Sun Java™ System

Application Server 7 Installation Guide

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About This Guide

This guide describes how install the Sun Java System Application Server 7 Standard and Enterprise Edition.

This preface addresses the following topics:

- Who Should Use This Guide
- Using the Documentation
- How This Guide is Organized
- Documentation Conventions
- Contacting Sun
- Accessing the Documentation

Who Should Use This Guide

The intended audience for this guide is the person who develops, assembles, and deploys beans in a corporate enterprise.

This guide assumes you are familiar with:

- Java programming
- Java APIs as defined in the Java™ Servlet, JavaServer Pages™ (JSP™), Enterprise JavaBeans™ (EJB™), and Java™ Database Connectivity (JDBC™) specifications
- The SQL structured database query languages
- Relational database concepts

- Software development processes, including debugging and source code control

Using the Documentation

The Sun Java System Application Server Standard and Enterprise Edition manuals are available as online files in Portable Document Format (PDF) and Hypertext Markup Language (HTML).

The following table lists tasks and concepts described in the Sun Java System Application Server manuals. The manuals marked *(updated for 7 2004Q2)* have been updated for the Sun Java System Application Server Standard and Enterprise Edition 7 2004Q2 release. The manuals not marked in this way have not been updated since the version 7 Enterprise Edition release.

Table 1 Sun Java System Application Server Documentation Roadmap

For information about	See the following
(Updated for 7 2004Q2) Late-breaking information about the software and the documentation. Includes a comprehensive, table-based summary of supported hardware, operating system, JDK, and JDBC/RDBMS.	*Release Notes*
Diagrams and descriptions of server architecture and the benefits of the Sun Java System Application Server architectural approach.	*Server Architecture*
New enterprise, developer, and operational features of Sun Java System Application Server 7.	*What's New*
How to get started with the Sun Java System Application Server product. Includes a sample application tutorial.	*Getting Started Guide*
(Updated for 7 2004Q2) Installing the Sun Java System Application Server Standard Edition and Enterprise Edition software and its components, such as sample applications and the Administration interface. For the Enterprise Edition software, instructions are provided for implementing the high-availability configuration.	*Installation Guide*
(Updated for 7 2004Q2) Evaluating your system needs and enterprise to ensure that you deploy Sun Java System 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.	*System Deployment Guide*
Creating and implementing Java™ 2 Platform, Enterprise Edition (J2EE™ platform) applications intended to run on the Sun Java System Application Server that follow the open Java standards model for J2EE components such as servlets, Enterprise JavaBeans™ (EJBs™), and JavaServer Pages™ (JSPs™). Includes general information about application design, developer tools, security, assembly, deployment, debugging, and creating lifecycle modules. A comprehensive Sun Java System Application Server glossary is included.	*Developer's Guide*

Table 1 Sun Java System Application Server Documentation Roadmap *(Continued)*

For information about	See the following
Creating and implementing J2EE web applications that follow the Java™ Servlet and JavaServer Pages (JSP) specifications on the Sun Java System Application Server. 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.	*Developer's Guide to Web Applications*
(Updated for 7 2004Q2) Creating and implementing J2EE applications that follow the open Java standards model for enterprise beans on the Sun Java System Application Server. 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.	*Developer's Guide to Enterprise JavaBeans Technology*
(Updated for 7 2004Q2) Creating Application Client Container (ACC) clients that access J2EE applications on the Sun Java System Application Server.	*Developer's Guide to Clients*
Creating web services in the Sun Java System Application Server environment.	*Developer's Guide to Web Services*
Java™ Database Connectivity (JDBC™), transaction, Java Naming and Directory Interface™ (JNDI), Java™ Message Service (JMS), and JavaMail™ APIs.	*Developer's Guide to J2EE Services and APIs*
Creating custom NSAPI plug-ins.	*Developer's Guide to NSAPI*
(Updated for 7 2004Q2) Information and instructions on the configuration, management, and deployment of the Sun Java System 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 Sun Java System Application Server glossary is included.	*Administration Guide*
Editing Sun Java System Application Server configuration files, such as the `server.xml` file.	*Administrator's Configuration File Reference*
Configuring and administering security for the Sun Java System Application Server operational environment. Includes information on general security, certificates, and SSL/TLS encryption. HTTP server-based security is also addressed.	*Administrator's Guide to Security*
Configuring and administering service provider implementation for J2EE™ Connector Architecture (CA) connectors for the Sun Java System Application Server. Topics include the Administration Tool, Pooling Monitor, deploying a JCA connector, and sample connectors and sample applications.	*J2EE CA Service Provider Implementation Administrator's Guide*
(Updated for 7 2004Q2) Migrating your applications to the new Sun Java System Application Server programming model, specifically from iPlanet Application Server 6.x and Sun ONE Application Server 7.0. Includes a sample migration.	*Migrating and Redeploying Server Applications Guide*
(Updated for 7 2004Q2) How and why to tune your Sun Java System Application Server to improve performance.	*Performance Tuning Guide*

Table 1 Sun Java System Application Server Documentation Roadmap *(Continued)*

For information about	See the following
(Updated for 7 2004Q2) Information on solving Sun Java System Application Server problems.	*Troubleshooting Guide*
(Updated for 7 2004Q2) Information on solving Sun Java System Application Server error messages.	*Error Message Reference*
(Updated for 7 2004Q2) Utility commands available with the Sun Java System Application Server; written in manpage style.	*Utility Reference Manual*
Using the Sun™ Java System Message Queue 3.5 software.	The Sun Java System Message Queue documentation at: `http://docs.sun.com/db?p=prod/s1.s1msgqu`

How This Guide is Organized

This guide addresses the following topics:

- Chapter 1, "Installing Standard and Enterprise Edition Software,"—Provides instructions for installing the Sun Java System Application Server 7 software components. Includes instructions for performing a non-interactive silent installation.
- Chapter 2, "Preparing for HADB Setup"—Provides instructions for configuring shared memory, and setting up host communications and the user environment for the high-availability configuration.
- Chapter 3, "Uninstalling the Standard and Enterprise Edition Software"—Provides instructions for uninstalling the Sun Java System Application Server 7 software. Includes instructions for performing a non-interactive silent uninstallation.
- Appendix A, "Upgrading the Application Software"—Provides instructions for upgrading from a previous installation of the Application Server to the current version.

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). For Windows versions, the directory paths are the same, except that backslashes are used to separate directories.
- **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, pathnames, 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** are indicated by *install_dir* in this document. Exceptions are noted in "Conventions Referring to Directories" on page 6.

  By default, the location of *install_dir* on **most** platforms is:
  - Solaris and Linux file-based installations:

    user's home directory`/sun/appserver7`
  - Windows, all installations:

    system drive`:\Sun\AppServer7`

  For the platforms listed above, *default_config_dir* and *install_config_dir* are identical to *install_dir*. See "Conventions Referring to Directories" on page 6 for exceptions and additional information.

- **Instance root directories** are indicated by *instance_dir* in this document, which is an abbreviation for the following:

  default_config_dir/`domains`/*domain*/*instance*

- **UNIX-specific descriptions** throughout this manual apply to the Linux operating system as well, except where Linux is specifically mentioned.

Conventions Referring to Directories

By default, when using the Solaris package-based or Linux RPM-based distributions, the application server files are spread across several root directories. This guide uses the following document conventions to correspond to the various default installation directories provided:

- *install_dir* refers to `/opt/SUNWappserver7`, which contains the static portion of the installation image. All utilities, executables, 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/config`, which contains installation-wide configuration information such as licenses and the master list of administrative domains configured for this installation.

Contacting Sun

You might want to contact Sun Microsystems in order to:

- Give Us Feedback
- Obtain Training
- Contact Product Support

Give Us Feedback

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

Obtain Training

Application Server training courses are available at:

http://training.sun.com/US/catalog/enterprise/web_application.html/

Visit this site often for new course availability on the Sun Java System Application Server.

Contact Product Support

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/supportraining/

- 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. Here are some of the commonly used commands:
  - **Solaris:** `pkginfo, showrev`
  - **Linux:** `rpm`
  - **All:** `asadmin version --verbose`
- Detailed steps on the methods you have used to reproduce the problem
- Any error logs or core dumps
- Configuration files such as:
  - *instance_dir*`/config/server.xml`
  - a web application's `web.xml` file,
    when a web application is involved in the problem
- For an application, whether the problem appears when it is running in a cluster or standalone

Accessing the Documentation

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

- Manuals—You can view Sun Java System Application Server manuals and Release Notes in HTML and in printable PDF downloads at:

  `http://docs.sun.com/db/coll/`

- 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. After setting the variable, you can access man pages for the Sun Java System Application Server commands by typing `man` *command_name* on the command line. For example: `man asadmin`.

Chapter 1

Installing Standard and Enterprise Edition Software

This chapter describes how to install the Sun Java System Application Server Standard and Enterprise Edition. You can install interactively or use silent mode to replicate an installation scenario on multiple machines.

The following topics are addressed:

- About the Application Server Installation
- Installing Application Server Software
- Installing the Load Balancer Plug-in Component
- Installing in Silent Mode

For any late-breaking updates to these instructions, check the *Sun Java System Application Server Release Notes*.

For more information about configuring your application server after installation, refer to the *Sun Java System Application Server Administration Guide.*

The following location contains product downloads and other useful information: http://www.sun.com/software/products/appsrvr/home_appsrvr.html

About the Application Server Installation

The Sun Java System Application Server product is made up of a number of software components that work together to create the Sun Java System Application Server experience. There are a number of choices you can make for your installation:

- You can install the Standard Edition or the Enterprise Edition of the product.

- You can install from the product CD or from the download site.
- You can install the file-based or the package-based distribution of the product.
- You can install from the command-line interface or the graphical interface.
- You can install interactively or in silent mode.

NOTE If you are using the file-based distribution, you can install multiple instances of Application Server on the same machine.

This section addresses the following topics:

- Distributions of the Product
- Packaging Models and Directory Structure
- Installation Components
- Installation Methods

Distributions of the Product

The Sun Java System Application Server offers two types of distributions:

- **File-based distribution** (on Solaris SPARC, x86, Linux, Microsoft Windows)—multiple installations can be installed by any non-root user
- **RPM-based** (on Linux) or **Package-based distribution** (on Solaris SPARC and x86)—must be installed with root access

You can install these distributions of the product from the product CD or as a download from the web site. The various downloads available for the Sun Java System Application Server product can be found at http://wwws.sun.com/software/download/app_servers.html

NOTE Multiple file-based Application Server installations can reside on a single machine.

The following table identifies the distribution types for each platform and the Application Server Edition available for each distribution.

Table 1-1 Product Distribution Definition

Distribution Type	Platform	Application Server Edition
File-based	Solaris SPARC, Solaris x86 Linux Microsoft Windows	Standard and Enterprise Standard and Enterprise Standard and Enterprise Standard and Enterprise
Package-based	Solaris SPARC, Solaris x86	Standard and Enterprise Standard and Enterprise
RPM-based	Linux	Standard and Enterprise

Refer to the *Sun Java System Application Server 7 Release Notes* to identify which platform versions are supported.

Packaging Models and Directory Structure

There are different installers for package-based and file-based distributions. Depending on the distribution of the product installed on your system, your Sun Java System Application Server software may be installed under a single root directory path or spread across several root directory paths.

This section addresses the following topics:

- Package-Based Installation on Solaris SPARC / x86 and RPM-based on Linux
- File-based Installation on Microsoft Windows and Solaris SPARC / x86

Package-Based Installation on Solaris SPARC/x86 and RPM-based on Linux

On Solaris SPARC / x86 package-based, and on Linux RPM-based distributions, the components are installed 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 Sun Java System Application Server software reside in this location.
- `/etc/opt/SUNWappserver7/config` 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.

NOTE For package-based distributions on Solaris SPARC / x86, and RPM-based distributions on Linux, you must be logged in as root.

File-based Installation on Microsoft Windows and Solaris SPARC/x86

On Microsoft Windows (available in file-based distribution only), and on Solaris SPARC / x86 file-based distributions, the components are installed under a single directory path. The default directories are:

- For Microsoft Windows: `c:\Sun\AppServer7`
- For Solaris SPARC and x86 file-based distribution: *appserver_install_dir*`/sun/appserver7`

In these cases, the `/config` and `/domains` directories are positioned under the installation directory root.

Installation Components

In general, you are installing the basic components that provide the functionality of the Sun Java System Application Server 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 A partial installation 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 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 without corrupting other components. However, incremental uninstallation is not supported.

The following installation components are included with the Sun Java System Application Server **Standard** and **Enterprise** Edition product:

- **Application Server**—all of Sun Java System Application Server, including its graphical and command-line administrative tools, the `asadmin` command, and Sun Java™ System Message Queue.

  For UNIX package-based or RPM-based distributions, and for Microsoft Windows distributions, the Sun Java System Message Queue software is automatically installed with the Application Server software here: *install_dir*`/imq`

  For UNIX file-based distributions, The Sun Java System Message Queue is distributed across `/usr/share/lib`, `usr/share/lib/imq` (lib files) and `/usr/bin` (binaries).

  If you want to install the Application Server Enterprise Edition and an HADB server node on the same system, select both components.

- **Application Server Administration Client**— `asadmin` utility

  Select the Administration Client component to install the command-line utility separately on a machine where the Application Server is *not* installed. When you install the Application Server, the Administration Client is also installed.

- **Java 2 Software Development Kit**—During installation, you can choose to reuse a Java 2 SDK that is already installed on your system as long as the Java 2 SDK version is correct. The default installation location for each distribution is:

  - For Solaris SPARC and x86, Linux, and Microsoft Windows file-based distributions: *install_dir*`/jdk`
  - For Solaris SPARC and x86 package-based distributions: `/usr/j2se`
  - For Linux RPM-based distributions: `/usr/java/j2sdk1.4.2_x`

  Refer to the *Sun Java System Application Server 7 Release Notes* to identify which version of the Java 2 SDK is supported.

NOTE The Sun Java System Application Server product is certified to work with Java 2 SDK from Sun Microsystems. Third-party JDK development kits, even with appropriate version numbers, are not supported.

- **Sample applications**—samples come with the source, schema, Ant build scripts, and EAR files. Any existing data associated with the database-related samples is available in the database. These sample applications are categorized as:

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

By default, the sample applications are installed at: *install_dir*`/samples`

More information about samples at: *install_dir*`/samples/index.html`

- **PointBase Server (Standard Edition only)**—By default, PointBase is installed at: *install_dir*`/pointbase`

  Refer to the *Sun Java System Application Server 7 Release Notes* to identify which version of the PointBase Server is supported.

The following additional components are included with the Sun Java System Application Server **Enterprise** Edition product:

- **High-Availability Database Server (Enterprise Edition)**—By default, the HADB Server is installed at: *install_dir*`/SUNWhadb`

  For more information on this component, refer to the HADB Configuration chapter in the *Sun Java System Application Server Administration Guide.*

- **High-Availability Administration Client (Enterprise Edition)**—only the `hadbm` command.

  Instructions for using the utilities are contained in the *Sun Java System Application Server Administration Guide*, the `hadbm` man pages, and the `asadmin` session persistence man pages.

- **Load balancer plug-in (Enterprise Edition)**—This component is dependent on a pre-installed web server. Supported web servers are listed in the *Sun Java System Application Server 7 Release Notes,* in the section titled *Platform Summary*.

  For additional information on this component, refer to the section titled "Installing the Load Balancer Plug-in Component" in this Installation Guide and the "Configuring Load Balancing" chapter in the *Sun Java System Application Server Administration Guide.*

Installation Methods

There are three methods of installation:

- **Graphical (interactive)**—The installation program prompts you using a sequence of graphical screens. This is the default method when you invoke the installation program without options: `./setup`.
- **Command-line (interactive)**—The installation program prompts you using a sequence of command-line prompts and messages. To activate the interactive command-line mode, invoke the installation program using the `-console` option: `./setup -console`. You must have root permission to install using the command-line interface.

  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 Solaris operating environment, you must use the command-line method. To start the installation program in a hardened environment, perform the steps in the "Other Limitations and Requirements" section of the *Sun Java System Application Server Release Notes*.

- **Silent mode**—The installation program reads installation parameters from a supplied configuration file. See "Installing in Silent Mode" on page 34 for more information on generating the configuration file.

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

The `setup` command syntax: `setup [-console [-savestate]] [-savestate] [-silent` *config_file*`] [-h || -help]`

Table 1-2 describes the `setup` command options.

Table 1-2 Options for the setup Command

Option	Description
`-console`	Runs the installation using the command-line method.
`-silent` *config_file*	Runs the installation in silent mode. Installation parameters are read from an existing installation configuration file. This option is mutually exclusive with the `savestate` option. The installation configuration file path must be explicitly provided; there is no default file path. Refer to "Installing in Silent Mode" on page 31 for further specifics on silent mode installation and the installation configuration file.

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

Option	Description
`-savestate`	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 `silent` option. If you do not specify this option, no installation configuration file will be created. The file will be called `statefile` and located in *install_dir*.
`-h || -help`	Displays the available command-line arguments for the `setup` command.

Table 1-3 identifies the command for each installation method.

Table 1-3 Commands for all the Installation Methods

Installation Method	Installation Command
Graphical interface (default)	`./setup`
Command-line interface	`./setup -console`
Graphical interface for creating configuration file for silent mode installation [1]	`./setup -savestate`
Command-line interface for creating configuration file for silent mode installation [1]	`./setup -console -savestate`
Silent mode based on an existing installation configuration file	`./setup -silent` *`config_file`*
Display available Command-line arguments for the `setup` command	`./setup -help`

[1] The file called `statefile` is created in *install_dir*.

Installing Application Server Software

This section provides instructions for installing the Sun Java System Application Server 7 Standard and Enterprise Edition distributions.

The following installation instructions are provided:

- Downloading from the Web Site
- Installing Standard Edition
- Installing Enterprise Edition

Downloading from the Web Site

This section provides for downloading the Sun Java System Application Server installation files from the web site. If you downloaded the product from the web site, a 60-day license is installed.

Downloading for Solaris SPARC and x86 or Linux

1. Select the download from the following Sun Java System Application Server download site and save it in a temporary directory on your Solaris SPARC and x86 or Linux machine.

   `http://wwws.sun.com/software/download/app_servers.html`

2. Navigate to the directory where you downloaded the file. For example:

   ```
   cd /temp_dir/as7download/
   ```

3. Unzip the .gz file using the `gunzip` command in this format:

   `gunzip` *`filename`*`.tar.gz`

4. Untar the unzipped file using the `tar -xvf` command in this format:

   `tar -xvf` *`filename`*`.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 `package` directory.

To determine whether you have download the file-based, RPM-based (Linux), or package-based distribution, see “Packaging Models and Directory Structure” on page 11.

Proceed to the instructions for installing the selected Application Server edition for your platform.

Downloading for Microsoft Windows

1. Select the download from the following Sun Java System Application Server download site and save it in a temporary directory on your Microsoft Windows machine.

   `http://wwws.sun.com/software/download/app_servers.html`

   A progress indicator bar tells you when the download has completed.

2. Navigate to the directory where you downloaded the installation zip file.

3. Unzip the installation zip file by opening the file and extracting its contents to your chosen folder. When the extraction is complete, you will see the `sun-appserver7` directory, which contains the `setup.exe` file, the `package` directory and other associated files.

Proceed to the instructions for installing the Application Server Standard Edition on Microsoft Windows.

Installing Standard Edition

This section provides instructions for installing the Application Server Standard Edition on the various platforms for the various distributions. The following installations are addressed:

- Installing Standard Edition on Solaris SPARC and x86
- Installing Standard Edition on Linux
- Installing Standard Edition on Microsoft Windows

Installing Standard Edition on Solaris SPARC and x86

The following instructions apply to file-based and package-based distribution unless specifically identified. You must have root access to install the package-based distribution. Root access is not required for file-based distribution.

1. Run the installation program.

   a. To run the installation program that uses the graphical interface, at the command prompt type `setup`.

   b. To run the installation program that uses the command-line interface, at the command prompt type `setup -console`.

2. Follow the installation wizard screens to accept the license agreement, and specify the path to the Application Server installation directory; or accept the default installation directory.

   The default installation directory is dependent on the distribution you are installing; see "Packaging Models and Directory Structure" on page 11.

3. Select the components you wish to install.

   If a component is disabled, the installation program has detected it as already installed on your system.

4. Choose to install the Java 2 SDK, or use a preinstalled Java 2 SDK.

- If the correct version of the Java 2 SDK is installed, it is reused or you can enter the path to another correct version.
- If there is no Java 2 SDK installed, you can choose to let the installation program install the Java 2 SDK automatically.
- For package-based distributions, if an incorrect version of the Java 2 SDK is found in the default path, you are prompted to upgrade your current version.
- For file-based distributions, if you choose to install the Java 2 SDK, a private copy is installed in *install_dir*.

The default Java 2 SDK installation path:

- For Solaris SPARC and x86 package-based distributions: `/usr/j2se`
- For Solaris SPARC and x86 file-based distributions: *install_dir*`/jdk`

5. For package-based distribution, you are prompted to identify your server configuration directory.

   The default server configuration directory is: `/etc/opt/SUNWappserver7`

6. For package-based distribution, you are prompted to identify your server domains directory.

   The default server domain directory is: `/var/opt/SUNWappserver7`

7. In the Server Configuration Information page (or at the command line), enter the following:

   - Admin User—Name of the user who administers the server
   - Admin User's Password—Password to access the Admin Server (8 character minimum)
   - Admin Server Port—Port number to access the Admin Server
   - HTTP Server Port—Port number to access the default server instance

NOTE The installation program automatically detects ports in use and suggests unused ports for the default settings. The default ports for package-based distribution are 80 for the HTTP Server, and 4848 for the Admin Server.

If you are installing as non-root user, the default ports for file-based installation are 1024 for the HTTP Server, and 4848 for the Admin Server.

The installation program verifies the available disk space on your machine. If you do not have enough disk space, an error message is displayed. Consult the *Sun Java System Application Server 7 Release Notes* to identify the minimum disk space required.

The Installation Summary page is displayed indicating the installation status. If the installation is unsuccessful, consult the log files located at:

- Install Log: `/var/tmp/Sun_ONE_Application_Server_install.log`
- Low-level log
  - For file-based Solaris SPARC and x86 root user: `/var/sadm/install/logs/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For file-based Solaris SPARC and x86 non-root user: `/var/tmp/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For package-based Solaris SPARC and x86: `/var/sadm/install/logs/Sun_ONE_Application_Server_install.`*`timestamp`*

If you downloaded the product from the web site, a 60-day license is installed.

If you installed the product from a CD, a non-expiring Application Server Standard Edition production license is installed.

Installing Standard Edition on Linux

The following instructions apply to RPM-based and package-based distribution unless specifically identified. You must have root access to install the package-based distribution. Root user is not required for RPM-based distribution.

1. Run the installation program.
   a. To run the installation program that uses the graphical interface, at the command prompt type `setup`.
   b. To run the installation program that uses the command-line interface, at the command prompt type `setup -console`.
2. Follow the installation wizard screens to accept the license agreement, and specify the path to the Application Server installation directory; or accept the default installation directory.

   The default installation directory is dependent on the distribution you are installing see "Packaging Models and Directory Structure" on page 11.

3. Select the components you wish to install.

   If a component is disabled, the installation program has detected it as already installed on your system.

4. Choose to install the Java 2 SDK, or use a preinstalled Java 2 SDK.

   - If the correct version of the Java 2 SDK is installed, it is reused or you can enter the path to another correct version.
   - If there is no Java 2 SDK installed, you can choose to let the installation program install the Java 2 SDK package automatically.
   - For RPM-based, if an incorrect version of the Java 2 SDK is found in the default path, you are prompted to upgrade your current version.
   - For file-based, if you choose to install the Java 2 SDK, a private copy is installed in *install_dir*.

   The default Java 2 SDK installation path:

   - For Linux RPM-based distributions: `/usr/java`
   - For Linux file-based distributions: *install_dir*`/jdk`

5. For RPM-based distribution, you are prompted to identify your server configuration directory.

   The default server configuration directory is: `/etc/opt/SUNWappserver7`

6. For RPM-based distribution, you are prompted to identify your server domains directory.

   The default server domain directory is: `/var/opt/SUNWappserver7`

7. In the Server Configuration Information page (or at the command line), enter the following:

   - Admin User—Name of the user who administers the server
   - Admin User's Password—Password to access the Admin Server (8 character minimum)
   - Admin Server Port—Port number to access the Admin Server
   - HTTP Server Port—Port number to access the default server instance

NOTE The installation program automatically detects ports in use and suggests unused ports for the default settings. The default ports for package-based distribution, or file-based distribution as root user are 80 for the HTTP Server, and 4848 for the Admin Server.

If you are installing file-based distribution as non-root user, the default ports are 1024 for the HTTP Server, and 4848 for the Admin Server.

The installation program verifies the available disk space on your machine. If you do not have enough disk space, an error message is displayed. Consult the *Sun Java System Application Server 7 Release Notes* to identify the minimum disk space required.

The Installation Summary page is displayed indicating the installation status. If the installation is unsuccessful, consult the log files located at:

- Install Log: `/var/tmp/Sun_ONE_Application_Server_install.log`
- Low-level log
  - For file-based Linux root and non-root user: `/var/tmp/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For RPM-based Linux: `/var/tmp/Sun_ONE_Application_Server_install.`*`timestamp`*

If you downloaded the product from the web site, a 60-day license is installed.

If you installed the product from a CD, a non-expiring Application Server Standard Edition production license is installed.

Installing Standard Edition on Microsoft Windows

You must have administrator privileges to install the Application Server software.

1. Navigate to the directory where you unpacked the installation files. You will see the `setup.exe` file.
2. Run the installation program.
   a. To run the installation program that uses the graphical interface, at the command prompt type `setup`.
   b. To run the installation program that uses the command-line interface, at the command prompt type `setup -console`.

3. Follow the installation wizard screens to accept the license agreement, and specify the path to the Application Server installation directory; or accept the default installation directory.

   The default installation directory is: c:\Sun\AppServer7

4. Select the components you wish to install.

   If a component is disabled, the installation program has detected it as already installed on your system.

5. Choose to install the Java 2 SDK, or use a preinstalled Java 2 SDK.

   - If the correct version of the Java 2 SDK is installed, it is reused or you can enter the path to another correct version.
   - If there is no Java 2 SDK installed, you can choose to let the installation program install the Java 2 SDK package automatically.
   - If you choose to install the Java 2 SDK, a private installation is installed at: c:\installdir\jdk

6. In the Server Configuration Information page (or at the command line), enter the following:

   - Admin User—Name of the user who administers the server
   - Admin User's Password—Password to access the Admin Server (8 character minimum)
   - Admin Server Port—Port number to access the Admin Server
   - HTTP Server Port—Port number to access the default server instance

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

The installation program verifies the available disk space on your machine. If you do not have enough disk space, an error message is displayed. Consult the *Sun Java System Application Server 7 Release Notes* to identify the minimum disk space required.

The Installation Summary page is displayed indicating the installation status. If the installation is unsuccessful, consult the installation log file located at *installdir*\install.log.

If you downloaded the product from the web site, a 60-day license is installed.

If you installed the product from a CD, a non-expiring Application Server Standard Edition production license is installed.

Installing Enterprise Edition

This section provides instructions for installing the Application Server Enterprise Edition on the various platforms for the various distributions. The following installation is addressed:

- Installing Enterprise Edition on Solaris SPARC, x86 and Linux
- Installing Enterprise Edition on Microsoft Windows

Installing Enterprise Edition on Solaris SPARC, x86 and Linux

Unless specifically identified, the following instructions apply to:

- File-based distribution on Solaris SPARC and x86, and Linux
- RPM-based distribution on Linux
- Package-based distribution on Solaris SPARC, x86

You must have root access to install the package-based and RPM-based distributions. Root user is not needed for file-based distribution.

1. After you have planned the topology, run the installation program.
   a. To run the installation program that uses the graphical interface, at the command prompt type `setup`.
   b. To run the installation program that uses the command-line interface, at the command prompt type `setup -console`

.

NOTE If you are installing the load balancer plug-in, your web server must already be installed. Refer to "Installing the Load Balancer Plug-in Component" on page 29.

2. Follow the installation wizard screens to accept the license agreement, and specify the path to the Application Server installation directory; or accept the default installation directory.

   The default installation directory is dependent on the distribution you are installing see "Packaging Models and Directory Structure" on page 11.

3. For package-based distribution, if you are installing only the HADB Server component, select `/opt` as the installation directory to install the HADB packages into the default location `/opt/SUNWhadb`.

4. For package-based distribution, select identical installation directories on all systems hosting HADB Server nodes.

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

5. Select the components you wish to install.

   If a component is disabled, the installation program has detected it as already installed on your system.

   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.

6. Choose to install the Java 2 SDK, or use a preinstalled Java 2 SDK.

   - If the correct version of the Java 2 SDK is installed, it is reused or you can enter the path to another correct version.
   - If there is no Java 2 SDK installed, you can choose to let the installation program install the Java 2 SDK package automatically.
   - For package-based or RPM-based distributions, if an incorrect version of the Java 2 SDK is found in the default path, you are prompted to upgrade your current version.
   - For file-based distribution, if you choose to install the Java 2 SDK, a private copy is installed in *install_dir*.

   The default Java 2 SDK installation path:

   - For Solaris SPARC and x86 package-based distribution: `/usr/j2se`
   - For Linux RPM-based distribution: `/usr/java`
   - For Solaris SPARC and x86 file-based distribution: *install_dir*`/jdk`

NOTE The Sun Java System Application Server Enterprise Edition software is certified to work with Java 2 SDK from Sun Microsystems. Third-party Java 2 SDK development kits, even with appropriate version number, are not supported.

7. For package-based and RPM-based distributions, you are prompted to identify your server configuration directory.

   The default server configuration directory is: `/etc/opt/SUNWappserver7`

8. For package-based and RPM-based distributions, you are prompted to identify your server domains directory.

   The default server domain directory is: `/var/opt/SUNWappserver7`

9. If you selected the load balancer plug-in component, identify your web server.

10. In the Server Configuration Information page (or at the command line), enter the following:

    - Admin User—Name of the user who administers the server
    - Admin User's Password—Password to access the Admin Server (8 character minimum)
    - Admin Server Port—Port number to access the Admin Server
    - HTTP Server Port—Port number to access the default server instance

    NOTE The installation program automatically detects ports in use and suggests unused ports for the default settings. For package-based distribution and file-based distribution as non-root user, the default ports are 80 for the HTTP Server, and 4848 for the Admin Server.

    If you are installing file-based distribution as non-root user, the default ports are 1024 for the HTTP Server, and 4848 for the Admin Server.

The installation program verifies the available disk space on your machine. If you do not have enough disk space, an error message is displayed. Consult the *Sun Java System Application Server 7 Release Notes* to identify the minimum disk space required.

The Installation Summary page is displayed indicating the installation status. If the installation is unsuccessful, consult the log files located at:

- Install Log: `/var/tmp/Sun_ONE_Application_Server_install.log`
- Low-level log
  - For file-based Solaris SPARC and x86 root user: `/var/sadm/install/logs/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For file-based Solaris SPARC and x86 non-root user: `/var/tmp/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For package-based Solaris SPARC and x86: `/var/sadm/install/logs/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For file-based Linux root and non-root user: `/var/tmp/Sun_ONE_Application_Server_install.`*`timestamp`*
  - For RPM-based Linux: `/var/tmp/Sun_ONE_Application_Server_install.`*`timestamp`*

If you downloaded the product from the web site, a 60-day license is installed.

If you installed the product from a CD, a non-expiring Application Server Standard Edition production license is installed.

11. Start the server.

12. If you selected the HADB components, verify that you have successfully installed the HADB on each host by typing: `hadbm --help`

A list of all commands available using the `hadbm` utility is displayed. The `hadbm` is located at *install_dir*`/SUNWhadb/4/bin`.

You are now ready to configure your system for high availability. Proceed to "Preparing for HADB Setup" on page 37.

13. After installation, if you selected the Load-balancer plug-in, edit the supplied `loadbalancer.xml.example` file to include references to actual application server instances. This file is located at: *webserver_instance_dir*`/config/loadbalancer.xml.example`

For more information on configuring HTTP load balancing and Failover, consult the *Sun Java System Application Server Administration Guide.*

14. Save the `loadbalancer.xml.example` file as `loadbalancer.xml` in the same directory.

Installing Enterprise Edition on Microsoft Windows

You must have administrator privileges to install the Application Server software.

1. Navigate to the directory where you unpacked the installation files.
2. Run the installation program. by selecting `setup.exe`.
3. Follow the installation wizard screens to accept the license agreement, and specify the path to the Application Server installation directory; or accept the default installation directory.

   The default installation directory is: c:\Sun\AppServer7
4. Select the components you wish to install.

   If a component is disabled, the installation program has detected it as already installed on your system.

   I

   NOTE If you are installing the load balancer plug-in, your web server must already be installed. Refer to "Installing the Load Balancer Plug-in Component" on page 29.
5. Choose to install the bundled Java 2 SDK, or use a pre-installed Java 2 SDK.
   - If the correct version of the Java 2 SDK is installed, you can re-use the existing installation. If the versions do not match, enter the path to an installation with the correct version.
   - If there is no Java 2 SDK installed, choose to install the bundled Java 2 SDK. The bundled Java 2 SDK is installed at: c:\installdir\jdk.
6. In the Server Configuration Information page (or at the command line), enter the following information:
   - Admin User—Name of the user who administers the server
   - Admin User's Password—Password to access the Admin Server (8 character minimum)
   - Admin Server Port—Port number to access the Admin Server
   - HTTP Server Port—Port number to access the default server instance

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

The installation program verifies the available disk space on your machine. If you do not have enough disk space, an error message is displayed. Consult the *Sun Java System Application Server 7 Release Notes* to identify the minimum disk space required.

The Installation Summary page is displayed indicating the installation status. If the installation is unsuccessful, consult the installation log file, `Sun_Java_system_Application_Server_install.log`, located in the Windows temp directory.

If you downloaded the product from the web site, a 60-day license is installed.

If you installed the product from a CD, a non-expiring Application Server Enterprise Edition production license is installed.

Installing the Load Balancer Plug-in Component

Follow the steps to separately install the load balancer plug-in component:

1. Check the system 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, remove it using the installation program.
2. Verify that the supported web server is installed on the machines where you are going to install the load balancer plug-in.

   NOTE You must install the web server and the load balancer plug-in using the same access permissions.

   Consult the *Sun Java System Application Server 7 Release Notes* to identify the currently supported Web Server versions.
3. Identify your web server and the web server instance path.

4. Follow the instructions in the setup program to complete the installation.

NOTE for Apache web server, the load balancer plug-in installation program extracts the necessary files to the `libexec` folder on Apache 1.3, or the `modules` folder on Apache 2.0.

- The Installation Summary page is displayed indicating the installation status. If the installation is unsuccessful, consult the installation log file located at `/var/tmp/Sun_Java_System_application_Server_install.log`. In addition, low-level installation log files are created at: `/var/sadm/install/logs/Sun_Java_System_Application_Server_install.`*`timestamp`*.

  On Windows, the installation log file is available in *install_dir*`\install.log`.

- On Windows, the installer adds the following properties in `sun-passthrough.properties` file, which is installed in `C:\Inetpub\wwwroot\sun-passthrough\`.

  `lb-config-file`: The path to loadbalancer.xml. The default location is *IIS_www_root*`\sun-passthrough\loadbalancer.xml`.

  `log-file`: The path to the loadbalancer log file. The default location is *IIS_www_root*`\sun-passthrough.log`

  `log-level`: The logging level for the loadbalancer plugin. The default is `INFO`.

5. After installation, edit `loadbalancer.xml.example` file to include references to actual application server instances. This file is located at: *webserver_instance_dir*`/config/loadbalancer.xml.example`

   On Windows: `ISS_www_root\sun-passthrough\loadbalancer.xml.example`.

6. Save the `loadbalancer.xml.example` file as `loadbalancer.xml` in the same directory.

NOTE After installing load balancer plug-in on Windows for IIS or Apache, append the path of the Application Server to the Path environment variable.

- Go to Start->Settings->Control Panel->System->Advanced->Environment Variables->System Variables->Path, and add: `appserver_install_dir\bin`
- You must restart the machine.

For more information on configuring HTTP load balancing and Failover, consult the *Sun Java System Application Server Administration Guide.*

Installing in Silent Mode

Silent mode installation runs without any user input checking a configuration file to obtain the installation information. The following topics are discussed:

- 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:

- 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 Methods" on page 14 for more detailed information.

Example Installation Configuration File

An installation configuration file looks similar to the following:

```
# Wizard Statefile created: Mon Jan 17 16:25:26 PST 2004
#              Wizard path: /tmp/sun-appserver7/./appserv.class
# Install Wizard Statefile for Sun Java System Application Server 7.1 Enterprise Edition
#
[STATE_BEGIN Sun Java System Application Server 108a4222b3a6a8ed98832d45238c7e8bb16c67a5]
defaultInstallDirectory = /opt/SUNWappserver7
currentInstallDirectory = /opt/SUNWappserver7
SELECTED_COMPONENTS = Java 2 SDK, Standard Edition 1.4.21_02#Application Server#Sun ONE
Message Queue 3.5#Sample Applications#Load Balancing Plugin#Uninstall#Startup
USE_BUNDLED_JDK = FALSE
JDK_LOCATION = /usr/j2se
JDK_INSTALLTYPE = PREINSTALLED
INSTALL_DEFAULT_CONFIG_DIR = /etc/opt/SUNWappserver7
INSTALL_CONFIG_DIR = /etc/opt/SUNWappserver7
INSTALL_DEFAULT_VAR_DIR = /var/opt/SUNWappserver7
INSTALL_VAR_DIR = /var/opt/SUNWappserver7
DOMAINS_DIR = /var/opt/SUNWappserver7/domains
WEBSERVER_INSTALL_DEFAULT_DIR = /usr/iplanet/servers
WEBSERVER_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 Java System Application Server 108a4222b3a6a8ed98832d45238c7e8bb16c67a5]
```

Modifying the Installation Configuration File

You can modify the installation configuration file by editing the variables and values described in Table 1-4.

Table 1-4 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	
SELECTED_COMPONENTS		List of product components selected for installation	Pound (#') character is used as list delimiter.
USE_BUNDLED_JDK	TRUE FALSE	Whether to install JDK bundled with the product	
JDK_LOCATION		JDK path	Preinstalled JDK 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 JDK installation	Only PREINSTALLED and CLEANINSTALL are valid values for silent installation configuration file.
INSTALL_DEFAULT_CONFIG_DIR		Default configuration files directory path	Value not actively used by installation program.
INSTALL_CONFIG_DIR		Selected configuration file directory path	
INSTALL_DEFAULT_VAR_DIR		Default domains configuration files directory path	Value not actively used by installation program.
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	**Enterprise Edition ONLY** Value not actively used by installation program.

Table 1-4 Installation Configuration File Variables *(Continued)*

Variable Name	Valid values (if applicable)	Content	Comments
WEBSERVER_INSTALL_DIR		Selected web server instance directory path	**Enterprise Edition ONLY**
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.

NOTE You cannot re-use the configuration file created for one distribution on other distributions or editions of the Application Server.

To view the results of the Silent installation, refer to the log file.

Installing in Silent Mode

To install the Sun Java System Application Server software in silent mode:

1. Review configuration file and verify that it contains what you want to use for your silent installation.
2. Copy your installation configuration file to each machine where you plan to install the Sun Java System Application Server software.
3. Copy the Sun Java System Application Server installation files to each machine where you plan to install the Application Server software.

4. Navigate to the directory where you copied the installation files and your installation configuration file.

5. 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 installed on your systems.

6. You can start the Application Server software by using the instructions in the *Sun Java System Application Server Administration Guide*.

   When the Admin Console is 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 37 to begin this process.

Chapter 2

Preparing for HADB Setup

After the high-availability components are installed on the servers that will be part of a cluster, you are ready to set up high availability.

The following topics are addressed here:

- Setting up HADB on Windows
- Configuring Shared Memory and Semaphores
- Setting Up Host Communication
- Setting Up the User Environment
- Setting Up Administration for Non-Root
- Using clsetup
- Time Synchronization

After you have done the tasks here, proceed to the *Sun Java System Application Server Administration 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 Java System Application Server System Deployment Guide.*

Setting up HADB on Windows

The version of HADB available on the Windows platform is 4.4.x compared to the version on UNIX platforms, which is 4.3.x. As such, there are a few changes from the UNIX version for configuring and administering HADB on Windows. These changes are called out at appropriate places in this chapter.

To setup an Application Server cluster along with an HADB database, you can use the clsetup utility on windows platforms, as described in "Using clsetup" on page 52. The examples in this section are UNIX-specific. Ensure that you make the appropriate changes for Windows platforms.

For details on setting up and running HADB on Windows platform, see Chapter 21, Administering High Availability on Windows," in *Sun Java System Application Server 7 2004Q2 Update 1 Administration Guide*.

The major differences between the two HADB versions are:

- New HADB management system. As a result, there are a few new commands added to hadbm and a few old ones have been deprecated.
- RSH / SSH configuration is not required on Windows platforms.
- New `adminpassword` option added to `hadbm` command. This administration password is different from the `dbpassword`.
- A few important limitations of the 4.3 version of HADB have been removed in the 4.4 version.
- A management agent process (that serves management requests from the hadbm, should be running before an HADB instance can be created.

For more information on these and other changes in HADB 4.4.x, see *Sun Java System Application Server 7 2004Q2 Update 1 Administration Guide*.

NOTE Windows might have to be reconfigured when HADB creates more than 60-80 SQL server processes. This may occur if you have configured too many JDBC connections in HA Store, or transiently after an application server has failed and then restarted.

If you have not configured windows, you might get the following error message in a pop-up window: `clu_sql_srv.exe: The application failed to initialize properly (0xc00000142). This` message is also registered in the event log. In the HADB server log, you will see a warning message such as, `Server time out waiting for sub-process, waited for 10 seconds`.

To avoid this problem, configure Windows as described here:

1. Reduce the number of JDBC connections that can be created against the database, or
2. Update the Windows registry according to the following procedure:

`http://support.microsoft.com/default.aspx?scid=kb;[LN];184802 (Cause 2)`.

Configuring Shared Memory and Semaphores

This sections contains instructions for configuring shared memory for the HADB host machines on UNIX platforms. You must configure the shared memory before working with the HADB.

NOTE This configuration is not required on Windows platform.

- Configuring Shared Memory on Solaris
- Configuring Shared Memory on Linux

Configuring Shared Memory on Solaris

1. Log in as root.

2. Add the following to the `/etc/system` file 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 0x10000000 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:

```
((<host> MB / 256 MB) * 0x10000000)
```

NOTE Note that the maximum value for `shmsys:shminfo_shmmax` is `0xffffffff`.

For semaphores:

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

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

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 computer for the shared memory settings to take effect.

   Consult the *HADB* chapter in the *Sun Java System Performance Tuning Guide* if there will be more than 16 nodes.

Configuring Shared Memory on Linux

1. To increase the shared memory to 512 MB, run the following:

   ```
   echo 536870912 > /proc/sys/kernel/shmmax
   echo 536870912 > /proc/sys/kernel/shmall
   ```

   `shmmax` is the maximum size of a single shared memory segment and `shmall` is the total shared memory to be made available.

   For a standard HADB node that uses default values, this value is enough. If you want larger size, then you have to increase it.

2. The default shared memory limit for `shmmax` can be changed in the `proc` file system without having to reboot your machine. Additionally, you can use `sysctl(8)` to change it.

3. To make these changes permanent, add this line to `/etc/sysctl.conf` file. This file is used during the boot process.

   ```
   echo kernel.shmmax=536870912 /etc/sysctl.conf
   ```

For an explanation of HADB nodes, see the section titled: *Configuring the HADB* in the *Administering the High-Availability Database (Enterprise Edition)* chapter of the *Sun Java System Application Server Administration Guide.* Additionally, consult the *Sun Java System Application Server Performance Tuning Guide* to learn about stress and performance testing.

Setting Up Host Communication

NOTE RSH / SSH configuration is not required on Windows platform.

To implement remote access for HADB administration, all machines that will be running HADB servers and the HADB management client must be configured for Remote Shell (RSH) or Secured Shell (OpenSSH / SSH). This procedure is required on UNIX platforms only.

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 & 10,the default installation of SSH is recommended.

On Solaris 8, by default SSH is not installed. Follow the instructions in "Installing SSH for Solaris 8" on page 45 if SSH is not on your Solaris 8 system.

If you want to use SSH, but it is not configured, you will not be able to use the `hadbm` command. Refer to "SSH Requirements and Limitations" on page 44 to verify that SSH is recognized.

This section contains instructions for:

- 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 2-3 on page 59 for guidelines on setting this parameter in the `clresource.conf` file.

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

To implement RSH:

1. Log in as root.
2. For Linux platform only, append the `/etc/securetty` file with the following:

   ```
   rexec
   rsh
   rlogin
   pts/0
   pts/1
   ```

   Additionally, under `/etc/xinetd.d/` change `disable=no` in the `rexec`, `rlogin`, and `rsh` files.

3. 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
   ```

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

5. Create a `.rhosts` file in the `$HOME` directory of the HADB user.

6. Verify that permissions are set to Read Only for group and other.

   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
   ```

   The identity is 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 SSH is installed by default on Solaris 9 systems, however, on Solaris 8, by default, SSH is *not* installed. To install SSH for Solaris 8 see "Installing SSH for Solaris 8" on page 45.

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 45.

- 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 Java System 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.

You are now ready to configure 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 44.
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:

1. Verify that SSH requirements have been met as specified in "SSH Requirements and Limitations" on page 44
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 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. Consequently, 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) add the node machine name to the `known_hosts` file under the `/.ssh` directory:

   `ssh` *machine_name*

   When queried about whether or not to add *machine_name* to the `known_hosts` file, 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.

Using HADB with Veritas file system on Solaris

When using Veritas file system on Solaris, you might get the message `WRN: Direct disk I/O mapping failed` in the HADB history files.

This message indicates that HADB is unable to turn on direct I/O for the data and log devices. Direct I/O is a performance enhancement that reduces the CPU cost of writing disk pages, and also causes less overhead of administering dirty data pages in the operating system.

To use direct I/O with Veritas, you should create the data and log devices on a file system that is mounted with the option `mincache=direct`. Note that this option will apply to all files created on the file system. For details, see the command `mount_vxfs(1M)`.

An alternative is to use the Veritas Quick I/O facility. In effect, this product makes it possible to perform raw I/O to file system files. For more information, see the Veritas document, *VERITAS File System™ 4.0 Administrator's Guide for Solaris*.

NOTE This description is based on available documentation only.

Sun Database Technology Group has not tested these configurations.

Using HADB With ext Filesystem on Linux

HADB does not support ext3 filesystem on Red Hat Advanced Server 2.1. Only ext2 is supported. ext3 filesystem is supported by HADB on Red Hat Advanced Server 3.0.

Setting Up the User Environment

NOTE The procedures mentioned in this chapter contain UNIX specific examples. Except where indicated, the same commands and examples, with appropriate modifications, are applicable for Microsoft Windows platforms.

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 `csh`. If you are using another shell, refer to the man page for your shell for instructions on setting variables.

1. Set the PATH variable:

   ```
   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, ensure that the JAVA_HOME environment is accessing JDK version 1.4.2_05 for Enterprise Edition.

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

4. If your HADB device files and log files are not in the default location (*appserver_install_dir*/SUNWhadb/4) ,use the following hadbm command to locate these important files:

   ```
   hadbm get configpath
   hadbm get devicepath
   hadbm get historypath
   hadbm get installpath
   ```

   Backup the locations listed by these commands.

Setting Up Administration for Non-Root

By default, during the initial installation or setup of the Sun Java System Application Server, write permissions of the files and paths created for Sun Java System Application Server are given to root only. For a user other than root to create or manage the Sun Java System 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 (with their default locations):

- Sun Java System Application Server configuration files—*install_config_dir*/cl*.conf
- Sun Java System Application Servers setup and administration scripts—*install_dir*/bin/cl*
- HADB binaries—*install_dir*/SUNWhadb
- HADB configuration—/etc/opt/SUNWhadb
- clsetup log file location—/var/tmp

You can create a user group for managing the Sun Java System 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 Java System 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 Java System Application Server user group. For example:

   ```
   # groupadd sjsasuser
   ```

   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 sjsasuser 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 clsetup

The purpose of the `clsetup` utility 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 Java System Application Server software is installed.

The `clsetup` utility is bundled with the Sun Java System Application Server software along with the `cladmin` utility.

NOTE The `cladmin` command is used to streamline the process of configuring and administering the cluster after all installation and configuration tasks are complete. Refer to the *Sun Java System Application Server Administration Guide* for instructions on creating the HADB and on using the `cladmin` command.

The following topics are addressed:

- How clsetup Works
- clsetup Requirements and Limitations

- Editing the clsetup Input Files
- Running clsetup
- Cleanup Procedures for clsetup

How clsetup Works

The `clsetup` utility is a set of Sun Java System Application Server commands that allow a cluster to be configured automatically, based on prepopulated input files. As part of cluster setup, an HADB is created. However, you must set up your working cluster using the hadbm commands as described in the *Sun Java System Application Server Administration Guide*.

NOTE The `clsetup` utility 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 clsetup Accomplishes
- Commands Used by clsetup

How the Input Files Work

Three input files are used by the `clsetup` utility 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 57 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 Java System Application Server 7.1 Enterprise Edition software. Refer to "The clpassword.conf File" on page 58 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 59 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.

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

What clsetup Accomplishes

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

- 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).
- Configures an RMI/IIOP cluster in all the instances listed in the `clinstance.conf` file (server1, server2); thereby enabling RMI/IIOP failover.
- Configures SFSB failover 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 clsetup

The `clsetup` utility uses a number of `hadbm` and `asadmin` commands to set up the cluster. In Table 2-1, the `clsetup` task is described in the left column and the command used to accomplish the task is listed in the right column.

Table 2-1 hadbm and asadmin Commands Used by the clsetup Utility

Task Performed by clsetup	Command
Checks to see if database exists.	`hadbm status`
Creates and starts the HADB.	`hadbm create`
Gets the JDBC URL.	`hadbm get jdbcURL`
Creates the session store.	`asadmin create-session-store`
Checks the instance status.	`asadmin show-instance-status`
Creates the instance.	`asadmin create-instance`
Creates the JDBC connection pool.	`asadmin create-jdbc-connection-pool`
Registers the data source.	`asadmin create-jdbc-resource`
Configures the persistence type	`asadmin configure-session-persistence`
Configures RMI/IIOP failover	`asadmin add-iiop-cluster-endpoint`
Configures SFSB failover	`asadmin set`
Reconfigures the instance.	`asadmin reconfig -u admin`

clsetup Requirements and Limitations

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

- The install paths, device paths, configuration paths, and so on must be the same on all machines that are part of the cluster.
- Before you can use `clsetup`, the `asadmin` and `hadbm` utilities must be available on the local machine. `clsetup` can only be run on a machine where the following are installed:
  - The Sun Java System Application Server component or the Sun Java System Application Server Administration Client component
  - The HADB component or the HADB Management Client component

- Before you can use `clsetup`, configure shared memory for UNIX platforms as described in "Configuring Shared Memory and Semaphores" on page 39. The `clsetup` utility does not set any shared memory values.

  This procedure is not required on Windows platforms.

- Before you can use the `clsetup` utility, set up the HADB cluster host communication for SSH or RSH (on UNIX platforms) as described in "Setting Up Host Communication" on page 41.

  This procedure is not required on Windows platforms.

- If you are using RSH (which is *not* the default), uncomment the following line in the `clresource.conf` file:

  ```
  #set managementProtocol=rsh
  ```

- 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 `clsetup`.

- Before running `clsetup`, start the Admin Servers of all the Sun Java System 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, `clsetup` 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. `clsetup` is not designed to set up instances with different values. For example, `clsetup` cannot create a JDBC connection pool with different settings for each instance.

- `clsetup` does not perform any `inetd` configuration; the HADB is created with no `inetd` settings. Instructions for performing `inetd` configuration are contained in the *Sun Java System Application Server Administration Guide*.

  This configuration is not required on Windows platform.

- Host names in the shell initialization files—If prompts are included with host names in your `.cshrc` or `.login` files, `clsetup` may appear to hang. 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 `clsetup` as a user other than root, follow the steps described in Setting Up Administration for Non-Root.

Editing the clsetup Input Files

The input files that are needed for the `clsetup` command are installed under the configuration installation directory, (by default `/etc/opt/SUNWappserver7` on UNIX and `c:\Sun\AppServer7\config\` on Windows), as part of the installation procedure. These input files are pre-populated with the values to set up a typical configuration, you can edit them as needed for your configuration.

This section addresses:

- The clinstance.conf File
- The clpassword.conf File
- The clresource.conf File

The clinstance.conf File

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

```
# Comment

instancename 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 the same order. Comments can be added anywhere in the file.

Table 2-2 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.

Table 2-2 Entries in the clinstance.conf File

Parameter	Definition	Default Value
`instancename`	Application Server instance name	server1, server2
`user`	Admin Server user name	`admin`
`host`	Host name	`localhost`
`port`	Admin Server port number	`4848`
`domain`	Administrative domain name	`domain1`
`instanceport`	Application Server instance port	`80`, `81`
`master`	Master instance (used for cluster verification)	false

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 `clsetup` runs, it launches the `asadmin` command which needs the Admin Server password 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 `clresource.conf` file is created to set up a typical configuration. The `clresource.conf` file contains information about the following resources that are part of the cluster:

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

On UNIX platforms, permissions 0600 are preset on the `clresource.conf` file, which can only be accessed by the root user.

NOTE Before running `clsetup`, the values specified in the `clresource.conf` 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.

Table 2-3 describes the HADB parameters in the clresource.conf File.

Table 2-3 HADB Parameters in the clresource.conf File

Parameter	Definition	Default Value
`historypath`	Path for the history files.	`/var/tmp` `On Windows:` *REPLACEDIR* (`REPLACEDIR` is replaced by the actual `URL` at runtime.)

Table 2-3 HADB Parameters in the clresource.conf File *(Continued)*

Parameter	Definition	Default Value
`devicepath`	Path for the data and log devices.	`/opt/SUNWappserver7/SUNWhadb/4` `On Windows: C:\Sun\AppServer7\SUNWhadb\4.4.0-14`
`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 *Sun Java System Application Server 7.1 Administration Guide*. 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. Not applicable on Windows plarform.	`false`
`inetdsetupdir`	Directory where the`inet` daemon setup files will be put. Not applicable on Windows plarform.	`/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.

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

Table 2-4 describes the session store parameters in the `clresource.conf` file.

Table 2-4 Session Store Parameters in the clresource.conf File

Parameter	Definition	Default Value
`storeurl`	URL of the HADB store	*REPLACEURL* 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 2-5.
`storepassword`	Password for the `storeuser`	`password` NOTE: Must match the password property in Table 2-5.
`dbsystempassword`	Password for the HADB system user	`password`
`adminpassword`	The administrator password to manage the domain. If you use the `adminpassword` option with `hadbm createdomain` or `hadbm create`, then you must enter this password each time you use any hadbm command. `(On Windows only)`	none
`adminpasswordfile`	Use the adminpasswordfile option to provide the password as a path to a file that contains the password `(On Windows only)`	None
`no-adminauthentication`	The --no-adminauthentication option allows the administrator to use all hadbm commands without providing the administrator's password. `(On Windows only)`	None

Table 2-5 describes the JDBC connection pool parameters in the `clresource.conf` file.

Table 2-5 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
`datasourceclassname`	Name of the vendor-supplied JDBC datasource. Name of the vendor-supplied JDBC datasources capable datasource class will implement `javax.sql.XADatasource` interface. Non-XA or Local transactions only datasources will implement `javax.sql.Datasource` interface.	`com.sun.hadb.jdbc.ds.HadbDataSource`
`isolationlevel`	Specifies the transaction isolation level on the pooled database connections.	`repeatable-read`
`isisolationguaranteed`	Transaction isolation level guaranteed	`true`
`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.)

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

Table 2-6 describes the JDBC resource parameters in the `clresource.conf` file.

Table 2-6 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 2-5.

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

Table 2-7 describes the session persistence parameters in the `clresource.conf` file.

Table 2-7 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.

Table 2-8 describes the stateful session bean parameter in the `clresource.conf` file.

Table 2-8 Stateful Session Bean Parameters in the clresource.conf File

Parameter	Definition	Default Value
sfsb	Stateful session bean failover	false

Table 2-9 describes the RMI/IIOP failover parameter in the `clresource.conf` file.

Table 2-9 RMI/IIOP Failover Parameters in the clresource.conf File

Parameter	Definition	Default Value
rmi_iiop	RMI/IIOP cluster configuration	false

Table 2-10 describes the cluster identification parameter in the `clresource.conf` file.

Table 2-10 Cluster Identification Parameters in the clresource.conf File

Parameter	Definition	Default Value
`cluster_id`	Cluster ID	`cluster1`

Example clresource.conf File on UNIX

```
[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:eliminat
eRedundantEndTransaction=true:serverList=REPLACEURL

appservCPL

[JDBC_RESOURCE]
connectionpoolid      appservCPL
jdbc/hastore
```

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

Example clresource.conf file on Windows

```
[HADBINFO]
package V4.4
historypath   REPLACEDIR
devicepath    C:\Sun\AppServer7\SUNWhadb\4.4.0-12
datadevices    1
portbase    15200
spares    0
#set    LogbufferSize=32,DataBufferPoolSize=128
devicesize    208
dbpassword    password
hosts    machine1,machine2
adminpassword    password
hadb
[SESSION_STORE]
storeurl    EPLACEURL
storeuser    appservusr
storepassword    password
dbsystempassword    password
[JDBC_CONNECTION_POOL]
steadypoolsize    8
maxpoolsize    2
datasourceclassname    com.sun.hadb.jdbc.ds.HadbDataSource
isolationlevel     repeatable-read
--isisolationguaranteed=true
validationmethod    meta-data
```

```
property    username=appservusr:password=password:cacheDataBaseMetaData=fa
lse:eliminateRedundantEndTransaction=true:serverList=REPLACEURL

appservCPL

[JDBC_RESOURCE]

connectionpoolid    appservCPL

jdbc/hastore

[SESSION_PERSISTENCE]

type    ha

frequency    web-method

scope    session

store    jdbc/hastore

[EJB_FAILOVER]

sfsb    true

[RMI_IIOP_FAILOVER]

rmi_iiop    true

[CLUSTER_ID]

cluster_id    cluster1
```

Running clsetup

The syntax for running `clsetup` is as follows:

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

If no arguments are specified, `clsetup` 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
```

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 57.

To run `clsetup`:

1. Verify that the requirements have been met as described in “clsetup Requirements and Limitations” on page 55.

NOTE If you want to run `clsetup` as a user other than root, see “Setting Up Administration for Non-Root” on page 51 to set this up.

2. Verify that the input files have the required information to set up the cluster. If necessary, edit the input files following the guidelines in “Editing the clsetup Input Files” on page 57.
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 Java System Application Server installation `/bin` directory.
5. Invoke the `clsetup` command:

   `On Unix:./clsetup`

   On Windows: `clsetup.bat`

   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` (on UNIX) or the default Windows `temp` directory (on Windows).

   If a vital error occurs, 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.

   If the entities to be handled (HADB nodes and Application Server instances) already exist, `clsetup` does not delete or reconfigure them, and the respective configuration steps are skipped. This type of event is recorded in the log file.
6. When `clsetup` completes the configuration, scan the log file after each run to review the setup.
7. Upon completion, `clsetup` returns the exit codes described in Table 2-11:

Table 2-11 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 `asadmin`
11	Script cannot find `hadbm`
12	Cannot create temporary file
13	Session store configuration failed
14	Create HADB failed
15	HADB `get jdbcURL` failed
16	User exits in welcome message

Cleanup Procedures for clsetup

After running `clsetup`, 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: `asadmin delete-instance` *instance_name*
- To delete the HADB:
  - **a.** `hadbm stop` *database_name*
  - **b.** `hadbm delete` *database_name*

- To clear the session store: `cladmin clear-session-store --storeurl` *URL_information* `--storeuser` *storeUsername* `--storepassword` *store_user_name*
- To delete the JDBC connection pool: `asadmin delete-jdbc-connection-pool` *connectionpool_name*
- To delete the JDBC resource: `cladmin delete-jdbc-resource` *JDBCresource_Name*

See the Man pages for detailed examples of each of these commands. You are now ready to proceed to the *Sun Java System Application Server Administration Guide* for instructions on configuring the HADB and managing the cluster, the load balancer plug-in, and the HADB.

Time Synchronization

It is strongly recommended to synchronize the clocks on the hosts running HADB because HADB uses time stamps based on the system clock for debugging purposes as well as for controlling internal events. The events are written out to history files prefixed by time stamps. Since HADB is a distributed system, the history files from all HADB nodes are analyzed together in troubleshooting. HADB also uses the system clock internally for managing time dependent events like timeouts.

Adjust the system clock on a running HADB system is not recommended. HADB has been implemented to handle this in general, but you should note the following points:

- Problems in the operating system or other software components on the hosts might cause problems for the whole system when the clock is adjusted. Typical problems are hangs or restarts of nodes.
- Adjusting the clock backward may cause some of the HADB server processes to hang for a period of time as the clock was adjusted. Adjusting the time forward does not exhibit the same problem.

To synchronize clocks, e.g., “xntpd” (network time protocol daemon) in Solaris and “ntpd” in Linux can be used.

Chapter 3

Uninstalling the Standard and Enterprise Edition Software

This chapter contains instructions for uninstalling the Sun Java System Application Server 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.

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. See the *Sun Java System Application Server Troubleshooting Guide*.

All components are uninstalled. Partial uninstallation is not supported.

Uninstallation Requirements

The following must be true for uninstallation to succeed on Enterprise Edition:

- All databases are stopped and disabled prior to uninstalling.

  For guidelines on stopping the HADB, refer to the *Sun Java System Application Server Administration Guide*.

- 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 41.

- The uninstallation program is run from the original installation host.

Uninstalling the Application Server Software

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

NOTE If your JDK used in the product is installed in a non-default directory, you must run:

`uninstall -javahome` *valid_j2se_directory*

where *valid_j2se_directory* is the path to your JDK installation.

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

1. Log in as the same user who performed the installation on the machine where you want to uninstall the Sun Java System Application Server software.
2. Navigate to your machine's Sun Java System Application Server installation directory.
3. Select your installation method.
   - To run uninstallation using the graphical interface: `./uninstall`
   - To run uninstallation using the command-line interface: `./uninstall -console`

4. Click Uninstall to start the uninstallation process.

   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:

- uninstall Log for Solaris SPARC, x86 and Linux: `/var/tmp/Sun_ONE_Application_Server_uninstall.log`
- uninstall Log for Microsoft Windows: *`installdir`*`\uninstall.log`
- Low-level log
  - For file-based Solaris SPARC and x86 root user: `/var/sadm/install/logs/Sun_ONE_Application_Server_uninstall.`*`timestamp`*
  - For file-based Solaris SPARC and x86 non-root user: `/var/tmp/Sun_ONE_Application_Server_uninstall.`*`timestamp`*
  - For package-based Solaris SPARC and x86: `/var/sadm/install/logs/Sun_ONE_Application_Server_uninstall.`*`timestamp`*
  - For file-based Linux root and non-root user: `/var/tmp/Sun_ONE_Application_Server_uninstall.`*`timestamp`*
  - For RPM-based Linux: `/var/tmp/Sun_ONE_Application_Server_uninstall.`*`timestamp`*

5. Select Close to quit the uninstallation program.
6. Verify that uninstallation succeeded by checking to see that the Application Server components have been removed from the system.

Uninstalling in Silent Mode (non-interactive)

To uninstall the Application Server software in non-interactive silent mode:

1. Log in as the same user who performed the installation on the machine where you want to uninstall the Application Server software.
2. Start silent uninstallation: `uninstall -silent`

   When the prompt is returned, the silent uninstallation is completed.
3. Verify that uninstallation succeeded by checking to see that the Sun Java System Application Server components have been removed from the system.
4. Repeat this process for each server which you want to uninstall.

Appendix A

Upgrading the Application Server

The Sun Java System Application Server installer is capable of upgrading from a previous installation of the Application Server to the current version.

Consult the *Sun Java System Application Server Release Notes* to identify the upgrade options available with the Sun Java System Application Server installer.

The following points should be kept in mind when upgrading the Application Server installation:

- Only package-based to package-based, file-based to file-based, RPM-based to RPM-based upgrades are supported.
- The upgrade installation option is available using the graphical-interface and console installation methods; silent mode upgrade is not supported.
- All the Application Server components can be upgraded as a whole or individually. Additionally, incremental installation can be used to upgrade each component separately.
- If you have a previous installation of Solaris 9 bundled with Application Server 7 Platform Edition, you must use the `prodreg` utility to uninstall the Application Server. The utility lists all the software bundles installed. Select the desired installation and uninstall it. This removes all the dependent packages from the machine and from the Solaris product registry.

The following topic is addressed:

- Upgrading the Standard or Enterprise Edition

Upgrading the Standard or Enterprise Edition

The following instructions apply to file-based and package-based distribution unless specifically identified.

1. Run the installation program.

   a. To run the installation program that uses the graphical interface, at the command prompt type `setup`.

   b. To run the installation program that uses the command-line interface, at the command prompt type `setup -console`.

2. Follow the installation wizard screens to accept the license agreement, and specify the path to the Application Server installation directory; or accept the default installation directory.

   The default installation directory is dependent on the distribution you are installing see "Packaging Models and Directory Structure" on page 11.

3. If you have a previous version of the Application Server installed on your system, The installation program detects it, identifies the upgrade option available, and prompts you to:

   - For file-based installation, select a new directory or continue with the upgrade.
   - For package-based and RPM-based installation:
     - If the selected installation directory is the same as the previously installed (old) version of the Application Server, select Continue.

       If the selected installation directory is different from the previously installed (old) version of the Application Server, you are prompted to change the directory path and continue with the upgrade.

4. In the Component Selection screen, already installed components are disabled. Select the additional components you wish to install.

5. Proceed with the rest of the installation process.

After upgrading the Application Server or any components to Enterprise Edition, you must run the `clsetup` program for cluster configuration.

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