



Sun Ray™ Server Software 4.1 Installation and Configuration Guide

for the Solaris™ Operating System

Sun Microsystems, Inc.
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Preface

The *Sun Ray Server Software 4.1 Installation and Configuration Guide for the Solaris™ Operating System* provides instructions for installing, upgrading, and configuring a system of Sun Ray™ DTUs and their server or servers. It is written for system and network administrators who are already familiar with the Sun Ray™ computing paradigm and have substantial networking knowledge. This guide may also be useful for those interested in customizing their Sun Ray systems.

Before You Read This Book

This guide assumes that you have access to the Sun Ray Server Software 4.1 CD or the Electronic Software Download (ESD).

How This Book Is Organized

[Chapter 1](#) gives a brief overview of installation, upgrade, and configuration along with two flow charts to help make it easier to get the latest Sun Ray Server Software up and running.

[Chapter 2](#) describes the requirements for installation.

[Chapter 3](#) steps through the installation process.

[Chapter 4](#) describes preparations for upgrading from earlier versions of Sun Ray Server Software. It includes a brief discussion of failover groups.

[Chapter 5](#) steps through the upgrade procedures.

[Chapter 6](#) describes configuration requirements. It includes a brief discussion of network topology and a set of worksheets.

[Chapter 7](#) steps through the configuration procedures.

[Appendix A](#) contains material that did not fit neatly into the chapters above. It includes, among other items, error messages from the installation script.

[Appendix B](#) contains additional instructions for installation and configuration on Solaris Trusted Extensions.

This manual also contains an index.

Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures, such as shutting down the system, booting the system, or configuring devices. This document does, however, contain information about specific Sun Ray system commands.

Typographic Conventions

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

Shell Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

Application	Title	Part Number
Administration	<i>Sun Ray Server Software 4.1 Administrator's Guide for the Solaris Operating System</i>	820-3768
Release Notes	<i>Sun Ray Server Software 4.1 Release Notes for the Solaris Operating System</i>	820-3774

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Overview

This guide describes how to install, upgrade, configure, and remove Sun Ray™ Server Software 4.1. It also provides instructions for upgrading to the appropriate version of the Solaris operating environment.

The reader is presumed to be familiar with basic UNIX® commands and to have experience in network configuration and administration. Technical information and procedures are presented with a command-line interface.

The installation flow chart (FIGURE 1-1) and network configuration flow chart (FIGURE 1-2) summarize the tasks to be performed. Following the procedures in this guide can help to avoid unnecessary problems when you install, upgrade, or configure Sun Ray systems.

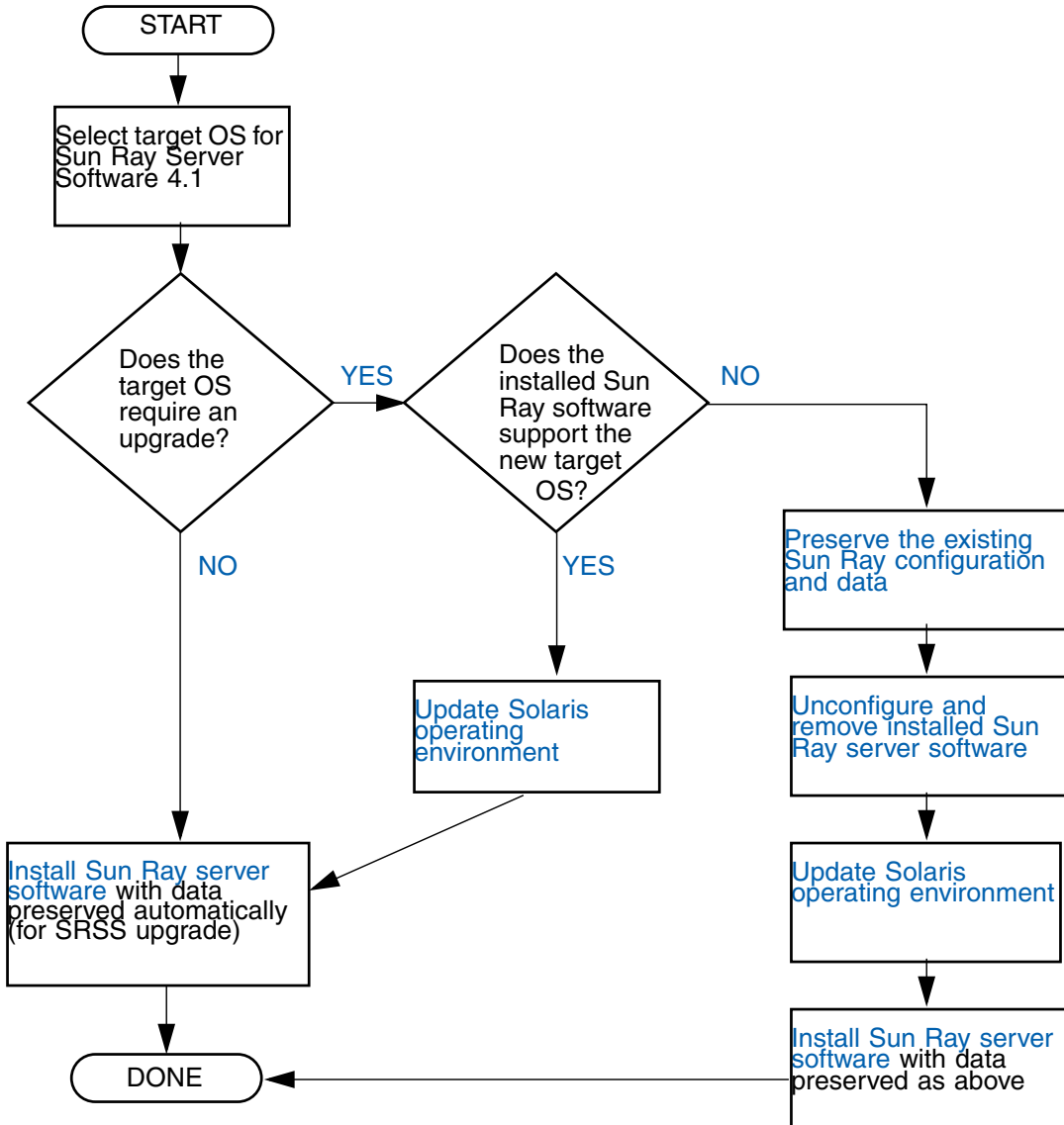
Media Formats

Sun Ray Server Software 4.1 is available on CD-ROM and ESD (electronic software download). If you download the software electronically, then when instructions and procedures in this guide ask you to change to the image directory on the CD-ROM, please change instead to the image directory under the download directory. Commands issued in either file system should execute properly.

Installation Flow Chart

The following diagram shows the key decisions you should take before performing an installation or upgrade.

FIGURE 1-1 Installation and Upgrade Flow Chart

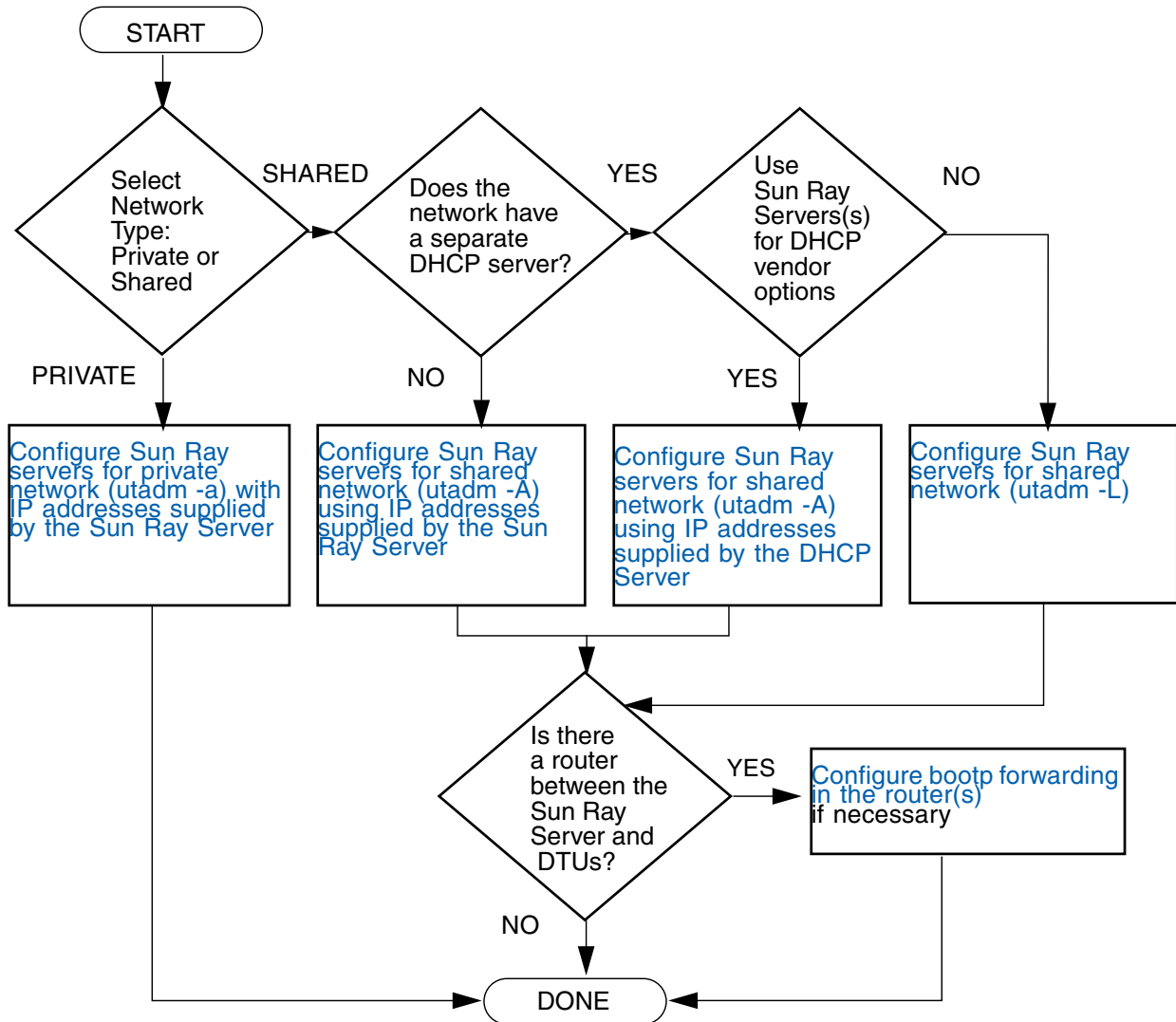


- If you are installing Sun Ray Server Software for the first time, go to [“Preparing for Installation”](#) on page 9.
- If you are upgrading Sun Ray Server Software, go to [“Preparing to Upgrade Sun Ray Server Software”](#) on page 19.
- If you are creating a failover group from both new and existing Sun Ray servers, see [“Configure the Sun Ray Server Hierarchy”](#) on page 50.

Network Configuration Flow Chart

The following diagram shows the key decisions to take before configuring Sun Ray servers and DTUs on a network, or before configuring a network for Sun Ray use.

FIGURE 1-2 Network Configuration Flow Chart



Preparing for Installation

The installation process is easy and straightforward; however, it is essential that you verify all requirements before you install Sun Ray Server Software 4.1. This chapter describes what you need to do.

Topics in this chapter include:

- [“Hardware Requirements” on page 10](#)
- [“Software Requirements” on page 11](#)

Before you install Sun Ray Server Software, you should:

- Verify the operating environment.
Make sure that you are running the desired supported operating system on your system. See [“Upgrading the Operating System” on page 29](#).
- Verify that you have installed the latest required patches.
See [“Solaris Trusted Extensions Patch Requirements” on page 12](#).
- Verify system requirements.
Make sure that the system(s) on which you plan to install the software fulfills the necessary hardware and software requirements.

Note – The `utinstall` script does not automatically add Sun Ray information to the `crontab`, `syslog`, `PAM`, and `SunMC` services as earlier versions did; instead, it adds them upon the first reboot after installation or upgrade.

Hardware Requirements

Disk Space

The standard installation of Sun Ray Server Software requires at least 95 MB of disk space. [TABLE 2-1](#) lists the disk space requirements for specific directories.

TABLE 2-1 Sun Ray Server Software Disk Space Requirements

Product	Default Installation Path	Requirements
Sun Ray core software	/	1 Mbyte
	/opt	20 Mbytes
	/var/adm/log	1 Mbyte
	/var/tmp	5 Mbytes
	/var/opt/SUNWut	Allow enough disk space for the log files.
Sun Ray Data Store	/opt/SUNWut/srds	4 Mbytes in /opt
	/etc/opt	0.1 Mbytes in /etc
	/var/opt/SUNWut/srds	Allow enough disk space for the data store and log files. For 1,000 entries, allocate roughly 1.5 Mbytes of disk space, 64 Mbytes of RAM, and 128 Mbytes of swap space.

Note – The suggested server configuration includes approximately 50-100 MB of swap space per user.

Software Requirements

Java Runtime Environment (JRE)

SRSS 4.1 requires JRE version 1.5 or later. The latest Java release is available at:

<http://java.sun.com/j2se>

Client vs. Server Java Virtual Machine (JVM)

By default, J2SE 5.0 on server-class machines — those with at least two CPUs and two GB of physical memory — uses a server JVM, rather than a client JVM for Java applications. The server JVM's default options also are tuned for server-type Java applications. These combined defaults produce a large memory footprint and extend the necessary startup time, both of which are undesirable for Java applications in a multiuser environment.

Use the `-client` option to the `java` command to specify the client JVM for Java user applications on the Sun Ray server. For further details, see:

<http://java.sun.com/j2se/1.5.0/docs/guide/vm>

Note – Since the 64-bit JVM is a server VM only, the 32-bit client JVM is preferable, even on 64-bit systems.

Solaris Operating System Versions

Sun Ray Server Software 4.1 runs on Solaris 10 5/08 on SPARC and x86 platforms, including Trusted Extensions. Supported operating systems are summarized in the *Sun Ray Server Software 4.1 Release Notes* published on `docs.sun.com`.

If the correct version of the Solaris operating environment is already installed on the system or systems on which you will install Sun Ray Server Software, go to [Chapter 3](#). If you need to upgrade the Solaris operating environment, please follow the instructions in “[Upgrading the Operating System](#)” on [page 29](#) before continuing.

- On SPARC platforms, configure the Sun Ray server with an “Entire Distribution” software cluster installation of the Solaris 10 “Server”, SPARC Platform Edition before you install the Sun Ray sever software.

- On x86 platforms, configure the x86 Sun Ray server with an “Entire Distribution” software cluster installation.

You can check the operating system version by typing the following command:

```
% cat /etc/release
```

It displays the current operating system release on the Sun Ray server, for instance:

```
Solaris 10 11/06 s10s_u3wos_10 SPARC  
Copyright 2006 Sun Microsystems, Inc. All Rights Reserved.  
Use is subject to license terms.  
Assembled 14 November 2006
```

If the server has a lower version number than you need, contact your Sun Microsystems representative to purchase the latest version of the Solaris software.

Solaris Trusted Extensions Patch Requirements

In a Solaris Trusted Extensions environment, certain patches must be installed prior to Sun Ray Software installation. These patches are available on the SunSolve™ Website, and the latest patch numbers are published in the *Sun Ray Server Software 4 Release Notes* on docs.sun.com.

SunMC Requirements

To use SunMC, the administrator must install the correct version of the SunMC software. See [“Installing the SunMC Software” on page 59](#).

Sun Ray Admin GUI Web Server Requirements

The Sun Ray Administration Tool (Admin GUI) requires that a Web server be installed and running on each Sun Ray Server. Since the previously used CGI-based rendering logic has been completely removed, the new Admin GUI must be hosted in a Web container that supports the Servlet 2.4 and JavaServer Pages™ 2.0 specification. The Apache Tomcat 5.5 Web container implements these standards and runs on any operating system that has a Java Runtime Environment (JRE).

The `utconfig` script prompts for the location of an Apache Tomcat HTTP Server and asks whether it should be configured automatically.

- If you supply the path and answer Yes, then it is so configured.

- If you answer No, then the configuration is stored in `/etc/opt/SUNWut/http/http.conf`. You can then use this file to configure the HTTP server manually.

An Apache Tomcat 5.5 archive is included in the Sun Ray Server Software 4.1 image under `Supplemental/Apache_Tomcat`. The most recent version of Tomcat 5.5 can be downloaded from <http://tomcat.apache.org>.

The Sun Ray configuration script uses port 1660 for the Sun Ray Administration Tool (Admin GUI) by default. If this port is unavailable, you can configure a new port while running the `utconfig` script.

▼ To Install Apache Tomcat

If Tomcat 5.5 is already installed on your system, you can omit the steps below and specify the path, if necessary, during configuration (see “[Configure Sun Ray Server Software](#)” on page 49).

1. As superuser, open a shell window on the Sun Ray server.

```
% su -
```

2. Change to the `Apache_Tomcat` directory, for instance:

```
# cd /cdrom/cdrom0/Supplemental/Apache_Tomcat
```

3. Extract the Tomcat archive into a suitable directory, such as `/opt`:

The Tomcat archive uses GNU tar extensions and must be untarred with a GNU-compatible version of the `tar` command, such as `gtar`.

```
# /usr/sfw/bin/gtar -xvz -C /opt -f apache-tomcat-5.5.20.tar.gz
```

4. For convenience, you can create a symbolic link to the installation to make future Tomcat updates easier:

```
# ln -s /opt/apache-tomcat-5.5.20 /opt/apache-tomcat
```


Web Browser Requirements

To view the Sun Ray Administration Tool (Admin GUI), you must have a Web browser, such as Mozilla or Netscape™ Communicator, installed on the system that will display it.

The latest version of the Mozilla browser is available at:

<http://www.mozilla.org/download.html>

The latest version of the Netscape Communicator Web browser is available at:

<http://www.netscape.com/download>

Sun Ray Data Store Port Requirements

When you configure a new Sun Ray server in a failover environment that uses SRSS 4.1 only, service port 7012 is used by default.

If you already have an LDAP (Lightweight Data Access Protocol) server configured on the Sun Ray server, it can coexist with Sun Ray Data Store; however, it must not use port 7012, which is reserved for use by the Sun Ray Data Store.

If you configure a new Sun Ray server in a mixed failover group, you must make sure that the primary server is running SRSS 4.1.

If the secondary server is running SRSS 4.1, no special care is required; the `utreplica` utility automatically synchronizes with the port number on the primary.

Note – Although it is possible to configure mixed failover groups consisting of servers running various versions of Sun Ray Server Software, this practice is discouraged. For more information, see Chapter 11 in the *Sun Ray Server Software 4.1 Administrator's Guide*.

Installation

This chapter contains instructions for installing Sun Ray Server Software. If you are *upgrading* Sun Ray Server Software from an earlier version, please see [“Preparing to Upgrade Sun Ray Server Software”](#) on page 19.

▼ Install Sun Ray Server Software

If you have already mounted the Sun Ray Server Software 4.1 CD-ROM locally or from a remote server, or if you have extracted the ESD files to an image directory, begin at [Step 3](#).

1. As superuser, open a shell window on the Sun Ray server.

Tip – To avoid installation script errors that can occur if user environment settings are carried forward, use one of the following commands for superuser login instead of using the `su` command without arguments:

```
% su -
```

```
% su - root
```

2. Insert the Sun Ray Server Software 4.1 CD-ROM.

If a file manager window opens, close it. The file manager CD-ROM window is not necessary for installation.

3. Change to the image directory. For example:

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

4. Install Sun Ray Server Software:

```
# ./utinstall
```

The installation process begins. The script first displays the text of the Sun Software License Agreement and prompts you to accept its terms and conditions.

a. After reviewing the license agreement, answer `y` (yes) to the prompt.

The `utinstall` script checks to see which SRSS components are already installed and displays the results.

- It prompts you for a response before it installs the required software products and any necessary patches.

b. Answer `y` (yes) to the prompt.

Next, it prompts you to approve installation of L10N admin locales.

Note – Earlier releases of SRSS installed all locales by default. For upgrades, the SRSS 4.1 installation script automatically installs whatever locales were previously installed. For fresh installations, it asks about each locale in sequence. If you have installed `en_US` only, then later want to add one or more foreign locales, please refer to the Release Notes for instructions.

c. Answer `y` (yes) to the prompt.

Finally, it prompts you for the location of the Java Runtime Environment, version 1.5 or later.

Tip – Be sure to use a 32-bit JRE regardless of whether you use a 32-bit or a 64-bit operating system.

- It prompts you for a response before it installs the required software products and any necessary patches.

d. Answer `y` (yes) to the prompt.

Note – The `utinstall` script requests that you reboot the Sun Ray server. In the past, this step was optional; however, it is now required.

The `utinstall` script ends. A time-stamped log file is available at:

```
/var/adm/log/utinstall.year_month_date_hour:minute:second.log
```

Note – For a listing of `utinstall` error messages, see [“utinstall Error Messages” on page 67](#).

Tip – Check the log file. Many installation problems are reported in this file and are frequently overlooked.

5. **If you have not already done so, reboot the Sun Ray server before trying to run `utadm` or `utconfig`.**

```
# /usr/sbin/reboot
```

6. **Go to [“Preparing for Configuration” on page 33](#) for instructions how to prepare to configure and reboot the Sun Ray server.**

If other systems need software installation, return to [“Upgrading the Operating System” on page 29](#), and repeat the tasks appropriate for those systems.

Preparing to Upgrade Sun Ray Server Software

This chapter describes the preparations for *upgrading* from earlier versions of Sun Ray Server Software.

Topics in this chapter include:

- [“Requirements” on page 19](#)
 - [“Failover Groups” on page 20](#)
 - [“Preserving Configuration Data” on page 22](#)
 - [“Preserving Controlled Access Mode \(CAM\) Prototype Data” on page 24](#)
 - [“Unconfiguring the Sun Ray Server” on page 25](#)
 - [“Removing the Software” on page 26](#)
-

Requirements

You can upgrade your current Sun Ray Server Software if you have purchased a new Sun Ray Server Software 4.1 Right-to-Use license or have a Sun Ray Server Software service contract that entitles you to upgrades.

To upgrade from the earlier versions of Sun Ray Server Software, first determine whether you need to upgrade your operating system release, and perform the operating environment upgrade if necessary. See [“Upgrading the Operating System” on page 29](#).

Note – Before you upgrade Sun Ray Server Software, inform your users of your plans, and have them terminate their sessions. An effect of the upgrade procedure is that all active and suspended sessions are lost.

In addition, the `utinstall` script for SRSS 4.1 does not automatically add Sun Ray information to the `crontab`, `syslog`, `PAM`, and `SunMC` services as earlier versions did; instead, it adds them upon the first reboot after installation or upgrade.

The following table summarizes your upgrade requirements.

TABLE 4-1 Summary of Upgrade Requirements

-
1. Preserve the configuration. Upgrading from previous releases of Sun Ray Server Software requires you to preserve the existing Sun Ray configuration manually. See [“Preserving Configuration Data” on page 22](#).
 2. Run `utadm -l` and note the configuration for all existing Sun Ray subnetworks, then run `utadm -r` to unconfigure all active Sun Ray interfaces and remove all Sun Ray entries from the configuration data store.
 3. Upgrade the operating system. See [“Upgrade the Operating System” on page 29](#).
 4. Upgrade Sun Ray Server Software. See [“Upgrading the Sun Ray Server” on page 30](#).
-

Note – It is not necessary to uninstall the current Sun Ray Server Software to perform the upgrade if you are not upgrading the operating system release.

Failover Groups

By configuring two or more Sun Ray servers in a failover group, you can reduce interruption of new service availability in the event that one server fails. If you plan to combine existing Sun Ray servers into a failover group, or to upgrade an existing failover group, please consider the following:

- Before you upgrade a given server, make sure that Sun Ray DTU users terminate their sessions.

Tip – If it is not convenient to upgrade all servers in a large configuration at once, upgrade one or two servers at a time until the entire configuration is complete.

- For best results in groups of four or more servers, configure the primary server so that it serves only the Sun Ray Data Store. Configure the secondary servers so that they serve users directly in addition to serving the Data Store.
- To take advantage of new features in SRSS 4.1, do not mix different Sun Ray Server Software versions within a failover group. Failover groups that use more than one software version revert to the functionality of the earliest version.
- Using the Admin GUI to restart or reset Sun Ray services does not work across servers with different Sun Ray releases. For example, even if you use the Admin GUI to restart all the servers in a failover group that are running SRSS 4.1, you should still restart or reset any Sun Ray servers running earlier versions of SRSS manually.
- When you configure a new server with `utconfig`, the Sun Ray Data Store uses port 7012 by default. When you upgrade an existing Sun Ray server, however, the 3.0 Sun Ray Data Store continues to use the old LDAP port 389, which can create port conflicts.

Tip – To avoid port conflicts, remove the old Sun Data Store product during the `utinstall` procedure. If you have any non-Sun Ray data stored in the Sun Data Store, back it up before upgrading the server so that you can restore the data later.

- Turn off all firmware updates until all the servers in a failover group are upgraded. For instance:

```
# /opt/SUNWut/sbin/utfwadm -D -a -n all
```

Note – Even if you upgrade one or two servers per week, you must wait until all servers in the group are upgraded before you update their firmware.

- If your configuration is a dedicated, private interconnect, disconnect the server from the Sun Ray interconnect.

Note – See [“Configure the Sun Ray Server Hierarchy” on page 50](#) for instructions and Chapter 11 in the *Sun Ray Server Software 4.1 Administrator’s Guide* for a more general discussion of failover groups, including diagrams of failover topologies.

▼ Disconnect the Sun Ray Server From the Interconnect



Caution – This procedure disconnects users from their sessions on the Sun Ray server. Make sure your users terminate their sessions before you continue.

1. As superuser, open a shell window on the Sun Ray server.
2. Disconnect the Sun Ray server from the Sun Ray interconnect:

```
# /opt/SUNWut/sbin/utadm -r
```

Tip – If you issue the signal <CTRL>C while performing utadm configuration, the Admin GUI may not function correctly the next time you invoke it. To correct this condition, type: **dhtadm -R**.

3. Perform one of the following tasks:

- If you need to upgrade or re-install the operating system, see [“Preserving Configuration Data” on page 22](#).
- Otherwise, see [“Upgrading the Sun Ray Server” on page 30](#).

Preserving Configuration Data

You must preserve your existing configuration before running the utinstall script if:

- You are upgrading the Solaris operating environment, for instance, because you are upgrading from an earlier version of Sun Ray Server Software.
or
- You are already running Solaris 10.

If neither condition applies, go to [“Upgrading the Sun Ray Server” on page 30](#).

The utpreserve script in the Sun Ray Server Software image directory preserves:

- X user settings
- Sun Ray Data Store
- Authentication Manager configuration files
- utslaunch properties

- Failover group information
- Kiosk mode configuration

Note – The `utpresave` script does not save *all* configuration files, so you must configure the Sun Ray interconnect interface and Sun Ray administration server the Administration Tool after upgrading Sun Ray Server Software.

▼ Preserve the Sun Ray Server Configuration

If you have already mounted the Sun Ray Server Software 4.1 CD-ROM locally or from a remote server, or if you have extracted the ESD files to an image directory, begin at [Step 3](#).



Caution – Running the `utpresave` script stops all Sun Ray daemons and services, including the Sun Ray Data Store, causing users to lose all of their sessions, both active and disconnected. Please inform them of your plans.

Depending on the size of your configuration, this procedure, including the operating system software upgrade, may take anywhere from five minutes to several hours or even more to complete.

1. As superuser, open a shell window on the Sun Ray server.

2. Insert the Sun Ray Server Software 4.1 CD-ROM.

If a file manager window opens, close it. It is not necessary for installation.

3. Change to the image directory. For example:

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

4. Preserve the Sun Ray configuration:

```
# ./utpresave
```

The `utpresave` script warns that it will stop all Sun Ray services, consequently terminating all user sessions, and asks if it should continue.



Caution – Answering `y` terminates all user sessions, both active and disconnected.

5. Answer `y`.

The `utpresave` script:

- Stops the Sun Ray services and the Sun Ray Data Store daemon.
- Lists the files that are saved.
- Tars and compresses the entire list of files as the `/var/tmp/SUNWut.upgrade/preserve_version.tar.gz` file, where *version* is the currently installed version of Sun Ray Server Software.
- Ends, indicating that a log file is available at `/var/adm/log/utpreserve.year_month_date_hour:minute:second.log`:

where *year*, *month*, etc. are represented by numeric values reflecting the time utpreserve was started.

Tip – Be sure to check this log file for errors that are frequently overlooked.

- Recommends that the `/var/tmp/SUNWut.upgrade/preserve_version.tar.gz` file be moved to a safe location before the operating system software upgrade.
6. **Use NFS, FTP, or other means to copy the `/var/tmp/SUNWut.upgrade/preserve_version.tar.gz` file to a safe location on another server.**
 7. **Make a tape backup of the Sun Ray server's file systems.**



Caution – If you have modified the `/etc/pam.conf` file in a previous version of Sun Ray Server Software, your changes may be lost when SRSS is upgraded. To avoid losing your modifications, be sure to save a copy before performing the update, then use the saved copy to restore your earlier modifications.

Preserving Controlled Access Mode (CAM) Prototype Data

To continue using an existing CAM configuration after upgrading to the latest Sun Ray Server Software, you must migrate the old CAM configuration data so that it can be used by the new Sun Ray Kiosk Mode. This requires you to preserve available CAM prototype data manually, as shown below, before upgrading. The data can then be restored once the upgrade is complete. See [“Migrating from Controlled Access Mode \(CAM\) to Kiosk Mode”](#) on page 57.

▼ Preserve CAM Prototype Data

- To preserve CAM prototype data, execute the following commands:

```
# cd /var/opt/SUNWut/kiosk
# tar cf /var/tmp/prototypes.tar prototypes
```

Tip – Copy the file `/var/tmp/prototypes.tar` to a safe location, such as on another host, before any upgrade.

▼ Restore CAM Prototype Data

- To restore CAM prototype data, execute the following commands:

```
# cd /var/opt/SUNWut/kiosk
# tar xf /var/tmp/prototypes.tar
```

Unconfiguring the Sun Ray Server

To upgrade Sun Ray Server Software, you must first remove the replication configuration, then unconfigure the Sun Ray server.

▼ Unconfigure Sun Ray Server Software

1. As superuser, open a shell window on the Sun Ray server.
2. Remove the replication configuration:

```
# /opt/SUNWut/sbin/utreplica -u
```

3. Unconfigure Sun Ray Server Software:

```
# /opt/SUNWut/sbin/utconfig -u
```

4. Answer `y` to all the prompts.
5. Perform one of the following tasks:

- To upgrade or re-install the operating system, see [“Upgrading the Operating System”](#) on page 29.
- Otherwise, go to [“Upgrading the Sun Ray Server”](#) on page 30.

Removing the Software

Note – The following procedures are *not* required for installation or upgrade.

▼ Remove Sun Ray Server Software

To remove Sun Ray Server Software in its entirety, follow this procedure.

1. Log in as the superuser of the Sun Ray server.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

3. If you are removing Sun Ray Server Software from a server in a failover group, follow steps a and b. Otherwise, skip to [Step 4](#).

- a. Disable Sun Ray DTU firmware downloads:

- i. For a private interconnect, use this syntax:

```
# ./utfwadm -D -a -n all
```

OR

- ii. For a LAN configuration, use this syntax:

```
# ./utfwadm -D -a -N all
```

- b. Remove the replication configuration:

```
# ./utreplica -u
```

4. Remove the Sun Ray network interface(s):

```
# ./utaadm -r
```

5. Unconfigure the Sun Ray software:

```
# ./utconfig -u
```

Answer *y* to all of the prompts.

6. Uninstall Sun Ray Server Software:

```
# cd /  
# /opt/SUNWut/sbin/utinstall -u
```

Answer *y* to all of the prompts.

7. Repeat the steps in this subsection for all remaining Sun Ray servers.

Upgrading

This chapter describes the procedure to *upgrade* from earlier versions of Sun Ray Server Software.

Topics in this chapter include:

- “Upgrading the Operating System” on page 29
- “Upgrading the Sun Ray Server” on page 30

Upgrading the Operating System

▼ Upgrade the Operating System

Note – For complete instructions, please refer to the documentation provided with the latest version of the Solaris Operating System. This procedure may take several hours or more to complete.

1. **Log in, or use the `rlogin` command to log in, as superuser of the Sun Ray server.**

Tip – To avoid preserve script errors that can occur if user environment settings are carried forward, use the `su` command with one of the following arguments instead of using the command without arguments.

```
% su -
```



```
% su - root
```

2. **Use NFS, FTP, or other means to copy the**
`/var/tmp/SUNWut.upgrade/preserve_version.tar.gz`
file, if it exists, to a safe location on another server.
3. **Make a backup of the Sun Ray server's file systems.**
4. **If you have run `utpreserve`, re-install or upgrade the operating system.**
Make an "Entire Distribution" software group installation. Instructions are provided with the Solaris software.

If you have not run `utpreserve`, go to Step 6.
5. **Use NFS, FTP, or other means to return the**
`/var/tmp/SUNWut.upgrade/preserve_version.tar.gz`
file to the Sun Ray server.
6. **Selectively restore the file systems previously backed up.**
7. **Go to "Upgrading the Sun Ray Server" on page 30.**

Upgrading the Sun Ray Server

▼ Upgrade the Sun Ray Server

Tip – If you have already mounted the Sun Ray Server Software 4.1 CD-ROM locally or from a remote server, or if you have extracted the ESD files to an image directory, begin at [Step 4](#).

1. **As superuser, open a shell window on the Sun Ray server.**
2. **Use NFS, FTP, or other means to return the**
`/var/tmp/SUNWut.upgrade/preserve_version.tar.gz`
file to the Sun Ray server.
3. **Insert the Sun Ray Server Software 4.1 CD-ROM.**
If a file manager window opens, close it. The file manager CD-ROM window is not necessary for upgrade.

4. Change to the image directory. For example:

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

5. Upgrade Sun Ray Server Software:

```
# ./utinstall
```

Tip – Reboot the Sun Ray server when the `utinstall` script requests that you do so.

The `utinstall` script:

- Checks to see which required software products are already installed.
- Displays a message about what it has found.
- Might indicate that an encryption change is about to happen. Answer `y` (yes).
- Asks if you want to install a localized Admin GUI.

Note – Pre-2.0 releases of SRSS installed all locales by default. For upgrades, the SRSS 4.1 installation script automatically installs whatever locales were previously installed. For fresh installations, it asks about each locale in sequence. If you have installed `en_US` only, then later want to add one or more foreign locales, please refer to the *Sun Ray Server Software 4.1 Release Notes* for instructions.

- Informs you that it will install, upgrade, or migrate the required software products and any necessary patches and waits for approval. Answer `y` (yes).
- Removes all previous Sun Ray software.
- Installs the required software applications.
 - Sun Ray Data Store
 - Sun Ray server:
 - Administration software
 - English man pages
 - Core software
 - Configuration
 - Drivers
 - Kiosk Mode software
- Provides a notice that the system must be rebooted.

- Ends, indicating a log file is available at
`/var/adm/log/utinstall.year_month_date_hour:minute:second.log`

where the values displayed reflect a time stamp of when `utinstall` was started.

Note – For a listing of `utinstall` error messages, see [“utinstall Error Messages” on page 67](#).

6. Run the `utfwadm` command to update the DTU firmware.

- a. For dedicated interconnects, run:**

```
# utfwadm -A -a -n all
```

- b. For LAN subnetworks, run:**

```
# utfwadm -A -a -N all
```

7. Run `utfwsync`:

```
# utfwsync -v
```

This step is required even for standalone servers.

8. See [“Configuration” on page 41](#) for instructions how to configure and reboot the Sun Ray server.

If other systems need a software upgrade, return to [“Preserving Configuration Data” on page 22](#) and repeat the tasks appropriate for each of those systems.

Preparing for Configuration

This chapter describes what to do before you configure the Sun Ray server.

Topics in this chapter include:

- [“Configuration Tasks” on page 33](#)
- [“Basic Network Topology” on page 38](#)
- [“Configuration Worksheets” on page 34](#)

Configuration Tasks

To configure a new installation or an upgrade of Sun Ray Server Software:

1. Determine your network topology.

Sun Ray servers can be deployed on dedicated private networks and on shared networks. Sun Ray Server Software deployments on shared networks, whether routed or non-routed shared networks (LANs), offer many benefits to users, especially hotdesking. Shared networks can be configured with or without:

- separate DHCP servers
- bootp forwarding

If you are not sure about any aspect of your network configuration, you may want to consult your IT staff. For more information, see [“Deployment on Shared Networks” on page 89](#) of the *Sun Ray Server Software 4.1 Administrator’s Guide*.

2. Fill in the [“Configuration Worksheets” on page 34](#).
3. Configure a Sun Ray interconnect interface if you do not require Sun Ray functionality on a LAN. See [“Configure a Dedicated Sun Ray Interconnect Interface” on page 45](#). To implement a LAN configuration, see [“Configure the Sun Ray Server on a LAN” on page 47](#).

4. Configure Sun Ray Server Software. See [“Configure Sun Ray Server Software” on page 49](#).
5. For failover groups, configure the hierarchy of the Sun Ray servers in the failover group. See [“Configure the Sun Ray Server Hierarchy” on page 50](#).
6. Synchronize the Sun Ray DTU firmware. See [“Synchronize the Sun Ray DTU Firmware” on page 52](#)
7. Synchronize the Sun Ray Data Store. See [“Convert and Synchronize the Sun Ray Data Store Port” on page 52](#).
8. After Configuration, reboot the Sun Ray server. See [“Reboot the Sun Ray Server” on page 57](#).

Repeat this sequence for each Sun Ray server in a failover group.

Note – When the hostname or IP address of a Sun Ray server is changed, the interfaces should also be configured, especially if the Sun Ray server is used for DHCP services.

Configuration Worksheets

Fill out these worksheets so that the information is readily available during the actual configuration process. Values that are provided in *italics* are only *examples* and should *not* be used. Values provided in this font are defaults and can be used. Superscripted numbers ⁽⁷⁾ refer to footnotes at the end of this worksheet.

TABLE 6-1 Basic Parameter Worksheet for Dedicated Interconnect Configuration

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
Configuring the Sun Ray interconnect interface using <code>utadm</code>	(Enter start time here)		
Interface name	<i>hme1</i>		
Host address*	192.168.128.1		
Net mask	255.255.255.0		
Net address	192.168.128.0		
Host name*	<i>hostname-interface-name</i>		
If Sun Ray server is used for IP address allocation			

TABLE 6-1 Basic Parameter Worksheet for Dedicated Interconnect Configuration (*Continued*)

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
First Sun Ray DTU address	192.168.128.16		
Number of Sun Ray DTU addresses [\]	X		
Firmware server ^d	192.168.128.1		
Router ^d	192.168.128.1		
Specify additional server list? (optional)	(yes or no)		
If yes, filename	<i>filename</i>		
Or, Server IP address	192.168.128.2		
Configuring Sun Ray Server Software using <code>utconfig</code>	(Enter start time here)		
Admin password	<i>adminpass</i>		
Configure Admin GUI? If yes, then:			
Sun Ray admin server port number	1660		
Enable remote administration? (optional)	(yes or no)		
Enable secure connection? (optional)	(yes or no)		
Configure Kiosk Mode? (optional)	(yes or no)		
If yes, User prefix	<i>utku</i>		
Group name	<i>utkiosk</i>		
User ID range start	150000		
Number of users [\]	25		
Configure failover group? (optional)	(yes or no)		
If yes, Failover group signature ^D	<i>signature1</i>		

*These values are different for each Sun Ray server, even if that server is part of a failover group.

\These values must be unique among the servers in a failover group. The following guidelines help you determine what addresses to allocate for each Sun Ray server:

- $X = (\text{Number of DTUs} / (\text{Number of servers} - 1)) - 1$
- First unit address for primary server = 192.168.128.16
- Last unit address for all servers = $X + \text{first unit address}$. If last unit address is greater than 240, reduce to 240.
- First unit address for secondary servers = $1 + \text{last unit address of previous server}$.

If first unit address is greater than 239, configure for a class B network. For example: 120 DTUs, 4 servers. $X = 39$

^dThese values are the same as the interface host address by default.

\The value entered for the number of users is the greater of:

- The total number of Sun Ray DTUs
- The total number of disconnected and active sessions

^D This signature *must* be the same for every Sun Ray server in a failover group. The signature requires at least one numeric character.

If you are configuring a Sun Ray server on a LAN, use the following worksheet:

TABLE 6-2 Local Interface Parameter Worksheet for LAN Configuration

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
Configuring the Sun Ray interconnect interface using <code>utadm</code>	(Enter start time here)		
Subnetwork	192.168.128.0		
Host address ⁽¹⁾	192.168.128.1		
Net mask	255.255.255.0		
Net address	192.168.128.0		
Host name ⁽¹⁾	<i>hostname-interface-name</i>		
If Sun Ray server is used for IP address allocation			
First Sun Ray DTU address ⁽²⁾	192.168.128.16		
Number of Sun Ray DTU addresses ⁽²⁾	X		
Firmware server ⁽³⁾	192.168.128.1		
Router ⁽³⁾	192.168.128.1		
Specify additional server list? (optional)	(yes or no)		
If yes, filename	<i>filename</i>		
Or, Server IP address	192.168.128.2		

(1) These values are different for each Sun Ray server, even if that server is part of a failover group.

(2) These values must be unique among the servers in a failover group. The following guidelines help you determine what addresses to allocate for each Sun Ray server:

* $X = (\text{Number of DTUs} / (\text{Number of servers} - 1)) - 1$

* First unit address for primary server = 192.168.128.16

* Last unit address for all servers = $X + \text{first unit address}$. If last unit address is greater than 240, reduce to 240.

* First unit address for secondary servers = 1 + last unit address of previous server. If first unit address is greater than 239, configure for a class B network.

Example: 120 DTUs, 4 servers. $X = 39$

(3) These values are the same as the interface host address by default.

If you are configuring for a failover group, fill in this portion of the worksheet:

TABLE 6-3 Sun Ray Server Configuration Failover Parameters

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
Configuring the Sun Ray server hierarchy using <code>utreplica</code> (Required for failover groups)	(Enter start time here)		
Primary Sun Ray server host name ⁽¹⁾	<i>primary-server</i>	_____	
Secondary Sun Ray server host name ⁽¹⁾	<i>secondary-server</i>	_____	

(1) These values are different for each Sun Ray server, even if that server is part of a failover group.

TABLE 6-4 First and Last Unit Address in a Failover Group

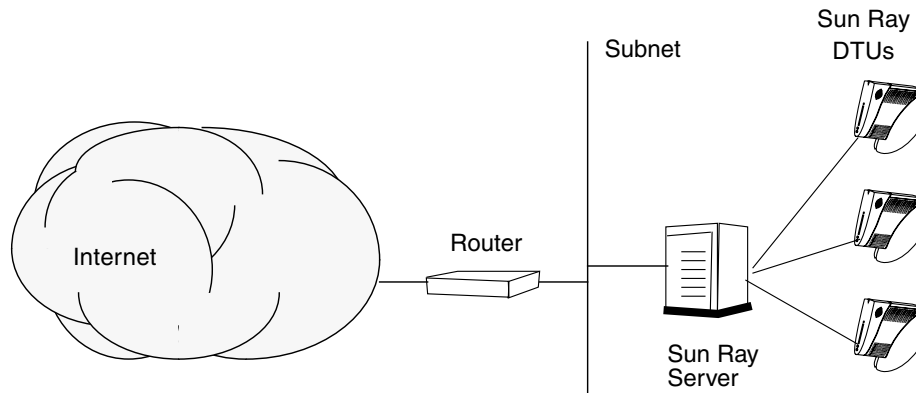
Server	First Unit Address	Last Unit Address
Primary	192.168.128.16	192.168.128.55
Secondary	192.168.128.56	192.168.128.95
Secondary	192.168.128.96	192.168.128.135
Secondary	192.168.128.136	192.168.128.175

Tip – If you forget the address range, use `utadm -l` to list the addresses you specified or `utadm -p` to print them.

Basic Network Topology

Before configuring a Sun Ray server on a shared network, you should understand what your basic network configuration looks like. The following figures illustrate, in simplified form, the most common types.

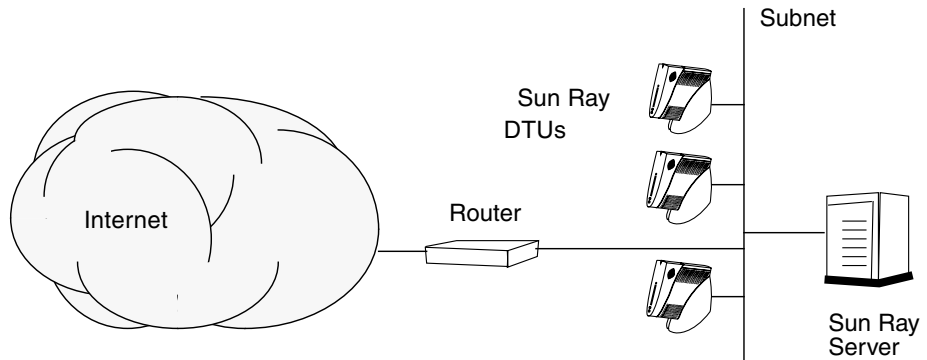
FIGURE 6-1 Dedicated Private Non-routed Sun Ray Network



In contrast to private network configurations, shared network configurations with existing DHCP servers may require `bootp` forwarding in order to function properly with existing network infrastructure.

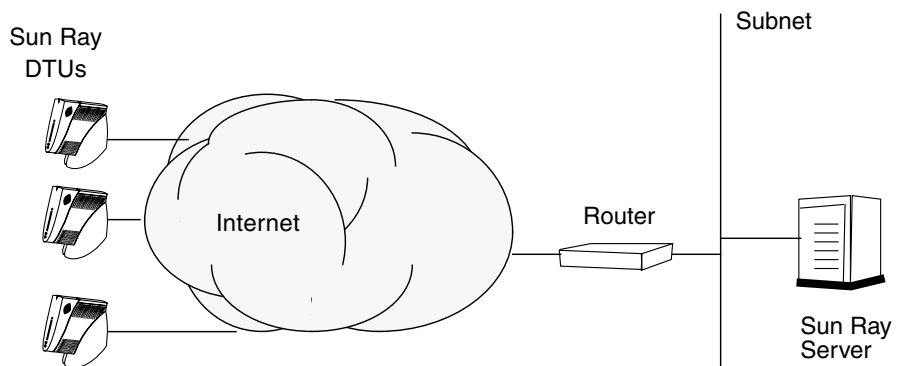
Many newer configurations resemble [FIGURE 6-2](#), which illustrates a shared network with non-routed Sun Ray DTUs.

FIGURE 6-2 Shared Network with Non-routed Sun Ray DTUs



Some new configurations use shared, routed networks, as illustrated in [FIGURE 6-3](#).

FIGURE 6-3 Shared Routed Network



Note – If you have any doubt as to which network model most nearly approximates your site, please consult your IT staff.

Configuration

This chapter describes how to configure Solaris Trusted Extensions as well as how to configure the Sun Ray server. Procedures in this chapter include:

- [“Configure a Dedicated Sun Ray Interconnect for Trusted Extensions”](#) on page 42
- [“Configure Shared Multilevel Ports \(MLP\) for Sun Ray Services”](#) on page 43
- [“Increase the Number of X Server Ports”](#) on page 44
- [“Configure a Dedicated Sun Ray Interconnect Interface”](#) on page 45
- [“Configure the Sun Ray Server on a LAN”](#) on page 47
- [“Turn the Sun Ray LAN Connection On or Off”](#) on page 48
- [“Configure Sun Ray Server Software”](#) on page 49
- [“Configure the Sun Ray Server Hierarchy”](#) on page 50
- [“Synchronize Primary and Secondary Sun Ray Servers”](#) on page 52
- [“Synchronize the Sun Ray DTU Firmware”](#) on page 52
- [“Convert and Synchronize the Sun Ray Data Store Port”](#) on page 52
- [“Re-enable the Old SunDS Service”](#) on page 53
- [“Determine the Integrity of the Configuration Files”](#) on page 54
- [“Replace the Xservers and Xconfig Files”](#) on page 56
- [“Reboot the Sun Ray Server”](#) on page 57
- [“Migrating from Controlled Access Mode \(CAM\) to Kiosk Mode”](#) on page 57

For more details on Sun Ray network configuration, see [“Deployment on Shared Networks”](#) on page 89 of the *Sun Ray Server Software 4.1 Administrator’s Guide*.

For further instructions on Solaris Trusted extensions, see [Appendix B](#).

Note – If Apache Tomcat 5.5 is not already installed on your system, see [“Sun Ray Admin GUI Web Server Requirements”](#) on page 12 before proceeding..

Configuring SRSS 4.1 on Trusted Extensions

Perform the following procedures as root from ADMIN_LOW (global zone).

- [Configure a Dedicated Sun Ray Interconnect for Trusted Extensions](#)
- [Configure Shared Multilevel Ports \(MLP\) for Sun Ray Services](#)
- [Increase the Number of X Server Ports](#)
- [Reboot the System](#)

Note – For the latest Solaris Trusted Extensions installation and configuration instructions, see <http://docs.sun.com/app/docs/coll/175.12>.

▼ Configure a Dedicated Sun Ray Interconnect for Trusted Extensions

Use the Solaris Management Console (SMC) Security Templates to assign the `cipso` template to the Sun Ray Server. Assign all other Sun Ray devices on the network an `admin_low` label. The `admin_low` template is assigned to the range of IP addresses you are planning to use in the `utadm` command.

The `/etc/security/tsol/tnrhdb` file should contain the following entries when you finish:

```
192.168.128.1:cipso
192.168.128.0:admin_low
```

1. Start the Solaris Management Console (SMC).

```
# smc &
```

2. Make the following selections:

- In the SMC, select Management Tools
->Select hostname:Scope=Files, Policy=TSOL.
- Select System Configuration->Computers and Networks
->Security Templates->`cipso`.
- From the menu bar, Select Action->Properties->Hosts Assigned to Template.

- d. Select Host and enter the IP Address of the Sun Ray interconnect (for example, 192.168.128.1).
 - e. Click Add then OK.
 - f. Select System Configuration->Computers and Networks ->Security Families->admin_low.
 - g. From the menu bar, Select Action->Properties->Hosts Assigned to Template.
 - h. Select Wildcard.
 - i. Enter the IP Address of the Sun Ray Interconnect Network (192.168.128.0).
 - j. Click Add then OK.
3. Assign all Sun Ray Servers in the failover group a cipso label.
 - a. Select System Configuration->Computers and Networks ->Security Families->cipso.
 - b. From the menu bar, Select Action->Properties->Hosts Assigned to Template.
 - c. Select Host and enter the IP Address of the other Sun Ray Server.
 - d. Click Add then OK.

▼ Configure Shared Multilevel Ports (MLP) for Sun Ray Services

A shared multilevel port has to be added to the global zone for Sun Ray services in order to have access from labeled zone.

1. Start the Solaris Management Console (SMC).

```
# smc &
```

2. Make the following selections under Management Tools:
 - a. Select hostname:Scope=Files, Policy=TSOL.
 - b. Select System Configuration->Computers and Networks ->Trusted Network Zones->global.
 - c. From the menu bar, Select Action->Properties.
 - d. Click Add under Multilevel Ports for Shared IP Addresses
 - e. Add 7007 as Port Number, Select TCP as Protocol and click OK.

- f. Repeat this step for ports 7010 and 7015.
- g. Restart network services by running the following command:

```
# svcadm restart svc:/network/tnctl
```

- h. Verify that these ports are listed as shared ports by running the following command:

```
# /usr/sbin/tninfo -m global
```

▼ Increase the Number of X Server Ports

The default entry in `/etc/security/tsol/tnzonecfg` makes three displays available (6001-6003). Increase the number of available X server ports per requirements.

1. Start the Solaris Management Console (SMC).

```
# smc &
```

2. Make the following selections:

- a. In the SMC, Under Management Tools
->Select `hostname:Scope=Files, Policy=TSOL` option.
- b. Select System Configuration->Computers and Networks
->Trusted Network Zones->global.
- c. From the menu bar, Select Action->Properties
- d. Under Multilevel Ports for Zone's IP Addresses, select `6000-6003/tcp`.
- e. Click Remove.
- f. Click Add->Enable Specify A Port Range.
- g. Enter 6000 in Begin Port Range Number and 6050 (for 50 displays) in End Port Range Number.
- h. Select TCP as Protocol.
- i. Click OK.

▼ Reboot the System

- When you have finished configuring SRSS 4.1 on Trusted Extensions, reboot:

```
# /usr/sbin/reboot
```

Configuring the Sun Ray Server

Sun Ray Server Software manipulates the `/etc/dt/config/Xservers` file. Generally speaking, you should copy `/usr/dt/config/Xservers` to `/etc/dt/config/Xservers.SUNWut.prototype` and customize it as needed. Sun Ray Server Software uses the contents of that file as a base configuration when you add Sun Rays DTUs to `/etc/dt/config/Xservers`.

The `Xservers` file shipped with `dtlogin` includes an entry for `DISPLAY:0`, on the assumption that there is a frame buffer in the system. On a headless Sun Ray server, you need to configure `/etc/dt/config/Xservers.SUNWut.prototype` so that `dtlogin` does not try to start an Xsun or Xnewt on `DISPLAY:0`. For instructions, see `/etc/dt/config/README.SUNWut`.

Note – If the server is headless, it has no display and cannot, therefore, have a meaningful value for the `DISPLAY` variable.

▼ Configure a Dedicated Sun Ray Interconnect Interface

1. Log in as the superuser of the Sun Ray server, either locally or remotely.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

Note – Make sure that the `/etc/hosts` file contains the following entry:
ip-address of the system hostname

3. Configure the Sun Ray interconnect interface:

```
# ./utadm -a interface-name
```

where *interface-name* is the name of the interface to the Sun Ray interconnect, for example: *hme1*, *qfe0*, or *ge0*.

The `utadm` script begins configuring DHCP for the Sun Ray interconnect, restarts the DHCP daemon, and configures the interface. The script then lists the default values and asks if they are acceptable.



Caution – If the IP addresses and DHCP configuration data are not set up correctly when the interfaces are configured, the failover feature cannot work properly. In particular, configuring the Sun Ray server’s interconnect IP address as a duplicate of any other server’s interconnect IP address may cause the Sun Ray Authentication Manager to generate “Out of Memory” errors.

4. If you are satisfied with the default values, and the server is not part of a failover group, answer `y`.

5. Otherwise, answer `n` and accept whatever default values are shown by pressing return or provide the correct values from the worksheet.

The `utadm` script prompts for the following:

- New host address (*192.168.128.1*)
 - New netmask (*255.255.255.0*)
 - New host name (*hostname-interface-name*)
 - Offer IP addresses for this interface? ([Y]/N)
 - New first Sun Ray DTU address (*192.168.128.16*)
 - Total number of Sun Ray DTU address (*X*)
 - New authorization server address (*192.168.128.1*)
 - New firmware server address (*192.168.128.1*)
 - New router address (*192.168.128.1*)
 - To specify an additional server list.
If you answer yes, it requests either a file name (*filename*) or a Server IP Address (*192.168.128.2*).
6. The `utadm` script again lists the configuration values and asks if they are acceptable. Answer appropriately.
- If you answer `n`, go back to [Step 5](#).

- If you answer *y*, the following Sun Ray-specific files are configured:

```
/etc/hostname.interface-name
/etc/inet/hosts
/etc/inet/netmasks
/etc/inet/networks
```

The `utadm` script configures the Sun Ray DTU firmware versions and restarts the DHCP daemon.

7. Repeat [Step 1](#) through [Step 6](#) for each of the secondary servers in your failover group.
8. Do one of the following:
 - If you upgraded Sun Ray Server Software without upgrading the Solaris operating environment, go to [“Synchronize the Sun Ray DTU Firmware”](#) on [page 52](#).
 - Otherwise, go to [“Configuring the Sun Ray Server”](#) on [page 45](#).

▼ Configure the Sun Ray Server on a LAN

1. Log in as the superuser of the Sun Ray server.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

3. Configure the Sun Ray LAN subnet:

```
# ./utadm -A subnet#
```

Where *subnet#* is the name (really a number) of the subnet, such as 192.168.128.0.

The `utadm` script begins configuring DHCP for the Sun Ray interconnect, restarts the DHCP daemon, and configures the interface. The script then lists the default values and asks if they are acceptable.



Caution – If the IP addresses and DHCP configuration data are not set up correctly when the interfaces are configured, the failover feature cannot work properly. In particular, configuring the Sun Ray server’s subnet IP address as a duplicate of any other server’s subnet IP address may cause the Sun Ray Authentication Manager to throw “Out of Memory” errors.

4. If you are satisfied with the default values, and the server is not part of a failover group, answer *y*.
5. Otherwise, answer *n* and accept whatever default values are shown by pressing return or provide the correct values from the worksheet.

The `utadm` script prompts for the following:

- New netmask (*255.255.255.0*)
 - New first Sun Ray DTU address (*192.168.128.16*)
 - Total number of Sun Ray DTU addresses
 - New authorization server address (*192.168.128.1*)
 - New firmware server address (*192.168.128.10*)
 - New router address (*192.168.128.1*)
 - To specify an additional server list. If you answer *yes*, it requests either:
 - File name (*filename*)
 - Server IP Address (*192.168.128.2*)
6. The `utadm` script again lists the configuration values and asks if they are acceptable. Answer appropriately.
 - If you answer *n*, go back to [Step 5](#).
 - If you answer *y*, the `utadm` script configures the Sun Ray DTU firmware versions and restarts the DHCP daemon.
 7. Repeat [Step 1](#) through [Step 6](#) for each of the secondary servers in your failover group. See [“Configure Sun Ray Server Software”](#) on page 49.
 8. Do one of the following:
 - If you upgraded Sun Ray Server Software without upgrading the Solaris operating environment, go to [“Synchronize the Sun Ray DTU Firmware”](#) on page 52.
 - Otherwise, proceed to [“Configure Sun Ray Server Software”](#) on page 49.
 9. Proceed to [“Configure Sun Ray Server Software”](#) on page 49.

▼ Turn the Sun Ray LAN Connection On or Off

When you configure a Sun Ray server for a shared network, the `utadm -A` command enables the server's LAN connection. If you do not use `utadm -A`, however, and you still wish to enable or disable the LAN connection, use this procedure.

When the LAN connection is turned off, Sun Ray DTUs on the LAN cannot attach to the server.

Tip – If you plan to use an existing DHCP server to provide Sun Ray parameters, use this procedure to turn the LAN connection on or off on the Sun Ray server.

1. Log in as the superuser of the Sun Ray server, either locally or remotely.
2. Turn the Sun Ray LAN connection on:

```
# /opt/SUNWut/sbin/utadm -L on
```

Tip – Use `utadm -l` to verify the current setting for Sun Ray LAN connection. To disable all Sun Ray LAN connections, use `utadm -L off`.

3. Restart services as prompted:

```
# /opt/SUNWut/sbin/utrestart
```

▼ Configure Sun Ray Server Software

1. If you have not already done so, log in as the superuser of the Sun Ray server.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

3. Configure Sun Ray Server Software.

```
# ./utconfig
```

4. Accept the default `utconfig` values shown by pressing Return or provide the correct values from the worksheet.

The `utconfig` script prompts for the following:

- Whether the script should continue (press Return)
- Sun Ray administration password (*adminpass*)
- Sun Ray administration password again

Note – All servers in a failover group must use the same administration password.

- To configure the Sun Ray Web Administration (Admin GUI), (press Return)
- Path to the Apache Tomcat installation directory (`/opt/apache-tomcat`)

- Web server port number (1660)
- Whether to enable secure connections ([Y]/n)
- If Yes, to enter HTTPS port number (1661)
- To supply a user name for the Tomcat process (utwww)
- Whether you want to enable remote administration ([Y]/n)
- Whether you want to configure Kiosk Mode ([Y]/n). If yes, it requests:
 - User prefix (utku)
 - Group (utkiosk)
 - User ID range start (150000)
 - Number of users (25)
- Whether you want to configure for a failover group
- Whether the script should continue (press Return)

The `utconfig` script begins configuring Sun Ray Server Software.

- If you responded that this is a failover group, the script requests the signature (*signature1*)
- The signature again
The Sun Ray Data Store is restarted.

Note – The `utconfig` script states that you must restart the authentication manager. This happens automatically when you reboot the Sun Ray server.

The `utconfig` script ends, indicating a log file is available at the following location:

- `/var/adm/log/utconfig.year_month_date_hour:minute:second.log`
where the *year*, *month*, etc. are represented by numeric values reflecting the time `utconfig` was started.

5. Repeat [Step 1](#) through [Step 4](#) for each secondary server if in a failover group.

6. Do one of the following:

- If you have a failover group, see [“Configure the Sun Ray Server Hierarchy” on page 50](#).
- Otherwise, go to [“Synchronize the Sun Ray DTU Firmware” on page 52](#).

▼ Configure the Sun Ray Server Hierarchy

Perform this task after all servers in the failover group have been configured.

1. If you have not already done so, log in as the superuser of the primary Sun Ray server.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

3. Configure this server as the primary Sun Ray server and identify all secondary servers.

```
# ./utreplica -p secondary-server1 secondary-server2 ...
```

Where *secondary-server1*, *secondary-server2*, ... identifies the host names of the secondary servers. Include all secondary servers in this command.

The *utreplica* script:

- Stops and starts the Sun Ray services
 - Reads the Authentication Manager policy
 - Indicates a log file is available at the appropriate location:
 - `/var/adm/log/utreplica.year_month_date_hour:minute:second.log`
4. Log in as the superuser of a secondary Sun Ray server.

5. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

6. Configure the server as a secondary Sun Ray server and identify the primary server.

```
# ./utreplica -s primary-server
```

Where *primary-server* is the host name of the primary server configured in [Step 3](#).

7. Repeat [Step 4](#) through [Step 6](#) for all remaining secondary servers.
8. When you are finished, go to [“Synchronize the Sun Ray DTU Firmware” on page 52](#).

▼ Synchronize Primary and Secondary Sun Ray Servers

Log files for Sun Ray servers contain time-stamped error messages which are difficult to interpret if the time is out of sync. To make troubleshooting easier, please make sure that all secondary servers periodically synchronize with their primary server. For instance:

```
# rdate <primary-server>
```

▼ Synchronize the Sun Ray DTU Firmware

Note – This task is performed on standalone Sun Ray servers or the last Sun Ray server configured in a failover group. If your server is not one of these, see [“Reboot the Sun Ray Server” on page 57](#).

1. If you have not already done so, log in as the superuser of the Sun Ray server.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

3. Synchronize the Sun Ray DTU firmware:

```
# ./utfwsync
```

The Sun Ray DTUs reboot themselves and load the new firmware.

4. When you are finished, reboot the server.

```
# /usr/sbin/reboot
```

▼ Convert and Synchronize the Sun Ray Data Store Port

In place of the old Sun Directory Service (Sun DS) used in Sun Ray Server Software versions 1.0 through 1.3, versions 2.0, 3, and later provides a private data store service, the Sun Ray Data Store (SRDS).

SRDS uses service port 7012, to avoid conflict with the standard LDAP port number, 389. When you upgrade a server to SRSS 2.0 or later, the LDAP port remains in use until all the servers in the failover group have been upgraded and converted. Port conversion is required only if you plan to continue to run SunDS on the recently upgraded SRSS server.

Note – Even though you have upgraded a server, you cannot run the Sun Ray Data Store until you also convert the port number.

Tip – Perform this task on standalone Sun Ray servers or on the primary server in a failover group after all the servers in the group have been upgraded.

1. If you have not already done so, log in as the superuser of the primary Sun Ray server.
2. Open a shell window and change to the following directory:

```
# cd /opt/SUNWut/sbin
```

3. Convert and synchronize the Sun Ray Data Store service port number on all the servers in a failover group:

```
# ./utdssync
```

This step restarts the Sun Ray Data Store on all the servers.

▼ Re-enable the Old SunDS Service

This procedure re-enables the old SunDS, in case you need to use it for old private data on the Sun Ray servers.

Note – You can re-enable the SunDS service only if you have chosen to preserve the old SunDS data when you upgraded from an earlier version of Sun Ray Server Software.

The following task requires you to have completed the `utdssync` command. See [“Convert and Synchronize the Sun Ray Data Store Port” on page 52](#).

1. If you have not already done so, log in as the superuser of the primary Sun Ray server.

2. Open a shell window and change to the following directory:

```
# cd /etc/opt/SUNWconn/ldap/current
```

3. Rename the saved configuration file to `dsserv.conf`:

```
# mv dsserv.conf_save_date_time dsserv.conf
```

where *date* is the current date, in YYMMDD format, and *time* is the time the save file is created, in hh:mm format.

4. Start the SunDS service:

```
# /etc/init.d/dsserv start
```

Note – Support for the Sun DS product was discontinued as of the Sun Ray Server Software 2.0 release and cannot be used unless it was purchased separately.

▼ Determine the Integrity of the Configuration Files

Two configuration files are susceptible to corruption:

- `/etc/dt/config/Xservers`
- `/etc/dt/config/Xconfig`

When they are corrupt, the `dtlogin` daemon cannot start the Xsun server properly. To prevent or correct this problem, use the following procedure.

Note – This procedure is needed *only* when the `Xservers` or `Xconfig` file is corrupted.

1. As a user of the Sun Ray server, open a shell window and compare the `/usr/dt/config/Xservers` and `/etc/dt/config/Xservers` files:

```
% diff /usr/dt/config/Xservers /etc/dt/config/Xservers
```

This command compares a known good file with the suspect file. The output should be similar to the following example:

```
106a107,130
> # BEGIN SUNRAY CONFIGURATION
> :3 SunRay local@none /etc/opt/SUNWut/basedir/lib/utxsun :3 -nobanner
.
.
> :18 SunRay local@none /etc/opt/SUNWut/basedir/lib/utxsun :18 -nobanner
> # END SUNRAY CONFIGURATION
```

Note – This is a simplified example. Your output may have tens of lines between the `BEGIN SUNRAY CONFIGURATION` and `END SUNRAY CONFIGURATION` comments.

In the first line of output, there is `106a107,130`. The `106` means that the two files are identical to the 106th line of the files. The `a107,130` means that the information on lines 107 through 130 of the second file would have to be added to the first file to make it the same as the second.

If your output shows the first three digits to be a number less than 100, the `/etc/dt/config/Xservers` file is corrupt.

2. Compare the `/usr/dt/config/Xconfig` and `/etc/dt/config/Xconfig` files:

```
% diff /usr/dt/config/Xconfig /etc/dt/config/Xconfig
```

The output should be similar to the following example:

```
156a157,180
> # BEGIN SUNRAY CONFIGURATION
> Dtlogin.*_8.environment:
SUN_SUNRAY_TOKEN=ZeroAdmin.m1.at88sc1608.6d0400aa
.
.
> Dtlogin.*_9.environment:
SUN_SUNRAY_TOKEN=ZeroAdmin.m1.at88sc1608.a10100aa
> # END SUNRAY CONFIGURATION
```

Note – This is a simplified example. Your output may have tens of lines between the `BEGIN SUNRAY CONFIGURATION` and `END SUNRAY CONFIGURATION` comments.

If your output shows the first three digits to be a number less than 154, the `/etc/dt/config/Xconfig` file is corrupt.

▼ Replace the Xservers and Xconfig Files



Caution – Replacing the `Xservers` file requires shutting down all Sun Ray DTU services. Remember to inform users of the outage.

1. As superuser, open a shell window and stop the Sun Ray server:

```
# /etc/init.d/utsvc stop
```

2. Replace the `Xservers` and `Xconfig` files as appropriate:

```
# /bin/cp -p /usr/dt/config/Xservers /etc/dt/config/Xservers
# /bin/cp -p /usr/dt/config/Xconfig /etc/dt/config/Xconfig
```

Note – For headless servers, comment out or remove the `:0` entry from the `Xservers` file.

3. Re-initialize the authentication policy:

```
# /opt/SUNWut/sbin/utrestart -c
```

The extra lines within the previous `Xservers` and `Xconfig` files are automatically rebuilt.

▼ Reboot the Sun Ray Server

After following the configuration procedures, reboot the Sun Ray server(s).

1. If you have not already done so, log in as the superuser of the Sun Ray server.
2. Open a shell window and reboot the Sun Ray server:

```
# /usr/sbin/reboot
```

3. Repeat [Step 1](#) and [Step 2](#) for each Sun Ray server.

Migrating from Controlled Access Mode (CAM) to Kiosk Mode

As of the Sun Ray Server Software 4.1 release, CAM has been replaced by Kiosk Mode. To continue using previous CAM configuration with Kiosk Mode, you must migrate all relevant CAM configuration data to its Kiosk Mode equivalent. The `utcammigrate` tool creates all the required Kiosk Mode applications and prototypes needed to convert an old CAM configuration to Kiosk Mode.

Tip – Before migrating from CAM to Kiosk Mode, be sure to preserve any existing CAM prototype data. See [“Preserve CAM Prototype Data”](#) on page 25.

1. To complete the migration process, execute the following command.

```
# /opt/SUNWut/sbin/utcammigrate -u
```

The `-u` option instructs `utcammigrate` to upload the relevant Kiosk Mode session configuration and selected applications list to the Sun Ray Data Store. This effectively selects the migrated session for use with all subsequent client connections. If you do not wish to select the session for immediate use, you may omit the `-u` option from the command above and configure your session manually using the Sun Ray Admin GUI.

2. When Kiosk configuration is complete, perform a cold restart of Sun Ray services.

You can select the server on the Servers tab of the Admin GUI and press the Cold Restart button, or you can execute the following command:

```
# /opt/SUNWut/sbin/utrestart -c
```

Failover Group Migration

Specifying the `-u` option to `utcammigrate` results in the automatic selection of the migrated session. This selection applies to all hosts in a failover group and, as such, it is essential that the migration be completed first before the selection takes place. To ensure that this is the case, execute `/opt/SUNWut/sbin/utcammigrate` without any options on all hosts but one in a failover group. You may then safely execute `/opt/SUNWut/sbin/utcammigrate -u` on the last host in the group.

For a more detailed explanation of the migration process, see the `utcammigrate(1m)` man page.

Additional Information

This appendix provides additional information regarding your installation or upgrade to Sun Ray Server Software 4.1.

Topics covered in this appendix include:

- [“Installing the SunMC Software” on page 59](#)
- [“Mounting a CD-ROM Remotely” on page 63](#)
- [“Modified System Files” on page 65](#)
- [“utinstall Error Messages” on page 67](#)

Installing the SunMC Software

Note – The Sun Management Center is not currently available for Linux implementations.

Sun Ray Server Software includes a module for interfacing with Sun Management Center software. If Sun Ray Server Software and Sun Management Center software are to run on the same server, different procedures are used, depending on the order in which the software is installed. If Sun Ray Server Software and Sun Management Center server component are configured on separate servers, then the module must be installed on both servers. This section describes the installation procedures. For more detail on SunMC functionality, see [“Monitoring the Sun Ray System” on page 131](#) of the *Sun Ray Server Software 4.1 Administrator’s Guide*.

If you are doing a clean installation of Sun Management Center software and Sun Ray Server Software on the same server, it is easier to install Sun Management Center software first.

When you install Sun Management Center software, you are given the option of installing any of the three components on the selected server. If you want to add only the agent to a Sun Ray server, just choose to add the agent component.

After the appropriate hardware configuration product is installed on the server, you can choose to run the setup now or later. When you run the setup, you are prompted for a host name of Sun Management Center server, a seed to generate security keys, a base URL for the console, and, if there is a conflict, a different port for the agent.

Tip – To monitor all the servers in a failover group, make sure every server runs Sun Ray Server Software 4.1. In addition, all servers must run the Sun Management Center agent component.

Note – Administration of the SunMC software is documented in the *Sun Ray Server Software 4.1 Administrator's Guide*.

SunMC Software Requirements

The Sun Ray system monitoring feature has the following software requirements:

- Sun Ray Server Software for Solaris
- Sun Management Center 4.0 software.

The Sun Ray module adds the following requirements when added to either the Sun Management Center server or agent component:

TABLE A-1 Additional Requirements for the Server

Component	Size
RAM	8 KB
/opt/SUNWut	153 KB
/opt/SUNWsymon	12 KB

TABLE A-2 Additional Requirements for the Agent

Component	Size
RAM	1 MB
Swap	1 MB
/opt/SUNWut	602 KB
/opt/SUNWsymon	12 KB
/var/opt/SUNWsymon	0.5 KB

The Sun Ray module adds the following requirements to the Sun Management Center server and agent components:

TABLE A-3 Additional Requirements for the Server and Agent Components

Component	Size
RAM	1008 KB
Swap	1 MB
/opt/SUNWut	602 KB
/opt/SUNWsymon	12 KB
/var/opt/SUNWsymon	.5 KB



Caution – The Sun Management Center server component has very high resource requirements. Do not install the complete Sun Management Center software on a Sun Ray server, especially if the Sun Ray server is configured for failover.

▼ To Install Sun Ray Server Software After Installing the Sun Management Center Software

1. Start the Sun Management Center software:

```
# /opt/SUNWsymon/sbin/es-start -c &
```

Check to see if the Sun Management Center works. If not, reinstall the Sun Management Center software, using the instructions in the *Sun Management Center 4.0 Installation and Configuration Guide*. Sun Management Center documentation is available at: <http://docs.sun.com/app/docs/coll/1734.1>.

2. Use the standard Sun Ray installation script to add the Sun Ray module:

```
# /opt/SUNWut/sbin/utinstall
```

If the Sun Management Center agent software is running, the standard Sun Ray install script automatically stops it, adds the Sun Ray module, and restarts the Sun Management Center agent software.

If the Sun Management Center agent software is not running, the Sun Ray install script adds the Sun Ray module but does not start the Sun Management Center agent software.

▼ To Install Sun Management Center Software After Installing Sun Ray Server Software

1. Use the standard Sun Ray installation script:

```
# /opt/SUNWut/sbin/utinstall
```

The Sun Ray module for SunMC is installed automatically on the server when `utinstall` installs Sun Ray Server Software.

2. Follow the installation instructions found in the *Sun Management Center Software Installation Guide* to install the Sun Management Center software.
3. Type the following to enable Sun Ray monitoring:

```
# /opt/SUNWut/sbin/utsunmc
```

4. Start the Sun Management Center software:

```
# /opt/SUNWsymon/sbin/es-start -c &
```

Check to see if Sun Management Center works. If not, reinstall the Sun Management Center software.

▼ To Install the SunMC Agent on Separate Servers

1. Verify that the Sun Management Center agent, `SUNWesagt`, is installed on the Sun Ray server:

```
# pkginfo -l SUNWesagt
```

2. Perform a standard installation of Sun Ray Server Software:

```
# /opt/SUNWut/sbin/utinstall
```

If the Sun Management Center agent is running, the installation process stops and restarts the SunMC software.

Note – You can install Sun Management Center agents after Sun Ray Server Software installation; however, you must then enable the Sun Ray module by typing `/opt/SUNWut/sbin/utsummc` to register the Sun Ray module with the SunMC.

3. Install the Sun Ray interface package on the Sun Management Center server:

If you have already mounted the Sun Ray Server Software 4.1 CD-ROM on the SunMC server or from a remote server, or if you have extracted the ESD files to an image directory, begin at [Step c](#).

a. As superuser, open a shell window on the SunMC server.

b. Insert the Sun Ray Server Software 4.1 CD-ROM

If a File Manager window opens, close it. The File Manger CD-ROM window is not necessary for installation.

c. Change to the image directory. For example:

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

d. Install the Sun Ray module:

```
# ./utsummcinstall
```

The installation process begins. The `utsummcinstall` script:

- Verifies that the SunMC software is installed.
- Verifies that Sun Ray Server Software is *not* installed.
- Installs the parts of the Sun Ray module needed on the SunMC server.

Mounting a CD-ROM Remotely

If you purchased the Sun Ray Server Software 4.1 CD-ROM but your Sun Ray server does not have a CD-ROM drive, follow these instructions to mount the Sun Ray Server Software CD-ROM from a remote server.

▼ To Mount the CD-ROM From a Remote Server

1. As superuser of the remote system, open a shell window.
2. Insert the Sun Ray Server Software 4.1 CD-ROM into the CD-ROM drive.
If a file manager window opens, close it. The file manager CD-ROM window is not necessary for installation.
3. Share the Sun Ray CD-ROM file system:

```
# share -o ro /cdrom/cdrom0
```

4. Use the `rlogin` command to log into the Sun Ray server as the root user:

```
# rlogin sunray-server-name -l root  
Password:
```

Where *sunray-server-name* is the host name of the Sun Ray server.

Tip – If you receive an error that you are not on the system console, comment out the line `CONSOLE=/dev/console` in the `/etc/default/login` file on the Sun Ray server.

5. Create the CD-ROM file system mount point:

```
# mkdir -p /cdrom/cdrom0
```

6. Mount the remote CD-ROM drive:

```
# mount -o ro cd-server-name:/cdrom/cdrom0 /cdrom/cdrom0
```

Where *cd-server-name* is the host name of the server with the Sun Ray CD-ROM.

7. Return to the point where you referenced this procedure.

▼ To Unmount the CD-ROM From a Remote Server

1. From the shell window where you mounted the CD-ROM, unmount the CD-ROM file system:

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

2. Close the `rlogin` session:

```
# exit
```

3. Unshare the CD-ROM file system:

Note – This procedure is for Solaris only.

```
# unshare /cdrom/cdrom0
```

Restoring `utadm` Functionality

If you issue the command `<CTRL>C` while performing `utadm` configuration, `utadm` may not function correctly the next time you invoke it. To correct this condition, type:

```
# dhtadm -R
```

Modified System Files

The following files are modified during `utadm`:

- `/etc/inet/hosts`
- `/etc/inet/networks`
- `/etc/inet/netmasks`
- `/etc/inet/dhcpsvc.conf` # including all DHCP related files
- `/etc/nsswitch.conf`

- /etc/hostname.<intf>
- /etc/notrouter

The following files are modified during SR service startup:

- /etc/inet/services
- /etc/inet/inetd.conf

The following files are modified during utconfig:

- /etc/passwd
- /etc/shadow
- /etc/group

After installation, the following files are updated upon reboot:

- /etc/syslog.conf
- /etc/pam.conf

utinstall Error Messages

If during an installation, upgrade, or uninstall the `utinstall` script returns an error, refer to the following table for assistance.

TABLE A-4 utinstall Error Messages

Message	Meaning	Resolution
<code>utinstall: fatal, media-dir</code> is not a valid directory.	You called the <code>-d</code> option, but <i>media-dir</i> is incomplete.	The <i>media-dir</i> directory requires relevant patches and packages for installation. The <i>media-dir</i> directory includes the Sun Ray directory.
Cannot open for read <code>admin-file</code>	The <code>admin_default</code> file is unreadable, or you called the <code>-a</code> option and the <i>admin-file</i> is unreadable.	Verify that the installation administration file exists (<code>admin_default</code> or other) and the permissions are correct.
For SPARC platforms: SunOS release is <code>x.x</code> , valid releases are: 10	You are attempting to install Sun Ray Server Software onto Solaris software version that does not support SRSS 4.1.	Upgrade to version 10 of the Solaris operating environment before installing Sun Ray Server Software.
For x86 platforms: SunOS release is <code>x.x</code> , valid releases are: 10	You are not running a valid OS release for this platform.	Upgrade to version 10 of the Solaris operating environment before installing Sun Ray Server Software.
Please clean up the directory <code>/var/tmp/SUNWut.upgrade</code> before rerunning <code>utinstall</code> .	Other unrelated files are found in the preserve directory.	Clean up the directory.
Please remove the existing preserved file <code><preserved_tarfilename></code> before rerunning <code>utinstall</code> .	You decided not to restore from the indicated tar file.	Remove the tar file before rerunning <code>utinstall</code> .
<code>utpreserve: unable to</code> preserve data. Error while creating archive file	The <code>utinstall</code> script failed to preserve existing configuration files.	Either exit and manually preserve these files or just continue.
<code>xxxxxx</code> not successfully installed	Might occur for the installation of any application or patch, <code>xxxxxx</code> , if relevant packages have not been properly installed.	Verify the component <code>xxxxxx</code> is present in the installation media directory path and has the correct permissions, then re-run the <code>utinstall</code> script.
The following packages were not successfully removed <code>xxxxxx ...</code>	The packages listed have not been properly removed.	Use the <code>pkgrm</code> command to remove each package listed manually, then run <code>utinstall -u</code> again.

TABLE A-4 utinstall Error Messages (*Continued*)

Message	Meaning	Resolution
A different version x.x of product has been detected. The other-product Software is only compatible with product y.y. You must either upgrade or remove the current product installation before proceeding.	Some of the applications provided with Sun Ray Server Software are only compatible with certain versions of other applications.	Compatible and necessary applications are included with Sun Ray Server Software. Remove older versions, then re-run the utinstall script.
Exiting ...		
error, no Sun Ray software packages installed.	None of the Sun Ray components are installed on this system.	No action is required as the product is not installed.
The following files were not successfully replaced during this upgrade. The saved copies can be found in <directory>	Some files were not properly replaced as part of the upgrade.	Manually copy the listed files from the <i>directory</i> overwriting the newer files if applicable.
Removal of product was not successfully completed. See log file for more details.	Removal of Sun Ray Server Software was incomplete.	Check <i>logfile</i> for the package that started the problem and manually remove it with the <code>pkgrm</code> command, then run <code>utinstall -u</code> again.
Partition Name Space Required Space Available ----- <i>partition</i> <i>xxx</i> <i>yyy</i>		Not enough disk space was allocated for <i>partition</i> . Repartition the disk and run utinstall again.

Solaris Trusted Extensions

Note – There are several ways to configure Solaris Trusted extensions. The configurations provided here for reference have been tested but are not meant to represent all possibilities. The latest, detailed instructions for installation and configuration of Solaris Trusted Extensions can be found on docs.sun.com/app/docs/coll/175.9.

Installation and Configuration

Note – Before beginning installation, please see “[Solaris Trusted Extensions Patch Requirements](#)” on page 12.

For Solaris Trusted extensions, each system should have a minimum of 1 GB of RAM, although 500 MB will work. Naturally, newer-model systems with sufficient capacity will provide faster installation.

▼ To Enable Solaris Trusted Extensions

- Use the `svcadm` command to enable Solaris Trusted Extensions:

```
# svcadm enable -s labeld
```


▼ To Configure a Shared Physical Interface

1. Verify that the `/etc/hosts` file has the following entry:

```
x.x.x.x    hostname
```

2. Use the Solaris Management Console (SMC) Security Templates to assign the `cipso` template to this hostname.
 - a. Start the Solaris Management Console (SMC).

```
# smc &
```

- b. Make the following selections:

- i. In the SMC, select Management Tools
->Select hostname:Scope=Files, Policy=TSOL.
- ii. Select System Configuration->Computers and Networks
->Security Templates->`cipso`.
- iii. From the menu bar, Select Action->Properties
->Hosts Assigned to Template.
- iv. Select Host and enter the IP Address of the Sun Ray server.
- v. Click Add to assign the `cipso` template to this host.
- vi. Click OK to confirm the changes.

3. Verify that `/etc/security/tsol/tnrhdb` file has the following entries:

```
x.x.x.x:cipso
```

4. From the Application Manager->Trusted Extensions folder, run the Share Physical Interface action.
5. Verify that the `/etc/hostname.<interface_name>` file has the following entries:

```
hostname    all-zones
```

6. Reboot the system.

```
# /usr/sbin/reboot
```

▼ To Configure One IP Address Per Zone

If you have an IP address for every labeled zone, follow this example procedure, which shows how to configure a zone called *public*. Repeat the procedure for all zones.

1. Configure an interface for each zone.

a. Update the `/etc/hosts` file.

If you have a separate IP address for every labeled zone, add this IP address and a corresponding hostname to the `/etc/hosts` file. Use a standard naming convention, such as adding `<zone-name>` to the hostname.:

```
10.6.132.111 srsstx-132
10.6.132.112 srsstx-132-zone_name
```

b. Update the `/etc/hostname.<interface>` file as follows:

```
srsstx-132
```

c. Update the `/etc/netmasks` file as follows.:

```
10.6.132.0 255.255.255.0
```

2. Assign a network template.

As above, use the Solaris Management Console (SMC) Security Templates to assign the `cipso` template.

a. Start the Solaris Management Console (SMC).

```
# smc &
```

b. Make the following selections:

- i. In the SMC, select Management Tools
->Select `hostname:Scope=Files, Policy=TSOL`.
- ii. Select System Configuration->Computers and Networks
->Security Templates->`cipso`.
- iii. From the menu bar, Select Action->Properties
->Hosts Assigned to Template.
- iv. Select Host and enter the IP Address of the Sun Ray host.
- v. Click Add to assign the `cipso` template to this host.
- vi. Click OK to confirm the changes.

- vii. **Select System Configuration -> Computers and Networks
->Security Templates -> zone_specific_template.**

In this example, the `zone_specific_template` is named *public*.

- viii. **From the menu bar, Select *Action* -> *Properties
-> Hosts Assigned to Template.**

- ix. **Select Wildcard, and enter the IP Address.**

For example, IP Address 10.6.132.0

- x. **Click Add.**

- xi. **Click OK to confirm the changes.**

The `/etc/security/tsol/tnrhdb` file should now contain the following entries:

```
10.6.132.111:cipso
10.6.132.112:cipso
10.6.132.0:public
```

3. Assign an IP address to each zone.

After you have completed the procedures in [Creating Zones](#) below, repeat the following steps for each zone you have created.:

```
zonecfg -z public
zonecfg:public> add net
zonecfg:public:net> set physical=bge1
zonecfg:public:net> set address=10.6.132.112/24
zonecfg:public:net> end
zonecfg:public> commit
zonecfg:public> exit
```

4. Verify the results.

```
# ifconfig -a
lo0:
flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu
8232 index 1
inet 127.0.0.1 netmask ff000000
lo0:1:
flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu
8232 index 1
zone public
inet 127.0.0.1 netmask ff000000
bge0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu
1500 index 2
inet 10.6.133.156 netmask ffffffff broadcast 10.6.133.255
ether 0:3:ba:27:f0:8b
bge1: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu
1500 index 3
inet 10.6.132.111 netmask ffffffff broadcast 10.6.132.255
ether 0:3:ba:27:f0:8c
bge1:1: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu
1500 index 3
zone public
inet 10.6.132.112 netmask ffffffff broadcast 10.6.132.255
```

5. Reboot the system:

```
# /usr/sbin/reboot
```

Creating Zones

You can either create zones one by one or create a sample zone to serve as a template from which to clone other zones. The second method is more efficient.

In these instructions, the following zones are created:

- public
- internal
- needtoknow
- restricted

▼ To Specify Zone Names and Zone Labels

1. **From the Application Manager -> Trusted Extensions folder, run the Configure Zone action.**

When the action prompts you for a name, give the zone the same name as the zone's label. For example, the name of a zone whose label is PUBLIC would be *public*.

2. **Repeat the Configure Zone action for every zone.**

For example, the default `label_encodings` file contains the following labels:

```
PUBLIC
CONFIDENTIAL: INTERNAL USE ONLY
CONFIDENTIAL: NEED TO KNOW
CONFIDENTIAL: RESTRICTED
```

3. **For each zone, associate the appropriate label with a zone name.**

- a. **In the SMC GUI, Under Management Tools
-> Select hostname:Scope=Files, Policy=TSOL option.**

- b. **Select System Configuration -> Computers and Networks
-> Trusted Network Zones.**

- c. **Select Action -> Add Zone Configuration Menu.**

The dialog box displays the name of a zone that does not have an assigned label. Look at the zone name before clicking Edit.

- d. **In the Label builder, click the appropriate label for the zone name.**

- e. **Click OK in the label builder and then OK in the Trusted Network Zone.**

4. **Repeat these steps for every zone.**

▼ To Create Security Templates

1. **In the SMC GUI, Under Management Tools
-> Select hostname:Scope=Files, Policy=TSOL option.**

2. **Select System Configuration -> Computers and Networks
-> Security Templates.**

3. **From the menu bar, Select Action -> Add Template.**

4. Under Host Type, Select Edit... and in the Label builder click the appropriate label for the template and click OK.

For the default configuration, Security Templates can be created for the following labels:

```
PUBLIC
CONFIDENTIAL: INTERNAL USE ONLY
CONFIDENTIAL: NEED TO KNOW
CONFIDENTIAL: RESTRICTED
```

5. Provide a Template Name and click OK.

▼ To Create Zones One by One

1. Install Zones.

- From the Application Manager->Trusted Extensions folder, run the Install Zone action.

2. Enter the labeled zone's name, for example, *public*.

Wait for a completion message before proceeding.

3. Monitor the zone being configured.

- From the Application Manager->Trusted Extensions folder, run the Zone Terminal Console to monitor the configuring.

4. Start the zone.

- a. From the Application Manager->Trusted Extensions folder, run Start Zone.

- b. Provide the host name, of the labeled zone, for example, *public*.

As the zone is started, information is displayed in the Zone Terminal Console.

- c. Provide the same hostname as mentioned in the `/etc/hosts` file.

5. Repeat these steps for the remaining zones.

▼ To Clone Zones

1. Create a ZFS pool (`zpool`) from disk device.

A single `zpool` will be used for all labeled zones.

```
# zpool create -f zone /dev/dsk/c0t0d0s5
```

2. Create a new file system for the zone.

For instance, for the public zone:

```
# zfs create zone/public
# chmod 0700 /zone/public
```

3. Install the first zone.

a. From the Application Manager->Trusted Extensions folder, run the `Install Zone` action.

b. Enter the labeled zone's name, for example, *public*.

Wait for a completion message before proceeding (about five minutes).

4. Monitor the zone being configured.

- From the Application Manager->Trusted Extensions folder, run the `Zone Terminal Console` to monitor the configuration process.

5. Start the zone.

a. From the Application Manager->Trusted Extensions folder, run `Start Zone`, and provide the host name, for example, *public*, of the labeled zone.

b. As the zone is started, information is displayed in the `Zone Terminal Console`.

6. Provide the same hostname as mentioned in the `/etc/hosts` file.

7. Shut down the zone.

a. View the public zone's `Console` window to verify that the zone has been completely started.

b. If it has been started, shut down the zone by typing the following in the `Console`:

```
# init 0
```

8. Exit the `Console`.

9. Through the global zone (that is, in a `Terminal` window), type:

```
# rm /zone/public/root/etc/auto_home_public
```

10. Create a ZFS snapshot of the public zone.

```
# zfs snapshot zone/public@snapshot
```

11. Clone the remaining zones.

a. From the Application Manager->Trusted Extensions folder, run the Clone Zone action.

b. Provide the zone being cloned and the ZFS snapshot, for example:

```
Enter Zone Name: internal  
ZFS Snapshot: zone/public@snapshot
```

12. Reboot the system:

```
# /usr/sbin/reboot
```


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