Sun Java™ System

Identity Install Pack 2005Q4M3 Installation

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Part No: 819-4480-10
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Preface

This guide provides detailed information and instructions to help you install and update Sun Java Systems Identity Install Pack and associated software. Identity Install Pack installs Sun Java™ System Identity Manager and Sun Java™ System Identity Auditor.

How to Find Information in this Guide

Chapter 1 details system requirements and tasks you should perform before installing the Identity Install Pack software.

Chapters 2 through 9 provide detailed procedures for installing Identity Install Pack and associated software for use with these application servers:

- Chapter 2 — Apache Tomcat, Version 4.1.x
- Chapter 3 — Apache Tomcat, Version 5
- Chapter 4 — BEA WebLogic, Versions 7 and 8.1
- Chapter 5 — IBM WebSphere Application Server, Version 4.x
- Chapter 6 — IBM WebSphere Application Server, Version 5.0
- Chapter 7 — iPlanet Application Server
- Chapter 8 — Sun ONE Application Server, Version 7
- Chapter 9 — Sun Java System Application Server 8

Chapter 10 provides detailed procedures for installing Identity Install Pack Service Provider Edition:

- Chapter 10 — Installing Identity Install Pack Service Provider Edition

Chapters 11 through 15 and the appendices provide additional procedures and information for installing and working with Identity Manager and Identity Auditor:

- Chapter 11. Installing the Sun Identity Manager Gateway — Provides procedures for installing the Sun Identity Manager Gateway.
- Chapter 12. Getting Started — Describes how to begin using Identity Manager and where to go for help and information.
- Chapter 13. Updating Identity Manager — Provides procedures for updating an installed version of the Identity Manager product.
- Chapter 14. Uninstalling Identity Manager or Identity Auditor — Lists steps for removing an installed version of the product.
Preface

- Chapter 15. Installing Identity Manager (Manual Version) — Details alternate, manual procedures for installing Identity Manager.
- Chapter 15. Installing Service Packs — Provides instructions for downloading and installing service packs.
- Appendix A. Index Database Selections — 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 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.
- Appendix H. Installing Identity Manager PasswordSync — Details steps to install and configure Identity Manager PasswordSync.

Related Documentation and Help

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

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

• 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 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.

Product Support

If you have problems with your software, 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
We'd Like to Hear from You!

We would like to know what you think of this guide and other documentation. If you have feedback - positive or negative - about your experiences using this product and documentation, please send us a note:

Sun Microsystems.
5300 Riata Park Court
Austin, TX 78727
Attn: Identity Manager Information Development

Email: idm-idd@sun.com
Before You Install

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

- Supported Software and Environments
- Recommended Configurations
- Prerequisite Tasks

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 2.2-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)
- BEA WebLogic® Express 8.1 (with JDK 1.4.2)
- BEA WebLogic® Server™ 8.1 (with JDK 1.4.2)
- IBM WebSphere® 6.0
- IBM WebSphere® Application Server - Express Version 5.1.1 (with JDK 1.4.2)
- Sun™ ONE Application Server 7
- Sun Java™ System Application Server Platform Edition 8

Note: If your current application server does not support JDK 1.4.2, please check with your vendor to examine the implications of upgrading to one that does before installing Identity Installation Pack 2005Q4M3.

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
Database Servers and Directories

- IBM® DB2® Universal Database for Linux, UNIX®, and Windows® 7.x, 8.1, 8.2
- Microsoft SQL Server™ 2000
- MySQL™ 4.1
- Oracle 9 ® and Oracle 10g ®
- Oracle Database 10g Release 1®
- Oracle E-Business Suite (Financials) 11.5.10®

**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 for DBMS Recovery and the Repository DBMS recovery information.

Sun Identity Manager Gateway

See Chapter 11, Install the Sun Identity Manager Gateway, for further information on the Sun Identity Manager Gateway.
# Supported Resources

## Databases
- IBM® DB2® Universal Database for Linux, UNIX®, and Windows® (7.x, 8.1, 8.2)
- Microsoft® Identity Integration Server (MIIS) 2003
- Microsoft SQL Server 2000
- MySQL™ 4.0.x
- Oracle9®
- Oracle Database 10g Release 1®
- Sybase Adaptive Server® 12.x

## Directories
- Sun™ Java System Directory Server 5 2004Q2, 2005Q1(1)
- LDAP v3(2)
- Novell® eDirectory on Novell NetWare 5.1, 6.0
- Open LDAP

## ERP Systems
- Oracle Financials on Oracle Applications 11.5.9, 11.5.10
- Peoplesoft (Read Only) with:
  - People Tools 8.1.8 w/ PS HRMS 8.3
  - People Tools 8.4.2 w/ PS HRMS 8.8
- SAP® R/3 4.5, 4.6, 4.7 and SAP HR 4.5, 4.6, 4.7 (read only)
- SAP® Enterprise Portal v6.0 SP2, SP9, SP10
- Siebel 6.2, 7.0.4

## Help Desk
- Remedy® Help Desk 4.5, 5.0

## Message Platforms
- Lotus Notes® 5.0, 6.5 (Domino)
- Microsoft® Exchange 5.5
- Microsoft® Exchange 2000, 2003(3)
- Novell® GroupWise 5.x, 6

## Operating Systems
- Sun Solaris™ 8, 9, 10
- HP-UX 11.0, 11i v1, 11i v2
- IBM AIX® 4.3.3, 5.2, 5L v5.3
- IBM OS/400® V4r3, V5r1
- Microsoft Windows® NT® 4.0
- Red Hat Linux 8.0, 9.0
- Red Hat Linux Advanced Server 2.1, 3.0, 4.0
- HP OpenVMS 7.2

## Security Managers
- eTrust CA-ACF2® Security
- Natural
- IBM RACF®
- ScriptedHostResourceAdapter
- RSA® SecurID® 5.0, 6.0
- RSA® SecurID® 5.1, 6.0 for UNIX
- eTrust CA-Top Secret® Security 5.3

## Web Access Control
- Sun™ Java System Identity Server 6 2004Q2, Sun™ Java System Access Manager 6 2005Q1, 7 2005Q4
- IBM Tivoli® Access Manager 4.x, 5.1
- Netegrity® Siteminder® 5.5
- RSA® ClearTrust® 5.0.1
Notes:

2. While these applications are tested on Sun ONE Directory Server and Open LDAP, LDAP servers that are v3-compliant may work without any changes to the resource adapter.

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

Recommended Configurations

For optimum performance and support, use one of the following operating system/server configurations.

Recommended configuration lists are based on input from customer configurations, support, professional services, and pre-sales. Listed configurations are those in which the majority of test effort occurred during the release cycle.

Server Configurations

- Microsoft Windows 2000 SP4, running one of:
  - WebLogic 7.2
  - WebLogic 8.1
Memory Requirements

- WebSphere 5.0, 6.0
- Sun ONE Application Server 7 or 8
- Sun Solaris 9, running one of:
  - Sun ONE Application Server 7 or 8
  - WebLogic 7.2
- IBM AIX 4.3.3, running WebSphere 5.0
- IBM AIX 5.2, running WebSphere 5.1
- IBM AIX 5L v5.3, running WebSphere 6.0

Database Configurations

- Oracle 10g, running on one of:
  - Microsoft Windows 2000 SP4
  - Sun Solaris 8
- Oracle 9i, running on one of:
  - Microsoft Windows 2000 SP4
  - Sun Solaris 9
  - AIX 4.3.3
- IBM DB2 Universal Database 7.2 fixpack 7, running on one of:
  - Microsoft Windows 2000 SP4
  - AIX 4.3.3

Test Configuration

For development purposes, use Microsoft Windows 2000 SP4, running Apache Tomcat 4.1.29 with JDK 1.4.2 and connecting to MySQL 4.1.

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
java -Xmx512M -Xms512M
```

Notes

- 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 waveset property 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 Install Pack 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 Install Pack software

Note

Identity Manager and Identity Auditor share the same jar file and are always installed or updated simultaneously.

If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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

• Optionally set up the Sun Identity Manager Gateway
• Optionally set up the 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 Install Pack 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 it 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 Install Pack 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.
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 Install Pack. Both of these can be found in a Java SDK. (The JRE packages do not include a Java compiler.)

Notes

• 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 Install Pack, 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.

WARNING 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 Install Pack 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.
Prerequisite Tasks

- Each named table (or view) must contain all of 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 Install Pack installation. Otherwise, go to one of the sections in this chapter to set up:

- MySQL
- Oracle
- IBM DB2 Universal Database for Linux, UNIX, or Windows
- SQL Server

**Setting Up MySQL**

Follow these steps to set up MySQL for use with the application.

**Notes**

- For additional information about setting up and configuring MySQL, refer to *Configuring MySQL*.
- See *Supported Software and Environments* 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 the application.

- **Note** See Supported Software and Environments 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.
Prerequisite Tasks


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.
Follow these steps to set up DB2.

**Note** See Supported Software and Environments 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.
   c. 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
      ```
Prerequisite Tasks

Setting Up SQL Server

Follow these steps to set up SQL Server for.

**Note** See *Supported Software and Environments* 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 2000 Driver for JDBC. To do this:
   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.
What's Next?

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

- Chapter 2, *Installing Identity Install Pack for Tomcat 4.1.x*
- Chapter 3, *Installing Identity Install Pack for Tomcat 5.0.x*
- Chapter 4, *Installing Identity Install Pack for WebLogic*
- Chapter 5, *Installing Identity Install Pack for WebSphere 4.x*
- Chapter 6, *Installing Identity Install Pack for WebSphere 5.0*
- Chapter 7, *Installing Identity Install Pack for iPlanet Application Server 6.5*
- Chapter 8, *Installing Identity Install Pack for Sun ONE Application Server 7*
- Chapter 9, *Chapter Installing Identity Install Pack for Sun Java System Application Server 8.*
Use the following information and procedures to install Identity Install Pack for use with the Apache Tomcat application server, Version 4.1.x.

Before You Begin

During installation, you will need to know:

- The location where Tomcat is installed
- Your license key(s)
- The login and password you selected when you set up the index database

Tomcat 4.1.x Requirements

If you are running Identity Install Pack with Tomcat 4.1.x, you must use the Java 1.4.2.x JDK.

Installation Steps

Follow these installation and configuration steps:

- Step 1: Install the Tomcat software
- Step 2: Install the Identity Install Pack software
- Step 3: Install the Sun Identity Manager Gateway (optional)

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.
3. Add the Java mail.jar and activiation.jar files to the ./tomcat/common/lib directory. The mail and activation jar files can be found at:
   
   http://java.sun.com/products/javamail

Installing on UNIX

After downloading and unpacking the Tomcat 4.1 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

Step 2: Install the Identity Install Pack Software

1. You may install the software using one of two methods:
   
   • Using the installer GUI
     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 Install Pack 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 GUI installer in these procedures.
Note

If no display is present, the installer defaults to the nodisplay option.
When installing on systems with JDK versions earlier than 1.4, ensure that the
DISPLAY environmental variable is 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.

Note

You may also upgrade from Identity Manager 5.0 through 5.0SP4.

4. Replace the displayed directory location with the location where you want to install
   Identity Install Pack. This could be a staging location or a specific folder. Enter the
   location (or click Browse to locate it), and then click Next.

Notes

   • 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.

WARNING 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 Appendix A, Index Database Reference. 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 product 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 Appendix A, Index Database Reference, for selections and setup instructions.

8. Click **Next**.
   The installer displays the License Key panel with a valid Identity Manager **Free use license** and License **Key** as default.

9. If appropriate, click **Import from File** to import your license key data from an XML file or click **Copy and Paste** to paste in your license key data.

   **Note** If you have an Identity Manager license key, enter it to enable support services.

   Depending on your license key data you will see the Identity Auditor, and/or Service Provider Edition boxes checked and a license valid message displayed.

   **Note** If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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**
Installation Steps

15. Enter the following Approver information:
   - Approver name
   - Approver password

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

16. Click **Next**.

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

   Select **None** if your environment has no server to manager. 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.

Getting More Information

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

Depending on the amount of information captured during the installation process, 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 
Installation Steps
3 Installing Identity Install Pack for Tomcat 5.0.x

Use the following information and procedures to install Identity Install Pack for use with the Apache Tomcat application server, Version 5.0.x.

Before You Begin

During installation, you will need to know:

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

Tomcat 5 Requirements

If you are running Identity Install Pack with Tomcat 5, you must use the Java 1.4.2 JDK.

Installation Steps

Follow these installation and configuration steps:

- Step 1: Install the Tomcat software
- Step 2: Install the Identity Install Pack software
- Step 3: Install the Sun Identity Manager Gateway (optional)

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.
3. Add the Java mail.jar and activiation.jar files to the ./tomcat/common/lib directory. The mail and activation jar files can be found at:
   http://java.sun.com/products/javamail

Installing on UNIX

After downloading and unpacking the Tomcat 5.0 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

Step 2: Install the Identity Install Pack Software

1. You may install the software using one of two methods:
   - **Using the installer GUI**
     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 Install Pack 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 GUI installer in these procedures.

   **Note**

   If no display is present, the installer defaults to the nodisplay option.
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 Install Pack. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

**Notes**

- 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.

**WARNING** 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 Appendix A, *Index Database Reference*. 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 product 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)
Installation Steps

- SQL Server (Data Source)
- LocalFiles

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

**Note** See Appendix A, Index Database Reference, for selections and setup instructions.

8. Click **Next**.

The installer displays the License Key panel with a valid Identity Manager **Free use license** and **License Key** as default.

9. If appropriate, click **Import from File** to import your license key data from an XML file or click **Copy and Paste** to paste in your license key data.

**Note** If you have an Identity Manager license key, enter it to enable support services.

Depending on your license key data you will see the Identity Auditor and/or Service Provider Edition boxes checked and a license valid message displayed.

**Note** If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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 manager. 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.

**Getting More Information**

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

Depending on the amount of information captured during the installation process, 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 
Installation Steps
Installing Identity Install Pack for WebLogic

Use the following information and procedures to install Identity Install Pack for use with the BEA WebLogic application server.

Before You Begin

During installation, you will need to know:

- Location where WebLogic is installed
- WebLogic domain name
- Your license key
- 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
- Step 2: Install the Identity Install Pack software
- Step 3: Configure the WebLogic server
- Step 4: Add the Identity Manager Main Page to Default Documents (for IIS only)
- Step 5: Install the Sun Identity Manager Gateway (optional)

Step 1: Configure the WebLogic Software

Install WebLogic and select the domain that will be referenced when installing the software.
Step 2: Install the Identity Install Pack Software

1. You may install the software using one of two methods:
   - **Using the installer GUI**
     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 Install Pack 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 GUI installer in these procedures.

   **Note**
   If no display is present, the installer defaults to the nodisplay option.

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 Install Pack. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

   **Notes**
   - 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:
     - Versions 7.1, 8.1 —
       `ServerHome/user_projects/DomainName/applications`
     - Version 8.1 SP1 —
       `ServerHome/user_projects/domains/DomainName/applications`
5. Click **Next** to begin installation. After installing the files, the installer displays the Launch Setup panel.

**WARNING** 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 Appendix A, *Index Database Reference*. 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 Appendix A, *Index Database Reference*, for selections and setup instructions.

8. Click **Next**.

The installer displays the License Key panel with a valid Identity Manager **Free use license** and **License Key** as default.
9. If appropriate, click **Import from File** to import your license key data from an XML file or click **Copy and Paste** to paste in your license key data.

**Note**  If you have an Identity Manager license key, enter it to enable support services.

Depending on your license key data you will see the Identity Auditor, and/or Service Provider Edition boxes checked and a license valid message displayed.

**Note**  If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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.
24. 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**.

Depending on the amount of information captured during the installation process, 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: Configure the WebLogic Server**

Use one of the following procedures to configure WebLogic:

- Configure WebLogic 7x
- Configure WebLogic 8.1

**Configure WebLogic 7x**

Use these steps to configure the server:

1. Start the WebLogic server:
2. Start the BEA WebLogic Administration Console.
3. In the left panel, expand deployments and then click **Web Applications**.
   The console displays the Web Applications panel.
4. Click **Configure a new Web Application**.
5. Using the links, locate the `idm` folder and select it.
6. Select the target server. To do this, select the server from the Available Servers list and move it to the Target Servers area, and then click **Configure and Deploy**.
7. Click **Deploy** to deploy Identity Manager Pack.

**Configure WebLogic 8.1**

Use these steps to configure the server:

1. Start the WebLogic server:
2. Start the BEA WebLogic Administration Console.
3. In the left panel, expand **documents**, and then choose **Web Application Modules**.
   
   The console displays the Web Applications panel.
4. Click **Deploy a new Web Application Module**.
5. Using the links, locate the `idm` folder and select it.
6. Click Target Module.
7. Review the Targets, Accessibility and Identity configuration.
8. Click **Deploy** to deploy Identity Manager Pack.

**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 or Identity Auditor main page will not resolve correctly when accessing the Identity Manager or Identity Auditor 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 
Installing Identity Install Pack for WebSphere 4.x

Use the following information and procedures to install Identity Install Pack for use with the IBM WebSphere Application Server, Version 4.x.

Before You Begin

During installation, you will need to know:

- Location where WebSphere is installed
- Your license key
- 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 Install Pack software
- Step 2: Install the Sun Identity Manager Gateway (optional)
- Step 3: Additional WebSphere configuration

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 Install Pack Software

To install and configure the software:

1. Unjar the idm.war file into an lh_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. Delete these files, if they exist:
   
   - WEB-INF/lib/log.jar
   - WEB-INF/lib/j2ee.jar
Installation Steps

- WEB-INF/lib/ldap.jar
- 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.

**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.

3. Install the Java Secure Socket Extension (JSEE) 1.0.3 .jar files, located at http://java.sun.com/products/jsse/index-103.html:

- WEB-INF/lib/jnet.jar
- WEB-INF/lib/jcert.jar
- WEB-INF/lib/jsse.jar

4. Download the latest jlog package from WebSphere at:

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

5. Replace the idm/WEB-INF/lib/log.jar file with the \com\ibm\logging\log.jar file.

6. Edit the idm/WEB-INF/bin/lh.bat file and add the following line at the top of the file (after the @echo off line):

   set CLASSPATH=%CLASSPATH%;\WebSphere\AppServer\lib\j2ee.jar

   where WebSphere is the location where WebSphere is installed.

7. 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 Appendix A, Index Database Reference. When finished, launch setup to continue with installation.

**WARNING** If you continue with setup before copying your index database files, setup will not proceed correctly. If this happens, copy the files, and then use the lh setup command to restart the setup portion of the process.

8. Set $WSHOME to the location of the staging directory where you unjarred the idm.war file.
9. Set JAVA_HOME in the environment to the Java directory under the WebSphere installation; for example:
   
   set JAVA_HOME=c:\ProgramFiles\WebSphere\AppServer\java

10. Change to $WSHOME, and then enter the command:

    lh setup

    The installer displays the Locate the Repository panel.

11. 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 Appendix A, *Index Database Reference*, for selections and setup instructions. If you are planning to use a WebSphere or WebLogic Data Source as your repository location, see the special instructions in Appendix C Configuring Data Sources for Identity Manager.

12. Click **Next**.

    Identity Manager displays the License Key panel.

13. Click **Import from File** to import your license key data from an XML file.

14. Click **Next**.

15. Identity Manager displays the Import XML Files panel.

16. Accept the default XML file (idm\sample\init.xml), or enter or browse to the path to the XML file you will use to set initial database values. When finished, click **Import File**.

17. When import completes, click **Done** in the setup panel.

18. Create a .war file from the staging folder with these commands:

    cd lh_staging
    jar -cvf c:\temp\idm.war *
19. Install the idm.war file by using the WebSphere Web Admin interface:
   a. Highlight Enterprise Applications, and then right-click and select Install Enterprise Application.
   b. For application display name, specify idm.
   c. For context root, specify /idm.

   **Note** If you installed WebSphere without the IBM HTTP server and chose another vendor's http server, skip Steps d through f.

   d. Edit the IBMHTTPServerLocation\conf\httpd.conf file to set up an alias in the IBM http server.
   e. Add the following lines at the bottom of the file:

   ```
   Alias /idm WebSphereIDManagerApplicationDirectory/idm.ear/idm.war
   ```
   f. Restart the HTTP server.
   g. Ensure that the application server is started to generate the plugin configuration during application startup. To do this:

   › From the Admin console, go to WebSphere Administrative Domain—>Nodes—>YourNodeName—>ApplicationServers—>YourApplicationServerName.
   › Go to the **Custom** tab, and set the value of Automatic Generation of Plugin to true.
   h. Restart the application server.

   **Note** Alternatively, if you are using WebSphere Advanced Single Server Edition, you can use the SEAppInstall utility to install the idm.war file:

1. `$WAS_HOME/bin/SEAppInstall.bat -install c:\temp\idm.war -nodeName HostName`

   You are prompted with the following questions; provide answers as follows:
   a. (Please Specify an application display name) idm
   b. (Please Specify a context root) /idm
   c. (Do you wish to precompile all JSPs in this application?) n
   d. (Do you wish to precompile individual Web Applications?) n
   e. (Please specify a Virtual Host for the following Web Applications
      1) Sun Identity Manager) [] default_host
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 Chapter 11, *Install the Sun Identity Manager Gateway*.

Step 3. Configure the Application Server for https

If you plan to use the application server for https, you must register the correct protocol handler.

For JDK 1.3.x:
1. Install the following IBM JCE and JSSE files into JAVA_HOME/jre/lib/ext:
   - ibmjcefw.jar
   - gskikm.jar
   - ibmjceprovider.jar
   - ibmjsse.jar
   - ibmpkcs.jar
3. Ensure that the following lines are in the JAVA_HOME/jre/lib/security/java.security file:
   - `security.provider.1=sun.security.provider.Sun`
   - `security.provider.2=com.sun.net.ssl.internal.ssl.Provider`
   - `security.provider.3=com.ibm.crypto.provider.IBMJCE`
   - `security.provider.4=com.ibm.jsse.JSSEProvider`

For JDK 1.4:
1. Add `java.protocol.handler.pkgs=com.ibm.net.ssl.internal.www.protocol` as a System Property on the JVM settings tab in the WebSphere Admin tool. On the Websphere Admin 4.x console, go to Nodes-> ServerName-> Application Servers-> Default Server-> JVM Settings-> System Properties and add
java.protocol.handler.pkgs=com.ibm.net.ssl.internal.www.protocol

2. Ensure that the following lines are in the
JAVA_HOME/jre/lib/security/java.security file:
   * security.provider.1=sun.security.provider.Sun
   * security.provider.2=com.sun.net.ssl.internal.ssl.Provider
   * security.provider.3=com.ibm.crypto.provider.IBMJCE
   * security.provider.4=com.ibm.jsse(JSSEProvider

Installation Steps
Installing Identity Install Pack for WebSphere 5.0

Use the following information and procedures to install Identity Install Pack for use with the IBM WebSphere Application Server, Version 5.0.

Before You Begin

During installation, you will need to know:

- Location where WebSphere is installed
- Your license key
- 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 Install Pack software
- Step 2: Install the Sun Identity Manager Gateway (optional)

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 Install Pack 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 Appendix A, *Index Database Reference*. When finished, launch setup to continue with installation.

**WARNING** 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 IDM Staging Directory
   ```

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.

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 Appendix A, *Index Database Reference*, 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).

Note  If you are planning to use a WebSphere or WebLogic Data Source as your repository location, see the special instructions in Appendix C *Configuring Data Sources for Identity Manager*.

7. Click **Next**.

   The installer displays the License Key panel with a valid Identity Manager **Free use license** and **License Key** as default.

8. Click **Import from File** to import your license key data from an XML file.

Note  If you have an Identity Manager license key, enter it to enable support services.

   If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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 manager. 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.

23. 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 BPE. Move those jars to a different location and create a CLASSPATH variable that points to those jars to re-enable the BPE.

24. Install the Java Secure Socket Extension (JSEE) 1.0.3 .jar files, located at http://java.sun.com/products/jsse/index-103.html:
    - WEB-INF/lib/jnet.jar
    - WEB-INF/lib/jcert.jar
    - WEB-INF/lib/jsse.jar

25. Download the latest jlog package from WebSphere at:
    http://www.alphaworks.ibm.com/tech/loggingtoolkit4j

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

27. Create a .war file from WSHOME:
    jar -cvf idm.war *

28. 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
29. Start the WebSphere administration console, and then select **Applications—>Install New Application.**

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

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

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

33. Click **Next**.

34. 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.
35. 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.

36. 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**.

37. 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**.

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

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

40. 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 

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6-6 Installing Identity Install Pack for WebSphere 5.0
Installing Identity Install Pack for iPlanet Application Server 6.5

Use the following information and procedures to install Identity Install Pack for use with iPlanet application server, Version 6.5.

Before You Begin

During installation, you will need to know:

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

Installation Steps

Follow these installation and configuration steps:

- Step 1: Install the Identity Install Pack software
- Step 2: Install the Sun Identity Manager Gateway (optional)

Step 1: Install the Identity Install Pack 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 GUI
     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 GUI installer in these procedures.
Installation Steps

Note
If no display is present, the installer defaults to the nodisplay option.

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 Install Pack. 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.

WARNING 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 Appendix A, Index Database Reference. 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)
Installation Steps

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

**Note**  See Appendix A, *Index Database Reference*, for selections and setup instructions.

8. Click **Next**.
   The installer displays the License Key panel with a valid Identity Manager **Free use license** and **License Key** as default.

9. Click **Import from File** to import your license key data from an XML file.
10. Click **Next**.

**Note**

If you have an Identity Manager license key, enter it to enable support services.
If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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.

### Getting More Information

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

Depending on the amount of information captured during the installation process, 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

24. Create a .war file for iPlanet deployment:

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

   **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.

25. 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
   ```

26. 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 
Installation Steps
Use the following information and procedures to install Identity Install Pack for use with the Sun ONE Application Server 7.

**Before You Begin**

During installation, you will need to know:

- Location where Sun ONE Application Server is installed
- Your license key
- 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 ONE Application Server software
- Step 2: Install the Identity Install Pack software
- Step 3: Deploy Identity Manager into Sun ONE Application Server
- Step 4: Install the Sun Identity Manager Gateway (optional)
- Step 5: Edit the server.policy file (optional)

**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 Install Pack Software

Follow these procedures to install the software:

1. You may install the software using one of two methods:
   - Using the installer GUI
     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 GUI installer in these procedures.

   **Note**

   If no display is present, the installer defaults to the nodisplay option.
   When installing on systems with JDK versions earlier than 1.4, ensure that the DISPLAY environmental variable is 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 Install Pack. 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.

**WARNING** 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 Appendix A, *Index Database Reference*. 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 Appendix A, *Index Database Reference*, for selections and setup instructions.

8. Click **Next**.
   The installer displays the License Key panel with a valid Identity Manager **Free use license** and **License Key** as default.
Installation Steps

9. If appropriate, click **Import from File** to import your license key data from an XML file or click **Copy and Paste** to paste in your license key data.

Depending on your license key data you will see the Identity Auditor, and/or Service Provider Edition boxes checked and a license valid message displayed.

**Note**

If you have an Identity Manager license key, enter it to enable support services.

If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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 manager. 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.

**Getting More Information**

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

Depending on the amount of information captured during the installation process, 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 
Step 5: Edit the server.policy File

When running Identity Manager on a Sun ONE server with Java 1.4 or later, 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.util.PropertyPermission "+", "read,write";
    permission java.lang.RuntimePermission "accessClassInPackage.sun.io";
    permission java.net.SocketPermission "+", "connect,resolve";
};

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 "/opt/SUNWappserver/domains/domain1/applications/j2ee-modules/idm/config/trace1.log", "read,write";
    permission java.io.FilePermission "${java.io.tmpdir}/${}/**" "read,write"
    permission java.util.PropertyPermission "trace.file", "read";
    permission java.util.PropertyPermission "trace.destination", "read";
    permission java.util.PropertyPermission "trace.enabled", "read";
};
Installation Steps

where FilePermission is the actual path of the trace file.

Note  After modifying the file, you must restart the application server.
9 Installing Identity Install Pack for Sun Java System Application Server 8

Use the following information and procedures to install Identity Install Pack for use with the Java System Application Server 8.

Before You Begin

During installation, you will need to know:

- Location where Java System Application Server is installed
- Your license key
- 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 Java System Application Server software
- Step 2: Install the Identity Install Pack software
- Step 3: Deploy Identity Manager into Java System Application Server
- Step 4: Install the Sun Identity Manager Gateway (optional)
- Step 5: Edit the server.policy file

Step 1: Install the 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 Install Pack Software

1. You may install the software using one of two methods:
   • Using the installer GUI
     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 GUI installer in these procedures.

   **Note**
   If no display is present, the installer defaults to the nodisplay option.
   When installing on systems with JDK versions earlier than 1.4, ensure that the DISPLAY environmental variable is 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 Install Pack. 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.

**WARNING** 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 Appendix A, *Index Database Reference*. 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 Appendix A, *Index Database Reference*, for selections and setup instructions.

8. Click **Next**. The installer displays the License Key panel with a valid Identity Manager **Free use license** and **License Key** as default.
9. Click **Import from File** to import your license key data from an XML file.
   Depending on your license key data you will see the Identity Auditor, and/or
   Service Provider Edition boxes checked and a license valid message displayed.

   **Note**
   
   If you have an Identity Manager license key, enter it to enable support services.
   If you re-license the product you must import update.xml again. This will insure
   that you get all the objects for the products which are licensed to you.

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 manager. 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.

### Getting More Information

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

Depending on the amount of information captured during the installation process, 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 Java System Application Server

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

1. Open a command prompt, and then change to the staging directory where you installed the Identity Install Pack files.

2. Create a `.war` file with the Identity Manager files by using the `jar.exe` command:

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

3. Launch and log in to the Java System Application Server Admin Console.

4. In the left panel, click Application Server.

5. Go to the JVM Settings tab in the right panel. Select the JVM Options link. Add the following JVM option for `waveset.home`:

   ```cmd
   -Dwaveset.home=SunAppServerHome\domain_home\applications\j2ee-modules\idm
   ```

   For example:

   ```cmd
   -Dwaveset.home=C:\Sun\AppServer\domains\domain1\applications\j2ee-modules\idm
   ```

6. Restart your application server instance. To do this, click Application Server in the left panel, and then click **Stop Server** in the right panel. After it has stopped, restart your application server.

7. Log in, and then navigate to and expand the Applications folder in the left panel.
8. Click the Web Applications folder.
9. Click **Deploy...** in the right panel.
10. Enter the file path for the *idm.war* file, and then click **Next**.
11. When prompted, set the Application Name to *idm*. Set the Context Root to */idm*, and then click **Finish**.
12. Restart your Application Server Instance (as in Step 6).
13. Log in to Identity Manager on the port you specified when you installed your applications server.

**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 Chapter 11, *Install the Sun Identity Manager Gateway*.
Step 5: Edit the server.policy File

When running Identity Manager on a Java System Application Server with Java 1.4 or later, 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):

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

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 which 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 5 files:

- ALMF
- pl.dict
- pl.fields
- pl.post

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

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
  "/opt/SUNWappserver/domains/domain1/applications/j2ee-modules/idm/config/trace1.log", "read,write"
  permission java.io.FilePermission "${java.io.tmpdir}"*"read,write"
  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.

Note After modifying the file, you must restart the application server.
10 Installing Identity Manager Service Provider Edition

Use the following information and procedures to install Identity Manager Service Provider Edition from Identity Install Pack 2005Q3M3. Identity Manager and Identity Manager Service Provider Edition must be installed on separate servers.

Before You Begin

During installation, you need to know:

- Your directory server access information.
- JDK 1.4.2.
- Your license key.
- The configuration objects you intend to export to your directory server.
- Schema changes and attributes used for Identity Manager Service Provider Edition.

Installation Steps

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

- Step 1: Install the Identity Install Pack software on the machine to be your Identity Manager server.
- Step 2: Install the Identity Install Pack software on the machine to be your Service Provider Edition server.
- Step 3: Perform the Bootstrap configuration.
- Step 4: Export Identity Manager configurations to the directory server.
- Step 5: Set up a transaction database.

Step 1: Install the Identity Install Pack Software on Your Identity Manager Server

Install the Identity Install Pack software on your server by referring to Before You Install on page 1-1 and the appropriate installation chapter in this guide.
Installing Identity Manager Service Provider Edition

Step 2: Install the Identity Install Pack Software on Your Service Provider Edition server

1. You may install the software using one of two methods:
   • **Using the installer GUI**
     
     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 (UNIX)**
     
     Change directory to the Identity Install Pack 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 GUI installer in these procedures.

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.

   **Note**
   
   You may also upgrade from Identity Manager 5.0 through 5.0 SP5.

4. Replace the displayed directory location with the location where you want to install Identity Install Pack. This could be a staging location or a specific folder. Enter the location (or click **Browse** to locate it), and then click **Next**.

   **Notes**
   
   • Unless you plan to create a new context (virtual directory) in Tomcat's `server.xml` directory, install Identity Manager in `%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. Click **DONE** on the Setup Wizard panel.
Getting More Information

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

Depending on the amount of information captured during the installation process, not all messages may not be displayed here. View the log file identified on the Details panel for more information.

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

7. To enable the Service Provider Edition server, uncomment the following line in the $Install/config/Waveset.Properties file:

   `spe.enableServer=true`

Step 3: Perform the Bootstrap Configuration

Service Provider Edition requires a directory for the storage of configuration objects and managed user accounts. Access information for this directory must be stored in a file called the bootstrap configuration file. Once this file is read and a connection to the directory is established, further configuration is read from the directory.

The `SpeConfiguration.xml` file is found in the **config** subdirectory of the Service Provider Edition installation directory. This file is encrypted, and must be edited using the `speconfig` utility. This file is similar to the `ServerRepository.xml` file which contains the bootstrap connection information for the IDM repository.

1. From a command line, change to the Identity Manager installation directory. Set environment variables with these commands:

   ```
   set WSHOME=<Path_to_idm_directory>
   set JAVA_HOME=<path_to_jdk>
   ```

   **Note**  On a UNIX system, you must also enter

   ```
   export WSHOME JAVA_HOME
   ```

2. To edit the bootstrap configuration file enter the following:

   ```
   cd $WSHOME/bin
   lh speconfig
   ```

3. Under the **Main** tab enter the following connection parameters for your directory server installation.
   - **Host** - The name of the host where the directory server is running
   - **Port** - The number of the TCP port on which the directory server is listening
   - **SSL** - Select if SSL is to be used when opening the connection
Installation Steps

- **User** - The name of a directory server account to be used by Service Provider Edition for managing configuration and user data.

  **Note**: The specified user must have sufficient privileges to carry out the directory operations required by Service Provider Edition.

- **Password** - The password of the specified user
- **Base DN** - The base distinguished name (DN) for the connection
- **Configuration Object DN** - The path relative to Base DN under which Service Provider Edition configuration objects are stored

  **Note**: The Configuration Object DN should identify an organization used only for Service Provider Edition configuration objects. Additional organizations under this are created for the various object types. The configuration object organizations and the objects in them must never be edited directly by other directory tools.

4. Click the **Test** button to connect to the directory server with the current set of parameters.

5. If appropriate, click on the **Configuration Object Classes** tab.
   Enter or edit any object classes you wish to configure at this time.

6. If appropriate, click on the **Configuration Schema Map**.

7. Enter or edit any Schema information you wish to configure at this time.

8. Save your information by clicking **Save**. If you click on **Exit** all of the changes are discarded.

**Step 4: Exporting Configuration Properties**

You must export the desired configuration properties from your Identity Manager server to your directory server. This is done either using the configurator user interface or by using the `speconsole` utility. See Chapter 2 Initial Configuration in the *Identity Manager Service Provider Edition Administration Addendum* for further details.
Step 5: Set Up a Transaction Database

A database must be set up to store the transaction data. If you plan to do this, use the general procedures in this section as guidelines when setting up the transaction database. Your database administrator may choose to customize the provided scripts to suit your site-specific configuration and standards.

**WARNING** If you store the transaction 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 transaction 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 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.

About the Sample Database Scripts

Identity Install Pack 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 of 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.

Sample files that create tables for Service Provider Edition are in:

- create_spe_tables.oracle
- create_spe_tables.db2

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 Install Pack installation. Otherwise, go to one of the sections in this chapter to set up:

• Oracle
• IBM DB2 Universal Database for Linux, UNIX, or Windows

Setting Up Oracle

Follow these steps to set up Oracle for use with the application.

Note See Supported Software and Environments 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_SPE_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_SPE_tables.oracle script:
      › Change the user password.
      › Change the path for DATAFILE to point to the location for your waveset.dbf data file.
   c. Create the new tables by using the following command:

On Windows

sqlplus dbusername/dbapassword @create_SPE_tables.oracle
On UNIX

```
sqlplus dbusername/dbapassword @create_SPE_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 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.
DB2 Setup

Follow these steps to set up DB2.

**Note**  See *Supported Software and Environments* 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_SPE_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_SPE_tables.db2` script:
      › Change the user password.
      › Change the path for the `CREATE TABLESPACE` command to a location appropriate for your environment.
   c. Create the new tables by using the following command:

On Windows

```
db2 -tvf create_SPE_tables.db2
```

On UNIX

```
db2 -tvf create_SPE_tables.db2
```
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

If you are using Domino, there are additional steps to perform for Domino gateway configuration. See the chapter titled Resources Reference in Identity Manager Technical Reference.

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

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.

   Tip 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

Notes
Prerequisites

- 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 Chapter 12, Getting Started.
Follow these steps to begin using the applications.

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

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

**Tip** 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* or *Identity Auditor Administration* or additional security recommendations.

### Enabling Language Support

The applications support multiple languages. To enable language support, follow these steps:

1. Download a language pack from the Sun Download Center, which is part of the Online Support Center (http://www.sun.com/supporttraining/). A registered account name and password is required to access to the download center.
2. Follow the installation instructions provided with the 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:

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

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:
4. Restart Safari.
5. Select Windows MSIE 6.0 from the Debug:User Agent menu.
6. Point Safari to your Identity Manager installation.

Starting the Business Process Editor

To run the Business Process Editor (BPE), you must have:

- Identity Manager installed on your local system
• Configurator-level access to Identity Manager

To start the BPE:

1. From a command line, change to the Identity Manager installation directory.
   Set environment variables with these commands:

   ```
   set WSHOME=<Path_to_idm_directory>
   set JAVA_HOME=<path_to_jdk>
   ```

   **Note** If your application server has staging directories, set WSHOME to the staging
   directory that was used for installation. Keep this directory after deploying the
   product.

   **Note** If you are starting the BPE on a UNIX system, you must also enter
   ```
   export WSHOME JAVA_HOME
   ```

2. To start the BPE from the `idm\bin` directory:
   ```
   lh config
   ```
   The BPE interface appears.

   **Note** You can enable automatic login of the BPE from the Options dialog. After
   logging in, select **Tools —> Options**. The BPE displays the Editor Options
   dialog, which lets you enable login by specifying a valid username and
   password.

---

### 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. There is
now an environment file that the `lh` script sources deployment specific environment
settings:

```
$WSHOME/bin/lhenv.sh
```

For example when using a WebSphere 5 datasource for the repository, extra
environment variables are required for `lh` to function. Sample files for this purpose are
included in:

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

- **Identity Manager Technical Deployment and Identity Manager Technical Reference**
  Detailed technical and reference information that enables you to configure key Identity Manager components and systems such as forms, workflow, and resources.

- **Online 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 marked with .
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 utilities to list and record your installation information:

inventory
installed

Note These commands became available in the 2005M3Q1 release and are not present in earlier releases.

Both commands are accessed by entering:

lh assessment

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] [options]...
Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h</td>
<td>help</td>
<td>Display usage.</td>
</tr>
<tr>
<td>-a</td>
<td>added</td>
<td>Display only added files.</td>
</tr>
<tr>
<td>-d</td>
<td>deleted</td>
<td>Display only deleted files.</td>
</tr>
<tr>
<td>-m</td>
<td>modified</td>
<td>Display only modified files.</td>
</tr>
<tr>
<td>-u</td>
<td>unchanged</td>
<td>Display only unchanged files.</td>
</tr>
</tbody>
</table>

installed

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

Usage

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

Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-h</td>
<td>help</td>
<td>Display usage.</td>
</tr>
<tr>
<td>-r</td>
<td>releases</td>
<td>Display only installed releases</td>
</tr>
<tr>
<td>-s</td>
<td>servicepacks</td>
<td>Display only installed service packs.</td>
</tr>
<tr>
<td>-h</td>
<td>hotfixes</td>
<td>Display only installed hotfixes</td>
</tr>
</tbody>
</table>
Prepare for Update
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 an 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 or Identity Auditor as appropriate, 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 Unistallation 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_Version_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.

<table>
<thead>
<tr>
<th>If your database is:</th>
<th>On this platform:</th>
<th>Run this command:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MySQL</td>
<td>Windows</td>
<td><code>c:\mysql\bin\mysql &lt; drop_waveset_tables.mysql</code></td>
</tr>
<tr>
<td>MySQL</td>
<td>UNIX</td>
<td><code>$MYSQL/bin/mysql &lt; drop_waveset_tables.mysql</code></td>
</tr>
<tr>
<td>Oracle</td>
<td>Windows</td>
<td><code>sqlplus dbusername/dbapassword @drop_waveset_tables.oracle</code></td>
</tr>
<tr>
<td>Oracle</td>
<td>UNIX</td>
<td><code>sqlplus dbusername/dbapassword @drop_waveset_tables.oracle</code></td>
</tr>
<tr>
<td>DB2</td>
<td>Windows and UNIX</td>
<td><code>db2 -tvf drop_waveset_tables.db2</code></td>
</tr>
<tr>
<td>SQL Server</td>
<td>Windows</td>
<td><code>isql -S &lt;server&gt; -U User -P Password -i PathToFile\drop_waveset_tables.sqlserver</code></td>
</tr>
</tbody>
</table>
If you do not want to install the applications through the installation interface, use these alternate, manual installation procedures.

**Before You Begin**

Before beginning installation, you need to know your application license key. The key was provided with the installation CD.

**Installation Steps**

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

- Step 1: Install and configure the application server software
- Step 2: Install the Identity Install Pack software
- Step 3: Configure the Identity Install Pack index database connection
- Step 4: Install the Sun Identity Manager Gateway (optional)

**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.

The procedures in this section begin with Step 2, Install the Application Software.

**Step 2: Install the Application Software**

Follow these procedures to install the software.
Before You Begin

On Windows

Enter the following series of commands:

```bash
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-3.2.3\webapps`.

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

ON UNIX

Enter the following series of commands:

```bash
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 `c:\tomcat-3.2.3\webapps`.

```bash
mkdir idm (or any other directory name)
cd idm
WSHOME=ApplicationDeploymentDirectory/idm;export WSHOME
jar -xvf /cdrom/cdrom0/idm.war
```

Note   If you re-license the product you must import update.xml again. This will insure that you get all the objects for the products which are licensed to you.

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 Appendix A, Index Database Reference.

When finished, continue with Step 3.
Step 3: Configure the Identity Install Pack 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 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 Appendix A, Index Database Reference, for selections and setup instructions.

3. Click Next.

   The installer displays the License Key panel.
4. Click **Import from File** to import your license key data from an XML file.
5. Click **Next**.
6. The installer displays the Import XML Files panel.
7. Accept the default XML file ($WSHOME\sample\init.xml), or enter or browse to the path to the XML file you will use to set initial database values. When finished, click **Import File**.
8. When import completes, click **Done** in the setup panel.

**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 Appendix F, `setRepo Reference`.

3. Set your license key with the following commands:
   
   ```
   cd idm\bin
   lh license set -f LicenseKeyFile
   ```

4. Start the application server.
5. 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 Chapter 11, *Install the Sun Identity Manager Gateway*. 
Sun periodically provides updates in release service packs. Following are instructions and information to help you when downloading and installing service pack contents.

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/supporttraining/

2. Select Online Support Center.

3. Select your country and language.

4. In the Downloads area, select Software Updates for Customers with Support Contracts.

5. Select the Download link for the Sun Java™ System Identity Manager or Identity Auditor service pack of interest from the available list of downloads.

6. Review the License Agreement. You must accept the License Agreement to download the service pack.

7. Select the link for the service pack to begin the download.

8. On the server, change to the installation directory.

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

   cd %WSHOME%\patches

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

11. Unjar the downloaded service pack jar file:

   jar -xvf ServicePackName

   This creates a new directory which 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.
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.
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.

<table>
<thead>
<tr>
<th>Index Database</th>
<th>Download or Product Location</th>
<th>Configuration Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 7.x, 8.1, 8.2</td>
<td>Db2/java/db2java.zip</td>
<td>1. Unzip the db2java.zip file.</td>
</tr>
<tr>
<td></td>
<td>—OR—</td>
<td>Note: On Windows systems rename the db2java.zip to db2java.jar.</td>
</tr>
<tr>
<td></td>
<td>If you are using Type 4 network driver use this file instead:</td>
<td>2. Copy the appropriate JAR files to the WEB-INF\lib directory.</td>
</tr>
<tr>
<td></td>
<td>db2jcc.jar</td>
<td>3. Start the jdbc driver:</td>
</tr>
<tr>
<td></td>
<td>If you are using DB2 8.1.2 or higher, you will also need the following files:</td>
<td>• On UNIX systems enter: db2jstrt port# (default 6789) running under instant owner</td>
</tr>
<tr>
<td></td>
<td>db2jcc_license_cisuz.jar</td>
<td>• On Windows systems start from services</td>
</tr>
<tr>
<td></td>
<td>db2jcc_license_cu.jar</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Copy the mysql-connector-java-3.0.8-stable-bin.jar file to the WEB-INF\lib directory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. (optional) Rename the .jar file to mysqljdbc.jar.</td>
</tr>
<tr>
<td>Index Database</td>
<td>Download or Product Location</td>
<td>Configuration Notes</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Oracle 9i, 10g      | Oracle/jdbc/lib/classes12.zip           | 1. Copy the classes12.zip file to the idm\WEB-INF\lib directory.  
|                     |                                         | 2. Rename classes12.zip to oraclejdbc.jar.                                        |
| SQL Server 2000     | Microsoft SQL Server 2000 Driver for JDBC/lib | Copy the msbase.jar, mssqlserver.jar, and msutil.jar files to the WEB-INF/lib directory. |
| JDBC 2.0 DataSource  | Depends on the directory service. Consult the documentation 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 Install Pack software and completing index database selections on the Locate Identity Install Pack Repository panel.

<table>
<thead>
<tr>
<th>If your selection is:</th>
<th>Enter:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JDBC 2.0 Data Source</strong></td>
<td>Enter the index database location. Optionally enter the password you selected when you set up the database.</td>
</tr>
<tr>
<td>Initial Context Factory:</td>
<td>com.sun.jndi.fscontext.RefFSContextFactory</td>
</tr>
<tr>
<td>DataSource Name/Path:</td>
<td>jdbc/SampleDB</td>
</tr>
</tbody>
</table>

MySQL

| URL: | jdbc:mysql://localhost/waveset |
| JDBC Driver: | org.gjt.mm.mysql.Driver |
| Connect as User: | waveset |

Oracle

| URL: | java:oracle:thin:@host.your.com:1521:dbname |
| JDBC Driver: | oracle.jdbc.driver.OracleDriver |
| Connect as User: | waveset |

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.
<table>
<thead>
<tr>
<th><strong>SQLServer</strong></th>
<th>Enter the index database location and the password you selected when you set up the database.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>URL:</strong></td>
<td><code>sqlserver://host.your.com:1433; DatabaseName=dbname;SelectMethod=Cursor</code></td>
</tr>
<tr>
<td><strong>JDBC Driver:</strong></td>
<td><code>com.microsoft.jdbc.sqlserver.SQLServerDriver</code></td>
</tr>
<tr>
<td><strong>Connect as User:</strong></td>
<td><code>waveset</code></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>LocalFiles</strong></th>
<th>Enter the database location, or click <strong>Browse</strong> to locate it.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Path:</strong></td>
<td><code>c:\jakarta-tomcat\webapps\idm\config</code></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>iPlanet/Sun ONE/Sun Java System Directory Service</strong></th>
<th>Enter the index database location. Optionally enter the password you selected when you set up the database.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Context Factory:</strong></td>
<td><code>com.sun.jndi.ldap.LdapCtxFactory</code></td>
</tr>
<tr>
<td><strong>URL:</strong></td>
<td><code>ldap://host.your.com/dc=myDomain,dc=your,dc=com</code></td>
</tr>
<tr>
<td><strong>User:</strong></td>
<td><code>waveset</code></td>
</tr>
</tbody>
</table>
This appendix describes how to set up and configure a MySQL database for use as your default data store.


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 a member of the Administrators group on Windows.
   For Windows after unzipping 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 (untared) 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/
   ```

   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 Install Pack tables**
   Modify the script `create_waveset_tables.mysql`, which can be found on the Identity Install Pack 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 Install Pack, and for security reasons should be different than the MySQL administrative account name and password.
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

Configuring a WebSphere Data Source for Identity Manager

Servlet 2.3 Data Sources

As of the Identity Install Pack 2005Q4M3 release, the deployment descriptor in the WEB-INF/web.xml file refers to Servlet 2.3. Because of this, WebSphere Application Server 5 allows the Identity Manager web application to only work with a WebSphere 5 data source.

WebSphere 5 enforces the following:

- A web application whose deployment descriptor refers to Servlet 2.3 must use a regular DataSource.
- A web application whose deployment descriptor refers to Servlet 2.2 must use a Version 4 DataSource.

Many deployments with WebSphere Application Server 5 continue to use Version 4 data sources. These deployments may continue to use the Version 4 data source with Identity Manager. If you want to use a Version 4 data source you must change one line in the WEB-INF/web.xml file.

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

1. Configure a JDBC provider.
2. Configure either a regular (version 5) or legacy (version 4) data source.
3. Point the repository to the data source.

These steps are discussed in detail below.
Configuring a JDBC Provider

Use WebSphere’s admin 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. The right pane displays a drop-down list of JDBC provider types.
4. Select the appropriate type of JDBC provider from the drop-down list. If the kind you want to create is not in the list, then use “User-Defined JDBC Provider”.
   Oracle will be used for this example. Select Oracle JDBC Provider and click OK.
5. Continue configuring general properties.
   - 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
   - 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.
   - 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 regular DataSource that uses this JDBC provider, see Point the Identity Manager Repository to the Data Source.

To configure a Version 4 Data Source that uses this JDBC provider, see Configuring a Version 4 Data Source.

Configuring a Websphere 5 Data Source

If you want to use a regular Data Source, you must first change deployment descriptor for the application to refer to Servlet 2.3.

1. Edit the idm/WEB-INF/web.xml file
2. Change the first line from
Next, 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 Install Pack, see Configuring a JDBC Provider.

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 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 Data Source

**Note** If configuring a data source in a Websphere 5.x cluster see Configure the DataSource in a Websphere Cluster on page C-5 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 (regular) 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 regular 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 -tdbms -iinitCtxFac -ffilepath.
   - Container-managed persistence should be left unchecked. Identity Install Pack 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 Authentication Data for more information.
   - Container-managed Authentication Alias is not used. Set this value to (none). Identity Install Pack 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 data source 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 data source. 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.
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. The port specified is what should be used 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.

If the application servers do not have the same port specified in the BOOTSTRAP_ADDRESS property, the java.naming.provider.url can specify multiple urls, for example:

```
```

**Configuring a Version 4 Data Source**

If you want to use a legacy (Version 4) data source, Identity Manager’s deployment descriptor must refer to Servlet 2.2.

1. Edit the idm/WEB-INF/web.xml file
2. Confirm that the first line contains:

```
DOCTYPE web-app PUBLIC "-//Sun Microsystems, Inc.//DTD Web Application 2.2//EN" "http://java.sun.com/j2ee/dtds/web-app_2_2.dtd"
```
Next, use WebSphere's Administrative Console to define a Version 4 data source with an existing JDBC provider. If you need to define a new JDBC Provider for use with Identity Install Pack, see Configuring a 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 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 (Version 4). The right pane displays a table of (legacy) Data Sources configured for use with this JDBC provider.
5. Click the New button above the table of legacy data sources. The right pane displays a table of general properties to configure.
6. Configure the general properties for the new Version 4 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 -tdbms -iinitCtxFac -ffilepath.
   • The Database Name is the name of the database instance. It usually has a short name such as waveset or idm_db.
   • The Default User ID is the name that will be used to connect to the DBMS.
   • The Default Password is used to connect to the DBMS.
   Click OK when you have configured this panel. The Data Sources (Version 4) page is displayed.

   Note For information on DBMS recovery see Appendix G DBMS Recovery and the Repository.

7. Click the data source 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 data source. 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)
   • portNumber is 1521 by default for Oracle.
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.

### 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 Install Pack installation; for example:
   ```bash
   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:
   ```bash
   export JAVA_HOME=$WAS_HOME/java
   ```

3. Make sure that the Java executable is in your path; for example:
   ```bash
   export PATH=$JAVA_HOME/bin:$PATH
   ```

4. Make sure the classpath is pointing to the WebSphere properties directory, for example:
   ```bash
   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:
   ```bash
   isql -Usa -p sa_password -S server_name -i \instjdbc.sql
   osql -E -i \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 -tdbms -iinitCtxFac -ffilepath-
icom.ibm.websphere.naming.WsnInitialContextFactory /
-fDataSourcePath
```

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 Appendix F setRepo Reference for more information about this command.

9. Add the following XML to the `$WAS_HOME/properties/j2c.properties` file within the `<j2c-customizations>` element.

```
<cm-properties>
  <logMissingTranContext>false</logMissingTranContext>
</cm-properties>
<security-properties connectionFactoryJNDIName="jdbc/waveset">
  <secureMode>false</secureMode>
</security-properties>
```

The `<secureMode>` element allows the setRepo command to find the data source. The `<logMissingTranContext>` element prevents WebSphere from filling the SystemOut.log with warnings.


10. Set the following property to true in the `$WSHOME/config/Waveset.properties` file:

```
com.waveset.repository.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

11. 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 $propertiesFile Path` 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:

```
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.

### 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

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:
   Name: Choose a unique name which identifies your connection pool. For example: myOraConnPool.

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.

<table>
<thead>
<tr>
<th>Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Name</td>
<td>Select the name of the oracle database that you wish to connect to. In this example myOraDB.</td>
</tr>
<tr>
<td>Host Name</td>
<td>Specify the host name of Oracle DB server.</td>
</tr>
<tr>
<td>Port</td>
<td>Specify the port (default is 1521) for the database server.</td>
</tr>
<tr>
<td>Database User Name</td>
<td>Specify the database account users name used in the connection.</td>
</tr>
<tr>
<td>Password</td>
<td>Specify the password for the account user.</td>
</tr>
</tbody>
</table>

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 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:

<table>
<thead>
<tr>
<th>Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Choose a unique name for this data source. This name is used as a reference throughout the Weblogic Console. For example, MyOraDataSource.</td>
</tr>
<tr>
<td>JNDI Name</td>
<td>Specify the JNDI name. This can be the same as the Data Source name. For example MyOraDataSource.</td>
</tr>
<tr>
<td>Honor Global Transactions</td>
<td>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.</td>
</tr>
<tr>
<td>Emulate Two-Phase Commit for non-XA Driver</td>
<td>See the WebLogic documentation for further information.</td>
</tr>
</tbody>
</table>

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:

```xml
<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"/>
```
Configuring a WebLogic Data Source for Identity Manager

Point The Identity Manager Repository to the Datasource

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 your 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.)
Changing the Database Repository Password

If you are using an index database (such as MySQL, Oracle, Sybase, DB2, or SQL Server) to store index data, 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.

1. Shut down your server.
2. 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.
3. Verify the existing repository:
   `lh setRepo -c`
   Identity Manager Pack 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 Pack to use the temporary file system repository location:
   `lh setRepo -tLocalFiles -fc:c:\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.

10. Remove the `c:\tempfs` temporary directory, and the `ServerRepository.xml` file that you archived in Step 2.
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.

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 Install Pack 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 Install Pack is installed in the described environment.

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

**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 Install Pack 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 higher.

**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 Install Pack 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 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.
Configuring the Application to Work with JCE
setRepo Reference

Usage

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

**location_flags**

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

Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-A administrator</td>
<td>Administrator username. The default username is configurator.</td>
</tr>
<tr>
<td>-C credentials</td>
<td>Administrator password (if changed from default)</td>
</tr>
<tr>
<td>-c</td>
<td>Current (print current location to stdout)</td>
</tr>
<tr>
<td>-v</td>
<td>Verbose (print configuration to stdout)</td>
</tr>
<tr>
<td>-n</td>
<td>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.</td>
</tr>
</tbody>
</table>

Syntax

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] 
| -tsqls -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

```bash
setRepo
setRepo -c
setRepo -tLocalFiles -f$WSHOME
setRepo -tOracle -hhost.your.com -p1521 -dbname
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
```
Examples
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 which 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.
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 GUI. Disabling this property reduces number of operations that Identity Manager executes against the repository when the application is idle.
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