

Oracle® Health Sciences Data Management Workbench Installation Guide



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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Preface

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

- [Documentation accessibility](#)
- [Related resources](#)
- [Access to Oracle Support](#)

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>.

Related resources

All documentation and other supporting materials are available on the [Oracle Help Center](#).

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.

1

System Requirements and Technology Stack

This section includes the following topics:

- [System Requirements](#)
- [Technology Stack](#)

System Requirements

This section includes system requirements for your Oracle Health Sciences Data Management Workbench (Oracle DMW) 3.3 installation. Oracle DMW is built on Oracle Life Sciences Data Hub (Oracle LSH). It contains the following topics:

- [Operating Systems](#)

Operating Systems

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

For details on the database and middle tier, see these topics:

- [Database Tier](#)
- [Middle Tier](#)

Database Tier

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

 **Note:**

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

- Linux x86-64 (64-Bit):
 - Oracle Enterprise Linux 7.4 or later, and 8.x
 - Red Hat Enterprise Linux 7.4 or later, and 8.x

Middle Tier

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

 **Note:**

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

Oracle LSH Middle Tier

- Linux x86-64 (64-Bit):
 - Oracle Enterprise Linux 7 or 8
 - Red Hat Enterprise AS/ES 6.x, 7.x, or 8.x

Oracle DMW Middle Tier

- Linux x86-64 (64-Bit):
 - Oracle Enterprise Linux 7 or 8
 - Red Hat Enterprise Linux 6.x, 7.x, or 8.x

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 Oracle LSH technology stack, Oracle DMW has the following requirements:

- Oracle LSH 3.3 and its technology stack
- Oracle WebLogic Server 12.2.1.4
- Java Development Kit (JDK) 1.8.0_281
- Oracle Application Developer 12.2.1.4
- One of the following:
 - Oracle InForm Adapter 6.3.x with Oracle InForm 6.3.x.
 - Oracle InForm 7.x

 **Note:**

There is no separate Oracle InForm Adapter for Oracle InForm 7.0 and above.

For details on browsers, see the following topic:

- [Supported Browsers](#)

Supported Browsers

Oracle DMW supports the following browsers on Microsoft Windows operating systems:

- Google Chrome Version 109.0.5414.120 (Official Build) (64-bit)
- Mozilla Firefox Quantum Extended Support Release 102.7.0esr (64-bit)
- Mozilla Firefox Version 109.0.1 (64-bit)
- Microsoft Edge Chromium Version 111.0.5500.0 (Developer Build) (64-bit)



Note:

For the best performance, use a minimum screen resolution of 1024 x 768.

2

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 *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 Oracle Help Center website to see if a revised version is available: <https://docs.oracle.com>.

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:

If you only install Oracle LSH to support Oracle DMW, you do not need to follow instructions listed in the "What's Next" chapter of the *Oracle Life Sciences Data Hub Installation Guide*. See the [What's Next](#) section in this document instead.

3

Deploy Oracle DMW on the WebLogic Server

This section contains the following topics:

- [Download the Oracle DMW Folder](#)
- [Deploy Oracle DMW with Default Support for HTTPS](#)
- [Deploy Oracle DMW and Disable HTTPS Support](#)
- [Check for and Install Any Oracle DMW 3.3.x Patches](#)
- [Run the Health Check Scripts](#)

Download the Oracle DMW Folder

Follow these steps to download the Oracle DMW folder from Oracle Software Delivery Cloud:

1. Go to Oracle Software Delivery Cloud, <http://edelivery.oracle.com>, click **Sign In**, and log in with your user ID.
2. Select **Download Package** from the **All Categories** drop-down list (or leave All Categories selected). Enter **Oracle Health Sciences Data Management Workbench** in the Search field and click **Search**.
3. Select **DLP: Oracle Health Sciences Data Management Workbench 3.3.0.0.0** and click **Add to Cart**.
4. Click **Checkout**. You see a list of the selected software:
 - Oracle Health Sciences Data Management Workbench 3.3.0.0.0 (Oracle Standard Terms and Conditions)
 - Oracle Life Sciences Data Hub 3.3.0.0.0
 - Oracle Health Sciences Data Management Workbench 3.3.0.0.0
5. From the **Platform** drop-down list, select the appropriate operating system.
6. Click **Continue**.
7. Review the Terms and Restrictions and select **I accept the terms in the license agreement** to continue. (Click **Print** from the top-right corner of the screen to print the agreement.) Click **Continue**. You see a list of zipped files for the Oracle Life Sciences Data Hub <your operating system> 3.3 release and Oracle Health Sciences Data Management Workbench <your operating system> 3.3 release:
 - Oracle Life Sciences Data Hub 3.3.0
 - Oracle Health Sciences Data Management Workbench 3.3.0
8. Leave the list of zipped files selected to download the package of Oracle Health Sciences Data Management Workbench 3.3.0.0.0 files or only select the files you need.
9. Click **Download**. Then browse to the location where you want to save the Oracle executable.

10. Double-click the Oracle executable. Leave the default destination or click **Browse** to select another one. Click **Next**. Oracle downloads the zipped files.
11. Move the zipped files to a staging area and unzip them. The full release contains a software folder for Oracle DMW (**p34103361_33000_MSWIN-x86-64.zip**) and Oracle LSH (**p34098406_R12_GENERIC.zip**).
12. Unzip the Oracle DMW 3.3 ZIP file (**p34103361_33000_MSWIN-x86-64.zip**) to a temporary directory on the WebLogic Server, creating the software directory containing the dmwapp.ear and plan.xml files.

 **Note:**

For details on installing Oracle LSH and Oracle TMS, see the *Oracle Life Sciences Data Hub Installation Guide*.

13. Deploy the patch, which contains the entire application. Depending if you use HTTPS or HTTP, following one of the following procedures:
 - To use HTTPS, follow the steps in [Deploy Oracle DMW with Default Support for HTTPS](#). By default, Oracle DMW supports and requires HTTPS.
 - To use HTTP, follow the steps in [Deploy Oracle DMW and Disable HTTPS Support](#)

Deploy Oracle DMW with Default Support for HTTPS

Deploy the Oracle DMW application tier on the WebLogic Server.

1. After you perform the steps listed in [Deploy Oracle DMW on the WebLogic Server](#), 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`

 **Note:**

If you have an earlier version of Oracle DMW deployed, stop it and delete it before deploying the new version.

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 checkbox and:

- a. Stop it by selecting Force Stop Now from the Stop drop-down list.
 - b. Delete it by clicking **Delete**. It no longer appears in the list.
2. Click **Install**. The Install Application Assistant opens.
 3. In the paragraph beginning with **Locate deployment to install and prepare for deployment**, click **upload your file(s)**.
 4. In the Deployment Archive line, click **Browse** and select dmwapp.ear from your local computer and click **Open**. The system returns to Install Application Assistant.

5. In the Install Application Assistant, click **Next**. This uploads dmwapp.ear to a server directory. This may take some time. When the process completes, the system displays the path to the server directory.
6. In Install Application Assistant, click **Next**.
7. Select **Install this deployment as an application** and click **Next**. The system displays a list of servers.
8. Select the managed server where you want to install the application (DMWServer) and click **Next**. Optional settings appear.
9. Under General, in the Name field, enter `dmwapp` and click **Finish**. The system displays a summary of your selections.
10. 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.
11. Click **Deployments** under **Domain Structure** to verify that dmwapp is included in the Deployments list and its state is Active.
12. 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`

Deploy Oracle DMW and Disable HTTPS Support

By default, Oracle DMW uses HTTPS. If you intend to use HTTP, you can deploy Oracle DMW 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 12c (12.2.1.4)* at <https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/depagd/index.html>.

1. After you perform the steps listed in [Deploy Oracle DMW on the WebLogic Server](#), log in to the WebLogic Server.
2. Open the software directory.
3. 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.
4. Open a shell window and set up the environment:

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


For example:

```
source app/oracle/middleware/Oracle_Home/wlserver/server/bin/setWLSEnv.sh
```
5. Change directory to the tmp directory.
6. If you have an earlier version of Oracle DMW deployed, stop it and delete it before deploying the new version by entering the following commands.

 **Note:**

If you want to store the username and password in a WebLogic configuration file, omit the username and password parameters in the following commands. For more information, see the WebLogic Scripting Tool Command-Line Reference in the *Oracle Fusion Middleware Deploying Applications to Oracle WebLogic Server 12c (12.2.1.4)* at <https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/use-weblogic-scripting-tool-tasks.html>.

```
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
```

7. Deploy the new Oracle DMW release by entering the following command. If you stored 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
```

8. Exit the shell by entering:

```
exit
```

9. 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
```

Check for and Install Any Oracle DMW 3.3.x Patches

Oracle strongly advises that you immediately install any patches that have been released (if available) since the full release.

For example, if you have installed 3.3 and assuming that there are two 3.3 patches available (3.3.1 and 3.3.2), first install patch 3.3.1 and then install patch 3.3.2 by following instructions in their respective 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.

Run the Health Check Scripts

Run the Health Check scripts for Oracle LSH and Oracle DMW as described in My Oracle Support Article 2733714.1 (<https://support.oracle.com>).

4

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:

- [Set Up the Distributed Processing Server](#)
- [Create Directories](#)
- [Secure Files in Folders](#)
- [Configure Server Time Zone Settings](#)
- [Complete Your File Watcher Configuration](#)

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 the Oracle SQL*Loader version 19.11 or above. It must also have access to the directories where you will put text data files to be loaded into Oracle DMW; see [Create Directories](#) for details.
- 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.

Create Directories

You must create the directories to serve as the Watched Folders that File Watcher monitors for data files. You can choose to archive loaded data files. If you want to archive loaded data files, you must create directories where you want the archived files placed.

This section contains topics to do the following:

- [Create Watched Folders](#)
- [Create Archive Folders \(Optional\)](#)

Create Watched Folders

Create nested directories on one or more computers that the DP Server can access. The folders are:

- A root folder on each computer where files load 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. (See the *Oracle Health Sciences Data Management Workbench Administration Guide* for details.) 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 Administration 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.

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.

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 4-1 Recommended Operating System Permissions

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

Table 4-1 (Cont.) Recommended Operating System Permissions

File Type	Description	Symbolic	Numeric
File	Owner and Group have Read and Write; others have no permissions.	-rw-rw----	660

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, set the time zone manually or automatically. Then verify the setting used by the Java Virtual Machine (JVM). See the following topics for details:

- [Set the TZ Environment Variable Manually](#)
- [Set the TZ Environment Variable Automatically](#)
- [Use the tzselect Utility](#)
- [Verify the Time Zone Setting Used by Java Virtual Machine \(JVM\)](#)

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](#).

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 WebLogic 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 WebLogic Server, set the TZ variable in the setDomainEnv.sh script from your WebLogic 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](#).

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.

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

On the middle tier servers Oracle 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 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 WebLogic 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.
- **WebLogic Server:** The log file is located in a full path similar to: `/app/product/middleware/user_projects/domains/base_domain/servers/DMWServer/logs`.

Complete Your File Watcher Configuration

Complete your File Watcher configuration for the instance and for studies in the Administration page of Oracle DMW. For each data source in each study, you must define a File-type input clinical data model.

On the Administration page of Oracle DMW, you can monitor study File Watchers and start and stop them. For details on the File Watcher configuration, see the *Oracle Health Sciences Data Management Workbench Administration Guide* on Oracle Help Center.

5

Install Oracle Thesaurus Management System (Optional)

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

- [Install Oracle Thesaurus Management System](#)
- [Edit setDomainEnv.sh](#)
- [Edit setDomainEnv.sh](#)
- [Run Script dmetmsseeddata.sql](#)

Install Oracle Thesaurus Management System

Oracle DMW supports Oracle Thesaurus Management System (Oracle TMS) 5.4. To install TMS 5.4, see *Oracle Thesaurus Management System Installation Guide* at <https://docs.oracle.com/en/industries/health-sciences/thesaurus-system/5.4/index.html>.

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. Stop the Administration Server.
2. Log in to the system, change to the domain\bin directory, and open setDomainEnv.sh in an editing tool.
3. 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
```

4. 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.

5. 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 8; 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
```

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

 **Note:**

Earlier Oracle DMW releases required different arguments: XX:PermSize instead of XX:MetaspaceSize and XX:MaxPermSize instead of XX:MaxMetaspaceSize. JDK 8 ignores the PermSize arguments and requires the MetaspaceSize arguments.

7. 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
```

8. Set PRODUCTION_MODE=true to run in Server mode.
9. 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/8/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
```

10. To be ready to integrate DMW with an electronic data capture system other than InForm, add parameter -DUseSunHttpHandler to JAVA_PROPERTIES and set it to True. For example:

```
JAVA_PROPERTIES="-Dplatform.home=${WL_HOME} -Dwls.home=${WLS_HOME} -
Dweblogic.home=${WLS_HOME} -DUseSunHttpHandler=true"
```

11. 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
```

12. 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 [#unique_47](#).

```

EXTRA_JAVA_PROPERTIES="${EXTRA_JAVA_PROPERTIES}
-Djbo.ampool.doampooling=true
-Djbo.ampool.maxavailablesize=expected_maximum_number_of_concurrent_users

-Djbo.ampool.initpoolsize=10
-Djbo.ampool.minavailablesize=10
-Djbo.recyclethreshold=same_as_maximum_number_of_concurrent_users
-Djbo.ampool.timetolive=3600000
-Djbo.ampool.maxinactiveage=1200000"
export EXTRA_JAVA_PROPERTIES

```

Edit setDomainEnv.sh

As directed in [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.

1. Stop the Administration Server.
2. Log in to the system, change to the `domain\bin` directory, and open `setDomainEnv.sh` in an editing tool.
3. On only one application server, add a parameter named `-DhandleDiscEvent` to `JAVA_OPTIONS` and set its value to `TRUE`.

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 (Oracle TMS) to InForm.

To add the parameter:

- a. Stop the Administration Server.
- b. Log in to the system, change to the `domain\bin` directory, and open `setDomainEnv.sh` in an editing tool.
- c. Search for the following text:


```
JAVA_OPTIONS="${JAVA_OPTIONS}"
```
- d. Add the parameter and its 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} -DhandleDiscEvent=TRUE"

export JAVA_OPTIONS

# SET THE CLASSPATH

```


Run Script dmetmsseeddata.sql

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

1. Make sure that no Oracle 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 Oracle TMS database.)
3. Go to \$CDR_TOP/patch/115/sql.
4. Run dmetmsseeddata.sql.

6

Upgrade to Release 3.3

For upgrading to Oracle DMW release 3.3, the following upgrade paths are supported:

- If you are upgrading from a release prior to Oracle LSH release 3.1.1:
 1. Upgrade to Oracle DMW release 3.1.1. Follow instructions in [Oracle Life Sciences Data Hub and Oracle Health Sciences Data Management Workbench Installation Instructions](#).
 2. Upgrade to Oracle DMW release 3.3. Follow instructions in the following topics:
 - [Upgrade Oracle Life Sciences Data Hub](#)
 - [Deploy Oracle DMW to the WebLogic Server](#)
 - [Upgrade File Watcher to Support Archiving Files \(Optional\)](#)
 - [Install Oracle Thesaurus Management System \(Optional\)](#)
- If you are upgrading from Oracle DMW release 3.2, follow instructions in the following topics:
 - [Upgrade Oracle Life Sciences Data Hub](#)
 - [Deploy Oracle DMW to the WebLogic Server](#)
 - [Run the Populate Custom Listings Script](#)
 - [Upgrade File Watcher to Support Archiving Files \(Optional\)](#)
 - [Install Oracle Thesaurus Management System \(Optional\)](#)

Upgrade Oracle Life Sciences Data Hub

Follow instructions in the *Oracle Life Sciences Data Hub Installation Guide* chapter on upgrading to Release 3.3. The process includes upgrading Oracle Database.

Deploy Oracle DMW to the WebLogic Server

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

Run the Populate Custom Listings Script

Run the dmepopqbenablestat.sql script to ensure that Oracle DMW populates the new custom listing status tracking table with the status for the custom listings you created in an earlier versions of Oracle DMW. Plan a maintenance window to run the script.

**Note:**

Run this script only if you are upgrading to Oracle DMW 3.3.

Follow these steps to run the script on a computer with an Oracle client that can connect to the Oracle DMW database server using SQLPlus:

1. Download the file from \$CDR_TOP/patch/115/sql/dmepopqbenablestat.sql.
2. Log in to SQLPlus (not SQLDeveloper) as the APPS database user.
3. Invoke the script from your download directory. For example:

```
<download_directory>/dmepopqbenablestat.sql
```

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 3.2 study, edit the study File Watcher and click **Regenerate** to enable archiving for the study.

For more information, see *Oracle Health Sciences Data Management Workbench Administration Guide*.

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 [Install Oracle Thesaurus Management System \(Optional\)](#).

7

What's Next

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

You perform most of the following tasks in Oracle Life Sciences Data Hub (Oracle LSH):

- [Set Up System Security](#)
- [Set Up User Security](#)
- [Set Up Oracle LSH Services](#)
- [Assign User Group to InForm Family Adapter](#)
- [Set Up OAuth for InForm and Oracle DMW Integration](#)
- [Enable rng-tools to Avoid Performance Issues While Sending Discrepancies](#)
- [Set Required Profile and Lookup Settings](#)
- [Create Study and Library Categories in Oracle LSH](#)
- [Set Up File Watcher](#)
- [Set Up Logging](#)
- [Integrate Other Applications \(Optional\)](#)

Set Up System Security

For information on securing your system, see *Oracle Health Sciences Life Sciences Warehouse Security Guide* and the *Secure Configuration Guide for Oracle E-Business Suite Release 12* ([My Oracle Support](#) document 403537.1.)

Set Up User Security

Oracle DMW uses the Oracle LSH security system, which uses the user security features of the Oracle E-Business Suite. See the *Oracle Health Sciences Data Management Workbench Administration Guide*.

Set Up Oracle LSH Services

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

This section contains details to do the following:

- [Distributed Processing Services for File Watcher](#)
- [PLSQL Service Instances](#)

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.

PLSQL Service Instances

InForm and Clinical One 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 InForm and Clinical One studies
- 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 recommends a setting of 100.

Assign User Group to InForm Family Adapter

Assign appropriate user group(s) to the InForm Adapter family as described in the *Oracle Life Sciences Data Hub System Administrator's Guide*.

Set Up OAuth for InForm and Oracle DMW Integration

For information on how to set up the OAuth for InForm and Oracle DMW integration, see *Oracle Health Sciences Data Management Workbench and InForm OAuth Set Up Prerequisites* (Document ID 2924826.1) on My Oracle Support.



Note:

OAuth setup is applicable only for integration of Oracle DMW with InForm 7.0.1 and higher versions.

Enable rng-tools to Avoid Performance Issues While Sending Discrepancies

The rngd service uses multiple entropy sources to constantly refresh the system entropy pool. To avoid any system performance issues while sending discrepancies, install the rng-tools and enable rngd.

1. If rng-tools is not installed on the system, install it by executing the following command using Linux:

```
$ yum install rng-tools
```
2. To check if the rng-tools is enabled, execute the following command:

```
$ systemctl status rngd
```
3. If the rng-tools is disabled, execute the following command to enable it:

```
$ systemctl enable --now rngd
```

Set Required Profile and Lookup Settings

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

Create Study and Library Categories in Oracle LSH

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

Set Up File Watcher

For details on setting up File Watcher, see the *Oracle Health Sciences Data Management Workbench Administration Guide*.

Set Up Logging

After you deploy the Oracle DMW application (dmwapp) as described in [Deploy Oracle DMW on the WebLogic Server](#), follow these steps to enable logging for dmwapp at the INFO level.

Note:

Check that you perform these steps whenever you need to restart the managed server. The system you use depends on where you deployed Oracle DMW (for example, WebLogic Server or Oracle Enterprise Manager). This procedure uses Oracle Enterprise Manager (OEM).

1. Log in to the managed server where you deployed Oracle DMW (for example, OEM).
2. From the Server section, select the managed server where you deployed Oracle DMW.
3. From the **WebLogic Server** menu, select **Logs > Log Configuration**.
4. Expand Root Logger, locate **dmwapp**, and select **Notification: <#> (INFO)** from the Oracle Diagnostic Logging Level (Java Level) column.
5. Click **Apply**.
If you deployed Oracle DMW to more managed servers, repeat steps 2 through 4 for each server.

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.

You can use Oracle Business Intelligence Enterprise Edition (OBIEE) for data visualizations

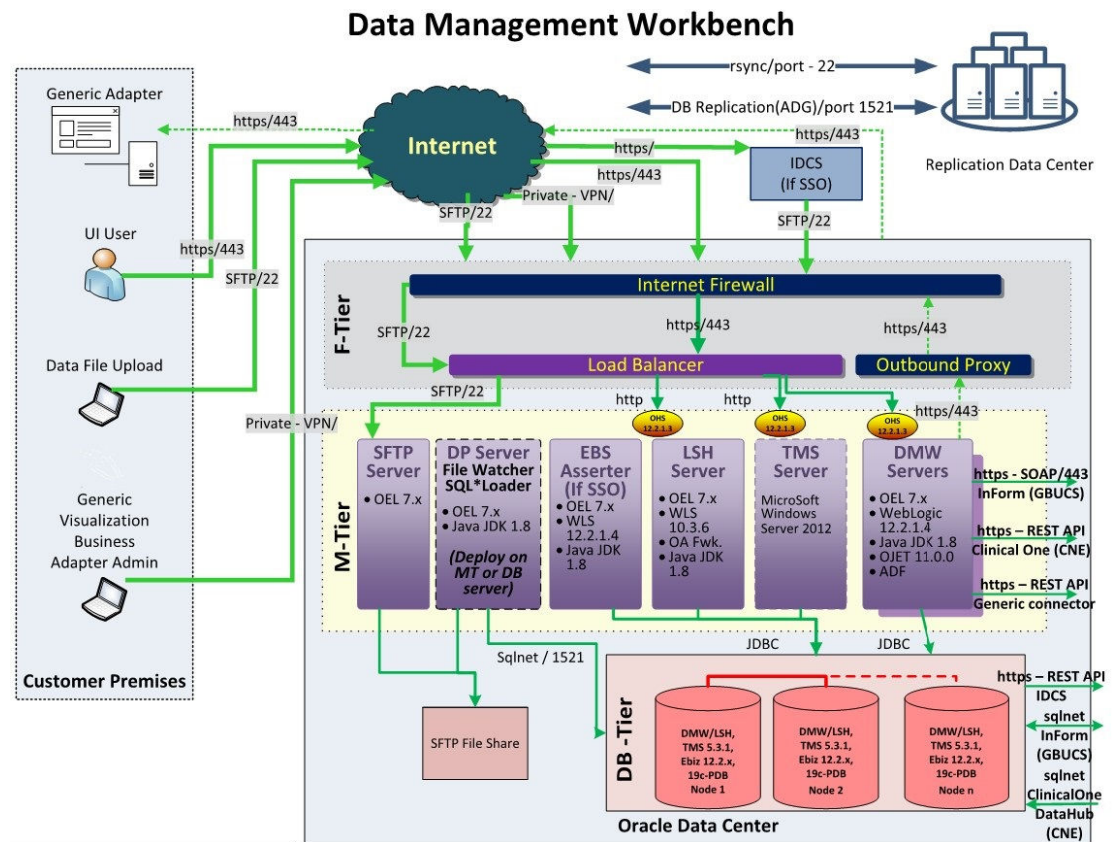
If you plan to integrate with Oracle Identity Cloud Services (IDCS) for the single sign-on solution, follow instructions in *Oracle Life Sciences Data Hub and Oracle Health Sciences Data Management Workbench SSO Configuration with IDCS* (Doc ID 2862928.1) on My Oracle Support.

8

Architecture

The following figure shows the architecture described in this section.

Figure 8-1 Oracle Health Sciences Data Management Workbench Architecture



This section contains the following topics:

- [Client Tier](#)
- [Application Tier](#)
- [Database Tier](#)

Client Tier

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

Most Users: Users 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 PC SAS, SQL*Plus, or SQL Developer
- Oracle LSH plug-in for launching Integrated Development Environments (IDEs)
- WinZip
- Web browser

Application Tier

Oracle DMW has two distinct application tiers:

- [Oracle LSH Application Tier](#)
- [Oracle DMW Application Tier](#)

Oracle LSH Application Tier

In addition to standard Oracle Applications components, the Oracle LSH 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.

Oracle DMW Application Tier

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

Database Tier

Oracle DMW uses the Oracle LSH database tier that 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 Thesaurus Management System (Oracle TMS) : Oracle LSH classification system is based on Oracle TMS.