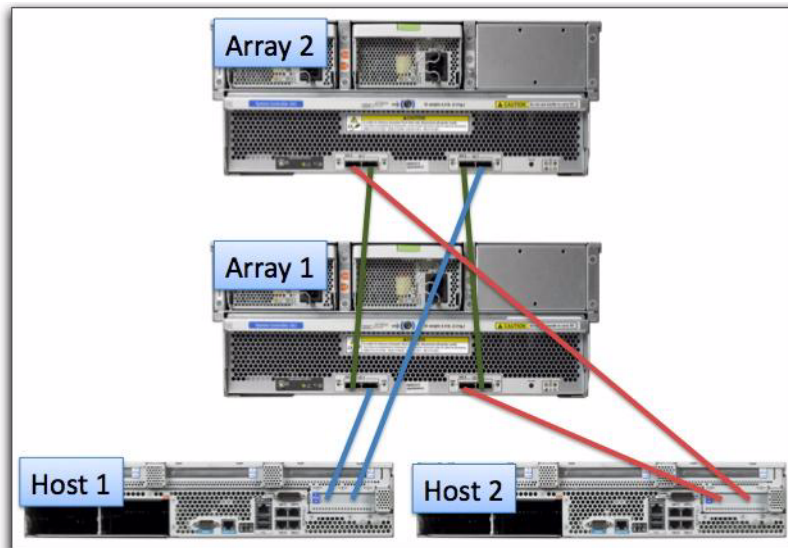
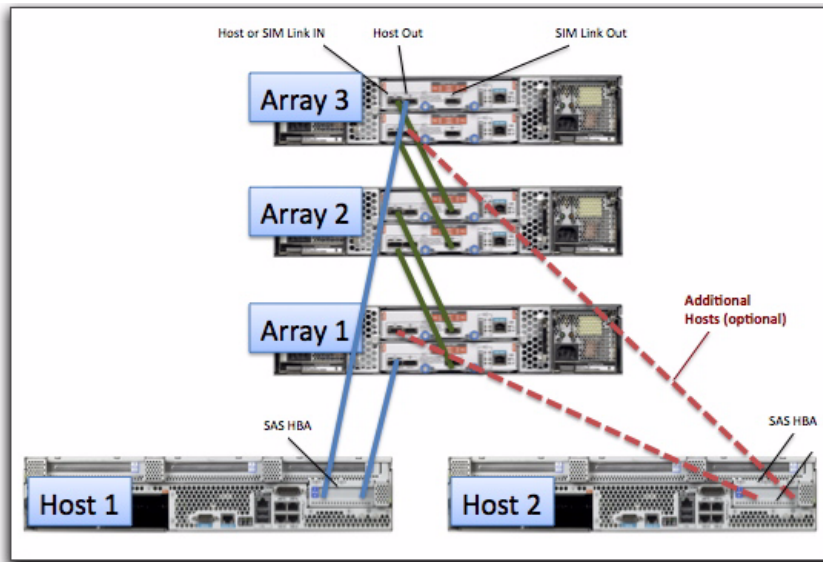


FIGURE 7-5 Recommended Cascading Configuration for J4200/J4400 Array Types



8. From the selected SAS Domain's Access Configuration page, click **Configure**.
At this time, all arrays, domains, and SAS ports from all attached hosts should be seen within the corresponding Access Configuration Pages.
If SAS ports from any attached hosts are not seen, verify that multipathing is disabled on those hosts. In addition, a reboot might be necessary to force an attached host to register their SAS ports with the storage arrays.
9. For connections between the host and array that do not attach to a different port on this array (or another array due to configuration guidelines), implement Access Configuration for those SAS ports.
 - a. From the selected SAS Domain's Access Configuration page, configure the SAS port and storage for the SAS domain.
 - b. If multiple SAS ports are seen, they should also be configured at this time (i.e., SAS port #1 might have disks 1-6 and SAS port #2 might have disks 7-12).
10. Repeat [Step 8](#) and [Step 9](#) to assign targets to the server (host) for all SAS domains found under the entry for the primary management server.
11. Configure the multipathing software for each attached host so that the multipathing drivers control any drives shared by multiple paths.
12. Export Access Configuration information for each SAS port.

Configuring Multiple Host Access for a J4x00 Array

Prerequisite: If you have configured multipathing, disable multipath software until after the access configuration is complete so the arrays will see all SAS ports.

Configuring Hosts for Access Configuration

The first server you will configure is referred to as the “primary array management server” and each additional server you set up for Access Configuration is referred to as “(additional) host.” The server used to configure access configuration can also be the combination of a management station and single proxy server.

1. **Install the full version of the array management software that supports zoning for the J4x00 array on the primary array management server (unless it is already installed).**

2. **Attach all SAS cables from all desired hosts, as indicated in your array user documentation.**

For example, you might attach the first server for the J4x00 array to either the input port on one controller or an input on each side (SAS A/B or SIM 0/1) if multipathing is desired.

3. **Log into Sun Storage Common Array Manager from the primary array management server you configured by opening the browser and entering the following address:**

<https://host-name:6789>

Where *host-name* is the DNS name of the server connected to the array.

4. **From the Storage System Summary page, click Register and follow the instructions in the wizard to register the arrays to the IP address of the first server.**

5. **If all attached SAS ports are not shown in the Access Configuration page, configure and reboot the primary array management and configure your multipathing software if multiple paths are attached at this point.**

If the primary array management does not immediately recognize the array, use the appropriate host commands to scan for storage.

6. **Configure the Access Configuration for each SAS port attached to the storage.**

In the Access Configuration page, the SAS port(s) from the additional host(s) should be visible; however, they may only be represented as unique SAS addresses (no host names) since the proxy has not been discovered yet.

Configuration for the additional host SAS ports should be done at this time by selecting the desired drives for one of the second host's SAS ports, then repeating for each SAS port on the second host.

- a. Expand the array tree for the server until the Access Configuration page for the first SAS Domain is displayed.
- b. Click Access Configuration > Configure to assign targets to each server.
- c. For each SAS port, choose the desired targets (disks or FMods) to which the SAS port should have access.
For multipath HBA initiator pairs, make sure the targets are the same.
- d. Click Add/Modify.

Access Configuration Summary > Configure Access between Ports and Targets

Configure Access between Ports and Targets - 50800200005719bf Save Cancel

Reset to Default Export... Import...

Current Access Configuration State: Disabled

Change Access Configuration State: ☐ Enable ☒ Disable

Port Name
<input type="radio"/> F5100-1900-P2Box(Chassis Exp...
<input type="radio"/> F5100-1900-P2Box(Chassis Exp...
<input type="radio"/> F5100-1900-P2Box(Chassis Exp...
<input type="radio"/> F5100-1900-P2Box(Chassis Exp...

Port Name	Targets
<input type="radio"/> F5100-1900-P2Box(Chassis Expander.02.Port 1]	unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="radio"/> F5100-1900-P2Box(Chassis Expander.02.Port 3]	unknown (508002000057198c,

- e. Verify the Access Configuration setting is set to “Enable” and click Save.
The selected settings will be applied to the SAS Expander devices in the storage.
 - f. Click OK.
7. Repeat [Step 6](#) for each SAS domain.
 8. Power cycle the attached hosts using the appropriate options (i.e., reconfigure-reboot on Solaris) which will perform a full re-scan of the attached storage.

SAS Access Configuration Summary

The recommended configuration sequence is to start by connecting one SAS port to a management host. Then configure SAS Access Configuration for this port, and connect the remaining hosts per your plan.

Note – If multiple SAS ports are connected to an array consisting of any SATA based disk drives during zoning configuration, the array will remember the SAS port that last accessed each SATA disk and will not allow another SAS port to access any SATA drives until the array is power cycled.

TABLE 7-2 provides a summary of tasks required to prepare for and configure SAS access configuration.

TABLE 7-2 SAS Access Configuration Steps

Step	Task	For More Information / Notes
Planning Access Configuration		
1.	Determine if your SAS storage will consist of one array or multiple arrays cascaded together.	See “Planning for SAS Access Configuration” on page 83
2.	Determine how many SAS domains you want on your storage system. Note: To form larger domains you can cable SAS expanders together.	See “Planning for SAS Access Configuration” on page 83.
3.	Note the available disks or FMods to be target devices.	See “SAS Access Configuration Planning Worksheets” on page 155
4.	Note which initiators to cable to which expander ports.	
5.	Decide how you want to assign storage: <ul style="list-style-type: none">• Use a template and SAS ports are automatically mapped to targets• Manually map SAS ports to targets• Group storage into groups of shared storage	
Software Installation and Initial Configuration		
6.	Install the array management software.	“Installing the Typical Full Management Software” on page 7
7.	Register the array.	“Registering Arrays” on page 33
Configuring SAS Access		
8.	View discovered SAS domains.	“Viewing SAS Domains and Details” on page 84
9.	Change the SAS domain name.	“Naming a SAS Domain” on page 85

TABLE 7-2 SAS Access Configuration Steps (*Continued*)

Step	Task	For More Information / Notes
10.	To manually configure access, select the SAS port and one or more targets.	“Manually Configuring SAS Port to Target Access” on page 85
11.	To use a template to configure access, select import and complete the wizard.	“Importing Access Configuration” on page 87
12.	Attach remaining SAS ports to the hosts.	

Configuring SAS Access Configuration

Using Access Configuration features, you can assign each host its own storage resources, optimizing efficiency through segregation and topology control. Access configuration is accomplished on a per host SAS port, per hard-disk level.

Important Notes

- A best practice is to configure one server at a time.
- Access Configuration features require a supported LSI-based HBA (SG-XPCIE8SAS-E-Z or SG-PCIE8SAS-EB-Z) with the minimum required firmware installed in the array management or data host, directly connected to the J4x00 array. See [“System Requirements for Access Configuration” on page 70](#) for more information.

Planning for SAS Access Configuration

Use the planning worksheets in [Appendix B](#) as you gather data for your configuration.

- 1. Determine if your SAS storage will consist of one array or multiple arrays cascaded together.**
- 2. Determine how many SAS domains you want on your storage system. If you want to form larger domains, cable SAS expanders together.**
 - Each J4200/J4400 array has its expanders cabled together which form one domain.
 - The J4500 has two internal domains.
 - The F5100 Flash Array has a separate domain for each expander.

3. Note the available disks or FMods to be target devices.
4. Decide how to assign storage:
 - a. Select a template to automatically assign SAS ports to targets.
 - b. Manually map SAS ports to targets and determine which SAS ports will map to which targets.
 - c. If you want to group storage devices into target groups of shared storage, decide which SAS ports to link to which target groups.
5. After you complete Access Configuration for one host, connect remaining SAS ports to hosts per your plan.

Registering the Array

Using the Register Array wizard, you can choose to have the software auto-discover the array, or you can choose to manually register an array. The array management software discovers the array on the subnet through a proxy agent running on a data host.

1. **From the Storage System Summary page, click Register.**

The management software launches the Register Array wizard.

2. **Follow the instructions in the wizard.**

After the array is registered, the SAS Domain Summary page displays the new array.

Viewing SAS Domains and Details

1. **From the left navigation pane, select the desired SAS Domains page located under the Host or Array that you want to configure.**

The SAS Domain Summary page displays, showing the discovered domains.

2. **Click a domain name in the SAS Domain Summary page.**

The SAS Domain Details page is displayed.

3. **Expand a domain name in the navigation pane.**

The Access Configuration and Administration menu items are displayed.

4. Click one of the following links:

Link	If you want to
Access Configuration	Set up access between SAS ports and specified targets (disks or FMods). You can configure access manually or import a predefined template.
Administration	Change the name of the selected domain, change the access configuration state for the selected domain, or manage the access configuration password.

Naming a SAS Domain

If you want to change a SAS domain's default name to a name that you can easily identify, do the following:

1. Select the SAS domain name to open the SAS Domain Details page.

From the SAS Domain Details page you can change the domain name. You can also view the:

- SAS domain ID
- Number of expanders associated with the SAS domain
- Number of initiators and associated SAS address
- Number of disks and details of each disk

2. Double-click the Name field and enter a unique, meaningful name for this SAS domain.

3. Click Save.

Manually Configuring SAS Port to Target Access



Caution – This step assumes you are configuring a new array. If data exists on the array, perform a full back up as a precautionary measure.

1. From the left navigation pane, click Access Configuration for the SAS domain you want to configure.

The Access Configuration Summary displays showing any existing access configurations.

Access Configuration Summary for SAS Domain 50800200005719bf

Access Configurations (4)		
<input type="button" value="Configure..."/> <input type="button" value="Reset to Default"/> <input type="button" value="Enable"/> <input type="button" value="Disable"/>		
Port Name	Connected To	Disks
F5100-1900-P2Box[Chassis.Expander.02.Port 0]	camtest17	unknown (508002000057198c, 5080020000571990, 5080020000571991)
F5100-1900-P2Box[Chassis.Expander.02.Port 1]		unknown (508002000057198c, 5080020000571990, 5080020000571991)
F5100-1900-P2Box[Chassis.Expander.02.Port 2]		unknown (508002000057198c, 5080020000571990, 5080020000571991)
F5100-1900-P2Box[Chassis.Expander.02.Port 3]		unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="button" value="Configure..."/> <input type="button" value="Reset to Default"/> <input type="button" value="Enable"/> <input type="button" value="Disable"/>		

2. Click the Configure button to configure access between SAS ports and targets.

Configure Access between Ports and Targets - 50800200005719bf

Current Access Configuration State: Disabled

Change Access Configuration State: ☐ Enable ☒ Disable

Ports (4)

Port Name
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 0]
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 1]
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 2]
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 3]

Disks (3)

Name	Storage
<input type="checkbox"/> 508002000057198c	-
<input type="checkbox"/> 5080020000571991	-
<input type="checkbox"/> 5080020000571990	-

Access Configuration (4)

Port Name	Targets
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 1]	unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 3]	unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 2]	unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 0]	unknown (508002000057198c, 5080020000571990, 5080020000571991)

3. Select the SAS port you want to configure.
4. Select the targets you want the selected SAS port to access.
5. Click Add/Modify.

The selected SAS port and target configuration is displayed.

6. To save this configuration, click Save.

The array management software saves the configuration to allow access control between the specified SAS ports and targets.

7. Click Export to save the configuration to a template (see [“Creating a SAS Access Configuration Template”](#) on page 88).

Importing Access Configuration

You can use the wizard to apply a predefined access configuration template.

1. From the left navigation pane, click Access Configuration for the SAS domain you want to configure.

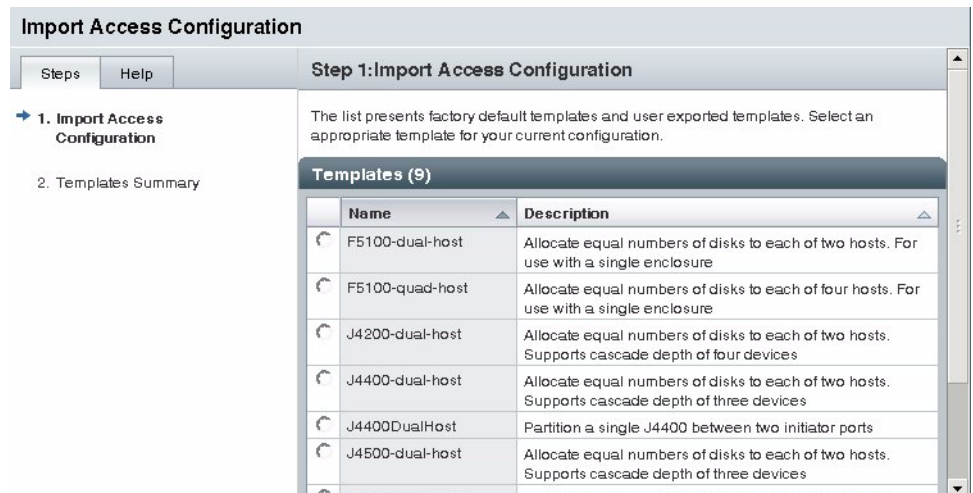
The Access Configuration Summary page displays showing any existing access configurations.

2. Click Configure.

The Configure Access Between Ports and Targets page is displayed.

3. Click Import.

The Import Access Configuration wizard is displayed.



4. Select the template that matches your configuration needs.

The templates represent some common configurations. For example, Simple Zone Split will evenly divide all available targets across all SAS ports. You can also create a custom configuration and Export to a template (see [“Creating a SAS Access Configuration Template”](#) on page 88).

5. If you select a template that requires more information, the wizard displays a page similar to the following. Select the appropriate targets you want to configure from the drop down menu and click Next.

The screenshot shows the 'Import Access Configuration' wizard at Step 1.1: Select configuration candidates. The left sidebar contains a list of steps: '1. Import Access Configuration' (selected), '1.1 Import Access Configuration', and '2. Templates Summary'. The main content area has a header 'Step 1.1: Select configuration candidates' and a sub-header 'Selected template has null, select appropriate candidate from the drop down menu so that the template can be applied appropriately.' Below this, there is a dropdown menu with 'F5100' selected and 'j4500-1-top-dbl-2' chosen from the list. A table below shows the selected configuration:

Name	Description
F5100	- A F5100 Array. This array has Host connections.

6. Review the selected configuration, and select one of the following:

- Click Finish to save the configuration
- Click Edit imported Access Configuration, to make additional modifications, and click Finish.

The screenshot shows the 'Import Access Configuration' wizard at Step 2: Templates -Review Configuration. The left sidebar contains a list of steps: '1. Import Access Configuration', '1.1 Import Access Configuration', and '2. Templates Summary' (selected). The main content area has a header 'Step 2: Templates -Review Configuration' and a sub-header 'Review and confirm your selections. If you wish to save this configuration select Finish button. If you wish to make further modifications to the configuration select Edit button.' Below this, there are fields for 'Template Name:' (F5100-dual-host), 'Array Name:' (j4500-1-top-dbl-2), and 'Array Type:'. There is also a 'Configuration:' section with a checkbox for 'Edit imported Access Configuration' which is currently unchecked.

7. If you select Edit imported Access Configuration, you return to the Configure Access Between Ports and Targets page. Make any additional modifications to the template and click Save.

Creating a SAS Access Configuration Template

The Export function enables you to create a custom configuration and save it as a template.

1. From the left navigation pane, click **Access Configuration** for the SAS domain you want to configure.

The Access Configuration Summary displays any existing access configurations.

2. Click **Configure**.

The Configure Access Between Ports and Targets page is displayed.

3. Select the SAS port and targets this initiator can access (see [“Manually Configuring SAS Port to Target Access”](#) on page 85 for details).

The selected SAS port and targets configuration is displayed, as shown in the following example:

Access Configuration Summary > Configure Access between Ports and Targets

Configure Access between Ports and Targets - 50800200005719bf Save Cancel

Reset to Default Export... Import...

Current Access Configuration State: Disabled

Change Access Configuration State: ☐ Enable ☒ Disable

Ports (4)

Port Name
<input type="radio"/> F5100-1900-P2Box[Chassis.Exp...
<input type="radio"/> F5100-1900-P2Box[Chassis.Exp...
<input type="radio"/> F5100-1900-P2Box[Chassis.Exp...
<input type="radio"/> F5100-1900-P2Box[Chassis.Exp...

Add/ Modify >>

Disks (3)

<input checked="" type="checkbox"/> <input type="checkbox"/> Name	Storage

<< Remove

Access Configuration (4)

Port Name	Targets
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 1]	unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 3]	unknown (508002000057198c, 5080020000571990, 5080020000571991)
<input type="radio"/> F5100-1900-P2Box[Chassis.Expander.02.Port 2]	unknown (508002000057198c,

4. Click **Export**.

The Export SAS Domain page is displayed.

5. Enter a name, and optional description, for the new template and click **Save**.

The template is now available as one of the templates in the Import Access Configuration wizard.

Managing the Access Configuration Password

You can set an access configuration password in Sun Storage Common Array Manager to prevent unauthorized changes to the SAS domain. The access configuration password is stored both in the array management software and on each JBOD SAS expander.

1. **To manage the access configuration password, click SAS Domains > *domain_ID* > Administration for the domain you want to manage.**
2. **Select one of the following options:**
 - **Clear the Password in Array Registration Database**—Use this option to set the password in the Array Registration Database to the factory default. If the password in the Array SAS Expander is not also set to the default, selecting this option will prevent modification operations on the SAS Domain.
 - **Change Password in Array Registration Database**—Use this option to change the password in the Array SAS Expander and in the Array Registration Database. The password can be a maximum of 32 alphanumeric characters.
 - **Update Password in Array Registration Database**—Use this option to update the password in the Array Registration Database if that password does not match the password in the Array SAS Expander. If the values do not match, you will not be able to perform modification operations on the SAS Domain.

For more information about access configuration passwords, see Online Help.

Changing the SAS Access Configuration State

Change the domain-wide access configuration state by selecting one of the following options:

Click...	To perform this task
Reset to Default	Remove SAS access configurations from all SAS ports. This will allow all SAS ports to have access to all targets.
Enable	Re-enable the access configuration state.
Disable	Temporarily disable SAS access configuration, but leave all configurations intact.

See the Online Help for more information.

Troubleshooting Access Configuration

This section includes possible issues you might encounter when using the Access Configuration (SAS Zoning) features.

Important Notes

- Multipath connections to a J4x00 array using separate SAS fabrics will not cause SATA affiliation issues because each host uses a separate path to the disks.



Caution – In a failover (multipath or clustered) configuration, granting multiple hosts access to the same disks through different controllers can lead to data loss. Be careful to properly assign the Access Configuration relationships between the hosts and storage while considering multipathing software to be used.

- Sun Storage Common Array Manager saves the current SAS domain configuration allowing you to revert back to functional settings in the event of misconfiguration, or when you replace an array component, such as a SIM card or controller module, containing Access Configuration (zoning) information. You can restore Access configuration information using templates.

- If you detect a performance problem after modifying access configuration on a Solaris host, run the following command:

```
devfsadm -Cv
```

- Problems with PHY port data could be caused by incorrect cabling for cascaded J4400 arrays. When cabling J4400 arrays, use the Host or SIM Link In port.

About SATA Affiliation Conflicts

The potential for SATA affiliation conflicts exists in J4500 and F5100 arrays, or in J4200 or J4400 arrays when any SATA drives are installed. Conflict can occur when more than one SAS port tries to access the drive via the same SIM or Controller path (i.e., more than one host attached to SIM0/1 on a J4200/J4400 array; more than one host attached to a F5100 array domain; or more than one host attached to SAS-A/B on a J4500 array).

Possible symptoms of SATA affiliation conflicts are:

- operating system hangs
- zoning operations take longer than 10 minutes to complete
- disk utilities like “format” will not return device lists in a timely manner

When more than one instance of Sun Storage Common Array Manager probes a SATA drive from a single SAS domain, SATA affiliation issues occur which lead to possible symptoms as stated above. For this reason, only a single array management host is connected to a SAS domain unless drives have already been zoned to prevent SATA affiliation issues. After the access configuration (zoning) is completed from a primary array management server (or a primary array management server with only one active proxy agent), the array management software can be installed or enabled on additional proxy hosts as desired.

Clearing SATA Affiliation Conflicts

1. **Un-register all CAM proxy agents on any hosts other than the one being used to configure the Access Configuration.**

This can also be accomplished by un-installing the CAM proxy agent or by not installing the CAM proxy agent until Access Configuration is complete.

Note – A single CAM proxy can be used if the primary array management host is not directly attached to the storage via a SAS connection.

2. Do not run commands on hosts other than the one used to configure the Access Configuration (i.e., `format`, `cfgadm`, etc.) which might attempt to access the attached storage.

RAID Configuration Worksheets

Use these worksheets to help you collect the information required to configure the RAID arrays and data hosts you are managing. Two worksheets are provided:

- [“Configuration Worksheet” on page 96](#)
- [“Data Host Information” on page 97](#)

TABLE A-2 lists the information you need to configure the array.

TABLE A-1 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:	
Notes:	

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

TABLE A-2 Data Host Information

Host name:	
Vendor:	
Model:	
Operating system:	
Patch/Service pack:	
Number of HBAs:	
HBA World Wide Name (WWN):	
HBA model:	
HBA driver:	
Notes:	

SAS Access Configuration Planning Worksheets

Use the worksheets in this section to help you organize data for your configuration.

- [“Planning Worksheet for J4200/J4400 Arrays” on page 100](#)
- [“Planning Worksheet for J4500 Arrays” on page 101](#)
- [“Planning Worksheet for F5100 Flash Arrays” on page 102](#)
- [“J4200 Array Disk Drive to HBA Mapping Worksheet” on page 103](#)
- [“J4400 Array Disk Drive to HBA Mapping Worksheet” on page 104](#)
- [“J4500 Array Disk Drive to HBA Mapping Worksheet” on page 105](#)
- [“F5100 Flash Array FMod to HBA Mapping Worksheet” on page 106](#)

Planning Worksheet for J4200/J4400 Arrays



Hosts

Host Type / Host OS Version	<input type="checkbox"/> Solaris OS <input type="checkbox"/> OpenSolaris OS <input type="checkbox"/> Windows <input type="checkbox"/> Linux	HBA	<input type="checkbox"/> SG-XPCIE8SAS-E-Z <input type="checkbox"/> SG-XPCIE8SAS-EB-Z
Multipathing enabled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Access Configuration (zoning) enabled?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Devices for each zone	_____	Logical device name	_____
RAID level	_____	Size	_____
Stripe size (KB)	_____	Physical devices	_____

Sun Storage Common Array Manager Software

CAM version	_____		_____
Master CAM server	_____	CAM proxy host(s)	_____
JBOD name	_____	JBOD type	_____
JBOD firmware	_____		_____
SAS domain name	_____	Access Configuration password	_____

Array

Model	_____	Number of Expanders	_____
Number of Disks	_____	Disk Capacity	_____

Use “J4200 Array Disk Drive to HBA Mapping Worksheet” on page 103 to plan initiator to disk mappings.

Planning Worksheet for J4500 Arrays



Hosts

Host Type /	<input type="checkbox"/> Solaris OS	HBA	<input type="checkbox"/> SG-XPCIE8SAS-E-Z
Host OS Version	<input type="checkbox"/> OpenSolaris OS		<input type="checkbox"/> SG-XPCIE8SAS-EB-Z
	<input type="checkbox"/> Windows		
	<input type="checkbox"/> Linux		
Multipathing enabled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Access Configuration (zoning) enabled?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Devices for each zone	_____	Logical device name	_____
RAID level	_____	Size	_____
Stripe size (KB)	_____	Physical devices	_____

Sun Storage Common Array Manager Software

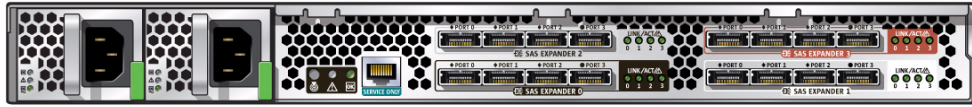
CAM version	_____		_____
Master CAM server	_____	CAM proxy host(s)	_____
JBOD name	_____	JBOD type	_____
JBOD firmware	_____		_____
SAS domain name	_____	Access Configuration password	_____

Array

Model	_____	Number of Expanders	_____
Number of Disks	_____	Disk Capacity	_____

Use the “[J4500 Array Disk Drive to HBA Mapping Worksheet](#)” on page 105 to plan initiator to disk mappings.

Planning Worksheet for F5100 Flash Arrays



Hosts

Host Type /	<input type="checkbox"/> Solaris OS	HBA	<input type="checkbox"/> SG-XPCIE8SAS-E-Z
Host OS Version	<input type="checkbox"/> OpenSolaris OS		<input type="checkbox"/> SG-XPCIE8SAS-EB-Z
	<input type="checkbox"/> Windows		
	<input type="checkbox"/> Linux		
Multipathing enabled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Access Configuration (zoning) enabled?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Devices for each zone	_____	Logical device name	_____
RAID level	_____	Size	_____
Stripe size (KB)	_____	Physical devices	_____

Sun Storage Common Array Manager Software

CAM version	_____		_____
Master CAM server	_____	CAM proxy host(s)	_____
JBOD name	_____	JBOD type	_____
JBOD firmware	_____		_____
SAS domain name	_____	Access Configuration password	_____

Array

Model	_____	Number of Expanders	_____
Number of Disks	_____	Disk Capacity	_____

J4200 Array Disk Drive to HBA Mapping Worksheet

The J4200 array scales from two to 12 hard disk drives per tray.

Host	Disk
	Disk.00
	Disk.01
	Disk.02
	Disk.03
	Disk.04
	Disk.05
	Disk.06
	Disk.07
	Disk.08
	Disk.09
	Disk.10
	Disk.11

Host	Disk
	Disk.12
	Disk.13
	Disk.14
	Disk.15
	Disk.16
	Disk.17
	Disk.18
	Disk.19
	Disk.20
	Disk.21
	Disk.22
	Disk.23

J4400 Array Disk Drive to HBA Mapping Worksheet

The J4400 array scales from 12 to 24 hard disk drives per tray.

Host	Disk	Host	Disk
	Disk.00		Disk.12
	Disk.01		Disk.13
	Disk.02		Disk.14
	Disk.03		Disk.15
	Disk.04		Disk.16
	Disk.05		Disk.17
	Disk.06		Disk.18
	Disk.07		Disk.19
	Disk.08		Disk.20
	Disk.09		Disk.21
	Disk.10		Disk.22
	Disk.11		Disk.23

Host	Disk	Host	Disk
	Disk.24		Disk.36
	Disk.25		Disk.37
	Disk.26		Disk.38
	Disk.27		Disk.39
	Disk.28		Disk.40
	Disk.29		Disk.41
	Disk.30		Disk.42
	Disk.31		Disk.43
	Disk.32		Disk.44
	Disk.33		Disk.45
	Disk.34		Disk.46
	Disk.35		Disk.47

J4500 Array Disk Drive to HBA Mapping Worksheet

The J4500 array is fully populated at 48 hard disk drives per tray.

Host	Disk	Host	Disk
	Disk.00		Disk.24
	Disk.01		Disk.25
	Disk.02		Disk.26
	Disk.03		Disk.27
	Disk.04		Disk.28
	Disk.05		Disk.29
	Disk.06		Disk.30
	Disk.07		Disk.31
	Disk.08		Disk.32
	Disk.09		Disk.33
	Disk.10		Disk.34
	Disk.11		Disk.35
	Disk.12		Disk.36
	Disk.13		Disk.37
	Disk.14		Disk.38
	Disk.15		Disk.39
	Disk.16		Disk.40
	Disk.17		Disk.41
	Disk.18		Disk.42
	Disk.19		Disk.43
	Disk.20		Disk.44
	Disk.21		Disk.45
	Disk.22		Disk.46
	Disk.23		Disk.47

F5100 Flash Array FMod to HBA Mapping Worksheet

The F5100 flash array has a total of 80 FMod disks, organized in four groups of 20.

TABLE B-1 Disks 00 through 19 for Expander 0 and Expander 1

Host	Disk	Host	Disk
	EXP0FMod.00		EXP1FMod.00
	EXP0FMod.01		EXP1FMod.01
	EXP0FMod.02		EXP1FMod.02
	EXP0FMod.03		EXP1FMod.03
	EXP0FMod.04		EXP1FMod.04
	EXP0FMod.05		EXP1FMod.05
	EXP0FMod.06		EXP1FMod.06
	EXP0FMod.07		EXP1FMod.07
	EXP0FMod.08		EXP1FMod.08
	EXP0FMod.09		EXP1FMod.09
	EXP0FMod.10		EXP1FMod.10
	EXP0FMod.11		EXP1FMod.11
	EXP0FMod.12		EXP1FMod.12
	EXP0FMod.13		EXP1FMod.13
	EXP0FMod.14		EXP1FMod.14
	EXP0FMod.15		EXP1FMod.15
	EXP0FMod.16		EXP1FMod.16
	EXP0FMod.17		EXP1FMod.17
	EXP0FMod.18		EXP1FMod.18
	EXP0FMod.19		EXP1FMod.19

TABLE B-2 Disks 00 through 19 for Expander 2 and Expander 3

Host	Disk	Host	Disk
	EXP2FMod.00		EXP3FMod.00
	EXP2FMod.01		EXP3FMod.01
	EXP2FMod.02		EXP3FMod.02
	EXP2FMod.03		EXP3FMod.03
	EXP2FMod.04		EXP3FMod.04
	EXP2FMod.05		EXP3FMod.05
	EXP2FMod.06		EXP3FMod.06
	EXP2FMod.07		EXP3FMod.07
	EXP2FMod.08		EXP3FMod.08
	EXP2FMod.09		EXP3FMod.09
	EXP2FMod.10		EXP3FMod.10
	EXP2FMod.11		EXP3FMod.11
	EXP2FMod.12		EXP3FMod.12
	EXP2FMod.13		EXP3FMod.13
	EXP2FMod.14		EXP3FMod.14
	EXP2FMod.15		EXP3FMod.15
	EXP2FMod.16		EXP3FMod.16
	EXP2FMod.17		EXP3FMod.17
	EXP2FMod.18		EXP3FMod.18
	EXP2FMod.19		EXP3FMod.19

Configuring the IP Address of the RAID Array Controllers

This appendix describes how to use Sun Storage Common Array Manager to substitute a static IP address for the default internal IP address. It contains the following sections:

- [“Configuring Static IP Addresses” on page 109](#)
- [“Establishing Temporary IP Connectivity” on page 111](#)
- [“Assigning IP Addresses to the Controllers” on page 114](#)
- [“Restoring the Management Host IP Configuration” on page 116](#)

In order for there to be an out-of-band Ethernet connection between the local management host and the array controllers, the management host and the array controllers must have valid IP addresses. There are three methods for adding the IP address:

- Dynamic Host Configuration Protocol (DHCP), for assigning IP addresses dynamically
- The serial port for assigning static IP addresses
- The Common Array Manager software for assigning static IP addresses

The first two methods are documented in your array installation guide.

Configuring Static IP Addresses

Use static IP addressing to assign a specific IP address to Ethernet port 1 of each array controller. Static IP addresses remain in effect until you modify or remove them.

Note – Some array models, such as the StorageTek 2500 Series, have only one Ethernet port on the controllers. In that case “Ethernet Port 1” applies to that single port.

Sun array controllers are shipped with the following default IP addresses:

- Ethernet port 1 of Controller A is assigned IP address 192.168.128.101
- Ethernet port 1 of Controller B is assigned IP address 192.168.128.102

The controller IP address configuration tasks are listed in [TABLE C-1](#).

TABLE C-1 IP Addressing Configuration Tasks

Step	Task	Section
1	Establish temporary IP connectivity between the management host and the array controllers	“Establishing Temporary IP Connectivity” on page 111
2	Assign static IP addresses to the controllers	“Assigning IP Addresses to the Controllers” on page 114
3	Restore the original host IP configuration	“Restoring the Management Host IP Configuration” on page 116

IPv6 Support

No IPv6 address is configured by default on IPv6-capable arrays. To configure IPv6, access the array via IPv4 or via the array’s serial console.

When enabled, IPv6 can be configured in one of two modes using the Physical Devices > Controllers page:

- **Obtain Configuration Automatically**

Select this for the array to obtain a stateless, auto-configured address.

- **Specify Network Configuration**

Select this if you have a specific, pre-assigned IPv6 address you want assigned to the array.

Establishing Temporary IP Connectivity

In order to assign IP addresses to the controllers, you must establish temporary IP connectivity between the management host and Ethernet port 1 of each controller.

There are two methods by which to do that, depending on the method by which the management host and controller's Ethernet ports are physically connected to the Ethernet, and the availability of an Ethernet interface on the management host.

The two methods of establishing temporary IP connectivity are as follows:

- Assigning a temporary IP address to a management host Ethernet interface in the same subnet as the default IP addresses of the controller's Ethernet ports (for example, IP address 192.168.128.100).

Use this method if the following conditions are true:

- You have an available Ethernet interface on the management host or you can temporarily reassign the IP address of an Ethernet interface on the management host.
- Ethernet port 1 of each controller can be directly connected to an Ethernet interface on the management host by an Ethernet crossover cable, or Ethernet port 1 of each controller and an Ethernet interface of the management host are connected to the same Ethernet hub.

For information on changing the IP address of an Ethernet interface on the management host, see [“Configuring the IP Address of the Management Host” on page 112](#).

- Creating a temporary virtual subnet on the management host.

Use this method if there is not an available Ethernet interface on the management host or if Ethernet port 1 of each controller is connected to a subnet on the local area network (LAN) that is not the subnet of the management host.

For information on creating a temporary virtual subnet on the management host, see [“Creating a Temporary Virtual Subnet on a Management Host” on page 113](#).

Configuring the IP Address of the Management Host

To configure IP addressing for the array, you may have to temporarily change the IP address of the management host.

The method you use to configure the IP address on the host depends on the platform you are using. Follow the instructions in one of the following sections, depending on your platform:

- [“Configuring the IP Address on the Management Host for the Solaris or Linux Operating System” on page 112](#)
- [“Configuring the IP Address for Windows 2000 Advanced Server” on page 112](#)
- [“Configuring the IP Address for Windows Server 2003” on page 113](#)

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

For information about changing the IP address on a Solaris or Linux 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, and click Add.
The new IP address is added to the IP addresses listing.
6. Open a command window and try to ping the IP addresses of the controller's Ethernet ports, as shown in the following example:

```
> ping 192.188.128.101
```

If the ping is unsuccessful, try rebooting the server and entering the ping command again.

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.

Creating a Temporary Virtual Subnet on a Management Host

To configure static IP addressing for an array, you might have to establish a virtual subnet in order to temporarily access the array from the management host. You should delete the virtual subnet after you configure static IP addressing for the array (see [“Deleting a Temporary Virtual Subnet on a Management Host” on page 116](#)).

Note – The following procedure applies to Solaris or Linux management hosts only. On Linux hosts, the syntax of the commands shown may vary slightly, depending on the Linux version used.

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 ffffffff broadcast 10.4.30.255
```

2. `ether 0:3:ba:32:4d:f1` As root, configure a temporary virtual subnet by typing 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. Type the following command to view the changes and thereby verify that you have established IP connectivity between the management host and the array controllers:

```
ipconfig -a
```

Assigning IP Addresses to the Controllers

After you have established temporary IP connectivity between the controller's Ethernet ports and the management host, you can use the Common Array Manager software to assign a static IP address to Ethernet port 1 of each controller.

Assigning an IP Address to Each Ethernet Port

1. Access the Common Array Manager software:

- a. Open a web browser and enter the IP address of the management host:

https://management-host:6789

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

The login page is displayed.

- b. Log in as root:

Login: **root**

Password: *root-password*

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

- c. From the Oracle Java Web Console page, click Sun Storage Common Array Manager.

The Storage System Summary page is displayed.

2. Temporarily register the array with the default Ethernet port IP addresses.
See [“Registering Arrays” on page 33](#) for instructions.

3. Assign a static IP address to Ethernet port 1 on each controller.

- a. In the navigation pane, expand Storage Systems and choose the array to which you want to assign an IP address.

The Administration page is displayed. (This procedure assumes that you previously set the array general information.)

- b. Enter the array name and click OK.

- c. In the navigation pane, under the array you want to work with, expand Physical Devices and choose Controllers.

The Controller Summary page is displayed.

- d. First for Controller A's (Controller 1) Ethernet port 1 and then for Controller B's (Controller 2) Ethernet port 1, select Specify Network Configuration and then enter the IP address, gateway address, and netmask. Click OK.

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

4. Delete the array to remove the default IP addresses:

- a. Log out of the console and then log in again.

The Storage System Summary page is displayed.

- b. On the Storage System Summary page, click the check box next to the original array with the original IP address, and click the Remove button to remove the old IP address.

5. Reregister the array with the static IP addresses.

To register the array, see [“Registering Arrays” on page 33](#) for instructions.

6. If you are configuring multiple arrays, use the following Solaris OS commands to clear the Address Resolution Protocol (ARP) table entry for each controller:

```
arp -d ip-address-controller-A
```

```
arp -d ip-address-controller-B
```

Restoring the Management Host IP Configuration

If you changed the IP address of the management host, once you have configured static IP addresses for the controllers you must restore the original IP address of the management host.

To restore the original IP address of an Ethernet interface on the management host, see [“Configuring the IP Address of the Management Host” on page 112](#).

If you established a virtual subnet to assign IP addresses, you should delete it. To delete the temporary virtual subnet on the management host, see [“Deleting a Temporary Virtual Subnet on a Management Host” on page 116](#).

Deleting a Temporary Virtual Subnet on a Management Host

1. Enter the following commands as root:

```
# ifconfig ethernet-port:1 down  
# ifconfig ethernet-port:1 unplumb
```

2. View the changes:

```
# ifconfig -a
```

Configuring In-Band Management

Setting up the array for in-band management is outlined in the following sections:

- [“About In-Band Management” on page 117](#)
- [“Installing In-Band Management” on page 121](#)
- [“Copying Configuration Files and In-Band Management” on page 122](#)

About In-Band Management

By default, the management host communicates with the arrays out-of-band over Ethernet. You can also configure in-band management for communication to travel over the data path (using Fibre Channel (FC), etc.) between a data host and the array.

In-band management uses a proxy agent running on a data host to communicate with a managed array. The Common Array Manager software discovers the proxy agents on the subnet and then queries arrays registered with the software. The proxy agent receives the queries over Ethernet and passes them on to the array over the data path between the data host and the array.

New arrays can be registered with the software using the registration wizard. The wizard can auto-discover the array via the proxies or you can specify the IP address of the proxy agent. Once an array is registered, management of the array appears the same as does management with an out-of-band connection. Volume creation, deletion, and mapping are accomplished in the same manner.

In-band management uses a special access LUN mapping to facilitate communications between the management software and the storage array. You can view all mappings on the array on the Mapping Summary Page in the Common Array Manager software. For in-band communication, an access volume is mapped

to LUN 31. This special access LUN (also called the UTM LUN) is mapped to the default domain. (All arrays have a default domain for volumes not registered with a storage domain.)

With new arrays, the mapping of the access LUN to the default domain is installed at the factory. If you lose this mapping, before installing in-band, use out-of-band management and the Common Array Manager software to re-map the access LUN to the default domain. See the Online Help in the software for more information about mapping.

This release supports Solaris Sparc and x86, Windows, and Linux for in-band management. For Red Hat Enterprise Linux AS, Release 5.1 or higher is required. Check the *Sun Storage Common Array Manager Release Notes* for the latest list of packages to install.

In-Band Management Operational Information and Issues

About the RAID Array Proxy Agent

The in-band management proxy agent is a package that is added to a host (or group of hosts) with in-band connectivity via Fibre Channel to the storage array. An external management station can then talk to this proxy host via an out-of-band connection and the management commands are then relayed to the storage device via the in-band path. This is a transparent proxy agent which simply converts the RPC request packets to UTM SCSI- specific messages. The API Sun Storage Common Array Manager uses to manage the arrays is identical whether the array is managed via the in-band or out-of-band path.

The proxy agent packages for each OS are located in the “Add-Ons” directory. Refer to the README file for installation instructions for your particular OS.

Known RAID Array Proxy Agent Limitations

A proxy agent restart is required after disruptive changes to the storage configuration. This does not apply to changes in volumes exposed from a single array but it does apply if storage arrays are re-cabled differently or if the storage array configuration has changed (i.e. adding new storage arrays to the configuration).

The in-band proxy agents will start when the host boots, but they will terminate if storage is not immediately seen. A restart of the agent (instructions below) will force a re-scan for storage arrays and, if any are found, the agent will remain running.

Solaris: Checking the UTM LUNs and Start/Stop of the Proxy Agent

Download Sun Storage Common Array Manager in-band proxy agents for Solaris from here:

http://www.oracle.com/technology/software/sun_az_index.html

To verify the host sees the arrays management (UTM) LUN, do the following:

1. Start / Stop the Agent (Solaris)

```
/opt/SMgr/agent/SMagent start
```

If the agent is already running, this will stop and then restart it.

2. Check the status of the agent

```
# ps -ef | grep SMagent | grep -v grep
root 5144      1    0 11:58:24 pts/3          0:01
/opt/SMgr/agent/jre/bin/java -classpath
/opt/SMgr/agent/SMagent.jar devmgr.launch
```

Linux: Checking The UTM LUNs and Start/Stop of the Proxy Agent

Note – The SMagent requires Red Hat 5.1 (also known as “5 update 1”) or higher. It is not supported on Red Hat 5.0.

Note – This information applies only to FLX240, FLX280, FLX380, 6130, 6140, 6540, 6580, 6780, 2510, 2530 and 2540 arrays.

Download Sun Storage Common Array Manager in-band proxy agents for Linux from here:

http://www.oracle.com/technology/software/sun_az_index.html

To verify the host sees the arrays management (UTM) LUN:

1. Start/Stop Agent

```
[root@nsvr-150 agent]# /opt/SMgr/agent/SMagent start
Stopping Agent process 12632.
SMagent started.
[root@nsvr-150 agent]# SANtricity Storage Array Host Agent,
Version 09.17.A0.03
Built Tue Dec 05 14:52:38 CST 2006
Copyright (C) 1999-2006 LSI Logic Corporation. All rights
reserved.
Checking device /dev/sda (/dev/sg0): Skipping
Checking device /dev/sdb (/dev/sg1): Skipping
Checking device /dev/sdc (/dev/sg2): Activating
Running...
```

2. Check for UTM LUN

```
[root@nsvr-150 agent]# java -classpath
/opt/SMgr/agent/SMagent.jar
devmgr.versioned.agent.DeviceIdentifier | grep "Volume Access"
/dev/sdc
(/dev/sg2) [Storage Array fms-lca1, Volume Access, LUN 31,
Volume ID <600a0b80002fc0740000000000000000>]
```

Windows: Checking The UTM LUNs and Start/Stop of the Proxy Agent

To verify the host sees the arrays management (UTM) LUN, do the following:

1. Start/Stop Agent

```
E:\Program Files (x86)\StorageManager\agent>net start
"SANtricity Storage Manager Agent"
The Storage Manager Agent service is starting.
The Storage Manager Agent service was started successfully.
```

2. Check for UTM LUN

```
E:\Program Files (x86)\StorageManager\agent>C:\Java\
jdk1.5.0_11\bin\java -classpath SMagent.jar
devmgr.versioned.agent.DeviceIdentifier |
findstr Access

\\.\PHYSICALDRIVE0 [Storage Array fms-lca1, Volume Access, LUN
31, Volume ID <600a0b80002458d20000000000000000>]

\\.\PHYSICALDRIVE1 [Storage Array fms-lca1, Volume Access, LUN
31, Volume ID <600a0b80002fc074
```

Installing In-Band Management

1. **Connect two in-band (FC, etc.) cables between HBAs on the data host where the proxy is to be installed and the array (one cable to each controller).**
2. **Install the SMruntime and SMagent packages on the proxy host, using the pkgadd command in Solaris and rpm command in Linux.**

- Installation example on Solaris

```
pkgadd -d <directory or disk-directory> SMruntime-SOL-xx.xx.xx.xx.pkg
pkgadd -d <directory or disk-directory> SMagent-SOL-xx.xx.xx.xx.pkg
```

- Installation example on Linux

```
rpm -ivh SMruntime.xx.xx.xx.xx-xxxx.rpm
rpm -ivh SMagent-LINUX-xx.xx.xx.xx-xxxx.rpm
```

3. **Solaris only - to verify that the host sees the access LUN to manage the array via the in-band path, perform the following commands on the data host:**

```
setenv LD_LIBRARY_PATH /opt/SMgr/agent
java -classpath /opt/SMgr/agent/SMagent.jar
devmgr.versioned.agent.DeviceIdentifier | grep "Volume Access"
```

The arrays with access LUNs visible to the agent will display as follows:

```
/dev/rdisk/c5t200600A0B82458D4d31s2 [Storage Array fms-lca1, Volume
Access, LUN 31, Volume ID <600a0b80002458d20000000000000000>]

/dev/rdisk/c5t200700A0B82458D3d31s2 [Storage Array fms-lca1, Volume
Access, LUN 31, Volume ID <600a0b80002fc07400000000000000000>]
```

4. **Verify that the Proxy Agent is running. If necessary, check the SMagent process and restart in** `/opt/SMgr/agent/SMagent`.

5. **To start the agent, perform this command in Solaris or its equivalent:**
`/opt/SMgr/agent/SMagent start`

If the agent was running, it will stop and then restart after a status check.

6. **Check the process status:**

```
# ps -ef | grep SMagent | grep -v grep  
  
/opt/SMgr/agent/jre/bin/java -classpath  
/opt/SMgr/agent/SMagent.jar devmgr.launch
```

Sign in to the software and begin configuring as described in [“Initial Array Set Up” on page 31](#). After the registration process discovers arrays, they display on the Storage System Summary page. The Network Address field displays whether the connection with each array is in-band or out-of-band. The Common Array Manager software can manage arrays with either in-band and out-of-band connections at the same time.

Copying Configuration Files and In-Band Management

If you copy a configuration file to a management host that will have in-band communication with the array, you need to preserve the mapping between the access LUN and the management host using the `import array` command with the `-n` (noclear) option.

```
import -x <XML-location> [ -L <list> ] [ -n ] array <array-name>
```

The `import` command typically applies an array configuration file to the specified array. The `-n` option preserves the current array configuration, including the mapping between the access LUN (LUN 31) and the default domain of the management host. This mapping is required for in-band management of the array.

OPTIONS

```
-x,--xml <XML-location>
```

Specifies the location of the XML file to be imported. The XML location can be in the form of a URL (`http://...` or `file:///...`) or a file name.

```
-L,--list
```

Specifies that no import take place. Instead, the array is checked against the XML file to ensure that it is compatible.

`-n, --noclear`

Specifies that the current array configuration will not be cleared.

`array <array-name>`

Specifies the array to which the configuration file is applied.

Using SNMP

This appendix provides an overview and best practices for using SNMP with Sun Storage Common Array Manager.

The array management software provides SNMP traps as well as an agent that can be queried.

SNMP Traps

Sun Storage Common Array Manager provides SNMP traps for all actionable events. The trap fields are defined by the SNMP trap MIB (see [“SNMP Trap MIB” on page 126](#)).

The traps that can be received are based on the alarms possible for the specific device. Traps are sent through port 162 to the IP addresses configured in the user interface (UI) or command-line interface (CLI). The minimum alarm priority used for trap generation can be selected using UI or CLI interfaces. Traps can only be sent to the default ‘public’ community at this time.

Sun Storage Common Array Manager does not provide an SNMP agent that can be queried using SNMP ‘GET’ operations. At times, the devices themselves support SNMP ‘GET’ operations although all the arrays supported by the array management software at this time do not. Instead customers typically do remote scripting using the remote CLI (SSCS) or the SMI-S industry standard provider is used.

SNMP Trap MIB

```
-----
-- Copyright 2001 - Sun Microsystems, Inc. All Rights Reserved.
-- FIXED for RFC 2578compatibility --
-- Sun Storage Agent Notification --
-- Definitions of the Sun Storage Agent Notification and Notification attributes
--
SUNSTORAGEAGENT-NOTIFICATION-MIB DEFINITIONS ::= BEGIN
    IMPORTS

        enterprises, MODULE-IDENTITY, NOTIFICATION-TYPE, OBJECT-TYPE
            FROM SNMPv2-SMI
        OBJECT-GROUP
            FROM SNMPv2-CONF;
    alertTrap MODULE-IDENTITY
        LAST-UPDATED "200210160000Z"
        ORGANIZATION "Sun Microsystems Inc."
        CONTACT-INFO
            "
                Sun Microsystems Inc.
                Customer Support
                Postal: 901 San Antonio Road
                Palo Alto, CA-94303-4900, USA
                Tel: 650-960-1300
                E-mail: service@sun.com"

        DESCRIPTION
            "This mib defines the trap sent by the Sun Storage Agent
            with the variable bindings. Any outside entity can
            subscribe for this trap."

        REVISION "200210160000Z"
            DESCRIPTION
                "Rev 1.0 19 January 2000 12:00, Initial version Of MIB."
            ::= { storagent 0 }
    sun OBJECT IDENTIFIER ::= { enterprises 42 }
    prod OBJECT IDENTIFIER ::= { sun 2 }
    storagent OBJECT IDENTIFIER ::= { prod 95 }
    alert OBJECT IDENTIFIER ::= { storagent 1 }
    alertInfoGroup OBJECT IDENTIFIER ::= { alert 3 }
```

```

-- alertInfoGroup OBJECT-GROUP
--     OBJECTS { deviceName, alertLevel, message }
--     STATUS current
--     DESCRIPTION
--         "Varbinds of alertMessage trap"
--     ::= { alertInfoGroup 3 }

alertMessage NOTIFICATION-TYPE
    OBJECTS { deviceName, alertLevel, message }
    STATUS current
    DESCRIPTION
        "An alertMessage trap signifies that an alert was
        was generated for a storage device monitored
        by the Storage Agent."
    ::= { alertTrap 6 }

deviceName OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "The name of the storage device that the alert message
        pertains to."
    ::= { alertInfoGroup 1 }

alertLevel OBJECT-TYPE
    SYNTAX INTEGER {
        notice(0),
        warning(1),
        failure(2),
        down(3)
    }
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "The level of importance of the alert related to failure."
    ::= { alertInfoGroup 2 }

```

```
message OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "The alert message for the storage device."
    ::= { alertInfoGroup 3 }
gridId OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "Event Grid ID"
    ::= { alertInfoGroup 4 }
deviceId OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "Device ID ie: t3:serialno"
    ::= { alertInfoGroup 5 }
```

END

Installation Troubleshooting

This appendix provides information related to installation problems and removing the software from the server:

- “Extracting Software From DVD” on page 129
- “Reviewing the Installation Logs” on page 130
- “CLI Installation Troubleshooting” on page 131
- “Uninstalling Software” on page 131

Extracting Software From DVD

If the wizard screen is not displayed or if you receive an error message, recheck that the host requirements in [TABLE 1-2](#) are met.

The `Host_Software_6.x.x.x` directory is unpacked into the default directory. The unpacking process takes a couple of minutes. The contents of this directory include:

- `bin/tools`
- `bin/iam`
- `bin/uninstall`
- `components/`
- `util/`

If the compressed installation files do not appear in a directory window:

1. Change to the cd-rom directory:

Solaris OS, OpenSolaris OS: /cdrom/cdrom0

Linux /media/cdrom

Windows <system drive>: (Example: D:)

2. Display the contents of the DVD:

```
ls -l
```

Reviewing the Installation Logs

You can verify the success of the installation or problems that might have occurred during installation by reviewing the installation logs. Note that the installation logs are mainly intended for debugging by developers. By scrolling to the end of the installation log, you can verify the successful installation message or any error messages.

If an error occurs:

- 1. Review the requirements in [“Check System Requirements”](#) on page 1.**
- 2. Review the `Readme.txt` file located in the installation directory (see [“Installation Files and Logs”](#) on page 11) for late-breaking information and attempt a reinstallation.**
- 3. Consult the installation logs.**

TABLE F-1 Installation Logs

Platform	Installation Log Location
Solaris	/var/sadm/install/se6000/
Linux	/var/opt/cam/
Windows 32-bit	\Program Files\Common Files\Sun Microsystems\se6000
Windows 64-bit	\Program Files (x86)\Common Files\Sun Microsystems\se6000

- 4. Verify that you made the firewall changes after you finished the installation.**

CLI Installation Troubleshooting

You can verify the installation by bringing up the CLI prompt, as discussed in [“Logging In and Out Using the CLI” on page 27](#).

At the CLI prompt, enter:

```
sscs list mgmt-sw
```

Review the installation logs as noted in [“Reviewing the Installation Logs” on page 130](#).

Uninstalling Software

If you need to remove Sun Storage Common Array Manager from your system, there are wizards and scripts to uninstall the software for Solaris OS, Linux, and Windows platforms.



Caution – Do not attempt to remove individual Common Array Manager components. If you want to remove the Common Array Manager, uninstall the entire application using the uninstall.bat script or using Control Panel - Add/Remove Programs.

Uninstalling on Solaris OS or Linux Using the Uninstall GUI

1. **Log in to the management host as root.**
2. **Change to the bin directory in the installation directory as described in [“Installation Files and Logs” on page 11](#).**

Example:

```
cd /var/opt/CommonArrayManager/Host-Software_6.x.x.x/bin
```

3. **Run the uninstall command.**

```
./uninstall
```

The uninstall GUI opens.

4. **Click Next.**

The Review Selections window is displayed.

5. **Select the software to be uninstalled, and click the Uninstall button.**

When the uninstall completes, the View Results screen is displayed.

6. **Click Finish.**

Uninstalling on Solaris OS or Linux Using the CLI

1. **Log in to the management host as root.**
2. **Change to the bin directory in the installation directory as described in “Installation Files and Logs” on page 11.**

Example:

```
cd /var/opt/CommonArrayManager/Host_Software_6.x.x.x/bin
```

3. **Execute the uninstall command**

```
./uninstall -c
```

4. **Follow the prompts in the install console dialog.**

If for any reason the uninstall failed, run the uninstall script with the -f option:

```
./uninstall -f
```

5. **Click Next.**

The Review Selections window is displayed.

6. **Select the software to be uninstalled, and click the Uninstall button.**

When the uninstall completes, the View Results screen is displayed.

7. **Click Finish.**

Uninstalling on a Windows System

Note – Before you uninstall Sun Storage Common Array Manager from a Windows platform, stop all applications that are running a `java.exe` or `javaw.exe` process.

1. **Navigate to the DVD bin directory:**

```
<system drive>:\Sun\CommonArrayManager\Host_Software_6.x.x.x\bin
```

2. **Click on the uninstall.bat icon.**

To run the uninstaller in console mode, enter: `uninstall.bat -c`

To clean up (remove all associated files), enter: `uninstall.bat -f`

Alternatively, you can remove the Common Array Manager using the Control Panel - Add/Remove Programs.



Caution – Do not attempt to remove individual Common Array Manager components. If you want to remove the Common Array Manager, uninstall the entire application using the `uninstall.bat` script or using Control Panel - Add/Remove Programs.

3. Follow the uninstall wizard steps as described in the [“Uninstalling on Solaris OS or Linux Using the Uninstall GUI”](#) on page 131.

Uninstalling a Previous Version

Note – Users must stop all applications that are running a `java.exe` or `javaw.exe` before running the uninstaller.

1. Log in to the CLI on the management host or using the remote CLI client.

Navigate to the appropriate directory for your operating system:

For Windows, navigate to:

```
%systemdrive%\Sun\CommonArrayManager\Host_Software_6.x.x.xx\  
bin\uninstall.bat
```

For Solaris and Linux, navigate to:

```
/var/opt/CommonArrayManager/Host_Software_6.x.x.xx/bin/uninstall
```

For the Suse 9 platform, CLI uninstall requires the following rpm packages:

- `libgcj-3.3.3-43.24.x86_64.rpm`
- `gettext-0.1.14.1-30.1.x86_64.rpm`

2. Use the following commands to remove the current installation, removing stored data:

- `uninstall -f`

Perform a full uninstall, with a prompt asking if you want to remove stored data.

- `uninstall -f -s`

Perform a full uninstall in “silent” mode that removes all stored data and asks no questions.

Glossary

Definitions obtained from the Storage Networking Industry Association (SNIA) Dictionary are indicated with “(SNIA)” at the end. For the complete SNIA Dictionary, go to www.snia.org/education/dictionary.

agent	The component of the system monitoring and diagnostic software that collects health and asset information about the array.
alarm	A type of event that requires service action. See also event .
alert	A subtype of an event that requires user intervention. The term <i>actionable event</i> often describes an alert. See also event .
array	Multiple disk drives that function as a single storage device. A high-availability (HA) array configuration has redundant controllers and expansion trays of disk drives.
array hot-spare	A disk that serves as a hot-spare within an array as part of the storage pool; a reserve disk that can be made available to all virtual disks within an array. See also hot-spare .
block	The amount of data sent or received by the host per I/O operation; the size of a data unit.
capacity	The amount of storage you must allocate to storage elements, including volumes, pools, and virtual disks. Capacity planning should include allocations for volume snapshots and volume copies.
control path	The route used for communication of system management information, usually an out-of-band connection.
customer LAN	See site LAN .
DAS	See direct attached storage (DAS) .

data host	Any host that uses the system for storage. A data host can be connected directly to the array (direct attach storage, or DAS) or can be connected to an external switch that supports multiple data hosts (storage area network, or SAN). See also host .
data path	The route taken by a data packet between a data host and the storage device.
direct attached storage (DAS)	A storage architecture in which one or two hosts that access data are connected physically to a storage array.
disk	A physical drive component that stores data.
event	A notification of something that happened on a device. There are many types of events, and each type describes a separate occurrence. See also alarm and alert .
extent	A set of contiguous blocks with consecutive logical addresses on a physical or virtual disk.
failover and recovery	The process of changing the data path automatically to an alternate path.
fault coverage	The percentage of faults detected against all possible faults or against all faults of a given type.
FC	See Fibre Channel (FC) .
Fibre Channel (FC)	A set of standards for a serial I/O bus capable of transferring data between two ports at up to 100 MB/second, with standards proposals to go to higher speeds. Fibre Channel supports point to point, arbitrated loop, and switched topologies. Fibre Channel was completely developed through industry cooperation, unlike SCSI, which was developed by a vendor and submitted for standardization after the fact. (SNIA)
Fibre Channel switch	A networking device that can send packets directly to a port associated with a given network address in a Fibre Channel storage area network (SAN). Fibre Channel switches are used to expand the number of servers that can connect to a particular storage port. Each switch is managed by its own management software.
HBA	See host bus adapter (HBA) .
host	A representation of a data host that is mapped to initiators and volumes to create a storage domain. See also data host , initiator .
host bus adapter (HBA)	An I/O adapter that connects a host I/O bus to a computer's memory system. (SNIA) See also initiator .
host group	A group of hosts with common storage characteristics that can be mapped to volumes. See also host .
hot-spare	The drive used by a controller to replace a failed disk. See also array hot-spare .

in-band traffic	System management traffic that uses the data path between a host and a storage device. See also out-of-band traffic .
initiator	A system component that initiates an I/O operation over a Fibre Channel (FC) network. If allowed by FC fabric zoning rules, each host connection within the FC network has the ability to initiate transactions with the storage array. Each host in the FC network represents a separate initiator, so if a host is connected to the system through two host bus adapters (HBAs), the system identifies two different initiators (similar to multi-homed, Ethernet-based hosts). In contrast, when multipathing is used in round-robin mode, multiple HBAs are grouped together, and the multipathing software identifies the group of HBAs as a single initiator.
IOPS	A measure of transaction speed, representing the number of input and output transactions per second.
JBOD	Just-a-Bunch-Of-Disks array that encloses SAS or SATA disk drives.
LAN	Local area network.
logical unit number (LUN)	The SCSI identifier for a volume as it is recognized by a particular host. The same volume can be represented by a different LUN to a different host.
LUN	See logical unit number (LUN) .
MAC address	See media access control (MAC) address .
management host	A Solaris host serving the configuration, management, and monitoring software for the Common Array Manager. The software on the station can be accessed with a browser to run the browser interface or with a remote scripting command-line interface (CLI) client to access the SSCS CLI commands.
master / alternate master	A design for reliability that uses redundant configuration. Array configurations share master/alternate master configurations: each array configuration has two controller trays that are grouped as one host. In each case, the master component uses the IP address and name. If the master fails, the alternate master assumes the IP address and name and takes over the master's functions.
media access control (MAC) address	The physical address identifying an Ethernet controller board. The MAC address, also called an Ethernet address, is set at the factory and must be mapped to the IP address of the device.
mirroring	A form of storage – also called RAID Level 1, independent copy, and real-time copy – whereby two or more independent, identical copies of data are maintained on separate media. Typical mirroring technologies enable the cloning of data sets to provide redundancy for a storage system.
multipathing	A design for redundancy that provides at least two physical paths to a target.

out-of-band traffic	System management traffic outside of the primary data path that uses an Ethernet network. See also in-band traffic .
pool	See storage pool .
profile	See storage profile .
provisioning	The process of allocation and assignment of storage to hosts.
RAID	An acronym for Redundant Array of Independent Disks, a family of techniques for managing multiple disks to deliver desirable cost, data availability, and performance characteristics to host environments. (SNIA)
remote monitoring	Monitoring of the functions and performance of a hardware system from a location other than where the hardware resides.
remote scripting CLI client	A command-line interface (CLI) that enables you to manage the system from a remote management host. The client communicates with the management software through a secure out-of-band interface, HTTPS, and provides the same control and monitoring capability as the browser interface. The client must be installed on a host that has network access to the system.
SAN	See storage area network (SAN) .
SAS	An acronym for Serial Attached SCSI. A SCSI interface standard that provides for attaching HBAs and RAID controllers to both SAS and SATA disk and tape drives, as well as other SAS devices. (SNIA)
SATA	An acronym for Serial Advanced Technology Attachment. A version of the ATA interface that uses a serial connection architecture. (SNIA)
site LAN	The local area network at your site. When the system is connected to your LAN, the system can be managed through a browser from any host on the LAN.
snapshot	An copy of a volume's data at a specific point in time.
SSCS	Sun Storage Command System. The command-line interface (CLI) that can be used to manage the array.
storage area network (SAN)	An architecture in which the storage elements are connected to each other and to a server that is the access point for all systems that use the SAN to store data.
storage domain	A secure container that holds a subset of the system's total storage resources. Multiple storage domains can be created to securely partition the system's total set of storage resources. This enables you to organize multiple departments or applications into a single storage management infrastructure.
storage pool	A container that groups physical disk capacity (abstracted as virtual disks in the browser interface) into a logical pool of available storage capacity. A storage pool's characteristics are defined by a storage profile. You can create

	multiple storage pools to segregate storage capacity for use in various types of applications (for example, high throughput and online transaction-processing applications).
storage profile	A defined set of storage performance characteristics such as RAID level, segment size, dedicated hot-spare, and virtualization strategy. You can choose a predefined profile suitable for the application that is using the storage, or you can create a custom profile.
storage tray	An enclosure containing disks. A tray with dual RAID controllers is called a controller tray; a tray without controllers is called an expansion tray.
stripe size	The number of blocks in a stripe. A striped array's stripe size is the stripe depth multiplied by the number of member extents. A parity RAID array's stripe size is the stripe depth multiplied by one less than the number of member extents. See also striping .
striping	Short for data striping; also known as RAID Level 0 or RAID 0. A mapping technique in which fixed-size consecutive ranges of virtual disk data addresses are mapped to successive array members in a cyclic pattern. (SNIA)
target	The system component that receives a SCSI I/O command. (SNIA)
thin-scripting client	See remote scripting CLI client .
tray	See storage tray .
virtual disk	A set of disk blocks presented to an operating environment as a range of consecutively numbered logical blocks with disk-like storage and I/O semantics. The virtual disk is the disk array object that most closely resembles a physical disk from the operating environment's viewpoint.(SNIA)
volume	A logically contiguous range of storage blocks allocated from a single pool and presented by a disk array as a logical unit number (LUN). A volume can span the physical devices that constitute the array, or it can be wholly contained within a single physical disk, depending on its virtualization strategy, size, and the internal array configuration. The array controller makes these details transparent to applications running on the attached server system.
volume snapshot	See snapshot .
WWN	World Wide Name. A unique 64-bit number assigned by a recognized naming authority such as the Institute of Electrical and Electronics Engineers (IEEE) that identifies a connection (device) or a set of connections to the network. The World Wide Name (WWN) is constructed from the number that identifies the naming authority, the number that identifies the manufacturer, and a unique number for the specific connection.

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