



Sun Ray™ Server Software 1.3 Installation Guide

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Part No. 806-7711-10
July 2001, [Revision A](#)

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Introduction

This guide describes how to install or upgrade the Sun Ray™ Server Software 1.3 on a server running the Solaris™ 2.6, 7, or 8 server operating environment.

This guide provides technical information and procedures using a command-line interface and assumes that the reader is fully confident in network configuration and administration and has a familiarity with UNIX®.

Topics covered in this chapter include:

- “Electronic Software Download” on page 1
- “Sun Management Center Disk Requirements” on page 2
- “Interoperability” on page 3
- “What Are My Options?” on page 3

Electronic Software Download

Though it can be purchased on CD-ROM, the Sun Ray server software 1.3 is also available online for purchase through an Electronic Software Download (ESD) from this URL:

<http://store.sun.com>

After download and extraction, an image of the Sun Ray server software 1.3 CD-ROM is created in a sub-directory of the download directory. When instructions and procedures in this guide ask you to change to the image directory on the CD-ROM, for example:

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

Users who have downloaded the software should change to the image directory under the download directory. Commands issued in either file system should execute properly.

Note – The CD-ROM image requires approximately 500 Mbytes of temporary free disk space in the download directory.

Sun Management Center Disk Requirements

If you are installing the Sun Management Center software, additional disk space is required. TABLE 1-1 shows the additional disk space required for each layer and functionality.

TABLE 1-1 Minimum Disk Space Requirements for Sun Management Center

Layer	Basic (Mbytes)	Advanced (Mbytes)	Premier (Mbytes)
Server	800 (300 for /opt, 500 for /var/opt)*	Basic + 3.3	Advanced + 45
Agent	18	Basic + 2.1	Advanced + 2
Console	62	Basic + 0.3	Advanced + 0.7

* At least 110 Mbytes under /var/opt are required to perform a setup of the server layer.

If you are installing the Sun Management Center server, agent, and console, you must configure the Sun Ray server with at least 512 Mbytes of RAM.

For more information, refer to the *Sun Ray Server Software 1.3 Advanced Administrator's Guide* or this URL:

<http://www.sun.com/sunmanagementcenter>

Interoperability

For information regarding Sun Ray interoperability with Windows NT, Windows 2000, mainframe, and Macintosh operating systems, refer to the *Interoperability and the Sun Ray Appliance* white paper at:

<http://www.sun.com/products/sunray/whitepapers/index.html>

What Are My Options?

- If you are installing Sun Ray server software for the first time, turn to “Installation” on page 5.
- If you are upgrading Sun Ray server software from version 1.0, turn to “Upgrading From Sun Ray Enterprise Server Software 1.0” on page 21.
- If you are upgrading Sun Ray server software from version 1.1 or 1.2, turn to “Upgrading From Sun Ray Enterprise Server Software 1.1 or Sun Ray Server Software 1.2” on page 29.
- If you are creating a failover group from both new and existing Sun Ray servers, consider the previous choices for each Sun Ray server that will be part of the group.

Installation

This chapter describes the tasks needed to *install* Sun Ray server software 1.3.

Note – If you are *upgrading* Sun Ray server software from *version 1.0*, turn to page 21. If you are *upgrading* Sun Ray server software from *version 1.1 or 1.2*, turn to page 29.

Topics in this chapter include:

- “Tasks You Will Do” on page 5
 - “Verifying the Requirements” on page 6
 - “Checking the Sun Ray Interconnect” on page 10
 - “Upgrading the Solaris Operating Environment” on page 14
 - “Installing the Sun Ray Server Software 1.3” on page 15
-

Tasks You Will Do

The following list is an outline of the steps taken to install the Sun Ray server software.

1. Verify system requirements — Determine that the system(s) on which you plan to install the software fulfills the necessary hardware and software requirements. See “Verifying the Requirements” on page 6.
2. Verify interconnect provisioning — Determine that the Sun Ray interconnect is properly provisioned. Consider switches, cabling, Sun Ray appliances, and topology if failover capabilities are desired. See “Checking the Sun Ray Interconnect” on page 10.

3. Verify operating environment — Determine that you are running the Solaris 2.6, 7, or 8 operating environment on your system. If not, you must upgrade your operating environment. See “Upgrading the Solaris Operating Environment” on page 14.
4. Install the software — See “Installing the Sun Ray Server Software 1.3” on page 15.

Verifying the Requirements

Verify all system specifications prior to beginning the installation.

Hardware Requirements

Sizing Hardware Requirements

TABLE 2-1 provides quick, generic sizing requirements. Because application resource demands vary, the values computed do not guarantee satisfactory performance for your Sun Ray server installation.

TABLE 2-1 Sizing Hardware Requirements

Component	Minimum Requirement	Equation	Comment
CPU	UltraSPARC™ 300 MHz	$(\text{no. of appliances} \times \% \text{ activity} \times 5\%) + (10\% \text{ for OS}) \times 300 \text{ MHz}$ Example with 40 appliances at 50% activity: $((40 \times 50\% \times 5\%) + (10\%)) \times 300 = 330 \text{ MHz}$	Round up to nearest CPU speed configurable or multiple CPUs*.
Memory	256 Mbytes	$(\text{no. of appliances} \times \% \text{ activity} \times 40 \text{ Mbyte}) + 64 \text{ Mbyte for OS}$ Example with 40 appliances at 50% activity: $(40 \times 50\% \times 40) + 64 = 864 \text{ Mbyte}$	Round up to nearest Mbyte configurable.
Hard drive swap space	(1 Gbyte of free space not part of swap)	$(\text{no. of appliances} \times 50 \text{ Mbyte}) - \text{memory} + 500 \text{ Mbyte (tmp)}$ Example with 40 appliances: $(40 \times 50) - 864 + 500 = 1636 \text{ Mbyte}$	Round up to nearest Mbyte configurable.

* If more than one CPU is used, best results are achieved when hard drive swap space is evenly divided to one spindle per each CPU.

Disk Space

Note – When configuring the server, the suggested server configuration includes approximately 50-100 MB of swap space per session.

The standard installation of the Sun Ray server software requires at least 95 MB of disk space. TABLE 2-2 lists the disk space requirements for specific directories:

TABLE 2-2 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
LDAP client libraries	/usr	1 Mbyte
Sun Directory Services 3.1	/opt/SUNWconn The default location for the directory database is /var.	JDK™ 1.1.x 25 Mbytes in /opt 2.0 Mbytes in /var 0.4 Mbytes in /etc Allow enough disk space for the database. 1,000 entries require roughly 1.5 Mbytes of disk space, 64 Mbytes of RAM, and 128 Mbytes of swap.
Sun Ray Administration Server 1.0	/opt/SUNWut/http	9.5 Mbytes for software and 2 Mbytes for documents and log files.
JRE 1.2.2	/opt	26.5 Mbytes
English docs (optional)	/opt	8.5 Mbytes

Typical Hardware Configurations

TABLE 2-3 lists three typical Sun Ray server hardware configurations. These examples are provided as guidelines and do not suggest absolute configurations.

TABLE 2-3 Typical Sun Ray Server Configurations

System	Processor(s)	Memory	Disk Space	Number of Sessions
Sun Enterprise™ 250	Two 300 MHz UltraSPARC CPUs	1-2 GB	4 GB	10-20 per CPU
Sun Enterprise 450	Four 300 MHz UltraSPARC CPUs	2-4 GB	8 GB	20-30 per CPU
Sun Enterprise 4500	Eight 336 MHz UltraSPARC CPUs	4-8 GB	24 GB	30-45 per CPU

Network Interface Requirements

The system to be configured as a Sun Ray server must have at least one additional Ethernet network interface installed. Dedicate the interface solely to the Sun Ray interconnect. The interface must have 100 Mbps bandwidth capability or faster. TABLE 2-4 lists suggested Ethernet network interface cards.

TABLE 2-4 Ethernet Network Interfaces

Interface	Device Name	Speed (Mb/s)	Comments
Gigabit Ethernet	ge0	1000	This high-speed interface is the ideal server to Ethernet switch solution.
SunFastEthernet™	hme1	100	
Sun Quad FastEthernet™	qfe0, qfe1, qfe2, qfe3	100	Four individual Ethernet interfaces on one card. Ensure that the SUNWqfed package is installed on the system if you are using this card. The SUNWqfed package was not part of the original Solaris 2.6 release. There has been at least one patch released for the SUNWqfed package since its initial release. Refer to the following web site for information regarding the latest driver patches and updates: http://access1.sun.com

For more thorough information regarding proper sizing of a Sun Ray server, refer to this URL:

<http://www.sun.com/products/sunray/whitepapers>

Your Sun Microsystems™ Inc., sales representative can also be of assistance.

CD-ROM and Peripheral Requirements

To install the software from a CD-ROM, make sure that the system has a CD-ROM drive, a monitor, a keyboard, and a mouse. If these peripherals are unavailable, install the software from a remote server on the public network. Refer to “Mounting a CD-ROM Remotely” on page 51 for instructions.

Software Requirements

Solaris Operating Environment

Note – The Sun Ray server *must* be preconfigured with an “Entire Distribution” software group installation of the server version 2.6, 7, or 8 of the Solaris operating environment before installing the Sun Ray sever software. If you are not certain of this, upgrade or re-install the Solaris software.

The Solaris 8 operating environment provides the best results. You can check the version by typing the following command as a user of the Sun Ray server:

```
% uname -r
```

A response of 5.6 means Solaris 2.6 software, a response of 5.7 means Solaris 7 software, and a response of 5.8 means Solaris 8 software. If the server has a lower version, contact your Sun Microsystems representative to purchase the latest version of the Solaris software. Alternatively, you can go to this URL:

<http://www.sun.com/software/solaris/how-to-buy.html>

Administration Server Conditions

The Sun Ray server software includes and installs the required Sun Ray Administration Server 1.0 web server software. A different web server configured on the Sun Ray server can coexist with the Sun Ray Administration Server. By default, the Sun Ray Administration Server uses port 1660 for the Sun Ray Administration Tool. If this port is unavailable, you can configure a new port while running the `utconfig` script.

Web Browser Conditions

To view the http-based Sun Ray Administration Tool, you must have a web browser installed on the system which will display it. For example, use Netscape™ Communicator 4.5.1 or a later version. The latest version of the Netscape Communicator Web browser is available at this URL:

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

LDAP Server Conditions

The Sun Ray server software includes and installs the required SunDS lightweight directory access protocol (LDAP) server. If you already have a different LDAP server configured on the Sun Ray server, it can coexist with SunDS; however, it must not use port 389. Port 389 is reserved for use by the SunDS LDAP server.

Checking the Sun Ray Interconnect

Interconnect Requirements

The recommended Sun Ray interconnect is implemented with a physically dedicated Ethernet network. Deployments using VLAN technology to implement a logically dedicated network are also supported. To maximize the quality of service, a 100BASE-T full-duplex network is preferred.

Follow these guidelines when constructing a new Sun Ray network or modifying your existing configuration:

- Do not use a public or company network to connect Sun Ray appliances to the Sun Ray server.
- Do not configure the Sun Ray server as a public router.
- Use 100 Mbps full-duplex networks whenever possible.
- Always assume that moderate amounts of statistical traffic multiplexing exist (10:1 is a safe and conservative ratio; for example, 100 appliances can be connected through one Gigabit link).

Switch Requirements

The Sun Ray interconnect uses off-the-shelf networking equipment, and supports Layer-2 and Layer-3 switches. The following table lists necessary specifications of switches for the Sun Ray interconnect.

TABLE 2-5 Switch Specifications

Switches Should	Switches Should Not
Auto-negotiate	Hard code speed/duplex rate
Full-duplex	Half-duplex

TABLE 2-5 Switch Specifications (*Continued*)

Switches Should	Switches Should Not
Fast power-on and link-up	Enable spanning tree protocols at the client port
Store and forward	Strict cut-through
Backplane bandwidth of a higher order than port bandwidth	Backplane bandwidth less than port bandwidth
Low latency	
Enable multi-casting	

See the *Sun Ray Server Software 1.3 Advanced Administrator's Guide* for more information regarding switch selection and configuration.

Hubs

Hubs provide shared bandwidth rather than switched bandwidth. Do not use hubs in a Sun Ray interconnect.

Cable Requirements

Cable selection and routing is also important.

- Use only Category 5 or faster Ethernet cabling.
- Cable multiple switches in a cascade rather than a daisy chain.

Sun Ray Appliance Hardware

This section contains requirements for the peripheral hardware used with the Sun Ray appliances.

Displays for Sun Ray 1 Appliances

Sun Ray 1 appliances work with multisync displays that adhere to the VESA specification. Typical display rates are 1152x900 at 66Hz (default), 1152x900 at 76Hz, and 1280x1024 at 76Hz.

Some monitors have automatic resolution configuration. To enable this feature, connect the display to the Sun Ray 1 appliance. Power on the display and then power on the appliance.

Note – Sun Ray 100 and Sun Ray 150 appliances do not require external monitors.

Keyboards and Mouses

Sun Ray appliances ship with a Sun Type 6 USB keyboard and Sun USB mouse. USB keyboards and mouses from other manufacturers might also work.

Smart Cards

See the following URL for information about smart cards:

<http://www.sun.com/products/sunray/smartcards.html>

Failover Topology

Configuring two or more Sun Ray servers in a failover group minimizes interruption of service should one server fail. FIGURE 2-1 and FIGURE 2-2 describe typical failover topologies. These diagrams are provided as guidelines and do not suggest the only topologies.

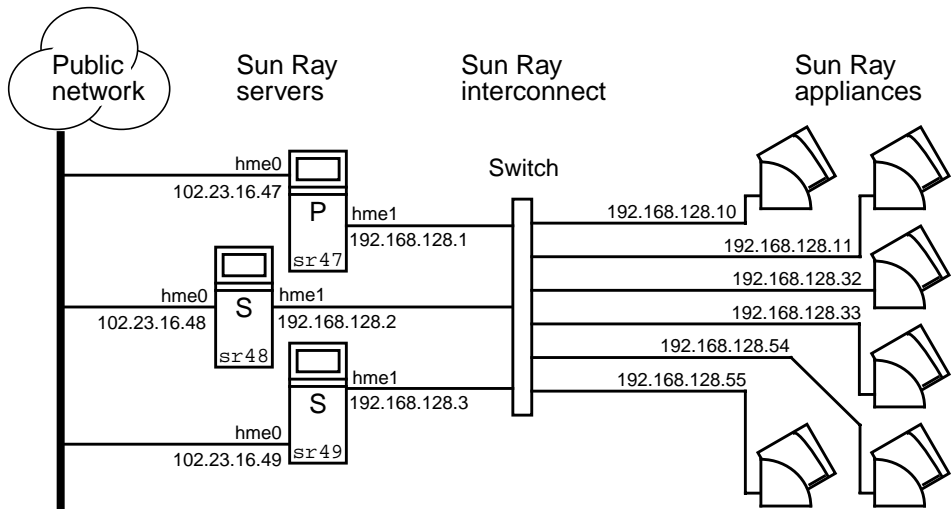


FIGURE 2-1 Simple Failover Group Example

The failover group illustrated in FIGURE 2-1 can provide maximum resources to a few Sun Ray appliances. The server sr47 is the primary Sun Ray server and sr48 and sr49 are the secondary Sun Ray servers.

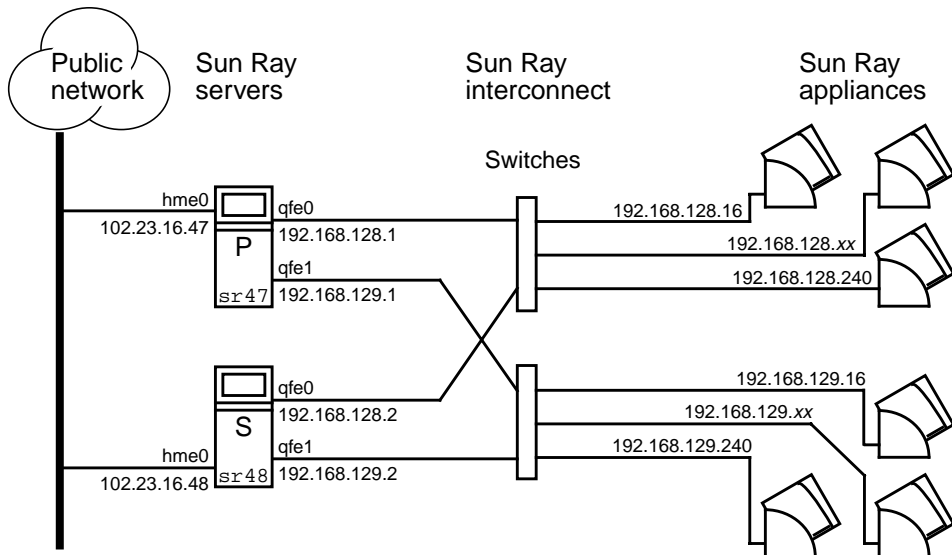


FIGURE 2-2 Redundant Failover Group

The failover group illustrated in FIGURE 2-2 can provide basic resources to many Sun Ray appliances. The server `sr47` is the primary Sun Ray server and `sr48` is the secondary Sun Ray server.

Sun Ray servers in failover groups must have the same version of the Sun Ray server software installed. Later on, in “To Configure the Sun Ray Server Hierarchy” on page 47, the steps to configure a failover group are performed.

See the *Sun Ray Server Software 1.3 Advanced Administrator’s Guide* for more information about failover groups.

Upgrading the Solaris Operating Environment

The Sun Ray system runs on the Solaris 2.6, 7, or 8 operating environment. Refer to the release notes for more information.

▼ To Upgrade the Solaris Operating Environment

The following procedure is an overview only. Refer to the documentation provided with the Solaris software for complete instructions.

Note – This procedure might take two to three hours to complete.

1. **Log in or use the `rlogin` command to log in as superuser of the server which is to be configured as the Sun Ray server.**
2. **Make a tape backup of the file systems.**
3. **Re-install or upgrade to either the Solaris 2.6, Solaris 7, or Solaris 8 operating environment.**
Make an “Entire Distribution” software group installation.
4. **Selectively restore the file systems previously backed up.**
5. **Go to “Installing the Sun Ray Server Software 1.3” on page 15.**

Installing the Sun Ray Server Software

1.3

Note – This procedure might take 30 minutes to complete.

1. If you have already mounted the Sun Ray server software 1.3 CD-ROM locally or from a remote server or if you extracted the ESD files to an image directory, begin at Step 4.

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

3. Insert the Sun Ray server software 1.3 CD-ROM.

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

4. Change to the image directory. For example:

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

5. Install the Sun Ray server software:

```
# ./utinstall
```

- The installation process begins. The script verifies which required software products are already installed, for example:

```
Sun Directory Services 3.1      not installed
Sun Ray Admin Server 1.0       not installed
Sun Ray server 1.3             not installed
```

- If you have an earlier version of any of the software products, the script displays a message about what it has found.

- The script asks if you want to install user documentation and man pages. For example:

```
Sun Ray server 1.3 English Documentation contains all English
product documents and man pages. The documentation files are
accessible from the Administration Tool.
```

```
Do you want to install English Documentation ([Y]/N):
```

- The script checks for the existence of Controlled Access Mode (kiosk) packages. For example:

```
Controlled Access Mode 1.0                not installed
```

- The script informs you that it is about to install the required software products and any necessary patches. For example:

```
About to carry out the following operations:
```

```
Install [ Solaris Patches for 5.8 ]
Install [ Sun Directory Services 3.1 ]
Install [ Sun Ray Admin Server 1.0 ]
Install [ Sun Ray server 1.3 ]
Install [ Sun Ray server 1.3 English documentation ]
Install [ Controlled Access Mode 1.0 ]
```

```
Continue? ([Y]/N):
```

6. Answer `y` (yes).

- After typing `y`, there is a five to ten minute pause while the filesystem is checked. Please wait.
- The script begins to install patches. For example:

```
Installing patch 105181-17 ...
```

```
.
.
```

- The script installs the required software applications. The following table is a screen output sample from the application installation portion of the `utinstall` script. The application is the Sun Directory Services server. Installation of each software application has sequential output similar to the following:

TABLE 2-6 Sample Application Installation

Screen Text	What Is Happening
Installing Sun Directory Services version 3.1 ...	Software application is installed.
Installing Sun Directory Services package SUNWsdcs, please wait ...	You are informed of time requirements.
Processing package instance <SUNWsdcs> from </cdrom/cdrom0/Sun_Directory_Services_3.1/Solaris_2.6+/Product>	You are informed from what directory the package is installed.
Sun Directory Services (sparc) 3.1 Copyright 1997 Sun Microsystems, Inc. All Rights Reserved . . JURIDIQUEMENT NUL ET NON AVENU.	Copyright, in both English and French, is displayed. (Edited for sample.)
Installing package <SUNWsdcs>: Sun Directory Services	Package is installed.
Using </opt> as the package base directory.	You are informed where package is installed.
## Processing package information. ## Processing system information. 9 package pathnames are already properly installed. ## Verifying disk space requirements.	Package script, <i>not</i> <code>utinstall</code> , checks the package information, system status, and available disk space.
Installing Sun Directory Services as <SUNWsdcs>	Actual installation of the package.
## Installing part 1 of 1. 34612 blocks	You are informed that the first part of only one part is installed with a content of 34612 blocks.
/etc/init.d/dsadm . . /etc/rc3.d/S86dsnmpserv <linked pathname>	Beginning and ending of a list of all files installed. (Very long. Edited for sample.)
## Executing postinstall script.	Postinstall script for the package, <i>not</i> <code>utinstall</code> , is run.
Make sure to run the license insertion tool or the license configuration script on this machine to install additional licenses.	You are reminded to run a license tool. No additional action is required.
Licenses for sunds.lic copied from /etc/opt/licenses to /opt /SUNWconn/license_dir	You are informed that licenses have been copied to the correct directories.
Please wait ...	You are asked to wait.

TABLE 2-6 Sample Application Installation (*Continued*)

Screen Text	What Is Happening
Creating /etc/opt/SUNWconn/ldap/current/dsnmpserv.conf ... Creating /etc/opt/SUNWconn/ldap/current/dsnmpserv.boots ... Creating /etc/opt/SUNWconn/ldap/current/dsnmprad.conf ... Creating /etc/opt/SUNWconn/ldap/current/dsnmprad.boots ...	Creation of configuration files.
The product contains two SNMP agents: A LDAP Server Agent (dsnmpserv) A RADIUS Server Agent (dsnmprad)	Two SNMP agents are identified.
You can configure them later by typing: /opt/SUNWconn/sbin/dsnmpcfg configure	
To restore a configuration from Sun Directory Services 1.0 type: /opt/SUNWconn/sbin/dsupgrade	No additional action required. The Sun Ray server software does not require these configuration scripts to be run.
To perform the initial configuration of the Sun Directory Services NIS server, type: /opt/SUNWconn/sbin/dsyinstall	
Updating system information	System information is updated.
Starting Sun DS administrative server (port 1398) ...	SunDS server is started.
Installation of <SUNWds> was successful.	You are informed that application installation was successful.

- The `utinstall` script continues to install:
 - LDAP client libraries
 - Sun Ray Administration Server
 - Sun Ray server:
 - Administration software
 - Java JRE software
 - English man pages and product documentation
 - Core software
 - Configuration
 - Drivers
 - Controlled Access Mode software

Note – The `utinstall` script requests that you reboot the Sun Ray server. This action should be deferred until you have configured all features.

- The `utinstall` script ends, indicating that a log file is available at:

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

Where the *year*, *month*, etc are represented by numeric values reflecting the time `utinstall` was started.

7. Go to “Configuration” on page 37 for instructions how to configure and reboot the Sun Ray server.

If other systems need a software installation, return to “Upgrading the Solaris Operating Environment” on page 14 and repeat the tasks appropriate for those systems.

Upgrading From Sun Ray Enterprise Server Software 1.0

This chapter describes the procedure to *upgrade* from the Sun Ray enterprise server software 1.0.

Note – If you are upgrading the Sun Ray server software from *version 1.1 or 1.2*, turn to page 29.

Topics in this chapter include:

- “Tasks You Will Do” on page 21
- “Failover Groups” on page 22
- “Preserving the Configuration” on page 23
- “Unconfiguring the Sun Ray Server” on page 25
- “Upgrading the Solaris Operating Environment” on page 25
- “Upgrading the Sun Ray Server” on page 26

Note – Be sure to inform your users to save their work and terminate their sessions before you begin the upgrade process as user sessions are lost due to the upgrade.

Tasks You Will Do

The following list is an outline of the steps taken to upgrade from the Sun Ray enterprise server software 1.0.

1. Users terminate sessions — An effect of the upgrade procedure is that all active and suspended sessions are lost. Inform your users of your plans.

2. Determine failover group — Determine if the Sun Ray server(s) will now become part of a failover group. See “Failover Groups” on page 22.
3. Preserve the configuration — Upgrade requires preserving the existing Sun Ray configuration. See “Preserving the Configuration” on page 23.
4. Unconfigure the server — An upgrade from the Sun Ray enterprise server software 1.0 requires the unconfiguration procedure. See “Unconfiguring the Sun Ray Server” on page 25.
5. Verify operating environment — Determine if a Solaris operating environment upgrade is to be performed. If necessary, upgrade the Solaris software. See “Upgrading the Solaris Operating Environment” on page 25.
If a Solaris software upgrade is not needed, upgrade the Sun Ray server software.
6. Upgrade the software — See “Upgrading the Sun Ray Server” on page 26.

Note – It is not necessary to uninstall the current Sun Ray server software to upgrade.

Failover Groups

Configuring two or more Sun Ray servers into a failover group minimizes interruption of service should one server fail. If existing Sun Ray servers will now be combined into a failover group, consider the following:

- Sun Ray server software versions cannot be mixed within the failover group.
- The first Sun Ray server you upgrade and configure is called the *primary*. All remaining Sun Ray servers are called *secondaries*.

Additional Information

Diagrams of failover topologies are provided in “Failover Topology” on page 12.

Later on, in “To Configure the Sun Ray Server Hierarchy” on page 47, the steps for configuring the Sun Ray server software for a failover group are performed.

See the *Sun Ray Server Software 1.3 Advanced Administrator’s Guide* for more information about failover groups.

Preserving the Configuration

When you upgrade the Sun Ray server software, consider preserving its configuration.

An script to preserve the Sun Ray configuration called `utpreserve` is provided in the Sun Ray server software image directory. The `utpreserve` script preserves:

- X user settings
- LDAP datastore
- LDAP configuration and log files
- Authentication Manager configuration files
- `utsettings` properties

The `utpreserve` script does not save all configuration files so you must configure the Sun Ray interconnect interface, Sun Ray administration server, and SSL for the Administration Tool (optionally) after upgrading the Sun Ray server software. Later on, “Configuration” on page 37 provides an explanation of the configuration process.

▼ To Preserve the Sun Ray Server Configuration

Caution – This procedure stops all Sun Ray daemons and services. Users will lose all of their sessions, both active and disconnected. Inform them of your plans.

Note – This procedure might take five minutes to complete.

1. **If you have already mounted the Sun Ray server software 1.3 CD-ROM locally or from a remote server or if you extracted the ESD files to an image directory, begin at Step 4.**
2. **As superuser, open a shell window on the Sun Ray server.**
3. **Insert the Sun Ray server software 1.3 CD-ROM.**
If a file manager window opens, close it. The file manager CD-ROM window is not necessary for installation.
4. **Change to the image directory. For example:**

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

5. Preserve the Sun Ray configuration:

```
# ./utpreserve
```

The utpreserve script tells you what it is about to do. For example:

```
About to carry out the following operations:

Preserve      [ LDAP datastore for LDAP Client Libraries 11.6.0 ]
Preserve      [ data for Authmanager ]
Preserve      [ data for utsettings ].

WARNING: all daemons/services will be stopped now

Continue? ([Y]/N): y
```

The utpreserve 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.

6. Answer *y*.

The utpreserve script:

- Stops the Sun Ray services and the SunDS daemon.
- Lists the files that are saved.
- Tars and compresses the entire list of files as the `/var/tmp/SUNWut.upgrade/preserve_1.0.tar.Z` file.
- Ends, indicating that a log file is available at:

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

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

- Recommends that the `/var/tmp/SUNWut.upgrade/preserve_1.0.tar.Z` file be moved to a safe location before Solaris software upgrade.

7. Go to “Unconfiguring the Sun Ray Server” on page 25.

Unconfiguring the Sun Ray Server

It is not possible to upgrade from Sun Ray enterprise server software 1.0 without first unconfiguring the Sun WebServer™. The `utconfig -u` command makes this easy.

▼ To Unconfigure the Sun Ray Server Software

Note – This procedure might take five minutes to complete.

1. As superuser, open a shell window on the Sun Ray server.
2. Unconfigure the Sun Ray server software:

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

3. Answer `y` to all of the prompts.
The Sun Ray server software is unconfigured.
4. Do one of the following tasks:
 - If you want to upgrade or re-install the Solaris operating environment, see “Upgrading the Solaris Operating Environment” on page 25.
 - Otherwise, go to “Upgrading the Sun Ray Server” on page 26.

Upgrading the Solaris Operating Environment

▼ To Upgrade the Solaris Operating Environment

The following procedure is an overview only. Refer to the documentation provided with the Solaris software for complete instructions.

Note – This procedure might take two to three hours to complete.

1. **Log in or use the `rlogin` command to log in as superuser of the Sun Ray server.**
2. **Move the `/var/tmp/SUNWut.upgrade/preserve_1.0.tar.Z` file to a safe location on another server.**
Use NFS, FTP, or other means.
3. **If necessary, make a tape backup of the Sun Ray server's file systems.**
4. **Re-install or upgrade to either the Solaris 7 or Solaris 8 operating environment.**
Make an “Entire Distribution” software group installation. Instructions are provided with the Solaris software.
5. **Return the `/var/tmp/SUNWut.upgrade/preserve_1.0.tar.Z` file to the Sun Ray server.**
Use NFS, FTP, or other means.
6. **Selectively restore the file systems previously backed up.**
7. **Go to “Upgrading the Sun Ray Server” on page 26.**

Upgrading the Sun Ray Server

▼ To Upgrade the Sun Ray Server

Note – This procedure might take 30 minutes to complete.

1. **If you have already mounted the Sun Ray server software 1.3 CD-ROM locally or from a remote server or if you extracted the ESD files to an image directory, begin at Step 4.**
2. **As superuser, open a shell window on the Sun Ray server.**
3. **Insert the Sun Ray server software 1.3 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 the Sun Ray server software:

```
# ./utinstall
```

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 English documentation.
- 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.
- Provides a notice that the system must be rebooted. This can be deferred until later.
- Installs patches.
- Installs the required software applications.
 - SunDirectory Services
 - LDAP client libraries
 - Sun Ray Administration Server
 - Sun Ray server:
 - Administration software
 - Java JRE software
 - English man pages and product documentation
 - Core software
 - Configuration
 - Drivers
 - Controlled Access Mode software

Note – The `utinstall` script requests that you reboot the Sun Ray server. This action should be deferred until you have configured all features.

- Ends, indicating a log file is available at:

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

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

6. Go to “Configuration” on page 37 for instructions how to configure and reboot the Sun Ray server.

If other systems need a software upgrade, return to “Preserving the Configuration” on page 23 and repeat the tasks appropriate for each of those systems.

Upgrading From Sun Ray Enterprise Server Software 1.1 or Sun Ray Server Software 1.2

This chapter describes the procedure to *upgrade* from the Sun Ray enterprise server software 1.1 or the Sun Ray server software 1.2.

Topics in this chapter include:

- “Tasks You Will Do” on page 29
- “Failover Groups” on page 30
- “Preserving the Configuration” on page 31
- “Upgrading the Sun Ray Server” on page 34

Note – Be sure to inform your users to either save their work and terminate their sessions or move their sessions to a failover server before you begin the upgrade process, because user sessions are lost due to the upgrade.

Tasks You Will Do

The following list is an outline of the steps taken to upgrade from either the Sun Ray enterprise server software 1.1 or the Sun Ray server software 1.2.

1. Users terminate sessions — An effect of the upgrade procedure is that all active and suspended sessions are lost. Inform your users of your plans and if in a failover group, have them move their sessions to another server.
2. Determine failover group — Determine if the Sun Ray server(s) will now become part of a failover group. If the server is already a member of a failover group, disconnect it from the Sun Ray interconnect. See “Failover Groups” on page 30.

3. Verify operating environment — Determine if a Solaris operating environment upgrade is to be performed.

Upgrading the Solaris software requires preserving the existing Sun Ray configuration. See “Preserving the Configuration” on page 31. If a Solaris software upgrade is not needed, upgrade the Sun Ray server software.

4. Upgrade the software — See “Upgrading the Sun Ray Server” on page 34.

Note – It is not necessary to uninstall the current Sun Ray server software to upgrade.

Failover Groups

Configuring two or more Sun Ray servers in a failover group minimizes interruption of service should one server fail. If existing Sun Ray servers will now be combined into a failover group, or when upgrading an existing failover group, consider the following:

- Sun Ray server software versions cannot be mixed within the failover group.
- Before the upgrade process, Sun Ray appliance users should either terminate their sessions or move the sessions to a Sun Ray server which shall be upgraded later.
- Upgrade and configure the primary Sun Ray server first and then the secondary server(s).

Additional Information

Diagrams of failover topologies are provided in “Failover Topology” on page 12.

Later on, in “To Configure the Sun Ray Server Hierarchy” on page 47, the steps for configuring the Sun Ray server software for a failover group are performed.

See the *Sun Ray Server Software 1.3 Advanced Administrator’s Guide* for more information about failover groups.

Preparing for Upgrade

If you are upgrading a Sun Ray server in a failover group, disconnect the server from the Sun Ray interconnect. Otherwise, go to “Preserving the Configuration” on page 31.

▼ To Disconnect the Sun Ray Server From the Interconnect

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

Note – This procedure might take three minutes to complete.

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 -f
```

The Sun Ray server is disconnected from the Sun Ray interconnect.

3. Do one of the following tasks:
 - If you want to upgrade or re-install the Solaris operating environment, see “Preserving the Configuration” on page 31.
 - Otherwise, go to “Upgrading the Sun Ray Server” on page 34.

Preserving the Configuration

If you are going to upgrade the Solaris operating environment, consider preserving the Sun Ray configuration. If you are not upgrading the Solaris software, go to “Upgrading the Sun Ray Server” on page 34.

An script to preserve the Sun Ray configuration called `utpreserve` is provided in the Sun Ray server software image directory. The `utpreserve` script preserves:

- X user settings

- LDAP datastore
- LDAP configuration and log files
- Authentication Manager configuration files
- `utsettings` properties

The `utpreserve` script does not save all configuration files so you must configure the Sun Ray interconnect interface, Sun Ray administration server, and SSL for the Administration Tool (optionally) after upgrading the Sun Ray server software. Later on, “Configuration” on page 37 provides an explanation of the configuration process.

▼ To Preserve the Sun Ray Server Configuration for Solaris Software Upgrade

Caution – This procedure stops all Sun Ray daemons and services. Users will lose all of their sessions, both active and disconnected. Inform them of your plans.

Note – This procedure, including the Solaris software upgrade, might take two to three hours to complete.

1. **If you have already mounted the Sun Ray server software 1.3 CD-ROM locally or from a remote server or if you extracted the ESD files to an image directory, begin at Step 4.**
2. **As superuser, open a shell window on the Sun Ray server.**
3. **Insert the Sun Ray server software 1.3 CD-ROM.**
If a file manager window opens, close it. The file manager CD-ROM window is not necessary for installation.
4. **Change to the image directory. For example:**

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

5. **Preserve the Sun Ray configuration:**

```
# ./utpreserve
```

The utpreserve script tells you what it is about to do. For example:

```
About to carry out the following operations:

Preserve      [ LDAP datastore for LDAP Client Libraries 11.6.0 ]
Preserve      [ data for Authmanager ]
Preserve      [ data for utsettings ].

WARNING: all daemons/services will be stopped now

Continue? ([Y]/N): y
```

The utpreserve 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.

6. Answer *y*.

The utpreserve script:

- Stops the Sun Ray services and the SunDS daemon.
- Lists the files that are saved.
- Tars and compresses the entire list of files as the `/var/tmp/SUNWut.upgrade/preserve_version.tar.Z` file. Where *version* is the current version of the Sun Ray server software, either 1.1 or 1.2.
- Ends, indicating that a log file is available at:

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

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

- Recommends that the `/var/tmp/SUNWut.upgrade/preserve_version.tar.Z` file be moved to a safe location before Solaris software upgrade.
7. **Move the `/var/tmp/SUNWut.upgrade/preserve_version.tar.Z` file to a safe location on another server.**
Use NFS, FTP, or other means.
8. **If necessary, make a tape backup of the Sun Ray server's file systems.**

9. **Re-install or upgrade to either the Solaris 7 or Solaris 8 operating environment.**
Make an “Entire Distribution” software group installation. Instructions are provided with the Solaris software.
10. **Return the `/var/tmp/SUNWut.upgrade/preserve_version.tar.z` file to the Sun Ray server.**
Use NFS, FTP, or other means.
11. **Selectively restore the file systems previously backed up.**
12. **Go to “Upgrading the Sun Ray Server” on page 34.**

Upgrading the Sun Ray Server

▼ To Upgrade the Sun Ray Server

Note – This procedure might take 30 minutes to complete.

1. **If you have already mounted the Sun Ray server software 1.3 CD-ROM locally or from a remote server or if you extracted the ESD files to an image directory, begin at Step 4.**
2. **As superuser, open a shell window on the Sun Ray server.**
3. **Insert the Sun Ray server software 1.3 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 the Sun Ray server software:**

```
# ./utinstall
```

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 English documentation.
- 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.
- Provides a notice that the system must be rebooted. This can be deferred until later.
- Installs patches.
- Installs the required software applications.
 - SunDirectory Services
 - LDAP client libraries
 - Sun Ray Administration Server
 - Sun Ray server:
 - Administration software
 - Java JRE software
 - English man pages and product documentation
 - Core software
 - Configuration
 - Drivers
 - Controlled Access Mode software

Note – The `utinstall` script requests that you reboot the Sun Ray server. This action should be deferred until you have configured all features.

- Ends, indicating a log file is available at:

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

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

6. Go to “Configuration” on page 37 for instructions how to configure and reboot the Sun Ray server.

If other systems need a software upgrade, return to “Failover Groups” on page 30 and repeat the tasks appropriate for each of those systems.

Configuration

This chapter describes how to configure the Sun Ray server.

Topics in this chapter include:

- “Tasks You Will Do” on page 37
- “Filling Out the Worksheet” on page 38
- “Configuring the Sun Ray Server” on page 41

Tasks You Will Do

The following list is an outline of the steps taken to configure a new installation or an upgrade of Sun Ray server software 1.3.

1. Prepare the worksheet found in “Filling Out the Worksheet” on page 38. The information helps you with data entry during the configuration process.
2. Configure the Sun Ray interconnect interface. See “To Configure the Sun Ray Interconnect Interface” on page 41.
3. Configure the Sun Ray server software. See “To Configure the Sun Ray Server Software” on page 43.
4. If the Sun Ray Administration Server is enabled with Secure Sockets Layer (SSL), configure an SSL certificate. See “To Configure a Secure Socket Layer Certificate” on page 44.
5. If a failover group is being configured, configure the hierarchy of the Sun Ray servers in the failover group. See “To Configure the Sun Ray Server Hierarchy” on page 47.
6. Synchronize the Sun Ray appliance firmware. See “To Synchronize the Sun Ray Appliance Firmware” on page 49

7. After Configuration, reboot the Sun Ray server. See “To Reboot the Sun Ray Server” on page 49.

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

Filling Out the Worksheet

Fill out this worksheet 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 the worksheet.

TABLE 5-1 Sun Ray Server Configuration Basic Parameters

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 ⁽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>		
First Sun Ray appliance address ⁽²⁾	192.168.128.16		
Last Sun Ray appliance address ⁽²⁾	192.168.128.240		
Firmware server ⁽³⁾	192.168.128.1		
Router ⁽³⁾	192.168.128.1		
Specify alternate server list? (optional)	(yes or no)		
If yes, File name	<i>filename</i>		
Or, Server IP address	<i>360.360.360.360</i>		
Configuring the Sun Ray server software using <code>utconfig</code>	(Enter start time here)		
Admin password	<i>adminpass</i>		
Sun Ray admin server port number	1660		
CGI username	utwww		

TABLE 5-1 Sun Ray Server Configuration Basic Parameters (Continued)

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
Enable remote administration? (optional)	(yes or no)		
If yes, Enable SSL? (optional)	(yes or no)		
Configure Controlled Access Mode? (optional)	(yes or no)		
If yes, User prefix	utcu		
User ID range start	150000		
Number of users ⁽⁴⁾	25		
Configure failover group? (optional)	(yes or no)		
If yes, Failover group signature ⁽⁵⁾	<i>signature1</i>		

If you are configuring SSL for remote administration, fill in this portion of the worksheet.

TABLE 5-2 Sun Ray Server Configuration SSL Parameters

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
Configuring a secured socket layer certificate using <i>crca</i> and <i>sslgencred</i> (Needed if SSL is enabled)			
Root Certificate Authority (RootCA) directory	<i>/var/certs</i>		
RootCA user	<i>rcauser</i>		
RootCA user password	<i>rcapass</i>		
RootCA user distinguished name ⁽⁶⁾	<i>cn=rcauser,ou=eng,o=fun,l=laffland,st=bliss,c=we</i>		
Key package password	<i>keypass</i>		
Store RootCA credentials in naming service	<i>yes</i>		
Sun Ray server root password	<i>rootpass</i>		
Sun Ray admin server public IP address ⁽¹⁾	<i>IPaddress</i>		
Sun Ray admin server certificate directory ⁽¹⁾	<i>/var/certs/IPaddress</i>		
Sun Ray server hostname ⁽¹⁾	<i>hostname</i>		

TABLE 5-2 Sun Ray Server Configuration SSL Parameters

Aspect or Variable	Default Value, Example, or (Other)	Your Primary Server Value	Your Secondary Server Value
Sun Ray server domain name	<i>eng.fun.com</i>		
Sun Ray admin server distinguished name (RootCA user distinguished name suffix)	<i>ou=eng,o=fun,l=laffland,st=bliss,c=we</i>		
Encryption password ⁽¹⁾	<i>encpass</i>		

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

TABLE 5-3 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 <i>utreplica</i> (Needed if a failover group)	(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.

(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:
 * $X = (\text{Number of appliances} / (\text{Number of servers} - 1)) - 1$
 * 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 appliances, 4 servers. $X = 39$

TABLE 5-4 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

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

(4) The value entered for the number of users is the greater of:
 * The total number of Sun Ray appliances
 * The total number of disconnected and active sessions

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

(6) The distinguished name and its attributes are provided by you in a recognized format. *cn=common-name, ou=organization-unit, o=organization, l=locality, st=state, c=country*
 Attributes might contain text, numbers, and spaces. For example:
cn=sunray,ou=engineering,o=funmicrosystems,l=laffland,st=blis

Configuring the Sun Ray Server

▼ To Configure the Sun Ray Interconnect Interface

Note – This procedure might take ten minutes to complete. Refer to the worksheet that you filled out earlier.

1. Log in as the superuser of the Sun Ray server.

You can log in locally or remotely use the `rlogin` or `telnet` commands.

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

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

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`.

Note – If you are upgrading a failover group from Sun Ray server software 1.1 or 1.2 and did not upgrade the Solaris operating environment and did not preserve the configuration, you can run this command:

```
# ./utadm -n
```

Now go to Step 8.

The script begins configuring DHCP for the Sun Ray interconnect, restarts the DHCP daemon, and configures the interface.

4. The `utadm` script lists the default values and asks if they are acceptable.

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*)
- New first Sun Ray appliance address (192.168.128.16)
- New last Sun Ray appliance address (192.168.128.240)
- New firmware server address (192.168.128.1)
- New router address (192.168.128.1)
- To specify an alternate server list. If you answer yes, it requests either:
 - Filename (*filename*)
 - Server IP Address (360.360.360.360)

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 files are configured:

```

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

The `utadm` script might provide this note:

```

There may not be enough ptys configured to support more
than a few Sun Ray users. To add more ptys, edit /etc/system and
add the line "set pt_cnt=NPTYs", where NPTYs is the expected
number of users times the average number of shell windows per
user. The system must be rebooted with the reconfiguration
option (-r) for the change to take effect.
```

The default value for NPTYs is 40. Administrators should change this value accordingly.

Note – If the Solaris 8 operating environment is installed, this note is not seen.

The `utadm` script configures the Sun Ray appliance 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 tasks:

- If you upgraded the Sun Ray server software without upgrading the Solaris operating environment, go to “To Synchronize the Sun Ray Appliance Firmware” on page 49.
- Otherwise, go to “To Configure the Sun Ray Server Software” on page 43.

▼ To Configure the Sun Ray Server Software

Note – This procedure might take ten minutes to complete. Refer to the worksheet that you filled out earlier.

1. **If you have not already done so, log in as the superuser of the Sun Ray server.**
You can log in locally or remotely use the `rlogin` or `telnet` commands.
2. **Open a shell window and change to the following directory:**

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

3. **Configure the 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
- To configure the Sun Ray Administration Server (press Return)
- Sun Ray administration server port number (1660)
- CGI username (*utwww*)
- Whether you want to enable remote administration. If you answer yes, it asks:
 - Whether you want to enable a Secure Sockets Layer for remote administration.
- Whether you want to configure Controlled Access Mode. If you answer yes, it requests:
 - User prefix (*utcu*)

- 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 the Sun Ray server software.

- If you responded that this was a failover group, the script requests the signature (*signature1*)
- The signature again

The Sun Directory Services are restarted.

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

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

```
/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 of the secondary servers if in a failover group.

6. Do one of the following tasks:

- If you enabled SSL for remote administration, see “To Configure a Secure Socket Layer Certificate” on page 44.
- If you have a failover group, see “To Configure the Sun Ray Server Hierarchy” on page 47
- Otherwise, go to “To Synchronize the Sun Ray Appliance Firmware” on page 49

▼ To Configure a Secure Socket Layer Certificate

Note – This procedure might take 30 minutes to complete. Use the worksheet to help you configure the SSL certificate.

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

You can log in locally or remotely use the `rlogin` or `telnet` commands.

2. Open a shell window and verify that the `skiserv` and `cryptorand` processes are present:

```
# ps -ef |grep cryptorand
# ps -ef |grep skiserv
```

3. If the processes are not running, restart them using the following commands:

```
# /etc/init.d/cryptorand stop
# /etc/init.d/skiserv stop
# /etc/init.d/cryptorand start
# /etc/init.d/skiserv start
```

4. Create the local RootCA user:

```
# useradd -c "Root CA user" -m -k /etc/skel -d /var/certs rcauser
# passwd rcauser
New password: rcapass
Re-enter new passwd: rcapass
# chmod 700 /var/certs
# chown rcauser /var/certs
```

5. Become the RootCA user and run the `crca` script to create the RootCA credentials:

```
# su rcauser
$ /usr/bin/crca
```

The `crca` script prompts for the following:

- RootCA distinguished name (`cn=rcauser,ou=eng,o=fun,l=laffland,st=bliss,c=we`)
- Root certificate directory (`/var/certs`)
- Key package password (`keypass`)
- Key package password again (`keypass`)
- To store the credentials in the name server (`y`)
- Sun Ray server root password (`rootpass`)

6. Create the Sun Ray administration server certificate directory and set permissions and ownership:

```
$ mkdir /var/certs/IPaddress
$ chmod 700 /var/certs/IPaddress
$ chown rcauser /var/certs/IPaddress
```

7. Run the `sslgencred` script to generate the Sun Ray administration server certificate:

```
$ /opt/SUNWut/http/bin/sslgencred -r rcauser -d /var/certs/IPaddress -i IPaddress
```

The `sslgencred` script prompts for the following:

- Sun Ray administration server (`httpd`) host name (press Return)
- Sun Ray administration server domain name (*eng.fun.com*)
- Sun Ray administration server DN (*ou=eng,o=fun,l=laffland,st=bliss,c=we*)
- Encryption password (*encpass*)
- Encryption password again (*encpass*)
- Key package password (*keypass*)

8. Become superuser again:

```
$ exit
```

9. Install the web server certificate:

```
# /opt/SUNWut/http/bin/sslstore -i IPaddress -p /var/certs/IPaddress 0
```

Note – In the above command, the last character is a zero.

The `sslstore` script requests the **encryption password**:

```
/usr/bin/skilogin; Enter host key package password: encpass
```

Note – Type the **encryption password** *encpass* here, not the key package password.

10. Configure the web server to use SSL.

Note – The `utconfig` script did this step for you when you chose to enable SSL.

- a. Open the `/etc/opt/SUNWut/http/utadmin.httpd.conf` file in a text editor.
- b. Find the text `ssl_enable "no"` and change it to `ssl_enable "yes"`.
- c. Save the file.

11. Start or restart the Sun Ray administration server to use SSL.

- Start the server:

```
# /opt/SUNWut/http/bin/htserver start
```

- Restart the server:

```
# /opt/SUNWut/http/bin/htserver restart
```

12. Repeat Step 1 through Step 11 for each of the secondary servers if in a failover group.

13. After configuring the Sun Ray server with an SSL certificate and enabling SSL, use the following URL to access the Sun Ray Administration Tool:

`https://hostname:port`

Where `hostname:port` is the host name and port of the Sun Ray Administration Server. By default, the port is 1660.

14. Do one of the following tasks:

- If you have a failover group, see “To Configure the Sun Ray Server Hierarchy” on page 47
- Otherwise, go to “To Synchronize the Sun Ray Appliance Firmware” on page 49

▼ To Configure the Sun Ray Server Hierarchy

Note – This procedure might take five minutes to complete. Refer to the worksheet that you filled out earlier.

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.

You can log in locally or remotely use the `rlogin` or `telnet` commands.

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:

```
/var/adm/log/SUNWut/tmp/utreplica.year_month_date_hour:minute:second.log
```

4. Log in as the superuser of a secondary Sun Ray server.

You can locally log in or remotely use the `rlogin` or `telnet` commands.

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.

Note – If any of the servers are monitored by the Sun Management Center, then restart the agent on that server. Type:

```
# /opt/SUNWsysmon/sbin/es-stop -a
# /opt/SUNWsysmon/sbin/es-start -a
```

8. When you are finished, go to “To Synchronize the Sun Ray Appliance Firmware” on page 49.

▼ To Synchronize the Sun Ray Appliance 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 not one of these, go to “To Reboot the Sun Ray Server” on page 49. This procedure might take five minutes to complete.

1. If you have not already done so, log in as the superuser of the Sun Ray server. You can log in locally or remotely use the `rlogin` or `telnet` commands.
2. Open a shell window and change to the following directory:

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

3. Synchronize the Sun Ray appliance firmware:

```
# ./utfwsync
```

The Sun Ray appliances will reboot themselves and load the new firmware.

4. When you are finished, go to “To Reboot the Sun Ray Server” on page 49 for instructions how to reboot the server.

▼ To 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.**
You can log in locally or remotely use the `rlogin` or `telnet` commands.
- 2. Open a shell window and reboot the Sun Ray server:**

```
# sync;sync;init 6
```

The Sun Ray server is rebooted.

- 3. Repeat Step 1 and Step 2 for each Sun Ray server.**
- 4. Go to Appendix A, “Additional Procedures” on page 51, for additional information and procedures.**

Additional Procedures

This appendix provides additional information regarding your installation or upgrade to Sun Ray server software 1.3.

Topics covered in this appendix include:

- “Mounting a CD-ROM Remotely” on page 51
- “utinstall Error Messages” on page 53
- “Patch Requirements” on page 55
- “Disabling and Unconfiguring SSL Certificates” on page 55
- “Sun Ray Server Software 1.3 Documentation” on page 58
- “Removing the Software” on page 58

Mounting a CD-ROM Remotely

If you purchased the Sun Ray server software 1.3 CD-ROM, yet 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. The installation or upgrade occurs from the remote server.

▼ To Mount the CD-ROM From a Remote Server

Note – This procedure might take five minutes to complete.

1. **As superuser of the remote system, open a shell window.**

2. Insert the Sun Ray Server Software 1.3 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.

Note – 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

Note – This procedure might take three minutes to complete.

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:

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

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-1 `utinstall` Error Messages

Message	Meaning	Resolution
<code>utinstall: fatal, <i>media-dir</i> is not a valid directory.</code>	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 <i>admin-file</i>	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.
SunOS release is <i>X.X</i> , valid releases are : 5.6 5.7 and 5.8	You are attempting to install the Sun Ray server software onto Solaris software version 2.5.1 (5.5.1) or older.	Upgrade to the Solaris 2.6 (5.6), 7 (5.7), or 8 (5.8) operating environment before installing the Sun Ray server software.
SUNWlldap package is part of the Solaris entire distribution install	The LDAP client is not installed under Solaris software version 7 (5.7).	Make a "Entire Distribution" software group install of the Solaris 7 (5.7) or 8 (5.8) operating environment or add the SUNWlldap package.

TABLE A-1 utinstall Error Messages (Continued)

Message	Meaning	Resolution
error, this is not an Entire Solaris distribuiton. SUNWfns is missing	The Federated Naming Service software is not installed under Solaris software version 7 (5.7).	Make a "Entire Distribution" software group install of the Solaris 7 (5.7) or 8 (5.8) operating environment or add the SUNWfns package.
utpreserve: unable to preserve data. Error while creating archive file	The utinstall script failed to preserve existing configuration files.	Either exit and manually preserve these files or just continue.
XXXXXX not successfully installed	Might occur for the installation of any application or patch, XXXXXX, if relevant packages have not been properly installed.	Verify the component XXXXXX is present in the installation media directory path and has the correct permissions, then re-run the utinstall script.
The following packages were not successfully removed XXXXXX ...	The packages listed have not been properly removed.	Use the pkgrm command to manually remove each package listed, then run utinstall -u again.
A different version <i>x.x</i> of <i>product</i> has been detected. The <i>other-product</i> Software is only compatible with <i>product y.y</i> . You must either upgrade or remove the current <i>product</i> installation before proceeding.	Some of the applications provided with the Sun Ray server software are only compatible with certain versions of other applications.	Compatible and necessary applications are included with the 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.
<i>product</i> has not installed correctly. All data saved during the upgrade 'Save & Restore' has been retained at the following location:	Upgrade of the Sun Ray server software was incomplete.	<ol style="list-style-type: none"> 1. Run utinstall again. 2. If message appears again, type: # pkginfo -p grep SUNWut 3. Use pkgrm to remove packages listed. 4. Type: # pkginfo grep SUNWut <ul style="list-style-type: none"> • If output, go to step 5. • If no output, type: # cd /cdrom/cdrom0/Sun_Ray_Server_1.3/Solaris_2.6+/Product 5. Run utinstall again.

TABLE A-1 utinstall Error Messages (Continued)

Message	Meaning	Resolution
The following files were not successfully replaced during this upgrade. The saved copies can be found in <i>directory</i>	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 <i>product</i> was not successfully completed. See <i>logfile</i> for more details.	Removal of the Sun Ray server software was incomplete.	Check <i>logfile</i> for the package which started the problem and manually remove it with the <code>pkgrm</code> command, then run <code>utinstall -u</code> again.
Message	Meaning and Resolution	
Partition Name Space Required ----- <i>partition</i> <i>xxx</i>	Space Available ----- <i>yyy</i>	Not enough disk space was allocated for <i>partition</i> . Repartition the disk and run <code>utinstall</code> again.

Patch Requirements

For the Sun Ray server software to function properly, certain patches are necessary. Most of these patches are automatically installed by the `utinstall` script. However, if the `utinstall` script encounters a newer version of a patch than what the `utinstall` script was going to install, the script does not replace this patch. Only the latest versions of patches are installed.

Information on the latest Sun Ray patches is located at the following URL:

<http://www.sun.com/product/sunray/patches.html>

Disabling and Unconfiguring SSL Certificates

▼ To Disable SSL

You do not need to unconfigure SSL to disable it.

Note – This procedure might take five minutes to complete.

1. Log in as the superuser of the Sun Ray server.

You can log in locally or remotely use the `rlogin` or `telnet` commands.

2. Open the `/etc/opt/SUNWut/http/utadmin.httpd.conf` file in a text editor.

3. Find the text `ssl_enable "yes"` and change it to `ssl_enable "no"`.

4. Save the file.

5. Start or restart the Sun Ray administration server.

- Start the server:

```
# /opt/SUNWut/http/bin/htserver start
```

- Restart the server:

```
# /opt/SUNWut/http/bin/htserver restart
```

▼ To Unconfigure SSL Certificates

Follow this procedure to unconfigure SSL certificates or as a prerequisite to reconfiguring a SSL certificate.

Note – This procedure might take ten minutes to complete.

1. Log in as the superuser of the Sun Ray server.

You can log in locally or remotely use the `rlogin` or `telnet` commands.

2. Open a shell window and stop both the `cryptorand` server and the `skiserv` server:

```
# /etc/init.d/cryptorand stop
# /etc/init.d/skiserv stop
```

3. Remove the Federated Naming Service directory:

```
# rm -rf /var/fn
```

4. Change to the `RootCA` directory:

```
# cd /var/certs
```

5. Remove the Sun Ray Administration Server certificate directory, files, and subdirectories from the `RootCA` directory:

```
# rm -rf new_cred_list keypkgs certs IPaddress
```

6. Start both the `cryptorand` server and the `skiserv` server:

```
# /etc/init.d/cryptorand start  
# /etc/init.d/skiserv start
```

7. If you wish to reconfigure a certificate, return to Step 5 of “To Configure a Secure Socket Layer Certificate” on page 44.

8. Start or restart the Sun Ray administration server.

- Start the server:

```
# /opt/SUNWut/http/bin/htserver start
```

- Restart the server:

```
# /opt/SUNWut/http/bin/htserver restart
```

Sun Ray Server Software 1.3 Documentation

Note – The Sun Ray server software 1.3 documentation is available online at:
<http://www.sun.com/products/sunray/docs>

After installation or upgrade, read the following documents:

- The *Sun Ray Server Software 1.3 Administrator's Guide* explains how to administer the Sun Ray server software and how to use the Administration Tool.
- The *Sun Ray Server Software 1.3 Advanced Administrator's Guide* provides additional information for advanced system administrators and includes procedures to optionally customize your Sun Ray server software installation.

English versions of these documents and this installation guide are available from the Online Documents link in the Administration Tool and from the image directory following this path:

`Docs/Solaris_2.6+/en/SUNWeutdo/reloc/SUNWut/doc/en`

Note – To install localized versions of the documentation, such as the Japanese *Sun Ray Server Software 1.3 Reference Manual*, refer to the README file.

Removing the Software

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

▼ To Remove the Sun Ray Server Software 1.3

If you wish to remove the Sun Ray server software 1.3 in its entirety, follow this procedure.

Note – This procedure might take 30 minutes to complete

1. Log in as the superuser of the Sun Ray server.

You can log in locally or remotely use the `rlogin` or `telnet` commands.

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

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

3. If you are removing the Sun Ray server software from a server in a failover group, take these immediate steps. Otherwise, skip to Step 4.

a. Disable Sun Ray appliance firmware downloads:

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

b. Remove the replication configuration:

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

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

```
# ./utadm -r
```

5. Unconfigure the Sun Ray software:

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

Answer `y` to all of the prompts.

6. Uninstall the Sun Ray server software 1.3:

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

Answer `y` to all of the prompts.

7. If you configured the Sun Ray server for SSL, follow these steps, otherwise go to Step 8:

a. Delete the Federated Naming service directory:

```
# rm -rf /var/fn
```

b. Delete the Certificate directory:

```
# rm -rf /var/certs
```

c. Delete the Root Certificate Authority user:

```
# userdel rcauser
```

8. Repeat from Step 1 to Step 7 for all remaining Sun Ray servers.