# Sun™ StorEdge™ RAID Manager 6.1.1 Installation and Support Guide for Solaris™

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# Preface

This document provides installation and operation instructions for Sun™ StorEdge™ RAID Manager software on Sun StorEdge A1000 and A3x00 systems. These instructions are designed for system administrators with some working knowledge of RAID Manager software.

# Typographic Conventions

**TABLE P-1** Typographic Conventions

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

# Shell Prompts

**TABLE P-2** Shell Prompts

| Shell | Prompt |
|---|---|
| C shell | *machine_name*`%` |
| C shell superuser | *machine_name*`#` |
| Bourne shell and Korn shell | `$` |
| Bourne shell and Korn shell superuser | `#` |

# Related Documentation

**TABLE P-3** Related Documentation

| Application | Title | Part Number |
|---|---|---|
| Installation | *Sun StorEdge RAID Manager 6.1.1 Release Notes* | 805-3656 |
| User | *Sun StorEdge RAID Manager 6.1.1 User's Guide* | 805-4057 |

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|---|---|---|
| Belgium | 02-720-09-09 | 02-725-88-50 |
| Canada | 1-800-873-7869 | 1-800-944-0661 |
| France | 0800-90-61-57 | 0800-90-61-58 |
| Germany | 01-30-81-61-91 | 01-30-81-61-92 |
| Holland | 06-022-34-45 | 06-022-34-46 |
| Japan | 0120-33-9096 | 0120-33-9097 |
| Luxembourg | 32-2-720-09-09 | 32-2-725-88-50 |
| Sweden | 020-79-57-26 | 020-79-57-27 |
| Switzerland | 0800-55-19-26 | 0800-55-19-27 |
| United Kingdom | 0800-89-88-88 | 0800-89-88-87 |
| United States | 1-800-873-7869 | 1-800-944-0661 |
| **World Wide Web:** `http://www.sun.com/sunexpress/` | | |

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```

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CHAPTER 1

# Installation

This chapter contains the following tasks for installing the Sun StorEdge RAID Manager software with the Solaris™ operating system:


- Software Installation Overview — page 1
- Checking the Hardware and Software — page 2
- Installing the Software — page 4
- De-installing the Sun StorEdge RAID Manager Software — page 14
- Configuring the Solaris Environment to Support Sun StorEdge RAID Manager — page 15
- SNMP Notification — page 20
- Software Limitations — page 24


## Software Installation Overview

- Ensure all hardware, and the minimum software components required, are properly installed as described in "Checking the Hardware and Software" on page 2.
- Install the Sun StorEdge RAID Manager Software as described in "Installing the Software" on page 4.
- Install patches to support Sun StorEdge RAID Manager.
- Configure your operating system to support Sun StorEdge RAID Manager as described in "Configuring the Solaris Environment to Support Sun StorEdge RAID Manager" on page 15.
- Reboot your host system.
- Verify the installation as described on page 13.
- Launch the Sun StorEdge RAID Manager software as described in Chapter 2, "Initial Startup."

- Refer to the *Sun StorEdge RAID Manager User's Guide* for information about using the Sun StorEdge RAID Manager software.

# Checking the Hardware and Software

Before installing the Sun StorEdge RAID Manager software, make sure you have the following components installed:

- The Solaris 2.5.1 or 2.6 operating system
  - You can use the `uname -a` command to obtain version information. The version is specified as either 5.5.1 (for Solaris 2.5.1) or 5.6 (for Solaris 2.6).
- At least an 800 x 600 resolution graphics card and mouse
- One of the following host adaptors:
  - US2D Ultra SCSI dual-ported differential card
  - SCSI-2 FAST and WIDE (DWIS)
  - Ultra SCSI (UDWIS)

---

**Note –** You can install Sun StorEdge RAID Manager with firmware versions before 2.5.2; however, you must immediately upgrade the firmware to version 2.5.2 or later *after* you have completed the installation. (See "Upgrading Controller Firmware" on page 29 for instructions on how to upgrade firmware.)

---

**Note –** If the host system is networked, see "SNMP Notification" to set up and enable the SNMP option.

---

1. **Use the following checklist to make sure that the RAID Module(s) have been connected correctly to your host system.**

   If necessary, refer to the *Sun StorEdge RAID Manager User's Guide*.

| Completed | Task | Notes |
|---|---|---|
| ☐ | Cable connections are correct and secure. | Without the system running (at the `ok` prompt), type `probe-scsi-all` to scan the SCSI buses and list all hardware paths and the devices attached to your system. This process list the targets (SCSI IDs) of the devices connected and recognized by your host adapter. There should be a target (SCSI ID) listed for each RAID controller in your RAID Modules. If a target is not listed, check the cable connections. |
| ☐ | Termination is correct and secure. | |
| ☐ | SCSI IDs are set properly. | Each controller in each RAID Module must have a unique SCSI ID (that is, no two controllers on the same SCSI bus can have the same SCSI ID). |

2. **Continue with "Installing the Software."**

# Installing the Software

**Caution –** Be sure all hardware is connected to your host system *before* installing the software. Failure to do so could cause your system to panic.

## ▼ Mounting the CD-ROM

**Note –** Depending on how your workstation is configured, your CD-ROM drive may be mounted automatically. If the CD-ROM drive is *not* mounted, you *must* mount it *before* you can install the software.

1. **Is the CD-ROM mounted?**

   *Yes*? Continue with Step 4.

   *No*? Continue with Step 2.

2. **If no mount point directory exists, create one.**

3. **Mount the CD-ROM drive by typing:**

```
# mount -F hsfs -o ro /dev/dsk/cXtXdXsX /cdrom
```

   Where `cXtXdXsX` is the device node of the CD-ROM (for example, `c0t6d0s0`) and `/cdrom` is the mount point.

4. **Load the disc label-side facing up into the CD-ROM drive.**

5. **Continue with "Sun StorEdge RAID Manager Installation Options."**

## Sun StorEdge RAID Manager Installation Options

There are two methods (`swmtool` and `pkgadd`) that can be used to install the Sun StorEdge RAID Manager software. `swmtool` provides a graphical user interface (GUI) that simplifies the task of installing the Sun StorEdge RAID Manager software package clusters. `pkgadd` is the standard command line interface installation process. Refer to TABLE 1-1 for package descriptions.

After mounting the CD-ROM drive, you can use one of the following methods to install the software for use with the Solaris operating system.

## swmtool

`swmtool`, the Software Manager, is the recommended method to use when installing software package clusters from the software CD. To use `swmtool`, you must have the X Window system installed on your system and running OpenWindows™. For instructions on using `swmtool`, refer to "To Install Sun StorEdge RAID Manager Using swmtool" on page 6.

---

**Note –** `swmtool` is the installation method described throughout this chapter (unless otherwise noted). `pkgadd` instructions are also provided if you prefer this method of installation.

---

## pkgadd

`pkgadd` is another method used to install software package clusters from the software CD. `pkgadd` differs from `swmtool` in that you do not need to run OpenWindows; you can invoke the `pkgadd` command at the operating system prompt. For instructions on using `pkgadd`, refer to "To Install Sun StorEdge RAID Manager Using pkgadd" on page 8.

**TABLE 1-1** Package Descriptions

| Cluster Name | Description |
|---|---|
| `SUNWosafw` | Open Storage Array (firmware) |
| `SUNWosar` | Open Storage Array (root) |
| `SUNWosau` | Open Storage Array (usr) |
| `SUNWosamn` | Open Storage Array (man pages) |
| `SUNWvtsse` | Diagnostic extensions to SunVTS™ for Sun StorEdge™ A1000 |

## ▼ To Install Sun StorEdge RAID Manager Using `swmtool`

---

**Caution –** This installation procedure requires you to reboot your system. Therefore, make sure that other users are not on the system when you install this software.

---

---

**Note –** Make sure the installation media device you are using is attached when you boot the system.

---

1. **Start the OpenWindows environment.**
2. **Load the Sun StorEdge RAID Manager CD into your CD-ROM drive, label-side facing up.**

   If there is another CD in the drive, remove it by typing `eject` in a shell window.
3. **Open File Manager.**
4. **Open a command window and (if you are not already `superuser`) become `superuser` using the `su` command and `superuser` password.**
5. **Start Software Manager by typing:**

```
# /usr/sbin/swmtool
```

   `Admintool:Software` is displayed.
6. **Select Edit ... Add.**

   The Set Source Media window is displayed.
7. **Select Mounted Directory if you are running Volume Management or Local CD-ROM as your media type.**
8. **Type the path to the source media in the Directory Name:**

```
/cdrom/cdrom0
```

   The Software Manager window is displayed with the Sun StorEdge RAID Manager clusters to be installed.
9. **Click on the Open Storage Array clusters to be installed.**

   Click on Customize if you need to change the Sun StorEdge RAID Manager packages.

10. **Click the Add button.**

    The Software Manager: Command Input/Output window is displayed with pre-installation information followed by this prompt:

    ```
    Do you want to continue with this installation?
    ```

11. **Respond with** `<y>` **(yes).**

    Installation messages are displayed in the Software Manager: Command Input/Output window.

    It may take one to two minutes before you notice certain tasks occurring (see TABLE 1-2).

    The following message is displayed after the installation process has been completed:

    ```
    Installation of SUNWxxxx was successful.
    ```

    where *SUNWxxxx* is the specific package name.

12. **Quit Software Manager.**

---

**Caution –** Install the software patches for your Solaris environment if you have not done so already. Failure to do so may cause your system to boot improperly. Refer to the patch information in the *Sun StorEdge RAID Manager Release Notes*.

---

13. **Shut down the system by typing:**

    ```
    shutdown -y -i0 -g0
    ```

    See the `shutdown`(1M) man page for more information. Using the `shutdown` command is more efficient than using the `halt` command.

---

**Caution –** Make sure you use the `boot -r` option for the reboot required in Step 14 and in future reboots following any changes in RAID configuration.

---

**14. Reboot the system by typing:**

```
boot -r
```

Several additional tasks are performed as the system reboots. You may notice some of these shown in TABLE 1-3.

**15. When the message** `The system is ready` **displays, do you see the** `NVSRAM settings are correct` **message?**

*If Yes*?

Continue with "To Verify the Installation" on page 13.

*If No*?

If the NVSRAM message says that settings were changed, do the following:

- Reboot the system by typing:

```
reboot -- -r
```

- After the system reboots, continue with "To Verify the Installation" on page 13.

## ▼ To Install Sun StorEdge RAID Manager Using `pkgadd`

---

**Note –** Before beginning this procedure, make sure you install patches that may be required for your Solaris environment. Refer to the *Sun StorEdge RAID Manager Release Notes* for patch numbers.

---

**Caution –** This installation procedure requires you to reboot your system. Therefore, make sure that other users are not on the system when installing this software.

---

**Note –** Make sure the installation media device you are using is attached when you boot the system.

---

1. **Load the Sun StorEdge RAID Manager CD into your CD-ROM drive, label-side facing up.**

   If there is another CD in the drive, remove it by typing `eject` in a shell tool window.

2. **Become** `superuser` **by using the** `su` **command and entering your** `superuser` **password.**

3. **Type:**

```
# /usr/sbin/pkgadd -d /cdrom/cdrom0/Product package_name
```

   The argument to the `-d` option must be a full path name to a device or directory. If you do not specify the device on which the package resides, `pkgadd` checks the default spool directory (`/var/spool/pkg`). If the package is not there, the installation fails.

   To install Sun StorEdge RAID Manager, choose the packages in the following order:

   1. `SUNWosar`
   2. `SUNWosafw`
   3. `SUNWosamn`
   4. `SUNWosau`
   5. `SUNWvtsse`

   During `pkgadd` installation, information is displayed, followed by this prompt:

```
Do you want to continue with this installation?
```

4. **Respond with** `<y>` **(yes).**

   It may take one to two minutes before you notice certain tasks occurring (see TABLE 1-2).

**TABLE 1-2** Tasks Performed During Installation

| What You Will See | Automatic Task Occurring | Why Is The Task Being Done? |
|---|---|---|
| `Installing RAID Manager as` <*rm6*> and a listing of directories and files being copied. | Files being copied to the host system. | All of the files are being copied to the appropriate directories. |
| `Installing` man `pages` | Reference man pages being copied to the host system. | man pages associated with Sun StorEdge RAID Manager are being copied to the appropriate directory. |
| `kernel/drv/sd.conf already exists. OK to modify?` | `sd.conf` file being updated. | This file is used to specify the logical unit (LUN) support for the operating system, but initially has only LUN 0 defined for each SCSI ID. Therefore, this file is edited to add multiple LUN support (0-7) for each controller in each RAID Module connected to the host system. |
| `Adding RAID Manager changes to /etc/syslog.conf` | `syslog.conf` file being updated. | Sun StorEdge RAID Manager logs certain failure messages from the `arraymon` daemon and the graphical user interface (GUI) applications to the `syslogd` daemon. This file is edited to ensure that Solaris consistently logs these messages to this file. |
| `RAID Manager README file /etc/raid/README` | The `README` file is displayed. | The `README` file provides important information about the software. |

5. **When you finish reviewing the** `README` **file, quit** `pkgadd`**.**

   You will see a message that the system must now be rebooted using `shutdown -y -i0 -g0`.

**Caution –** Install the software patches for your Solaris environment if you have not done so already. Failure to do so may cause your system to boot improperly. Refer to the patch information in the *Sun StorEdge RAID Manager Release Notes*.

6. **Shut down the system by typing:**

```
shutdown -y -i0 -g0
```

Refer to the `shutdown`(1M) man page for more information, if needed. Using the shutdown command is more efficient than using the `halt` command.

**Caution –** Make sure you use the `boot -r` option for the reboot required in Step 7 and in future reboots following any changes in RAID configuration.

7. **Reboot the system by typing** `boot -r`**.**

Several additional tasks are performed as the system reboots. You may notice some of these shown in TABLE 1-3.

When the message `The system is ready` displays, do you see the `NVSRAM settings are correct` message?

*If Yes*?

Continue with "To Verify the Installation" on page 13.

*If No*?

If the NVSRAM message says that settings were changed, do the following:

a. **Reboot the system by typing:**

```
reboot -- -r
```

b. **After the system reboots, continue with "To Verify the Installation" on page 13.**

**TABLE 1-3** Tasks Performed During System Reboot

| What You Will See | Automatic Task Occurring | Why Is The Task Being Done? |
|---|---|---|
| `Setting up RAID Manager device access`<br>`Re-generating rdexus.conf file`<br>`Re-generating rdriver.conf file` | The software is setting up the correct device nodes for Redundant Disk Array Controller (RDAC) support. | To ensure software device access. |
| `RDAC Driver loaded`<br>`RDAC Daemons Initiated` | The Redundant Disk Array Controller (RDAC) driver is loaded and RDAC daemons are started. | The RDAC Driver and daemons provide fail-over support for the I/O data paths.<br><br>**Note:** For a description of RDAC and the protection it provides, refer to the `rdac` man page. |
| Example if NO changes were made:<br>`The NVRAM settings of controller cXtXdX (1TXXXXXXX) are correct.`<br>`nvutil command succeeded.`<br><br>Example if changes were made:<br>`The NVRAM value of Unconfigured LUNs bit field of controller cXtXdX (1TXXXXXXX) at offset 0x11 is invalid, the value is 0x20 (the valid value should be 0x0).`<br>`The incorrect NVRAM settings of controller cXtXdX (1TXXXXXXX) have been fixed.`<br>`Reboot the system for the new settings to take effect.`<br>`nvutil command succeeded.`<br><br>**Note**: If you have trouble getting the software to recognize the RAID Modules, review "NVRAM Settings" on page 57. | NVRAM settings on the controller(s) in the RAID Module being checked and, if necessary, corrected by the `nvutil` program. | Certain configuration settings must be set so that the software can communicate correctly with the controllers in the RAID Module. |
| `Array monitor initiated` | The monitor daemon (`arraymon`) is started. | The array monitor daemon (`arraymon`) automatically checks the RAID Module(s) for any problems/events and provides appropriate notification. |

**TABLE 1-3** Tasks Performed During System Reboot *(Continued)*

| What You Will See | Automatic Task Occurring | Why Is The Task Being Done? |
|---|---|---|
| `RDAC Resolution Daemon locked in memory...` | RDAC is set up to resolve errors. | If errors occur, RDAC can resolve them. |

## ▼ To Upgrade Sun StorEdge RAID Manager from a Previous Version

1. **First save your** `rmparams` **file as** `rmparams.orig` **if you want a record of any customized settings you have made.**
2. **Save a copy of your current configuration information (using File → Save Module Profile, All information types).**
3. **Make a list of your current RAID Modules and their name or number under the previous version of software.**

   The RAID Module numbers or names will change; thus, any labels that you have placed on your RAID Modules will *not* correspond to the list of modules in the new version of this software. In this new version, the module name is derived from the name of the host machine where the storage management software is installed. The old version labeled the modules `RAID Module` *XX*. The new version labels them <*hostname*>`_XXX`. Therefore, for example, a module connected to a host machine running this software named `qualab133` would be called `qualab133_XXX`.
4. **Make sure the previous version of the software is not currently open or running.**

   Use `pkgrm` (see "De-installing the Sun StorEdge RAID Manager Software") and follow the instructions on the screen to remove any previous versions of Sun StorEdge RAID Manager to prevent any conflicts. If you have previously been using your RAID Module, unmount any file systems and stop any other I/O to the module.
5. **Follow the steps in "To Install Sun StorEdge RAID Manager Using pkgadd."**

## To Verify the Installation

1. **At the command line, type:**

```
pkginfo -l package_name
```

A list showing statistics (version information, installation date, file information, etc.) about the software should display. The status field reads “completely installed” if the installation was successful.

2. **At the command line type:**

```
ps -ef | grep arraymon
```

A confirmation line should show the array monitor (`arraymon`) as a working process.

3. **At the command line type:**

```
ps -ef | grep rdaemon
```

A confirmation line should show the `rdac` resolution/restart daemons as two working processes.

- If the previous steps are unsuccessful, try the following:

a. **Shut down the system by typing:** `shutdown -y -i0 -g0`

b. **Reboot the system by typing:** `boot -r`

c. **Repeat Steps 1-3.**

- If you still have problems, reinstall Sun StorEdge RAID Manager.

# De-installing the Sun StorEdge RAID Manager Software

If you need to de-install Sun StorEdge RAID Manager (for example, to reinstall the software if there was some problem during the installation procedure), use the `pkgrm` command and remove the packages in the following order:

1. `SUNWosafw`
2. `SUNWosau`
3. `SUNWosar`
4. `SUNWosamn`
5. `SUNWvtsse`

**Note –** If you are de-installing a Sun StorEdge RAID Manager version prior to 6.1, the `SUNWosafw` and `SUNWvtsse` packages do not exist.

**Note –** The `rmlog.log` file remains in the `/var/osa` directory after using `pkgrm` to de-install the software. Although keeping this file should not cause any problems, you may want to manually delete it.

# Configuring the Solaris Environment to Support Sun StorEdge RAID Manager

TABLE 1-4 summarizes the changes you need to make to fully support Sun StorEdge RAID Manager with the Solaris operating environment.

**TABLE 1-4** Required Changes for Solaris Operating Systems

| Task To Perform | Purpose | For More Details, See |
|---|---|---|
| Install patches to support Sun StorEdge RAID Manager. | To ensure optimum performance of Sun StorEdge RAID Manager with the Solaris operating environment | "Patches Required to Support Solaris Operating Systems" on page 16 |
| Edit the `rmparams` file. | To increase LUN support per host adapter and/or enable SNMP notification | "To Edit the rmparams File" on page 17 |
| Edit the `rmscript` file. | To set up scriptable event notifications (such as third-party vendor's paging, Fax, etc.) | "Setting Up Other Scriptable Notification Options" on page 19 |
| Set the SNMP notification. | To enable or disable this remote notification option | "SNMP Notification" on page 20 |
| Run the SunVTS `enctest`. | To detect StorEdge A1000 enclosures for configuration and repair verification. | The `enctest` documentation on your CD. |

---

**Note –** The `ses` driver must be on the system with the StorEdge enclosure(s). If the `ses` driver is not present, SunVTS will not detect the StorEdge hardware. Use the following command to see if the `ses` driver is present:
**`pkginfo SUNWses`**
Install the package if necessary.

The `ses` driver patch must also be installed on the system. Refer to the *Sun StorEdge RAID Manager Release Notes* for details on how to access the correct `ses` driver patch.

---

# Patches Required to Support Solaris Operating Systems

There are patches available to ensure optimum performance of the Sun StorEdge RAID Manager software with the Solaris operating system.

Individual patches can be identified by their respective patch ID number. For information on installing specific patches, refer to the *Sun StorEdge RAID Manager Release Notes*.

1. **Determine the Solaris version you have by typing:**

   ```
   uname -a
   ```

   The version is specified as either 5.5.1 (for Solaris 2.5.1) or 5.6 (for Solaris 2.6).

2. **Install the correct patch (for your version of Solaris) on your host system.**

---

**Note –** If you are using Solaris 2.5.1, you need to install the 2.5 `/kernel/drv/isp` driver. Using the 2.5.1 driver causes applications to hang.

---

## ▼ To Edit the `rmparams` File

The `/etc/raid/rmparams` file is used to store several configurable options available through Sun StorEdge RAID Manager. TABLE 1-5 shows a list of the parameters in the file that you may need to change during initial installation. A listing of the entire `rmparams` file is provided in "rmparams File Listing" on page 58. Most of these options (other than the ones shown in TABLE 1-5) should *not* be changed, and many of the other options should only be changed through the GUI.

---

**Note –** You must edit the `rmparams` file to increase LUN support per host adapter or if you want to enable SNMP notification (see "SNMP Notification" on page 20).

---

1. **For multiple LUN support, edit the** `/etc/raid/rmparams` **file to increase the parameter line** `System_MaxLunsPerHostAdapter` **to:**
   - **8** for Solaris 2.5.1
   - **32** for Solaris 2.6 (with patch installed)

   Change the `System_MaxLunsPerControllers` parameter from 8 to 32 if you are running Solaris 2.6 and your system supports 32 LUNs per RAID Module.

   This parameter determines the maximum number of logical units supported per RAID Module. Remember that this limit applies to a RAID Module (whether it has a single controller or redundant controllers). Therefore, if you have a RAID Module with two active controllers, the total number of LUNs between them cannot be more than 32.

2. **Make any necessary changes for other parameters using** TABLE 1-5**.**

**TABLE 1-5** Optional Changes for Additional Parameters

| Parameter | Description | When To Change | How To Change |
|---|---|---|---|
| **System_MaxLunsPerHostAdapter=16** | Determines the maximum number of logical LUNs supported per host adapter.<br><br>**Note:** This applies to LUNs per host adapter. There is still a Solaris limit of eight LUNs per RAID Module. | If you have Solaris 2.5.1 installed. | Edit the `rmparams` file and change "32" to the appropriate number. |
| **System_MaxLunsPerControllers=8** | Determines the maximum number of logical units per RAID Module supported by the storage management software, and also sets the highest LUN number displayed in that software. | After determining if you can support 32 LUNs. | Edit the `rmparams` file and change the 8 to 32. |
| **SNMP_Target_IP_Address=127.0.0.1** | Provides the SNMP IP Address for remote notification. | If you want to enable SNMP notification. | See "SNMP Notification" on page 20. |
| **SNMP_Community_Name=NONE** | Provides the community name to be used for SNMP remote notification. | If you want to enable SNMP notification. | See "SNMP Notification" on page 20. |
| **System_MaxControllers=32** | Determines the maximum number of RAID Controllers supported by Sun StorEdge RAID Manager. | If you have more than 32 RAID controllers. | Edit the `rmparams` file and change "32" to the appropriate number. |
| **System_DefaultModuleSelect=FALSE** | Determines if the Select Module box displays each time you open an application. | Anytime you want to change the default to display the Select Module box so you can select a specific RAID Module after you open an application. | Edit the `rmparams` file and change FALSE to TRUE. |

**Caution –** You need to increase the `System_MaxLunsPerControllers` parameter if you are running Solaris 2.6 and can support more than eight LUNs on any RAID Module, because this parameter also affects the highest LUN number that the Sun StorEdge RAID Manager software displays. For example, if you have LUNs 0, 3, and 31 configured on a RAID Module, LUN 31 would not appear in the display if this parameter were only set to 8.

**Note –** Remember that this limit applies to a RAID Module (whether it has a single controller or redundant controllers). Therefore, if you have a RAID Module with two active controllers, the total number of LUNs between them cannot be more than 32.

3. **Save the** `rmparams` **file, then copy it to the** `/etc/default` **directory.**
4. **Continue with "Setting Up Other Scriptable Notification Options."**

# Setting Up Other Scriptable Notification Options

You can edit the `rmscript` file. For example, if you want to install third-party notification software to perform various events (such as, faxing or paging), you would add the appropriate script for each event near the end of this file. Consult the third-party's software documentation for specific details.

For more information in this guide about the `rmscript` file, see:

- "rmscript File Listing" section in Appendix A for the file's contents.
- The `rmscript` man page for a description of the format this file uses.

## Editing Example

The following procedure provides an example for editing the `rmscript` file to add two scripts for extracting information during a defined event and dispatching a paging command.

**Caution –** The last line in the `rmscript` file must *always* be `rm $1`. Therefore, when editing this file, always place any new event script above this line.

1. **To look for AEN events and create a command for a sendpage, add the following event script near the end of the `rmscript` file:**

```
# Use AWK to parse the common fields of the record.

eval `awk -F\~ 'NF > 0 {print "TYPE=" $6 ";HOST=" $1 ";CONTROLLER=" $2 \
";DATE=" $5 ";TIME=" $6}' < $1`

# Simple test for AEN events. If one received, send a page to
# someone interested in any AEN event.
if [ $TYPE = "00" ]
then sendpage "John H. User" "AEN event on $HOST"
fi
```

2. **To look for parity errors and create a command for a sendpage, add the following event script below the previously added text:**

```
# Similar test, but for parity errors.
if [ $TYPE = "20" ]
then sendpage "John H. User" "Parity errors found on ($HOST, $CONTROLLER)"
fi
```

3. **Do *one* of the following:**
   - Continue with"SNMP Notification" if you are interested in using this remote notification option.
   - If you do not want to enable SNMP at this time, go to "To Verify the Installation" on page 13.

# SNMP Notification

This software can provide remote notification of RAID events to designated network management stations (NMS) using Simple Network Management Protocol (SNMP) traps. Use the information in this section to set up the NMS, to enable or disable this notification option for specific hosts, and to understand the contents of an SNMP trap message.

You need to set up your designated NMS only once. Use the following procedure to compile the Sun StorEdge RAID Manager Management Information Base (MIB) into your NMS.

To enable SNMP notification on your host, you must edit the /etc/raid/rmparams file so that the software will know where to direct the SNMP trap messages when a RAID Event has occurred.

## ▼ To Set Up the NMS

---

**Note –** The MIB was written to standard version 1 SNMP syntax. It was designed specifically for Sun StorEdge RAID Manager. It is not applicable to other vendor RAID products.

---

1. **Copy the** `/etc/raid/rm6traps.mib` **file to the network management station.**
2. **Follow the steps required by your specific network management station to compile the MIB.**

---

**Note –** For details on the required steps, consult your network administrator or the documentation specific to the NMS product you are using.

---

## ▼ To Enable SNMP

1. **Edit the** `/etc/raid/rmparams` **file as follows:**

   a. **Include the IP address of the host that has the SNMP-trap proxy agent. For example:**

```
SNMP_Target_IP_Address=129.146.243.54
```

   b. **Define the community name. For example:**

```
SNMP_Community_Name=public
```

2. **Make sure the** `/etc/resolv.conf` **file exists, even if it is empty.**
3. **Make sure that the** `/etc/raid/locks/rmparams.lock` **file is writable by root.**

   This can be a problem if the Sun StorEdge RAID Manager software is NFS mounted.

4. **Make sure that the** `/etc/raid/rm6traps.mib` **file is compiled and imported by the network management system.**

   For example, if you are using SunNet Manager, the command `mib2schema rm6traps.mib` creates the following files:

   - `rm6traps.mib.schema`
   - `rm6traps.mib.oid`
   - `rm6traps.mib.traps`

   The `rm6traps.mib.schema` and `rm6traps.mib.oid` files are placed in the `/opt/SUNWconn/snm/agents` directory.

   The `rm6traps.mib.traps` file is appended to the `/var/opt/SUNWconn/snm/snmp.traps` file.

   When an array event occurs, the script `rmscript`(1M) takes the information passed by `arraymon`(1M) and constructs an SNMP trap message and then sends it to the host defined in the `/etc/raid/rmparams` file.

   See your network management system documentation for more information on how to install SNMP devices.

## ▼ To Disable SNMP

To disable this notification on your host and stop this software from sending SNMP traps:

1. **In the** `/etc/raid/rmparams` **file,**

   - Delete the `SNMP_Target_IP_Address` line.

     Or

   - Change the value of the `SNMP_Community_Name` line to NONE.

2. **Save the** `rmparams` **file and copy it to the** `/etc/default` **directory. It is critical that you have a backup copy of this file.**

## SNMP Trap Message Description

TABLE 1-6 describes the contents of an SNMP trap message for Sun StorEdge RAID Manager.

**Note –** If the trap type is anything other than informational, you should use the Status or Recovery Application to get more information or specific instructions on how to remedy the problem. Do not remove the SNMP message until the problem has been corrected, since most trap notifications associated with this software are not persistent.

**TABLE 1-6** SNMP Trap Message Description

| Item | Description |
|---|---|
| Host IP Address | The standard IP address dot notation for the host where the RAID Module is attached. |
| Host Name | The text name assigned to the host. |
| Trap Type | There are four trap types:<br>**Informational** – No failure has occurred. Information is provided that an event such as a LUN creation has occurred.<br><br>**Degraded Array** – A subsystem component failure has occurred. The module is still operational but now lacks redundancy in some area. (For example, a drive failure resulting in a degraded LUN, a power supply failure, or a failure of one controller in a controller pair.)<br><br>**Failed Array** – A failure has occurred that leaves a module or LUN unable to communicate. (For example, a failure of the controller in a single-controller RAID Module or a multiple drive failure resulting in a dead logical unit.)<br><br>**Critical** – This is a small category of failures that may require timely intervention to correct. (For example, the two-minute warning from an uninterruptible power supply or a warning that write-back cache has been disabled due to a low battery.) |
| Affected RAID Module | Indicates which RAID Module had the event (for example, RAID Module 01). |
| Condition Description | A string of characters (42 or less) describing the event that has occurred. |

# Software Limitations

TABLE 1-7 details the limitations of this software for operating with the Solaris environment. You should also refer to Chapter 3, "Common Questions and Troubleshooting" for troubleshooting information.

---

**Note –** Always check for a `README` file on any installation media, or *release notes* accompanying your documentation. These documents may contain important information that was not available at the time this installation guide was prepared.

---

**TABLE 1-7** Software Limitations and Suggested Workarounds

| Restriction/Note | Application | Workaround |
|---|---|---|
| The RAID Module (subsystem) was qualified on Solaris as a secondary peripheral device only. No testing was done to verify installation of the Solaris operating system on the RAID Module (that is, you cannot use the RAID Module as a boot device). | General | None |
| The status of a component after certain configuration change operations may not be updated immediately.<br><br>For example, this could occur after a Manual Recovery task is completed, especially LUN Reconstruction. | All Applications | Wait for the background monitor to run (default is five minutes) and update the status.<br>**OR**<br>To update immediately, do one of the following:<br>• Re-select the RAID Module.<br>• Exit and re-launch the application. |
| Using Recovery operations to revive or fail an actual bad drive can cause the RAID Controller to no longer be reported. This also occurs when a failed Hot Spare drive is replaced with a bad drive. A series of time-outs in the RAID Controller, Sun StorEdge RAID Manager, and the SCSI host adapter driver eventually result in the host stopping the retries. After this, all SCSI operations to the controller fail until the host is rebooted. | Recovery | Reboot if a controller disappears after a drive replacement or revival.<br><br>If a drive is suspect for some reason, it is best to let the controller fail it during normal I/O rather than trying to manually fail it using Manual Recovery options. |

**TABLE 1-7** Software Limitations and Suggested Workarounds *(Continued)*

| Restriction/Note | Application | Workaround |
|---|---|---|
| If you have both RAID Modules and non-array devices (such as CD-ROM drives, tape drives, or hard disks) on the same physical bus, then the storage management software see the modules on a pseudo bus and their device names do not match with Solaris. | General | In order to have RDAC protection to these modules, you must accept the pseudo device name that appears.<br>If the modules are single-controller or otherwise don't require RDAC protection, edit the `rmparams` file to change the RDAC_SupportDisabled parameter to TRUE. Then the device names for the modules will match in this software and Solaris. |
| When you replace a failed drive, this software allows 35 seconds for the controller to initialize the new drive. However, if you have a 3620 controller and are in a Dead LUN situation (single Drive Failure for RAID 0 or Multiple Drive Failure for RAID 1, 3, or 5), Recovery Guru does not perform a format on the LUNs. If you do not manually format the LUNs, subsequent file system mounts will fail. | Recovery, Recovery Guru | After inserting the replacement drive, wait for the drive's activity light to go off before clicking OK (that is, wait for more than 35 seconds).<br><br>If you do not wait and you see the `LUN is still Dead due to remaining drive failures` message, you need to use **Options** ➔ **Manual Recovery** ➔ **Logical Units** and **Format** the affected LUNs.<br><br>If the affected LUNs had file systems that failed to mount, use `newfs` to create a new file system. |
| Recovery Guru may display misleading information for replacing or reviving a failed single-drive RAID 0 LUN. Also, if power to the RAID Module is turned off and back on when this drive is failed, the LUN is no longer visible and must be recreated using the Configuration Application.<br><br>**Caution**<br>Remember that if a drive fails in a RAID 0 LUN, data cannot be recovered from that drive. | Recovery, Recovery Guru | If you are using this configuration and a drive failure occurs, do the following:<br><br>Physically replace the failed drive with a good drive.<br>Select **Options** ➔ **Manual Recovery** ➔ **Drives**, highlight the failed drive (the drive you just replaced), and select **Revive**.<br>Ignore the error panel that displays.<br>Select **Options** ➔ **Manual Recovery** ➔ **Logical Units**, highlight the affected LUN, and select **Format**.<br><br>The LUN's status returns to Optimal when the format is complete; however, you have lost the data on that LUN. |

**TABLE 1-7** Software Limitations and Suggested Workarounds *(Continued)*

| Restriction/Note | Application | Workaround |
|---|---|---|
| The more configured LUNs you have can increase the amount of time it takes to change the reconstruction rate. This occurs because of the update/refresh functions involved in changing this rate. | Maintenance/ Tuning LUN Reconstruction Rate | None. Continue changing the rate for as many LUNs as possible between appearances of the hourglass. |

CHAPTER 2

# Initial Startup

This chapter contains procedures for operating the Sun StorEdge RAID Manager software and determining if the system configuration meets your needs.


- Starting the Software — page 28
- Upgrading Controller Firmware — page 29
- Running A Health Check — page 29
- Determining the Current Configuration — page 32
- Determining if Changes Are Necessary — page 37
- What's Next? — page 40

# Starting the Software

**Note –** You must have root privileges and become superuser to access this software.

1. **Start OpenWindows if it is not already running.**

**Note –** You can add `/usr/sbin/osa` to your path. After doing so, you will only need to type `rm6` to start Sun StorEdge RAID Manager.

2. **Start Sun StorEdge RAID Manager by typing the following:**

```
/usr/sbin/osa/rm6
```

The application icons (FIGURE 2-1) are displayed and you are ready to select the various applications. For a description of some key terms used in the Sun StorEdge RAID Manager applications, see the *Sun StorEdge RAID Manager User's Guide*.

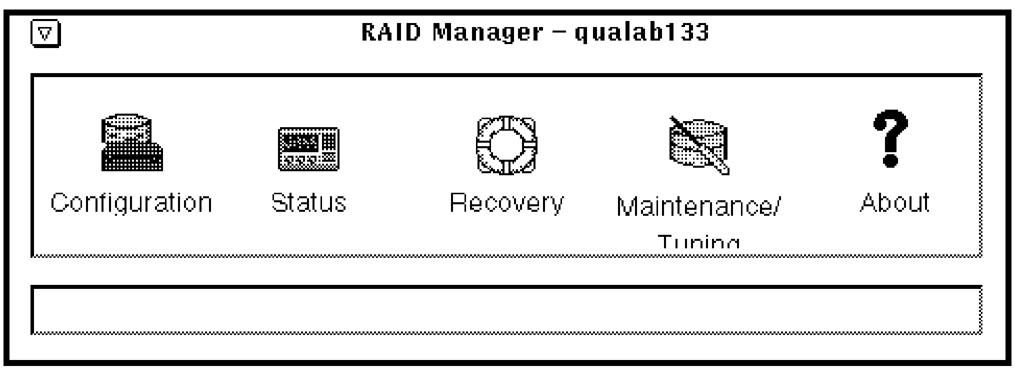


**FIGURE 2-1** Application Icons

**Note –** Sun StorEdge RAID Manager uses the iso8859 font/character set for its various displays. If you do not have these fonts installed, Sun StorEdge RAID Manager will use the fonts that are available, which could cause minor display problems. If you suspect this is happening, verify that you have the correct Sun font packages installed by typing `pkginfo SUNWxwoft SUNWxwcft`. If *neither* of these font packages exist, install them.

# Upgrading Controller Firmware

The controller firmware files were copied during installation to the `/etc/raid/fw` directory, and will be detected by the Firmware Upgrade option in the Maintenance/Tuning application.

To download controller firmware version 2.5.2 or later, follow the Upgrading Controller Firmware procedure in the *Sun StorEdge RAID Manager User's Guide*.

# Running A Health Check

The Health Check application is used to immediately check selected RAID Module(s) for failures on the I/O data path, controllers, drives, LUNs, and other components. The software performs an immediate check of the selected RAID Module(s) and displays a summary of the results.

## ▼ To Ensure That the RAID Modules Are Operational

1. **Double-click the Status icon from the application icon group.**

   The main Status screen is displayed (see FIGURE 2-2). The default screen shows All RAID Modules and Message Log selected.

**Note –** Sun StorEdge RAID Manager assigns a number for each RAID Module connected to your host system (for example, RAID Module 001, RAID Module 002 etc.) These designations are shown at the top of each application's screen.

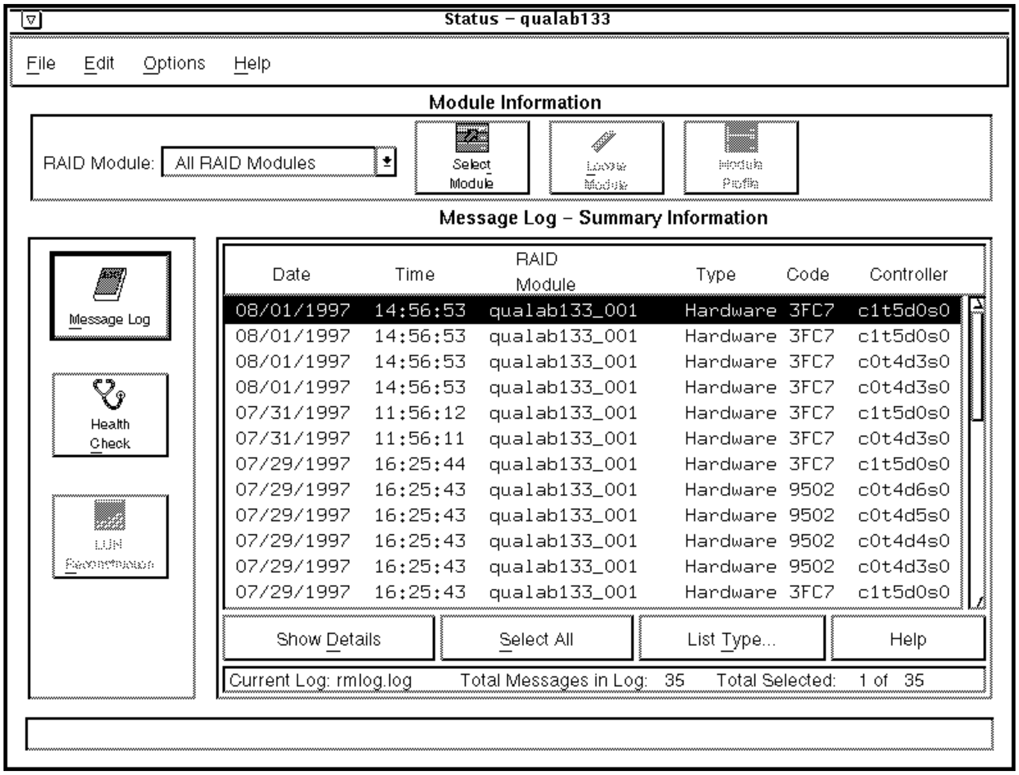


**FIGURE 2-2** Main Status Screen

2. **Make sure that All RAID Modules is selected, then choose Health Check.**

   The display area shows the summary results of the health check on all of the RAID Modules.

   - If all of the RAID Modules report an Optimal status, you are finished with this procedure.
   - If any of the RAID Modules report a status other than Optimal, select that RAID Module and click Show Details to determine the appropriate action to take.

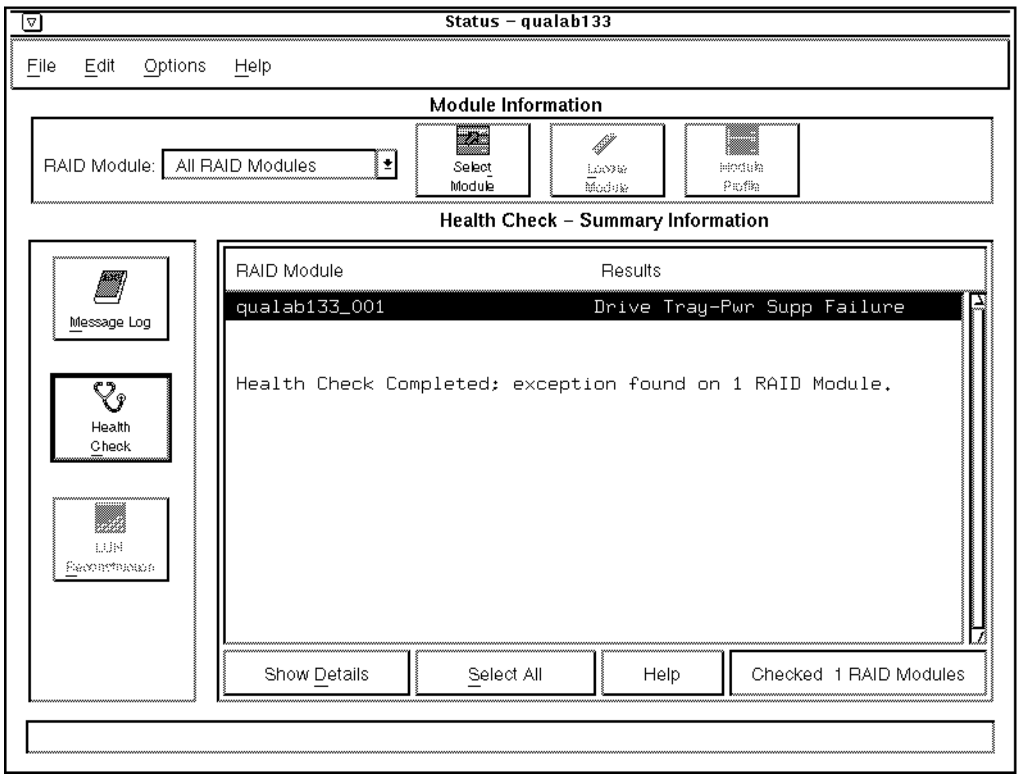


**FIGURE 2-3** Health Check Screen

# Determining the Current Configuration

Now that you have successfully installed the software, you need to use it to identify each RAID Module connected to your host system and determine the module's current configuration (number of drives, number of controllers, LUNs, etc.).

---

**Note –** Most RAID Modules are preconfigured with LUNs already defined. This default LUN configuration may or may not work for your particular environment.

---

---

**Note –** Sun StorEdge RAID Manager assigns a number for each RAID Module connected to your host system (for example, `qualab137_001`, `qualab137_002`, etc.). These designations are shown in the RAID Module selection list near the top of each application's screen (see FIGURE 2-4).

---

## ▼ To Identify the Module and Determine Its Current Configuration

1. **View the current drive groups and LUNs in a RAID Module.**

   a. **Double-click the Configuration icon from the program group.**

   The main Configuration screen is displayed (FIGURE 2-4). The configuration information for RAID Module 001 is shown by default. The main Configuration screen is composed of the following major areas:

   - **Module Information Area** — Enables you to select a RAID Module, identify and locate it, and obtain profile information about the controllers, drives, and LUNs.
   - **Drive Groups Area** — Provides an overview of the different drive groups and their characteristics on the selected RAID Module.
   - **Logical Unit (LUN) Information Area** — Provides a summary of the LUNs configured on the selected RAID Module.

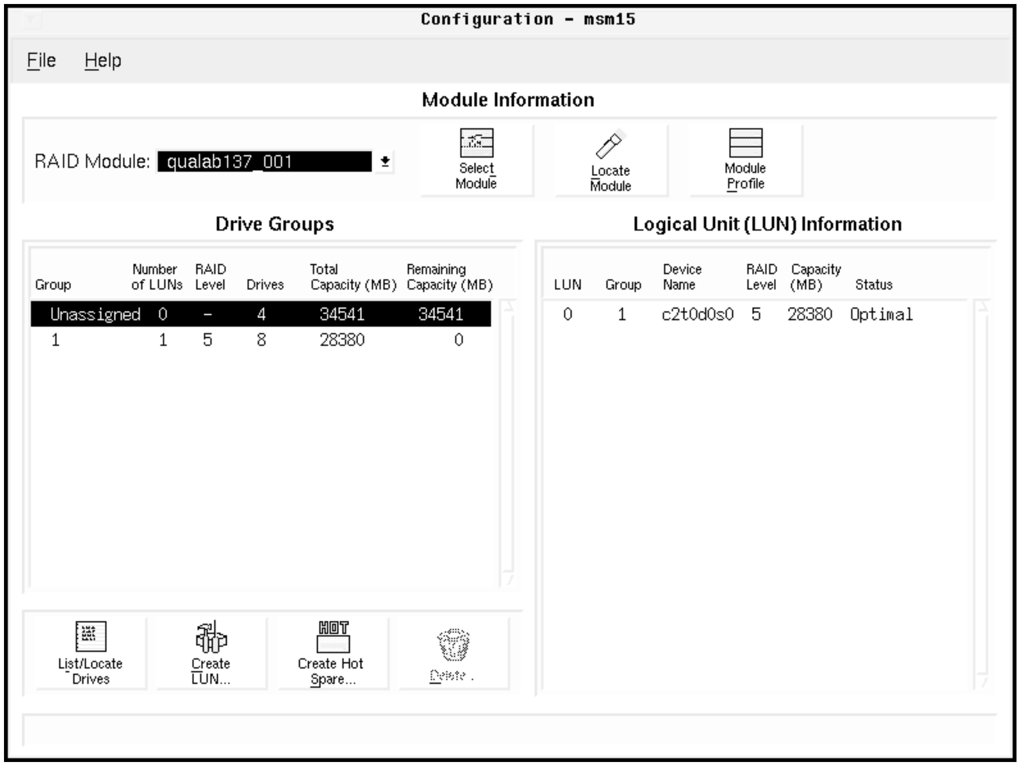


**FIGURE 2-4** Main Configuration Screen

b. **Make sure that the first RAID Module is selected in the RAID Module selection list near the top of the main Configuration screen.**

---

**Note –** If you have more than one RAID Module connected to your host system, each RAID Module appears in the list.

---

c. **At the main Configuration screen, view the current drive groups and LUNs.**

As you highlight a drive group in the list on the left side of the main screen, the corresponding LUNs are highlighted in the LUN Information area on the right side of the screen. You can highlight only one drive group at a time. You *cannot* select or highlight any item in the LUN information list (it is information only).

2. **Locate and label a RAID Module.**

a. **Click Locate Module, then Start.**

The activity lights flash on the drive canisters in this module. Remember that the RAID Module is the *entire unit* and not a particular set of drives.

b. **Physically locate the RAID Module that has its activity lights flashing.**

Once you have identified the RAID Module, place a sticker label on it (for example, RAID Module 001, RAID Module 002, etc.) that corresponds to the number of the RAID Module you selected in Step b of Step 1 above. Use the label for future reference.

c. **Click Stop to turn off the flashing activity lights.**

---

**Note –** It is very important that you save the profile of each RAID Module during initial installation and any time you change your configuration. You can use this information as a reference if you need to perform any recovery or maintenance tasks.

---

3. **Save and print a RAID Module's profile information.**

a. **Make sure the desired RAID Module is selected.**

b. **From the top menu, choose File → Save Module Profile.**

A screen shows the different types of information you can save.

c. **Make sure All is selected (all of the buttons should be selected), then click OK to save all of the types of information.**

A screen display prompts you for a file name.

d. **Enter an appropriate path and file name on the Selection line, then click OK.**

The information is saved to the path and file name you specified.

e. **Print the Module Profile information you saved in Step d using your host system's printer utility.**

4. **(Optional) View a RAID Module's profile.**

   a. **Make sure the desired RAID Module is selected.**

   b. **Click Module Profile.**

      A summary information screen displays (see FIGURE 2-5) information about the controllers, drives, and LUNs in the RAID Module.

   c. **Click Controllers, Drives, or LUNs for more detailed information on these components.**

   d. **Click OK to exit the profile information.**

5. **(Optional) View details on specific drives in a drive group.**

   a. **If you want to know which specific drives comprise a particular drive group, select the drive group (in the main screen) and click List/Locate Drives.**

   b. **Use the drive location information [x,y] provided in the list to physically locate individual drives in the module.**

      You can also select Locate Module to flash the drives' activity lights in the RAID Module.

   c. **Click OK to exit the drive information.**

6. **Repeat Step 1 through Step 3 (and Step 4 and Step 5, if desired) for each RAID Module connected to your host system.**

   You should now have enough information to understand the current configuration for each RAID Module.

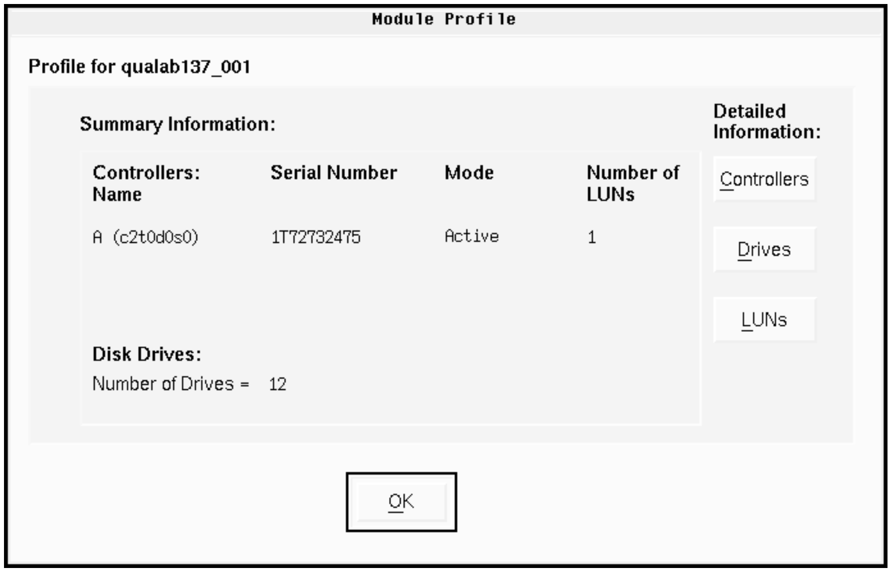


**FIGURE 2-5** Main Module Profile Screen

# Determining if Changes Are Necessary

In the previous section "Determining the Current Configuration" you should have performed the following tasks for each RAID Module connected to your host system:

- Reviewed each module's current configuration (controllers, drives, and LUNs/drive groups).
- Identified each RAID Module using Locate Module and labeled the module.
- Saved the Module Profile information to a file using Save Module Profile, and printed the information.

Now, determine if you need to make any changes to the configuration to meet the requirements of your environment.

1. **Use** TABLE 2-1 **and the Module Profile information you saved and printed to assist you in determining if any changes are necessary.**
2. **If desired, exit the Configuration application.**

**TABLE 2-1** Determine Required Configuration Changes

| Parameter | Description | Why Change? | For More Information |
|---|---|---|---|
| GENERAL PARAMETERS | | | |
| Controller Mode<br><br>**Maintenance/ Tuning** | Applicable controller modes are single active, active/ passive, or active/ active. | If you have an active/passive controller pair, you should consider changing it to active/active for best performance. | See the Maintenance/ Tuning Application chapter in the *User's Guide.*<br>Use the online help in the Maintenance/ Tuning Application. |
| Auto Parity Check/Repair<br><br>**Maintenance/ Tuning → Options** | An automatic parity check/repair process runs each day at a specific time. Defaults are auto parity enabled and run at 2:00 am. | If you want to disable the check/ repair or change the time when it runs. It is highly recommended that you do *not* disable this feature. | See the Maintenance/ Tuning Application chapter in the *User's Guide.*<br>Use the online help in the Maintenance/ Tuning Application. |

**TABLE 2-1** Determine Required Configuration Changes

| Parameter | Description | Why Change? | For More Information |
|---|---|---|---|
| Checking Interval<br><br>**Status→ Options → Log Settings** | The array monitor checks the RAID Modules periodically looking for events and failures.<br>The default is to check every 5 minutes. | If you want to increase or decrease the frequency of the checking interval. | See the Status Application chapter in the *User's Guide.*<br>Use the online help in the Status Application. |
| Hot Spare Drives<br><br>**Configuration → Create Hot Spare** | A hot spare is a drive containing no data that acts as a standby in case a drive fails in a RAID 1, 3, or 5 LUN.<br>The hot spare adds another level of redundancy to your RAID Module. | If you want to create new or additional hot spare drives for added protection. | See the Configuration Application chapter in the *User's Guide.*<br>Use the online help in the Configuration Application. |
| LUN PARAMETERS | | | |
| RAID Level or Number of Drives<br><br>**Configuration → Delete**, then **Create LUN** | Specifies how the data is striped across the drives and how many drives comprise a drive group/LUN. | If the current RAID Level is not appropriate for your environment, or you need to change the number of drives.<br>**Note**: This requires you to delete and re-create the LUN(s)/drive group you want to change. | See the Configuration Application chapter in the *User's Guide.*<br>Use the online help in the Configuration Application. |
| Segment Size<br><br>**Configuration → Delete**, then **Create LUN → Options** | Specifies in 512-byte blocks how much data is written to one drive before data is written to another drive in the group. | If the segment size is not appropriate for your environment.<br>**Note**: This requires you to delete and re-create the LUN(s) you want to change. | See the Configuration Application chapter in the *User's Guide.*<br>Use the online help in the Configuration Application. |

**TABLE 2-1** Determine Required Configuration Changes

| Parameter | Description | Why Change? | For More Information |
|---|---|---|---|
| Capacity<br><br>**Configuration ➔ Delete**, then **Create LUN ➔ Options** | Specifies in Mbytes how much capacity is available on the LUN(s). | If you want to increase or decrease the capacities.<br>**Note**: This requires you to delete and recreate the LUN(s) you want to change. | See the Configuration Application chapter in the *User's Guide.*<br>Use the online help in the Configuration Application. |
| Caching<br><br>**Maintenance/ Tuning** | Specifies the caching parameters for each LUN. | If you want to enable or disable any of these parameters. | See the Maintenance/ Tuning Application chapter in the *User's Guide* to change caching parameters on existing LUNs, or use the online help.<br>See the Configuration Application chapter in the *User's Guide* if you are creating new LUNs, or use the online help. |
| LUN Assignment and LUN Balancing<br><br>**Configuration ➔ Create LUN ➔ Options**<br><br>**Maintenance/ Tuning** | Determines what controller owns which LUNs/ drive groups.<br><br>(Not applicable to single-controller configurations.) | To reassign or balance the LUNs/ drive groups between controllers in an active/active pair. | See the Maintenance/ Tuning Application chapter in the *User's Guide* to change LUN Assignments on existing LUNs, or use the online help.<br>See the Configuration Application chapter in the *User's Guide* if you are creating new LUNs, or use the online help. |
| Reconstruction Rate<br><br>**Maintenance/ Tuning** | Determines how quickly reconstruction occurs on a LUN when a failed drive is replaced. | To increase or decrease the reconstruction performance. | See the Maintenance/ Tuning Application chapter in the *User's Guide*.<br>Use the online help in the Maintenance/ Tuning Application. |

## What’s Next?

Now that you have successfully completed the installation of the software, refer to the *Sun StorEdge RAID Manager User’s Guide* for detailed information on how to use each application and to make any changes that you determine are necessary.

Continue with Chapter 3, “Common Questions and Troubleshooting” for troubleshooting tips on problems you may encounter as you use this software with the Solaris operating environment.

CHAPTER 3

# Common Questions and Troubleshooting

## Common Questions

This chapter contains answers to common questions about using and troubleshooting the Sun StorEdge RAID Manager software.

**Note –** If you cannot find the question you are looking for, consult the *Sun StorEdge RAID Manager User's Guide* for additional common questions that are independent of the specific operating system.

**TABLE 3-1** Common Questions About Using Sun StorEdge RAID Manager Software

| **How many logical units can I have per RAID Module?** |
|---|
| Both the operating system and the host adapter limit the maximum number of LUNs they can support. However, it may be possible to support up to 32 LUNs on a RAID Module. Because this can involve several support changes, carefully follow the information and procedures in "Configuring the Solaris Environment to Support Sun StorEdge RAID Manager" in Chapter 1. These changes include installing patches for the version of Solaris you are using, determining how many LUNs you can support (varies on the type of host adapter you have), and changing certain parameters in the `rmparams` file. |

**TABLE 3-1** Common Questions About Using Sun StorEdge RAID Manager Software

| How can I remove logical units from VERITAS control? |
| --- |
| **Important**<br>If you are using VERITAS and you want to perform any Sun StorEdge RAID Manager operation that requires exclusive access of the LUNs, you first need to remove the affected logical units/drive groups from VERITAS control, then unmount the devices. Such operations include **Delete** for LUNs and **Reset Configuration** (Configuration), fixing Multiple Drive Failures with **Recovery Guru** and formatting a LUN with **Options ➔ Manual Recovery ➔ Logical Units** (Recovery), and **Firmware Upgrade ➔ Offline** method (Maintenance/Tuning).<br>1. Remove the LUN from its disk group by typing: **vxdg [-g groupname] rmdisk** *diskname*<br>For example, type: vxdg -g rootdg rmdisk disk01<br>2. Remove the LUN from Volume Manager control by typing: **vxdisk rm** *devname*<br>For example, type: vxdisk rm c1t0d0s2<br>3. Place the physical LUN offline by typing: **vxdisk offline** *devname*<br>For example, type: vxdisk offline c1t0d0s2 |
| **Are there special considerations when creating the LUNs/drive groups on a RAID Module?** |
| If you are currently creating/formatting the first LUN *and* attempt to create another LUN on a different drive group before the first LUN's format is completed, the first LUN's status changes to Dead, then to Optimal after it is formatted. Subsequent LUNs on the different drive group should be formatted successfully. However, subsequent LUNs on the same (first) drive group could fail to be created.<br><br>This restriction applies to both the GUI and command line program `raidutil`. |
| **Action:**<br>*Wait* for the format to finish on the first drive group/LUN before creating LUNs on additional drive groups. |

**TABLE 3-1** Common Questions About Using Sun StorEdge RAID Manager Software

**What do I need to do *after* creating a LUN?**

Once you create a LUN using the Configuration Application, you have to make it part of the operating system. Refer to your Solaris documentation for details on adding a drive. Remember, each LUN (not a drive group) is seen by the operating system as *one* drive.

**Can I disable the RDAC (redundant disk array controller) protection feature?**

Yes. It is possible to disable the RDAC protection by adding the Rdac_SupportDisabled parameter to the `/etc/raid/rmparams` file and setting the value to TRUE. You also need to reboot your system (`boot -r`) for this change to take effect. See the `rmparams` man page for an explanation of this parameter.

### Caution

If you do *not* have RDAC protection, certain features do not work as described in the *User Guide*:

• **Configuration** — cannot check for I/Os before deleting LUNs. Therefore, make sure you stop I/Os and no other users are on the system before selecting **Delete LUN**.

• **Recovery** and **Status** — **Recovery Guru** and **Health Check** may not display the Data Path Failure type for every condition. Therefore, thoroughly verify that the interface cable/ terminator is not removed or damaged before proceeding with any controller-related recovery procedure.

• **Maintenance/Tuning** — does not check for I/Os or verify LUNs are Optimal before upgrading firmware, balancing LUNs, or changing controller mode:

1. **Firmware Upgrade** — the **Online** method for Firmware Upgrade is grayed out. Before selecting the **Offline** method of Firmware Upgrade, you must stop I/Os and unmount any file systems contained on the affected LUNs.
2. **LUN Balancing/Controller Mode** — make sure you stop I/Os because they could fail. Also, if the LUNs contain file systems, you must first unmount them.

**What files do I need for upgrading firmware?**

You need to copy the appropriate controller firmware files to your host system.

### Controller Firmware Files

When you receive new controller firmware files, copy them to your host system before attempting to perform the upgrade procedure. With any new controller firmware upgrade, you should receive one to three firmware files and the `fwcompat.def` file. This last file allows the software to compare the firmware files for compatibility during the upgrade process, providing you with a list of compatible files to select for downloading. Also, the software searches the default installation directory
`/etc/raid/fw` for these files.

### Important

If you do not copy `fwcompat.def` file to the host system, the software is unable to check the files for compatibility. Although you can still enter firmware filenames and download them, you do *not* have the protection that this compatibility check provides.

**TABLE 3-1** Common Questions About Using Sun StorEdge RAID Manager Software

| **What environment variables do I need to update after installing the Sun StorEdge RAID Manager software?** |
|---|
| After installing the Sun StorEdge RAID Manager software, you must include the following location in your `$PATH` environment variable to enable command line access to the various tools and utilities: `/usr/sbin/osa` |
| **Are there any automation tools for building and configuring my Sun StorEdge A3x00 system?** |
| A set of configuration scripts has been included in this product to help you set up RAID configurations. The scripts provide a "turnkey" setup mechanism based on several default configurations, and they can also be used as templates for building your own custom configurations. These scripts and an associated `README` can be found in the following directory on the CD: `/Tools/default_configs`<br><br>**Note**<br>These scripts are designed specifically for use with Seagate ST15230W 4.2 Gbyte disk drives. The scripts will need to be modified if other disk drives are used in the configuration. |
| **Can I configure Sun StorEdge devices during SunInstall?** |
| It has been reported that some problems exist when attempting to configure Sun StorEdge A1000 and Sun StorEdge A3x00 devices during SunInstall. Therefore, you should not configure these devices during SunInstall. Instead, wait until Solaris has completed installation on the host system disks and until all required patches have been installed. |
| **If I remove the Sun StorEdge A1000 or Sun StorEdge A3x00 controller module from my system, do I need to remove the software as well?** |
| If you remove the controller module, you should also remove the Sun StorEdge RAID Manager software to avoid any potential problems. |
| **I have replaced a bad controller with a new one and upon bringing up the Sun StorEdge RAID Manager software, it shows that the new controller is marked as *passive*. Is this expected behavior? How do I set the controllers back to *active/active* mode?** |
| There are some conditions during administration of Sun StorEdge A3x00 systems using the Sun StorEdge RAID Manager software that can cause controllers to set to *active/passive* mode. You can reset the controllers to the *active/active* state as follows:<br><br>1. Go to the Maintenance and Tuning application of `rm6`.<br>2. Select the RAID Module you want to change.<br>3. Select the Controller Mode icon.<br>The controller state will be listed.<br>4. Select the button to switch to Active/Active.<br>You will be prompted to balance the LUNs. Select this option if desired. |
| **Are there some things I can do from the Sun StorEdge RAID Manager graphical user interface (GUI) that I can't do from the command line and vise versa?** |
| Yes, Some functionality differences exist between the command line interface (CLI) utilities provided with the Sun StorEdge RAID Manager software and the GUI facility. The functionality differences are documented in TABLE 3-2 for reference only and are subject to change. Where appropriate, the section under the GUI or the applicable CLI utility used to perform the indicated function is included in the table. |

**TABLE 3-2** Functionality Differences Between the Sun StorEdge RAID Manager Graphical User Interface and the Command Line Interface

| Functionality | GUI | CLI |
|---|---|---|
| Display/modify/correct NVSRAM | No | Yes (`nvutil`) |
| Parity check and repair | Yes — all, some or one LUN(s); manual or automatic start (Recovery Guru) | Yes — all or one LUN(s); manual start only (`parityck`) |
| Create/delete LUN(s) | Yes — all RAID levels; max 20 drives per LUN (Configuration) | Yes — all RAID levels; max 30 drives per LUN (`raidutil`) |
| Create/delete Global Hot Spare(s) | Yes (Configuration) | Yes (`raidutil`) |
| Set LUN reconstruction rate | Yes (Maintenance/Tuning) | Yes (`raidutil`) |
| Configure/enable/disable LUN Read-Ahead Caching | No | Yes (`raidutil`) |
| Enable/disable LUN write, mirrored, nonvolatile caching | Yes (Maintenance/Tuning) | Yes (`raidutil`) |
| Print Caching Mode Page | No | Yes (`raidutil`) |
| Report drive status and detailed information (serial number, size, firmware, etc.) | Yes (Module Profile) | Yes (`drivutil`) |
| Report available space on a drive group | Yes (Configuration) | Yes (`drivutil`) |
| Report LUN status and detailed information (size, RAID level, number of pieces, etc.) | Yes (Module Profile) | Yes — reports LUN RAID level and size only (`raidutil,drivutil`) |
| Report controller firmware version and SCSI Inquiry information | Yes (Module Profile) | Yes (`raidutil`) |
| Report controller device name, serial number, owned LUNs | Yes (Module Profile) | Yes (`lad`, `rdacutil`, `raidutil`) |
| Report controller status and mode | Yes (Module Profile) | Yes (`rdacutil`) |
| Load balancing | Yes — even/odd load balancing; LUN-by-LUN load balancing (Maintenance/Tuning) | Yes — even/odd load balancing (`rdacutil`) |
| Fail and unfail controllers | Yes (Recover Guru) | Yes (`rdacutil`) |
| Fail and unfail drives | Yes (Recovery Guru) | Yes (`drivutil`) |
| Controller mode switch | Yes — Active/Passive to Passive/Active, Active/Passive to Active/Active (Maintenance/Tuning) | Yes —- Active/Passive to Passive/Active, Active/Passive to Active/Active, Active/Active to Active/Passive (`rdacutil`) |

| Functionality | GUI | CLI |
|---|---|---|
| Locate RAID Module or drive group | Yes (Configuration) | No |
| Perform a Health Check on a RAID Module | Yes (Status) | Yes (`healthck`) |
| Report LUN reconstruction progress | Yes (Status) | No |
| Report RAID module events/ errors | Yes (Status) | Yes (`logutil`) |
| Report detailed instructions for recovering from component failures | Yes (Recovery Guru) | No |
| Manually start reconstruction on a drive | Yes (Recovery Guru) | No |
| Revive a drive or LUN | Yes (Recovery Guru) | Yes (`drivutil`) |
| Upgrade controller firmware | Yes (Maintenance/Tuning) | Yes (`fwutil`) |

# Troubleshooting: Solaris Solutions

The troubleshooting tables that follow provide probable cause and action to take for specific problems you may have as you use the Sun StorEdge RAID Manager software with the Solaris operating environment.

The first section includes general topics that you might encounter using any of the applications. The sections that follow are organized by application.

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**Note –** If you cannot find the problem you are looking for, consult the *User's Guide* for additional troubleshooting information. The *User's Guide* troubleshooting is independent of the specific operating system.

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**Note –** Be sure to read "Software Limitations" on page 24 for the restrictions and important notes for using this software in the Solaris environment.

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- General — page 48
- Configuration Application — page 51
- Status Application—Message Log — page 53
- Recovery Application—Recovery Guru — page 54
- Maintenance/Tuning Application—Firmware Upgrade — page 55

## General

In TABLE 3-3, you will find general problems you could have in all applications:

**TABLE 3-3** General Troubleshooting

| |
|---|
| **Software does not load when you type `rm6` at the prompt.** |
| **Cause:** The OpenWindows environment may not be running, or the `rmparams` file may be corrupted or missing from the installation (`/etc/raid`) directory. |
| **Action**:<br>1. Start the OpenWindows environment and try to start the software again. (See "Starting the Software" on page 28 if you need more information on starting this software.)<br><br>2. Copy the backup `/etc/default/rmparams` file to the `/etc/raid` directory and try to start the software again.<br><br>**Important**<br>The `rmparams` file is required for normal operation of the Sun StorEdge RAID Manager utilities. Therefore, if you make any changes to the `/etc/raid/rmparams` file, copy the edited file to the `/etc/default` directory. |
| **Font display problems on screen.** |
| **Cause:** Sun StorEdge RAID Manager uses the iso8859 font/character set for its various displays. If you do not have these fonts installed, then Sun StorEdge RAID Manager will use the fonts that are available which could cause minor display problems. |
| **Action:** Verify that you have two Sun font packages installed:<br>1. At the system prompt, type: `pkginfo SUNWxwoft SUNWxwcft`.<br><br>2. If *both* packages do not exist, install them. |
| **Some logical units are not visible on screen.** |
| **Cause:** Any time a long operation is being performed (such as formatting LUNs, upgrading controller firmware, checking/repairing parity, etc.) on logical units (LUNs), these LUNs do not appear on the screen *except* in the application where the operation was initiated. The software uses a file (`/etc/raid/lunlocks)` to hide these LUNs from the other applications, so that no other operations can be performed on them until the current operation is completed. For example, if you started a format in the Recovery Application, these LUNs show a "Formatting" status in Recovery, but do not appear in any other application.<br><br>Should the utility holding the LUN lock come to an abnormal termination (that is, if it crashes), these LUNs may remain hidden from the other applications. |

**TABLE 3-3** General Troubleshooting *(Continued)*

**Action**:
1. Wait for the operation to be completed, or perform operations on a different RAID Module.
2. If the utility holding the LUN lock crashes and/or you do not see LUNs that you know exist, do the following:
- Remove the lunlocks file (`rm /etc/raid/lunlocks`).
- Re-create this file (`touch /etc/raid/lunlocks`).
- Exit, then re-enter the application that could not see the LUN.

**Some controllers/RAID Modules are not visible on screen.**

**Cause**: If controllers or RAID Modules are not displayed and you know they exist, there could be some faulty connection between the RAID Module and the host adapter/network card. It is also possible that the RAID software or operating system does not yet recognize the devices. Less likely, the NVSRAM settings for the module's controllers may not be set properly to run this software. Normally, these settings are changed automatically during installation, and any incorrect settings are detected and corrected by the software.

**Action**:
1. Verify there is no problem on the data path:
- Select **Recovery Guru** and follow the **Fix** procedures for any component problem detected.
- Check the interface cables or network connections, as well as the SCSI IDs of the controllers. If they appear OK, turn off power to the module, and turn it back on.

**OR**

2. If you see a message (on the console) that incorrect NVSRAM settings have been fixed, immediately reboot the operating system (connected to your RAID Modules via SCSI cable) so the new settings can take effect.

**"Cannot secure access to the LUNs" message displays (operations won't run for a selected RAID Module).**

**Cause:** Most likely a second application has requested exclusive access to the selected RAID Module when some other application has already secured access.

Many operations require exclusive access to the affected drive group/LUNs until its operation is completed (Sun StorEdge RAID Manager "locks" these components to secure this access). Also, if the affected LUNs have mounted file systems or are under VERITAS control, Sun StorEdge RAID Manager cannot gain exclusive access. Either this message is displayed, or the second request is denied and an error message indicates that the module has I/Os occurring or file systems are present. Operations requiring exclusive access include:

**Delete** for LUNs and **Reset Configuration** (Configuration); fixing Multiple Drive Failures with **Recovery Guru** and formatting a LUN with **Options** → **Manual Recovery** → **Logical Units** (Recovery); and **Firmware Upgrade** → **Offline** method (Maintenance/Tuning).

**TABLE 3-3** General Troubleshooting *(Continued)*

| |
|---|
| **Caution**<br>If the RAID Module has a multi-host configuration, use caution when performing the tasks that need exclusive access to ensure the two hosts do not send conflicting commands to the controllers in the RAID Modules.<br><br>**Action**:<br>1. Wait for any Sun StorEdge RAID Manager operation that has secured exclusive access to the LUNs to be completed before performing another operation on the same RAID Module.<br>2. If no other Sun StorEdge RAID Manager operations are running and the RAID Module has LUNs with mounted file systems,<br>• Stop I/Os to the affected RAID Modules.<br>• Unmount the file systems on the RAID Module and select the operation again. If you are unable to unmount the file systems (this may occur if writes were occurring when drives failed), reboot your system.<br>• If you are using VERITAS, you need to remove the LUNs from VERITAS control. See “How can I remove logical units from VERITAS control?” on page 42. |
| **Solaris doesn’t use the new device name when LUN ownership is transferred between controllers (Maintenance/Tuning → LUN Balancing).** |
| Although the device name will update in the application’s screen displays, Solaris continues to use the original path (first controller’s device name) until you perform a reboot (`boot -r`) to recognize the configuration change. |
| **“Help files are missing or corrupted” message** |
| **Action:** Check that the correct Help files are installed in the `/etc/raid/bin/` directory. You should have five help files: `helpcfg.txt`, `helpstat.txt`, `helprecv.txt`, `helpmnt.txt`, and `glossary.txt`. Re-install them if necessary. |

# Configuration Application

**TABLE 3-4** Troubleshooting for Configuration Changes

| **Total capacity (main window) and available capacity (Create LUN screen) isn't correct for a RAID Module that has drives with different capacities.** |
|---|
| If your unassigned drive group contains drives with different capacities, such as 9-GB and 4-GB, then Configuration initially bases the total capacity and available capacity of the unassigned drive group (displayed in the Create LUN screen) on the capacity of the smaller drives. For example, if the unassigned drive group consisted of three 9-GB drives and two 4-GB drives, then the total/available capacity shown would be 8 GB (4-GB x 2).<br><br>Furthermore, if you create LUNs using mixed capacity drives, you use only the smallest capacity available (4-GB) and you *cannot* access the additional capacity on the larger drives. |
| **Action**: To avoid wasting the additional capacity of the larger capacity drives when creating logical units, select drives of the same capacity:<br><br>1. Highlight the **Unassigned** drive group.<br>2. Select **Create LUN** and set the desired RAID Level, number of drives, and number of LUNs.<br>3. Click **Options** → **Drive Selection** and choose specific drives that share the same capacity (large or small).<br><br>For example, if you were going to create a three-drive RAID 0 LUN and the unassigned drive group contains 5 drives (two 2-GB drives and three 4-GB drives), you want to select the larger capacity drives. Once you select the number of drives in the main Create LUN screen, the available capacity is initially reported as 6-GB (instead of 12-GB). However, using Options ' Drive Selection you can select the three 4-GB drives (move them to the Selected Drives box) and the correct available capacity is reported. |

**TABLE 3-4** Troubleshooting for Configuration Changes *(Continued)*

| |
|---|
| **"The hot spare you just created at drive location [x,x] has a smaller capacity than some of the drives in the module" message.** |
| **Cause:** Hot spares cannot cover for drives with a larger capacity (that is, a 4 GB hot spare drive cannot stand in for a 9 GB failed drive). If your unassigned drive group contains drives with different capacities, then the Configuration Application selects the first available drive, *which may not be the largest capacity.* |
| **Note**: Remember [x,y] indicates the unique location of the drive in the selected RAID Module. This identifier corresponds to the drive's SCSI Channel number and SCSI ID where the channel number is always listed first. For example, [2,8] corresponds to the drive at location SCSI Channel 2 and SCSI ID 8.<br><br>**Important**<br>The unassigned drive group must contain a drive of the largest capacity in order for you to create a hot spare that can cover for any failed drive in the RAID Module.<br><br>1. *Before* creating hot spares, use **List/Locate Drives** to determine the sizes of the drives in the RAID Module, and to record the capacities and location of the larger-capacity drives in the unassigned drive group.<br>2. In the main Configuration screen, highlight the **Unassigned** drive group.<br>3. Select **Create Hot Spare**.<br>4. Select the number of hot spare drives you want to create, then select **Options**.<br>5. Does a larger-capacity drive appear in the Selected Drives list?<br>• YES. Select **Create**.<br>• NO. Highlight a larger-capacity drive in the Unselected Drives list. Select **Move**. Select **Create**. |

# Status Application—Message Log

**TABLE 3-5** Troubleshooting for Message Log

| Unexpected information in Message Log. |
|---|
| **Cause:** If you do not see the information you expect in Message Log, most likely your default log file is new or has been cleared recently. It could also mean that there are no messages for the message type you selected (from List Type), or for the RAID Module you selected. Normally, no messages in the log indicates that no events have been detected, so nothing has changed, gone wrong, or been corrected.<br><br>**Note**: It is possible to detect and correct problems using Health Check before the background monitor detects them, especially if you change the checking interval to a time larger than the default setting (five minutes). In such cases where you correct problems before the background monitor detects them, these events are *not* written to Message Log. |
| **Action:** If you do not see any messages and feel that an empty log is not possible:<br><br>1. Select List Type to be sure that All message types are selected.<br>2. Try selecting another module or All RAID Modules.<br>3. Check Current Log File at the bottom of the screen to verify that it matches the log file specified as the default in Log Settings. The default log is the file new messages are written to.<br>4. From the top menu, choose File → Open Log to view a different log file.<br><br>If these do not work, try the following for your Solaris operating system:<br>a. Check the file permissions of the log file. Does root have read/write access to the file?<br>b. If the file does not exist, does root have read/write/execute access to the directory? Execute access to a directory means the ability to get a directory listing.<br>c. Is the `arraymon` daemon actually running? Type `ps -ef \| grep array` to look for the process.<br>d. Does the script `/etc/raid/bin/rmscript` exist and have at least the `putplog $1` line?<br>e. Does root have read/execute privileges for the `/etc/raid/bin/rmscript` file?<br>f. Does the executable `/etc/raid/bin/putplog` exist and have execute privileges? |

# Recovery Application—Recovery Guru

**TABLE 3-6** Troubleshooting for Recovery Guru

| **Cannot secure access to the LUNs .** |
|---|
| **Cause:** If you have multiple drive failures on a LUN/drive group, Recovery Guru needs exclusive access to that LUN in order to provide instructions for replacing the failed drives and restoring the LUN. If file systems are mounted on the affected LUN, Recovery Guru does not have this access.<br><br>**Note:** This also can occur if a single drive fails in a module without RAID technology. |
| **Action**:<br>1. Wait for any Sun StorEdge RAID Manager operation that has secured exclusive access to the LUNs to be completed before performing another operation on the same RAID Module.<br>2. If no other Sun StorEdge RAID Manager operations are running and the RAID Module has LUNs with mounted file systems,<br>• Unmount the file systems on the RAID Module and select the operation again. If you are unable to unmount the file systems (this may occur if writes were occurring when drives failed), reboot your system.<br>• If you are using VERITAS, you need to remove the LUNs from VERITAS control. See “How can I remove logical units from VERITAS control?” on page 42. |

# Maintenance/Tuning Application—Firmware Upgrade

**TABLE 3-7** Troubleshooting for Maintenance/Tuning

| **Cannot secure access to LUNs (when upgrading controller firmware)** |
|---|
| **Cause:** The software needs exclusive access to the LUNs in order to perform an Offline firmware upgrade in the Maintenance/Tuning Application. |
| **Action**:<br>1. Wait for any Sun StorEdge RAID Manager operation that has secured exclusive access to the LUNs to be completed before performing another operation on the same RAID Module.<br>2. If no other Sun StorEdge RAID Manager operations are running and the RAID Module has LUNs with mounted file systems,<br>• Unmount the file systems on the RAID Module and select the operation again. If you are unable to unmount the file systems (this may occur if writes were occurring when drives failed), reboot your system.<br>• If you are using VERITAS, you need to remove the LUNs from VERITAS control. See "How can I remove logical units from VERITAS control?" on page 42. |
| **No firmware files/version(s) display.** |
| **Cause:** If the area under Compatible Files/Version(s) is blank after you select Firmware Upgrade, then the default directory does not contain *all* the necessary firmware files or the `fwcompat.def` file does not recognize the release version of your controller firmware. Remember that the software first searches the default installation subdirectory (`/etc/raid/fw/`) for the firmware files and the `fwcompat.def` file. If you copy these files to another directory, remember that it must also contain `fwcompat.def`, or you will see a `no compatible files found` message. |
| **Action**:<br>1. If you copied the files to some directory other than the default directory, enter that directory on the Path line, then select **OK**. If you have copied these files to another directory, remember that it must also contain `fwcompat.def`, or you will see a `no compatible files found` message.<br>2. Recopy the firmware files and the `fwcompat.def` file to the `fw` directory and try the firmware upgrade process again.<br><br>**Note**: You should select the version line that has both Firmware Level and Boot Level versions specified.<br><br>3. If the upgrade fails a second time, obtain a new copy of the firmware upgrade files. |

APPENDIX **A**

# Reference Material

This appendix includes the following reference material:


- NVRAM Settings — page 57
- rmparams File Listing — page 58
- rmscript File Listing — page 63
- man pages — page 66


## NVRAM Settings

During installation of the software, the `nvutil` program (which is part of the installation package) will automatically check and, if necessary, change any NVRAM settings on the controllers in the RAID Modules necessary to run Sun StorEdge RAID Manager. Thus, in most cases, you should have no concerns about NVRAM settings and will need to read no further in this section.

However, if you have a RAID Module that has one controller and you are not seeing the controller using the `Module Profile` option in any of the applications (such as Configuration or Status), or you are seeing unusual behavior, you may need to change some NVRAM settings. You can use the command line `nvutil` program for this purpose. View the `nvutil` man page for online usage instructions.

---

**Note –** If you make any changes with `nvutil`, reboot the system. If you do not want to have to shut down your system, cycling power on the RAID Module without a reboot is sufficient *unless* you have changed the values at offset 0x0011 or 0x0024.

---

# rmparams File Listing

The following is a complete listing of the rmparams file. Note that some values/ entries may not be the same as the file on your system.

**Note –** The rmparams man page documents the parameters that are considered safe for users to modify. All other parameters should be left alone.

**Caution –** Because of the critical nature of the rmparams file, a backup copy of the file has been installed in the /etc/raid/ directory. If the rmparams file becomes corrupted or missing, copy the /etc/raid/rmparams file to the /etc/raid directory to resume normal operation. If you make any changes to this file directly or use the options in the GUI that write to this file (such as log settings, auto parity settings, etc.), always copy the new version of the file to the /etc/raid directory.

```
#***************************************************
#***       IDENTIFICATION ***
#***************************************************
#
# Name:                    rmparams
# Summary:                 RAID Manager Parameters File
# Component: solsysd
# Version:                 8
# Update Date:%
# Programmer: %
#
#          COPYRIGHT 1996, 1997 by Symbios Logic Inc.
#
# Description:
```

```
# The RAID Manager Parameters File holds runtime parameters for RAID Manager. RAID Manager programs access these values via the GetParam and PutParam interfaces (params.c). This scheme provides some control over RAID Manager behavior without use of command line options or program recompilation.

#

# Reference:

# 1. PIP0003A.DOC, Source Code Integrity Measures

#

#Coding Standard Waivers:

#*****************************************************

# System Parameters


System_AltDevDirRoot=/dev/symsm/dev/rdsk

System_LunlocksDirPath=/etc/symsm/lunlocks

System_MaxLunsPerController=8

System_MaxControllers=32

System_NamefileDirPath=/etc/symsm/mnf

System_RmHomeDirectory=/usr/lib/symsm

System_NametempDirPath=/etc/symsm/nametmp

System_TimestampDirPath=/etc/symsm/timestamps

System_RmBootHomeDirectory=/usr/lib/symsm/bin

System_RmFirmwareDirectory=fw

System_MaxHostAdapters=32

System_MaxSCSIid=31

System_MaxLunsPerHostAdapter=16

System_SafePassThroughLun=0

System_LunReDistribution=TRUE

System_NvsramDefDirPath=/usr/lib/symsm/fw/
```

```
System_RdacBlkDirectory=/dev/symsm/dev/dsk

System_RdacChrDirectory=/dev/symsm/dev/rdsk

System_UnprotectedOfflineUpgradeAllowed=FALSE

System_DefaultModuleSelect=FALSE


# Array Monitor Parameters


Monitor_PollInterval=5

Monitor_ParityTime=02:00

Monitor_PchkEnabled=1

Monitor_ParityName=bin/parityck -aqf


# Graphical Viewer Parameters


Viewer_Log_Opened = rmlog.log

Viewer_Controller= All DiskArrays

Viewer_Select1= NONE

Viewer_Inequallity1= NONE

Viewer_Conjunction1= NONE

Viewer_Phrase1= NONE (NOTE: This value could be set to NONE or
it could appear blank)

Viewer_Select2= NONE

Viewer_Inequallity2= NONE

Viewer_Conjunction2= NONE

Viewer_Phrase2= NONE (NOTE: This value could be set to NONE or
it could appear blank)

Viewer_LogSize= 40


Help_Files_Directory       = help/
```

```
Help_Files_GlossaryName    = help/glossary.txt

# Parity Assurance Parameters

# Limits for Parity_Amount is 1000 to 37767
# Limits for Parity_Delay is 0 to 10

Parity_Amount=10000
Parity_Delay=1

# Notification Parameters

Notify_LogName=rmlog.log
Notify_LogEnabled=1
Notify_ScriptName=usr/lib/symsm/bin/rmscript

# The System_CatalogLanguage parameter corresponds to
# the set ID in the RAID Manager message catalog.
# Supporting a new language involves adding a new set to
# the messages.cat file and setting the
# System_CatalogLanguage parameter to the new set ID. The
# currently defined sets are:
#
#         Set ID            Language
#         ______   ________
#
#           101              ENGLISH
#
```

```
# RAID Manager reserves sets 101 and above for its use; sets 1-
100 are available for user customization.

System_CatalogLanguage=101

# RDAC driver/Resolution Daemon Failover parameters

Rdac_SupportDisabled=FALSE
Rdac_Forced_Quiescence_Flag=TRUE
Rdac_Fail_Flag=TRUE
Rdac_Quiescence_Timeout=5
Rdac_Ioctl_Retry_Flag=TRUE

#SNMP Trap Notification Daemon Definitions
#SNMP_Action_Number=0 - no notifications are sent
#SNMP_Action_Number=1 - SNMP version one traps are sent
#SNMP_Action_Number=2 - all relevant data is written to the
file trap.dat

SNMP_Target_IP_Address=127.0.0.1
SNMP_Community_Name=NONE
SNMP_Action_Number=0
```

# rmscript File Listing

The following is a complete listing of the `rmscript` file. Note that some values/ entries may not be the same as the file on your system.

---

**Caution –** The last line in the `rmscript` file must *always* be `rm $1`.

---

```
#!/bin/sh


#####################################################

###          IDENTIFICATION###

######################################################

# Name: rmscript


# Title: Initial RAID Manager event notification script

# for Solaris

# Version:

# Revision:

# Update Date:

# Programmer:

# Documents:

#

# COPYRIGHT 1995 SYMBIOS LOGIC

#

# Description:

# This script is called by the RAID Manager application

# or daemon every time a new event has been detected.

# The application creates an event record and saves it
```

```
# in a file whose name is passed as the first argument
# to this script.
#
# After initial installation, users may change this
# script to add or remove features, such as mailing
# the superuser account, etc. However, this script
# should always call putplog to update the proprietary
# log (disabling of this can be done via the parameter
# file), and it must delete the event file when it is
# done with it.
#
# Add the event to the proprietary log
putplog $1

# Add the event to the syslog
EVTYPE=‘cut -d\~ -f6 $1‘
if [ EVTYPE != 30 ]



then
(case $EVTYPE in
# An AEN event
00) awk -F\~ 'NF > 0 { printf “AEN event Host=%s Ctrl=%s
Dev=%s\n
ASC=%s ASCQ=%s FRU=%s LUN=%s LUN Stat=%s\n Sense=%s”, $1, $2,
$3, substr($7,1,2), substr($7,3,2), $8, $9, $10, $11 }' < $1;;
#
#Mode Page events are ignored for now
#10) ;;
```

```
#

#Parity event

20) awk -F\~ 'NF > 0 { printf "Parity event Host=%s Ctrl=%s
Dev=%s\n

Start Blk=%s End Blk=%s # Blks=%s LUN=%s ", $1, $2, $3, $7, $8,
$9, $10 }' < $1;;

#

#Text events are ignored for now

90) ;;

esac) | ( if [ -x "/usr/ucb/logger" ]

  then

       /usr/ucb/logger -t raid -p user.err

            elif [ -x "/usr/bin/logger" ]

  then

       /usr/bin/logger -t raid -p user.err

  fi

  )


# Mail the superuser that an event has occurred

(awk -F\~ 'NF > 0 { printf "An array event has been detected on
Controller %s \n  Device %s at Host %s - Time %s %s\n", $2, $3,
$1, $4, $5 }' < $1;

 echo "\nGo to the Message Log in the Status Application for
details" ) | mailx -s "raid Event" root


case $EVTYPE in

    00) cCode="`cut -d\~ -f7 $1`"

         cCode="`echo 0000$cCode`";;

    20)cCode="`cut -d\~ -f11 $1`";;

    90)cCode="`cut -d\~ -f11 $1`";;
```

```
esac

ctrlName=”`cut -d\~ -f2 $1`”

hostName=”`cut -d \~ -f1 $1`”

hostIP=”`nslookup $hostName | sed -n '5,5p' | cut -d : -f2`”


trapcntl $cCode $ctrlName $hostIP $hostName

fi


# Delete the event file (needed since arraymon does not do
this)

rm $1
```

# man pages

The following man pages provide supplementary information for disk array management and administration.

- arraymon
- lad
- logutil
- nvutil
- parityck
- raidman
- raidutil
- rdac
- rdacutil
- rdaemon
- rmevent
- rmparams
- rmscript
- storutil

Some tasks are carried out automatically by `daemon` processes that run from system startup to system shutdown. There are, however, command line utilities that enable you to embed customized and/or interactive operations.

For an overview of the Sun StorEdge RAID Manager graphical user interface, command line programs, daemon programs, driver modules, and customizable elements, see the `raidman` man page.

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