

**Oracle® Health Sciences Data Management
Workbench**

Installation Guide

Release 2.4

E52291-03

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Preface

The *Oracle Health Sciences Data Management Workbench Installation Guide* describes how to install and configure the Oracle Health Sciences Data Management Workbench (Oracle DMW) application for use in clinical trials.

Audience

This document is intended for system administrators and information technology professionals who are installing Oracle Health Sciences Data Management Workbench.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Finding Information and Patches on My Oracle Support

Your source for the latest information about Oracle Health Sciences Data Management Workbench (Oracle DMW) is Oracle Support's self-service website My Oracle Support.

Before you install and use Oracle DMW, always visit the My Oracle Support website for the latest information, including alerts, white papers, and bulletins.

Creating a My Oracle Support Account

You must register at My Oracle Support to obtain a user name and password account before you can enter the website.

To register for My Oracle Support:

1. Open a web browser to <https://support.oracle.com>.
2. Click the **Register** link to create a My Oracle Support account. The registration page opens.
3. Follow the instructions on the registration page.

Signing In to My Oracle Support

To sign in to My Oracle Support:

1. Open a web browser to <https://support.oracle.com>.
2. Click **Sign In**.
3. Enter your user name and password.
4. Click **Go** to open the My Oracle Support home page.

Finding Information on My Oracle Support

There are many ways to find information on My Oracle Support.

Searching by Article ID

The fastest way to search for information, including alerts, white papers, and bulletins is by the article ID number, if you know it.

To search by article ID:

1. Sign in to My Oracle Support at <https://support.oracle.com>.
2. Enter the article ID in the text box in the upper right corner of the My Oracle Support page.
3. Click the magnifying glass icon to the right of the search box (or press the Enter key) to execute your search.

The Knowledge Browser displays the results of your search. If the article is found, click the link to view the text and attachments, if any.

Searching by Product and Topic

You can use the following My Oracle Support tools to browse and search the knowledge base:

- **Product Focus** — On the Knowledge page under Select Product, type part of the product name and the system immediately filters the product list by the letters you have typed. (You do not need to type "Oracle.") Select the product you want from the filtered list and then use other search or browse tools to find the information you need.
- **Advanced Search** — You can specify one or more search criteria, such as source, exact phrase, and related product, to find information. This option is available from the **Advanced** link on almost all pages.

Finding Patches on My Oracle Support

Be sure to check My Oracle Support for the latest patches, if any, for your product. You can search for patches by patch ID or number, or by product or family.

To locate and download a patch:

1. Sign in to My Oracle Support at <https://support.oracle.com>.
2. Click the **Patches & Updates** tab. The Patches & Updates page opens and displays the Patch Search region. You have the following options:
 - In the **Patch ID or Number** field, enter the number of the patch you want. (This number is the same as the primary bug number fixed by the patch.) This option is useful if you already know the patch number.

- To find a patch by product name, release, and platform, click the **Product or Family** link to enter one or more search criteria.
- 3. Click **Search** to execute your query. The Patch Search Results page opens.
- 4. Click the patch ID number. The system displays details about the patch. In addition, you can view the Read Me file before downloading the patch.
- 5. Click **Download**. Follow the instructions on the screen to download, save, and install the patch files.

Finding Oracle Documentation

The Oracle website contains links to all Oracle user and reference documentation. You can view or download a single document or an entire product library.

Finding Oracle Health Sciences Documentation

To get user documentation for Oracle Health Sciences applications, go to the Oracle Health Sciences documentation page on oracle.com at:

<http://www.oracle.com/technetwork/documentation/hsgbu-154445.html>

or, for the documentation for this product, to:

<http://www.oracle.com/technetwork/documentation/hsgbu-clinical-407519.html>

Note: Always check oracle.com to ensure you have the latest updates to the documentation.

Finding Other Oracle Documentation

To get user documentation for other Oracle products:

1. Go to the following web page:

<http://www.oracle.com/technology/documentation/index.html>

Alternatively, you can go to <http://www.oracle.com>, point to the Support tab, and then click **Product Documentation**.

2. Scroll to Health Sciences and click the link.
3. Click the **Clinical Documentation** the link.
4. Click the link for the documentation you need.

Related Documents

This section lists the documents in the documentation set, followed by their part number. The most recent version of each guide is posted on the Oracle website; see "[Finding Oracle Health Sciences Documentation](#)" on page ix.

Oracle Health Sciences Data Management Workbench Documentation Set Available on Oracle Website

- *Oracle Health Sciences Data Management Workbench Installation Guide* (Part E35223)
- *Oracle Health Sciences Data Management Workbench User's Guide* (Part E35217)
- *Oracle Health Sciences Data Management Workbench and Oracle Life Sciences Data Hub Security Guide* (Part E38924)

Oracle LSH Documentation Set Available on Oracle Website

The following Oracle LSH manuals contain information about Oracle DMW as well as Oracle LSH:

- *Oracle Life Sciences Data Hub Installation Guide* (Part E35295)
- *Oracle Life Sciences Data Hub System Administrator's Guide* (Part E35297)
- *Oracle Life Sciences Data Hub Application Programming Interface Guide* (Part E35306)

The following Oracle LSH manuals contain information that may be helpful to Oracle DMW developers:

- *Oracle Life Sciences Data Hub Application Developer's Guide* (Part E35298)
- *Oracle Life Sciences Data Hub Adapter Toolkit Guide* (Part E35307)
- *Oracle Life Sciences Data Hub Implementation Guide* (Part E35296)
- *Oracle Life Sciences Data Hub User's Guide* (Part E35305)

Product Release Notes

The release notes for the Oracle DMW and Oracle LSH products are available on the My Oracle Support website. Their article ID is listed in the installation guide.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

System Requirements and Technology Stack

This section includes the following topics:

- [Section 1.1, "System Requirements"](#)
- [Section 1.2, "Technology Stack"](#)

1.1 System Requirements

This section includes system requirements for your Oracle Health Sciences Data Management Workbench (Oracle DMW) installation. Oracle DMW is built on Oracle Life Sciences Data Hub (Oracle LSH).

1.1.1 Operating Systems

To get the most current information on the technology stack, see My Oracle Support article 180430.1, *Oracle Life Sciences Applications Supported Technology Stacks*.

1.1.1.1 Database Tier

The requirements are the same as for the Oracle LSH database tier:

- Linux x86 (32-Bit)
 - Oracle Enterprise Linux 5
 - Oracle Enterprise Linux 6
 - Red Hat Enterprise AS/ES 5
 - Red Hat Enterprise AS/ES 6
- Linux x86-64 (64-Bit)
 - Oracle Enterprise Linux 5
 - Oracle Enterprise Linux 6
 - Red Hat Enterprise AS/ES 5
 - Red Hat Enterprise AS/ES 6
- AIX 6.1 (64-Bit)
- Oracle Solaris 10 on SPARC (64-Bit)
- Oracle Solaris 11 on SPARC (64-Bit)

1.1.1.2 Middle Tier

Oracle DMW requires both an Oracle LSH middle tier and a Oracle DMW middle tier.

1.1.1.2.1 Oracle LSH Middle Tier

- Linux x86 (32-Bit)
 - Oracle Enterprise Linux 5
 - Oracle Enterprise Linux 6
 - Red Hat Enterprise AS/ES 5
 - Red Hat Enterprise AS/ES 6
- Linux x86-64 (64-Bit)
 - Oracle Enterprise Linux 5
 - Oracle Enterprise Linux 6
 - Red Hat Enterprise AS/ES 5
 - Red Hat Enterprise AS/ES 6
- HP Itanium 11i v3 (11.31) (64-bit)
- AIX 6.1 (64-Bit)
- Oracle Solaris 10 on SPARC(64-Bit)
- Oracle Solaris 11 on SPARC (64-Bit)

1.1.1.2.2 Oracle DMW Middle Tier

- Linux x86-64 (64-Bit)
 - Oracle Enterprise Linux 5
 - Oracle Enterprise Linux 6
 - Red Hat Enterprise AS/ES 5
 - Red Hat Enterprise AS/ES 6
- Oracle Solaris 10 on SPARC (64-Bit)
- Oracle Solaris 11 on SPARC (64-Bit)

1.1.2 Hardware

You must install the WebLogic Server on a different application server from Oracle Life Sciences Data Hub. This also allows you to perform some installation steps in parallel:

- You can install JDK, WebLogic Server, and Oracle Applications Developer (up to [Section 3.15.2, "Apply the JSF Library to the Oracle DMW Domain"](#) in this book) without dependency on any steps in the *Oracle Life Sciences Data Hub Installation Guide*.
- After you have upgraded Oracle Database to 11.2.0.4 as directed in the *Oracle Life Sciences Data Hub Installation Guide*, you can perform [Section 3.7, "Copy runtime12.jar into the Domain's lib Directory"](#) to [Section 3.15, "Configure the DMWServer Managed Server"](#).

Subsequent steps in this guide are dependent on completing the installation of Oracle LSH.

For additional hardware considerations, see the *Oracle Life Sciences Data Hub Installation Guide*.

1.2 Technology Stack

To get the most current information on the Oracle DMW technology stack, see My Oracle Support article 180430.1. In addition to the technology stack specified in the *Oracle Life Sciences Data Hub Installation Guide*, Oracle DMW requires the following:

In addition to the Oracle LSH technology stack, Oracle DMW has the following requirements:

- Oracle Life Sciences Data Hub 2.4 and its technology stack
- Oracle WebLogic Server 10.3.6
- Java Development Kit (JDK) 1.7.0_51 or higher
- Oracle Application Developer 11.1.2.4
- Oracle Health Sciences InForm 5.5.1 *or* Oracle Health Sciences InForm 6.0
- Oracle Health Sciences InForm Adapter 1.3.5 with Oracle Health Sciences InForm 5.5.1 *or*
Oracle Health Sciences InForm Adapter 1.3.6.1 with Oracle Health Sciences InForm 6.0

1.2.1 Supported Browsers

Oracle DMW supports the following browsers:

- Internet Explorer (IE) 9
- Internet Explorer (IE) 8

Note: For Internet Explorer, only Native mode is supported. View Compatibility mode should be disabled; see [Chapter 8, "Internet Explorer Settings."](#)

- Firefox 10

Install Oracle Life Sciences Data Hub

Oracle Health Sciences Data Management Workbench (Oracle DMW) is built on top of Oracle Life Sciences Data Hub (Oracle LSH). It uses the Oracle LSH database, processing engine, Distributed Processing (DP) Server, security system, defined objects, and adapters. The Oracle LSH installation includes everything required to support Oracle DMW's database.

Install Oracle LSH and its technology stack, including Oracle eBusiness Suite and Oracle Database, following instructions in the Release 2.4 *Oracle Life Sciences Data Hub Installation Guide*. The original version is on the Oracle Health Sciences Life Sciences Warehouse media pack but always check the documentation website to see if a revised version is available:

<http://www.oracle.com/technetwork/documentation/hsgbu-clinical-407519.html>.

Also check My Oracle Support article 1138053.1 *Oracle Life Sciences Data Hub and Oracle Clinical Development Analytics Known Install and Configuration Issues* for the latest information.

The *Oracle Life Sciences Data Hub Installation Guide* gives instructions for downloading the software from Oracle Software Delivery Cloud and My Oracle Support into a staging area.

Note: You do not need to follow instructions in the "What's Next" chapter of the *Oracle Life Sciences Data Hub Installation Guide* if you are installing Oracle LSH only to support Oracle DMW. The information relevant to Oracle DMW installations is covered in [Chapter 10](#), "What's Next" in this document.



Install Oracle WebLogic Server

This section contains the following topics:

- Section 3.1, "Install Oracle Java Development Kit"
- Section 3.2, "Install and Patch Oracle WebLogic Server"
- Section 3.3, "Install and Upgrade Oracle Application Developer Framework"
- Section 3.4, "Create the Metadata Services Repository Schema in the Database"
- Section 3.5, "Create a WebLogic Server Domain for Oracle DMW"
- Section 3.6, "Upgrade ADF in the Oracle DMW Domain"
- Section 3.7, "Copy runtime12.jar into the Domain's lib Directory"
- Section 3.8, "Edit setDomainEnv.sh"
- Section 3.10, "Change the Default Timeout Period (Optional)"
- Section 3.12, "Restart WebLogic Server and Check Settings"
- Section 3.13, "Change WebLogic Server to Production"
- Section 3.14, "Enable E-Business Suite User Authentication"
- Section 3.15, "Configure the DMWServer Managed Server"
- Section 3.16, "Restart the WebLogic Server"

The complete documentation set for Oracle WebLogic Server 10.3.6 is available at:
http://docs.oracle.com/cd/E23943_01/wls.htm.

Note: You must install Oracle WebLogic Server on a different application server from Oracle Life Sciences Data Hub (Oracle LSH).

Note: Perform all installation tasks as the same OS user.

3.1 Install Oracle Java Development Kit

Oracle Java Development Kit (JDK) 1.7 is also known as JDK 7. Oracle DMW 2.4 uses JDK 1.7.0_51 or higher.

To download and install JDK 1.7.0_51:

1. Go to My Oracle Support at <https://support.oracle.com> and sign in.

2. In the Search Knowledge Base field in the upper right, enter: All Java SE Download on MOS [ID 1439822.1].
3. Click the link to the document *All Java SE Downloads on MOS* (ID 1439822.1).
4. Scroll down to the list of JDK versions to **Oracle JDK 7 Update 51** (or higher).
5. Click the patch number link.
6. Select the appropriate platform and click **ReadMe** to read the release notes and **Download** to download the patch.
7. Follow instructions in the release notes to apply the patch.

3.2 Install and Patch Oracle WebLogic Server

3.2.1 Install Oracle WebLogic 10.3.6

Install WebLogic 10.3.6 following instructions in *Oracle® Fusion Middleware Installation Guide for Oracle WebLogic Server 11g Release 1 (10.3.6)*, which you can find on the media pack or at http://docs.oracle.com/cd/E23943_01/doc.1111/e14142.pdf, or download the PDF from here: http://docs.oracle.com/cd/E23943_01/wls.htm.

Point to Installed JDK 7

The WebLogic Server installation process includes specifying a JDK installation. At this point, specify the Oracle Java Development Kit (JDK) that you installed in [Section 3.1](#).

3.2.2 Apply Patch 10.3.6.0.8

Install Oracle WebLogic Server Patch Set Update (PSU) 10.3.6.0.8, which is patch **18040640**, following instructions in the readme file. See "[Finding Patches on My Oracle Support](#)" on page viii.

3.3 Install and Upgrade Oracle Application Developer Framework

Install Oracle Developer Framework (ADF, which is also known as Oracle Application Developer) and apply required patches.

3.3.1 Install Oracle Application Developer Framework

Install Oracle Application Developer Framework (ADF) 11g R1 (11.1.1.6), which is included in the media pack as Application Development Runtime.

Follow instructions in *Oracle® Fusion Middleware Installation Guide for Application Developer 11g Release 1 (11.1.1.6.0)*, which you can find on the media pack or at http://docs.oracle.com/cd/E23943_01/doc.1111/e14827/toc.htm.

3.3.2 Upgrade ADF to 11.1.2.4

Additional information is in the patch readme files. However, because there are no WebCenter components explicitly installed, you cannot follow the patch readme instructions completely.

Note: Oracle supports only English OS language settings for the application tier.

1. Copy the following patches from the staging area you created when you downloaded the media pack to a temporary directory:
 - 16546129—JDeveloper patch
 - 16546157—WebCenter Composer patch
2. Set environment variables to run the OPatch utility.


```
export MW_HOME=MIDDLEWARE_HOME
export ORACLE_HOME=MIDDLEWARE_HOME/oracle_common
export PATH=$PATH:MIDDLEWARE_HOME/oracle_common/OPatch
```
3. Run OPatch to verify that the current Oracle Application Developer 11g version installed is: 11.1.1.6.0.


```
opatch lsinventory
```
4. Change to the temporary directory where you put the patches.
5. Unzip the patches and confirm that they are extracted.


```
unzip p16546129_111160_Generic.zip
unzip p16546157_111160_Generic.zip
ls
should return
16546129 16546157 p16546129_111160_Generic.zip p16546157_111160_Generic.zip
```
6. Change to directory 16546129 and run `opatch apply`. Enter `y` when prompted.
7. Change to directory 16546157 and run `opatch apply`. Enter `y` when prompted.
8. Verify that both patches are applied successfully:


```
opatch lsinventory
```

The system returns the date and time they were applied, lists the bugs they fix, and says OPatch succeeded.

3.4 Create the Metadata Services Repository Schema in the Database

Run the Repository Creation Utility 11.1.1.6 to create the metadata services schema, DEV_MDS, in the database. See http://docs.oracle.com/cd/E23943_01/doc.1111/e14259/rcu_screens.htm.

This step is required for the Web Services Manager (WSM) Policy Manager.

3.5 Create a WebLogic Server Domain for Oracle DMW

Create a WebLogic domain with the suggested name `DMWDomain` following instructions in *Creating Domains Using the Configuration Wizard* at http://docs.oracle.com/cd/E23943_01/web.1111/e14140.pdf.

During domain creation, do the following.

3.5.1 Select Oracle Common Options

During domain creation, select **Generate a domain configured automatically to support the following products** and then select:

- Oracle JRF - 11.1.1.0 [oracle_common]
- Oracle Enterprise Manager - 11.1.1.0 [oracle_common]
- Oracle WSM Policy Manager - 11.1.1.0 [oracle_common]

3.5.2 Select Development Mode

In the **Configure Server Start Mode and JDK** step, select **Development Mode**.

You will change to Production mode later; see [Section 3.13, "Change WebLogic Server to Production"](#).

3.5.3 Create a WebLogic Server "Machine"

During domain creation, create a Machine with the suggested name `DMWMachine`. A *machine* is the logical representation of the computer that hosts one or more WebLogic Server instances. Each Managed Server must be assigned to a machine.

3.5.4 Create a Managed Server and Assign it to the Machine

During domain creation, create a Managed Server with the suggested name `DMWServer` and assign it to the DMW Machine.

Note: The following instructions refer to this Managed Server as **DMWServer** and the Machine as **DMWMachine**.

3.5.5 Configure the JDBC Schema

Provide the details of the schema you created in [Section 3.4, "Create the Metadata Services Repository Schema in the Database"](#) to configure the JDBC component schema.

Specify that the JDBC services `mds-owsm` and `wsm-pm` are deployed to the AdminServer or the managed server where you want the WSM service to be running.

3.5.6 Support SSL Wildcards and SSL Web Services

If you are using HTTPS, check the following settings and change them if necessary to support SSL wildcards; for example `*.company.com` instead of `server.company.com`.

1. Log in to the WebLogic Server Console and open the SSL tab.
2. Set **Hostname Verification** = Custom Hostname Verifier.
3. Set **Custom Hostname Verifier** =
`weblogic.security.utils.SSLWLSWildcardHostnameVerifier`
4. Select **Use JSSE SSL**. This is required for HTTPS SSL web services, not specifically for wildcards. If you are using HTTP, do not select this setting.
5. Save.

3.5.7 Restart the WebLogic Server

See [Section 3.16, "Restart the WebLogic Server."](#)

3.6 Upgrade ADF in the Oracle DMW Domain

1. Navigate to `MIDDLEWARE_HOME/oracle_common/common/bin`.
2. Run `setWlstEnv.sh` to set up the environment.
3. Run `wlst.sh` to start the WebLogic Scripting Tool (WLST).
4. At the WLST prompt enter:

```
upgradeADF('DOMAIN_HOME');
```

For example:

```
upgradeADF('Middleware_Home/user_projects/domains/DMWDomain')
```

Tip: In the WebLogic Scripting Tool shell you can type `help()` to get information on available commands.

3.7 Copy runtime12.jar into the Domain's lib Directory

The Oracle Database file `runtime12.jar` is included in `$ORACLE_HOME/sqlj/lib` on the Oracle LSH database server computer.

Using SFTP, copy it from there to the WebLogic Server computer, to the `lib` directory of the domain created when you installed the WebLogic Server.

3.8 Edit setDomainEnv.sh

Modify the `setDomainEnv.sh` to configure the WebLogic Administration Server and DMWServer. Oracle recommends the following settings for production use. Be careful to **insert text as directed before or after the located sections**.

1. Check the available RAM on your machine. In Step 6 Oracle recommends setting it to 8gb, but this may not be possible.
2. Stop the Administration Server.
3. Log in to the system, change to the `domain\bin` directory, and open `setDomainEnv.sh` in an editing tool.
4. Add a parameter named `DdmwWebService` to `JAVA_OPTIONS` and set its value to:
 - `SSL` if you plan to use HTTPS for InForm adapter web service calls.
 - `NONSSL` if you plan to use HTTP for InForm adapter web service calls.

Search for the following text:

```
JAVA_OPTIONS="${JAVA_OPTIONS}"
```

Add the parameter and value within the quotes. For example:

```
if [ "${WEBLOGIC_EXTENSION_DIRS}" != "" ] ; then
  JAVA_OPTIONS="${JAVA_OPTIONS} -Dweblogic.ext.dirs=${WEBLOGIC_EXTENSION_DIRS}"
  export JAVA_OPTIONS
```

```
fi
```

```
JAVA_OPTIONS="${JAVA_OPTIONS} -DdmwWebService=SSL"
export JAVA_OPTIONS
```

```
# SET THE CLASSPATH
```

5. On one and only one application server, add a parameter named `-DhandleDiscEvent` to `JAVA_OPTIONS` and set its value to `TRUE`, following the instructions in the previous step.

This is required to support multiple middle tiers pointing to the same database. Only the server with this parameter set to `True` will be able to send data from Oracle Thesaurus Management System (TMS) to InForm.

6. Synchronize the DMW WebLogic server clock with the InFormAdapter server clock by adding a parameter named `user.timezone` to `JAVA_OPTIONS` and set its value to the same timezone used by the InForm Adapter server, using a valid format supported by Java 7; for example:

```
-Duser.timezone=GMT
```

or

```
-Duser.timezone=EST
```

Make sure this parameter is contained within the quotes:

```
JAVA_OPTIONS="${JAVA_OPTIONS} -Duser.timezone=VALID_TIMEZONE"
export JAVA_OPTIONS
```

7. Locate the following section:

```
if [ "${USER_MEM_ARGS}" != "" ] ; then
MEM_ARGS="${USER_MEM_ARGS}"
export MEM_ARGS
fi
```

and add the following text (which may continue to the next page) **BEFORE** the text shown above:

Note: If you are using names other than "AdminServer" and "DMWServer," change the text accordingly.

```
# Set 1024MB for AdminServer
if [ "${SERVER_NAME}" == "AdminServer" ] ; then
    USER_MEM_ARGS="-Xms512m -Xmx1024m -XX:PermSize=256m -XX:MaxPermSize=512m"
"
    export USER_MEM_ARGS
fi
#Set 4G for Managed Server
if [ "${SERVER_NAME}" == "DMWServer" ] ; then
    USER_MEM_ARGS="-Xms8192m -Xmx8192m -XX:PermSize=1024m
-XX:MaxPermSize=1024m -XX:NewSize=1024m -XX:MaxNewSize=1024m
-XX:SurvivorRatio=8"
    export USER_MEM_ARGS
fi
```

8. Locate the following section:

```
if [ "${POST_CLASSPATH}" != "" ] ; then
```

```

POST_CLASSPATH="${COMMON_COMPONENTS_HOME}/modules/oracle.jrf_
11.1.1/jrf.jar${CLASSPATHSEP}${POST_CLASSPATH}"
export POST_CLASSPATH
else
POST_CLASSPATH="${COMMON_COMPONENTS_HOME}/modules/oracle.jrf_11.1.1/jrf.jar"
export POST_CLASSPATH
fi

```

and add the following **AFTER** the text shown above:

```

if [ "${POST_CLASSPATH}" != "" ] ; then
POST_CLASSPATH="${COMMON_COMPONENTS_HOME}/modules/features/adf.model_
11.1.1.jar${CLASSPATHSEP}${POST_CLASSPATH}"
export POST_CLASSPATH
else
POST_CLASSPATH="${COMMON_COMPONENTS_HOME}/modules/features/adf.model_
11.1.1.jar"
export POST_CLASSPATH
fi

```

9. Locate the first occurrence of POST_CLASSPATH and add the following after it:

```

if [ "${POST_CLASSPATH}" != "" ] ; then
    POST_CLASSPATH="${DOMAIN_HOME}/lib/fndext.jar${CLASSPATHSEP}${DOMAIN_
HOME}/lib/runtime12.jar${CLASSPATHSEP}${POST_CLASSPATH}"
    export POST_CLASSPATH
else
    POST_CLASSPATH="${DOMAIN_HOME}/lib/fndext.jar${CLASSPATHSEP}${DOMAIN_
HOME}/lib/runtime12.jar"
    export POST_CLASSPATH
fi

```

10. Set PRODUCTION_MODE=true to run in Server mode.

11. If you want to use a date format other than the default format, dd-MMM-yyyy (01-JAN-2016), in the Listings pages, add the parameter -DlistingDateFormat to JAVA_PROPERTIES and set it to one of the supported values found in <http://docs.oracle.com/javase/7/docs/api/java/text/SimpleDateFormat.html>.

If the date format has space character in it, you must replace the space with an underscore (_) character because WebLogic Server on Linux will not start with spaces in a parameter. For example, the following value:

```
-DlistingDateFormat=yyyy.MM.dd_G_'at'_HH:mm:ss_z"
```

displays dates as:

```
2001.07.04 AD at 12:08:56 PDT
```

12. Locate the first occurrence of EXTRA_JAVA_PROPERTIES and add the following to enable huge pages after it.

```
EXTRA_JAVA_PROPERTIES="${EXTRA_JAVA_PROPERTIES} -XX:+UseLargePages"
export EXTRA_JAVA_PROPERTIES
```

13. Set application module properties:

Note: The setting `-Djbo.ampool.maxinactiveage=1200000` creates a session timeout value of 20 minutes. If you prefer a different timeout period, see ["Change the Default Timeout Period \(Optional\)"](#) on page 3-8.

```
EXTRA_JAVA_PROPERTIES="{EXTRA_JAVA_PROPERTIES}
-Djbo.ampool.doampooling=true
-Djbo.ampool.maxavailablesize=expected_maximum_number_of_concurrent_users
-Djbo.ampool.initpoolsize=80%_of_maximum_number_of_concurrent_users
-Djbo.ampool.minavailablesize=80%_of_maximum_number_of_concurrent_users
-Djbo.recyclethreshold=same_as_maximum_number_of_concurrent_users
-Djbo.ampool.timetolive=-1
-Djbo.ampool.maxinactiveage=1200000"
export EXTRA_JAVA_PROPERTIES
```

3.9 Restart the WLS Server

See [Section 3.16, "Restart the WebLogic Server."](#)

3.10 Change the Default Timeout Period (Optional)

The default timeout period is 20 minutes. It is set in both `setDomainEnv.sh` and `plan.xml`. The values in each place must be equal.

Note: If you change these settings after deploying Oracle DMW, you must redeploy it, following instructions in [Chapter 4, "Deploy Oracle DMW on the WebLogic Server."](#)

To set a different timeout value:

1. Edit `plan.xml`, which is located in the top level of the DMW release .zip file. Open `plan.xml` in an editor, search for `SessionTimeout`, then change its value, which is **in minutes**, from 20 to the number of minutes you want.

```
<variable>
  <name>SessionTimeout</name>
  <value>number_of_minutes</value>
</variable>
```

2. Edit `setDomainEnv.sh`, which is located in the `domain\bin` directory, to add a value **in milliseconds** equal to the number of minutes you entered in `plan.xml`. For example, 20 minutes is 1200000 milliseconds. Find:

```
EXTRA_JAVA_PROPERTIES="{EXTRA_JAVA_PROPERTIES}
```

and add or edit the line:

```
-Djbo.ampool.maxinactiveage=number_of_milliseconds
```


3.11 Start the Node Manager and Check Settings

You can use the Node Manager to start and stop the Administration Server and the Managed Server and to start the server. If the following settings are not correct, change them manually.

1. Start the node manager; see http://docs.oracle.com/cd/E23943_01/web.1111/e13813/reference.htm#WLSTC516.
2. In the `nodemanager.properties` file, located at `Middleware_Home/wlserver_10.3/common/nodemanager`, set:


```
StartScriptEnabled = TRUE
```
3. The Managed Server listener address must be correct for your environment. It defaults to localhost, which causes problems when restarting the Node Manager.
 - a. Log in to the WebLogic Server Console, then click **Environment**, then **Machines**. Select **DMWMachine**, then **Node Manager**.
 - b. Change the value for **Listen Address** to the correct hostname for your environment.

3.12 Restart WebLogic Server and Check Settings

For the new `setEnvDomain.sh` settings take effect:

1. Restart the WebLogic Server. For instructions, see [Section 3.16, "Restart the WebLogic Server"](#).
2. Open the log file at `domain_home/servers/DMWServer/logs/DMWServer.log`.
3. Check that the new user memory settings `-Xms512m` and `-Xmx1024m` appear in the log file.

3.13 Change WebLogic Server to Production

You installed WebLogic Server in Development mode. Change WebLogic Server to Production mode, following instructions at http://docs.oracle.com/cd/E23943_01/apirefs.1111/e13952/taskhelp/domainconfig/ChangeRuntimeModes.html

3.14 Enable E-Business Suite User Authentication

Oracle DMW uses the user authentication feature of Oracle E-Business Suite, not the Oracle WebLogic Server. To enable Oracle DMW and Oracle WebLogic Server to communicate with the E-Business Suite, you must build a desktop database connection file and `fnxext.jar` using the Oracle E-Business Suite Software Development Kit (SDK) for Java, a library of lightweight E-Business Suite APIs. SDK is not required after this initial setup.

3.14.1 Prepare the Oracle Applications Server to Receive Messages from Oracle DMW

Instructions in this section are in the guide *Oracle® E-Business Suite Software Development Kit for Java*, which you can find on the media pack and on My Oracle Support, ID 974949.1 at

https://support.oracle.com/epmos/faces/DocumentDisplay?_afLoop=455292524919907&id=974949.1&_adf.ctrl-state=1a8dpgv5nt_57.

3.14.1.1 Copy the Database Connection File

1. Create a directory on the WebLogic Server.
2. On the Oracle Applications Server that you installed for Oracle Life Sciences Data Hub, from \$FND_SECURE copy the .dbc Oracle Applications database connection file to the directory.

3.14.1.2 Download and Install the Software Development Kit for Java

The E-Business Suite Software Development Kit for Java ships as patch 17269917 (p17269917_R12_GENERIC.zip) on the Oracle Health Sciences Life Sciences Warehouse media pack.

The .zip file contains:

- The Oracle E-Business Suite SDK for Java file, **fnnext.jar**
 - README.txt
 - Javadoc for Oracle E-Business Suite SDK for Java
 - An Apache Ant XML file named **txkEbsSdkConfig.xml**
1. Extract fnnext.jar.
 2. Copy the extracted fnnext.jar file and the txkEbsSdkConfig.xml file to a directory such as /home/user1/ebssdk on the WebLogic server.
 3. Copy the Javadoc to any appropriate location for convenient reference.

3.14.1.3 Register the External Node and Generate the Desktop DBC File

Follow instructions in Section 2.1.2, "Register the External Node and Generate the Desktop DBC File," in the *Oracle® E-Business Suite Software Development Kit for Java*.

3.14.1.4 Create the Required User dmwebs@oracle.com

Follow instructions in Section 2.1.3, "Set Up Necessary Oracle E-Business Suite Users" in *Oracle® E-Business Suite Software Development Kit for Java* to create a user named dmwebs@oracle.com user with the role UMX | APPS_SCHEMA_CONNECT.

This is the proxy user required to pass authentication messages.

3.14.2 Configure AppDataSource on the WebLogic Server

See Section 2.1.5, "Configuring AppsDataSource on Oracle WebLogic server (WLS)" in *Oracle® E-Business Suite Software Development Kit for Java* for detailed instructions for **only** the following steps.

3.14.2.1 Rebuild the fnnext.jar file for Oracle WebLogic Server on UNIX/LINUX

Follow instructions for Step 2.1.5.1 in *Oracle® E-Business Suite Software Development Kit for Java*. Use the new .dbc file created in [Section 3.14.1.3, "Register the External Node and Generate the Desktop DBC File"](#).

3.14.2.2 Deploy AppsDataSource Code on the Oracle WebLogic Server

Follow instructions for Step 2.1.5.3 in *Oracle® E-Business Suite Software Development Kit for Java*.

3.14.2.3 Configure the AppsDataSource in the Administration Console

Follow instructions for Step 2.1.5.4 in *Oracle® E-Business Suite Software Development Kit for Java* with the following requirements specific to Oracle DMW:

Note: The .dbc file referred to here is the file that was copied in step [Section 3.14.1.1, "Copy the Database Connection File."](#)

In Step 5, enter values **exactly** as follows:

- Name for the datasource: lswdbDS
 - JNDI Name: jdbc/lswdbDS
 - Database Type: Oracle
 - Database Driver: Oracle's Driver (Thin) for Instance connections;
Versions: 9.0.1, 9.2.0, 10, 11
- (This is for a non-XA data source, since Oracle DMW has only one database.)

In Step 10, enter values **exactly** as follows:

- Driver Class Name:
`oracle.apps.fnd.ext.jdbc.datasource.AppsDataSource`
- Database User Name:
`dmwebs@oracle.com`

3.14.2.4 Enable CLOB Support

You must enable CLOB Support for Oracle DMW in the WebLogic Server:

1. Navigate to Home, then Data Sources, then lswdbDS.
2. Click the **Connection Pool** tab.
3. Click **Advanced**.
4. Uncheck the property **Wrap Data Types**.
5. Restart the WebLogic server; see [Section 3.16, "Restart the WebLogic Server."](#)

3.14.3 Prepare a Security Realm on the WebLogic Server

Follow instructions for Step 3.3, "JAAS Configuration for Oracle WebLogic Server," up to substep 3.3.5, in *Oracle® E-Business Suite Software Development Kit for Java*.

For the Realm Name, enter `EbsRealm` (Step 6, Section 3.3.2, "Set Up Security Realm.")

3.15 Configure the DMWServer Managed Server

Make the following changes on the DMWServer Managed Server.

3.15.1 Apply the JRF Template to DMWServer

1. Log in to Enterprise Manager.
2. Select the managed server DMWServer from the left pane.
3. Click the **Apply JRF Template** button at the top of the right pane.

3.15.2 Apply the JSF Library to the Oracle DMW Domain

In the WebLogic Server Console:

1. Click **Deployments**.
2. Under **Name**, select `jsf(2.0,1.0.0.0_2-0-2)`.
3. Select the **Targets** tab.
4. Select the **DMWServer** and **AdminServer** check boxes if they are not already selected.
5. Save.

3.15.3 Change the Connection Pool Maximum Capacity on DMWServer

In the WebLogic Server Console:

1. Navigate to **Services**, then **Data Sources**, then `lswpdbDS`, then the **Connection Pool** tab.
2. Change the **Maximum Capacity** setting from 15 to the number you entered ([Section 3.8, "Edit setDomainEnv.sh"](#), Step 9) for the maximum number of concurrent users during peak time plus 15%.

3.15.4 Clear the Listen Address

In the WebLogic Server Console:

1. Under Settings for DMWServer, select **Configuration**, then **General**.
2. Clear the value in the **Listen Address** field.
3. Save.

3.15.5 Set Up HTTPS

By default Oracle DMW supports and requires HTTPS. The following setup is required to use HTTPS.

Note: If you want to use HTTP instead, skip this section. And when you get to [Chapter 4, "Deploy Oracle DMW on the WebLogic Server"](#), follow instructions in [Section 4.2, "Alternative Oracle DMW Deployment Disabling HTTPS Support"](#).

In the WebLogic Server Console:

1. Navigate to **Servers**, then **Summary of Servers**, then `DMWServer`.
2. Click `DMWServer`.
3. In the **General** tab, enable SSL by verifying that the following check boxes are selected:
 - **SSL Listen Port Enabled**
 - **Client Cert Proxy Enabled**
4. Verify that a port number is displayed for the **SSL Listen Port**.

3.16 Restart the WebLogic Server

For information on starting and stopping the WebLogic Server, see the *Oracle® Fusion Middleware Managing Server Startup and Shutdown for Oracle WebLogic Server 11g Release 1 (10.3.6)* at:

- HTML: http://docs.oracle.com/cd/E23943_01/web.1111/e13708/toc.htm
- PDF: You can download a PDF version of the same document in the same location by right-clicking the **PDF** link and selecting **Save Target As**.

Log Files Log files for the AdminServer and the DMWServer are located in:

`middleware_home/user_projects/domains/DMWDomain/servers/AdminServer/logs`

and

`middleware_home/user_projects/domains/DMWDomain/servers/DMWServer/logs`

Deploy Oracle DMW on the WebLogic Server

By default Oracle Health Sciences Data Management Workbench (Oracle DMW) supports and requires HTTPS. If you prefer to use HTTP, you can follow instructions in [Section 4.2](#) instead of [Section 4.1](#) to enable the use of HTTP.

Follow instructions in **one** of the following sections:

- [Section 4.1, "Deploy with Default Support for HTTPS"](#)
- [Section 4.2, "Alternative Oracle DMW Deployment Disabling HTTPS Support"](#)

Note: Before deploying Oracle DMW, make sure the WebLogic Server clock is synchronized with the InForm Adapter server clock by modifying the `setDomainEnv.sh` file. You should already have done this following instructions in [Section 3.8, "Edit setDomainEnv.sh."](#)

Then follow instructions in **both** of the following sections:

- [Section 4.3, "Apply the Latest Patch Set"](#)
- [Section 4.4, "Check for and Install Oracle DMW Release 2.4.x Patches"](#)

4.1 Deploy with Default Support for HTTPS

Deploy the Oracle DMW application tier on the WebLogic Server.

1. If necessary, copy the Oracle DMW 2.4 .zip file from your staging area to the WebLogic Server so that you can select it from the WebLogic Administration Console.
2. Unzip the file, creating the **software** directory containing the `dmwapp.ear` and `plan.xml` files.
3. Log in as the admin user to the WebLogic Administration Console. The URL is:
`http(s)://host_name.company_domain.com:port/console/`
for example:
`http(s)://machine.example.com:1234/console`
4. **If you have an earlier version of Oracle DMW deployed**, stop it and delete it before deploying the new version. If you are installing Oracle DMW for the first time, you do not need to do this step.

In the Weblogic Administration Console, select **Deployments** from **Domain Structure**. A list of all deployed applications appears.

If `dmwapp` is included in the list, select its check box and:

- a. Stop it by selecting **Force Stop Now** from the **Stop** drop-down list.
 - b. Delete it by clicking **Delete**. `dmwapp` disappears from the list.
5. Click **Install**. The **Install Application Assistant** is displayed.
 6. In the paragraph beginning **Locate deployment to install and prepare for deployment**, click the link **upload your file(s)**.
 7. In the Deployment Archive line, click **Browse** and select `dmwapp.ear` from your local computer and click **Open**. The system returns you to the **Install Application Assistant**.
 8. In the **Install Application Assistant** click **Next**. This uploads `dmwapp.ear` to a server directory. This may take some time.

When the process is complete, the system displays the path to the server directory.

9. In the **Install Application Assistant** click **Next**.
10. Select **Install this deployment as an application** and click **Next**. The system displays a list of servers.
11. Select the managed server to which you are installing the application—`DMWServer`—and click **Next**. Optional settings appear.
12. Under General, in the Name field, enter: `dmwapp` and click **Finish**. The system displays a summary of your selections.
13. Click **Finish**. The system deploys the Oracle DMW middle tier on the managed server. After a successful deployment a new page called **Settings for dmwapp** appears with the Overview tab displayed.
14. Click **Deployments** under **Domain Structure** to verify that `dmwapp` is included in the Deployments list and its state is Active.
15. Go to the login screen to check that the application is running. The URL is:

`http://host_name.company_domain.com:port/lsw/dme/faces/DmeLogin.jsf`

For example:

`http://srv123.example.com:1234/lsw/dme/faces/DmeLogin.jsf`

4.2 Alternative Oracle DMW Deployment Disabling HTTPS Support

By default Oracle DMW is configured to use HTTPS. If you intend to use HTTP, you can deploy Oracle DMW Release 2.4 using the deployment plan (`Plan.xml`) that disables HTTPS for Oracle DMW.

For further information, see the *Oracle® Fusion Middleware Deploying Applications to Oracle WebLogic Server 11g Release 1 (10.3.6)* at http://docs.oracle.com/cd/E23943_01/web.1111/e13702/intro.htm

1. Log in to the WebLogic Server and create a `tmp` directory.
2. Copy the latest Oracle DMW 2.4.x patch set to the WebLogic Server computer. Unzip the DMW file to the `tmp` directory, creating the **software** directory containing the `dmwapp.ear` and `plan.xml` files.
3. Open the software directory.

4. Copy the dmwapp.ear file and the plan.xml file to the tmp directory and delete the software directory. The tmp directory now contains only the dmwapp.ear and plan.xml files.

5. Open a shell window and set up the environment:

```
source WL_HOME/server/bin/setWLSEnv.sh
```

for example:

```
source /app/oracle/product/middleware/wlserver_10.3/server/bin/setWLSEnv.sh
```

6. Change directory to the tmp directory.
7. **If you have an earlier version of Oracle DMW deployed**, stop it and delete it before deploying the new version. If you are installing Oracle DMW for the first time, you do not need to do this step.

Enter the following commands. Or store the username and password in a WebLogic configuration file and omit the username and password parameters in the commands below. For information, see the WebLogic Scripting Tool Command-Line Reference in the *Oracle® Fusion Middleware Deploying Applications to Oracle WebLogic Server 11g Release 1 (10.3.6)* at

http://docs.oracle.com/cd/E23943_01/web.1111/e13702/wldeployer.htm#DEPGD318.

```
java weblogic.Deployer -adminurl t3://host_name.your_company_domain.com:port_number -username WLS_USER -password WLS_PASSWORD -stop -targets DMW_SERVER_NAME -name dmwapp
```

```
java weblogic.Deployer -adminurl t3://host_name.your_company_domain.com:port_number -username WLS_USER -password WLS_PASSWORD -undeploy -targets DMW_SERVER_NAME -name dmwapp
```

8. Deploy the new Oracle DMW release. Enter the following command. If you are storing the username and password in a configuration file, omit the username and password parameters.

```
java weblogic.Deployer -adminurl t3://host_name.your_company_domain.com:port_number -username WLS_USER -password WLS_PASSWORD -targets DMW_SERVER_NAME -deploy dmwapp.ear -name dmwapp -upload -plan Plan.xml
```

9. Exit the WebLogic Scripting Tool by entering:

```
exit()
```

10. Exit the shell by entering:

```
exit
```

11. Go to the login screen to check that the application is running. The URL is:

http://host_name.company_domain.com:port/lsw/dme/faces/DmeLogin.jsf

For example:

<http://srv123.example.com:1234/lsw/dme/faces/DmeLogin.jsf>

4.3 Apply the Latest Patch Set

Note: Oracle recommends that you install the latest Oracle DMW patch set for release 2.4.

1. Check My Oracle Support article 1558745.1, *Oracle Health Sciences Data Management Workbench (DMW) Summary of Patches Available* at <https://support.oracle.com>.
2. Download and install the latest patch set for Oracle DMW Release 2.4 (2.4.x; for example, 2.4.7), following instructions in the patch set release notes.

Note: Be sure to follow all instructions, including applying any technology stack patches that may be required.

4.4 Check for and Install Oracle DMW Release 2.4.x Patches

Important: Oracle strongly advises that any patches that have been released since the release or patch set should be installed immediately.

For example, if you installed patch set 2.4.7 and there are two 2.4.7 patches (2.4.7.1 and 2.4.7.2) install 2.4.7.1 first and then 2.4.7.2, following instructions in their release notes.

1. Check My Oracle Support article 1558745.1, *Oracle Health Sciences Data Management Workbench (DMW) Summary of Patches Available* at <https://support.oracle.com>.
2. If any patches have been released on top of the release you installed, download and install all of them, in order, following instructions in their release notes.

Integrate Oracle Health Sciences InForm

This section contains the following topics:

- [Section 5.1, "Get a CA Certificate if You Use HTTPS"](#)
- [Section 5.2, "Use Character Semantics"](#)
- [Section 5.3, "Create Oracle Accounts for the Oracle DMW InForm Connector"](#)
- [Section 5.4, "Set Up the InForm Adapter"](#)

5.1 Get a CA Certificate if You Use HTTPS

To support HTTPS, you need to request a certificate from a Certificate Authority (CA) vendor such as Thawte, Entrust, or Verisign. Allow some time for the certificate to be issued.

5.2 Use Character Semantics

Set the Oracle Applications profile **LSH: Use Character Semantics for Workarea Installation** to **Yes** on each computer where you install Oracle DMW is required for integration with InForm. See the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide*.

5.3 Create Oracle Accounts for the Oracle DMW InForm Connector

The InForm Connector is a component of Oracle DMW. It is required to import study data and metadata from InForm. On each InForm study database, run scripts to create a read-only user account for Oracle DMW to use to access data and metadata in InForm.

The account has Select privileges on all tables and views in study accounts referenced by the InForm Connector, including metadata views, operational data views, and RDE views. This schema also has packages that facilitate the data load process.

Use the credentials of this account when you set up a database connection (remote location) in the Oracle DMW InForm configuration for each study using the InForm database. See the *Oracle Health Sciences Data Management Workbench User's Guide* Administration chapter.

5.3.1 Create Directory on Each InForm Database

On each InForm database with a study for which you plan to use Oracle DMW, create one OS directory using the `mkdir` command to hold scripts you must copy and run.

You need one directory per database, not per study.

5.3.2 Copy Scripts

Copy the following files from the directory `$CDR_TOP/patch/115/sql/` on the computer where you have installed Oracle Life Sciences Data Hub to each InForm database directory you created in [Section 5.3.1](#):

- **DMWInFormInstall.sql**—the driver script
- **DMWInFormUser.sql**—creates new users or confirms existing users
- **DMWInFAdms.pls**—installs a package specification into the Oracle DMW administration account
- **DMWInFAdmb.pls**—installs a package body into the Oracle DMW administration account
- **DMWInFormROAccessObjs.sql**—installs a table into the Oracle DMW read-only access account
- **DMWInFroas.pls**—installs a package specification into the Oracle DMW read-only access account
- **DMWInFroab.pls**—installs a package body into the Oracle DMW read-only access account

5.3.3 Run the Driver Script

The driver prompts for all required input parameter values and calls the other scripts as required.

1. Log into SQL*Plus with an account with DBA privileges.
2. Go to the directory that contains the downloaded scripts.
3. Execute `DMWInFormInstall.sql`. The script prompts for:
 - A name to give the log file.
 - TNS name **or** connect string for the InForm database. If you enter the connect string, do not enter any spaces.
 - `system` or other DBA username and password.
 - Name of the Oracle DMW Admin account to be used or created for the purpose of giving privileges to the Oracle DMW read-only access account. The system creates the account if it does not already exist.
 - Name of the Oracle DMW read-only access account to be used or created. The system creates the account if it does not already exist.

Note: Do not use spaces or special characters other than underscore (`_`) in the username or password.

- Passwords for both accounts. If the accounts are new, the script prompts you to confirm each password. If the accounts already exist, you must enter a password, but the system does not change the existing password. It proceeds to create or update the packages owned by the schema.
- If the read-only access account is new, the script also prompts for a tablespace name. It then creates a tablespace on the InForm database to be used for the

integration with Oracle DMW and creates or updates all Oracle DMW objects in this tablespace.

5.4 Set Up the InForm Adapter

The InForm Adapter is an Oracle Health Sciences InForm component. Oracle DMW uses it to send discrepancies to InForm.

5.4.1 Install the InForm Adapter

Install the appropriate version of the InForm Adapter for the version of InForm you are using:

- If you are using Oracle Health Sciences InForm 5.5.1, install InForm Adapter Release 1.3.5, 1.3.6, or 1.3.7.
- If you are using Oracle Health Sciences InForm 6.0, install InForm Adapter Release 1.3.6 or 1.3.7.

Oracle Health Sciences InForm Adapter 1.3.7 *Installation Guide* is available at http://docs.oracle.com/cd/E59505_01/index.htm

You can install the Discrepancy Enhanced interface, Adapter Admin interface and RegisterTrialTool on a dedicated computer—the most common configuration—or on the InForm application server computer with the InForm Server Adapter (ISA).

The InForm Server Adapter (ISA) must be available on the InForm application server to invoke the "Issue" and "Update" methods in the Discrepancy Enhanced interface, and the ISA Windows service must be running.

Note: Make sure that all clocks are synchronized on the machines on which you are installing the InForm Adapter interfaces, the InForm server, the database server, and the Oracle DMW application tier.

5.4.2 Register the InForm Server Adapter

Follow instructions in the Oracle Health Sciences InForm Adapter *Installation Guide* at http://docs.oracle.com/cd/E59505_01/index.htm to register the InForm Server Adapter (ISA) using the SetServer command in the Register Trial Tool.

5.4.3 Register Each Trial

Follow instructions in the Oracle Health Sciences InForm Adapter *Installation Guide* at http://docs.oracle.com/cd/E59505_01/index.htm to register each trial, using the SetTrial command in the Register Trial Tool.

5.4.4 Check the InForm Integration

1. Verify that the ISA URL opens correctly in the browser from your local machine.
2. To verify that it is accessible from DMW server and there are no network connectivity issues, execute the wget command:

```
wget your_ISA_URL
```

It should return a message ending in "...connected."

5.4.5 Create InForm Users

On each InForm database with a study you plan to use Oracle DMW:

1. Log in to UMT using an account that can create new users, such as `system`.
2. Create a user with a **suggested username** `DMW_AUTH` to be used for authentication purposes by the web service connection. This user does not need any privileges. Its username and password will be used within Oracle DMW when creating web service locations.
3. Create a user with the **required name** `DMW_QUERY` to be used for sending and updating discrepancies in InForm.
 - Make `DMW_QUERY` a sponsor user
 - Assign the `DMW_QUERY` user to a query group.

It is not required to give the `DMW_QUERY` user access to sites or even be part of a rights group that can manipulate discrepancies. The password for this user is not used in Oracle DMW.

4. Activate both accounts.

Configure File Watcher Support

The File Watcher utility checks a file system location that you specify for data files whose name matches a pattern you specify and loads them into DMW for use in a particular study.

File Watcher can detect and load two types of files:

- SAS—including CPort or XPort formats, a single dataset, or a single dataset in a .zip file.
- Text—including .txt or .csv files that may be contained in a .zip file.

This section contains the following topics:

- [Section 6.1, "Set Up the Distributed Processing Server"](#)
- [Section 6.2, "Create Directories"](#)
- [Section 6.3, "Secure Files in Folders"](#)
- [Section 6.4, "Configure Server Time Zone Settings"](#)
- [Section 6.5, "Complete Your File Watcher Configuration"](#)

6.1 Set Up the Distributed Processing Server

The Oracle LSH Distributed Processing (DP) Server is required for File Watcher. Following instructions in the *Oracle Life Sciences Data Hub Installation Guide*, you have already set up the Distributed Processing (DP) Server, including:

- Installed the DP Server where it has access to Oracle SQL*Loader. It must also have access to the directories where you will put text data files to be loaded into Oracle DMW; see [Section 6.2, "Create Directories"](#).
- Installed the DP Server where it has access to the SAS processing engine and the directories where you will put SAS data files to be loaded into Oracle DMW.

If the same DP Server has the access required for both SAS and text files, you need only one DP Server.

- Started the DP Server with the File Watcher service enabled. The File Watcher service detects files to be loaded.
- Defined a Service Location in the Oracle LSH user interface for each computer where the DP Server is installed.

Note: The system populates the list of values in Oracle DMW's Watcher Listing for the Text and SAS DP Servers with the Service Locations you define.

- Defined a **Text for SQL*Loader** service on the Service Location that has access to Oracle SQL*Loader and the text files to be loaded. This service loads data from text files into the Oracle DMW database.
- Defined a **SAS** service on the Service Location that has access to SAS and the SAS files to be loaded. This service loads data from SAS files into the Oracle DMW database.

See the *Oracle Life Sciences Data Hub System Administrator's Guide* for more information on Service Locations and services.

6.2 Create Directories

You must create the directories that will serve as the Watched Folders that File Watcher monitors for data files. You can choose to archive loaded data files; in which case you must create directories in which to place the archived files.

6.2.1 Create Watched Folders

Create nested directories on one or more computers to which the DP Server has access:

- A root folder on each computer from which files are loaded into Oracle DMW.
- Subfolders
 - Six folders: one for each combination of the two file types (SAS and text) and the three lifecycle areas (Development, Quality Control, and Production). These folders can be on different computers, but there can be only six across the installation. Oracle recommends using a naming convention that includes the file type and lifecycle mode.
 - Alternatively, you can use just three folders, one for each lifecycle area and both file types.

A DP Server must have access to each of these folders; for example, you can set up an NSF mount of the file system to each computer where a DP Server is installed.

All studies in this Oracle DMW instance must use the same three or six root folders for their input data files. The system creates a study-specific subfolder in each root folder using the name you specify; instructions are in the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide*. The study-specific subfolders become the *watched locations* for the study.

You must enter the location of these folders as system profile values; see "Registering Folder Locations" in the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide*.

Note: If the study will use only SAS files or only Text files for data loading, you do not need to create subfolders for the other file type. If you do not plan to use the Quality Control/UAT lifecycle area, you do not need to create subfolders for that lifecycle area.

6.2.2 Create Archive Folders (Optional)

If you want to archive data files after their data has been loaded, create directories in which to archive them. They must have the same structure as the watched folders—either six or three folders. Oracle recommends creating them on the same UNIX file system as the watched folders.

6.3 Secure Files in Folders

On the computers where labs or other data sources will post data files, restrict access to data files to prevent investigators and others from seeing data they should not see, such as blinded data and data from other sources.

1. Set up a secure file transfer method:
 - Transfer files using a secure system process such as SFTP or a secure file synchronization service.
 - Isolate the file share from direct user access by using an indirect method of conveying files to the file share such as a dropbox.
2. Use UNIX/Linux file system security by creating a UNIX/Linux file system *group* and assigning user IDs that require access to the group:
 - The OS user ID that executes the DP Server that is running File Watcher. You set up this account during Oracle LSH installation.
 - OS user IDs that place files in the file share (using SFTP, for example).
 - The OS user ID that executes a program that places files in the file share (an automated file transfer or file synchronization program).
3. Restrict access to the file share. Only the file *owner* and *group* should have any permissions. The *other* permissions should be empty. If the user ID running the DP Server is the same as the user ID used to transfer all files, then only *owner* file permissions are needed. Assuming this is not the case, grant permissions to both the file *owner* and *group* as follows.

In `/etc/bashrc` or `/etc/profile`, set `umask`:

```
umask 007
```

This has the same effect as the following settings:

Table 6–1 Recommended Operating System Permissions

File Type	Description	Symbolic	Numeric
Directory	Owner and Group have Read, Write, and Execute; others have no permissions.	drwxrwx---	770
File	Owner and Group have Read and Write; others have no permissions.	-rw-rw----	660

6.4 Configure Server Time Zone Settings

For File Watcher to load the data files it detects in a timely manner, the date and time settings on your servers—database server, the middle tier server where the WebLogic Server is installed, and the middle tier server(s) where the Oracle LSH Distributed Processing (DP) Server is installed—must all have the same date and time setting.

If your servers are located in different time zones, do one of the following:

- [Section 6.4.1, "Set the TZ Environment Variable Manually"](#)

- [Section 6.4.2, "Set the TZ Environment Variable Automatically"](#)

To determine valid values for the TZ environment variable, see [Section 6.4.3, "Use the tzselect Utility"](#).

Finally, follow [Section 6.4.4, "Verify the Time Zone Setting Used by Java Virtual Machine \(JVM\)"](#).

6.4.1 Set the TZ Environment Variable Manually

You can set the TZ environment variable as follows:

```
TZ='<correct timezone>'
export TZ
```

For example, to set the time zone to the US Pacific time zone:

```
TZ='America/Los_Angeles'
export TZ
```

To determine a valid TZ value, see ["Use the tzselect Utility"](#) on page 6-4.

6.4.2 Set the TZ Environment Variable Automatically

You can set the TZ environment variable automatically by one of the following methods:

- Set the TZ variable in the startup configuration file (.profile or .cshrc file) for the operating system user that runs the DP Server process or the Web Logic Server process on the respective middle tier.
- Set the TZ variable in the shell script that starts the process:
 - For the DP Server, set the TZ variable in the *DP Server Home/cdr_apps_dpserver.sh* shell script, or in a shell script that invokes *cdr_apps_dpserver.sh*; see the *Oracle Life Sciences Data Hub Installation Guide* for information
 - For the Web Logic Server, set the TZ variable in the *setDomainEnv.sh* script from your Web Logic installation in a full path similar to *middleware_home/user_projects/domains/base_domain/bin/setDomainEnv.sh*.

To determine a valid TZ value, see ["Use the tzselect Utility"](#) on page 6-4.

6.4.3 Use the tzselect Utility

Many UNIX systems provide the *tzselect* utility to aid in selecting a Posix standard time zone format. You enter this command at the UNIX command prompt with no arguments and it prompts you to select a continent or ocean and then a time zone region. It returns the string to use in the TZ command.

See your operating system documentation for more information about this command in your specific environment.

6.4.4 Verify the Time Zone Setting Used by Java Virtual Machine (JVM)

On the middle tier servers DMW is implemented using Java, and you must confirm that the Java Virtual Machine (JVM) is using the correct time zone

Note that a correct return from the UNIX *date* command does NOT mean that the Java Virtual Machine (JVM) is using the correct time zone. The JVM looks for the time zone

settings as follows. This can vary in different implementations of UNIX/Linux, so check your operating system documentation for further information:

1. JVM uses the environment variable TZ if it is set.
2. If TZ is not set, then JVM looks for the file `/etc/sysconfig/clock` and finds the ZONE entry.
3. If neither TZ nor ZONE is set, JVM compares the contents of `/etc/localtime` to the files in `/usr/share/zoneinfo` looking for a match. The matching path and filename under `/usr/share/zoneinfo` provides the time zone.

Check the time zone that the DP Server and Web Logic Server are actually using by reading the time zone information displayed at the beginning of most lines in their log files:

- **DP Server:** The log file is located in the directory: *DP Server Home*/log.
- **Web Logic Server:** The log file is located in a full path similar to:
`/app/product/middleware/user_projects/domains/base_
domain/servers/DMWServer/logs`.

6.5 Complete Your File Watcher Configuration

In addition, for each data source in each study a File-type input clinical data model must be defined; see the clinical data model chapter of the *Oracle Health Sciences Data Management Workbench User's Guide*.

On the Administration page of Oracle DMW you can monitor study File Watchers and start and stop them.

Installing Oracle Thesaurus Management System (Optional)

Oracle Thesaurus Management System (TMS) can be integrated with Oracle Health Sciences Data Management Workbench for use in coding clinical patient data to standard dictionary terms.

7.1 Install Oracle Thesaurus Management System

Follow instructions in the most recent version of the Release 5.0.1 *Oracle Thesaurus Management System Installation Guide*. The installation guide is available at http://docs.oracle.com/cd/E37006_01/index.htm.

7.2 Edit setDomainEnv.sh

As directed in [Section 3.8, "Edit setDomainEnv.sh"](#) add the parameter `-DhandleDiscEvent` set to `True` on one and only one application server.

This is required to support multiple middle tiers pointing to the same database. Only the server with this parameter set to `True` will be able to send data from TMS to InForm.

7.3 Run Script dmetmsseeddata.sql

Run `dmetmsseeddata.sql` to populate TMS-related seed data required for Oracle DMW.

1. Make sure that no LSH session is up and running.
2. Log in to SQL*Plus as `tms`. (You created a password for this account when you ran the Installer for the TMS database.)
3. Go to `$CDR_TOP/patch/115/sql`.
4. Run `dmetmsseeddata.sql`.

Internet Explorer Settings

Oracle Health Sciences Data Management Workbench (Oracle DMW) users who are using Internet Explorer 8 or 9 must not use IE's Compatibility View, which causes problems in Oracle DMW user interface display.

1. In Internet Explorer 8 or 9, navigate to **Tools**, then **Compatibility View Settings**.
2. Check that there are no websites added to Compatibility View and the following check boxes **are not selected**:
 - Include updated website lists from Microsoft
 - Display intranet sites in Compatibility View
 - Display all websites in Compatibility View
3. Click **Close**.

Upgrading to Release 2.4

To upgrade Oracle Health Sciences Data Management Workbench (Oracle DMW) from Release 2.3.1 to Release 2.4, follow instructions in this chapter.

9.1 Upgrade Oracle Life Sciences Data Hub

Follow instructions in the *Oracle Life Sciences Data Hub Installation Guide* chapter on upgrading to Release 2.4. The process includes upgrading Oracle Database.

9.2 Install the Latest Version of JDK

Follow instructions in [Section 3.1, "Install Oracle Java Development Kit"](#) to install JDK 1.7.0_51 or higher.

9.3 Apply WLS Patch 10.3.6.0.8

Install Oracle WebLogic Server Patch Set Update (PSU) 10.3.6.0.8, which is patch **18040640**, following instructions in the readme file. See ["Finding Patches on My Oracle Support"](#) on page viii.

9.4 Enable WLS Policy Manager

9.4.1 Create the Metadata Services Repository Schema in the Database

See [Section 3.4, "Create the Metadata Services Repository Schema in the Database."](#)

9.4.2 Extend Your WebLogic Server Domain

Extend your WLS domain (suggested name `DMWDomain`) to add these settings. Instruction for extending domains are included in *Creating Domains Using the Configuration Wizard* at http://docs.oracle.com/cd/E23943_01/web.1111/e14140.pdf.

- Oracle WSM Policy Manager - 11.1.1.0 [oracle_common]
- For the JDBC Component Schema, specify the Metadata Services Schema you created in ["Create the Metadata Services Repository Schema in the Database"](#) on page 3-3.

- Specify that the JDBC services mds-owsm and wsm-pm are deployed to the AdminServer or the managed server where you want the WSM service to be running.

9.4.3 Support SSL Wildcards and SSL Web Services

See [Section 3.5.6, "Support SSL Wildcards and SSL Web Services."](#)

9.5 Edit setDomainEnv.sh

Even if you already edited setDomainEnv.sh for a previous release, additional changes are required for Release 2.4. Follow instructions in [Section 3.8, "Edit setDomainEnv.sh."](#)

9.6 Restart the WebLogic Server

See [Section 3.16, "Restart the WebLogic Server."](#)

9.7 Deploy Oracle DMW to the WebLogic Server

You must deploy the new version of Oracle DMW to the WebLogic Server. Follow instructions in [Section 4, "Deploy Oracle DMW on the WebLogic Server,"](#) including instructions for applying the latest patch set and patches.

9.8 Update InForm Setup

The InForm setup files have been updated for Release 2.4. To apply the changes:

1. Follow instructions in [Section 5.3.2, "Copy Scripts"](#).
2. Follow instructions in [Section 5.3.3, "Run the Driver Script"](#).

When prompted for an Admin account, enter an existing account. Confirm that you want to upgrade.

When prompted for a DMW Read-Only account, enter an existing account. Confirm that you want to upgrade.

9.9 Upgrade File Watcher to Support Archiving Files (Optional)

File Watcher now supports automatically archiving loaded data files. To archive loaded files, you must set up the folders in which to store them the same way you do the folders where you put files to be loaded: create a specified directory structure and register the path for each as Oracle LSH profile values.

To archive files in an existing, pre-Release 2.4 study, edit the study File Watcher and click the **Regenerate** button to enable archiving for the study.

See the *Oracle Health Sciences Data Management Workbench User's Guide* for more information.

9.10 Install Oracle Thesaurus Management System (Optional)

If you plan to use Oracle Thesaurus Management System (TMS) as a coding tool integrated with Oracle DMW, follow instructions in [Chapter 7, "Installing Oracle Thesaurus Management System \(Optional\)."](#)

After you have finished all the installation tasks outlined in this book, you must do the following tasks before you can begin to use the Oracle Health Sciences Data Management Workbench (Oracle DMW). Most tasks are performed in Oracle Life Sciences Data Hub (Oracle LSH).

- [Section 10.1, "Set Up System Security"](#)
- [Section 10.2, "Set Up User Security"](#)
- [Section 10.3, "Set Up Oracle LSH Services"](#)
- [Section 10.4, "Assign User Group to InForm Family Adapter"](#)
- [Section 10.5, "Set Required Profile and Lookup Settings"](#)
- [Section 10.6, "Create Study and Library Categories in Oracle LSH"](#)
- [Section 10.7, "Set Up File Watcher"](#)
- [Section 10.8, "Integrate Other Applications \(Optional\)"](#)

10.1 Set Up System Security

For information on securing your system, see *Oracle Health Sciences Data Management Workbench and Oracle Life Sciences Data Hub Security Guide* and the *Secure Configuration Guide for Oracle E-Business Suite Release 12* (My Oracle Support article 403537.1; see ["Finding Information on My Oracle Support"](#) on page viii.)

10.2 Set Up User Security

Oracle DMW uses the Oracle LSH security system, which uses the user security features of the Oracle E-Business Suite. Start by reading the section on setting up security in the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide*.

10.3 Set Up Oracle LSH Services

Define Oracle LSH service locations and service instances to support Oracle DMW features as follows, following instructions in the chapter "Setting Up Services" in the *Oracle Life Sciences Data Hub System Administrator's Guide*.

10.3.1 Distributed Processing Services for File Watcher

You need the following service types to support Oracle DMW File Watcher:

- **Text for SQL Loader** if you are loading text files from labs or elsewhere.
- **SAS** if you are loading SAS files from labs or elsewhere.

10.3.2 PLSQL Service Instances for InForm Metadata and Data Loading and PL/SQL Jobs

InForm metadata and data loading use the PLSQL service. Oracle LSH installation automatically creates a service location with the database SID as its name and creates the PLSQL service under it in the Oracle LSH user interface with three service instances, which allows concurrent processing of three PL/SQL jobs.

In Oracle DMW these jobs include:

- loading metadata and data for an InForm study
- executing a PL/SQL custom program for a transformation
- executing a generated transformation
- executing a validation check batch

Increase the number of PLSQL service instances to support the number of PL/SQL jobs you are likely to run concurrently. Oracle suggests a setting of 100.

10.4 Assign User Group to InForm Family Adapter

Assign appropriate user group(s) to the InForm Adapter family, following instructions in the *Oracle Life Sciences Data Hub System Administrator's Guide* chapter on Adapters, section "Setting Up Security for Adapters."

10.5 Set Required Profile and Lookup Settings

Oracle DMW uses Oracle Applications profiles and lookups to determine some aspects of system behavior. See the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide* for information.

10.6 Create Study and Library Categories in Oracle LSH

After finishing the installation, create subdomains within the shipped DMW domain to organize your company's studies and libraries. See the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide* for information.

10.7 Set Up File Watcher

See the Administration chapter of the *Oracle Health Sciences Data Management Workbench User's Guide*.

10.8 Integrate Other Applications (Optional)

If you plan to use Oracle or third-party applications with Oracle DMW, follow instructions in the *Oracle Life Sciences Data Hub Installation Guide* and *Oracle Life Sciences Data Hub System Administrator's Guide* to integrate them with Oracle LSH, including defining Distributed Processing Services for them. Applications must be purchased and licensed separately.

Applications you may want to use include:

- Informatica PowerCenter or SAS for custom transformation programs
- JReview or Spotfire for data visualizations
- Oracle Business Intelligence Enterprise Edition (OBIEE) for data visualizations

11

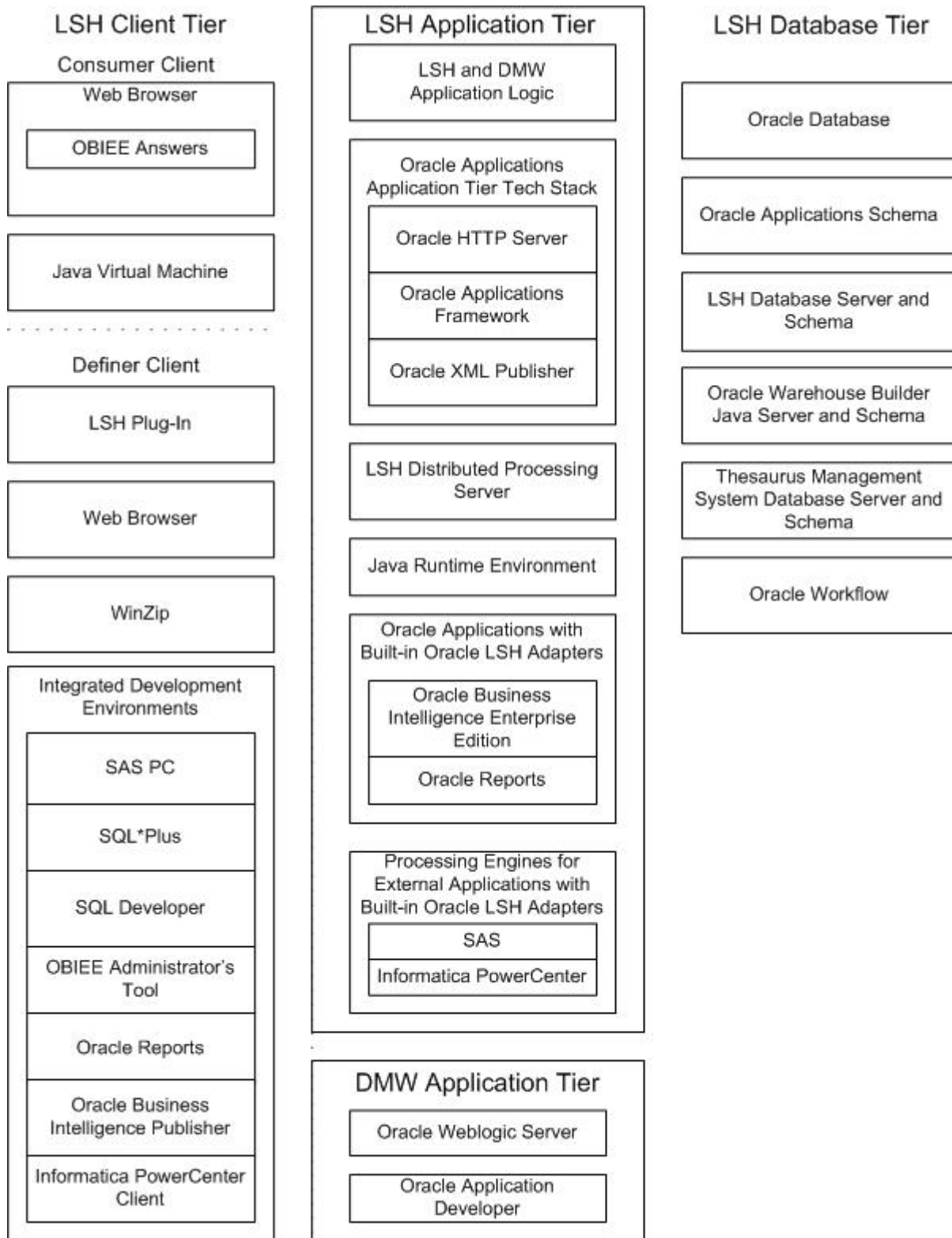
Architecture

This section contains the following topics:

- [Section 11.1, "Client Tier"](#)
- [Section 11.2, "Application Tier"](#)
- [Section 11.3, "Database Tier"](#)

[Figure 11-1](#) shows the logical Oracle Health Sciences Data Management Workbench (Oracle DMW) architecture that is described in the following sections.

Figure 11-1 Oracle Health Sciences Data Management Workbench Architecture



11.1 Client Tier

There are two ways to set up a client, depending on the type of user:

Most Users Oracle DMW who do not write custom programs for transformations and validation checks, require the following on their personal computers:

- A Web browser
- Java Virtual Machine (JVM)

Administrators require JVM to use any of the Oracle Forms screens related to security, including setting up user accounts, and to run the post-installation jobs.

Programmers Users who write custom programs in an integrated development environment from Oracle LSH require additional software:

- One or more integrated development environments such as SAS PC, SQL*Plus, SQL Developer, or Informatica PowerCenter client.
- Oracle LSH plug-in for launching Integrated Development Environments (IDEs)
- WinZip
- Web browser

11.2 Application Tier

Oracle DMW has two distinct application tiers:

11.2.1 Oracle Life Sciences Data Hub Application Tier

In addition to standard Oracle Applications components, Oracle LSH's application tier includes the following:

Oracle LSH Application Server The Oracle LSH Application Server renders the user interface using the Oracle Applications Framework and handles the communication between the user interface and the database using the Java Runtime Environment.

Oracle LSH Distributed Processing (DP) Server The Oracle LSH DP Server handles the communication between Oracle LSH and the external processing systems required to support the IDEs.

Processing Systems XML Publisher is required for internal Oracle LSH processing. The other systems are required only if you are developing Oracle LSH Programs in those technologies:

- **SAS** executes user-developed SAS Programs.
- **Informatica PowerCenter** executes user-developed Informatica programs.

11.2.2 Oracle Health Sciences Data Management Workbench Application Tier

The Oracle DMW-specific application tier requires Oracle WebLogic Server and Oracle Applications Developer.

11.3 Database Tier

Oracle DMW uses the Oracle LSH database tier , which includes:

Oracle Enterprise Edition RDBMS All of Oracle LSH's database tier components use the Oracle Enterprise Edition database server and database.

Oracle Applications Schema The Oracle Applications Schema is the schema installed as part of the Oracle Applications installation. It contains the Oracle LSH schema.

Oracle LSH Database Server and Schema These include Oracle LSH's business logic in PL/SQL packages, internal Oracle LSH tables and views, security, adapters, and APIs; as well as Oracle LSH user-developed metadata tables and packages.

Oracle Warehouse Builder (OWB) Oracle LSH uses the OWB Java Server and schema for running and tracking internal and external jobs. Oracle LSH uses the following custom OWB operators:

- The OWB PL/SQL operator communicates with SQL*Plus, which runs many of Oracle LSH's internal processes as well as user-developed PL/SQL Programs.
- The OWB Workflow operator communicates with Oracle Workflow.
- The OWB Distributed Processing (DP) Server operator communicates with external processing engines to run jobs in external technologies.

Oracle Thesaurus Management System (TMS) Oracle LSH's classification system is based on TMS.