Sun Java™ System

Identity Manager 7.1 Installation

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Contents

Preface

This *Sun Java™ System Identity Manager Installation* publication provides detailed information and instructions to help you install and update Sun Java Systems Identity Manager and associated software.

Who Should Use This Book

Sun Java™ System Identity Manager Installation was designed for those who will install Identity Manager and perform initial deployment tasks.

Deployers should have a background in application servers, databases, and network connectivity.

How This Book Is Organized

Identity Manager Installation is organized into these chapters:

- Chapter 1, "Before You Install" — Details system requirements and tasks you should perform before installing the Identity Manager software.
- The contents of Chapter 2 through Chapter 8 provide detailed procedures for installing Identity Manager and associated software for use with these application servers:
  - Chapter 2 — Tomcat
  - Chapter 3 — WebLogic
  - Chapter 4 — WebSphere
  - Chapter 5 — iPlanet Application Server

- Chapter 6 — Sun ONE Application Server
- Chapter 7 — Sun Java System Application Server
- Chapter 8 — JBoss

- Chapter 9, “Install the Sun Identity Manager Gateway” — Provides procedures for installing the Sun Identity Manager Gateway.
- Chapter 10, “Getting Started” — Describes how to begin using Identity Manager and where to go for help and information.
- Chapter 11, “Updating Identity Manager” — Provides procedures for preparing to update an installed version of the Identity Manager product For full upgrade information see *Identity Manager Upgrade*..
- Chapter 12, “Uninstalling Applications” — Lists steps for removing an installed version of the product.
- Chapter 13, “Installing Identity Manager Manually” — Details alternate, manual procedures for installing Identity Manager.
- Chapter 14, “Installing Service Packs” — Provides instructions for downloading and installing service packs.
- Appendix A, “Index Database Reference” — Shows selection options for index database setup during Identity Manager installation.
- Appendix B, “Configuring MySQL” — Describes how to set up and configure a MySQL database for use as the Identity Manager default data store.
- Appendix C, “Configuring Data Sources for Identity Manager” — Describes how to update the repository configuration in Identity Manager to point to a WebSphere or WebLogic data source.
- Appendix D, “Changing the Database Repository Password”Appendix D. Changing Your Database Repository Password — Procedures for changing the repository password for your index database.
- Appendix E, “Configuring JCE” — Details steps to configure the Java Cryptography Extension (JCE) to work with Identity Manager.
- Appendix F, “setRepo Reference” — Reference page for the setRepo command.
- Appendix G, “DBMS Recovery and the Repository” — Details steps to recovering the repository from a failure.

Conventions Used in This Book

The tables in this section describe the conventions used in this book.

Typographic Conventions

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

Table 1 Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123 (Monospace)	API and language elements, HTML tags, web site URLs, command names, file names, directory path names, onscreen computer output, sample code.	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
AaBbCc123 (Monospace bold)	What you type, when contrasted with onscreen computer output.	`% su` `Password:`
AaBbCc123 (Italic)	Book titles, new terms, words to be emphasized. A placeholder in a command or path name to be replaced with a real name or value.	Read Chapter 6 in the *User's Guide*. These are called *class* options. Do *not* save the file. The file is located in the *install-dir*`/bin` directory.

Symbols

The following table describes the symbol conventions used in this book.

Table 2 Symbol Conventions

Symbol	Description	Example	Meaning
`[ ]`	Contains optional command options.	`ls [-l]`	The `-l` option is not required.
`{ | }`	Contains a set of choices for a required command option.	`-d {y|n}`	The `-d` option requires that you use either the `y` argument or the `n` argument.

Table 2 Symbol Conventions<E Emphasis>(Continued)

Symbol	Description	Example	Meaning
-	Joins simultaneous multiple keystrokes.	Control-A	Press the Control key while you press the A key.
+	Joins consecutive multiple keystrokes.	Ctrl+A+N	Press the Control key, release it, and then press the subsequent keys.
>	Indicates menu item selection in a graphical user interface.	File > New > Templates	From the File menu, choose New. From the New submenu, choose Templates.

Related Documentation and Help

Sun provides additional printed and online documentation and information to help you install, use, and configure Identity Manager:

- *Identity Manager Upgrade*: Step-by-step instructions and reference information to help you upgrade and configure Identity Manager and associated software.
- *Identity Manager Administration*: Procedures, tutorials, and examples that describe how to use Identity Manager to provide secure user access to your enterprise information systems.
- *Identity Manager Technical Deployment Overview*: Conceptual overview of the Identity Manager product (including object architectures) with an introduction to basic product components.
- *Identity Manager Workflows, Forms, and Views*: Reference and procedural information that describe how to use the Identity Manager workflows, forms, and views — including information about the tools you need to customize these objects.
- *Identity Manager Resources Reference*: Reference and procedural information that describe how to load and synchronize account information from a resource into Sun Java™ System Identity Manager.
- *Identity Manager Deployment Tools*: Reference and procedural information that describe how to use different Identity Manager deployment tools including rules and rules libraries, common tasks and processes, dictionary support, and the SOAP-based Web service interface provided by the Identity Manager server.

- *Identity Manager Tuning, Troubleshooting, and Error Messages*: Reference and procedural information that describe Identity Manager error messages and exceptions, and provide instructions for tracing and troubleshooting problems you might encounter as you work.
- *Identity Manager Service Provider Edition Deployment*: Reference and procedural information that describes how to plan and implement Sun Java™ System Identity Manager Service Provider Edition.
- Identity Manager Help

  Online guidance and information that offers complete procedural, reference, and terminology information about Identity Manager. You can access help by clicking the Help link from the Identity Manager menu bar. Guidance (field-specific information) is available on key fields.

Accessing Sun Resources Online

For product downloads, professional services, patches and support, and additional developer information, go to the following:

- Download Center
  http://wwws.sun.com/software/download/
- Professional Services
  http://www.sun.com/service/sunps/sunone/index.html
- Sun Enterprise Services, Solaris Patches, and Support
  http://sunsolve.sun.com/
- Developer Information
  http://developers.sun.com/prodtech/index.html

Contacting Sun Technical Support

If you have technical questions about this product that are not answered in the product documentation, contact customer support using one of the following mechanisms:

- The online support web site at http://www.sun.com/service/online/us
- The telephone dispatch number associated with your maintenance contract

Related Third-Party Web Site References

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For example, the title of this book is Sun Java™ System *Identity Manager Resource Reference*, and the part number is 820-0817-10.

Chapter 1

Before You Install

Use the information and procedures in the following sections to prepare for installation of Identity Manager:

Supported Software and Environments

This section lists software and environments that are compatible with the software:

- Operating Systems
- Application Servers
- Browsers
- Database Servers
- Java Runtime Environment
- Sun Identity Manager Gateway
- Supported Resources
- Web Servers

NOTE Because software product developers frequently ship new versions, updates, and fixes to their software, the information published here changes often. Review the release notes for updates before proceeding with installation.

Operating Systems

- AIX 4.3.3, 5.2, 5L v5.3
- HP-UX 11i v1, 11i v2
- Microsoft Windows 2000 SP3 or above
- Microsoft Windows 2003
- Solaris 8, 9, 10 Sparc and x86d
- Red Hat Linux Advanced Server 2.1
- Red Hat Linux Enterprise Server 3.0, 4.0
- Novell SuSE Linux Enterprise Server 9 SP1

Application Servers

The application server you use with these applications must be Servlet 2.3-compliant and installed with the included Java platform (unless noted as follows):

- Apache Tomcat
  - Version 4.1.x (with JDK 1.4.2)
  - Version 5.0.x (with JDK 1.4.2)
  - Version 5.5 (with JDK 1.5)
- BEA WebLogic® Express 8.1 (with JDK 1.4.2)
- BEA WebLogic® Server™ 8.1 (with JDK 1.4.2)
- BEA WebLogic® Server™ 9.1 and 9.2 (with JDK 1.5)
- IBM WebSphere® 6.0, 6.1
- IBM WebSphere® Application Server - Express Version 5.1.1 (with JDK 1.4.2)

- JBoss Application Server 4.0.4
- Sun™ ONE Application Server 7
- Sun Java™ System Application Server Platform Edition 8, 8.2
- Sun Java™ System Application Server Platform Edition and Enterprise Edition 8.1
- Sun Java™ System Application Server Platform Edition 9

NOTE If your current application server does not support JDK 1.4.2 or 1.5, please check with your vendor to examine the implications of upgrading to one that does before installing Identity Manager.

Your current application server container must support UTF-8.

Browsers

- Microsoft Internet Explorer 5.x and later
- Safari 2.0 and later for Mac OS X 10.3.3 and later
- Mozilla 1.78 with JRE 1.5
- Firefox 1.04,1.05,1.06 with JRE 1.5

Repository Database Servers

- IBM® DB2® Universal Database for Linux, UNIX®, and Windows® (Version 7.x, 8.1, 8.2)
- Microsoft SQL Server™ 2000, 2005
- MySQL™ 4.1, 5.0
- Oracle 9i® and Oracle Database 10g, 10gR1 and 10gR2®

NOTE You must configure your database with a character set that will support the characters that you want to store. If you need to store multi-byte characters, you should use a character set (such as UTF-8) that supports Unicode.

See “DBMS Recovery and the Repository” on page 145 for DBMS recovery information.

Sun Identity Manager Gateway

See“Install the Sun Identity Manager Gateway” on page 85, for further information on the Sun Identity Manager Gateway.

Supported Resources

See the *Identity Manager Resources Reference* for a list of all supported resource adapters.

Web Servers

NOTE Integration between an application server and Web server is not required. You may choose to use a Web server for better load balancing and for increased security (through the https protocol).

- Apache 1.3.19
- iPlanet 4.1
- Microsoft Internet Information Server (IIS) 4.0, 5.0
- Sun™ ONE Web Server 6

NOTE When using Web Server 6 add the Java mail.jar and activation.jar files to the WEB-INF/lib directory. The mail and activation jar files can be found at:

`http://java.sun.com/products/javamail`
`http://java.sun.com/products/beans/glasgow/jaf.html`

Memory Requirements

You should determine your memory needs and set values in your application server's JVM. Do this by adding maximum and minimum heap size to the Java command line; for example:

```
java -Xmx512M -Xms512M
```

NOTE

- For best performance, set these values to the same size.
- Depending on your specific implementation, you may need to increase these recommended values if you run reconciliation.

For performance tuning purposes, you may also set the following in the `waveset.property` file:

```
max.post.memory.size value
```

NOTE The `max.post.memory.size` specifies the maximum number of bytes that a posted file (for example., via an `HTML FileSelect` control) may contain without being spooled to the disk. For cases where you do not have permission to write to temp files, you should increase the `max.post.memory.size` to avoid having to spool to the disk. The default value is 8 Kbytes.

For additional system requirements and information, refer to the Identity Manager release notes.

Setup Task Flow

Depending on your choice of application server and database, the steps you will follow for setup differ. In general, you will:

- Perform prerequisite tasks, such as installing a Java compiler and JVM, and setting up an index database
- Install and configure an application server
- Install and configure the Identity Manager software

NOTE The installer now supports upgrading installations that have renamed / deleted / disabled the default Configurator account. The installer now prompts for the proper username and password that can import the update.xml during the upgrade post process. If the incorrect user or password is entered the user is prompted up to three times. The error should be displayed in the text box behind it. For manual installation you must provide the `-U <username> -P <password>` in order to pass the credentials to UpgradePostProcess.

NOTE On UNIX or Linux systems:

- When installing versions 5.0 - 5.0 SP1, `/var/tmp` must exist and be writable by the user running the installer.
- When installing versions 5.0 SP2 and higher, `/var/opt/sun/install` must exist and be writable by the user running the installer.

When using application servers with staging directories, keep the staging directory that was used for Identity Manager installation after deploying the product.

- Optionally set up the Sun Identity Manager Gateway
- Optionally set up PasswordSync

For some application server types and preferences, these general steps are combined, performed in a different order, or eliminated entirely.

Prerequisite Tasks

Before installing the Identity Manager software, you need to:

- Decide Where to Store Index Repository Files
- Set Up a Java Virtual Machine and Java Compiler
- Set Up an Index Database
- What's Next?

Decide Where to Store Index Repository Files

You must create the directory where you will store application files before launching the installation program. You can store application files in a staging folder, or you can install into your application server's Web application directory.

Using a Staging Directory

Because the applications are based on J2EE Web, you can store them in a staging folder. This staging folder is used to deploy the application into your specific application server. Typically, a Web Application Archive (`.war`) file is created for use in the deployment steps.

Using a Web Application Directory

You may choose to install directly into an application server's Web application directory. In this case, you will specify the Web application directory during installation. The installation program will place the Identity Manager files in folder named idm in that location by default.

NOTE When using a localfiles index repository in a WebSphere application server environment, set the localfiles repository to a location outside of the Identity Manager directory.

NOTE For an Oracle RAC environment as Identity Manager repository, connecting with thin driver, use the following format as url parameter in lh setup:

```
jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
(ADDRESS=(PROTOCOL=TCP)(HOST=host01)(PORT=1521))(
ADDRESS=(PROTOCOL=TCP)(HOST=host02)(PORT=1521))
(ADDRESS=(PROTOCOL=TCP)(HOST=host03)(PORT=1521))
(CONNECT_DATA=(SERVICE_NAME=PROD)))
```

Set Up a Java Virtual Machine and Java Compiler

The application requires a Java compiler and a Java Virtual Machine (JVM) to run the Java classes that perform actions within Identity Manager. Both of these can be found in a Java SDK. (The JRE packages do not include a Java compiler.)

NOTE

- Many application servers include a JDK bundled with their installation. The JDK version that is shipped with the application server is always preferred to any other JDK installed on your server.
- You should add `JAVA_HOME` to your list of system environment variables and to your system path. To do this, add `JAVA_HOME` to your system environment and `JAVA_HOME\bin` to your path, making sure to list it before any other Java variables. While adding `JAVA_HOME` to your list of system environment variables is helpful for Identity Manager, it may affect other applications.

Set Up an Index Database

You should use a third-party relational database to store the system index data. If you plan to do this, use the general procedures in this section as guidelines when setting up the index database. Your database administrator may choose to customize the provided scripts to suit your site-specific configuration and standards.

CAUTION If you store the Index data in a local file system, you should select a location outside of the application or Web server directory structure. The dynamic directories created for the index data cannot be protected from intruders who might use a Web browser to scan directories serviced by the Web server.

NOTE You must configure your database with a character set that will support the characters that you want to store. If you need to store multi-byte characters, you should use a character set (such as UTF-8) that supports Unicode.

About the Sample Database Scripts

Identity Manager provides sample database scripts that you can modify and use to create tables and indexes. You may choose to use an alternate method to create equivalent tables and indexes, but must meet these requirements:

- Tables (or views) must exist with the names specified in the sample DDL.

- Each named table (or view) must be owned by (or aliased to) the proxy user that is represented as “waveset” in the sample DDL.
- Each named table (or view) must contain all the columns specified for that table in the sample DDL.
- Each named column must have a data type that is consistent with the data type specified for that column in the sample DDL.

You can modify the sample scripts to suit your environment. Common changes include:

- Specifying a different proxy user
- Specifying different tablespaces, or separate tablespaces for tables and indexes
- Changing a data type. This is acceptable if a view or the JDBC driver makes the change transparent.
- Adding columns. This is acceptable if each column is nullable or defaulted.
- Removing or renaming columns. This is acceptable if a view makes this transparent.
- Renaming indexes

NOTE If you make changes to the sample scripts, then you must make equivalent changes to any sample database upgrade scripts that you receive in the future.

If you choose to set up Index data in regular files in a file system, skip to the chapter detailing Identity Manager installation. Otherwise, go to one of the sections in this chapter to set up:

- MySQL
- Oracle
- DB2
- SQL Server

Setting Up MySQL

Follow these steps to set up MySQL for use with Identity Manager.

NOTE

- For additional information about setting up and configuring MySQL, refer to "Configuring MySQL" on page 115.
- See "Supported Software and Environments" on page 15 for supported database server versions, and for download or product locations.

1. Install the MySQL software. Start the MySQL process (if it does not start automatically).
2. Create the database. To do this:
   a. Copy the `create_waveset_tables.mysql` script from the `db_scripts` directory on the installation CD (or from the `idm\sample` directory if you have already installed) to a temporary location.
   b. Modify the `create_waveset_tables.mysql` script to change the database user password.
   c. Create the new tables by using one of the following commands:

      On Windows

      ```
      c:\mysql\bin\mysql -u root < create_waveset_tables.mysql
      ```

      On UNIX

      ```
      $MYSQL/bin/mysql -u root < create_waveset_tables.mysql
      ```

Setting Up Oracle

Follow these steps to set up Oracle for use with Identity Manager.

NOTE See "Supported Software and Environments" on page 15 for supported database server versions, and for download or product locations.

1. Install Oracle or confirm the connection to an Oracle database.
2. Connect to the Oracle instance as a user with privileges to create users and tables.
3. Create the database. To do this:

a. Copy the `create_waveset_tables.oracle` script from the `db_scripts` directory on the installation CD (or from the `idm\sample` directory if you have already installed) to a temporary location.

b. Modify the `create_waveset_tables.oracle` script:

- Change the user password.
- Change the path for DATAFILE to point to the location for your `waveset.dbf` data file.

NOTE Your database administrator may want to modify the script to meet site-specific requirements for backup, replications, disk allocation, distribution, or other considerations.

---

c. Create the new tables by using the following command:

On Windows

```
sqlplus dbausername/dbapassword @create_waveset_tables.oracle
```

On UNIX

```
sqlplus dbausername/dbapassword @create_waveset_tables.oracle
```

Setting Up DB2

Before setting up DB2, you should decide how DB2 will provide JDBC access.

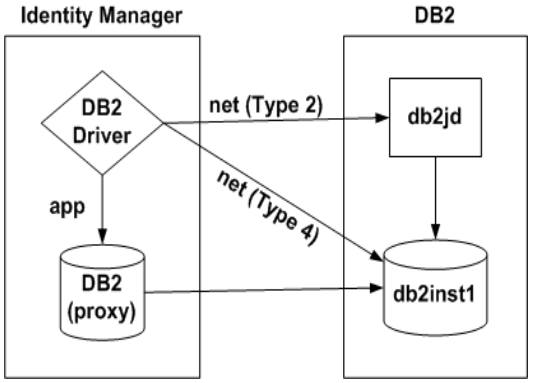
JDBC Access Considerations

DB2 offers two types of JDBC access, each of which requires a different URL format. The setup process allows you to select a preferred driver and automatically displays the corresponding URL template.

The application driver (`COM.ibm.db2.jdbc.app.DB2Driver`) requires local client software and a local database instance. Since DB2 runs on a separate (often dedicated) host in most production environments, the local database instance usually contains an alias to the remote database instance. In this configuration, the local database instance uses a DB2-specific protocol to communicate with the remote database instance.

The Type 2 network driver (`COM.ibm.db2.jdbc.net.DB2Driver`) does not require local client software or a local database. It does require that the DB2 Java Daemon (`db2jd`) be running on the target server. (In most production environments, the target server is a separate host, but the network driver works as well with a local database instance.) This daemon is not started by default, but the database administrator can start it manually or configure it to start automatically when the database instance starts.

The Type 4 network driver (`COM.ibm.db2.jcc.DB2Driver`) connects directly to the DB2 database.



NOTE When using the type 4 driver (in a direct connection) with DB2 8.1.2 and above, download the following driver:

`com.ibm.db2.jcc.DB2Driver`

The following files that need to be in the `$WSHOME/WEB-INF/lib` directory:

`db2jcc`
`db2jcc_license_cisuz.jar or db2jcc_license_cu.jar`

DB2 Setup

Follow these steps to set up DB2.

NOTE See "Supported Software and Environments" on page 15 for supported database server versions, and for download or product locations.

1. Install DB2 or confirm the connection to a DB2 database.
2. Connect to the DB2 instance as a user with privileges to create users and tables.
3. Create the database. To do this:
   a. Copy the `create_waveset_tables.db2` script from the `db_scripts` directory on the installation CD (or from the `idm\sample` directory if you have already installed) to a temporary location.
   b. Modify the `create_waveset_tables.db2` script:
      - Change the user password.
      - Change the path for the `CREATE_TABLESPACE` command to a location appropriate for your environment.

NOTE Your database administrator may want to modify the script to meet site-specific requirements for backup, replications, disk allocation, distribution, or other considerations.

Create the new tables by using the following command:

On Windows

```
db2 -tvf create_waveset_tables.db2
```

On UNIX

```
db2 -tvf create_waveset_tables.db2
```

Setting Up SQL Server

Follow these steps to set up SQL Server.

NOTE See "Supported Software and Environments" on page 15 for supported database server versions, and for download or product locations.

1. Install Microsoft SQL Server or confirm the connection to a SQL Server installation.
2. Create the database. To do this:

a. Copy the `create_waveset_tables.sqlserver` script from the `db_scripts` directory on the installation CD (or from the `idm\sample` directory if you have already installed) to a temporary location.

b. Modify the `create_waveset_tables.sqlserver` script to change the login password.

NOTE Your database administrator may want to modify the script to meet site-specific requirements for backup, replications, disk allocation, distribution, or other considerations.

c. Create the new tables by executing the `create_waveset_tables.sqlserver` script, located on the installation CD; for example:

```
osql -E -i PathToFile\create_waveset_tables.sqlserver
```

NOTE You must have privileges to create databases and logins.

3. Download and install the Microsoft SQL Server 2005 Driver for JDBC. To do this:

a. Go to http://www.microsoft.com/downloads.

b. In the Search for a Download area, enter “SQL Server JDBC” in the keywords field, and then click **Go**.

c. Locate, download, and install the correct version of the driver for your installation.

NOTE During installation, you will pause to install this driver and the Microsoft .jar files (installed with the driver) before continuing setup. Refer to the installation procedures in the following chapters for instructions.

Set Up a Service Provider Edition Transaction Database

If you are installing Identity Manager Service Provider Edition, then you must set up a database in which to store transaction data. If you plan to do this, use one of the following sample scripts as a starting point for creating your transaction database:

- `create_spe_tables.oracle`
- `create_spe_tables.db2`

Use the procedures outlined in "Set Up an Index Database" on page 22 to guide you through the process of creating a transaction database.

NOTE You must configure your database with a character set that supports the characters that you want to store. If you need to store multi-byte characters, you should use a character set (such as UTF-8) that supports Unicode.

Globalization Configuration

Inconsistent encodings may introduce certain globalization issues, such as incorrect handlings of multibyte characters. Make sure the locale or encoding is consistent with the following software in Identity Manager (IDM) deployment environment:

- Application server instance
- Database
- Java Virtual Machine (JVM)

In globalized environments, UTF-8 should be implemented on all products.

Refer to the documentation for these products for information about setting the locale / encoding. Also, when loading or unloading data via CSV or XML files, ensure that their encodings are consistent with Identity Manager's deployment environment encoding to retain data integrity. For enabling localization support see "Enabling Language Support" on page 90.

What's Next?

Use the procedures outlined in one of the following chapters to install and set up Identity Manager for your application server type:

- “Installing Identity Manager for Tomcat” on page 31
- “Installing Identity Manager for WebLogic” on page 37
- “Installing Identity Manager for WebSphere” on page 45
- “Installing Identity Manager for iPlanet Application Server 6.5” on page 53
- “Installing Identity Manager for Sun ONE Application Server 7” on page 59
- “Installing Identity Manager for Sun Java System Application Server” on page 69.

Before you begin installing Identity Manager, note that by default, the `waveset.serverId` Java system property is the name of the machine the application server is installed on. If you need to set this property to another value (for example, the application server machine contains multiple application server installations), add the following command to the startup script for your application server.

```
-Dwaveset.serverId=Name
```

Installing Identity Manager for Tomcat

Use the following information and procedures to install Identity Manager for use with the Apache Tomcat application server, Versions 4.1.x 5.0.x, or 5.5. This chapter contains:

Before You Begin

During installation, you will need to know:

- The location where Tomcat is installed
- The login and password you selected when you set up the index database

Tomcat 5 Requirements

Identity Manager with Tomcat requires the Java 1.4.2.x or 1.5 JDK.

Installation Steps

Follow these installation and configuration steps:

Step 1: Install the Tomcat Software

NOTE Steps in this chapter that outline Tomcat installation are for general reference only. For detailed information about installing Tomcat, refer to the Web page or reference information provided by the application server software provider.

Install the Tomcat software according to the instructions provided by the application server provider. You may find helpful information at the Jakarta Project site, at http://jakarta.apache.org/tomcat/ .

Installing on Windows

If you are installing from the Tomcat installer:

1. Specify the Tomcat installation location.
2. Select to start Tomcat as a service, and then select the port to run on. The default port is 8080.

Installing on UNIX

1. After downloading and unpacking the Tomcat installation bundle, modify the Tomcat startup script by using this procedure:

   In the `setclasspath.sh` file in the `$TOMCAT_HOME/bin` directory, add these lines to the top of the file:

   ```
   JAVA_HOME=Location of a JDK
   BASEDIR=Location of your unpacked Tomcat
   export JAVA_HOME BASEDIR
   ```

2. When configuring Tomcat to support UTF-8, add the `URIEncoding="UTF-8"` attribute to the *connector* element in the *TOMCAT DIR*`conf/server.xml` file, for example:

   ```
   <!-- Define a non-SSL Coyote HTTP/1.1 Connector on the port specified
   during installation -->
   <Connector port="8080"
      maxThreads="150"
      minSpareThreads="25"
      maxSpareThreads="75"
   ```

```
enableLookups="false" redirectPort="8443"
acceptCount="100" debug="0" connectionTimeout="20000"
disableUploadTimeout="true"
URIEncoding="UTF-8" />
```

3. When configuring Tomcat to support UTF-8, also add `-Dfile.encoding=UTF-8` in your java vm options.

Step 2: Install the Identity Manager Software

1. You may install the software using one of two methods:

   - *Using the installer Graphic User Interface*

     Run the `install.bat` (for Windows) or `install` (for UNIX) command to launch the installation process.

     The installer displays the Welcome panel.

   - *Using the nodisplay option*

     Change directory to the Identity Manager software location. Enter the following command to activate the installer in nodisplay mode:

     ```
     install -nodisplay
     ```

     The installer displays the Welcome text. The installer then presents a list of questions to gather installation information in the same order as the Graphic User Interface installer in these procedures.

NOTE If no display is present, the installer defaults to the `nodisplay` option. The DISPLAY environment variable must be set to a valid X server or the installation may fail.

2. Click **Next** to display the Install or Upgrade? panel.
3. Leave the New Installation option selected, and then click **Next**.

   The installer displays the Select Installation Directory panel.
4. Replace the displayed directory location with the location where you want to install Identity Manager. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

NOTE

- Unless you plan to create a new context (virtual directory) in Tomcat's `server.xml` directory, we recommend installing to `%TOMCAT_HOME%\webapps\idm`.
- If the directory you enter does not exist, the installer prompts for confirmation, and then creates the directory.

5. Click **Next** to begin installation.

   After installing files, the installer displays the Launch Setup panel.

6. Add the Java `mail.jar`, `activation.jar`, and `jms.jar` files to the `$WSHOME/WEB-INF/lib` directory. These files can be found at:

   `http://java.sun.com/products/javamail`

   `http://java.sun.com/products/beans/glasgow/jaf.html`

   `http://java.sun.com/products/jms/index.jsp`

CAUTION Before you continue, if you plan to use an index database, you may need to copy one or more files to the `idm/WEB-INF/lib` directory. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, click **Launch Setup** to launch the Setup Wizard and continue with setup steps.

If you click **Launch Setup** before copying your index database files, setup will not proceed correctly. If this happens, quit the installation program, and then use the `lh setup` command to restart the setup portion of the installation process.

7. Click **Next** on the Setup Wizard panel.

   The product displays the Locate the Repository panel.

8. Select an index database:
   - Oracle (JDBC Driver)
   - Oracle (Data Source)

- MySQL (JDBC Driver)
- MySQL (Data Source)
- DB2 (JDBC Driver)
- DB2 (Data Source)
- SQL Server (JDBC Driver)
- SQL Server (Data Source)
- LocalFiles

Depending on your selection, setup prompts for additional setup information.

NOTE See "Index Database Reference" on page 111, for selections and setup instructions.

9. Click **Next**.
10. The Continue Identity Manager Demo Setup? panel appears.
11. If this is a non-demo installation, click **No, I will configure Identity Manager myself**. Go to Step 20.
12. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
13. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

14. Enter the following Approver information:
    - Approver name
    - Approver password
15. Click **Next**.
16. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.
17. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.
18. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.
19. Click **Next**.
20. The installer displays the Import Save Configuration panel.
21. Click **Execute** to perform all the listed functions. If desired, click **Hide Details**.
22. When all functions complete, click **Done** in the setup panel.

Getting More Information

When installation completes, the installer displays the Installation Summary panel. For detailed information about the installation, click **Details**.

Not all messages may not be displayed here. View the log file (identified in details) for more information.

When finished, click **Close** to exit the installer.

Step 3: Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Chapter 3

Installing Identity Manager for WebLogic

Use the following information and procedures to install Identity Manager for use with the BEA WebLogic application server. This chapter contains:

Before You Begin

During installation, you will need to know:

- Location where WebLogic is installed
- WebLogic domain name
- The password you selected when you set up the index database

Installation Procedures

Follow these installation and configuration steps, located in this chapter and following chapters:

Step 1: Configure the WebLogic Software

1. Install WebLogic and select the domain that will be referenced when installing the software.
2. Set the environment variables JAVA_HOME and WSHOME:

   ```
   set JAVA_HOME=/PathTo/java
   set WSHOME=Path To IDMDirectory
   ```

NOTE Make sure the value of the WSHOME environment variable does NOT contain the following:

- Quotation marks (“ “)
- A slash or backslash at the end of the path (/ or \)

Do not use quotation marks, even if the path to the application deployment directory contains spaces.

---

3. For WebLogic 9.1 and higher only, add the Java `mail.jar`, and `activation.jar` files to the `$WSHOME/WEB-INF/lib` directory. These files can be found at:

   `http://java.sun.com/products/javamail`

   `http://java.sun.com/products/beans/glasgow/jaf.html`

Step 2: Install the Identity Manager Software

1. You may install the software using one of two methods:
   - Using the installer Graphic User Interface

     Run the `install.bat` (for Windows) or `install` (for UNIX) command to launch the installation process.

     The installer displays the Welcome panel.

   - Using the nodisplay option

On UNIX systems, change directory to the Identity Manager software location. Enter the following command to activate the installer in nodisplay mode:

```
install -nodisplay
```

The installer displays the Welcome text. The installer then presents a list of questions to gather installation information in the same order as the Graphic User Interface installer in these procedures.

NOTE If no display is present, the installer defaults to the `nodisplay` option. The DISPLAY environment variable must be set to a valid X server or the installation may fail.

2. Click **Next**. The installer displays the Install or Upgrade? panel.
3. Leave the New Installation option selected, and then click **Next**.

   The installer displays the Select Installation Directory panel.
4. Replace the displayed directory location with the location where you want to install Identity Manager. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

NOTE

- If the directory you enter does not exist, The installer prompts for confirmation, and then creates the directory.
- The WebLogic Web application home directory is:
  - Version 8.1 — *ServerHome*/user_projects/*DomainName*/applications
  - Version 8.1 SP1 and later service packs — *ServerHome*/user_projects/domains/*DomainName*/applications
  - Version 9.1 and 9.2 — *ServerHome*/user_projects/domains/*DomainName*/autodeploy

5. Click **Next** to begin installation.

   After installing the files, the installer displays the Launch Setup panel.

CAUTION Before you continue, if you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, click **Launch Setup** to launch the Setup Wizard and continue with setup steps.

If you click **Launch Setup** before copying your index database files, setup will not proceed correctly. If this happens, quit the installation program, and then use the `lh setup` command to restart the setup portion of the installation process.

6. Click **Next** on the Setup Wizard panel.

   The installer displays the Locate the Repository panel.

7. Select an index database:

   - Oracle (JDBC Driver)
   - Oracle (Data Source)
   - MySQL (JDBC Driver)
   - MySQL (Data Source)
   - DB2 (JDBC Driver)
   - DB2 (Data Source)
   - SQL Server (JDBC Driver)
   - SQL Server (Data Source)
   - LocalFiles

   Depending on your selection, setup prompts for additional setup information.

NOTE See "Index Database Reference" on page 111, for selections and setup instructions.

8. Click **Next**.

9. The Continue Identity Manager Demo Setup? panel appears.
10. If this is a non-demo installation click **No, I will configure Identity Manager myself**. Go to Step 19.
11. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
12. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

13. Enter the following Approver information:
    - Approver name
    - Approver password
14. Click **Next**.
15. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.
16. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.
17. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.
18. Click **Next**.
19. The installer displays the Import Save Configuration panel.
20. Click **Execute** to perform all the listed functions. If desired, click **Hide Details**.

21. When all functions complete, click **Done** in the setup panel.
22. If you are running JDK 1.4.1 or higher, remove the Cryptix jars (`cryptix-jce-api.jar` and `cryptix-jce-provider.jar`) from the `idm\WEB-INF\lib` directory.

NOTE The Cryptix jars are no longer included and no longer supported. You need to remove them if you haven't already. If you've customized your Waveset.properties file, please make sure that `security.jce.workaround` property is set to false or removed. An exception will be thrown if this property is set to true because the intention of this property will not be fulfilled.

Getting More Information

When installation completes, the installer displays the Installation Summary panel. For detailed information about the installation, click **Details**.

Not all messages may not be displayed here. View the log file (identified in details) for more information.

When finished, click **Close** to exit the installer.

After successfully completing, the installer installation, continue setup by configuring the WebLogic server.

Step 3: Deploy the Application

By default, WebLogic automatically deploys from the `applications` or `autodeploy` directory. Use the WebLogic Console to deploy Identity Manager if automatic deployment is not enabled.

Step 4: Add the Application Main Page to Default Documents for IIS (optional)

If you are using Internet Information Server (IIS) as your Web server, you must add index.html to the list of Default Documents (under Properties) on the Identity Manager virtual directory in ISS. Otherwise, the Identity Manager main page will not resolve correctly when accessing the Identity Manager server.

Step 5: Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Chapter 4

Installing Identity Manager for WebSphere

Use the following information and procedures to install Identity Manager for use with the IBM WebSphere Application Server, Versions 5.1 express and 6.0. This chapter includes:

Before You Begin

During installation, you will need to know:

- Location where WebSphere is installed
- The password you selected when you set up the index database

Installation Steps

Follow these installation and configuration steps, located in this chapter and following chapters:

- Step 1: Install and Configure the Identity Manager Software
- Step 2. Install the Sun Identity Manager Gateway

These procedures assume that you have set up an application server and servlet engine in WebSphere. For detailed information about installing and using WebSphere, refer to the Web page or reference information provided by the application server software provider.

Step 1: Install and Configure the Identity Manager Software

To install and configure the software:

1. Unjar the `idm.war` file into an `idm_staging` folder on a file system:

   ```
   jar -xvf idm.war
   ```

NOTE The `idm.war` file is located in the base directory of the Installation CD.

2. If you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory. To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, launch setup to continue with installation.

CAUTION If you launch setup before copying your index database files, setup will not proceed correctly. Copy the files, and then use the `lh setup` command to restart the setup portion of the installation process.

3. Set the environment variables JAVA_HOME and WSHOME:

   ```
   set JAVA_HOME=c:\Program Files\WebSphere\AppServer\java
   set WSHOME=Path To IDMStaging Directory
   ```

NOTE Make sure the value of the WSHOME environment variable does NOT contain the following:

- Quotation marks (" ")
- A slash or backslash at the end of the path (/ or \)

Do not use quotation marks, even if the path to the application deployment directory contains spaces.

NOTE The following step is not necessary when installing version 6.0 or later.

4. Change to the staging directory, and delete the following files, if they exist:

   ```
   WEB-INF\lib\cryptix-jce-provider.jar
   WEB-INF\lib\cryptix-jce-api.jar
   ```

NOTE The Cryptix jars are no longer included and no longer supported. You need to remove them if you haven't already. If you've customized your `Waveset.properties` file, please make sure that `security.jce.workaround` property is set to false or removed. An exception will be thrown if this property is set to true because the intention of this property will not be fulfilled.

Removing the jars from `WEB-INF/lib` for WebSphere disables the BPE. Move those jars to a different location and create a CLASSPATH variable that points to those jars to re-enable the BPE.

5. Run the following command.

   ```
   bin\lh setup
   ```

   The installer displays the Locate Repository panel.

6. Select an index database:

   - Oracle (JDBC Driver)
   - Oracle (Data Source)
   - MySQL (JDBC Driver)
   - MySQL (Data Source)
   - DB2 (JDBC Driver)
   - DB2 (Data Source)
   - SQL Server (JDBC Driver)
   - SQL Server (Data Source)
   - LocalFiles

   Depending on your selection, setup prompts for additional setup information.

NOTE

- See "Index Database Reference" on page 111, for selections and setup instructions. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection).
- If you are planning to use a WebSphere or WebLogic Data Source as your repository location, see the special instructions in "Configuring Data Sources for Identity Manager" on page 119.

7. Click **Next**.
8. The Continue Identity Manager Demo Setup? panel appears.
9. If this is a non-demo installation click **No, I will configure Identity Manager myself**. Go to Step 18.
10. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
11. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

12. Enter the following Approver information:
    - Approver name
    - Approver password
13. Click **Next**.

14. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.

15. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.

16. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.

17. Click **Next**.

18. The installer displays the Import Save Configuration panel.

19. Click **Execute** to perform all the listed functions. If desired click **Hide Details**.

20. When all functions complete, click **Done** in the setup panel.

21. Delete these files, if they exist:

    - `WEB-INF/lib/log.jar`
    - `WEB-INF/lib/j2ee.jar`
    - `WEB-INF/lib/ldap.jar`

NOTE Removing the jars from `WEB-INF/lib` for WebSphere disables the Business Process Editor. Move those jars to a different location and create a CLASSPATH variable that points to those jars to re-enable the BPE.

22. Download the latest `jlog package` from WebSphere at:

    http://www.alphaworks.ibm.com/tech/loggingtoolkit4j

NOTE The `jlog package` is now incorporated in WebSphere'6.0. Download this only for earlier versions.

23. Copy the `com\ibm\logging\log.jar` file to `idm/WEB-INF/lib/log.jar`.

24. Create a `.war` file from WSHOME:

    ```
    jar -cvf idm.war *
    ```

25. Start the application server. You must use WebSphere's script to do this. For example, if WebSphere's binary files are installed in `c:\Program Files\WebSphere\AppServer\bin`, and that the application server is named server1:

    ```
    cd c:\Program Files\WebSphere\AppServer\bin
    ```

    ```
    startServer.bat server1
    ```

26. Start the WebSphere administration console, and then select **Applications—>Install New Application**.

27. Add the full path to the `idm.war` file in the Path:ServerPath field.

28. Add the path to the Context Root for the Identity Manager installation (for example, `/idm`), and then click **Next**.

29. Select the Generate Default Bindings option. (Use the default selections for Override and Virtual Host.)

30. Click **Next**.

31. Accept the `was.policy` file that is displayed under the heading **Application Security Warnings**. Scroll down to the bottom of this file and click the **Continue** button.

32. Configure the **Step 1: provide options to perform the installation** page as needed.

    - If you want to install the application to a different location than WebSphere's default location, enter the path to install the application in the Directory to Install Application field; for example:

      `c:\Program Files\WebSphere\AppServer\installedApps\`*Hostname*

    - Make sure the Distribute Application and Use Binary Configuration options are selected.

    - Make sure that the Create Mbeans for Resources and Deploy EJBs options are not selected.

    - Enter the name of the application in the Application Name field (the default is `idm`).

    - If desired, select the Enable class reloading option.

    Click **Next** after configuring this dialog.

33. Make sure the **Step 2: Map virtual hosts for web modules** panel displays a line for the current release of Identity Manager and that it maps to the appropriate virtual host, and then click **Next**.

34. Make sure the **Step 3: Map modules to application servers** panel displays a line for the current release of Identity Manager and that it maps to the appropriate server, and then click **Next**.

35. Review the summary of options, then click **Finish**.

36. After Identity Manager has been installed, click **Save to Master Configuration** to save the configuration.

37. Click **Save**, and then wait for the page to clear.

Step 2. Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Chapter 5

Installing Identity Manager for iPlanet Application Server 6.5

Use the following information and procedures to install Identity Manager for use with iPlanet application server, Version 6.5. This chapter includes:

Before You Begin

During installation, you will need to know:

- Location where iPlanet is installed
- The password you selected when you set up the index database

Installation Steps

Follow these installation and configuration steps:

Step 1: Install the Identity Manager Software

Follow these procedures to install the software.

To install Identity Manager:

1. You may install the software using one of two methods:

   - *Using the installer Graphic User Interface*

     Run the `install.bat` (for Windows) or `install` (for UNIX) command to launch the installation process.

     The installer displays the Welcome panel.

   - *Using the nodisplay option*

     On UNIX systems, change directory to the software location. Enter the following command to activate the installer in nodisplay mode:

     ```
     install -nodisplay
     ```

     The installer displays the Welcome text. The installer then presents a list of questions to gather installation information in the same order as the Graphic User Interface installer in these procedures.

NOTE If no display is present, the installer defaults to the `nodisplay` option. The DISPLAY environment variable must be set to a valid X server or the installation may fail.

2. Click **Next**. The installer displays the Install or Upgrade? panel.
3. Leave the New Installation option selected, and then click **Next**.

   The installer displays the Select Installation Directory panel.
4. Replace the displayed directory location with the location where you want to install Identity Manager. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

NOTE If the directory you enter does not exist, Identity Manager prompts for confirmation, and then creates the directory.

5. Click **Next** to begin installation.

   After installing the files, the installer displays the Launch Setup panel.

CAUTION

- Before you continue, if you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, click **Launch Setup** to launch the Setup Wizard and continue with setup steps.
- If you click **Launch Setup** before copying your index database files, setup will not proceed correctly. If this happens, quit the installation program, and then use the `lh setup` command to restart the setup portion of the installation process.

6. Click **Next** on the Setup Wizard panel.

   The installer displays the Locate the Repository panel.

7. Select an index database:

   - Oracle (JDBC Driver)
   - Oracle (Data Source)
   - MySQL (JDBC Driver)
   - MySQL (Data Source)
   - DB2 (JDBC Driver)
   - DB2 (Data Source)
   - SQL Server (JDBC Driver)
   - SQL Server (Data Source)
   - LocalFiles

   Depending on your selection, setup prompts for additional setup information.

NOTE See Index Database Reference, for selections and setup instructions.

8. Click **Next**.
9. The Continue Identity Manager Demo Setup? panel appears.
10. If this is a non-demo installation click **No, I will configure Identity Manager myself**. Go to Step 19.
11. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
12. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

13. Enter the following Approver information:
    - Approver name
    - Approver password
14. Click **Next**.
15. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.
16. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.
17. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.
18. Click **Next**.
19. The installer displays the Import Save Configuration panel.

20. Click **Execute** to perform all the listed functions. If desired, click **Hide Details**.

21. When all functions complete, click **Done** in the setup panel.

Getting More Information

When installation completes, The installer displays the Installation Summary panel. For detailed information about the installation, click **Details**.

Not all messages may not be displayed here. View the log file (identified in details) for more information.

When finished, click **Close** to exit the installer.

Create and Deploy a .war File

22. Create a `.war` file for iPlanet deployment:

```
cd StagingDirectory\idm*
del WEB-INF\lib\j2ee.jar
jar -cvf ../idm.war *
```

NOTE Removing the `j2ee.jar` file from `WEB-INF/lib` disables the Business Process Editor. Move those jars to a different location and create a CLASSPATH variable that points to those jars to re-enable the BPE.

23. Deploy the `.war` file into iPlanet:

    a. Change to the staging directory:

    ```
    cd StagingDirectory
    ```

    b. Enter the following command:

    ```
    iPlanetInstallation\ias6\ias\bin\iasdeploy deploymodule
    -verbose -user Administrator -password Password -host Hostname
    -port AdminPort idm.war
    ```

24. Restart the application server.

Step 2. Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Chapter 6

Installing Identity Manager for Sun ONE Application Server 7

Use the following information and procedures to install Identity Manager for use with the Sun ONE Application Server 7. This chapter includes:

Before You Begin

During installation, you will need to know:

- Location where Sun ONE Application Server is installed
- The password you selected when you set up the index database

Installation Steps

Follow these installation and configuration steps, located in this chapter and following sections:

Step 1: Install the Sun ONE Application Server Software

NOTE Information in this chapter about Sun ONE Application Server installation is for general reference only. For detailed information, refer to the Web page or reference information provided by the application server software provider.

You may need to perform one or more of these general steps when installing the software:

- Use the Sun ONE Typical installation.
- Specify the location for the Installation Directory.
- Specify the administrator name and password for Application Server administration.

Step 2: Install the Identity Manager Software

Follow these procedures to install the software.:

1. You may install the software using one of two methods:
   - *Using the installer Graphic User Interface*

     Run the `install.bat` (for Windows) or `install` (for UNIX) command to launch the installation process.

     The installer displays the Welcome panel.
   - *Using the nodisplay option*

     On UNIX systems, change directory to the software location. Enter the following command to activate the installer in nodisplay mode:

     ```
     install -nodisplay
     ```

     The installer displays the Welcome text. The installer then presents a list of questions to gather installation information in the same order as the Graphic User Interface installer in these procedures.

NOTE If no display is present, the installer defaults to the `nodisplay` option. The DISPLAY environment variable must be set to a valid X server or the installation may fail.

2. Click **Next**. The installer displays the Install or Upgrade? panel.
3. Leave the New Installation option selected, and then click **Next**.

   The installer displays the Select Installation Directory panel.
4. Replace the displayed directory location with the location where you want to install Identity Manager. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

NOTE If the directory you enter does not exist, Identity Manager prompts for confirmation, and then creates the directory.

5. Click **Next** to begin installation.

   After installing the files, the installer displays the Launch Setup panel.

CAUTION Before you continue, if you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, click **Launch Setup** to launch the Setup Wizard and continue with setup steps.

If you click **Launch Setup** before copying your index database files, setup will not proceed correctly. If this happens, quit the installation program, and then use the `lh setup` command to restart the setup portion of the installation process.

6. Click **Next** on the Setup Wizard panel.

   Identity Manager displays the Locate the Repository panel.

7. Select an index database:
   - Oracle (JDBC Driver)
   - Oracle (Data Source)
   - MySQL (JDBC Driver)
   - MySQL (Data Source)
   - DB2 (JDBC Driver)
   - DB2 (Data Source)
   - SQL Server (JDBC Driver)
   - SQL Server (Data Source)
   - LocalFiles

   Depending on your selection, setup prompts for additional setup information.

NOTE See "Index Database Reference" on page 111, for selections and setup instructions.

8. Click **Next**.
9. The Continue Identity Manager Demo Setup? panel appears.
10. If this is a non-demo installation click **No, I will configure Identity Manager myself**. Go to Step 19.
11. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
12. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

13. Enter the following Approver information:
    - Approver name
    - Approver password
14. Click **Next**.
15. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.
16. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.
17. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.
18. Click **Next**.
19. The installer displays the Import Save Configuration panel.
20. Click **Execute** to perform all the listed functions. If desired, click **Hide Details**.
21. When all functions complete, click **Done** in the setup panel.

Getting More Information

When installation completes, Identity Manager displays the Installation Summary panel. For detailed information about the installation, click **Details**.

Not all messages may not be displayed here. View the log file (identified in details) for more information.

When finished, click **Close** to exit the installer.

After completing installation, continue by optionally installing the Sun Identity Manager Gateway.

Step 3. Deploy Identity Manager into Sun ONE Application Server

Follow these steps to deploy the Identity Manager application into Sun ONE Application Server. For additional information about deploying applications under Sun Java One Application Server, refer to the Sun Java One Application Server documentation.

1. Open a command prompt, and then change to the staging directory where you installed the Identity Manager files.
2. Create a `.war` file with the Identity Manager files by using the `jar.exe` command:

   ```
   c:\java1.4\bin\jar.exe cvf ..\idm.war *
   ```

3. Launch and log in to the Sun ONE Admin Console. For example, to start a domain:
   a. Change to the *SUNWAppServer Installation Directory*`/appserver/bin` directory.
   b. Enter the command:
   `./asadmin start-domain --user` *User* `--password` *Password DomainName*

NOTE To verify that the domain is running, go to https:/ / *Host*:*Port* from a Web browser. You should see the Sun Java Application Server Administration console.

4. In the Common Task Panel (left panel), go to Applications, and then Web Applications.
5. In the Web Applications window, click **Deploy**.
6. In the Deploy Web Module window, do one of the following:
   - Specify the path to the staged Sun Java One System Identity Manager Installation to upload.
   - Enter a path to the installation if accessible on the server.
7. Click **Next**.
8. Deploy the application.

9. In the Common Task Panel (left panel), go to Configurations, expand server-config (Admin Config), and then select JVM Settings.

10. Under the JVM Options tab, add the following JVM option:

    `-Dwaveset.home=`*domain_home*`/applications/j2ee-modules/`*StagedIDMName*

    For example:

    ```
    -Dwaveset.home=/var/opt/SUNWappserver/domains/domain1/
      applications/j2ee-modules/idm
    ```

11. If you are using specific resource drivers, you may need to add them in the Classpath Suffix under the JVM Settings, Path Settings tab. For example, if you are using the Oracle jdbc driver, add:

    DomainHome`/applications/j2ee-modules/idm/WEB-INF/lib/ojdbc14.jar`

12. Configure the security policy to allow Identity Manager to operate. See **Step 5. Edit the server.policy File** for recommended permissions settings.

13. Restart your domain instance. For example:

    ```
    ./asadmin stop-domain Domain1
    ./asadmin start-domain --user User --password Password
     DomainName
    ```

14. To verify setup, log in to Identity Manager on port 8081 (the application server default port setting).

Step 4. Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Step 5: Edit the server.policy File

When running Identity Manager on a Sun ONE server with Java 1.4 or 1.5, Identity Manager must be given permissions to perform certain actions.

Add the following lines to the `server.policy` file for the domain in which Identity Manager is installed (located in *`ApplicationServerHome`*`/domains/`*`domainName`*`/config`):

```
grant {
  permission java.lang.RuntimePermission "accessClassInPackage.sun.io";
  permission java.lang.RuntimePermission "getClassLoader";
  permission java.lang.RuntimePermission "createClassLoader";
  permission java.lang.RuntimePermission "accessDeclaredMembers";
  permission com.waveset.repository.test.testConcurrentLocking "read";
  permission java.net.SocketPermission "*", "connect,resolve";
  permission java.io.FilePermission "*", "read";
  permission java.util.PropertyPermission "*", "read,write";
};

grant codeBase "file:${waveset.home}/-" {
  permission java.util.PropertyPermission "waveset.home", "read,write";
  permission java.util.PropertyPermission "security.provider",
"read,write";
  permission java.io.FilePermission "${waveset.home}${/}
*", "read,write,execute";
  permission java.io.FilePermission "$(java.io.tmpdir)$(/)*",
"read,write,delete";
  permission java.util.PropertyPermission "*", "read,write";
  permission java.lang.RuntimePermission "accessClassInPackage.sun.io";
  permission java.net.SocketPermission "*", "connect,resolve";
};
```

If you want to run with Identity Manager Service Provider Edition, add the following permissions to the above `server.policy` file entries.

```
grant {
permission java.lang.RuntimePermission "shutdownHooks";
permission java.io.FilePermission
"${waveset.home}/WEB-INF/spe/config/spe.tld", "read";
};
```

If you want to run with trace set to write to a file, you will need to add the following additional permissions to the `server.policy` file.

```
  permission java.io.FilePermission "$(java.io.tmpdir)$(/)*",
"read,write,delete";
  permission java.util.PropertyPermission "trace.file", "read";
  permission java.util.PropertyPermission "trace.destination", "read";
  permission java.util.PropertyPermission "trace.enabled", "read";
};
```

where `FilePermission` is the actual path of the trace file. Adjust the path to the output file as needed.

NOTE After modifying the file, you must restart the application server.

Chapter 7

Installing Identity Manager for Sun Java System Application Server

Use the following information and procedures to install Identity Manager for use with the Sun Java System Application Server, version 8 or Platform Edition 9 . This chapter includes:

Before You Begin

During installation, you will need to know:

- Location where Java System Application Server is installed
- The password you selected when you set up the index database

Installation Steps

Follow these installation and configuration steps, located in this chapter and following chapters:

Step 1: Install the Sun Java System Application Server Software

NOTE Information in this chapter about Java System Application Server installation is for general reference only. For detailed information, refer to the Web page or reference information provided by the application server software provider.

You may need to perform one or more of these general steps when installing the software:

- Use the Java System Application Server typical installation.
- Specify the location for the Installation Directory.
- Specify the administrator name and password for Application Server administration.

Step 2: Install the Identity Manager Software

1. You may install the software using one of two methods:

   - Using the installer Graphic User Interface

     Run the `install.bat` (for Windows) or `install` (for UNIX) command to launch the installation process.

     The installer displays the Welcome panel.

   - Using the nodisplay option

     On UNIX systems, change directory to the software location. Enter the following command to activate the installer in nodisplay mode:

     ```
     install -nodisplay
     ```

   The installer displays the Welcome text. The installer then presents a list of questions to gather installation information in the same order as the Graphic User Interface installer in these procedures.

NOTE If no display is present, the installer defaults to the `nodisplay` option. The DISPLAY environment variable must be set to a valid X server or the installation may fail.

2. Click **Next**. The installer displays the Install or Upgrade? panel.
3. Leave the New Installation option selected, and then click **Next**.

   The installer displays the Select Installation Directory panel.
4. Replace the displayed directory location with the location where you want to install Identity Manager. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

NOTE If the directory you enter does not exist, Identity Manager prompts for confirmation, and then creates the directory.

5. Click **Next** to begin installation.

   After installing the files, Identity Manager displays the Launch Setup panel.

CAUTION Before you continue, if you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, click **Launch Setup** to launch the Setup Wizard and continue with setup steps.

If you click **Launch Setup** before copying your index database files, setup will not proceed correctly. If this happens, quit the installation program, and then use the `lh setup` command to restart the setup portion of the installation process.

6. Click **Next** on the Setup Wizard panel.

   The installer displays the Locate the Repository panel.
7. Select an index database:

- Oracle (JDBC Driver)
- Oracle (Data Source)
- MySQL (JDBC Driver)
- MySQL (Data Source)
- DB2 (JDBC Driver)
- DB2 (Data Source)
- SQL Server (JDBC Driver)
- SQL Server (Data Source)
- LocalFiles

Depending on your selection, setup prompts for additional setup information.

NOTE See "Index Database Reference" on page 111, for selections and setup instructions.

8. Click **Next**.
9. The Continue Identity Manager Demo Setup? panel appears.
10. If this is a non-demo installation click **No, I will configure Identity Manager myself**. Go to Step 19.
11. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
12. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

13. Enter the following Approver information:
    - Approver name
    - Approver password
14. Click **Next**.
15. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.
16. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.
17. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.
18. Click **Next**.
19. The installer displays the Import Save Configuration panel.
20. Click **Execute** to perform all the listed functions. If desired, click **Hide Details**.
21. When all functions complete, click **Done** in the setup panel.

Getting More Information

When installation completes, the installer displays the Installation Summary panel. For detailed information about the installation, click **Details**.

Not all messages may not be displayed here. View the log file (identified in details) for more information.

When finished, click **Close** to exit the installer.

After completing installation, continue by optionally installing the Sun Identity Manager Gateway.

Step 3. Deploy Identity Manager into Sun Java System Application Server

Follow these steps to deploy the Identity Manager application into Sun Java System Application Server:

1. Open a command prompt, then change to the staging directory where you installed the Identity Manager files. (This is the directory you specified in Step 4 in the procedure "Step 2: Install the Identity Manager Software.")
2. Create a `.war` file with the Identity Manager files by using the `jar.exe` (on Windows) or `jar` (on UNIX) command:

   ```
   c:\java1.4\bin\jar.exe cvf ..\idm.war *
   /usr/bin/jar cvf ../idm.war *
   ```

3. Launch your application server and log in to the Java System Application Server Admin Console.
4. Navigate to and expand the Applications folder in the left panel.
5. Click the Web Applications folder.
6. Click **Deploy...** in the right panel.
7. Enter the file path for the `idm.war` file, and then click **Next**.
8. When prompted, set the Application Name to idm. Set the Context Root to `/idm`, and then click **Finish**.
9. If you are deploying on Platform Edition 9, perform the following steps to ensure that you can create resources in Identity Manager.
   a. Click on the Application Server link in the left pane of the Admin Console
   b. Select the **JVM Settings** tab, then select the **JVM Options** tab.
   c. Click **Add JVM Option**.
   d. Add the the following to the blank box in the **Value** column:

      ```
      -Dcom.sun.enterprise.server.ss.ASQuickStartup=false
      ```

   e. Click **Save**.
10. Restart your Application Server Instance.
11. To verify setup, log in to Identity Manager. You can do this within the Admin Console by clicking the **Launch** button on the "idm" line of the Web Applications folder.

Step 4. Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Step 5: Edit the server.policy File on Application Server 8

When running Identity Manager on a Sun Java System Application Server 8 with Java 1.4 or 1.5, Identity Manager must be given permissions to perform certain actions.

NOTE This step is not applicable to Platform Edition 9.

Add the following lines to the `server.policy` file for the domain in which Identity Manager is installed (located in *`ApplicationServerHome`*`/domains/`*`domainName`*`/config`):

```
grant {
permission java.lang.RuntimePermission "accessClassInPackage.sun.io";
permission java.lang.RuntimePermission "getClassLoader";
permission java.lang.RuntimePermission "createClassLoader";
permission java.lang.RuntimePermission "accessDeclaredMembers";
permission com.waveset.repository.test.testConcurrentLocking "read";
permission java.net.SocketPermission "*", "connect,resolve";
permission java.io.FilePermission "*", "read";
permission java.util.PropertyPermission "*", "read,write";
};
grant codeBase "file:${waveset.home}/-" {
permission java.util.PropertyPermission "waveset.home", "read,write";
permission java.util.PropertyPermission "security.provider", "read,write";
permission java.io.FilePermission "${waveset.home}${/} *",
"read,write,execute";
permission java.io.FilePermission "${waveset.home}/help/index/-",
"read,write,execute,delete";
permission java.io.FilePermission "$(java.io.tmpdir)$(/)*",
"read,write,delete";
```

```
permission java.util.PropertyPermission "*", "read,write";
permission java.lang.RuntimePermission "accessClassInPackage.sun.io";
permission java.net.SocketPermission "*", "connect,resolve";
};
```

If you want to deploy Identity Manager Service Provider Edition, add the following permissions to the above server.policy file entries.

```
grant {
permission java.lang.RuntimePermission "shutdownHooks";
permission java.io.FilePermission
"${waveset.home}/WEB-INF/spe/config/spe.tld", "read";
};
```

NOTE If you fail to update the old `server.policy file` with the above, and try to use the search engine, lock files may be created in the index directory that cannot be removed by the container. This *always* causes queries to hang, even if the server.policy file is subsequently updated.

For example, the contents of the help/index/docs directory should contain these five files:

```
AL
MF
p1.dict
p1.fields
p1.post
```

In addition to the above, there may be two lock files:

```
AL.lock
MF.lock
```

These must be deleted manually. Once these are removed (and the server.policy file updated correctly), search queries will work as expected.

If you want to run with trace set to write to a file, you will need to add the following additional permissions to the `server.policy` file.

```
grant {
  permission java.io.FilePermission
"/var/opt/SUNWappserver/domains/domain1/applications/j2ee-modules/
idm/config/trace1.log", "read,write";
  permission java.io.FilePermission "$(java.io.tmpdir)$(/)*",
```

```
"read,write,delete";
  permission java.util.PropertyPermission "trace.file", "read";
  permission java.util.PropertyPermission "trace.destination", "read";
  permission java.util.PropertyPermission "trace.enabled", "read";
};
```

where `FilePermission` is the actual path of the trace file. Adjust the path to the output file as needed.

NOTE After modifying the file, you must restart the application server.

Installing Identity Manager for JBoss

Use the following information and procedures to install Identity Manager for use with the JBoss application server, Versions 4.0.4. This chapter contains:

Before You Begin

During installation, you will need to know:

- The location where JBoss is installed
- The login and password you selected when you set up the index database

Installation Steps

Follow these installation and configuration steps:

Step 1: Install the JBoss Software

NOTE Steps in this chapter that outline JBoss installation are for general reference only. For detailed information about installing JBoss, refer to the Web page or reference information provided by the application server software provider.

Install the JBoss software according to the instructions provided by the application server provider. You may find helpful information at the JBoss Project site, at http://labs.jboss.com/portal/jbossas .

You may need to perform one or more of these general steps when installing the software:

- Install the full JBoss application server.
- Ensure that the JBoss installation path does not contain spaces.
- Specify the administrator name and password for Application Server administration.
- When configuring JBoss to support UTF-8, add the `URIEncoding="UTF-8"` attribute to the `Connector` element in the *InstallDir*`\server\default\deploy\jbossweb-tomcat55.sar\server.xml` file, for example:

  ```
  <!-- A HTTP/1.1 Connector on port 8080 -->
  <Connector port="17001" address="${jboss.bind.address}"
     maxThreads="250" strategy="ms" maxHttpHeaderSize="8192"
     emptySessionPath="true" enableLookups="false" redirectPort="8443"
     acceptCount="100" connectionTimeout="20000"
     disableUploadTimeout="true" URIEncoding="UTF-8" />
  ```

- When configuring JBoss to support UTF-8, also add `-Dfile.encoding=UTF-8` in your java vm options.

Step 2: Install the Identity Manager Software

1. Set the environment variables JAVA_HOME and WSHOME:

   ```
   set JAVA_HOME=/PathTo/java
   set WSHOME=Path To IDM Directory
   ```

NOTE Make sure the value of the WSHOME environment variable does NOT contain the following:

- Quotation marks (“ “)
- A slash or backslash at the end of the path (/ or \ )

Do not use quotation marks, even if the path to the application deployment directory contains spaces.

2. You may install the software using one of two methods:

- *Using the installer Graphic User Interface*

  Run the `install.bat` (for Windows) or `install` (for UNIX) command to launch the installation process.

  The installer displays the Welcome panel.

- *Using the nodisplay option*

  Change directory to the Identity Manager software location. Enter the following command to activate the installer in nodisplay mode:

  ```
  install -nodisplay
  ```

  The installer displays the Welcome text. The installer then presents a list of questions to gather installation information in the same order as the Graphic User Interface installer in these procedures.

NOTE If no display is present, the installer defaults to the `nodisplay` option. The DISPLAY environment variable must be set to a valid X server or the installation may fail.

3. Click **Next** to display the Install or Upgrade? panel.
4. Leave the New Installation option selected, and then click **Next**.

   The installer displays the Select Installation Directory panel.
5. Replace the displayed directory location with a staging directory. Enter the location (or click **Browse** to locate it), and then click **Next**.

NOTE If the directory you enter does not exist, the installer prompts for confirmation, and then creates the directory.

6. Click **Next** to begin installation.

   After installing files, the installer displays the Launch Setup panel.

7. Add the Java `mail.jar` and `activation.jar` files to the `$WSHOME/WEB-INF/lib` directory. These files can be found at:

   `http://java.sun.com/products/javamail`

   `http://java.sun.com/products/beans/glasgow/jaf.html`

CAUTION Before you continue, if you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory. For example, you may need to place into `idm/WEB-INF/lib` a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111. When finished, click **Launch Setup** to launch the Setup Wizard and continue with setup steps.

If you click **Launch Setup** before copying your index database files, setup will not proceed correctly. If this happens, quit the installation program, and then use the `lh setup` command to restart the setup portion of the installation process.

8. Click **Next** on the Setup Wizard panel.

   The product displays the Locate the Repository panel.

9. Select an index database:

   - Oracle (JDBC Driver)
   - Oracle (Data Source)
   - MySQL (JDBC Driver)
   - MySQL (Data Source)
   - DB2 (JDBC Driver)

- DB2 (Data Source)
- SQL Server (JDBC Driver)
- SQL Server (Data Source)
- LocalFiles

Depending on your selection, setup prompts for additional setup information.

NOTE See "Index Database Reference" on page 111, for selections and setup instructions.

10. Click **Next**.
11. The Continue Identity Manager Demo Setup? panel appears.
12. If this is a non-demo installation, click **No, I will configure Identity Manager myself**. Go to Step 21.
13. If appropriate, click **Yes, I would like to continue setting up a demonstration environment**.

    This allows you to quickly configure users and enter environment and server information.
14. Enter the following personal information:
    - First name
    - Last name
    - Email address

NOTE This personal information is used to create the Approver user (with configurator privileges.)

15. Enter the following Approver information:
    - Approver name
    - Approver password
16. Click **Next**.

17. Select the **Server Type** from the list.

    Select **None** if your environment has no server to manage. If there is a server you wish to manage, select the appropriate server type. You will be prompted for further server information as appropriate.

18. If you have an email SMTP server, click **SMTP Host** and enter the server address. If desired, click Test Server to verify communication to the SMTP server.

19. If you would like email notifications to be written to a file, click **Notification File**. Click **Browse** to select another notification file.

20. Click **Next**.

21. The installer displays the Import Save Configuration panel.

22. Click **Execute** to perform all the listed functions. If desired, click **Hide Details**.

23. When all functions complete, click **Done** in the setup panel.

    When installation completes, the installer displays the Installation Summary panel. For detailed information about the installation, click **Details**.

    Not all messages may not be displayed here. View the log file (identified in details) for more information.

    When finished, click **Close** to exit the installer.

24. Create a `.war` file from WSHOME:

    ```
    jar -cvf idm.war *
    ```

25. Copy the `idm.war` file to the JBoss `deploy` directory. (For example, *InstallDir*`\server\default\deploy`)

Step 3: Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Chapter 9

Install the Sun Identity Manager Gateway

If you plan to set up Windows Active Directory, Novell NetWare, Novell GroupWise, Exchange 5.5, Remedy, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway.

Prerequisites

The Sun Identity Manager Gateway may be installed on Windows 2000 SP3 or above and Windows 2003 platforms.

Systems that are running the Sun Identity Manager Gateway should be configured so that Dr. Watson does not produce visual notifications. If this feature is set, then if the gateway encounters an error, the process will hang until the pop-up window is closed.

The gateway system should also be configured to use a default ANSI codepage that is compatible with all data that Identity Manager manages.

You should use UTF-8 whenever possible, and if multiple resources are to be accessed from a single gateway, the gateway and all resources should all be configured to use UTF-8.

If you need to access resources that use different code pages, install a separate gateway for each code page. The gateway and resource should implement the same code page.

Refer to the following web page for information about setting international support on Windows XP and Server 2003 systems:

http://www.microsoft.com/globaldev/handson/user/xpintlsupp.mspx

Installation

To install the gateway on a Windows machine:

1. Select the Windows machine on which to install the gateway. It must be a member of the domain in which the accounts and other objects will be managed (the managed domain) or a member of a domain that is trusted by the managed domain. The gateway does not need to run on a domain controller.

NOTE For better performance, the gateway should be located near (from a network connectivity perspective) the domain controllers of the managed domain.

2. If you are selecting a system that is not the Identity Manager server, then:
   a. Create a directory called `idm` on the remote system.
   b. Copy the `gateway.zip` file from the Identity Manager Installation CD.
   c. Unpack and copy the contents of the `gateway.zip` file to the `idm` directory.
3. From the directory where the gateway files are installed, run the following command to install the gateway as a service:

   ```
   gateway -i
   ```

4. Run the following command to start the gateway service:

   ```
   gateway -s
   ```

NOTE

- You can stop the gateway service by running the command:

  ```
  gateway -k
  ```

- You can also start and stop the gateway by following these steps:
  - Open the Windows Control Panel.
  - Open Services. (In Windows, Services is located in Administrative Tools.)
  - Select Sun Identity Manager Gateway.
  - Click **Start** or **Stop**.

Failure Messages

Two common messages and their likely causes when working with the gateway are as follows:

- `'Overlapped I/O operation is in progress'`

  The most common cause of this message is that you have asked for the service to be installed or removed before a prior installation or removal has fully completed. Check the state of the service.

- `'Input/output error'`

  The most common cause of this is that you do not have rights to work with this service.

What's Next?

To begin using Identity Manager, follow the steps in "Getting Started" on page 89.

Chapter 10

Getting Started

Follow these steps to begin using Identity Manager or Identity Manager SPE.

1. Start your application server.
2. In a Web browser, enter the URL for your application server, including port, appended with the URL for the Web application (typically, this is `/idm`).

   For example: `http://appserver.example.com:8080/idm`

NOTE If you are using Internet Information Server (IIS) as your Web server, you must add `index.html` to the list of Default Documents under Properties, on the Identity Manager virtual directory in ISS. Otherwise, the applications main page will not resolve correctly when accessing the Identity Manager server.

3. Enter a user ID and password to log in. You can log in with one of the default account IDs and passwords:

   ID: Configurator
   Password: configurator

   or

   ID: Administrator
   Password: administrator

CAUTION It is strongly recommended that you reset the default administrator account passwords after installation.

NOTE For security reasons, we additionally recommend that you access the applications through a secure Web server using https. Read the chapter titled Identity Manager Security in *Identity Manager Administration* for additional security recommendations.

Enabling Language Support

The applications support multiple languages. Use the following steps to install localized files on your application server.

1. Download a language pack from the Sun Download Center, which is part of the Online Support Center (`http://www.sun.com/download`). A registered account name and password is required to access the download center.
2. Unpack the downloaded language pack to a temporary location.
3. Copy the JAR file from the temporary location to the *IdentityManagerInstallation*`/WEB-INF/lib` directory.
4. Restart the application server instance.

For additional information regarding Identity Manager localization, refer to Identity Manager L10N Readme file, which can be found in every Identity Manager language pack.

Deploying Identity Manager for Mac OS X

When deploying Identity Manager, you must make several modifications to accommodate the Mac OS X environment.

Modify the lh.sh File

You must modify the `bin/lh.sh` file to detect Darwin as an operating system. Otherwise, Identity Manager assumes that it is executing on the Windows operating system.

Customize MultiSelect Components for the User Interface

MultiSelect boxes, as presented by default in the Identity Manager User Interface, are not compatible with the Safari browser. You must customize all forms containing MultiSelect components to set the `noApplet` option. Set this option as follows:

```
<Display class='MultiSelect'>
<Property name='noApplet' value='true'/>
  ...
```

Use Safari Enhancer for the Administrator Interface

While the Administrator Interface is not officially supported for Safari, you can try this unsupported method that is known to work for Safari users:

1. Quit Safari.
2. Install Safari Enhancer from the following location, and enable Safari's Debug menu:

   http://www.versiontracker.com/dyn/moreinfo/macosx/17776
3. Restart Safari.
4. Select Windows MSIE 6.0 from the Debug:User Agent menu.
5. Point Safari to your Identity Manager installation.

Setting the lh Environment

Some deployments require added environment variables and other settings to the shell environment (or command environment in Windows) for `lh` to function. For example, when using a WebSphere 5 datasource for the repository, extra environment variables are required.

You may create an environment file that `lh` uses to load deployment-specific environment settings. This file must be named and placed in the following location:

`$WSHOME/bin/idm-env.sh (UNIX)`

`%WSHOME%\bin\idm-env.bat (Windows`

This file is not provided. However, you can use the following files as a starting point for your own environment file:

`sample/other/idm-env.sh-ws5 (UNIX)`

`sample\other\idm-env.bat-ws5 (Windows)`

Help and More Information

The following printed and online documentation and information can help you use Identity Manager after installation:

- *Identity Manager Administration*

  Procedures, tutorials, and examples that describe how to use Identity Manager to provide secure user access to your enterprise information systems.

- *Identity Manager Technical Deployment Overview*

  Conceptual overview of the Identity Manager product (including object architectures) with an introduction to basic product components.

- *Identity Manager Workflows, Forms, and Views*

  Reference and procedural information that describe how to use the Identity Manager workflows, forms, and views — including information about the tools you need to customize these objects.

- *Identity Manager Resources Reference*

  Reference and procedural information that describe how to load and synchronize account information from a resource into Sun Java™ System Identity Manager.

- *Identity Manager Deployment Tools*

  Reference and procedural information that describe how to use different Identity Manager deployment tools including rules and rules libraries, common tasks and processes, dictionary support, and the SOAP-based Web service interface provided by the Identity Manager server.

- Identity Manager Help

  Online guidance and information that offers complete procedural, reference, and terminology information about Identity Manager. You can access help by clicking the Help link from the Identity Manager menu bar. Guidance (field-specific information) is available on key fields.

Chapter 11

Updating Identity Manager

Use the following procedures to prepare for upgrading your current Identity Manager installation. For full upgrade information, see *Identity Manager Upgrade*.

Prepare for Update

Before updating your Identity Manager installation, you should perform these tasks:

Assess Your Current Identity Manager Installation

It is important to understand what Identity Manager version, hotfixes and service packs have been installed prior to updating. Use the following command-line utilities to list and record your installation information:

```
lh assessment inventory
```

```
lh assessment installed
```

NOTE These commands work only for releases, services packs, and hotfixes greater than 5.0 SP4.

inventory

The **inventory** command inspects the file system for files that were added or deleted to the system based on the files packaged in the release. It is only able to determine which files are changed based on the manifest shipped with Identity Manager.

Usage

```
inventory [option] [option]...
```

Options

Option	Function	Description
-h	help	Display usage.
-a	added	Display only added files.
-d	deleted	Display only deleted files.
-m	modified	Display only modified files.
-u	unchanged	Display only unchanged files.

installed

The **installed** command searches the patches directory for manifests and displays versions from those filenames.

Usage

```
installed [option] [option]...
```

Options

Option	Function	Description
-h	help	Display usage.
-r	releases	Display only installed releases.
-s	servicepacks	Display only installed service packs.
-h	hotfixes	Display only installed hotfixes.

Uninstalling Applications

Follow these instructions to remove:

- The application software
- The application database

Remove the Software

Use these instructions to remove the software from a Windows or UNIX installation.

On Windows

1. Stop your application server.
2. If you are using a Windows server to run the Sun Identity Manager Gateway, stop the gateway service with the command `gateway -k`.

NOTE You can later remove the gateway service with the command:

```
gateway -r
```

---

3. Remove configuration database files. To do this:
   a. Log in to your database server.
   b. Run the `drop_waveset_tables.`*DatabaseType* script for your database type.

4. From the Windows Control Panel, open the Add/Remove Program facility.
5. Click to highlight Identity Manager, and then click **Change/Remove**. Your system displays an Uninstaller panel.
6. Click **Uninstall Now** to remove the application files and registry entries. After reading the Unistall Summary, click **Finish**.
7. Remove links and references to the application software from your application server.

On UNIX

1. Go to the location where you installed the application.
2. Remove configuration database files. To do this:
   a. Log in to your database server.
   b. Run the `drop_waveset_tables.`*DatabaseType* script for your database type.
3. Enter the following command:

   ```
   JAVA uninstall_Sun_Java_System_Identity_Manager_Installer
   ```

NOTE Do not include the .class extension of this file to the command.

Remove the Application Database

Use one of the following commands to remove the application database.

If your database is:	On this platform:	Run this command:
MySQL	Windows	`c:\mysql\bin\mysql < drop_waveset_tables.mysql`
MySQL	UNIX	`$MYSQL/bin/mysql < drop_waveset_tables.mysql`
Oracle	Windows	`sqlplus` *dbausername/dbapassword* `@drop_waveset_tables.oracle`
Oracle	UNIX	`sqlplus` *dbausername/dbapassword* `@drop_waveset_tables.oracle`

If your database is:	On this platform:	Run this command:
DB2	Windows and UNIX	`db2 -tvf drop_waveset_tables.db2`
SQL Server	Windows	`isql -S` *`Server`* `-U` *`User`* `-P` *`Password`* `-i` *`PathToFile`*`\drop_waveset_tables.sqlserver`

Installing Identity Manager Manually

If you do not want to install Identity Manager through the installation interface, use these alternate, manual installation procedures.

Installation Steps

Follow these general installation and configuration steps, located in this appendix and other chapters:

- Step 1: Install the Application Server software
- Step 2: Install the Application Software
- Step 3: Configure the Identity Manager Index Database Connection
- Step 4: Install the Sun Identity Manager Gateway

Step 1: Install the Application Server software

NOTE The application server installation and configuration process differs by type. Refer to previous application server-specific installation chapters for more information on their installation and configuration.

Step 2: Install the Application Software

Follow these procedures to install the software.

On Windows

Enter the following series of commands:

```
set JAVA_HOME=Path to JDK
cd ApplicationDeploymentDirectory
```

where *ApplicationDeploymentDirectory* is the directory where your application server is deployed. For example, for a Tomcat installation, change directory to `c:\tomcat-4.1.3\webapps`.

```
mkdir idm (or any other directory name)
cd idm
set WSHOME=ApplicationDeploymentDirectory\idm
jar –xvf %CDPATH%\idm.war
```

NOTE Make sure the value of the WSHOME environment variable does NOT contain the following:

- Quotation marks (“ “)
- A backslash at the end of the path (\)

Do not use quotation marks, even if the path to the application deployment directory contains spaces.

ON UNIX

Enter the following series of commands:

```
PATH=$JAVA_HOME/bin:$PATH
cd $TOMCAT_HOME/webapps
cd ApplicationDeploymentDirectory
```

where *ApplicationDeploymentDirectory* is the directory where your application server is deployed. For example, for a Tomcat installation, change directory to `/tomcat-4.1.3/webapps`.

```
mkdir idm (or any other directory name)
cd idm
WSHOME=ApplicationDeploymentDirectory/idm;export WSHOME

jar –xvf /cdrom/cdrom0/idm.war
```

Change directory to `$WSHOME/bin` then set permissions on the files in the directory so that they are executable.

NOTE As of the 5.0 SP3 release the adapter classes are now contained in the idmadapter.jar file. If you have a custom adapter, you might need to update your class path.

Before You Continue

If you plan to use an index database, you may need to copy one or more files to the `idm/WEB-INF/lib` directory. For example, you may need to place a JAR file containing a JDBC driver (for a DriverManager connection) or a JAR file containing a JNDI InitialContextFactory (for a DataSource connection). To determine the steps you may need to perform before you go on, see "Index Database Reference" on page 111.

When finished, continue with Step 3.

Step 3: Configure the Identity Manager Index Database Connection

The `ServerRepository.xml` file is an encrypted file that defines how to connect to the index repository. Use one of the following procedures to configure the repository XML file.

Windows or Xwindows (UNIX) Environments

If you are running on Windows or in an Xwindows-capable environment:

1. Enter one of the following commands to launch the setup interface.

   On Windows

   ```
   cd %WSHOME%\bin
   lh setup
   ```

   On UNIX

   ```
   cd $WSHOME/bin
   lh setup
   ```

The installer displays a welcome page. Click **Next** to display the **Locate the Repository** panel.

2. Select an index database:

- Oracle (JDBC Driver)
- Oracle (Data Source)
- MySQL (JDBC Driver)
- MySQL (Data Source)
- DB2 (JDBC Driver)
- DB2 (Data Source)
- SQL Server (JDBC Driver)
- SQL Server (Data Source)
- LocalFiles

Depending on your selection, setup prompts for additional setup information.

NOTE See "Index Database Reference" on page 111, for selections and setup instructions.

3. Click **Next** to display the **Continue Identity Manager Demo Setup?** panel. Follow all subsequent prompts as directed.

Non-Xwindows Environments

If you are not running in an Xwindows-capable environment, follow these steps.

1. Set your index repository with the following series of commands:

```
cd $WSHOME/bin
chmod 755 *
```

2. Run the setRepo command, using the appropriate location flags required to connect to the database.

NOTE For complete `setRepo` usage and options, see "setRepo Reference" on page 141.

3. Start the application server.
4. Load the initial database values. Follow these general steps:
   a. Log in to the Administrator Interface.

b. From the menu bar, select **Configure→Import Exchange File**.

c. Enter or browse for the `init.xml` file (located in the `idm\sample` directory), and then click **Import**.

Step 4: Install the Sun Identity Manager Gateway

If you plan to set up Windows 2000, Novell NetWare, or RSA ACE/Server resources, you should install the Sun Identity Manager Gateway. Follow the procedures in "Install the Sun Identity Manager Gateway" on page 85.

Chapter 14

Installing Service Packs

Sun periodically provides updates in release service packs. Following are instructions and information to help you when downloading and installing service pack contents. This chapter contains:

- Downloading Service Packs
- Backing Up
- Installing Service Packs

Service packs are cumulative within a release. This means that each service pack includes the contents of the service packs introduced prior to it within the release. For example, you can install Service Pack 2 directly on the base product without first having to install Service Pack 1.

Downloading Service Packs

Follow these general steps to download service packs:

1. Log on to the Sun Online Support Center:

   `http://www.sun.com/service/online`

2. Select your country and language.
3. Select the **Patches & Downloads** tab. Then select the **Contracted Software Downloads** link.
4. Enter a valid username and password
5. Select the link for the service pack to begin the download.
6. On the server, change to the installation directory.

7. Create a directory named `patches`, and then change to that directory:

   ```
   cd %WSHOME%\patches
   ```

8. Make sure the `jar` command is in the system path. The `jar` command is usually located in the Java SDK `bin` directory.

9. Unjar the downloaded service pack `jar` file:

   ```
   jar -xvf ServicePackName
   ```

   This creates a new directory that contains:

   - `gateway.zip` – Gateway service pack file
   - *ServicePackName*`.README` – The readme file containing instructions for installing the service pack.
   - An installation package or a jar file to be installed or placed on the server.

Backing Up

You should backup the Identity Manager database and file system before applying any Identity Manager service packs, hotfixes, or going through any major upgrades. You should also back up your database and file system with some regularity — how often will depend on your environment.

When you are ready to backup your database and file system, you must first shutdown (or idle) Identity Manager. Then, you can use your database back-up utilities to backup the database and your file system back-up utilities to backup the directory where you installed Identity Manager.

NOTE In general, export commands are useful, but there are issues with using their output for restoring data to a new database:

- Audit records are not exported by default. You would have to explicitly export these records to recover from a more catastrophic failure.

  Other records may be missing from the default export as well.

- When importing exported users to a new database, the create dates are set to the date of the import.

Use the Identity Manager console export tools only to “backup the backup” and to get data out of waveset for other, more general purposes.

Installing Service Packs

Follow the steps outlined in the readme file to install the service pack contents. The readme also contains a list of features and fixes included in the service pack.

Appendix A

Index Database Reference

If you plan to use an index database, you may need to copy one or more files to the `idm\WEB-INF\lib` directory during the installation process. The following table shows the download or installed product location of one or more `.jar` files you need to copy for your index database type.

Index Database	Download or Product Location	Configuration Notes

DB2 7.x, 8.1, 8.2	`Db2/java/db2java.zip`
	
	—OR—
	If you are using Type 4 network driver use this file instead:
	`db2jcc.jar`
	If you are using DB2 8.1.2 or higher, you will also need the following files:
	`db2jcc_license_cisuz.jar`
	`db2jcc_license_cu.jar`
		Unzip the `db2java.zip` file.
		Note On Windows systems rename the `db2java.zip` to `db2java.jar`.
		1. Copy the appropriate JAR files to the `WEB-INF\lib` directory.
		2. Start the JDBC driver:
		• On UNIX systems, enter: `db2jstrt port#` (default 6789) running under instant owner
		• On Windows systems, start from services

MySQL 4.1, 5.0	http://dev.mysql.com/downloads/ Select a version of MySQL Connector/J to download.	Unpack the connector package. Copy the `mysql-connector-`*`Version`*`-bin.jar` file to the `WEB-INF\lib` directory. (optional) Rename the `.jar` file to `mysqljdbc.jar`.
Oracle 9*i, 10g*	`Oracle/jdbc/lib/ojdbc14.jar`	Copy the `ojdbc14.jar` file to the `idm\WEB-INF\lib` directory. Rename `ojdbc14.jar` to `oraclejdbc.jar`.
SQL Server 2000, 2005	`MicrosoftSQL Server 2005 Driver for JDBC/lib`	Copy the `mssqlserver.jar` file to the `WEB-INF\lib` directory.

Index Database	Download or Product Location	Configuration Notes
JDBC 2.0 Data Source	Depends on the directory service. Consult the documention for your Application Server or other directory service to locate an appropriate jar that contains the InitialContextFactory class.	Copy the appropriate jar (or jars) to the `WEB-INF/lib` directory.

NOTE For a DataSource connection, you must copy or download (and place into WEB-INF/lib) a jar that contains the InitialContextFactory class.

Refer to the following table when installing the Identity Manager software and completing index database selections on the Locate Identity Manager Repository panel.

If your selection is:	Enter
JDBC 2.0 Data Source • **Initial Context Factory:** com.sun.jndi.fscontext.RefFSContextFactory • **DataSource Name/Path:** jdbc/SampleDB	Enter the index database location. Optionally enter the password you selected when you set up the database.
MySQL • **URL:** jdbc:mysql://localhost/waveset • **JDBC Driver:** org.gjt.mm.mysql.Driver • **Connect as User:** waveset	Enter the index database location and the password you selected when you set up the database.
Oracle • **URL:** java:oracle:thin:@host.your.com:1521:dbname • **JDBC Driver:** oracle.jdbc.driver.OracleDriver • **Connect as User:** waveset	Enter the index database location and the password you selected when you set up the database.

If your selection is:	Enter
DB2 • **URL:** jdbc:db2://host.your.com:6789/dbname • **JDBC Driver:** COM.ibm.db2.jdbc.net.DB2Driver —OR— com.ibm.db2.jcc.DB2Driver • **Connect as User:** Waveset	Enter the index database location and the password you selected when you set up the database.
SQLServer **Default values, to be used with the Microsoft SQL Server 2005 JDBC Driver:** • **URL:** "jdbc:sqlserver://host.your.com:1433;DatabaseName=dbname" • **JDBC Driver:** com.microsoft.sqlserver.jdbc.SQLServerDriver • **Connect as User:** waveset **Use the following values with the Microsoft SQL Server 2000 JDBC Driver:** • **URL:** "jdbc:microsoft:sqlserver://host.your.com:1433;DatabaseName=dbname;SelectMethod=Cursor" • **JDBC Driver:** com.microsoft.jdbc.sqlserver.SQLServerDriver • **Connect as User:** waveset	Enter the index database location and the password you selected when you set up the database. **Note:** All connections to SQL Server must be performed using the same version of the JDBC driver. This includes the repository as well as all resource adapters that manage or require SQL Server accounts or tables, including the Microsoft SQL adapter, Microsoft Identity Integration Server adapter, Database Table adapter, Scripted JDBC adapter, and any custom adapter based on these adapters. Conflict errors occur if you attempt use different versions of the driver.
LocalFiles • **Path:** c:\jakarta-tomcat\webapps\idm\config	Enter the directory location, or click Browse to locate it.
iPlanet/Sun ONE/Sun Java System Directory Service • **Initial Context Factory:** com.sun.jndi.ldap.LdapCtxFactory • **URL:** ldap://host.your.com/dc=myDomain,dc=your,dc=com • **User:** waveset	Enter the index database location. Optionally enter the password you selected when you set up the database.

Appendix B

Configuring MySQL

This appendix describes how to set up and configure a MySQL database for use as your default data store.

MySQL is a free database software package. You can download it from www.mysql.com. For more information about MySQL, read the MySQL manual, available online at www.mysql.com/documentation/mysql/commented/manual.php.

Sections from the manual that are particularly relevant to this discussion include:

- 4 Installing MySQL
- 4.6 Installing a MySQL Binary Distribution
- 4.13 Windows Notes
- 4.16 Post-installation Setup and Testing

Perform these steps on your local machine (non-shared database):

1. **Download MySQL**
   Download the latest recommended version of MySQL. For Windows, this should be a zip file. For Solaris it is a gzip'ed tar file. For Redhat Linux, download the `MySQL-VERSION.i386.rpm` and the `MySQL-client-VERSION.i386.rpm` binaries. For other versions of Linux, there is a tar file.

2. **Install MySQL**
   Unpack the MySQL image and install it as root on UNIX systems or as a member of the Administrators group on Windows.
   For Windows after unzip'ing the zip file, run setup to begin the install shield extract.
   For Redhat Linux run the following command:

```
rpm -i MySQL-VERSION.i386.rpm MySQL-client-VERSION.i386.rpm
```

If you are missing the perl5 dependency (for example you have perl5.00503-12 instead), you can use the `--nodeps` at the end of the above command.

`MySQL` is installed (untarred) into `/usr/bin` and `/var/lib/mysql` on UNIX, and no additions to your path need to be made. On Windows, it is installed into `c:\mysql` and `c:\mysql\bin` can be added to your **PATH** environment to assist in running some commands.

3. **Start the MySQL process**
   To make sure the installation process started the MySQL process, run the following command:

   ```
   <MySQL_Install_Dir>/bin/mysqlshow
   ```

   It should list the default databases created during the installation process.

   If this process has not been started, then use the following steps to register and start MySQL.
   On Windows, if you are installing in a directory other than `c:\mysql` then create a file called `c:\my.cnf` with the following content:

   ```
   [mysqld]
   basedir=d:/mysql/
   default-character-set=utf8
   default-collation=utf8_bin
   ```

   On Windows, install and start the service:

   ```
   cd <MySQL_Install_Dir>/bin
   mysqld-nt --install
   net start mysql
   ```

4. **Create a MySQL database**
   On Windows and Redhat Linux, the installation mechanism will create the MySQL database. On Solaris and other UNIX platforms, the following post-install command must be run as root to create the database.

   ```
   <MySQL_Install_Dir>/bin/scripts/mysql_install_db
   ```

   The MySQL manual covers this in several places, including 4.16 Post-installation Setup and Testing.

5. **Create the Identity Manager tables**

   Modify the script `create_waveset_tables.mysql`, which can be found on the Identity Manager installation CD or in the `idm/sample` directory. It is recommended that you change the default password that will be used to connect to the MySQL database. Create the new tables as the MySQL "root" user using the following command.

   ```
   cd idm/sample
   mysql -uroot [ -ppassword ] < create_waveset_tables.mysql
   ```

   MySQL installation creates a MySQL "root" user (not to be confused with any system account "root") and prompts you to set a password.

   MySQL's interactive SQL command line tool is called `mysql`. MySQL utilities take option -u*user* (and, optionally, -p*password*) to specify as which user to connect.

NOTE The username and password used in the command above is different than the one set in the file above. The one set in the file above should be used only by Identity Manager, and for security reasons should be different than the MySQL administrative account name and password.

Appendix C

Configuring Data Sources for Identity Manager

This appendix provides procedures for creating data sources for Identity Manager in the following sections:

- Configuring a WebSphere Data Source for Identity Manager
- Configuring a WebLogic Data Source for Identity Manager
- Configurating a Sun Java System Application Server Data Source for Identity Manager

Configuring a WebSphere Data Source for Identity Manager

Use the following information to configure a WebSphere Data Source for Identity Manager. this section includes:

- Servlet 2.3 Data Sources
- Configuring a JDBC Provider
- Configuring a WebSphere JDBC Data Source
- Point the Identity Manager Repository to the Data Source
- Specifying Additional JNDI Properties to the setRepo Command

Servlet 2.3 Data Sources

As of the Identity Manager 6.0 Release, the deployment descriptor in the WEB-INF/web.xml file refers to Servlet 2.3. Because of this, the Identity Manager web application can no longer be used with a WebSphere Application Server Version 4 Data Source.

Use the following steps to configure a WebSphere data source for Identity Manager:

1. Configure a JDBC provider.
2. Configure a WebSphere JDBC Data Source.
3. Point the repository to the data source.

These steps are discussed in detail below.

Configuring a JDBC Provider

Use WebSphere's administration console to configure a new JDBC Provider.

1. Click the **Resources** tab in the left pane to display a list of resource types.
2. Click **JDBC Providers** to display a table of configured JDBC providers.
3. Click the **New** button above the table of configured JDBC providers.
4. Select from the list of JDBC database types, jdbc type and implementation type. Click Next.

   Oracle, Oracle JDBC Drive, and Connection pool Data Source will be used for this example.
5. Continue configuring general properties.
   - Specify the name.
   - Specify the path to the JAR that contains the JDBC driver in the **Classpath** field. For example, to specify the Oracle thin driver, specify a path similar to the following:

     ```
     /usr/WebSphere/AppServer/installedApps/idm/idm.ear/idm.war/WEB-INF/lib/oraclejdbc.jar
     ```

NOTE You can use the administration console to specify the path to the JAR that contains the JDBC Driver. From the menu labeled **Environment**, select the **WebSphere Variable** menu item. On that pane, first choose the **cell**, **node**, and **server** for which to define this environment variable. Then specify the path to the JAR as the value of this variable.

- Specify the fully qualified name of the JDBC Driver class in the **Implementation ClassName** field.
    - For the Oracle thin driver, this value is `oracle.jdbc.pool.OracleConnectionPoolDataSource`.
    - For db2 jcc driver, this value is com.ibm.db2.jcc.DB2ConnectionPoolDataSource
- You may also change the name or description of the provider to anything you choose.

  When you are finished, click the **OK** button at the bottom of the table. The right pane should display the provider you added.

To configure a data source that uses this JDBC provider, see "Point the Identity Manager Repository to the Data Source" on page 125.

Configuring a WebSphere JDBC Data Source

1. Use WebSphere's Administrative Console to define a data source with an existing JDBC Provider. If you need to define a new JDBC Provider for use with Identity Manager, see "Configuring a JDBC Provider" on page 120.

Before you can finish configuring the data source, you must configure authentication data. These aliases contain credentials that are used to connect to the DBMS.

Configure the 5.1 Authentication Data

1. Click on the **Security** tab in the left pane to display a list of security configuration types.
2. Click on the **JAAS Configuration** tab in the left pane to display a list of JAAS configuration types.

3. Click on the **J2C Authentication Data** tab in the left pane. The right pane displays a table of authentication data entries.
4. Click the **New** button above the table of authentication data entries. The right pane displays a table of general properties that can be configured.
5. Configure the general properties for the new authentication data entry. Note the following:
   - **Alias** is the name that will be shown in the selection list whenever someone configures the DBMS credentials for a Data Source.
   - **UserID** is the name used to connect to the DBMS.
   - **Password** is the password used to connect to the DBMS.

Next, configure the data source.

Configure the 6.x Authentication Data

1. Click **Security > Global security**.
2. Under Authentication, click **JAAS configuration > J2C authentication data**. The **J2C Authentication Data Entries** panel is displayed.
3. Click **New**.
4. Enter a unique alias, a valid user ID, a valid password, and a short description (optional).
5. Click **OK** or **Apply**. No validation for the user ID and password is required.
6. Click **Save**.

NOTE The newly created entry is visible without restarting the application server process to use in the data source definition. But the entry is only in effect after the server is restarted.

Configure the Data Source

NOTE If configuring a data source in a Websphere 5.x cluster, see "Configure the DataSource in a Websphere Cluster" on page 124 for more information.

1. Click the **Resources** tab in the left pane to display a list of resource types.

2. Click **JDBC Providers** to display a table of configured JDBC providers.
3. Click on the name of a JDBC provider in the table. The right pane displays a table of general properties configured for the selected JDBC provider.
4. Scroll down to a table of additional properties. Click on **Data Sources**. The right pane displays a table of data sources configured for use with this JDBC provider.

NOTE Be aware of the **Scope** field at the top of the frame in the WebSphere administration console. Ensure that **Node** and **Server** are blank so that the cell information is presented for configuration underneath the **New** and **Delete** buttons.

---

5. Click the **New** button above the table of data sources. The right pane displays a table of general properties to configure.
6. Configure the general properties for the new data source. Note the following:
   - The **JNDI Name** is the path to the DataSource object in the directory service.
     You must specify this same value as the `-f` argument in `setRepo -t`*`dbms`* `-i`*`initCtxFac`* `-f`*`filepath`*.
   - **Container-managed persistence** should be left unchecked. Identity Manager does not use Enterprise Java Beans (EJBs).
   - **Component-managed Authentication Alias** points to the credentials that will be used to access the DBMS (to which this DataSource points).
   - Select from the drop-down list the alias that contains the appropriate set of DBMS credentials. See "Configure the 5.1 Authentication Data" on page 121 for more information.
   - **Container-managed Authentication Alias** is not used. Set this value to `(none)`. Identity Manager makes its own connection to the DBMS (to which this DataSource points).
   - Click **OK** when you have configured this panel. The Data Sources page is displayed.
7. Click the DataSource you created. Then scroll down to the table of Additional Properties near the bottom. Click the **Custom Properties** link.

   The right pane displays a table of DBMS-specific properties.

8. Configure the custom properties for this DataSource. Click on the link for each property to set its value. Note the following:
   - **URL** is the only required property. This database URL identifies the database instance and contains driverType, serverName, portNumber and databaseName.You may also specify some of these as individual properties.
   - **driverType** in this example is thin.
   - **serverName** is a host name (or an IP address).
   - **databaseName** is usually a short database name.
   - **portNumber** is 1521 by default for Oracle.
   - **preTestSQLString** may be worth configuring to a value such as SELECT 1 FROM USEROBJ. This SQL query confirms that the USERJOB table exists and is accessible.
9. From the table of Additional Properties, you may also click the **Connection Pool** link if you wish to configure these properties for performance tuning.

Configure the DataSource in a Websphere Cluster

When configuring the DataSource in clustered WebSphere environments, configure it at the cell level. This allows the DataSource to be accessed from all nodes in the cell.

To configure this use the `-D` *`$propertiesFilePath`* option where *`$propertiesFilePath`* contains:

`java.naming.provider.url=iiop://localhost:`*`jndi_port/`*

or:

`-u iiop://localhost:`*`jndi_port/`*

To determine the JNDI port to specify, examine the WebSphere configuration.

1. In the WebSphere administration console, navigate to **Application Servers** > **test_server1** > **End Points**.
2. Look at the **BOOTSTRAP_ADDRESS** property. Use the specified port in the `java.naming.provider.url` property.

NOTE The java.naming.provider.url uses **localhost** as the hostname. WebSphere 5.x replicates a JNDI server on each node in the cluster so that each application server has its own JNDI server to query. Specify **localhost** for the host so that each application server in the cluster is used as the JNDI server that Identity Manager queries when the **DataSource** is being located.

Point the Identity Manager Repository to the Data Source

Use the following steps to point the repository to the newly created data source.

1. Set the WSHOME environment variable to point to your Identity Manager installation; for example:

   ```
   export WSHOME=$WAS_HOME/installedApps/idm.ear/idm.war
   ```

   where `$WAS_HOME` is the WebSphere home directory, such as `/usr/WebSphere/AppServer`

2. Make sure that the JAVA_HOME environment variable is set correctly; for example:

   ```
   export JAVA_HOME=$WAS_HOME/java
   ```

3. Make sure that the Java executable is in your path; for example:

   ```
   export PATH=$JAVA_HOME/bin;$PATH
   ```

4. Make sure the classpath is pointing to the WebSphere properties directory. For example

   ```
   export CLASSPATH=$WAS_HOME/properties
   ```

5. Change to the `$WSHOME/bin` directory.

6. (For SQLServer only): Install JTA support:

   a. Copy the `sqljdbc.dll` file located in the SQLServer JTA directory to the `SQL_SERVER_ROOT/binn` directory of the SQLServer database server.

NOTE The default location of the SQLServer JTA directory is `C:\Program Files\Microsoft SQL Server 2000 Driver for JDBC\SQLServer JTA`. The default location of `SQL_SERVER_ROOT/binn` is `C:\Program Files\Microsoft SQL Server\MSSQL\Binn`.

b. From the database server, use the ISQL or OSQL utility to run the `instjdbc.sql` script, which is also found in the SQLServer JTA directory. The following examples illustrate the use of these utilities:

```
isql -Usa -psa_password -Sserver_name
-ilocation\instjdbc.sql

osql -E -ilocation\instjdbc.sql
```

7. Archive a copy of the existing `ServerRepository.xml` file, in case you need to revert. By default, this file is located in $WSHOME/WEB-INF.

8. Point the repository to the new location. For example:

```
lh -Djava.ext.dirs=$JAVA_HOME/jre/lib/ext:$WAS_HOME/lib setRepo
-Uusername
-Ppassword
-toracle -icom.ibm.websphere.naming.WsnInitialContextFactory
-fDataSourcePath
```

   In the above example the *DataSourcePath* might be `jdbc/jndiname`. The `bootstrap_port` is the websphere server bootstrap address port.

   The `-Djava.ext.dirs` option adds all of the JAR files all of the JAR files in WebSphere's `lib/` and `java/jre/lib/ext/` directories to the CLASSPATH. This is necessary in order for the setRepo command to run normally.

   Change the `-f` option to match the value you specified for the **JNDI Name** field when configuring the data source. See "setRepo Reference" on page 141 for more information about this command.

9. In the RepositoryConfiguration configuration object, set the connectionPoolDisable attribute to true.

```
<RepositoryConfiguration connectionPoolDisable='true'>
```

   This setting prevents WebSphere from sending extraneous warnings to the `SystemOut.log` file. For more information, see `http://www-1.ibm.com/support/docview.wss?uid=swg21121449`

10. Restart WebSphere to pick up changes. (This also restarts the system.)

Specifying Additional JNDI Properties to the setRepo Command

The `setRepo` command provides an option that allows you to specify an arbitrary set of properties. The `-D $propertiesFilePath` option allows you to specify any number of settings, including vendor-specific properties not specified by JNDI, by including them in a properties file that you create.

For example, to specify a different JNDI port number, include a line like the following in your properties file:

```
java.naming.provider.url=iiop://localhost:2909
```

Configuring a WebLogic Data Source for Identity Manager

Use the following procedure to update the repository configuration in Identity Manager to point to a WebLogic Data Source. This section includes:

- Create a WebLogic Data Source
- Create a JDBC Data Source
- Point the Identity Manager Repository to the Data Source

Create a WebLogic Data Source

This example procedure describes configuration steps to use an Oracle database driver. Specific entries you make will differ, depending on your database type.

NOTE These steps assume that you have:

- Identity Manager installation running on WebLogic, Version 8.1
- A current working repository

Create a Connection Pool

1. Log in to the WebLogic Administrator Web console (by default, `http://localhost:7001/console/`).

2. Expand the **Services** folder for the domain located in the navigation (left) pane.
3. Expand the **JDBC** folder.
4. Expand the **Connection Pools** folder.
5. In the right pane (JDBC Connection Pools), click **Configure a new JDBC Connection Pool**.
6. For Database Type select **Oracle**. You can use any of the applicable types. Note that drivers must be installed in order to use them.
7. Select an applicable drive in the **Database Driver** selection box. In this example, select **Oracle's Driver (Thin)**.
8. Click **Continue**.
9. Configure the JDBC driver as follows:

Value	Action
Name	Choose a unique name that identifies your connection pool. For example: myOraConnPool.
Database Name	Select the name of the oracle database that you wish to connect to. In this example myOraDB.
Host Name	Specify the host name of Oracle DB server.
Port	Specify the port (default is 1521) for the database server.
Database User Name	Specify the database account users name used in the connection.
Password	Specify the password for the account user.

10. Click **Continue**.
11. Test the database connection on this page or click **Skip this step**. You may need to add additional properties depending on your installation. See the administrator's guide for your target database.

NOTE The following **Connection Pool Settings** are dependent on the driver that you select. The following options are for the Oracle driver and may not be applicable if you choose another kind of driver.

The JDBC drivers must be installed for this to succeed. Follow the instructions provided with your target driver.

12. Click **Create and deploy**.
13. Configure connection settings for this connection pool:

    ```
    Example Connection Settings:
    Initial Capacity:20
    Maximum Capacity:100
    Capacity Increment: 10
    Statement Cache Type: LRU
    Statement Cache Size: 20
    ```

Create a JDBC Data Source

1. Expand the Services folder for the domain located in the navigation (left) pane.
2. Expand the **JDBC** folder.
3. Expand the **Data Source** folder.
4. In the right pane (JDBC Data Sources), click **Configure a new JDBC Data Source**.
5. Configure the JDBC Data Source as follows:

Value	Action
Name	Choose a unique name for this data source. This name is used as a reference throughout the Weblogic Console. For example, MyOraDataSource.
JNDI Name	Specify the JNDI name. This can be the same as the Data Source name. For example MyOraDataSource.
Honor Global Transactions	Select this check box (selected by default) if you wish to enable global transactions using this data source (see weblogic online help for more information concerning this option). In this example we keep the default.
Emulate Two-Phase Commit for non-XA Driver	See the WebLogic documentation for further information.

6. Click **Continue**.

7. Select the **connection pool** from part A. This allows an application to get a connection from the underlying connection pool.
8. Click **Continue**.
9. Select the servers on which you want deploy the new data source.
10. Click Create.

NOTE The configuration steps are saved in your WebLogic config.xml file for a given domain. Changes to the XML file appear as:

```
<JDBCConnectionPool
DriverName="oracle.jdbc.driver.OracleDriver"
Name="myOraConnPool"
Password="{3DES}7Ne5r7/NaLfLyXYQGBHoYg=="
Properties="user=myuser" Targets="myserver"
TestTableName="SQL SELECT 1 FROM DUAL"
URL="jdbc:oracle:thin:@my.hostname:1521:mydatabasename"/>
<JDBCTxDataSource JNDIName="MyOraDataSource"
Name="MyOraDataSource" PoolName="MyOraConnPool"
Targets="myserver"/>
```

Point the Identity Manager Repository to the Data Source

1. Set the WSHOME environment variable to point to your Identity Manager installation; for example:

   ```
   set WSHOME=C:\bea\user_projects\domains\mydomain\applications\idm
   ```

2. Make sure that the JAVA_HOME environment variable is set correctly; for example:

   ```
   set JAVA_HOME=C:\j2sdk1.4.2_04
   ```

3. Make sure that your chosen database drivers are installed for you Weblogic Server. See the Weblogic documentation for further information. In this example, the Oracle drivers and classes12.jar are installed in following directory:

   WebLogicHome\server\lib

   a. On Windows, set the class path to include these files:

      ```
      set CLASSPATH=%CLASSPATH%;WeblogicHome\server\lib\<MyDBLibrary>
      ```

b. For Oracle, set the class path to include these files:

```
set
CLASSPATH=%CLASSPATH%;c:\bea\weblogic81\server\lib\classes12.zip
```

4. Include weblogic.jar in your CLASSPATH. On Windows, enter:

   ```
   set CLASSPATH=%CLASSPATH%;WeblogicHome\server\lib\weblogic.jar
   ```

   For example:

   ```
   set CLASSPATH=%CLASSPATH%;c:\bea\weblogic81\server\lib\weblogic.jar
   ```

5. Change to the %WSHOME directory.

6. Remove the j2ee.jar file from WEB-INF\lib\ after making a backup.

NOTE Removing the jars from `WEB-INF/lib` for WebSphere disables the BPE. Move those jars to a different location and create a CLASSPATH variable that points to those jars to re-enable the BPE.

7. Change directory to the %WSHOME\bin directory

8. Point the repository to the new location. For example:

   ```
   lh setRepo -v -tOracle -iweblogic.jndi.WLInitialContextFactory
   -fDatasourceName -u"t3:Server:Port" -U"Username" -P"Password"
   ```

   For example:

   ```
   lh setRepo -v -tOracle -iweblogic.jndi.WLInitialContextFactory
   -fMyOraDataSource -u"t3://localhost:7001/" -U"weblogic" -P"weblogic"
   ```

NOTE Change the -f option to match the value you selected for the JNDI Name field.

9. If there are no reported errors, restart WebLogic to pick up the changes. (This also restarts the Identity Manager system.)

Configurating a Sun Java System Application Server Data Source for Identity Manager

Refer to the documentation for the Sun Java System Application Server for information about creating and configuring a data source.

Use the following steps to point the repository to an Application Server data source.

1. Remove the `j2ee.jar` file from the `$WSHOME/WEB-INF/lib` directory. This file causes conflicts with the `j2ee.jar` that ships with Application Server.

2. If not using default host name and port, then you must add the following flags to your JAVA_OPTS:

   ```
   -Dorg.omg.CORBA.ORBInitialHost=Hostname
   -Dorg.omg.CORBA.ORBInitialPort=Port
   ```

   The default values for *Hostname* and *Port* are `localhost` and `3700`, respectively.

3. Set your CLASSPATH to include only these jars (in order):

   SAS_INSTALL_DIR`/lib/appserv-admin.jar`

   SAS_INSTALL_DIR`/lib/appserv-rt.jar`

   SAS_IMQ_DIR`/lib/imq.jar`

   SAS_INSTALL_DIR`/lib/j2ee.jar`

   MYSQL_DIR`/lib/mysql-connector-java-3.0.9-stable-bin.jar`

NOTE Substitute the appropriate JAR file required for your JDBC connection.

4. Connect to the data source with the following command:

   ```
   lh setRepo -v -tDatastore
   -icom.sun.enterprise.naming.SerialInitContextFactory -fjdbc/idm
   -uiiop://localhost:3700
   ```

Appendix D

Changing the Database Repository Password

If you are using a DBMS (such as MySQL, Oracle, Sybase, DB2, or SQL Server) as the location for the Identity Manager repository, it may be necessary to change the database connection password or username periodically. The procedure for changing these values depends on how Identity Manager connects to the database.

- If you connect with a JDBC Driver, follow the procedure described in "When Identity Manager Stores the Password".
- If you connect using a JDBC DataSource object as your IDM repository location, and the connection username and password are stored in the DataSource object, follow the procedure described in "When the DataSource Stores the Password".
- If you connect using a JDBC DataSource object but do not store the connection username and password in the DataSource object, follow the procedure described in "When Identity Manager Stores the Password".

When Identity Manager Stores the Password

Use the following procedure to:

- Change the repository password
- Update the application to use the modified repository information

NOTE It is recommended that you perform each of these steps in the order presented. If you change the repository password at a time other than when directed in this sequence, problems can occur.

The examples used in this procedure are for a MySQL repository; some steps may vary depending on the specific repository used.

If Identity Manager connects to the repository with a JDBC driver, or if it connects to the repository using a DataSource that does not contain the connection user name and password, then use the following procedure to change the user or password:

1. Archive a copy of the existing `ServerRepository.xml` file, in case you need to revert. By default, this file is located in `$WSHOME/WEB-INF`.

   If you have deployed the Identity Manager web application in an application server cluster, you should operate on the main *source* folder for Identity Manager (*from* which the application server deploys the IDM web application), rather than on each *target* folder (*to* which the application server deploys the web application on a particular server or node within the cluster).

2. Shut down the Identity Manager web application. If you have deployed the Identity Manager web application in a cluster, then you must stop all instances of the web application across the cluster.

3. Verify the existing repository:

   ```
   lh setRepo -c
   ```

   Identity Manager responds with the current repository information; for example:

   ```
   MysqlDataStore:jdbc:mysql://localhost/waveset
   ```

4. Create a temporary file system repository location:

   ```
   mkdir c:\tempfs
   ```

5. Set Identity Manager to use the temporary file system repository location:

   ```
   lh setRepo -tLocalFiles -fc:\tempfs
   LocalFiles:c:\tempfs
   ```

6. Change the password for your repository. This procedure depends on the mechanism provided by your repository provider. This example highlights steps for a MySQL database:

   ```
   mysqladmin.exe -hlocalhost -uwaveset -poldpasswd password newpasswd
   ```

7. Set the application to use the modified repository information:

   ```
   lh setRepo -tMysql -ujdbc:mysql://localhost/waveset
   -Uwaveset -Pnewpasswd
   ```

   The application responds with this warning:

   ```
   WARNING: No UserUIConfig object in repository.
   MysqlDataStore:jdbc:mysql://localhost/waveset
   ```

NOTE The warning message appears because the temporary file system that you pointed to has no contents. Ignore this message; after running the command, the temporary file system will no longer be needed.

8. Verify the new repository value:

   ```
   lh setRepo -c
   ```

   The application responds with the new value:

   ```
   MysqlDataStore:jdbc:mysql://localhost/waveset
   ```

9. Restart the server and verify that you can log in. If you have deployed the Identity Manager web application in a cluster, then you must re-deploy the Identity Manager across the cluster. This will distribute the updated web application (which includes the updated `ServerRepository.xml` file), to all nodes in the application server cluster.

10. Remove the `c:\tempfs` temporary directory, and the `ServerRepository.xml` file that you archived in Step 1.

When the DataSource Stores the Password

If Identity Manager connects to the repository via a JDBC data source, and the data source contains the user name and password, then use the following procedure to change the username or password.

1. Stop the Identity Manager web application. If you have deployed Identity Manager in an application server cluster, stop the application on all hosts.
2. Change the password for the connection user name in the DBMS instance that you are using as your repository location. For example, on MySQL

   ```
   mysqladmin.exe -hlocalhost -uwaveset -poldpasswd password newpasswd
   ```

3. Change the password that is stored on the DataSource object using the tools provided by the application server, directory server, or DBMS that manages your DataSource object.
4. Re-start the server and verify that you can login. If you have deployed the Identity Manager web application in a cluster, then you must re-deploy the Identity Manager across the cluster. This will distribute the updated web application (which includes the updated `ServerRepository.xml` file), to all nodes in the application server cluster.

Appendix E

Configuring JCE

This chapter details the steps necessary to configure the Java Cryptography Extension (JCE) to work with the application.

The JCE provides the application with the crypto ciphers that it uses for data encryption and decryption as well as MD5 hashing of private data.

NOTE Because you must install JDK 1.4.2 for this release, all supported environments should now have a JCE 1.2 included and information in this appendix is no longer applicable.

What is JCE?

JCE is a set of packages that provides a framework and implementations for:

- Encryption. Support for encryption includes symmetric, asymmetric, block, and stream ciphers.
- Key generation and key agreement
- Message Authentication Code (MAC) algorithms

The software also supports secure streams and sealed objects.

JCE is designed so that other qualified cryptography libraries can be plugged in as service providers and new algorithms can be added seamlessly. Qualified providers are digitally signed by a trusted entity.

JCE has been integrated into the Java 2 SDK, Standard Edition, Version 1.4. In previous releases of the Java 2 SDK, Standard Edition, JCE was an optional extension package.

When to Implement JCE?

Administrators typically set up JCE to work with the application when:

- Installing the Identity Manager product
- Updating an application server
- Reconfiguring its JCE providers

Configuring the Application to Work with JCE

The following table identifies the actions you should take when Identity Manager is installed in the described environment.

Scenario	Action
JDK does not include an implementation of JCE (Look in `jre/lib` or `jre/lib/ext` to confirm that you have JCE installed.)	No configuration changes are needed. The JCE framework and provider will be loaded at runtime from `idm/WEB-INF/lib`.
JDK does include an implementation of JCE 1.2.x	Follow the procedure outlined in "When the JDK Includes an Implementation of JCE 1.2.x" on page 138.

NOTE Java searches for classes to load at runtime in the following order:

1. Java runtime (`jre/lib/rt.jar`)
2. Java extensions directory (`jre/lib/ext`)
3. Java application class path (for example, `idm/WEB-INF/lib`)

When the JDK Includes an Implementation of JCE 1.2.x

Use the following procedure when Identity Manager is installed in an environment where the JDK includes an implementation of JCE 1.2.x (in `jre/lib` or `jre/lib/ext`). Do not use the Cryptix JCE if you are using Java 1.4 or 1.5.

NOTE The Cryptix jars are no longer included and no longer supported. You need to remove them if you haven't already. If you've customized your Waveset.properties file, please make sure that `security.jce.workaround` property is set to false or removed. An exception will be thrown if this property is set to true because the intention of this property will not be fulfilled.

1. Remove the Cryptix jars (`cryptix-jce-api.jar` and `cryptix-jce-provider.jar`) from the `idm/WEB-INF/lib` directory.
2. Ensure that the `jre/lib/security/java.security` file contains at least one provider that implements the DESede cipher (triple DES). You can find this information in its list of providers to be searched when a crypto cipher is requested.

   If you are unsure, you can add the `com.sun.crypto.provider.SunJCE` file, which supports this cipher, to the `java.security` file as follows:

   `security.provider.`*n*`=com.sun.crypto.provider.SunJCE`

   where *n* is the next number in the list of providers to be searched. You can download this file from the Sun Web site.

   Put the provider that implements the DESede cipher in the `jre/lib/ext` directory so it can be loaded by the Java runtime class loader. If the JCE framework cannot find a provider that implements the DESede cipher, you will most likely see the following error message at Identity Manager server startup time.

   ```
   Error initializing Encryptor: Algorithm DESede not available
   ```
3. Ensure that the two certificate files are in the same directory as the JCE provider. These certificate files are:

   `local_policy.jar (US cert)`

   `US_export_policy.jar (exportable cert)`
4. If the application server is running Java 1.4, 1.5, or higher, make sure that `security.jce.workaround=true` has not been added to the `waveset.properties` file. Delete this property if it exists.
5. Restart the Web application server and your application.

Appendix F

setRepo Reference

Usage

```
setRepo [location_flags] [options]
```

location_flags

Flag	Description
`-d` *databaseName*	dbName in URL. The default name is `waveset`. Ignored if the `-u` flag is specified.
`-D` *propsPath*	Path to Properties file (JDBC/JNDI Connection Properties)
`-f` *filepath*	Filesystem path for LocalFiles (JNDI RDN for DataSource)
`-h` *hostName*	Hostname URL. Ignored if the `-u` flag is specified.
`-i` *initCtxFac*	Name of the `InitialContextFactory` class for JNDI
`-j` *jdbcDriver*	JDBC Driver class. (The default is DBMS-specific.)
`-o` *outfile*	Output file path (write config file; do not update Server)
`-p` *portNumber*	Port number in URL. Ignored if the `-u` flag is specified.
`-P` *password*	Password for JDBC connection. The default value is `waveset`.
`-t` *type*	LocalFiles, MySQL, Oracle, DB2, or SQLServer
`-u` *url*	URL for JDBC connection (overrides the `-d, -h`, and `-p` flags)
`-U` *username*	User name for JDBC connection. The default value is `waveset`.

Options

Option	Description
`-A` *administrator*	Administrator username. The default username is `configurator`.
`-C` *credentials*	Administrator password (if changed from default)
`-c`	Current (print current location to `stdout`)
`-v`	Verbose (print configuration to `stdout`)
`-n`	No checks. Use with the –o flag when the new location is unreachable, or with -c when current location is unreachable from the command line environment.

Syntax

NOTE If any parameters contain a shell escape or illegal characters, use double quotation marks around them to avoid failures. For example, the ';' '&', '&&', '|', and '||'characters cause these failures.

The following is an example containing arguments for a direct JDBC driver connection:

```
{-toracle { -u$url | -h$host [-p$port] [-d$dbname] } [-U$userid \
-P$pwd] [-D$propsPath]

| -tmysql [ -u$url | [-h$host] [-p$port] [-d$dbname] ] [-U$userid \
-P$pwd] [-D$propsPath]

| -tsqls { -u$url | -h$host [-p$port] [-d$dbname] } [-U$userid \
-P$pwd] [-D$propsPath]

| -tdb2 { -u$url | -h$host [-p$port] [-d$dbname] } [-U$userid \
-P$pwd] [-D$propsPath]

}
```

The following is an example containing arguments that specify a direct DataSource connection:

```
| -toracle -i$initCtxFac -f$path [-u$providerUrl] [-U$userid \
-P$pwd] [-D$propsPath]
```

```
| -tmysql -i$initCtxFac -f$path [-u$providerUrl] [-U$userid -P$pwd] \
[-D$propsPath]

| -tsqlserver -i$initCtxFac -f$path [-u$providerUrl] [-U$userid \
-P$pwd] [-D$propsPath]

| -tdb2 -i$initCtxFac -f$path [-u$providerUrl] [-U$userid -P$pwd] \
[-D$propsPath]
}
```

Examples

```
setRepo

setRepo -c

setRepo -tLocalFiles -f$WSHOME

setRepo -tOracle -hhost.your.com -p1521 -ddbname

setRepo -tOracle -ujava:oracle:thin:@host.your.com:1521:dbname

setRepo -tOracle -icom.sun.jndi.fscontext.RefFSContextFactory \
  -fjdbc/SampleDB

setRepo -tMysql

setRepo -tMysql -ujdbc:mysql://localhost/waveset

setRepo -tSQLServer
-  ujdbc:microsoft:sqlserver://host.your.com:1433;Database\
  Name=dbname;SelectMethod=Cursor

setRepo -tDB2 -ujdbc:db2://host.your.com:6789/dbname

setRepo -tDB2 -ujdbc:db2:dbname -jCOM.ibm.db2.jdbc.app.DB2Driver
```

Appendix G

DBMS Recovery and the Repository

Recovering the Repository

Disaster recovery planning is an essential part of deploying any business-critical system. Each supported DBMS has multiple mechanisms for data backup and restoration. Any of these are appropriate; Identity Manager has no implicit requirements.

Typically, if a database fails, it would only be necessary to restore the repository to the point just before the database failure. However, if business requirements dictate that the repository be restored to any given point-in-time (through use of the appropriate vendor-specific methods such as ARCHIVELOG mode or Flashback in Oracle or FULL logging mode in SQL Server), this can be done as well. Regardless of the recovery method used, it is necessary to consider some implications of restoring a version of the repository that is not completely up-to-date.

While the state of the repository will be self-consistent after the data restoration, it will not necessarily be consistent (or even compatible) with external objects such as the resources. The following items demonstrate some possible inconsistencies that might arise:

- Restored resources might be configured incorrectly, if resource attributes were changed.
- Restored users might have pending attribute changes that are no longer desirable, because of more recent changes.
- Restored workflows and tasks might be in a state that no longer matches the environment. For instance, formerly completed tasks could attempt to run again, and approvals might re-appear, requesting action from an administrator.

Additionally, resources are themselves the repository of account attributes. Restoring the repository to a specific point-in-time may not aid in restoring resources to prior states, since the information required to do so may never have been stored in the repository.

redo Logs

Point-in-time recovery methods require the existence of an unbroken set of change records (typically referred to as “redo logs”). This can often present logistical challenges if the rate of change is high, generating a large volume of redo.

Identity Manager tries to minimize the need to write to the redo logs. However, database activity cannot be completely eliminated. Even when Identity Manager appears to be idle, each server polls the repository in order to detect changes to repository objects, tasks ready to run, tasks ready to clean up, and so forth.

The intervals on which these activities occur are configurable, and increasing these configured intervals will reduce the frequency of (but will not eliminate) database operations that Identity Manager executes against the repository when idle. To configure these intervals, define new values for the `cache.pollingInterval` and other properties that begin with `cache` and `ChangeNotifier` in the `Waveset.properties` file.

In addition, disable the `listcache.size` property on any application server in a cluster that does not serve the Identity Manager Graphic User Interface. Disabling this property reduces number of operations that Identity Manager executes against the repository when the application is idle.

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