



# Solaris Resource Manager 1.3 Installation Guide

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# Preface

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This guide describes how to install Solaris™ Resource Manager 1.3 on systems running the releases of Solaris *SPARC™ Platform Edition* listed in Chapter 1. It covers the Solaris Resource Manager 1.3 packages described in Table 1–6. This document is applicable to all releases of the Solaris Resource Manager product.

Troubleshooting tips and instructions on how to remove the Solaris Resource Manager 1.3 software from your system are also provided.

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**Note** – Read all the information in this guide and follow the instructions carefully. Installing the Solaris Resource Manager software makes some significant changes to your system.

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## Who Should Use This Book

This book is for system administrators who want to install Solaris Resource Manager on their servers. It is expected that the administrator has at least 1–2 years of experience with UNIX® administration.

## Contents of the CD-ROM

The product CD includes the following files and directories.

File/Directory Name	Description
Copyright	Copyright file
SolarisResourceManager_1.3	Directory that contains the product and the documentation
Installer	Installation script
Uninstaller	Script to remove the product
README_en	Product README file

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## How This Book Is Organized

Chapter 1 describes how to install the Solaris Resource Manager product.

Chapter 2 describes how to install the Solaris Resource Manager and Sun Cluster products together.

Chapter 3 explains how to remove the Solaris Resource Manager product from your system.

Chapter 4 provides information on installation problems and their solutions.

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## Related Books

The following resources provide configuration, usage, and release information for the Solaris Resource Manager product:

- The *Solaris Resource Manager 1.2 Release Notes* gives a brief product introduction, identifies patches required to use the product, and provides information on bugs and known problems.
- The *Solaris Resource Manager 1.3 System Administration Guide* describes how to configure and administer the Solaris Resource Manager software. Read this guide to understand how the product works and how to configure it to best meet your needs.

- The *Solaris Resource Manager 1.3 Reference Manual* is the AnswerBook2™ version of the Solaris Resource Manager man pages. These entries supplement the Sun™ operating system base man pages installed on your system. The administration guide references these pages. Online versions of the man pages, accessible using the `man` command, are also provided in the Solaris Resource Manager `SUNWsrmm` and `SUNWrcapm` packages.

For additional information on Sun Cluster installation, see the *Sun Cluster 3.0 12/01 Software Installation Guide* in the Sun Cluster 3.0 12/01 Collection, available on the docs.sun.com<sup>SM</sup> Web site.

## Accessing Sun Documentation Online

The docs.sun.com<sup>SM</sup> Web site enables you to access Sun technical documentation online. You can browse the docs.sun.com archive or search for a specific book title or subject. The URL is `http://docs.sun.com`.

## What Typographic Conventions Mean

The following table describes the typographic changes used in this book.

**TABLE P-1** Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories in text; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> You have mail.
<b>AaBbCc123</b>	What you type, contrasted with on-screen computer output	<code>machine_name%</code> <b>su</b> Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <code>rm filename</code> .

**TABLE P-1** Typographic Conventions (Continued)

Typeface or Symbol	Meaning	Example
<i>AaBbCc123</i>	Book titles or words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . You <i>must</i> log in first.

## Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

**TABLE P-2** Shell Prompts

Shell	Prompt
C shell prompt	machine_name%
C shell superuser prompt	machine_name#
Bourne shell and Korn shell prompt	\$
Bourne shell and Korn shell superuser prompt	#



# Installing Solaris Resource Manager

## 1.3

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This chapter provides step-by-step instructions for installing Solaris Resource Manager 1.3 on systems running Solaris 8 *SPARC Platform Edition*, Solaris 7 *SPARC Platform Edition* 5/99 or later update release, and Solaris 2.6 *SPARC Platform Edition* 5/98 with KU patch 105181-11 (or greater) installed.

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**Note** – Ensure that you have read, understood, and agreed to the terms and conditions set out in the Software License Agreement before installing Solaris Resource Manager.

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## Before You Begin

Before beginning the installation, note the following:

- Before installing Solaris Resource Manager on a system running Solaris 8 *SPARC Platform Edition*, you must have patch 108995-04 (or greater) installed on your system. If you do not have this patch installed, the installation script will automatically install it on your system before it installs the resource capping daemon packages.
- Before installing Solaris Resource Manager on a system that is already running Solaris 2.6 *SPARC Platform Edition*, verify that the system has been upgraded to the Solaris 2.6 *SPARC Platform Edition* 5/98 update release and that KU patch 105181-11 (or greater) has been installed.

Before installing Solaris Resource Manager on a system that is currently running Solaris 7 *SPARC Platform Edition*, verify that the system has been upgraded to the Solaris 7 *SPARC Platform Edition* 5/99 or later update release.

- If you are currently running Solaris Resource Manager 1.0 on Solaris 2.6 *SPARC Platform Edition* and want to upgrade to Solaris Resource Manager 1.3 on Solaris 7 5/99 (or later update) or Solaris 8, first read the instructions in “Upgrading From

Solaris Resource Manager 1.0” on page 21.

- If you are currently using the Solaris Resource Manager product on a system running the Solaris 2.6 operating environment, the CD does not contain significant revised functionality for your software. Therefore, you should *not* install the Solaris Resource Manager 1.3 CD unless you:
  - Want to upgrade your operating system to Solaris 7 5/99 (or later update) or Solaris 8
  - Want to load the AnswerBook™ or other documentation to take advantage of the enhancements made to these materials in the Solaris Resource Manager 1.3 release. See “Installing Only the Solaris Resource Manager 1.3 Documentation From the Product CD” on page 22 for instructions.
- If you are currently using the Solaris Resource Manager product on a system running an earlier release than the Solaris 8 operating environment, the CD does not contain significant revised functionality for your software. Therefore, you should *not* install the Solaris Resource Manager 1.3 CD unless you:
  - Want to upgrade your operating system to Solaris 8
  - Want to load the AnswerBook or other documentation to take advantage of the enhancements made to these materials in the Solaris Resource Manager 1.3 release. See “Installing Only the Solaris Resource Manager 1.3 Documentation From the Product CD” on page 22 for instructions.

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## Supported Hardware

Solaris Resource Manager can be installed on UltraSPARC™ processor systems for all SPARC 4U and 4U-1 platforms produced by Sun Microsystems, Inc. This includes, but is not limited to:

- Sun Fire™ 15K, Sun Fire 12K, and Sun Enterprise™ 10000 servers
- Sun Fire 3800, Sun Fire 4800, and Sun Fire 6800 servers
- Sun Enterprise 3500, Sun Enterprise 4500, Sun Enterprise 5500, and Sun Enterprise 6500 servers
- Sun Fire 280R, Sun Fire V480, and Sun Fire V880 servers
- Sun Enterprise 250, Sun Enterprise 420R, and Sun Enterprise 450 servers
- Netra™ 1200T system platform

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# Installing Solaris Resource Manager With Sun Cluster

You can use the Solaris Resource Manager and Sun Cluster products together, and they can be installed in any order. See the guidelines in Chapter 2 for installation information. Also see the *Sun Cluster 3.0 12/01 Software Installation Guide*, which is available on the docs.sun.com Web site.

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## Preparing for Installation

As a precautionary measure, do a full backup of your system before installing this product.

## Required Patches

Patches can be obtained at <http://sunsolve.sun.com> or through your normal support channels.

If you plan to perform Dynamic Reconfiguration operations on a Sun Enterprise 3500, Sun Enterprise 4500, Sun Enterprise 5500, or Sun Enterprise 6500 system platform, you must be running at least the 3.2.22 revision of the CPU PROM. If your system is running with a lower version of the CPU PROM, download patch 103346-22 or greater and install it as described in the patch's README file. This patch should be installed on your system before you install Solaris Resource Manager 1.3.

To run Solaris Resource Manager on Solaris 8, you must have patch 108995-04 (or greater) installed on your system. If this patch is not installed, the installation script will automatically install it before it installs the resource capping daemon packages.

If you are running Solaris Resource Manager on Solaris 7, you should install patch 109256-01. This patch prevents the `srmdm` utility from accepting negative values, which are invalid, for the `delta` and `maxusage` tunable parameters. If these parameters are set to invalid values, a Solaris 7 system installed with Solaris Resource Manager can become unusable.

Prior to installing Solaris Resource Manager 1.3 on your Solaris 2.6 *SPARC Platform Edition* 5/98 system, install these patches:

- KU patch 105181-11 (or greater), which contains the kernel enhancements necessary to enable Solaris Resource Manager in the Solaris 2.6 environment

- Patch 106123-04 (or greater), which is needed to display the Solaris Resource Manager man pages contained in the `SUNWsrmm` package on Solaris 2.6 systems

Note that the Solaris 7 5/99 or later release incorporates KU patch 106541-04, which contains the kernel enhancements necessary to enable Solaris Resource Manager in the Solaris 7 environment. If the patch for the release you are running is revised in the future, you might want to install the updated version on your system.

## Disk Space Requirements

Use this table to calculate the approximate disk space required to run Solaris Resource Manager on your system, and verify that the required disk space is available.

**TABLE 1-1** Disk Space Requirements

Volume: / (root)	Size (KB)
System extensions in: <code>/platform/sun4?/kernel</code>	216
Configuration files in: <code>/etc</code>	62
Total for / (root) volume	260
<b>Volume: /usr/lib</b>	138
Libraries in: <code>/usr/lib</code>	2152
<b>Volume: /usr</b>	
Class files in: <code>/usr/lib/class/SHR</code>	36
Software in: <code>/usr/srm</code>	235
Total for /usr volume	271
<b>Volume: /var</b>	
Inode database in: <code>/var/srm/srmDB</code>	
<b>Calculate:</b> Number of users on your system multiplied by 2 KB per user; for example, 200 users would require 400 KB.	

## Changes That Will Be Made to System Files

The following system files are modified when you install Solaris Resource Manager.

**TABLE 1-2** Added System Files

---

/dev/srmdrv <sup>1</sup>
/etc/init.d/init.srm
/etc/rc0.d/K52srm
/etc/rc1.d/K52srm
/etc/rc2.d/S10srm
/etc/srm/limconf
/etc/srm/nolnode
/etc/system.noshpload
/kernel/drv/srmdrv <sup>2</sup>
/kernel/drv/srmdrv.conf
/kernel/misc/srmlim
/kernel/sched/SHR
/kernel/sys/srmlimitsys
/usr/lib/srm/liblim.so
/usr/lib/srm/liblim.so.1
/usr/lib/srm/srmscru
/usr/srm/lib/limdaemon
/usr/srm/bin/liminfo
/usr/srm/bin/limreport
/usr/srm/bin/srmkill
/usr/srm/bin/srmstat
/usr/srm/bin/srmuser
/usr/srm/sbin/limadm
/usr/srm/sbin/srmadm
/usr/lib/class/SHR/SHRdispadmin
/usr/lib/class/SHR/SHRpriocntl
/usr/lib/security/pam_srm.so
/usr/lib/security/pam_srm.so.1

---

<sup>1</sup>Created during reboot following installation.

<sup>2</sup> This file is only used in the Solaris Resource Manager 1.0 and 1.1 releases.

**TABLE 1-3** Added System Files, Solaris Resource Manager 1.3 Only

---

/etc/init.d/rcapd
/etc/rc0.d/K10rcapd
/etc/rc1.d/K10rcapd
/etc/rc2.d/S99rcapd
/usr/srm/bin/rcapstat
/usr/srm/sbin/rcapadm
/usr/srm/sbin/rcapd
/usr/srm/sbin/sparcv7/rcapd
/usr/srm/sbin/sparcv9/rcapd

---

**TABLE 1-4** Updated System Files

---

/etc/devlink.tab
/etc/pam.conf
/etc/passwd
/etc/shadow
/etc/system

---

The following table contains useful but unsupported scripts.

**TABLE 1-5** Unsupported System Files

---

/usr/srm/unsupported/limid
/usr/srm/unsupported/passwd_lnodes
/usr/srm/unsupported/schedtree

---

## Installing From CD-ROM

Load the Solaris Resource Manager 1.3 CD in the CD-ROM drive. The Solaris Volume Manager (see `vold(1M)`) will mount the CD-ROM automatically onto the file system.

---

**Note** – If you are installing on a Sun Enterprise 10000, Sun Fire 15K, or Sun Fire 12K server, follow the instructions in the next section.

---

## CD-Mounting on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K Servers

Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K servers do not come with a CD-ROM drive directly attached. Instead, the System Service Processor (SSP) includes an internal CD-ROM drive. Thus, any installation instructions that involve software on a CD require two additional steps for these servers:

1. **Insert the Solaris Resource Manager 1.3 CD into the CD-ROM drive of the SSP.**
2. **Become the superuser on the SSP and share the CD-ROM:**

```
ssp# share -F nfs -o ro,anon=0 /cdrom/cdrom0
```

Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K systems are divided into domains, each acting as its own server and running its own instance of the Solaris environment. This means that you must install Solaris Resource Manager 1.3 on each domain where you want to have this functionality available. Whenever the instructions in this guide say “system,” read it as “domain” for your Sun Enterprise 10000, Sun Fire 15K, or Sun Fire 12K server.

---

**Note** – You do not need to install Solaris Resource Manager on all of the domains in the platform; you can install it only on the domains in which you need its services.

---

---

## Installing the Packages

There are eleven packages in the Solaris Resource Manager 1.3 product. These packages contain all the software, documentation, and other files required to run Solaris Resource Manager.

---

**Note** – Only install the three Solaris AnswerBook2 Version 1.4 Documentation Server packages (SUNWab2r, SUNWab2s, and SUNWab2u) from the product CD if you are installing Solaris Resource Manager on a system running Solaris 2.6 or Solaris 7 5/99. Solaris 7 8/99, Solaris 7 11/99, and Solaris 8 systems are shipped with later versions of the AnswerBook2 server that you do not want to overwrite.

---

**TABLE 1-6** Solaris Resource Manager 1.3 Packages

Package	Title	OS
SUNWrcapm	Solaris Resource Capping Daemon Man Pages	Solaris 8 (SPARC Platform Edition)
SUNWrcapr	Solaris Resource Capping Daemon (Root)	Solaris 8 (SPARC Platform Edition)
SUNWrcapu	Solaris Resource Capping Daemon (User)	Solaris 8 (SPARC Platform Edition)
SUNWrcapx	Solaris Resource Capping Daemon (64-bit)	Solaris 8 (SPARC Platform Edition)
SUNWsrma	Solaris Resource Manager 1.3 Collection (AnswerBook2)	Solaris 2.6 (SPARC Platform Edition) Solaris 7 (SPARC Platform Edition) Solaris 8 (SPARC Platform Edition)
SUNWsrmb	Solaris Resource Manager 1.3 User Commands	Solaris 2.6 (SPARC Platform Edition) Solaris 7 (SPARC Platform Edition) Solaris 8 (SPARC Platform Edition)
SUNWsrmm	Solaris Resource Manager 1.3 Man Pages (Note that entries associated with the Solaris Resource Capping Daemon are in the SUNWrcapm package)	Solaris 2.6 (SPARC Platform Edition) Solaris 7 (SPARC Platform Edition) Solaris 8 (SPARC Platform Edition)
SUNWsrmr	Solaris Resource Manager 1.3 Libraries and System Utilities	Solaris 2.6 (SPARC Platform Edition) Solaris 7 (SPARC Platform Edition) Solaris 8 (SPARC Platform Edition)
SUNWab2r, SUNWab2s, SUNWab2u	Solaris AnswerBook2 v1.4 documentation server	Solaris 2.6 (SPARC Platform Edition) Solaris 7 5/99 (SPARC Platform Edition)



To install the packages:

1. **Log in to the system where you want to install Solaris Resource Manager, and become the superuser:**

```
$ su
Password:
#
```

2. **Bring the system down to single-user system administration mode:**

```
# shutdown -i 1
```

---

**Note** – This step is not necessary on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K servers.

---

3. **Change directories to the location where the CD has been mounted:**

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

---

**Note** – On Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K servers, you must NFS mount the CD from the SSP that has the internal CD-ROM drive before changing directories:

```
# mkdir -p /cdrom/cdrom0
# mount -F nfs ssp:/cdrom/cdrom0 /cdrom/cdrom0
# cd /cdrom/cdrom0
```

---

4. **To ensure that the CD-ROM is mounted correctly, do a listing of the directory and verify that these files appear:**

```
# ls
Copyright                SolarisResourceManager_1.3
Installer                 Uninstaller
README_en
```

5. **Start the product installation tool, Installer.**

If the system reports that the package already exists, see “Resolving Installation Problems” on page 33 before continuing.

```
# ./Installer
```

The two product packages, SUNWsrmb and SUNWsrmr, will be installed first. You will see a processing message similar to this:

```
Installing.....Solaris Resource Manager 1.3 (SRM)
```

```
Processing package instance <SUNWsrmb> from
</cdrom/srm_1_3/SolarisResourceManager_1.3/Solaris_8/sparc/Product/locale/C>
```

```

Solaris Resource Manager
(sparc) 1.3,REV=2002.09.12.12.52
Copyright 2002 Sun Microsystems, Inc. All rights reserved.
Copyright 2002 Sun Microsystems, Inc. Tous droits reserves.

## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

```

6. **You will be warned that the package contains scripts that will be run with superuser privileges. Since these scripts are part of the normal package installation process and are required to install the software correctly, type *y* when asked if you want to continue the installation:**

This package contains scripts which will be executed with super-user permission during the process of installing this package.

Do you want to continue with the installation of <SUNWsrmb> [y,n,?] **y**

As the package is installed onto the system, it will display various messages about the installation process. The package should install in a minute or two.

```

Installing Solaris Resource Manager as <SUNWsrmb>
## Installing part 1 of 1.
/usr/srm/bin/liminfo
/usr/srm/bin/limreport
/usr/srm/bin/srmkill
/usr/srm/bin/srmstat
/usr/srm/bin/srmuser
/usr/srm/lib/limdaemon
/usr/srm/sbin/limadm
/usr/srm/sbin/srmadm
/usr/srm/unsupported/passwd_lnodes
/usr/srm/unsupported/schedtree
[ verifying class ]

```

After the successful installation of the first two packages, this message will display:

```

Installation of <SUNWsrmr> was successful.

```

---

**Note** – During the installation, make sure that you read all the information and carefully follow the instructions displayed on the screen. If you make a mistake, you must wait until the Installer command finishes, and then use Uninstaller to remove Solaris Resource Manager and revert the system to its original state. You can then install the software again as described in Step 5.

---

7. **If you are installing Solaris Resource Manager 1.3 on Solaris 8, you will then be prompted to install the SUNWrcapr, SUNWrcapu, SUNWrcapx, and SUNWrcapm packages. These packages contain the resource capping daemon functionality documented in “Physical Memory Management Using the Resource Capping**

**Daemon” in *Solaris Resource Manager 1.3 System Administration Guide*. To install the packages at this time, type `y` at the prompt. The script will automatically install the required patches for Solaris 8 to enable resource capping functionality.**

- 8. You will then be prompted to install the `SUNWsrmm`, `SUNWab2r`, `SUNWab2s`, `SUNWab2u`, and `SUNWsrma` packages. You should skip this step *unless* you are running Solaris 2.6 or Solaris 7 5/99. To install the packages at this time, type `y` at each prompt.**

---

**Note** – If you are running Solaris 2.6 or Solaris 5/99 and you choose to install the AnswerBook2 server, you will be warned that some of the files are already installed on the system and are being used by another package, and that attribute changes will be made. You should choose to install the updated AnswerBook2 server supplied with Solaris Resource Manager by typing `y` at the prompt.

The server is compatible with both Solaris 2.6 and Solaris 7 AnswerBook2 collections.

---

---

**Note** – If you encountered any errors or problems during the installation process, refer to Chapter 4. Do not continue with system configuration if these packages were not successfully installed.

---

- 9. During the installation of the `SUNWsrmmr` package, three special users were created: `srmidle`, `srmlost`, and `srmother` (for the “idle,” “lost,” and “other” lnodes, respectively).**

User Name	UID
srmidle	41
srmlost	42
srmother	43

Verify that these UIDs are not in conflict with any existing UIDs on the system by typing:

```
# /usr/bin/egrep 41\|42\|43 /etc/passwd
```

If a conflict exists, you can change the UIDs by editing the password and shadow files, `/etc/passwd` and `/etc/shadow`.

---

**Note** – These special users do not require home directories or login access. The names `srmlost` and `srmidle` are only recommended default names. If desired, you can use other names and override the defaults by adding assignments for *LostLnode* and *IdleLnode* in `/etc/init.d/init.srm`. The name `srmother` is assigned by the system and cannot be changed.

---

**10. Reboot the system. During the reboot sequence, make a note of any errors, particularly those related to device driver configuration.**

# **reboot**

When the system is coming up for the first time with Solaris Resource Manager enabled, it will automatically perform some necessary initial configuration that may take a while. This includes creating a new Solaris Resource Manager database by scanning the password file for users registered on the system. You should see messages similar to these:

```
SunOS Release 5.8 Version Generic 64-bit [UNIX(R) System V Release 4.0]
Copyright (c) 1983-2002, Sun Microsystems, Inc.
Solaris Resource Manager v1.2.1 (allocated 990 lnodes)
configuring IPv4 interfaces: hme0.
Hostname: example
Configuring the /devices directory
Configuring the /dev directory
Configuring the /dev directory (compatibility devices)
The system is coming up. Please wait.
Enabling Solaris Resource Manager.
SRM database '/var/srm/srmDB' not present - creating empty database
SRM - creating user lnodes; may take a while
uid      37
Solaris Resource Manager Enabled.
...
The system is ready.
```

Once the system has come up and you have logged in on the console, you should see messages similar to these:

```
Last login: Mon Mar 3 08:40:09 on console
Sun Microsystems Inc. SunOS 5.8
```

---

**Note** – If you encountered any errors or problems during the reboot process or when logging in, refer to Chapter 4.

---

---

## Where to Now?

When you have successfully installed Solaris Resource Manager and have confirmed that the system is up and running and you can log in, you may want to perform each of these tasks in the order shown.

1. Use the *Solaris Resource Manager 1.3 System Administration Guide* to design, set up, and administer Solaris Resource Manager on your system.
2. Test and monitor the performance of your system to attain the configuration that best suits your needs, and explore the power to manage system resources that this product provides.

---

## Upgrading From Solaris Resource Manager 1.0

If you are currently running Solaris Resource Manager 1.0 on Solaris 2.6 *SPARC Platform Edition* and want to upgrade to Solaris Resource Manager 1.3 on Solaris 8 *SPARC Platform Edition* or Solaris 7 *SPARC Platform Edition*, follow the instructions in this section.

The Inode database for Solaris Resource Manager 1.0 is not compatible with the current Solaris Resource Manager Inode database. To upgrade, you must convert the database using the following script, which should be created with the name `savelnodes`.

```
#!/bin/sh
/usr/srm/bin/limreport 'flag.real' - lname preserve | \
sed 's/,/:/g' | sed 's/services.flag.xterm=.*/:/g' | sed 's/umask=[0-9]*:/:/g'
```

To upgrade a Solaris 2.6 system running Solaris Resource Manager 1.0:

1. **Execute the `savelnodes` script:**

```
# savelnodes > /export/home/savelnodes.out
```

2. **Remove the Inode database:**

```
# rm /var/srm/srmDB
```

**3. Remove Solaris Resource Manager 1.0 from your system.**

See Chapter 3.

**4. Upgrade Solaris 2.6 to Solaris 8.**

For instructions, see the Solaris 8 Installation Collection.

**5. Install Solaris Resource Manager 1.3.**

Go to the beginning of this chapter.

**6. Execute the `limadm` command to restore the Inodes:**

```
# /usr/srm/sbin/limadm set -f /export/home/savelnodes.out
```

---

## Installing Only the Solaris Resource Manager 1.3 Documentation From the Product CD

The product documentation has been enhanced in the Solaris Resource Manager 1.3 release. The documentation is applicable to all Solaris Resource Manager releases, so even if you are not upgrading your Solaris Resource Manager 1.0, 1.1, or 1.2 software at this time, you should still use the latest documentation.

To update your documentation as described in this section, log in to the system where Solaris Resource Manager is installed and become the superuser.

If you are using the online man pages supplied with Solaris Resource Manager 1.0 or 1.1, you should install the Solaris Resource Manager 1.3 `SUNWsrmm` package.

To replace the online man pages:

**1. Remove the Solaris Resource Manager 1.0 or 1.1 man pages by typing:**

```
# pkgrm SUNWsrmm
```

**2. Mount the Solaris Resource Manager 1.3 CD as described in “Installing From CD-ROM” on page 14 or “CD-Mounting on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K Servers” on page 15 if necessary.**

**3. Change directories to**

`/SolarisResourceManager_1.3/Solaris_8/sparc/Product/locale/C` **and type:**

```
# pkgadd -d . SUNWsrmm
```

4. Add `/usr/srm/man` to the `MANPATH` variable in the user's environment as described in "Using Online Man Pages" in the *Solaris Resource Manager 1.3 Release Notes*.

To install the new Solaris Resource Manager 1.3 Collection:

1. Remove the existing Solaris Resource Manager 1.0 Collection, Solaris Resource Manager 1.1 Collection, or Solaris Resource Manager 1.2 Collection, by typing:

```
# pkgrm SUNWsrma
```

2. Mount the CD as described in "Installing From CD-ROM" on page 14 or "CD-Mounting on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K Servers" on page 15 if necessary. Change directories to  
`/SolarisResourceManager_1.3/Solaris_2.6+/sparc/Product/locale/C`

3. Type:

```
# pkgadd -d . SUNWsrma
```

To copy the PDF versions of the Solaris Resource Manager documents onto your system:

1. Mount the CD as described in "Installing From CD-ROM" on page 14 or "CD-Mounting on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K Servers" on page 15 if necessary. Change directories to:  
`/SolarisResourceManager_1.3/Solaris_2.6+/sparc/Common/Docs/locale/C.`
2. Copy the files onto your system.





# Installing Solaris Resource Manager 1.3 in Sun Cluster 3.0 Update Environments

---

This chapter should be used by experienced system administrators with extensive knowledge of Sun software and hardware.

Solaris Resource Manager is normally installed and configured by the system administrator, but Sun Cluster is considerably more complex and it is normally installed by a Sun Service professional. Consider this when planning your installation sequence.

Several Sun Cluster 3.0 12/01 documents are referenced in this book. These Sun Cluster documents are available in the Sun Cluster 3.0 12/01 Collection and in the Sun Cluster 3.0 12/01 Data Services Collection.

---

**Note** – If you are using a Sun Cluster 3.0 update release later than U1, refer to the appropriate Sun Cluster documentation for the release you are running.

---

---

## Installation Overview

This chapter contains guidelines for two installation scenarios.

- “Installing Solaris Resource Manager on an Existing Sun Cluster” on page 26
- “Installing Sun Cluster on an Existing Solaris Resource Manager Configuration” on page 27

You can install Solaris Resource Manager and Sun Cluster in any order.



---

**Caution** – Both the Sun Cluster and Solaris Resource Manager products modify the `/etc/system` file during installation. Making changes to this file after a Sun Cluster installation can lead to unpredictable cluster behavior if the Sun Cluster modifications to this file cannot be accessed during boot.

The procedure to disable or troubleshoot Solaris Resource Manager instructs you to use the backup `/etc/system.noshrload` file in place of the `/etc/system` file. *Be aware that if the `system.noshrload` file does not include the Sun Cluster modifications, this substitution can cause problems with your cluster.*

---

---

## Installing Solaris Resource Manager on an Existing Sun Cluster

When installing the Solaris Resource Manager product on an existing Sun Cluster, consider the following guidelines.

- Before you install the Solaris Resource Manager product on a node that is part of an existing cluster, the Sun Cluster product should already be installed and fully functional on all nodes of that cluster, using the installation procedures described in the Sun Cluster documentation.
- Once Sun Cluster is correctly installed, boot each node on which you plan to install Solaris Resource Manager in non-cluster mode. The Solaris Resource Manager installation procedure requires a reboot of each node. For more information about rebooting a cluster node in non-cluster mode, see the *Sun Cluster 3.0 12/01 System Administration Guide*.
- To ensure continuous availability of applications during Solaris Resource Manager installation, install it on one node at a time. Before installing Solaris Resource Manager on a node, switch over all of that node's applications to a backup node. For more information about switching the current primary of a resource group, see the *Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide*.
- If your cluster includes Sun Enterprise 10000 machines, you must install Solaris Resource Manager on each domain in which you want Solaris Resource Manager functionality.
- The Solaris Resource Manager limits database files (`/var/srm/srmDB`) do not need to be identical on all nodes. See the section "Configuring Solaris Resource Manager in Sun Cluster 3.0 Update Environments" in "Advanced Usage" in *Solaris Resource Manager 1.3 System Administration Guide*.
- Installation of Solaris Resource Manager on a two-node Sun cluster should take less than 30 minutes. Exact installation times vary depending on the number of nodes, number of file systems, and speed of the systems.

There are no other special requirements.

---

## Installing Sun Cluster on an Existing Solaris Resource Manager Configuration

When installing Sun Cluster on nodes that already contain Solaris Resource Manager, consider the following guidelines.

- Install Sun Cluster on all nodes, using the installation procedures described in the Sun Cluster documentation.
- The Solaris Resource Manager configuration files (`/var/srm/srmDB`) do not have to be identical on all nodes. See “Configuring Solaris Resource Manager in Sun Cluster 3.0 Update Environments” in *Solaris Resource Manager 1.3 System Administration Guide*.
- Installation times vary, depending on the number of nodes and file systems and the speed of the systems. The presence of Solaris Resource Manager does not lengthen the install time for Sun Cluster.

There are no other special requirements.

---

## Installing Solaris Resource Manager and Sun Cluster Together Initially

When performing initial installations of Solaris Resource Manager and Sun Cluster on the same node, do not install both products at the same time. Follow the procedures in “Installing Solaris Resource Manager on an Existing Sun Cluster” on page 26 or “Installing Sun Cluster on an Existing Solaris Resource Manager Configuration” on page 27.



## Removing Solaris Resource Manager

---

To remove the Solaris Resource Manager software from your system, follow the steps in this chapter.

Note that you may not want to remove the Solaris AnswerBook2 v1.4 documentation server (packages SUNWab2r, SUNWab2s, and SUNWab2u) from your system.

---

**Note** – If you are removing this product from a Sun Enterprise 10000 server, refer to the special instructions in “CD-Mounting on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K Servers” on page 15.

---

---

## Preparing for Removal



---

**Caution** – Do not attempt to remove the Solaris Resource Manager files manually. You would have trouble reinstalling the software later and could end up with an unusable system.

---

Before you remove any of the Solaris Resource Manager software, make a backup of the Solaris Resource Manager database file, `/var/srm/srmDB`. This is particularly important if you plan to use this product again. If you lose this file, you will have to rebuild your Solaris Resource Manager database from scratch. You may also want to back up the database if the information in it is important to you.

See “Managing Lnodes” in *Solaris Resource Manager 1.3 System Administration Guide* for instructions on how to save and restore the `/var/srm/srmDB` database.

---

# Removing the Solaris Resource Manager Packages

Follow these steps to remove the product software from your system.

---

**Note** – Make a full backup of your system before continuing.

---

1. **Log in to the system from which you want to remove Solaris Resource Manager, and become the superuser:**

```
$ su
Password:
#
```

2. **Bring the system down to single-user system administration mode using the shutdown command:**

```
# shutdown -i 1
```

---

**Note** – This step is not necessary on Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K servers.

---

3. **Verify that Solaris Resource Manager is not running.**

Although not mandatory, it is best if Solaris Resource Manager is not running when you remove it.

```
# srmadm show fileopen
# no
```

4. **Mount the Solaris Resource Manager CD as described in “Installing From CD-ROM” on page 14, and change directories to the location where the CD has been mounted:**

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

---

**Note** – On Sun Enterprise 10000, Sun Fire 15K, and Sun Fire 12K servers, you must NFS mount the CD from the System Service Processor (SSP) that has the internal CD-ROM drive before changing directories:

```
# mkdir -p /cdrom/cdrom0
# mount -F nfs ssp:/cdrom/cdrom0 /cdrom/cdrom0
# cd /cdrom/cdrom0
```

---

**5. Start the package removal tool, Uninstaller:**

```
# ./Uninstaller
```

**6. The first package to be removed will be displayed. Type *y* to continue with the removal of Solaris Resource Manager:**

```
Removing.....Solaris Resource Manager 1.3 (SRM)
The following package is currently installed:
    SUNWsrmr      Solaris Resource Manager
                  (sparc) 1.3,REV=2002.09.12.12.52
```

```
Do you want to remove this package? y
```

**7. You will be warned that the package contains scripts that will be run with superuser privileges. Since these scripts are part of the normal package removal process and are required to remove the software correctly, type *y* when asked if you want to continue:**

```
## Removing installed package instance <SUNWsrmr>
This package contains scripts which will be executed with super-user
permission during the process of removing this package.
```

```
Do you want to continue with the removal of this package [y,n,?,q] y
```

**8. The package will now be removed from your system, and you will see various messages about the removal process:**

```
## Verifying package dependencies.
## Processing package information.
## Removing pathnames in class <shadow>
## Removing pathnames in class <pamconf>
## Removing pathnames in class <etcssystem>
## Removing pathnames in class <passwd>
## Removing pathnames in class <devlinktab>
## Removing pathnames in class <none>
/usr/lib/srm/srmscru
/usr/lib/srm/liblim.so.1
/usr/lib/srm/liblim.so
/usr/lib/srm
/usr/lib/security/pam_srm.so.1
/usr/lib/security/pam_srm.so
/usr/lib/security <shared pathname not removed>
/usr/lib/class/SHR/SHRpriocntl
/usr/lib/class/SHR/SHRdispadmin
/usr/lib/class/SHR
/usr/lib/class <shared pathname not removed>
/usr/lib <shared pathname not removed>
/usr <shared pathname not removed>
/kernel/sched/SHR
/kernel/sched <shared pathname not removed>
/kernel/misc/srmlim
/kernel/misc <shared pathname not removed>
/kernel/drv/srmdrv.conf
/kernel/drv/srmdrv
```

```

/kernel/drv <shared pathname not removed>
/kernel <shared pathname not removed>
/etc/srm/nolnode
/etc/srm/limconf
/etc/srm
/etc/rc2.d/S10srm
/etc/rc2.d <shared pathname not removed>
/etc/rc1.d/K52srm
/etc/rc1.d <shared pathname not removed>
/etc/rc0.d/K52srm
/etc/rc0.d <shared pathname not removed>
/etc/init.d/init.srm
/etc/init.d <shared pathname not removed>
/etc <shared pathname not removed>
## Executing postremove script.
## Updating system information.

```

After the package has been removed successfully, you will see this message:

```
Removal of <SUNWsrnr> was successful.
```

and the next Solaris Resource Manager package for removal will be displayed.

**9. Continue the removal process for each Solaris Resource Manager package being removed.**

---

**Note** – If you encountered any errors or problems during the package removal process, refer to Chapter 4.

---

**10. Reboot the system so that device reconfiguration can complete the removal of Solaris Resource Manager from your system:**

```
# reboot
```

## Cleanup

The Solaris Resource Manager database file `/var/srm/srmDB` will not be removed from the system by the normal package removal process. If you will not need this file, remove it manually.

You have now removed Solaris Resource Manager from your system.



## Troubleshooting

If you experienced a problem installing or starting up Solaris Resource Manager 1.3, this chapter provides possible solutions for resolving the problem.

If you require additional assistance, contact your Sun Software Support Provider.

---

## Resolving Installation Problems

**TABLE 4-1** Installation Problems and Solutions

Symptom(s)	Possible Cause/Solution(s)
Checking the OS release fails.	You might not have the SunOS 5.6 SPARC, SunOS 5.7 SPARC, or SunOS 5.8 SPARC release of the operating system installed.  Type <code>uname -psr</code> to find out which release of the operating system you are running.
System reports that there is not enough space on the file systems to install a package.	Make enough space available on the relevant file systems. Restart the installation.
Failure occurred when trying to execute one of the package installation scripts.	Installer was unable to access the file as user <code>nobody</code> . The permissions to all files and directories in the package must allow <code>world read</code> (and <code>execute</code> , where applicable) access. The directories leading from the location where the package is stored up to the root ( <code>/</code> ) directory must also be <code>world</code> accessible.

**TABLE 4-1** Installation Problems and Solutions (Continued)

Symptom(s)	Possible Cause/Solution(s)
An unexpected or internal error occurred in one of the package installation scripts.	Report the problem to your Sun Software Support Provider.
System reported that the package already exists, so an update will occur.	The package is already installed on the system. If you continue, the software will bring the current installation back in line with the package. WARNING: Any files that have been modified since the previous installation will be lost during this process.
Installer quits while installing SUNWsrmmr.	One of the user names <code>srmiddle</code> , <code>srmllost</code> , or <code>srmother</code> may have already been used in the <code>passwd</code> file. You must either delete the entry or change the user name as described in Step 9 for Solaris Resource Manager to install and work.
Installer quits with the message that a patch is not installed.	The patch 105181-11 (or greater), which contains the kernel enhancements necessary to enable Solaris Resource Manager in the Solaris 2.6 environment, is required prior to installing the product on a Solaris 2.6 system. The patch 106123-04 (or greater) is required prior to installing the man page package <code>SUNWsrmm</code> on a Solaris 2.6 system.

---

## Resolving Startup Problems

**TABLE 4-2** Startup Problems and Solutions

Symptom(s)	Possible Cause/Solution(s)
Solaris Resource Manager did not start on reboot.	Solaris Resource Manager is not installed correctly. Verify that you have installed these packages correctly:  <pre>pkginfo -l SUNWsrmb</pre> <pre>pkginfo -l SUNWsrmmr</pre>
A warning that no idle ( <code>srmiddle</code> ) user exists appeared on reboot.	There is no entry in the <code>passwd</code> file for the <code>srmiddle</code> user. Create the user as outlined in Step 9 in "Installing the Packages" on page 15.

**TABLE 4-2** Startup Problems and Solutions (Continued)

Symptom(s)	Possible Cause/Solution(s)
A warning that no lost (srmlost) user exists appeared on reboot.	There is no entry in the passwd file for the srmlost user. Create the user as outlined in Step 9 “Installing the Packages” on page 15.
A kernel panic occurs during reboot.	There is a conflict with the operating system. Follow the instructions in “Recovering From Boot Failure” on page 35. Report the problem immediately to your Sun Software Support Provider.
Unable to log in.	There is a problem with the PAM module configuration. Reboot the machine in single-user mode, and comment out the line pam_srm.so.1 in /etc/pam.conf.

---

## Recovering From Boot Failure

If a kernel panic occurs on boot, there are three ways to boot the machine with Solaris Resource Manager disabled. Try Method A first; if that fails, try Method B or Method C.

---

**Note** – Do not use Method B to recover from boot failure on a Sun Enterprise 10000 system.

---

### ▼ Method A: Booting From Your Current Boot Disk

1. Be at the boot monitor prompt, ok. If you are not, then send a break sequence to the console.

2. Boot the system with prompt mode enabled:

```
ok boot -a
Booting from: sd(0,0,0) -a
```

3. Accept the default kernel file to load and module path by pressing the Return key:

```
Enter filename [kernel/unix]: <Return>
Enter default directory for modules [/platform/SUNW,.../kernel
/kernel /usr/kernel]: <Return>
SunOS Release 5.7
```

Version ... [UNIX(R) System V Release 4.0]

4. **Type `etc/system.noshrlload` when prompted for the name of the system file to use.**

This is an original version of your `/etc/system` file, as it was prior to the installation of the Solaris Resource Manager product. This copy was generated automatically when you installed Solaris Resource Manager.

Name of system file [`etc/system`]: **`etc/system.noshrlload`**

5. **Accept the defaults for the remaining questions:**

root filesystem type [`ufs`]: <Return>

Enter physical name of root device [...]: <Return>

Your system will now boot with Solaris Resource Manager disabled.

## ▼ Method B: Booting From a Local CD-ROM

---

**Note** – Do not use this method on a Sun Enterprise 10000 system platform.

---

You need to know the name of your normal root file system disk device to use this procedure.

1. **Boot Solaris from your installation media (CD-ROM):**

```
ok boot cdrom -s
```

2. **Mount the normal root file system disk device:**

```
# mount /dev/dsk/device-name /a
```

3. **Use a text editor such as `vi` to edit the `/etc/system` file on the normal root file system:**

```
# vi /a/etc/system
```

4. **Comment out the line that sets `initclass` to `SHR`.**

Note that the comment character in this file is an asterisk (\*).

```
* set initclass="SHR"
```

5. **Unmount the normal root file system:**

```
# umount /a
```

6. **Reboot the system from the normal root file system disk device:**

```
# init 0
# boot devalias
```

where *devalias* is the name of the normal root file system disk device.  
Your system will now boot with Solaris Resource Manager disabled.

## ▼ Method C: Booting From the CD-ROM on the Boot Server

Use this procedure to set up the boot server, boot the host system from the boot server console window, and disable Solaris Resource Manager.

---

**Note** – For Sun Enterprise 10000 systems, “boot server” refers to the SSP, “host system” refers to the domain, and “console window” refers to the `netcom` window (see the `netcon(1M)` man page in the *Sun Enterprise 10000 SSP 3.2 Reference Manual* in the Sun Enterprise 10000 SSP 3.2 Collection).

---

## ▼ To Set Up the Boot Server

1. **Insert the Solaris CD into the CD-ROM drive on the boot server.**

After the CD is inserted, it will take about 1 minute for Volume Manager to mount the CD-ROM.

2. **Log in to the boot server as superuser.**

3. **Change directories to the `/Tools` directory on the CD:**

```
# cd /cdrom/cdrom0/s0/Solaris_2.X/Tools
```

4. **Execute the `share(1M)` command in the console window:**

```
# share -F nfs -o ro,anon=0 /cdrom/cdrom0/s0
```

5. **Set up the host system as an install client:**

```
# ./add_install_client host_name sun4u
```

The `add_install_client(1M)` command should share the CD across the net.

---

**Note** – If the `/etc/nsswitch.conf` file contains a DNS entry in its host list, you could receive the following message:

Error: *host\_name* does not exist in the NIS ethers map.

If you receive this message, remove the DNS entry in the `/etc/nsswitch.conf` file, add the *host\_name* to the ethers map if the name is not already in the map, and rerun the `add_install_client(1M)` command.

---

6. Exit the superuser level.

## ▼ To Boot the System From the Network

1. Open a host system console window and drop down to the OpenBoot™ PROM prompt, `ok`.

---

**Note** – For Sun Enterprise 10000 systems, a host system console window refers to a `netcon(1M)` window. This implies that the `bringup(1M)` command has been successfully executed for the host system.

---

2. Boot the host system from the network:

```
ok boot net
```

---

**Note** – You should have an alias (usually `net`) in OpenBoot PROM for the proper network interface. Use that alias with the `boot(1M)` command, as shown in the previous example. Otherwise, you must type in the complete OpenBoot PROM device path. If you specify an alias (or path) that does not describe the proper network interface, the `boot` command will fail.

If an alias does not exist for a network interface that is on the same subnet as the boot server, you can create one by typing:

```
ok nvalias net device_path
```

---

The `boot net` command starts the `suninstall` utility. This utility prompts you to provide site and platform-specific information.

For more information about the `suninstall` utility and instructions specific to the Sun Enterprise 10000, refer to the *Solaris 7 Sun Hardware Platform Guide* in the Solaris 7 on Sun Hardware Collection or the *Solaris 8 Sun Hardware Platform Guide* in the Solaris 8 on Sun Hardware Collection.

**TABLE 4-3** Information for the `suninstall` Utility

Set the network information	Select the appropriate level of information you want to provide. If you select any option other than None, the <code>suninstall</code> utility displays a series of dialogs that request configuration information. Provide that information.
Solaris Interactive Installation	Quit <code>suninstall</code> by pressing F5.

---

**Note** – Do not install the Solaris operating environment at this time.

---

After quitting `suninstall`, the host system shell prompt should appear.

**3. Mount the normal root file system disk device:**

```
# mount /dev/dsk/device-name /a
```

**4. Use a text editor such as `vi` to edit the `/etc/system` file on the normal root file system:**

```
# vi /a/etc/system
```

**5. Comment out the line that sets `initclass` to `SHR`.**

Note that the comment character in this file is an asterisk (\*).

```
* set initclass="SHR"
```

**6. Unmount the normal root file system:**

```
# umount /a
```

**7. Reboot the system from the normal root file system disk device:**

```
# init 0
# boot devalias
```

where *devalias* is the name of the normal root file system disk device.  
Your system will now boot with Solaris Resource Manager disabled.

