

Installation Guide

Sun™ ONE Application Server

Version 7, Enterprise Edition

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Sun Microsystems, Inc.
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About This Guide

This *Installation Guide* provides instructions for installing the Sun™ Open Net Environment (Sun ONE) Application Server 7, Enterprise Edition product.

The following topics are addressed here:

- [Who Should Use This Guide](#)
- [How This Guide is Organized](#)
- [Using the Documentation](#)
- [Documentation Conventions](#)
- [Product Support](#)
- [For More Information](#)

Who Should Use This Guide

This manual is intended for system administrators, network administrators, evaluators, application server administrators, and developers who want to install the Sun ONE Application Server software.

This guide assumes you are familiar with the following:

- Installation of enterprise-level software products
- UNIX® operating system
- Client/server programming model
- Internet and World Wide Web
- High-availability and clustering concepts

How This Guide is Organized

This guide contains the following documentation components:

- [Chapter 1, “Preparing to Install” on page 15](#)—Provides information on the installation components, installation methods, and requirements for installing Sun ONE Application Server 7, Enterprise Edition software
- [Chapter 2, “Installing Enterprise Edition Software” on page 31](#)—Provides instructions for installing the Sun ONE Application Server 7, Enterprise Edition software components. Includes instructions for performing a non-interactive silent installation.
- [Chapter 3, “Preparing for HADB Setup” on page 53](#)—Provides instructions for configuring shared memory, and setting up host communications and the user environment for the high-availability configuration.
- [Chapter 4, “Post-installation Tasks” on page 81](#)—Describes additional tasks you may need to perform during or after installing the Sun ONE Application Server software.
- [Chapter 5, “Uninstalling the Enterprise Edition Software” on page 87](#)—Provides instructions for uninstalling the Sun ONE Application Server 7 software. Includes instructions for performing a non-interactive silent uninstallation.
- [Chapter 6, “Troubleshooting” on page 93](#)—Provides information on logging as well as solutions to problems you may encounter during or after installation or uninstallation.
- [Appendix A, “Installation Cheatsheet” on page 101](#)—Provides a checklist of the summarized tasks of installing the Sun ONE Application Server Version 7, Enterprise Edition software.

Using the Documentation

The Sun ONE Application Server 7, Enterprise Edition manuals are available in Portable Document Format (PDF) and Hypertext Markup Language (HTML) on the documentation CD that is distributed with the product.

The following table lists tasks and concepts described in the Sun ONE Application Server manuals. The left column lists the tasks and concepts, and the right column lists the corresponding manuals.

Application Server Documentation Roadmap

For information about	See the following
Late-breaking information about the software and the documentation	<i>Release Notes</i>
Comprehensive, table-based summary of supported hardware, operating system, JDK, and JDBC/RDBMS.	<i>Platform Summary</i>
Sun ONE Application Server 7 overview, features available with each product edition	<i>Product Overview</i>
Diagrams and descriptions of server architecture, benefits of the Sun ONE Application Server architectural approach	<i>Server Architecture</i>
New enterprise, developer, and operational features of Sun ONE Application Server 7	<i>What's New</i>
How to get started with the Sun ONE Application Server 7 product. Includes new features, architectural overview, and sample application tutorial.	<i>Getting Started Guide</i>
Installing the Sun ONE Application Server software and its components, such as sample applications, the Administration interface, and the high-availability components. Instructions for implementing a basic high-availability configuration are included.	<i>Installation Guide</i>
Evaluating your system needs and enterprise to ensure that you deploy Sun ONE Application Server in a manner that best suits your site. General issues and concerns that you must be aware of when deploying an application server are also discussed.	<i>System Deployment Guide</i>
Best practices for HTTP session availability that application architects and developers can use	<i>Application Design Guidelines for Storing Session State</i>
Creating and implementing J2EE applications intended to run on the Application Server 7 that follow the open Java standards model for servlets, Enterprise JavaBeans™ (EJBs™), JavaServer Pages (JSPs), and other J2EE components. Includes general information about application design, developer tools, security, assembly, deployment, debugging, and creating lifecycle modules. A comprehensive Application Server glossary is included.	<i>Developer's Guide</i>
Creating and implementing J2EE web applications that follow the Java™ Servlet and JavaServer Pages™ (JSP™) specifications on the Application Server 7. Discusses web application programming concepts and tasks, and provides sample code, implementation tips, and reference material. Topics include results caching, JSP precompilation, session management, security, deployment, SHTML, and CGI.	<i>Developer's Guide to Web Applications</i>

Application Server Documentation Roadmap (*Continued*)

For information about	See the following
Creating and implementing J2EE applications that follow the open Java standards model for enterprise beans on the Sun ONE Application Server 7. Discusses Enterprise JavaBeans™ (EJB™) programming concepts and tasks, and provides sample code, implementation tips, and reference material. Topics include container-managed persistence, read-only beans, and the XML and DTD files associated with enterprise beans.	<i>Developer's Guide to Enterprise JavaBeans Technology</i>
Creating Application Client Container (ACC) clients that access J2EE applications on the Application Server 7	<i>Developer's Guide to Clients</i>
Creating web services in the Sun ONE Application Server environment	<i>Developer's Guide to Web Services</i>
Java™ Database Connectivity (JDBC™), transaction, Java Naming and Directory Interface™ (JNDI), Java™ Message Service (JMS), and JavaMail™ APIs	<i>Developer's Guide to J2EE Services and APIs</i>
Creating custom NSAPI plugins	<i>Developer's Guide to NSAPI</i>
Information and instructions on the configuration, management, and deployment of the Sun ONE Application Server subsystems and components, from both the Administration interface and the command-line interface. Topics include cluster management, the high-availability database, load balancing, and session persistence. A comprehensive Application Server glossary is included.	<i>Administrator's Guide</i>
Editing Sun ONE Application Server configuration files, such as the <code>server.xml</code> file	<i>Administrator's Configuration File Reference</i>
Configuring and administering security for the Sun ONE Application Server operational environment. Includes information on general security, certificates, and SSL/TLS encryption. HTTP server-based security is also addressed.	<i>Administrator's Guide to Security</i>
Configuring and administering service provider implementation for J2EE™ Connector Architecture (CA) connectors for the Sun ONE Application Server 7. Topics include the Administration Tool, Pooling Monitor, deploying a JCA connector, and sample connectors and sample applications.	<i>J2EE CA Service Provider Implementation Administrator's Guide</i>
Migrating your applications to the new Sun ONE Application Server 7 programming model, specifically from iPlanet Application Server 6.x and from Netscape Application Server 4.0. Includes a sample migration.	<i>Migrating and Redeploying Server Applications Guide</i>
How and why to tune your Sun ONE Application Server to improve performance	<i>Performance Tuning Guide</i>
Information on solving Sun ONE Application Server problems	<i>Troubleshooting Guide</i>

Application Server Documentation Roadmap (*Continued*)

For information about	See the following
Messages that you may encounter while running Sun ONE Application Server 7. Includes a description of the likely cause and guidelines on how to address the condition that caused the message to be generated.	<i>Error Message Reference</i>
Utility commands available with the Sun ONE Application Server; written in manpage style	<i>Utility Reference Manual</i>
Using the Sun ONE Message Queue software.	The Sun ONE Message Queue documentation at: http://docs.sun.com/db?product=s1.s1msgqu

Documentation Conventions

This section describes the types of conventions used throughout this guide:

- [General Conventions](#)
- [Conventions Referring to Directories](#)

General Conventions

The following general conventions are used in this guide:

- **File and directory paths** are given in UNIX[®] format (with forward slashes separating directory names).
- **URLs** are given in the format:

`http://server.domain/path/file.html`

In these URLs, *server* is the server name where applications are run; *domain* is your Internet domain name; *path* is the server's directory structure; and *file* is an individual filename. Italic items in URLs are placeholders.

- **Font conventions** include:
 - The monospace font is used for sample code and code listings, API and language elements (such as function names and class names), file names, path names, directory names, and HTML tags.
 - *Italic* type is used for code variables.

- *Italic* type is also used for book titles, emphasis, variables and placeholders, and words used in the literal sense.
- **Bold** type is used as either a paragraph lead-in or to indicate words used in the literal sense.
- **Installation root directories** for most platforms are indicated by *install_dir* in this document.
- **Instance root directories** are indicated by *instance_dir* in this document, which is an abbreviation for the following:

default_config_dir/domains/*domain*/*instance*

Conventions Referring to Directories

By default, when using the Solaris 8 and 9 package-based installation, the application server files are spread across several root directories. These directories are described in this section.

- *install_dir* refers to `/opt/SUNWappserver7`, which contains the static portion of the installation image. All utilities, executable files, and libraries that make up the application server reside in this location.
- *default_config_dir* refers to `/var/opt/SUNWappserver7/domains` which is the default location for any domains that are created.
- *install_config_dir* refers to `/etc/opt/SUNWappserver7/`, which contains installation-wide configuration information such as licenses and the master list of administrative domains configured for this installation.

Product Support

Use your early access support process for any product or documentation issues and for submitting defects.

If you have general feedback on the product or documentation, please send this to appserver-feedback@sun.com.

If you have problems with your system, contact customer support using one of the following mechanisms:

- The online support web site at:
<http://www.sun.com/supporttraining/>

- The telephone dispatch number associated with your maintenance contract

Please have the following information available prior to contacting support. This helps to ensure that our support staff can best assist you in resolving problems:

- Description of the problem, including the situation where the problem occurs and its impact on your operation
- Machine type, operating system version, and product version, including any patches and other software that might be affecting the problem
- Detailed steps on the methods you have used to reproduce the problem
- Any error logs or core dumps

For More Information

Useful information can be found at the following Internet locations:

- Sun ONE products and services information

<http://www.sun.com/service/sunps/sunone/index.html>

- Sun ONE developer information

http://www.sun.com/software/product_categories/application_development.html

- Sun ONE learning solutions

<http://www.sun.com/software/training/>

- Sun ONE product data sheets

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

- Sun Microsystems product documentation

<http://docs.sun.com/>

For More Information

Preparing to Install

This chapter explains the Sun Open Net Environment (Sun ONE) Application Server 7, Enterprise Edition software components, the scope and limitations of your installation choices, and the system requirements for the Application Server environment.

The following topics are addressed here:

- [Installation Roadmap](#)
- [Installation Components](#)
- [Installation Methodology](#)
- [Distribution of the Product](#)
- [Installation Requirements](#)
- [Accessing the Documentation](#)

Read the *Sun ONE Application Server Release Notes* for any late-breaking installation information.

For more information about configuring the Sun ONE Application Server software after installation, refer to the *Sun ONE Application Server Administrator's Guide*.

The following location contains helpful information, including Technical Notes, Forum discussions, tools and utilities, and product downloads:

http://www.sun.com/software/products/appsrvr/home_appsrvr.html

Installation Roadmap

Implementing the functionality of the Enterprise Edition of Sun ONE Application Server 7 is not a simple process. The complexities of the high-availability database (HADB), clustering, failover, and load balancing are different for each possible scenario and for each installation.

The roadmap in [Table 1-1](#) describes the high-level tasks that are required to fully implement the Sun ONE Application Server 7, Enterprise Edition software. The right column provides the location of instructions for the task.

Table 1-1 Installation Roadmap

Step	Description of Task	Location of Instructions
1	Decide on your high-availability configuration and set up your systems.	<i>System Deployment Guide</i>
2	Verify that Enterprise Edition requirements are met.	“Installation Requirements” on page 23 <i>Platform Summary</i>
3	Install the software components.	“Installing Enterprise Edition Software” on page 31
4	Set up shared memory for the HADB hosts.	“Configuring Shared Memory and Semaphores” on page 53
5	Set up communication for the HADB management client using SSH or RSH.	“Setting Up Host Communication” on page 55
6	Set the environment variables for the HADB management client.	“Setting Up the User Environment” on page 63
7	Set up a basic cluster.	“Using the clsetup Command” on page 65
8	Start the application server instances.	“Starting and Stopping the Server” on page 81
9	Install the load balancer plug-in.	“Installing the Load Balancer Plug-in” on page 44
10	Set up the loadbalancer.xml file.	<i>Administrator’s Guide</i> , Configuring Load Balancing
11	Tailor your high-availability setup.	<i>Administrator’s Guide</i> , HADB Configuration <i>Administrator’s Guide</i> , Session Persistence
12	Administer the installed cluster.	<i>Administrator’s Guide</i> , Cluster Management

In addition to this high-level roadmap, the summarized installation steps are presented in a checklist format in [Appendix A, “Installation Cheatsheet.”](#)

Sun ONE Application Server 7, Enterprise Edition documentation is located on the documentation CD that accompanies the product.

Installation Components

The Sun ONE Application Server Version 7, Enterprise Edition product is made up of the following software components that work together to create the Application Server platform:

- [Application Server](#)
- [Administration Client](#)
- [Sun ONE Message Queue](#)
- [Java 2 Software Development Kit \(J2SE\)](#)
- [Sample Applications](#)
- [Always-On Technology Components](#)

Application Server

This component includes the core components of the Sun ONE Application Server software and is dependent on the J2SE component. Refer to *What's New* and the *Product Overview* documents for a more in-depth explanation of the features of Sun ONE Application Server 7, Enterprise Edition.

Administration

The Administration interface and the command-line interface are automatically installed when you install the Application Server component. When the Administration interface has been started, the initial page of the Application Server graphical interface is displayed.

- Admin Server—Provides administration facilities (one Admin Server per domain).
- Administration interface—Graphical interface used for performing server administration tasks. Also called the Admin Console.

- **Command-line interface**—Performs the same tasks as the Administration interface. A number of high-availability commands are available with this release. Refer to the *Application Server Administrator's Guide* for instructions on using these commands.
- **Multiple administrative domains**—This mechanism allows different administrators to create and manage their own sets of application server instances.

Both the graphical and command-line administration clients allow you to manage and configure your servers and the applications hosted on them, as well as help you deploy your applications.

Full instructions for using the administration tools are contained in the *Sun ONE Application Server Administrator's Guide*, the Administration interface online help, and the `asadmin` and `hadbm` man pages.

Administration Client

The administration client is the separate command-line component of the Application Server. It is installed automatically when the Sun ONE Application Server component is installed and is dependent on the J2SE component.

You can choose to install the command-line version of this client separately on a machine where the Application Server is *not* installed. Do this by selecting the Sun ONE Administration Client component instead of the Sun ONE Application Server component during installation.

Java 2 Software Development Kit (J2SE)

The Sun ONE Application Server product requires the J2SE 1.4.1_03 and leverages the performance and feature improvements that are part of the 1.4 platform.

During an installation, you can choose to reuse a J2SE component that is already installed on your system as long as the J2SE version is correct.

NOTE	The Sun ONE Application Server 7 product is only certified to work with J2SE 1.4.1_03 from Sun Microsystems. Third-party J2SE development kits, even with appropriate version numbers, are not supported.
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The J2SE is installed here by default: `/usr/j2se`

Sun ONE Message Queue

The Sun ONE Message Queue, Platform Edition software is a production implementation of the Java Messaging Service (JMS) 1.0.2 specification. It is automatically installed when you install the Application Server software.

The Platform Edition of Sun ONE Message Queue differs from the Enterprise Edition in that Platform Edition does not have the following Message Queue features:

- Support for multi-broker message services
- HTTP/HTTPS connections
- Secure connection services
- Scalable connection capability
- Multiple queue delivery policies

For further information, the Sun ONE Message Queue has its own documentation set that can be found at the following location:

<http://docs.sun.com/db?p=prod/s1.s1msgqu>

Sample Applications

The Sun ONE Application Server Version 7, Enterprise Edition product includes over sixty sample applications that are available when you install the Application Server software. This component is dependent on the Application Server component.

All samples come with the source, schema, Ant build scripts, and EAR files. These sample applications are categorized as follows:

- Technology samples—Introduce you to various technical aspects of the Java™ 2 Platform, Enterprise Edition (J2EE™) specification as well as the value added features of the Sun ONE platform. High-availability samples are included.
- Interoperability samples—Provide more detailed views on how these technologies come together on the Application Server platform.

The sample applications are installed here:

`install_dir/samples`

More information about the samples can be found here:

`install_dir/samples/index.html`

Always-On Technology Components

The Sun ONE Application Server 7, Enterprise Edition includes the Always-On Technology, which supports multi-tiered, multi-machine, clustered application server deployments. In Enterprise Edition, the web tier supports load balancing and application traffic partitioning using a web server plug-in.

Various topologies for the Always On Technology are discussed in the *Sun ONE Application Server System Deployment Guide*. For instructions on configuring and administering high availability for the Application Server, refer to the *Sun ONE Application Server Administrator's Guide*.

The following installation components provide the basis for the Always-On Technology:

- [High-Availability Database \(HADB\)](#)
- [HADB Management Client](#)
- [Load Balancer Plug-in](#)

High-Availability Database (HADB)

The Application Server provides a transactional, highly-available and highly-scalable session state persistence infrastructure. Application Server uses the HADB to store session information.

For additional information on this component, refer to the HADB Configuration chapter in the *Sun ONE Application Server Administrator's Guide*.

HADB Management Client

The HADB management client is the command-line interface for the HADB. A full set of utilities is available for performing HADB configuration, runtime management, and monitoring.

Instructions for using the utilities are contained in the *Sun ONE Application Server Administrator's Guide*, the `hadbm` man pages, and the `asadmin` session persistence man pages.

Load Balancer Plug-in

The load balancer is responsible for taking incoming HTTP requests and distributing them across the instances in the cluster. The load balancer also makes it possible for sessions to fail over to new instances when an instance becomes unavailable, and for a user to quiesce an instance prior to taking it offline.

The Application Server high-availability load balancer plug-in is an enhanced version of the HTTP reverse proxy plug-in. In addition, third-party load balancers can be used. This component is dependent on a pre-installed web server. Supported web servers are listed in the *Sun ONE Application Server Platform Summary*.

For additional information on this component, refer to [“Installing the Load Balancer Plug-in” on page 44](#) and the Configuring Load Balancing in the *Sun ONE Application Server Administrator’s Guide*.

Installation Methodology

The Sun ONE Application Server can be installed or uninstalled using the command-line interface or the graphical interface. You can install interactively using either the graphical or command-line interfaces, or you can use silent mode to replicate an installation scenario on one or multiple machines.

Partial and incremental (subsequent) installations are supported. Using either of the interactive methods, you can do a partial installation which can be followed by any number of incremental installations. For silent mode, you can do a partial *initial* installation, but any subsequent installations must be done using an interactive method.

The installation program or uninstallation program checks for component dependencies and does not allow you to install or uninstall components without their dependent components.

The following sections explain the various installation methods:

- [Graphical Interface Method](#)
- [Command-Line Interface Method](#)
- [Silent Mode](#)

Graphical Interface Method

If you choose to use the graphical interface for installation, you are provided with a set of interactive graphical dialogs.

To invoke the installation program using the graphical (default) method:

```
./setup
```

To invoke the uninstallation program using the graphical (default) method:

```
./uninstall
```

Command-Line Interface Method

If you choose to use the command-line interface, the installation steps are the same as for the graphical-interface installation, but a graphics-capable display is not provided.

To invoke the installation program using the command-line method:

```
./setup -console
```

To invoke the uninstallation program using the command-line method:

```
./uninstall -console
```

If you are using Telnet to access a remote server, you can use the command-line interface to install the product in an interactive fashion.

NOTE	For a hardened Solaris operating environment, you must use the command-line method. To start the installation program in a hardened environment, you will need to perform the steps in “Hardened Solaris Operating Environment Requirement” on page 26 .
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Silent Mode

You can use silent mode to perform a scripted installation based on the presence of a parameter file that was created during an interactive installation. In silent mode, the Application Server software is installed or uninstalled without any interaction with you. By referring to the installation configuration file, the components that were installed or uninstalled in the interactive model are automatically installed or uninstalled on one or multiple servers.

Instructions for using silent mode are contained in [“Installing in Silent Mode \(Non-Interactive\)” on page 48](#) and [“Uninstalling in Silent Mode \(non-interactive\)” on page 90](#).

Distribution of the Product

The Sun ONE Application Server 7, Enterprise Edition software is available on a CD-ROM. The Enterprise Edition license is automatically installed with the product and doesn't expire. No other licenses can be transitioned to the Enterprise Edition license.

The package-based model installs the components as packages. By default, the installation locations are spread across three directory roots:

- `/opt/SUNWappserver7` contains the static portion of the installation image. All utilities, executables and libraries of the Application Server software reside in this location.

NOTE	Only product patches and upgrades affect <code>/opt/SUNWappserver7</code> .
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- `/etc/opt/SUNWappserver7` contains installation-wide configuration information such as licenses and the master list of administrative domains configured for this installation.
- `/var/opt/SUNWappserver7/domains` is the default area under which administrative domains are created.

Installation Requirements

This section lists the requirements that must be met before installing the Sun ONE Application Server 7, Enterprise Edition product.

- [Platform Requirements](#)
- [Solaris Requirements](#)
- [General Requirements](#)
- [High-Availability Requirements](#)

Platform Requirements

Table 1-2 through Table 1-4 summarize the Sun ONE Application Server 7, Enterprise Edition requirements for the various high-availability configurations.

Configuration 1

Table 1-2 describes a three-machine type of configuration:

- * Machine 1—Web Server
- ** Machine 2—Application Server instance 1, HADB Node 1
- *** Machine 3—Application Server instance 2, HADB Node 2

Table 1-2 Platform Requirements for Configuration 1

Machine	Config uration	Operating System	Archite cture	Minimum Memory	Recommend ed Memory	Minimum Disk Space	Recommende d Disk Space
1	*	Solaris 8, 9 for SPARC	32 and 64 bit	96 MB	128 MB	250 MB	500 MB
2	**	Solaris 8, 9 for SPARC	32 and 64 bit	512 MB (256 MB for AppServ; 256 MB HADB)	768 MB	500 MB (250 MB for AppServ; 250 MB for HADB)	750 MB
3	***	Solaris 8, 9 for SPARC	32 and 64 bit		768 MB	500 MB (250 MB for AppServ; 250 MB for HADB)	750 MB

Configuration 2

Table 1-3 describes a two-machine type of configuration:

- * Machine 1—Web Server/Application Server (1 Admin Server instance, 1 Application Server instance)
- ** Machine 2—Application Server instance 2 (1 Admin Server instance, 1 Application Server instance), 2 HADB Nodes

Table 1-3 Platform Requirements for Configuration 2

Machine	Configuration	Operating System	Architecture	Minimum Memory	Recommended Memory	Minimum Disk Space	Recommended Disk Space
1	*	Solaris 8, 9 for SPARC	32 and 64 bit	352 MB	640 MB	500 MB	1 GB
2	**	Solaris 8, 9 for SPARC	32 and 64 bit	768 MB	1 GB	750 MB	1 GB

Configuration 3

[Table 1-4](#) describes a single-machine type of configuration:

- * Machine 1—Web Server/Application Server (1 Admin Server instance, 2 Application Server instances), 2 HADB Nodes

Table 1-4 Platform Requirements for Configuration 3

Machine	Configuration	Operating System	Architecture	Minimum Memory	Recommended Memory	Minimum Disk Space	Recommended Disk Space
1	*	Solaris 8, 9 for SPARC	32 and 64 bit	992 MB	1.5 GB	1.128 GB	1.75 GB

You can check your operating system version using the `uname` or `showrev` command. Disk space can be checked using the `df -k` command. RAM can be checked using the `prtconf` or `top` commands.

For the latest information about supported directory servers, web servers, web browsers, and so on, refer to the *Sun ONE Application Server Platform Summary*.

Solaris Requirements

The following Solaris-specific requirements must be met:

- [Solaris 8 Patch Requirements](#)
- [Shared Message Queue Broker Requirement](#)
- [Hardened Solaris Operating Environment Requirement](#)

Solaris 8 Patch Requirements

NOTE Solaris 8 systems should have the “Sun recommended patch cluster” installed. The patch cluster includes the three required patches listed in this section and is available under “Recommended and Security Patches” here:

<http://sunsolve.sun.com/>

For Solaris 8 systems, the following Solaris patches must be installed:

- 109326-06
- 108827-26
- 110934-02

These patches are available individually from the patch finder page here:

<http://sunsolve.sun.com/pub-cgi/show.pl?target=patches/patch-access>

Shared Message Queue Broker Requirement

If your machine has an active installation of the Solaris 9 bundled version of the Application Server software, and you install the unbundled version of the server, the Message Queue broker for these application server installations will be shared.

Therefore, if you fail to uniquely name your domains and instances, you may receive the following errors when starting up the second instance with the same domain or instance name:

```
SEVERE: JMS5024: JMS service startup failed
SEVERE: CORE5071: An error occurred during initialization
```

To avoid these errors, see JMS Support in the *Sun ONE Application Server Administrator's Guide*.

Hardened Solaris Operating Environment Requirement

Hardening means customizing existing services or functions so as to improve the overall security of the platform. The hardening process generally includes tasks such as disabling unnecessary services, strengthening ownership and permissions on objects, and enabling miscellaneous security functions such as non-default logging and auditing. A hardened operating system usually doesn't allow GUI-based applications to be run in the environment.

The following two libraries are required to install and use Sun ONE Application Server 7, Enterprise Edition in a hardened Solaris operating environment:

- `libC.so.5`
- `libCrun.so.1`

These libraries can be obtained by installing the `SUNWlibC` (Sun Workshop Compilers Bundled libC) package which is part of the Solaris distribution in the end-user package cluster (not in the core).

General Requirements

The following additional requirements should be met before installing the Sun ONE Application Server 7, Enterprise Edition product:

- Removing previously-installed Sun ONE Application Server 7 software—If there is previously-installed Sun ONE Application Server 7 software on the target machine, you must remove it using the uninstallation program before starting installation.

NOTE	Solaris 9 bundled installations or non-package-based evaluation installations do not affect the Enterprise Edition installation program, so they do not need to be removed from your system. However, port conflicts must be resolved.
-------------	--

- Available ports
 - You'll assign one for the Admin Server and another for the HTTP server default instance during installation.
 - The installation program will detect used ports and assign two others for you: Sun ONE Message Queue (by default, 7676), and IIOP (by default, 3700). If either of these default port numbers are in use, the installation program will assign the next available port (for example, 7677 or 7678, and so on).
 - Additional ports will be needed for the HADB servers. Refer to the HADB configuration chapter in the *Sun ONE Application Server Administrator's Guide* for guidelines.
- Root privileges—You must have root privileges on your target machine.

- Single installation—You can have only one installation per machine, however, you can have multiple instances running within the same installation.

High-Availability Requirements

The following requirements are key to setting up your high-availability environment:

- [Topology Planning](#)
- [Space Considerations](#)
- [Web Server Installation](#)
- [Shared Memory Setup](#)
- [Remote Access Setup](#)

Topology Planning

Before you install the Sun ONE Application Server 7, Enterprise Edition software, you will need to decide on product topology, that is, which component will be hosted on which available system. The Sun ONE Application Server and the HADB server can generally be hosted in two ways:

- Application Server and HADB server node hosted on the same system
- Application Server and HADB server node hosted on separate systems

In both cases, at least two systems per component are needed to achieve high availability.

The installation program enforces explicit component dependencies, but will not otherwise limit combinations of product components that can be installed on a particular machine. As a result, the number of possible product topologies is quite large.

Details on the various topologies that can be implemented for the Always On Technology are discussed in the Enterprise Edition of the *Sun ONE Application Server Operational Deployment Guide*.

Space Considerations

Data devices should not be filled beyond 50% of capacity because additional space is needed to refragment the HADB. If refragmentation fails, it might be because devices are too full and there is not enough space. If devices are running at 80% or 90% of capacity and refragmentation fails, the HADB will need to be *cleared*, meaning that all data removed from the database and the session schema.

It is important to monitor the space on the devices using the `hadbm deviceinfo` command. When device capacity exceeds 50%, additional nodes should be added. Refer to the *Sun ONE Application Server Administrator's Guide* and the *Sun ONE Performance Tuning Guide* for information and instructions.

Web Server Installation

Before you start the installation process, your web server must be installed on any machine where you are going to install the load balancer plug-in.

Currently-supported versions include the following:

- Sun ONE Web Server 6.0 SP6
- Apache Web Server 1.3.27

For installing the Sun ONE Web Server, refer to the *iPlanet WebServer Installation Guide* at this location:

<http://docs.sun.com/db/prod/slwebsrv>

Instructions for installing the plug-in are contained in “[Installing the Load Balancer Plug-in](#)” on page 44.

Shared Memory Setup

You will need to configure shared memory on the HADB hosts before you can set up the HADB. This can be done before or after installing the high-availability components. Refer to “[Configuring Shared Memory and Semaphores](#)” on page 53 for instructions.

Remote Access Setup

Before you can set up the HADB, you will need to configure remote access on the HADB hosts to enable the high-availability management client to communicate among HADB nodes. This can be done before or after installing the high-availability components. Refer to “[Setting Up Host Communication](#)” on page 55 for instructions on configuring OpenSSH/SSH or RSH.

Accessing the Documentation

The Sun ONE Application Server documentation is provided in a number of ways:

- **Manuals**—The Sun ONE Application Server 7, Enterprise Edition manuals and release notes, in HTML and in printable PDF, are available on the documentation CD-ROM that comes with the product.
- **Online help**—Click the Help button in the graphical interface to launch a context-sensitive help window.
- **Man pages**—To view man pages at the command line, you must first add *install_dir*/man to your MANPATH environment variable (Solaris) and add the HADB /bin directory to PATH. After setting the variable, you can access man pages for the Sun ONE Application Server commands by typing `man command_name` on the command line. For example:

```
man asadmin
man hadbm
```

Installing Enterprise Edition Software

This chapter provides instructions for installing the Sun ONE Application Server 7, Enterprise Edition product. You can install this version of the product interactively or you can use silent mode to replicate an installation scenario on multiple machines. Refer to “[Installation Roadmap](#)” on page 16 to see the full sequence of events for implementing the Sun ONE Application Server 7, Enterprise Edition product.

The following topics are addressed here:

- [About Installation](#)
- [Installing Application Server Software](#)
- [Installing the Load Balancer Plug-in](#)
- [Installing in Silent Mode \(Non-Interactive\)](#)

You should be familiar with the information in “[Preparing to Install](#)” on page 15 before beginning the tasks in this chapter.

For any late-breaking updates to these instructions, check the *Sun ONE Application Server Release Notes*. For more information about configuring your application server after installation, refer to the *Sun ONE Application Server Administrator's Guide*.

The following location contains product downloads in addition to other useful information:

http://www.sun.com/software/products/appsrvr/home_appsrvr.html

About Installation

Only one Sun ONE Application Server 7 installation can reside on a single machine. If an installation of Application Server 7 already exists on your system, the installation program will not overwrite it, but the pre-existing installation will be detected and you will not be allowed to proceed with the installation until you have removed the existing Application Server 7 software using the uninstallation program.

NOTE	Solaris 9 bundled installations and non-package-based evaluation installations do not affect the Enterprise Edition installation program, so they do not need to be removed from your system.
-------------	---

The following topics are addressed in this section:

- [Installation Components](#)
- [Installation Options](#)

Installation Components

In general, you are installing the basic components that provide the functionality of the Sun ONE Application Server Version 7, Enterprise Edition product. You can choose *not* to install some of the components. Later, if you want to add a component that you initially chose not to install, you can do an *incremental installation* of that component, providing dependencies are met.

NOTE	Using either of the interactive methods, you can do a partial installation which can be followed by any number of incremental (subsequent) installations. For silent mode, you can do a partial <i>initial</i> installation, but any subsequent installations must be done using an interactive method.
-------------	---

Since only one installation of the same component package on the same system is allowed, the installation program tries to detect components that are already installed. If a component is already installed, installation of that component is disabled.

The installation program enforces component dependencies as specified for each component. Once component dependencies are satisfied, component life cycles are independent. A particular component can be installed or uninstalled dynamically through incremental installation and partial uninstallation mechanisms without corrupting other components.

The following installation components are included with the Sun ONE Application Server 7, Enterprise Edition product:

- Sun ONE Application Server—all of Sun ONE Appserver 7, including its graphical and command-line administrative tools, the `asadmin` command, and Sun ONE Message Queue 3.0.1

NOTE If you want to install the Application Server and an HADB server node on the same system, select both components. Otherwise select only one of them.

The `clsetup` command must be run from a machine where the `asadmin` and the `hadbm` utilities are available. Instructions for using the `clsetup` command to create a basic cluster can be found in “Using the `clsetup` Command” on page 65.

- Sun ONE Application Server Administration Client—only the `asadmin` command

NOTE You can choose to install the administration client command-line version separately on a machine where the Application Server is *not* installed. Do this by selecting only the Administration Client component during incremental installation.

- Java 2 Software Development Kit (J2SE), Standard Edition 1.4.0_03
- Sample applications (Optional)
- High-Availability Database (HADB)—all of HADB, including the `hadbm` command
- HADB Management Client—only the `hadbm` command
- Load balancer plug-in for web servers

The load balancer plug-in is usually installed in a separate process on a separate machine. Refer to [“Installing the Load Balancer Plug-in” on page 44](#) for guidelines.

See [“Installation Components” on page 17](#) for further description of the Sun ONE Application Server components.

Installation Options

There are three ways you can perform the installation:

- Graphical method (interactive)—The installation program prompts you using a sequence of graphical screens. This is the default method.
- Command-line method (interactive)—The installation program prompts you using a sequence of command-line prompts and messages.
- Silent mode—The installation program reads installation parameters from a supplied configuration file and logs all output into a log file.

The setup command allows you to specify the method you want to use for installation, and allows you to create a configuration file for silent installation.

NOTE The default installation mode is the graphical method, so if you don't specify an option when you run `setup`, the installation program presents the graphical screens.

Use the following syntax when running the `setup` command:

```
setup [-console] [-silent config_file] [-savestate]
```

[Table 2-1](#) describes the `setup` command options.

Table 2-1 Options for the setup Command

Option	Description
-console	Runs the installation using the command-line method.

Table 2-1 Options for the setup Command (*Continued*)

Option	Description
-silent <i>config_file</i>	<p>Runs the installation in silent mode. Installation parameters are read from an existing installation configuration file. This option is mutually exclusive with the <code>savestate</code> option.</p> <p>The installation configuration file path must be explicitly provided; there is no default file path. Refer to “Installing in Silent Mode (Non-Interactive)” on page 48 for further specifics on silent mode installation and the installation configuration file.</p>
-savestate	<p>Runs the installation using either the graphical or command-line method and creates an installation configuration file based on this installation. This option is mutually exclusive with the <code>silent</code> option. If you do not specify this option, no installation configuration file will be created.</p> <p>The file will be called <code>statefile</code> and located in <i>install_dir</i>.</p>

Installation Syntax

- To run the installation using the graphical interface, type the following at the command prompt (no options; this is the default method):

```
./setup
```

- To run the installation using the command-line interface, type:

```
./setup -console
```

- To run the installation using the graphical interface and create an installation configuration file for silent mode installation:

```
./setup -savestate
```

The file called `statefile` will be created in *install_dir*.

- To run the installation using the command-line interface and create an installation configuration file for silent mode installation:

```
./setup -console -savestate
```

The file called `statefile` will be created in *install_dir*.

- To run a silent mode installation based on an existing installation configuration file:

```
./setup -silent config_file
```

Refer to [“Installing in Silent Mode \(Non-Interactive\)” on page 48](#) for further specifics on silent mode installation and the installation configuration file.

- To display the available command-line arguments for the `setup` command:

```
./setup -help
```

or

```
./setup -h
```

Installing Application Server Software

This section provides instructions for installing the Sun ONE Application Server software using either the graphical-interface or command-line interface. The steps are identical for both methods. However, for the command-line interface, text-based screens are displayed instead of graphical screens.

TIP	If you are familiar with high availability concepts and installation of enterprise-level products, you may want to use the summary checklists in Appendix A, “Installation Cheatsheet.”
------------	---

After you have planned the topology, run the installation program on each system, selecting and installing the appropriate components based on your topology.

1. Uninstall any previous versions of the Sun ONE Application Server 7 software on the machines where you are going to install the Enterprise Edition of the Application Server.

NOTE	If the previously-installed packages are bundled in the Solaris operating environment, they need not be removed. However, port conflicts must be resolved.
-------------	--

2. Verify that all requirements that apply to your installation have been met. See [“Installation Requirements” on page 23](#) for information on requirements.
3. Log in as root and create a temporary directory for the product distribution file.

NOTE If you are installing the load balancer plug-in, your web server must already be installed on the machines where you are going to install the load balancer plug-in before you start the installation process. Refer to [“High-Availability Requirements” on page 28](#).

4. Start all the processes on your system that use ports and are expected to run at the same time as the Application Server software. This allows the installation program to detect what ports are in use and avoid assigning them for other purposes.

5. For a download, unzip the .gz file as follows:

```
gunzip sun-appserver7-sol.tar.gz
```

6. For a download, untar the unzipped file as follows:

```
tar -xvf sun-appserver7-sol.tar
```

This process may take a little time. When the files are unpacked, you will see the `sun-appserver7` directory, which contains the `setup` file and the `pkg` directory.

7. Navigate to the `sun-appserver7` directory.
8. Select your installation method.

Refer to [“Installation Options” on page 34](#) for guidelines on selecting the correct options to use with the `setup` command.

When the installation starts, the Welcome page of the installation program is displayed.

NOTE Click the Help button to display context-sensitive information for a page.

9. Read the Welcome page and click Next.
The License Agreement page is displayed.
10. Read the License Agreement and click Yes to agree to the terms of the license (or type Yes at the command line), then click Next.

NOTE You must accept the license agreement to continue with the installation.

After you accept the License Agreement, the Select Installation Directory page is displayed.

11. Specify the path to your Sun ONE Application Server installation directory (default is `/opt/SUNWappserver7`).

If you are installing only the HADB Server component, you can choose `/opt` as the installation directory. This will install the HADB packages into their default location, which is `/opt/SUNWhadb`.

NOTE You must select identical installation directories on all systems hosting HADB Server nodes.

NOTE When installing the Sun ONE Application Server together with HADB, if you do not want to use the default installation folder, you can create alternate directories, then create symlinks (`ln -s`) to these directories from the `/var/opt` and `/etc/opt` directories.

The standards for packaging Solaris packages require that the licenses and configuration files are located in the `/var/opt` and `/etc/opt` directories.

- Click Browse to browse for a directory (or press Enter at the command line to accept the default installation directory).
- If you enter a directory name that does not already exist, the Create New Directory? dialog is displayed.
 - Click Create Directory (or type 1 at the command line) to create a new directory.
 - Click Choose New (or type 2 at the command line) to return to the Select Installation Directory page.

The Component Selection page displays the available components.

12. Choose from the components listed on the Component Selection page (or type Yes or press Enter to accept a component from the command line).

NOTE If some components are disabled on the Component Selection page (or if a command-line mode installation did not offer them for installation), this means the disabled component has been detected as already installed on your system.

- **Sun ONE Application Server**, with graphical and command-line interfaces (J2SE and Sun ONE Message Queue are installed along with this component)

NOTE If you want to install Sun ONE Application Server and an HADB server node on the same system, select them both. Otherwise, select only one of them.

- (Optional) **Sample Applications**
- **Sun ONE Application Server Administration Client** (select only this component to install standalone command-line)
- **High-Availability Database**
- **High-Availability Database Administration Client**
- **Load Balancer Plug-in**

Refer to [“Installing the Load Balancer Plug-in” on page 44](#) for instructions on installing this component separately.

NOTE If you do not already have your web server installed on the machine where you are installing the load balancer plug-in, you cannot continue to install the load-balancer plug-in.

13. **Sun ONE Message Queue**—If the installation program detects a version of the Sun ONE Message Queue preinstalled in your system, you are presented with one of the following actions:
 - **If the correct version of the package-based Sun ONE Message Queue is installed**, it will be reused. You can choose to exit at this point. If you don't exit, the installation program will use the installed version and proceed to the next step.

- **If there is no package-based Sun ONE Message Queue installed**, you can choose to let the installation program install the Sun ONE Message Queue packages automatically.
 - **If an incorrect version of the package-based Sun ONE Message Queue is found**, a message is displayed, asking if you want to upgrade your current version or cancel. Choose one of the following:
 - To have the installation program update your current Sun ONE Message Queue, click Upgrade (or type 1 at the command line).
 - To exit the installation program, click Cancel (or type 2 at the command line).
14. For J2SE—The installation program looks in the `/usr/j2se` default location to detect if you have the correct version of the J2SE preinstalled in your machine.

You are presented with one of the following actions (if you have any problems in this step, refer to [“J2SE Installation/Upgrade Issues” on page 94](#)):

- **If the correct version of the package-based J2SE is installed**, it will be reused or you can enter the path to another correct version. The installation program proceeds to the next step.
- **If there is no package-based J2SE installed**, you can choose to let the installation program install the J2SE package automatically or reuse an existing J2SE installation.
- **If an incorrect version of the package-based J2SE is found**, a message is displayed asking if you want to upgrade your current version or cancel. Choose one of the following options:
 - To have the installation program update your current J2SE version, click Upgrade (or type 1 at the command line).

NOTE Because other applications might be running and using this J2SE installation, upgrading J2SE is a potentially disruptive process. You may prefer to cancel the current installation and take care of all dependencies (such as gracefully shutting down processes).

- To exit the installation program, click Cancel (or type 2 at the command line).

Before continuing with the installation, you must uninstall the J2SE currently located in `/usr/j2se` or upgrade it to J2SE 1.4.1_03. Then restart the Application Server installation.

NOTE If your J2SE requires an upgrade, you will need to reboot your machine after completing the Application Server installation.

NOTE This Sun ONE Application Server 7 software is certified to work with J2SE 1.4.1_03 from Sun Microsystems. Third-party J2SE development kits, even with appropriate version number, are not supported.

15. Specify your product configuration directory.

Accept the default (`/etc/opt/SUNWappserver7`) or enter the path to your Sun ONE Application Server product configuration directory.

- Click the ellipsis (...) to browse for a directory (or press Enter at the command line to accept the default installation directory).
- If the directory does not already exist, the Create New Directory? dialog is displayed.
- Click Create Directory (or type 1 at the command line). You can also click Choose New (or type 2 at the command line) to select an existing directory.

16. Specify your server configuration directory.

Accept the default (`/var/opt/SUNWappserver7`) or enter the path to your Sun ONE Application Server Version 7, Enterprise Edition domains installation directory.

- Click the ellipsis (...) to browse for a directory (or press Enter at the command line to accept the default installation directory).
- If the directory does not already exist, the Create New Directory? dialog is displayed.
- Click Create Directory (or type 1 at the command line). You can also click Choose New (or type 2 at the command line) to select an existing directory.

If you selected Application Server for installation, the Server Configuration Information page is displayed. Skip to [Step 18](#).

If you selected the load balancer plug-in, the Web Server Directory page is displayed. Proceed to [Step 17](#).

17. If you selected the load balancer plug-in, identify your web server as follows:

- Choose which web server you are going to install (Sun ONE Web Server or Apache Web Server).
- Enter the web server instance path.

Default values will be offered based on web server type. The installation program checks to see if appropriate configuration files can be found at the provided location.

Refer to [“Installing the Load Balancer Plug-in” on page 44](#) if you are installing the load balancer plug-in separately.

18. If you selected the Sun ONE Application Server component, enter the following:

- Admin User—Name of the user who administers the server (for example, admin).
- Admin User’s Password—Password to access the Admin Server. Minimum number of characters is 8. For example, adminadmin. Re-enter the password to confirm your choice.
- Admin Server Port—Port number to access the Admin Server.

A default port number is displayed (for example 4848, if that port is not in use on your machine). Change the default number if necessary. The installation program will check port numbers for validity and availability when you click Next.

- HTTP Server Port—Port number to access the default server instance.

A default port number is displayed (for example 80, if that port is not in use on your machine). Change the default number if necessary. The installation program will check port numbers for validity and availability when you click Next.

NOTE	The installation program automatically detects ports in use and suggests currently unused ports for the default settings. By default, the initial default ports are 80 for the HTTP server and 4848 for the Admin Server.
-------------	---

If these initial default ports are being actively used on your system, the installation program will suggest alternative port numbers.

19. Click Next.

The installation program proceeds to verify that you have enough disk space based on the components you selected. The Checking Disk Space progress indicator bar is displayed.

- If you do not have enough disk space, an error message is displayed.

In this case, you need to exit the installation program, create enough space, and restart the installation. Information on space requirements is contained in [“Platform Requirements” on page 24](#).

- If you have enough disk space, the Ready to Install page is displayed.

20. On the Ready to Install page, you have the following choices:

- Click Back if you want to return to the previous page. Disk space is rechecked if you do this.
- Click Install Now (or type 1 at the command line) to start the installation process.
- Click Cancel to exit the installation program.

An Installation progress indicator bar is displayed.

When installation finishes, the Installation Summary page is displayed.

21. Check the installation outcome on the Installation Summary page. If installation failure has occurred, review the following log file:

- `/var/sadm/install/logs/Sun_ONE_Application_Server_install.log`

Refer to [“About Logs and Messages” on page 93](#) for additional information.

22. Click Finish (or type Finish at the command line) to complete the installation.

The installation components are now installed on your systems.

23. Start the server.

You can start the Sun ONE Application Server software by using the instructions on [“Starting and Stopping the Server” on page 81](#).

When the Admin Console has been started, the initial page of the Application Server graphical interface is displayed.

NOTE The installation program creates an initial domain called `domain1` with a single instance called `server1`. Refer to [“Creating Domains and Instances” on page 84](#) for instructions on creating additional domains and instances.

24. If you have not already done so, add the `HADB bin` directory to the `PATH` environment variable as described in [“Setting Up the User Environment” on page 63](#).
25. If you selected the HADB components, verify that you have successfully installed the HADB software by doing the following on each host:

```
hadbm --help
```

The result of this command should be a list of all commands available using the `hadbm` command-line utility.

You are now ready to configure your system for high availability. Proceed to [“Preparing for HADB Setup” on page 53](#) to begin this process.

Installing the Load Balancer Plug-in

This section provides instructions for installing the load balancer plug-in component separately.

To install the load balancer plug-in component, perform these steps:

1. Check the system that will be hosting the web server and load balancer plug-in to see if a previously-installed load balancer plug-in or reverse proxy plug-in is present. If it is, you will need to remove it using the uninstallation program.

As root, run the following command:

```
pkginfo SUNWaspX
```

On a clean system, the following message will be displayed:

```
ERROR: information for "SUNWaspX" was not found.
```

2. Verify that the correct web server is present on the machines where you are going to install the load balancer plug-in. Currently supported versions include the following:
 - Sun ONE Web Server 6.0 SP6

- Apache Web Server 1.3.27

NOTE Make a note of the web server installation directory. This information will be needed during installation.

3. Log in as root and create a temporary directory for the product distribution file.

4. For a download, unzip the .gz file as follows:

```
gunzip sun-appserver7-sol.tar.gz
```

5. For a download, untar the unzipped file as follows:

```
tar -xvf sun-appserver7-sol.tar
```

This process may take a little time. When the files are unpacked, you will see the `sun-appserver7` directory, which contains the `setup` file and the `pkg` directory.

6. Navigate to the `sun-appserver7` installation directory.

7. Select your installation method.

Refer to [“Installation Options” on page 34](#) for guidelines on selecting the correct options to use with the `setup` command.

When the installation starts, the Welcome page of the installation program is displayed.

8. Read the License Agreement and click Yes to agree to the terms of the license (or type Yes at the command line), then click Next.

NOTE You must accept the license agreement to continue with the installation.

After you accept the License Agreement, the Select Installation Directory page is displayed.

9. Specify the path to your Sun ONE Application Server installation directory (default is `/opt/SUNWappserver7`).
 - Click Browse to browse for a directory (or press Enter at the command line to accept the default installation directory).

- If you enter a directory name that does not already exist, the Create New Directory? dialog is displayed.
 - Click Create Directory (or type 1 at the command line) to create a new directory.
 - Click Choose New (or type 2 at the command line) to return to the Select Installation Directory page.

The Component Selection page displays the available components.

10. Choose the load balancer plug-in component on the Component Selection page (or type `Yes` or press Enter to accept the component from the command line).

NOTE	If some components are disabled on the Component Selection page (or if a command-line mode installation did not offer them for installation), this means that disabled component has been detected as already installed on your system.
-------------	---

If you selected the load balancer plug-in component, the Web Server Directory page displays.

11. Identify your web server.

- Choose the web server you have installed (Sun ONE Web Server or Apache Web Server).
- Enter the web server instance path.

Default values will be offered based on server type. The installation program checks to see if appropriate configuration files can be found at the specified location.

12. Click Next.

The installation program proceeds to verify that you have enough disk space based on the components you selected. The Checking Disk Space progress indicator bar is displayed.

- If you do not have enough disk space, an error message is displayed.

In this case, you need to exit the installation program, create enough space, and restart the installation. Information on space requirements is contained in [“Platform Requirements” on page 24](#).

- If you have enough disk space, the Ready to Install page is displayed.

13. On the Ready to Install page, you have the following choices:
- Click Back if you want to return to the previous page. Disk space is rechecked if you do this.
 - Click Install Now (or type 1 at the command line) to start the installation process.
 - Click Cancel to exit the installation program.

An Installation progress indicator bar is displayed.

When installation finishes, the Installation Summary page is displayed.

14. Check installation outcome on the Installation Summary page. If installation failure has occurred, review the following log file:

```
/var/sadm/install/logs/Sun_ONE_Application_Server_install.log
```

Refer to [“About Logs and Messages” on page 93](#) for additional information.

15. Click Finish (or type Finish at the command line) to complete the installation.
16. Edit the supplied `loadbalancer.xml.example` file to include references to actual application server instances. This file is located in the following location:

For Sun ONE Web Server:

```
webserver_instance_dir/config/loadbalancer.xml.example
```

For Apache Web Server:

```
webserver_instance_dir/conf/loadbalancer.xml.example
```

17. After you have made your modifications, save the `loadbalancer.xml.example` file as `loadbalancer.xml` in the same directory.

NOTE If you want to configure more than one web server instance, or want to add additional instances at a later time, you will need to manually configure them. Instructions for doing this are contained in the Configuring Load Balancer Plug-in section in the *Sun ONE Application Server Administrator's Guide*.

Refer to the Apache documentation for information on the Apache Web Server.

Installing in Silent Mode (Non-Interactive)

If you choose to install the Sun ONE Application Server Version 7, Enterprise Edition software in silent mode, the installation program runs without any user input. This is made possible when the installation program accesses a text file that provides the installation program with the configuration information it needs.

The following topics are discussed in this section:

- [Creating the Installation Configuration File](#)
- [Installing in Silent Mode](#)

Creating the Installation Configuration File

The installation configuration file is created when you use the `savestate` option with the `setup` command to start a interactive installation. During the interactive installation, your input is collected and stored in the configuration file you specified. This forms the template for silent installation, which you can use later to install the product on one or more machines.

If needed, you can modify the installation configuration file.

The following topics are addressed in this section:

- [Syntax for Creating the Installation Configuration File](#)
- [Example Installation Configuration File](#)
- [Modifying the Installation Configuration File](#)

Syntax for Creating the Installation Configuration File

The syntax for creating an installation configuration file is as follows:

For graphical method:

```
./setup -savestate
```

For command-line method:

```
./setup -console -savestate
```

Refer to [“Installation Options” on page 34](#) for more detailed information.

Example Installation Configuration File

An installation configuration file looks similar to the following:


```
# Wizard Statefile created: Mon Jan 27 16:25:26 PST 2003

#           Wizard path: /tmp/herc/sun-appserver7/./appserv.class
# Install Wizard Statefile section for Sun ONE Application Server
#

[STATE_BEGIN Sun ONE Application Server 108a4222b3a6a8ed98832d45238c7e8bb16c67a5]

defaultInstallDirectory = /opt/SUNWappserver7
currentInstallDirectory = /opt/SUNWappserver7

SELECTED_COMPONENTS = Java 2 SDK, Standard Edition 1.4.1_03#Application
Server#Sun ONE Message Queue 3.0.1#Sample Applications#Load Balancing
Plugin#Uninstall#Startup

USE_BUNDLED_JDK = FALSE
JDK_LOCATION = /usr/j2se
JDK_INSTALLTYPE = PREINSTALLED
AS_INSTALL_DEFAULT_CONFIG_DIR = /etc/opt/SUNWappserver7
AS_INSTALL_CONFIG_DIR = /etc/opt/SUNWappserver7
AS_INSTALL_DEFAULT_VAR_DIR = /var/opt/SUNWappserver7
AS_INSTALL_VAR_DIR = /var/opt/SUNWappserver7
DOMAINS_DIR = /var/opt/SUNWappserver7/domains
WEBSEVER_INSTALL_DEFAULT_DIR = /usr/iplanet/servers
WEBSEVER_INSTALL_DIR = /opt/iplanet/servers/https-tesla.red.iplanet.com
INST_ASADMIN_USERNAME = admin
INST_ASADMIN_PASSWORD = adminadmin
INST_ASADMIN_PORT = 4848
INST_ASWEB_PORT = 81
INSTALL_STATUS = SUCCESS
[STATE_DONE Sun ONE Application Server 108a4222b3a6a8ed98832d45238c7e8bb16c67a5]
```

Modifying the Installation Configuration File

You can modify the installation configuration file by editing the variables and values described in [Table 2-2](#).

Table 2-2 Installation Configuration File Variables

Variable Name	Valid values (if applicable)	Content	Comments
defaultInstallDirectory		Default installation directory path	Value not actively used by installation program.
currentInstallDirectory		Selected installation directory path	

Table 2-2 Installation Configuration File Variables (*Continued*)

Variable Name	Valid values (if applicable)	Content	Comments
SELECTED_COMPONENTS		List of product components selected for installation	Pound (#) character is used as list delimiter.
USE_BUNDLED_JDK	TRUE FALSE	Whether to install J2SE bundled with the product	
JDK_LOCATION		J2SE path	Preinstalled J2SE path if USE_BUNDLED_J2SE is set to false; otherwise installation location for bundled J2SE.
JDK_INSTALLTYPE	PREINSTALLED CANNOTUPGRADE UPGRADABLE CLEANINSTALL	How to handle existing J2SE installation	Only PREINSTALLED and CLEANINSTALL are valid values for silent installation configuration file.
AS_INSTALL_DEFAULT_CONFIG_DIR		Default configuration files directory path	Value not actively used by installation program.
AS_INSTALL_CONFIG_DIR		Selected configuration file directory path	
AS_INSTALL_DEFAULT_VAR_DIR		Default domains configuration files directory path	Value not actively used by installation program.
AS_INSTALL_VAR_DIR		Selected domains configuration file directory path	
DOMAINS_DIR		Selected domains configuration file directory path, plus domains subdirectory	AS_INSTALL_VAR_DIR and DOMAINS_DIR are generally redundant. However, both entries are needed by legacy installation program code.
WEBSERVER_INSTALL_DEFAULT_DIR		Default web server instance directory path	Value not actively used by installation program.
WEBSERVER_INSTALL_DIR		Selected web server instance directory path	

Table 2-2 Installation Configuration File Variables (*Continued*)

Variable Name	Valid values (if applicable)	Content	Comments
INST_ASADMIN_USERNAME		Administrator username for initial domain	
INST_ASADMIN_PASSWORD		Administrator password for initial domain	
INST_ASADMIN_PORT	0 - 65535	Administration server port number for initial domain	
INST_ASWEB_PORT	0 - 65535	Server port number for initial server instance	
INSTALL_STATUS	SUCCESS FAILURE	Installation outcome	Mandated by installer implementation. Value not actively used by installation program.

Installing in Silent Mode

NOTE For silent mode, you can do a partial *initial* installation, but any incremental (subsequent) installations must be done using an interactive method.

To install the Sun ONE Application Server software in non-interactive silent mode, perform these steps:

1. With a text editor, examine the current installation configuration file and verify that it contains what you want to use for your silent installation.
2. Save your *config_file* with any name. For example:

```
cp statefile my_silent_config
```
3. Copy your installation configuration file to each machine where you plan to install the Sun ONE Application Server Version 7, Enterprise Edition software.
4. Copy the Sun ONE Application Server installation files to each machine where you plan to install the Application Server software.

5. If you are not in the directory already, navigate to the directory where you copied the installation files and your installation configuration file.
6. As superuser, start silent installation at the command line using the following command format:

```
./setup -silent config_file
```

The installation program reads the specified *config_file*, checks for adequate disk space, then installs the product based on the data in *config_file*.

When the prompt is returned, the silent installation is complete and the installation components are now installed on your systems.

7. You can start the Application Server software by using the instructions on [“Starting and Stopping the Server” on page 81](#).

When the Admin Console has been started, the initial page of the Application Server graphical interface is displayed.

You are now ready to configure your system for high availability. Proceed to [“Preparing for HADB Setup” on page 53](#) to begin this process.

Preparing for HADB Setup

After the high-availability components have been installed on the servers that will be part of an cluster, perform the tasks in this chapter to prepare for setting up high availability. Refer to [“Installation Roadmap” on page 16](#) to see the full sequence of events for implementing the Sun ONE Application Server 7, Enterprise Edition product.

The following topics are addressed here:

- [Configuring Shared Memory and Semaphores](#)
- [Setting Up Host Communication](#)
- [Setting Up the User Environment](#)
- [Setting Up Administration for Non-Root](#)
- [Using the clsetup Command](#)

After you have done the tasks here, proceed to the *Sun ONE Application Server Administrator's Guide* for comprehensive instructions on configuring and managing the cluster, the load balancer plug-in, and the high-availability database (HADB).

Information on high-availability topologies is available in the *Sun ONE Application Server System Deployment Guide*.

Configuring Shared Memory and Semaphores

You will need to configure shared memory for the HADB host machines before beginning to work with the HADB.

1. Log in as root.

NOTE If necessary, make sure permissions are set correctly to administer the HADB as non-root user. See [“Setting up RSH for HADB Administration” on page 56, Step 5.](#)

2. Add lines similar to the following to the `/etc/system` file if they do not already exist:

For shared memory:

```
set shmsys:shminfo_shmmax=0x80000000
set shmsys:shminfo_shmseg=20
```

This example sets maximum shared memory `shmmax` to 2GB (hexadecimal 0x80000000) which is sufficient for most configurations.

The `shmsys:shminfo_shmmax` setting is calculated as 10,000,000 per 256 MB and should set to be identical to the memory size for the host. To determine your host's memory, run this command:

```
prtconf | grep Memory
```

Then plug the value into the following formula:

$$((\text{<host> MB} / 256 \text{ MB}) * 10,000,000)$$

For semaphores:

Your `/etc/system` file may already contain `semnmi`, `semmns`, and `semmnu` entries. For example:

```
set semsys:seminfo_semnmi=10
set semsys:seminfo_semmns=60
set semsys:seminfo_semmnu=30
```

NOTE Your original `/etc/system` file may or may not contain all of these entries.

If the entries are present, increment the values by adding 16, 128, and 1000 respectively, as follows:

```
set semsys:seminfo_semmni=26
set semsys:seminfo_semmns=188
set semsys:seminfo_semmnu=1030
```

If your `/etc/system` file does not contain the above mentioned entries, add the following entries at the end of the file:

```
set semsys:seminfo_semmni=16
set semsys:seminfo_semmns=128
set semsys:seminfo_semmnu=1000
```

This is sufficient to run up to 16 HADB nodes on the computer.

3. Reboot the machine for changes to take effect.

For an explanation of HADB nodes, see *Configuring the High Availability Database* in the *Sun ONE Application Server Administrator's Guide*.

Setting Up Host Communication

To implement remote access for HADB administration, all machines that will be used for running HADB servers and the HADB management client must be configured for Remote Shell (RSH) or Secured Shell (OpenSSH/SSH).

RSH is a simple remote shell command and does not have any security features. The SSH communication channel provides a level of security by encrypting the data that passes between the HADB nodes.

NOTE For Solaris 9, it is recommended that you use the default installation of SSH. However, you can use RSH if preferred by following the instructions in [“Setting up RSH for HADB Administration” on page 56](#) and then editing the `clresource.conf` file to specific RSH as described in [“Running the `clsetup` Command” on page 77](#).

On Solaris 8, by default SSH is not installed. Follow the instructions in [“Installing SSH for Solaris 8” on page 59](#) if SSH is not on your Solaris 8 system.

If you want to use SSH, but it is not configured or not available, you will not be able to use the `hadbm` command. Refer to [“SSH Requirements and Limitations” on page 58](#) to verify that SSH is recognized.

This section contains instructions for the following tasks:

- [Setting up RSH for HADB Administration](#)
- [Setting Up SSH for HADB Administration](#)

Setting up RSH for HADB Administration

If you want to use RSH instead of SSH, you must explicitly specify RSH using the `set managementProtocol` option. Refer to [Table 3-3 on page 72](#) for guidelines on setting this parameter in the `clresource.conf` file.

NOTE SSH is the strongly recommended default for the `hadbm create` command because SSH is more secure than RSH.

To implement RSH, perform these steps:

1. Log in as root.
2. Edit the `/etc/hosts` file to contain entries for all the selected HADB hosts, including the host name of the local host. Use *localhost* format. For example:

```
computer1.xbay.company.com
computer99.zmtn.company.com
```

3. Append this file to the `/etc/hosts` file of all selected installation hosts.

4. Create a `.rhosts` file in the `$HOME` directory of the HADB user, if one does not already exist.

```
vi .rhosts
```

5. Verify that permissions are set to Read Only for group and other. For example:

```
rw-r--r--
```

6. Add the host name of each HADB host, including the name of your local host, followed by the name of your database user. For example, if the database user is Jon:

```
computer1.xbay.company.com    Jon
computer99.zmtn.company.com   Jon
mine456.red.mycompany.com     Jon
```

7. Append this file to the `.rhosts` file of each HADB host.
8. Check host communication for each host. For example:

```
rsh computer99.zmtn.company.com uname -a
```

If all is well, the identity will be returned from the other host.

Setting Up SSH for HADB Administration

SSH is strongly recommended for using the `hadbm create` command because SSH is more secure than RSH.

NOTE From a security perspective, the DSA-based version 2 protocol is recommended instead of the RSA-based version 1 protocol. The version you select depends on the SSH client software in use at your site.

This section contains the following sections:

- [SSH Requirements and Limitations](#)
- [Installing SSH for Solaris 8](#)
- [Configuring SSH](#)

SSH Requirements and Limitations

NOTE Although SSH is installed by default on Solaris 9 systems, on Solaris 8, by default SSH is *not* installed. Instructions for installing SSH for Solaris 8 are contained in [“Installing SSH for Solaris 8” on page 59](#).

You may need to take action on any or all of the following requirements during your SSH setup:

- **Location of the SSH binaries**—The high-availability management client expects to find the `ssh` and `scp` binaries in the following location on each HADB host:
`/usr/bin`
 - If the binaries are on your system but this location is not correct, you will need to make a symbolic link from `/usr/bin` to the correct location.
 - If you are on a Solaris 8 system, the SSH binaries are not installed by default and so may not be present. If this is the case, follow the instructions in [“Installing SSH for Solaris 8” on page 59](#).
- **Support**—The only tested support is for SunSSH and OpenSSH. If you are using another version of SSH, it is best to refer to the setup instructions in that product’s documentation to ensure that your SSH communications work correctly.
- **OpenSSH clients and daemons**—If you are running in an environment with OpenSSH clients and daemons, you should name the key file as follows:
`~/.ssh/authorized_keys2` or `~/.ssh/authorized_keys`.
- **Running as root**—If you are running the HADB admin clients as root, make sure that the `sshd` configuration (`/etc/ssh/sshd_config`) on all machines has the `PermitRootLogin` parameter set to `yes`.

NOTE By default, Sun SSH does not permit root login; it is set to `no`. If the `sshd` configuration is changed, `sshd` must be restarted. Type the following to restart the service:

```
/etc/init.d/sshd stop/start
```

- No SSH protocol version 2 support—If your SSH clients and daemons do not support SSH protocol version 2, you will need to run `ssh-keygen` without options. The key file will then be named `identity.pub` instead of `id_dsa.pub`. This file must be appended to `~/.ssh/authorized_keys`.
- Mixed SSH environment—If you are operating in a mixed SSH environment, you will need to create both files `~/.ssh/authorized_keys2` and `~/.ssh/authorized_keys`; the latter may contain both version 1 and version 2 keys.
- Co-location—If the Sun ONE Application Server and the HADB are co-located on the same machine, you will need to create a `known_hosts` file under the `.ssh` directory by running one of the following commands:

```
ssh localhost
```

or

```
ssh hostname
```

Installing SSH for Solaris 8

The `ssh` and `scp` binaries are not installed by default on Solaris 8 systems. If the binaries are not on your Solaris 8 system, perform these steps:

1. Go to the following site:

<http://www.sunfreeware.com/openssh8.html>

On this site, you may receive a message similar to the following:

```
===PLEASE NOTE!!!..... make a note of some of the mirror
sites so that if the servers are down, you can still download
from a mirror site.
```

If you receive such a message, try one of the many mirror sites listed in the FTP/Mirror Sites link. For example:

<http://sunfreeware.secsup.org/>

2. On this site, follow the instructions in the Installation Steps to download and install all the necessary OpenSSH packages and patches.
3. After you have installed OpenSSH, proceed to the next section on [Configuring SSH](#).

Configuring SSH

To set up SSH on a system where the `ssh` and `scp` binaries are already installed, perform the steps in one of the following sections:

- [SSH for Non-Mounted Home Directories](#)
- [SSH for Mounted Home Directories](#)

SSH for Non-Mounted Home Directories

To implement SSH in systems with home directories that are not mounted, perform these steps:

1. Verify that SSH requirements have been understood and met as specified in [“SSH Requirements and Limitations” on page 58](#).
2. Log in to the host as the HADB user.
3. Generate your keys by running the following:

```
ssh-keygen -t dsa
```

For SSH1 and OpenSSH/1, you normally do not need to give any parameters to the `ssh-keygen` command.

4. For the next three prompts, accept the default options by pressing Enter.
5. Repeat steps 1, 2, and 3 for all machines in your cluster.

A file called `identity.pub` or `id_dsa.pub` (depends on whether you are using SSH version 1 or version 2) located in your `~/.ssh` directory holds the public key. To connect to a machine without being asked for a password, the content of this file must be appended to a file called `authorized_keys` on all the machines.

6. To set up login identity, go to your user directory:

```
~/.ssh.
```

For SSH1, OpenSSH/1:

- a. Copy the `identity.pub` file and name it `authorized_keys`.
- b. For each of the other machines in the cluster, copy the content of the `identity.pub` file and append it to the local `authorized_keys` file.

OpenSSH/2:

- a. Copy the `id_dsa.pub` file and name it `authorized_keys2`.
 - b. For each of the other machines in the cluster, copy the content of the `id_dsa.pub` file and append it to the local `authorized_keys2` file.
7. Copy the `authorized_keys` file to the `~/.ssh` directory on all the HADB machines.

8. Verify that the `.ssh` directory, HADB user's home directory, and the `.ssh/authorized_keys` file do *not* have write permissions for group and other.

If needed, disable these group/other write permissions as follows:

```
chmod og-w ~/.ssh
chmod og-w ~/.ssh/authorized_keys
chmod og-w $HOME
```

Replace `$HOME` with the home directory of the HADB user. For example :

```
chmod og-w ~/johnsmith
```

NOTE If the files under the `~/.ssh` directory have even read permission given to group/other, you cannot set up an automatic SSH login identity. In this case, if you try `ssh machine_name`, the system complains about the incorrect permissions and asks for a password. In other words, it is best not to give any permissions at all for group/other if you want to enable automatic login.

9. To enable login without any user input, at initial SSH usage (after the SSH environment is set up) you need to add the node machine name to the `known_hosts` file under the `/.ssh` directory as follows:

- a. Type the following:

```
ssh machine_name
```

You will be prompted with a Yes/No question whether to add `machine_name` to the `known_hosts` file.

- b. Answer Yes.

You will now be able to log in without any input.

10. To verify that SSH is set up correctly, SSH to each host in the cluster before trying to run the management tool for HADB.

You are automatically logged in without a password requirement.

SSH for Mounted Home Directories

To implement SSH in systems with mounted home directories, perform these steps:

1. Verify that SSH requirements have been understood and met as specified in [“SSH Requirements and Limitations” on page 58](#)

2. Log in to host as the HADB user.
3. Generate your keys by running the following:

```
ssh-keygen -t dsa
```

For SSH1 and OpenSSH/1, you normally do not need to give any parameters to the `ssh-keygen` command.

4. For the next three prompts, accept the default options by pressing Enter.

A file called `identity.pub` or `id_dsa.pub` (depends on whether you are using SSH version 1 or version 2) located in your `~/.ssh` directory holds the public key. To connect to a machine without being asked for a password, the content of this file must be appended to a file called `authorized_keys2` on all the machines. This can be done as follows:

5. To set up login identity, go to your user directory:

```
~/.ssh.
```

For SSH1, OpenSSH/1—Copy the `identity.pub` file and name it `authorized_keys`.

For OpenSSH/2—Copy the `id_dsa.pub` file and name it `authorized_keys`.

6. Verify that the `.ssh` directory and the `.ssh/authorized_keys` file do *not* have write permissions for group and other.

If necessary, disable these group/other write permissions as follows:

```
chmod og-w ~/.ssh
chmod og-w ~/.ssh/authorized_keys
chmod og-w /$HOME
```

Replace `HOME` with the home directory of the HADB user. For example:

```
chmod og-w ~/johnsmith.
```

NOTE If the files under the `~/.ssh` directory have even read permission given to group/other, you cannot set up an automatic SSH login identity. In this case, if you try to run `ssh machine_name`, the system complains about =incorrect permissions and asks for a password. In other words, it is best not to give any permissions for group/other if you want to enable automatic login.

7. To enable login without any user input, at initial SSH usage (after the SSH environment is set up) you need to add the node machine name to the `known_hosts` file under the `/.ssh` directory

- a. Type the following:

```
ssh machine_name
```

You will be queried about whether or not to add *machine_name* to the `known_hosts` file.

- b. Answer Yes.

You will now be able to log in without any input.

8. To verify that SSH is set up correctly, SSH to each host in the cluster before trying to run the management tool for HADB.

You are automatically logged in without a password requirement.

Setting Up the User Environment

After you have set up host communication, you can run the `hadbm` command from the `install_dir/SUNWhadb/4/bin` directory location as follows:

```
./hadbm
```

However, it is much more convenient to set up your local environment to use the high-availability management client commands from anywhere. To set this up, perform the following steps.

NOTE	The examples in this section apply to using <code>csh</code> . If you are using another shell, refer to the man page for your shell for instructions on setting variables.
-------------	--

1. Set the `PATH` variable as follows.

```
setenv PATH ${PATH}:install_dir/bin:install_dir/SUNWhadb/4/bin
```

2. Verify that the `PATH` settings are correct by running the following commands:

```
which asadmin
which hadbm
```

3. If multiple Java versions are installed on your system, you must ensure that the `JAVA_HOME` environment variable points to the correct Java version (1.4.1_03 for Enterprise Edition).

```
setenv JAVA_HOME java_install_dir
setenv PATH ${PATH}:${JAVA_HOME}/bin
```

Setting Up Administration for Non-Root

By default, during the initial installation or setup of the Sun ONE Application Server, write permissions of the files and paths created for Sun ONE Application Server are given to root only. For a user other than root to create or manage the Sun ONE Application Server, write permissions on the associated files must be given to that specific user, or to a group to which the user belongs. The files that are affected are the following (with their default locations):

- Sun ONE Application Server configuration files—*install_config_dir*/cl*.conf
- Sun ONE Application Servers setup and administration scripts—*install_dir*/bin/cl*
- HADB binaries—*install_dir*/SUNWhadb
- HADB configuration—*/etc/opt/SUNWhadb*

You can create a user group for managing the Sun ONE Application Server as described in the following procedure. (An alternate approach is to set permissions and ownership for the specific user.)

To create a Sun ONE Application Server user group and set permissions on the installation root directory, repeat the following process for each affected file:

1. Log in as root.
2. From the command prompt, create the Sun ONE Application Server user group. For example:

```
# groupadd slasuser
```

You can type `groupadd` at the command line to see appropriate usage.

3. Change the group ownership for each affected file to the newly-created group. For example:

```
chgrp -R slasuser install_config_dir/cl*.conf
```


4. Set the write permission for the newly-created group:

```
chmod -R g+rw install_config_dir/cl*.conf
```

5. Repeat steps 3 and 4 for each affected file.

6. Make the `clsetup` and `cladmin` commands executable by the newly-created group. For example:

```
chmod -R g+x install_dir/bin/cl*
```

7. Delete and recreate the default domain, `domain1`, using the `--sysuser` option. The `sysuser` must also belong to the newly-created group. For example:

```
asadmin delete-domain domain1
```

```
asadmin create-domain --sysuser bleonard --adminport 4848  
--adminuser admin --adminpassword password domain1
```

Using the clsetup Command

The purpose of the `clsetup` command is to automate the process of setting up a basic cluster in a typical configuration. The `clsetup` command is located in *install_dir*/bin, where *install_dir* is the directory where the Sun ONE Application Server software is installed.

The `clsetup` command is bundled with the Sun ONE Application Server software along with the `cladmin` command.

NOTE The `cladmin` command is used to streamline the process of configuring and administering the cluster after all installation and configuration tasks are complete, and is not documented here.

When you have completed the tasks in this *Installation Guide*, refer to the *Sun ONE Application Server Administrator's Guide* for instructions on creating the HADB and on using on the `cladmin` command.

The following topics are addressed in this section:

- [How the clsetup Command Works](#)
- [clsetup Requirements and Limitations](#)
- [Editing the clsetup Input Files](#)

- [Running the clsetup Command](#)
- [Cleanup Procedures for the clsetup Command](#)

How the clsetup Command Works

The `clsetup` command is a set of Sun ONE Application Server commands that are gathered together in a script that allows a cluster to be configured automatically, based on prepopulated input files. As part of cluster setup, an HADB is created, but you will still need to set up your working cluster using the `hadbm` commands as described in the *Sun ONE Application Server Administrator's Guide*.

NOTE	The <code>clsetup</code> command interface is unstable. An unstable interface may be experimental or transitional, and may therefore change incompatibly, be removed, or be replaced by a more stable interface in the next release.
-------------	--

The following topics are addressed in this section:

- [How the Input Files Work](#)
- [What the clsetup Command Accomplishes](#)
- [Commands Used by the clsetup Command](#)

How the Input Files Work

Three input files are used by the `clsetup` command to configure the cluster:

- `clinstance.conf`—This file is pre-populated with information about application server instances `server1` and `server2`. Refer to [“The clinstance.conf File” on page 70](#) for information on the contents of this file.
- `clpassword.conf`—This file is pre-populated with the Admin Server password for `domain1`, which you provided when you installed the Sun ONE Application Server 7, Enterprise Edition software. Refer to [“The clpassword.conf File” on page 71](#) for information on the contents of this file.
- `clresource.conf`—This file is pre-populated with information about the cluster resources: HADB, JDBC connection pool, JDBC resource, and session store and persistence. Refer to [“The clresource.conf File” on page 72](#) for information on the contents of this file.

NOTE The configuration parameters required to set up the cluster are always read from the input files, and cannot be supplied through the command line.

You can use the `clsetup` configuration parameters as they are preconfigured to set up a typical cluster configuration. To support a different configuration, you can make edits to any or all of the configuration files.

What the clsetup Command Accomplishes

Using the pre-populated values in the `clsetup` input files, the `clsetup` command accomplishes the following:

- Creates a new server instance named `server2` in the default domain named `domain1`. The HTTP port number for `server2` is the next sequential number after the HTTP port number specified for `server1` during installation (for example, if port number 80 is provided for `server1` during installation, the port number for `server2` is 81).
- Creates the HADB named `hadb` with two nodes on the local machine. The port base is 15200, and the database password is `password`.
- Creates the HADB tables required to store session information in the HADB.
- Creates a connection pool named `appservCPL` in all the instances listed in the `clinstance.conf` file (`server1`, `server2`).
- Creates a JDBC resource named `jdbc/hastore` in all the instances listed in the `clinstance.conf` file (`server1`, `server2`).
- Configures the session persistence information in all the instances listed in the `clinstance.conf` file (`server1`, `server2`).
- Enables high availability in all the instances listed in the `clinstance.conf` file (`server1`, `server2`).

NOTE Because the `clresource.conf` and `clpassword.conf` input files store passwords, they are access-protected with 0600 permissions.

Commands Used by the clsetup Command

The `clsetup` command uses a number of `hadbm` and `asadmin` commands to perform the steps for setting up the cluster. In [Table 3-1](#), the `clsetup` task is described in the left column and the command used to accomplish the task is listed in the right column.

Table 3-1 `hadbm` and `asadmin` Commands Used by the `clsetup` Command

Task Performed by <code>clsetup</code>	Command
Checks to see if database exists.	<code>hadbm status</code>
Creates and starts the HADB.	<code>hadbm create</code>
Gets the JDBC URL.	<code>hadbm get jdbcURL</code>
Creates the session store.	<code>asadmin create-session-store</code>
Checks the instance status.	<code>asadmin show-instance-status</code>
Creates the instance.	<code>asadmin create-instance</code>
Creates the JDBC connection pool.	<code>asadmin create-jdbc-connection-pool</code>
Registers the data source.	<code>asadmin create-jdbc-resource</code>
Configures the persistence type	<code>asadmin configure-session-persistence</code>
Reconfigures the instance.	<code>asadmin reconfig -u admin</code>

clsetup Requirements and Limitations

The following requirements and limitations apply to the `clsetup` command:

- The install paths, device paths, configuration paths, and so on must be the same on all machines that are of the cluster.
- Before you can use the `clsetup` command, the `asadmin` and `hadbm` commands must be available on the local machine. Therefore, this command can only be run on a machine where the following are installed:
 - The Sun ONE Application Server component or the Sun ONE Application Server Administration Client component
 - The HADB component or the HADB Management Client component
- Before you can use the `clsetup` command, you must have configured shared memory as described in [“Configuring Shared Memory and Semaphores” on page 53](#). The `clsetup` command does not set any shared memory values.

- Before you can use the `clsetup` command, you must have set up the HADB cluster host communication for SSH or RSH as described in [“Setting Up Host Communication” on page 55](#).
- If you are using RSH (which is *not* the default), you will need to uncomment the following line in the `clresource.conf` file (remove the `#` sign):

```
#set managementProtocol
```
- If you are co-locating the Application Server and the HADB on the same machine using SSH, a `known_hosts` file must exist under the `.ssh` directory. If it does not, run either the `ssh localhost` or the `ssh hostname` command before using the `clsetup` command.
- Before running the `clsetup` command, you must start the Admin Servers of all the Sun ONE Application Server instances that are part of the cluster.
- The administrator password must be the same for all domains that are part of the cluster.
- If the entities to be handled (HADB nodes and Application Server instances) already exist, the `clsetup` command does not delete or reconfigure them, and the respective configuration steps are skipped.
- The values specified in the input files will be the same for all the instances in a cluster. The `clsetup` command is not designed to set up instances with different values. For example, this command cannot create a JDBC connection pool with different settings for each instance.
- The `clsetup` command does not perform any `inetd` configuration; the HADB is created with no `inetd` settings. Instructions for performing `inetd` configuration are contained in the *Sun ONE Application Server Administrator's Guide*.
- Host names in the shell initialization files—If prompts are included with host names in your `.cshrc` or `.login` files, the `clsetup` command may appear to hang. You will need to remove any prompts and excess output in any remote command invocations. For example, running the `hostname` command on `hostB` should print `hostB` without a prompt.
- To run the `clsetup` command as a user other than root, you'll need to make the changes as described in [“Setting Up Administration for Non-Root” on page 64](#).

Editing the clsetup Input Files

The input files that are needed for the `clsetup` command are installed under the configuration installation directory, default `/etc/opt/SUNWappserver7`, as part of the installation procedure. The installation program pre-populates these files with the values to set up a typical configuration, but you can edit any or all of them as needed using a text editor.

This section addresses the following topics:

- [The `clinstance.conf` File](#)
- [The `clpassword.conf` File](#)
- [The `clresource.conf` File](#)

The `clinstance.conf` File

For the `clsetup` command to work properly, all application server instances that are part of a cluster must be defined in the `clinstance.conf` file. During installation, the installation program creates a `clinstance.conf` file with entries for two instances. If you add more instances to the cluster, you must add information about these additional instances.

The format of the `clinstance.conf` file is as follows:

```
# Comment

instancetype instance_name
user user_name
host localhost
port admin_port_number
domain domain_n
instanceport instance_port_number
```

One set of entries is required for each instance that is part of the cluster. Any line that starts with a hash mark (#) is treated as a comment.

NOTE The order in which these entries appear in the `clinstance.conf` file is important and must not be changed from the order specified here.

If you add information about more application server instances, entries for these instances must appear in this order.

Comments can be added anywhere in the file.

Table 3-2 provides information about the entries in the `clinstance.conf` file. The left column contains the parameter name, the middle column defines the parameter, and the right column contains the default value specified by the installation program.

Table 3-2 Entries in the `clinstance.conf` File

Parameter	Definition	Default Value
<code>instancename</code>	Application Server instance name	<code>server1, server2</code>
<code>user</code>	Admin Server user name	<code>admin</code>
<code>host</code>	Host name	<code>localhost</code>
<code>port</code>	Admin Server port number	<code>4848</code>
<code>domain</code>	Administrative domain name	<code>domain1</code>
<code>instanceport</code>	Application Server instance port	<code>80, 81</code>

Example `clinstance.conf` File

This `clinstance.conf` file contains information about two instances.

```
#Instance 1

instancename server1
user admin
host localhost
port 4848
domain domain1
instanceport 80

#Instance 2

instancename server2
user admin
host localhost
port 4848
domain domain1
instanceport 81
```

The `clpassword.conf` File

When the `clsetup` command is run, the `asadmin` command needs the Admin Server password, which is specified in the `clpassword.conf` file during installation.

The format of the `clpassword.conf` file is as follows:

```
AS_ADMIN_PASSWORD= password
```

where *password* is the Admin Server password.

Permissions 0600 are preset on the `clpassword.conf` file, which can only be accessed by the root user.

The clresource.conf File

During installation, the installation program creates the `clresource.conf` file to set up a typical configuration. The `clresource.conf` file contains information about the following resources that are part of the cluster:

- HADB information
- Session store information
- JDBC connection pool information
- JDBC resource information
- Session persistence information

Permissions 0600 are preset on the `clresource.conf` file, which can only be accessed by the root user.

NOTE	Before running the <code>clsetup</code> command, the values specified in the <code>clresource.conf</code> file can be modified for optimization, or for setting up a different configuration. If you edit the values, make sure that the order and format of the file is not changed.
	Any line that begins with a hash mark (#) is treated as a comment.

The parameters of the `clresource.conf` file are described in the following tables. The left column contains the parameter name, the middle column defines the parameter, and the right column contains the default value specified by the installation program.

Table 3-3 describes the HADB parameters in the `clresource.conf` file.

Table 3-3 HADB Parameters in the `clresource.conf` File

Parameter	Definition	Default Value
historypath	Path for the history files.	<code>/var/tmp</code>
devicepath	Path for the data and log devices.	<code>/opt/SUNWappserver7/SUNWhadb/4</code>

Table 3-3 HADB Parameters in the clresource.conf File (*Continued*)

Parameter	Definition	Default Value
datadevices	Number of data devices on each node.	1
portbase	Port base number used for node 0. Other nodes are then assigned port number bases in increments of 20 from the number specified here (a random number in the range 10000 - 63000).	15200
spares	Number of spare nodes.	0
set	Comma-separated list of database configuration attributes.	For explanations of valid database configuration attributes, see <i>Sun ONE Application Server Administrator's Guide</i> . For example, to specify the use of RSH instead of SSH (the default), uncomment the following line: #set managementProtocol=rsh
inetd	Indicates if HADB runs with the inet daemon.	false
inetdsetupdir	Directory where the inet daemon setup files will be put.	/tmp
devicesize	Size of device in MB. This size is applicable to all devices.	512
dbpassword	Password for the HADB user.	password
hosts	All hosts used for all data nodes.	Values are populated automatically based on the hosts specified during installation.

NOTE The database name is specified at the end of the [HADBINFO] section in the clresource.conf file.

Table 3-4 describes the session store parameters in the clresource.conf file.

Table 3-4 Session Store Parameters in the clresource.conf File

Parameter	Definition	Default Value
storeurl	URL of the HADB store	<i>REPLACEURL</i> NOTE: Value is replaced by actual URL at runtime.
storeuser	User who has access to the session store	appservusr NOTE: Must match the username property in Table 3-5 .
storepassword	Password for the storeuser	password NOTE: Must match the password property in Table 3-5 .
dbssystempassword	Password for the HADB system user	password

[Table 3-5](#) describes the JDBC connection pool parameters in the `clresource.conf` file.

Table 3-5 JDBC Connection Pool Parameters in the clresource.conf File

Parameter	Definition	Default Value
steadypoolsize	Minimum and initial number of connections maintained in the pool.	8
maxpoolsize	Maximum number of connections that can be created.	32
datasourceclass name	Name of the vendor-supplied JDBC datasource. Name of the vendor-supplied JDBC datasources capable datasource class will implement <code>javax.sql.XADataSource</code> interface. Non-XA or Local transactions only datasources will implement <code>javax.sql.DataSource</code> interface.	<code>com.sun.hadb.jdbc.ds.HadbDataSource</code>
isolationlevel	Specifies the transaction isolation level on the pooled database connections.	<code>repeatable-read</code>

Table 3-5 JDBC Connection Pool Parameters in the clresource.conf File (*Continued*)

Parameter	Definition	Default Value
validationmethod	Specifies the type of validation method.	meta-data
property	Property used to specify username, password, and resource configuration.	username=appservusr:password=password:cacheDataBaseMetaData=false:eliminateRedundantEndTransaction=true:serverList=REPLACEURL NOTE: Make sure that the username and password properties use the same values as shown in the Session Store Parameters table. REPLACEURL is replaced by the actual URL at runtime.)

NOTE The connection pool name is specified at the end of the [JDBC_CONNECTION_POOL] section in the clresource.conf file.

[Table 3-6](#) describes the JDBC resource parameters in the clresource.conf file.

Table 3-6 JDBC Resource Parameters in the clresource.conf File

Parameter	Definition	Default Value
connectionpoolid	Name of the connection pool	appservCPL NOTE: Connection pool name is specified in Table 3-5 .

NOTE The JDBC resource name is defined at the end of the [JDBC_RESOURCE] section in the clresource.conf file.

[Table 3-7](#) describes the session persistence parameters in the clresource.conf file.

Table 3-7 Session Persistence Parameters in the clresource.conf File

Parameter	Definition	Default Value
type	Session persistence type	ha
frequency	Session frequency	web-method
scope	Session scope	session
store	Session store	jdbc/hastore
		NOTE: Store name is defined at end of the [JDBC_RESOURCE] section.

Example clresource.conf File

```
[HADBINFO]
historypath /var/tmp
devicepath /opt/SUNWappserver7/SUNWhadb/4
datadevices 1
portbase 15200
spares 0
#set      managementProtocol=rsh
inetd false
inetdsetupdir /tmp
devicesize 512
dbpassword password
hosts machine1,machine1
hadb

[SESSION_STORE]
storeurl          REPLACEURL
storeuser         appservusr
storepassword     password
dbsystempassword password

[JDBC_CONNECTION_POOL]
steadypoolsize    8
maxpoolsize       32
datasourceclassname com.sun.hadb.jdbc.ds.HadbDataSource
isolationlevel    repeatable-read
validationmethod  meta-data
property
username=appservusr:password=password:cacheDataBaseMetaData=false:e
liminateRedundantEndTransaction=true:serverList=REPLACEURL

appservCPL
```

```
[JDBC_RESOURCE]
connectionpoolid      appservCPL
jdbc/hastore

[SESSION_PERSISTENCE]
type                  ha
frequency             web-method
scope                 session
store                 jdbc/hastore
```

Running the clsetup Command

The syntax for running the `clsetup` command is as follows:

```
clsetup [--help] [--instancefile instance_file_location] [--resourcefile
resource_file_location] [--passwordfile password_file_location]
```

If no arguments are specified, the `clsetup` command assumes the following defaults:

```
--instancefile is install_config_dir/clinstance.conf
--resourcefile is install_config_dir/clresource.conf
--passwordfile is install_config_dir/clpassword.conf
```

You can override these arguments by providing custom input file locations. For example:

```
./clsetup --resourcefile /tmp/myappservresource.conf
```

NOTE When providing custom input files, follow the required format found in the input files. For information on doing this, see “Editing the clsetup Input Files” on page 70.

To run the `clsetup` command, perform the following steps:

1. Verify that the requirements have been met as described in “[clsetup Requirements and Limitations](#)” on page 68.

NOTE If you want to run the `clsetup` command as a user other than root, follow the instructions in “[Setting Up Administration for Non-Root](#)” on page 64 to set this up.

2. Verify that the input files have the information that is required to set up the cluster. If necessary, edit the input files following the guidelines in [“Editing the clsetup Input Files” on page 70](#).

3. If you are using RSH, edit the `clresource.conf` file to uncomment the following line (remove the # sign):

```
#set managementProtocol
```

4. Go to the Sun ONE Application Server installation `/bin` directory:

```
cd install_dir/bin
```

5. Invoke the `clsetup` command using the appropriate syntax. For example, to run the command using the defaults:

```
./clsetup
```

The `clsetup` command displays the welcome message, the prerequisites for configuring the cluster, and the following message:

```
Do you want to start configuring your cluster? [Yes/No]
```

6. To start configuring, type `Yes` and press Enter.

The `clsetup` command runs in verbose mode. The various commands are displayed on the screen as they run, and the output is redirected to the log file, `/var/tmp/clsetup.log`.

If a vital error occurs (for example, failure to create a non-existing HADB), the configuration stops and the error is recorded in the log file. If the log file already exists, the output is appended to the existing log file.

NOTE	If the entities to be handled (HADB nodes and Application Server instances) already exist, the <code>clsetup</code> command does not delete or reconfigure them, and the respective configuration steps are skipped. This type of event is recorded in the log file.
-------------	--

7. When the `clsetup` command completes the configuration, you are advised about the location of the log file. It's a good idea to scan the log file after each run.
8. Upon completion, the `clsetup` command returns the exit codes as described in [Table 3-8](#):

Table 3-8 Exit Codes for the clsetup Command

Exit Code	Description
0	Successful exit
2	Usage error
3	Instance file not found
4	Instance file cannot be read
5	Resource file not found
6	Resource file cannot be read
7	Password file not found
8	Password file cannot be read
10	Script cannot find <code>asadmin</code>
11	Script cannot find <code>hadbm</code>
12	Cannot create temporary file
13	Session store configuration failed
14	Create HADB failed
15	HADB <code>get jdbcURL</code> failed
16	User exits in welcome message

You can obtain a list of the exit codes by running the following command from the command line immediately after running the `clsetup` command:

```
'echo $?'
```

Cleanup Procedures for the clsetup Command

After running the `clsetup` command, errors that have occurred are logged in the log file `/var/tmp/clsetup.log`. Examine the log file after every run of the `clsetup` command and correct any significant errors that are reported (for example, failure to create a non-existing instance).

You can undo all or part of the configuration as follows:

- To delete an Application Server instance, use the following command:

```
asadmin delete-instance instance_name
```

For example:

```
asadmin delete-instance server1
```

- To delete the HADB, use the following commands:

- a. `hadbm stop database_name`

For example:

```
hadbm stop hadb
```

- b. `hadbm delete database_name`

For example:

```
hadbm delete hadb
```

- To clear the session store, use the following command:

```
cladmin clear-session-store --storeurl URL_information  
--storeuser storeUsername --storepassword store_user_name
```

For example:

```
cladmin clear-session-store --storeurl  
jdbc:sun:hadb:localhost:10005,localhost::10025 --storeuser  
appservusr --storepassword password
```

- To delete the JDBC connection pool, use the following command:

```
asadmin delete-jdbc-connection-pool connectionpool_name
```

For example:

```
asadmin delete-jdbc-connection-pool appservCPL
```

- To delete the JDBC resource, use the following command:

```
cladmin delete-jdbc-resource JDBCresource_Name
```

For example:

```
cladmin delete-jdbc-resource jdbc/hastore
```

After you have completed the tasks in this chapter (and the post-installation tasks in the following chapter, if needed), proceed to the *Sun ONE Application Server Administrator's Guide* for instructions on configuring the HADB and managing the cluster, the load balancer plug-in, and the HADB.

Post-installation Tasks

This chapter discusses some tasks you may need to perform during or after installing the Sun ONE Application Server 7, Enterprise Edition software.

The following topics are addressed here:

- [Starting and Stopping the Server](#)
- [Creating Domains and Instances](#)
- [Web Services Client Implementation](#)
- [Stopping and Starting the HADB](#)

Starting and Stopping the Server

Because the Sun ONE Application Server is not automatically started during installation, you will need to start the application server environment yourself using either of the following methods:

- [Using the Command-line Interface](#)
- [Using the Administration Interface](#)

Using the Command-line Interface

You can use the `asadmin` command-line interface to start and stop:

- The entire application server
- A specific administrative domain
- An individual application server instance

The subcommands of `asadmin` listed in [Table 4-1](#) are relevant to start and stop operations.

Table 4-1 Start/Stop Subcommands of `asadmin`

Subcommand	Description
<code>start-appserv</code>	Starts the entire Application Server.
<code>stop-appserv</code>	Stops the Application Server.
<code>start-domain</code>	Starts the administrative server and application server instances of the specified administrative domain
<code>stop-domain</code>	Stops the administrative server and the application server instances of the specified administrative domain.
<code>start-instance</code>	Starts the specified application server instance. Can be run in either a local or remote mode. In local mode, running this subcommand does not require the administrative server to be running.
<code>stop-instance</code>	Stops the specified application server instance. Similar in operation to <code>start-instance</code> .

Using `start-domain` and `stop-domain`

If the Application Server is running, use the following command to stop both the Admin Server as well as the application server instance of the initially-configured domain:

```
asadmin stop-domain --domain domain1 --local
```

where `domain1` is the default name of the administrative domain defined during installation of the Application Server.

As the command completes, you should observe the following results:

```
asadmin stop-domain --domain domain1 --local
Instance domain1:server1 stopped
Domain domain1 Stopped.
```

Likewise, you can start the initially-configured administrative domain by running the following command:

```
asadmin start-domain --domain domain1
```

As the command completes, you should observe the following results:

```
asadmin start-domain --domain domain1
Instance domain1:admin-server started
Instance domain1:server1 started
Domain domain1 Started.
```

Using start-instance and stop-instance

To stop a specific application server instance without relying on the presence of an Admin Server, you can use the following command:

```
asadmin stop-instance --local server1
```

where `server1` is the default name of the application server instance. If your environment contains more than one administrative domain, then you need to specify the administrative domain name when invoking the `stop-instance` command. For example:

```
asadmin stop-instance --local --domain domain1 server1
```

To start a specific application server instance in local mode, you can use the following command:

```
asadmin start-instance --local server1
```

If you want to start or stop an instance on a remote system, you can specify the target Admin Server and administrative user name and password on the `start-instance` and `stop-instance` commands.

Getting Helpful Information

If you run either of these subcommands without parameters, usage information is displayed. For example:

```
asadmin start-instance

Invalid number of operands received
Command 'start-instance' not executed successfully

USAGE: start-instance [--user admin_user] [--password
admin_password] [--host localhost] [--port 4848] [--local=false]
[--domain domain_name] [--debug=false] [--secure | -s]
instancename
```

Alternatively, you can issue the subcommands followed by the `--help` option to obtain complete usage information.

Using the Administration Interface

When the Admin Server is running, you can use the web-based Administration interface to start and stop application server instances.

To start the Administration interface (also called the Admin Console or the graphical interface):

1. Open a browser window and specify the location of your Admin Server's console application.

During installation, the default port number for the Admin Server is set to 4848. If this port was already in use, or you selected another port number, specify that port number. For example:

<http://localhost:4848>

2. Sign into the Administration interface using the administrative user name and password specified during installation.

After you've been successfully authenticated, the initial screen of the Administration interface is displayed.

3. Select the server1 node to access the start and stop functions.

The application server instance is either in a Running or Not Running state.

4. Depending on the server instance state, click either Start or Stop to start or stop the application server instance.

Creating Domains and Instances

The installation program creates an initial domain called domain1 with a single instance called `server1`. Create any additional domains and server instances using following commands:

To create a new domain:

```
asadmin create-domain --adminport port_number --adminuser admin
--adminpassword password domain_name [--path domain_path] [--sysuser
sys_user] [--passwordfile file_name]
```

To create a new instance:

```
asadmin create-instance --instanceport instanceportinstance_name
[--user admin_user] [--password admin_password] [--host localhost]
[--port 4848] [--sysuser sys_user] [--domain domain_name]
[--local=false] [--passwordfile filename] [--secure|-s]
```

Refer to the `asadmin` man pages for additional information on these commands.

Web Services Client Implementation

To install and configure the web services client, refer to the *Sun ONE Application Server Developer's Guide to Clients*.

Stopping and Starting the HADB

This section addresses the following topics:

- [Stopping the HADB](#)
- [Starting the HADB After Stopping](#)

Stopping the HADB

If you are uninstalling, you will need to stop the running HADB on the node where you are working. The `hadbm stop` command stops all HADM processes on each node. It also captures the role of each node and saves this information *locally* to the `/etc/opt/SUNWhadb/dbdef/mydb/stopstate` file. The `hadbm start` command references this file so it knows what role to give the nodes when it starts the database.

To stop a running HADB, perform these steps:

1. Log in as root on the system where the HADB is running.
2. Run the `hadbm stop` command using the following format:

```
hadbm stop hadb_name
```

This command stops the database.

3. Type `yes` or `y` to confirm, anything else to cancel. When the HADB is stopped, the following is displayed:

```
Database successfully stopped
```

4. Verify the HADB is stopped by running the following command:

```
hadbm status --nodes hadb_name
```

The state for all nodes should be Stopped.

NOTE If the `inetd` process was still running, the `clu_nsup_srv` process would be running and the state for the nodes (NodeState) would be Starting.

Starting the HADB After Stopping

You must issue the `hadbm start` command from the host where you issued the `hadbm stop` command because the `stopstate` file is on that host and the `stopstate` file is needed for the `hadbm start` command.

To start all active nodes of an HADB after it has been stopped using the `hadbm stop` command, perform these steps:

1. Log in as root on the system where the HADB resides.
2. Run the `hadbm start` command from the host where you issued the `hadbm stop` command using the following format:

```
hadbm start hadb_name
```

After the HADB has started, the following is displayed:

```
Database successfully started
```

Uninstalling the Enterprise Edition Software

This chapter contains instructions for uninstalling the Sun ONE Application Server 7, Enterprise Edition software from your system.

The following topics are addressed here:

- [About Uninstalling](#)
- [Uninstalling the Application Server Software](#)
- [Uninstalling in Silent Mode \(non-interactive\)](#)

About Uninstalling

The installation program enforces component dependencies as specified for each component. Once component dependencies are satisfied, component life cycles are independent. A particular component can be installed or uninstalled dynamically through incremental installation and partial uninstallation mechanisms without corrupting other components.

Uninstallation failure will result in a complete rollback of the installation, requiring you to reinstall the product.

NOTE	If an uninstallation fails, you may need to clean up some leftover files or processes before attempting a new installation. In this case, perform the tasks in “Uninstallation Failure Cleanup” on page 98 .
-------------	--

Components

The following components can be uninstalled separately or as a complete package:

- Sun ONE Application Server, including its graphical and command-line administrative tools and Sun ONE Message Queue 3.0.1
- Java 2 Software Development Kit (J2SE), Standard Edition 1.4.1_03
- Sun ONE Application Server Administration Client (command-line tool only)
- Sample applications
- High-Availability Database (HADB)
- Load balancer plug-in for web servers

Installation files, configuration files, and all log files are removed from local and remote hosts during installation.

Uninstallation Requirements

The following must be true for uninstallation to succeed:

- All databases are stopped and disabled prior to uninstalling.
For guidelines on stopping the HADB, refer to the [“Stopping the HADB” on page 85](#).
- All database hosts are reachable by SSH or RSH for the root user.
For instructions on setting this up HADB communications, refer to [“Setting Up Host Communication” on page 55](#).
- The uninstallation program is run from the original installation host.

Uninstalling the Application Server Software

The uninstallation program detects any running Sun ONE Application Server processes and stops them before continuing to uninstall.

NOTE If your J2SE is installed in a directory other than `/usr/j2se`, you must use the following command:

```
./uninstall -javahome valid_j2se_directory
```

where *valid_j2se_directory* is the path to your J2SE 1.4.1_03 installation.

To uninstall the Application Server software, perform the following steps:

1. Verify that you have met the requirements in [“Uninstallation Requirements” on page 88](#).
2. Log in as root on the machine where you want to uninstall the Sun ONE Application Server 7, Enterprise Edition software.
3. Navigate to your machine’s Sun ONE Application Server 7 installation directory.

4. Select your installation method.

- To run uninstallation using the graphical interface, type the following at the command prompt (no options; this is the default method):

```
./uninstall
```

- To run uninstallation using the command-line interface, type:

```
./uninstall -console
```

The Welcome page of the uninstallation program is displayed.

5. Read the Welcome page and click Next (or press Enter at the command line) to continue.
6. You will be queried about whether you want to do an incremental uninstallation.
 - If you answer No, the Ready to Install page is displayed as shown in [Step 7](#).
 - If you answer Yes, the component selection page is displayed showing the components that are installed on your system.

7. Select which components you want to uninstall and click Next (or press Enter at the command line).

The Ready to Uninstall page is displayed showing a list of the Application Server components you have selected to uninstall.

8. Click Uninstall Now (or press Enter on the command line) to start the uninstallation process.

The Uninstallation progress indicator bar is displayed.

When uninstallation finishes, the Uninstall Summary page is displayed.

9. Review the details by clicking Details.

A details listing displays the top portion of the log file. Complete information on the uninstallation can be found in the uninstallation log file specified at the end of the details listing:

```
/var/sadm/install/logs/Sun_ONE_Application_Server_uninstall.log
```

10. Click Dismiss to close the Details page.
11. Click Close (or press Enter at the command line) to quit the uninstallation program.
12. Verify that uninstallation succeeded by checking to see that the Application Server components have been removed from the system.

NOTE	If uninstallation is interrupted, or if you have trouble installing the Application Server software after removing a previous version or a component, refer to “Uninstallation Failure Cleanup” on page 98 .
-------------	--

Uninstalling in Silent Mode (non-interactive)

NOTE	The interactive methods allow you to select which components you want to uninstall; silent mode does not. That is, incremental, or partial, uninstallation is not available for silent mode.
-------------	--

To uninstall the Sun ONE Application Server software in non-interactive silent mode, perform these steps:

1. Log in as root on the machine where you want to uninstall the Application Server 7, Enterprise Edition software.
2. Start silent uninstallation at the command line as follows:

```
./uninstall -silent
```

When the prompt is returned, the silent uninstallation is completed.

3. Verify that uninstallation succeeded by checking to see that the Sun ONE Application Server components have been removed from the system.
4. Repeat this process for each server where you want to uninstall.

Troubleshooting

This chapter describes how to solve common problems that might occur during installation of the Sun ONE Application Server 7, Enterprise Edition software.

The following topics are addressed here:

- [About Logs and Messages](#)
- [J2SE Installation/Upgrade Issues](#)
- [Forgotten User Name or Password](#)
- [Forgotten Admin Server Port Number](#)
- [Connection Refused for Administration Interface](#)
- [Server Won't Start: CGI Error Occurs](#)
- [Uninstallation Failure Cleanup](#)

About Logs and Messages

Both the installation and uninstallation programs create log files and log all installation and uninstallation events to these files. The primary purpose of these log files is to provide troubleshooting information.

In addition to installation program messages and log files, operating system utilities such as `pkginfo` and `showrev` on Solaris can be used to gather system information.

Log file entries include information about the attempted action, the outcome of the action, and, if applicable, the cause of failure. The log files contain the following types of message entries:

- **INFO**—These messages mark normal completion of a particular installation tasks.
- **WARNING**—These messages mark non-critical failures. Warning messages generally contain information about the cause and the nature of the failure, and also provide possible remedies.
- **ERROR**—These messages mark critical failures that cause installation or uninstallation status to be reported as Failed. Error messages generally provide detailed information about the nature and the cause of the problem that occurred.

For a full listing of the Sun ONE Application Server error messages, refer to the Enterprise Edition of the *Sun ONE Application Server Error Messages Reference*.

The following Application Server logs can be useful for troubleshooting:

- For problems you may have with the installation or uninstallation process:
`/var/sadm/install/logs/Sun_ONE_Application_Server_install.log`
`/var/sadm/install/logs/Sun_ONE_Application_Server_uninstall.log`
- In addition to these log files, low-level installation and uninstallation log files are created at these locations:

`/var/sadm/install/logs/Sun_ONE_Application_Server_install.<timestamp>`

`/var/sadm/install/logs/Sun_ONE_Application_Server_uninstall.<timestamp>`

- For problems with the `clsetup` command:
`/var/tmp/clsetup.log`
- For problems with the `cladmin` command:
`/var/tmp/cladmin.log`

J2SE Installation/Upgrade Issues

The installation program can only upgrade your J2SE installation when the following requirements are met:

1. The following Solaris J2SE packages reside on the machine where you are performing installation:
 - `SUNWj3rt`
 - `SUNWj3dev`

- SUNWj3man
- SUNWj3dmo

Verify this by running the `pkginfo -i -l` command on these packages.

NOTE The installation program can only upgrade a package-based J2SE installation, not a file-based J2SE installation.

2. The version of the Solaris J2SE packages is greater than or equal to version 1.3 and less than version 1.4.1_03.
3. The `/usr/j2se` (default) directory is writable by the user performing the installation.

The following types of errors may occur if you attempt to upgrade your J2SE during installation:

- [Incompatible J2SE version---cannot upgrade.](#)
- [Failure to install J2SE reported through install log file.](#)

Incompatible J2SE version---cannot upgrade.

If you receive this type of error, the first or second requirements above have not been met.

Solution

Resolve your J2SE package or version issues by either fixing the Solaris packages or completely removing the Solaris packages (only if they are not used by any other application programs) using the `pkgrm` command.

If you remove the packages, you can then install the J2SE component using the installation program by selecting the Install Java 2 SDK (1.4.1_03) option in the Java Configuration panel.

Failure to install J2SE reported through install log file.

If you receive this type of error, the third requirement above has not been met.

Solution

Verify that your `/usr/j2se` directory is not read-only.

Forgotten User Name or Password

If you do not remember the administrative user name that was supplied during installation, try these solutions in this order:

1. Enter the user name `admin`. This is the default user name specified in the server configuration dialog during installation.
2. If this doesn't work, look in the following file:

`domain_config_dir/domain1/admin-server/config/admpw`

This file contains the administrator's user name followed by the encrypted form of the administrative user's password. Seeing the user name may jog your memory.

3. If this doesn't work, delete the administrative domain and recreate it with a new password.
4. As a last resort, uninstall and reinstall the Sun ONE Application Server.

Forgotten Admin Server Port Number

If you do not remember the HTTP server port number of the Admin Server, you can inspect the Admin Server's configuration file to determine the HTTP server port number:

1. Navigate to `domain_config_dir/domain1/admin-server/config/` and open the `server.xml` file in a text editor.
2. Look for the following element:

```
http-listener id="http-listener-1" address="0.0.0.0"
port="4848"...
```

In this case, port 4848 is the HTTP port number in use.

Connection Refused for Administration Interface

If the connection was refused when attempting to invoke the graphical Administration interface, it is likely that the Admin Server is not running. The Admin Server log file may be helpful in determining the reason the Admin Server is not running.

To start the Admin Server, use the command-line instructions in [“Starting and Stopping the Server” on page 81](#).

Server Won't Start: CGI Error Occurs

If the Sun ONE Application Server won't start, you may receive the following error:

```
[05/Aug/2002:01:12:12] SEVERE (21770): cgi_init reports:
HTTP4047: could not initialize CGI subsystem

(Cgistub path /export/home/sun/appserver7/appserv/lib/Cgistub),
err fork() failure [Not enough space]
```

The system may require additional resources. Possible solutions are described in the following sections:

- [Set Limits on File Descriptions](#)
- [On Solaris: Change Kernel Parameters](#)

Set Limits on File Descriptions

You can use the `ulimit` command to determine the number of available file descriptors or set limits on the system's available file descriptors. The `ulimit` command displays the limits for the current shell and its descendants.

For the `sh` shell, the `ulimit -a` command lists all the current resource limits. The `ulimit -n` command lists the maximum file descriptors plus 1.

On Solaris: Change Kernel Parameters

On Solaris, increase the system resources by modifying the `/etc/system` file to include the following entries:

```
set rlim_fd_max=4086
set rlim_fd_cur=1024
```

The system will require a reboot for the new kernel parameters to take effect.

After you have set the shell resources, the Sun ONE Application Server should start.

Uninstallation Failure Cleanup

If an uninstallation fails, you may need to clean up some leftover files or processes before attempting a new installation.

1. Log in as root.
2. Navigate to your installation directory and check the content of the `/var/sadm/install/productregistry` file for installed packages. That is, check for files having the SUNW string.

```
cat /var/sadm/install/productregistry | grep SUNW
```

3. Run `pkgrm` for the SUNW packages that were found in the product registry file. For example:

```
pkgrm SUNWasaco
```

4. Remove the following files, if they are present:

```
/tmp/setupSDKNative
```

```
/tmp/SolarisNativeToolkit_3.0_1
```

5. After the packages have been removed, manually remove the Sun ONE Application Server-specific product registry file itself.

```
rm /var/sadm/install/productregistry
```

6. At the command line, find and kill all `appservd` processes that may be running by typing the following:

```
ps -ef | grep appservd
kill -9 PID
```

7. Remove all remaining files under the Sun ONE Application Server installation directories.

- 8.** If present, remove the following log file:

```
/var/sadm/install/logs/Sun_ONE_Application_Server_install.log
```

This is necessary because every iteration of installation appends the log information to this file if it exists.

Installation Cheatsheet

Sun ONE Application Server 7, Enterprise Edition is a complex product to implement. However, if you are an experienced installer and are familiar with configuring high-availability systems, the summarized steps in this appendix may be useful.

The installation phase of product implementation consists of the following high-level tasks:

1. [Fulfill the installation requirements.](#)
2. [Install the software components.](#)
3. [Complete the high-availability installation tasks.](#)
4. [Complete the post-installation tasks.](#)

When you have finished the tasks listed in this appendix, the installation is considered complete. You are now ready to proceed to the high-availability configuration tasks as documented in the *Sun ONE Application Server Administrator's Guide*.

1. Fulfill the installation requirements.

[Table A-2](#) lists the requirements that must be met in order to install the Sun ONE Application Server Version 7, Enterprise Edition product.

Table A-1 Installation Requirements Tasks

Done	Task	Location of Full Instructions
	Platform and HA configuration—Verify platform and HA configuration have been met.	“Platform Requirements” on page 24

2. Install the software components.

Table A-1 Installation Requirements Tasks (*Continued*)

Done	Task	Location of Full Instructions
	(if applicable) Solaris 8 patches—Verify the correct patches are installed.	“Solaris 8 Patch Requirements” on page 26
	(if applicable) Solaris 9 bundled, Message Queue broker—Verify unique naming of domains and instances.	“Shared Message Queue Broker Requirement” on page 26
	(if applicable) Hardened Solaris operating system—Verify needed libraries are installed.	“Hardened Solaris Operating Environment Requirement” on page 26
	(if applicable) Existing installations—Remove any existing Application Servers using uninstallation.	“General Requirements” on page 27
	Available ports—Plan your port preferences.	“General Requirements” on page 27
	Root privileges—Verify that the installation person has root privileges on target machine.	
	HA topology—Plan your high-availability topology.	“Topology Planning” on page 28 <i>Operational Deployment Guide</i>
	HA space—Evaluate your high-availability space requirements	“Space Considerations” on page 29 “Platform Requirements” on page 24
	Web server—Install the Sun ONE Web Server 6.0 SP6	“Web Server Installation” on page 29 <i>iPlanet WebServer Installation Guide</i>

2. Install the software components.

[Table A-2](#) lists the tasks for installing the Sun ONE Application Server Version 7, Enterprise Edition product components.

Table A-2 Product Installation Tasks

Done	Task	Location of Full Instructions
	Requirements—Verify that requirements are met.	Table A-1 on page 101

Table A-2 Product Installation Tasks *(Continued)*

Done	Task	Location of Full Instructions
	Start processes—Start processes that use ports and will run at same time as Application Server.	Procedure starts here: “Installing Application Server Software” on page 36
	(if applicable) Download the software bundle: <pre>gunzip sun-appserver7-sol.tar.gz tar -xvf sun-appserver7-sol.tar</pre>	
	Choose your installation method: To invoke the graphical interface— <code>./setup</code> To invoke the command-line interface— <code>./setup -console</code>	
	Select installation components (load balancer is usually installed separately) and respond to all installation program prompts.	
	Check installation summary and logs.	
	Set PATH environment variable for HADB <code>/bin</code> .	
	Start the Application Server.	
	Verify that <code>asadmin</code> and <code>hadbm</code> commands run.	
	If a previous load balancer plugin is installed, remove it with the uninstallation program	Procedure starts here: “Installing the Load Balancer Plug-in” on page 44
	Verify that the correct web server is installed: Sun ONE 6.0 SP6 or Apache Web Server 1.3.27	
	Invoke the Installation program to install the load balancer plugin and respond to all installation program prompts.	
	(if applicable) Perform silent installation	“Installing in Silent Mode (Non-Interactive)” on page 48

3. Complete the high-availability installation tasks.

[Table A-3](#) lists the high-availability preparation tasks that are part of installing the Sun ONE Application Server Version 7, Enterprise Edition product.

Table A-3 High-Availability Installation Tasks

Done	Task	Location of Full Instructions
	Configure shared memory for the HADB hosts.	“Configuring Shared Memory and Semaphores” on page 53

4. Complete the post-installation tasks.

Table A-3 High-Availability Installation Tasks (*Continued*)

Done	Task	Location of Full Instructions
	Set up communication for the HADB hosts, either using RSH or SSH. (SSH is Solaris 9 default)	“Setting up RSH for HADB Administration” on page 56 “Setting Up SSH for HADB Administration” on page 57
	If needed for Solaris 8, install OpenSSH.	“Installing SSH for Solaris 8” on page 59
	Set up the user environment for hadbm.	“Setting Up the User Environment” on page 63
	(If applicable) Set up for running the clsetup command as non-root.	“Setting Up Administration for Non-Root” on page 64
	Verify that clsetup requirements are met.	“clsetup Requirements and Limitations” on page 68
	(If applicable) Edit the clsetup input files for your configuration.	“Editing the clsetup Input Files” on page 70
	Run clsetup to configure a basic cluster.	“Running the clsetup Command” on page 77
	Scan clsetup logs and correct any errors.	“Cleanup Procedures for the clsetup Command” on page 79

4. Complete the post-installation tasks.

[Table A-4](#) lists the final tasks required for installing the Sun ONE Application Server Version 7, Enterprise Edition product.

Table A-4 Post-Installation Tasks

Done	Task	Location of Full Instructions
	(If needed) Use asadmin commands to start or stop the Application Server.	“Creating Domains and Instances” on page 84
	(If needed) Create additional domains.	“Creating Domains and Instances” on page 84
	(If needed) Use hadbm commands to stop or start the HADB.	“Stopping and Starting the HADB” on page 85
	(If needed) Install and configure web services client.	<i>Developer’s Guide to Clients</i>

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