

Oracle Thesaurus Management System

Installation Guide



Release 5.4
F53032-01



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Preface

This preface contains the following sections:

- [Documentation accessibility](#)
- [Diversity and Inclusion](#)
- [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>.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

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 Support Cloud.

Contact our Oracle Customer Support Services team by logging requests in one of the following locations:

- English interface of Oracle Health Sciences Customer Support Portal (<https://hsgbu.custhelp.com/>)
- Japanese interface of Oracle Health Sciences Customer Support Portal (<https://hsgbu-jp.custhelp.com/>)

You can also call our 24x7 help desk. For information, visit <http://www.oracle.com/us/support/contact/health-sciences-cloud-support/index.html> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

1

Prepare to Install Oracle Thesaurus Management System

This chapter includes:

- [Check Installation Documentation](#)
- [Architecture](#)
- [Software Requirements](#)
- [Supported Configurations with Oracle Data Guard and RAC](#)
- [Download the Software](#)
- [Use the Silent Installer \(Optional\)](#)
- [Choose a Character Set](#)
- [Download the Latest TMS Patches](#)
- [Integrate TMS with Other Products and Options](#)

Check Installation Documentation

Check these additional resources.

- [My Oracle Support Articles](#)
- [User and Installation Documentation](#)

My Oracle Support Articles

Visit the My Oracle Support website at <http://support.oracle.com> for the most up-to-date installation information, including alerts, release notes, bulletins, White Papers, and patches.

The My Oracle Support website includes these important installation topics:

- *Oracle Thesaurus Management System 5.4 Release Notes* (Article ID 2854539.1)
- *Known Installation and Configuration Issues for Oracle Health Sciences products Oracle Clinical, RDC Onsite, and TMS version 5.x* (Article ID 1572864.1)
- *Oracle Thesaurus Management System Security Guide* available with the user documentation.
- *Oracle Health Sciences Applications Supported Technology Stack* (Article ID 180430.1)
- *Oracle Thesaurus Management System Installation Verification Test* (Article ID 1590939.1)
- *Oracle Thesaurus Management System Summary of Patches Available* (Article ID 132626.1)
- *Information Center: Oracle Thesaurus Management System* page (Article ID 1343408.1): Check here for new notes and White Papers, including the performance White Paper and

the Installation Verification Test, which are not available at the time of publication of this document.

User and Installation Documentation

The most current Oracle Thesaurus Management System user documentation, including this guide is available at:

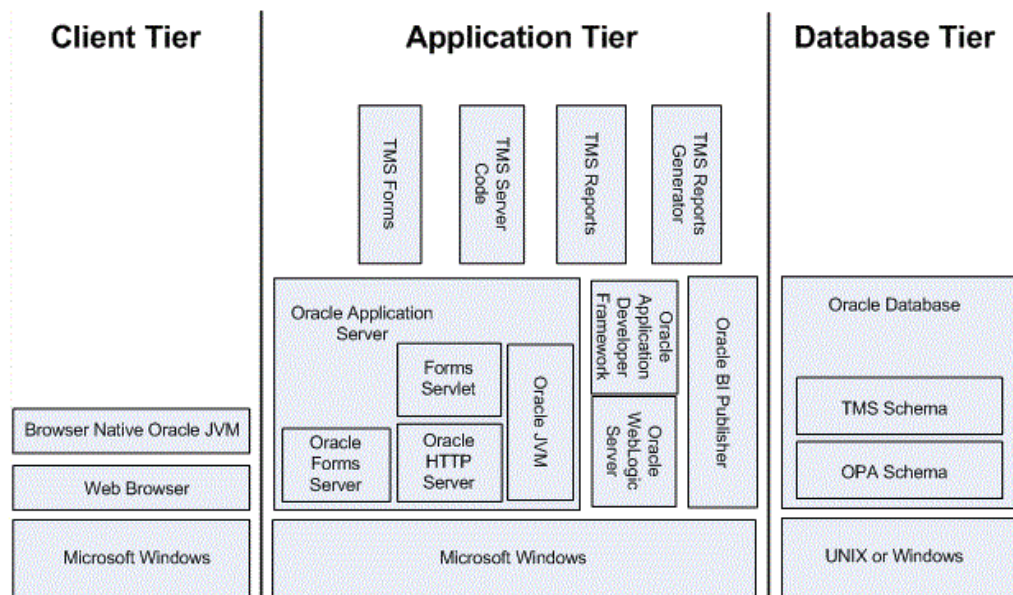
<https://docs.oracle.com/en/industries/health-sciences/thesaurus-system/5.4/index.html>

Architecture

The architecture for TMS consists of three tiers: the database tier, the application tier, and the client tier.

The following figure illustrates the architecture and technology stack for TMS.

Figure 1-1 Figure 1-1 TMS Architecture and Technology Stack



The **database tier** in a TMS environment includes the Oracle Database 19c software, and the TMS databases. In past releases, the database tier was called the back end.

The **application tier** includes:

- **TMS Forms Server** — The Forms Server performs all forms processing, communicates the display changes to the client, and calls forms to query, update, select, and delete data from the database.
- **TMS Server Code**— The Server Code consists of scripts used to create TMS databases.
- **TMS Reports Server** — The Reports Server triggers or schedules all jobs.
- **TMS Reports Generator** — The TMS Reports Generator (OPAXDO service) creates output for different TMS reports.

The **client tier** communicate users' keystrokes and mouse movements to the application tier. It requires a browser and Browser Native Oracle JVM.

Software Requirements

Upon release, TMS 5.4 is certified for use with OCT 2021 CPU. For more information, see *Oracle Health Sciences Critical Patch Update October 2021* (Doc ID 2806298.1) on My Oracle Support.



Note:

You must apply the OCT 2021 CPU after installing TMS 5.4.



Note:

After release, TMS 5.4 will continually be certified for future CPUs. For the latest technology stack certification detail, see *Oracle Health Sciences (Life Sciences/ Pharmaceutical/ Healthcare) Supported Technology Stacks* (Doc ID 180430.1) on My Oracle Support or contact Health Sciences Support.

Table 1-1 Oracle Thesaurus Management System Database Tier Technology Stack

Component	Supported Version
Operating System	Oracle Linux 7.6, 7.7, and 8.1 with the Unbreakable Enterprise Kernel (UEK), 64 bit (US English) Oracle Solaris SPARC 11.4, 64-bit architecture (US English) HP-UX Itanium 11.31; 64-bit architecture (US English) Microsoft Windows Server 2019 (US English)
Oracle Database	Oracle Database 19c Release (19.3.0.0) Enterprise Edition, 64-bit
Compiler (when integrated with Oracle Clinical)	For Oracle Linux 7.6. or 7.7: GCC-4.8.5 or later; command to identify compiler is <code>gcc -v</code> For Oracle Linux 8.1: GCC-8.5.0; command to identify compiler is <code>gcc -v</code> For Oracle Solaris SPARC 11: Oracle Solaris Studio 12.6 Sun C 5.15; command to identify compiler is <code>cc -v</code> For HP-UX Itanium: HP-UX 11.31 September 2014 B.11.31.1409 or later; command to identify compiler is <code>'which cc'</code> and <code>cc -v</code>
Optional Software (when integrated with Oracle Clinical)	SAS 9.4—Note that if you install the Oracle Clinical database tier on Windows, you must install SAS on Windows. Oracle Real Application Clusters (RAC) on Sun, HP, and Linux, including Exadata

Table 1-2 Oracle Thesaurus Management System Application Tier Technology Stack

Component	Supported Version
Operating System	Microsoft Windows Server 2016 Standard and 2019 Standard

Table 1-2 (Cont.) Oracle Thesaurus Management System Application Tier Technology Stack

Component	Supported Version
Oracle WebLogic Server	Oracle WebLogic Server 12c Release 2 (12.2.1.4)
Oracle Fusion Middleware Infrastructure	Oracle Fusion Middleware Infrastructure 12c Release 2 (12.2.1.4)
Oracle Application Development Framework	Oracle Application Development Framework 12c Release 2 (12.2.1.4) Note: Included with Oracle Fusion Middleware Infrastructure.
Oracle Forms and Reports	Oracle Forms and Reports 12c Release 2 (12.2.1.4)
Oracle Java Development Kit (JDK)	Oracle Java Development Kit 1.8 Update 251 or later (JDK 1.8 is also known as JDK 8)
Oracle Java Runtime Environment (JRE)	Oracle Java Runtime Environment (JRE) 1.8 update 311 or later, also known as JRE 8
Microsoft Visual Studio	Visual C++ in Microsoft Visual Studio 2010 and 2012 (x64 distributed)—Required for Oracle WebLogic Server 12c (12.2.1.4) and Oracle Forms and Reports 12c (12.2.1.4). Also, can be used to invoke Data Capture API methods from custom clients.

Table 1-3 Oracle Thesaurus Management System Client Tier Technology Stack

Component	Supported Version
Operating Systems	Microsoft Windows 10; 32-bit or 64-bit architecture (US English)
Supported Browsers	The following Microsoft browser and operating system combinations are supported: <ul style="list-style-type: none"> Microsoft Windows 10: Microsoft Edge v96 and Google Chrome v96
Oracle Java Runtime Environment (JRE)	JRE 1.8 update 311 or later, also known as JRE 8
Adobe Reader	Adobe Acrobat Reader DC 21 or Adobe Acrobat Reader 2020 (Classic Track)

For more information, see:

- [Database Tier Operating System Requirements](#)

Database Tier Operating System Requirements

To verify that your system fits the requirements, do the following in Unix or in Windows:

UNIX

To verify UNIX operating system details, enter the following command:

```
uname -a
```

In addition, to verify the update version for Linux, enter the following command:

```
cat /etc/issue
```

Windows

To verify Windows operating system details, navigate to the Control Panel, then System and Security, then System.

Supported Configurations with Oracle Data Guard and RAC

Oracle Thesaurus Management System 5.4.0 supports a distributed environment with Oracle Clinical 5.4.0 over a network or within an Exadata machine.

See information about running PSUB in a RAC environment in the Oracle Clinical Installation Guide.

This section contains:

- [Supported Configurations with Oracle Real Application Clusters \(RAC\)](#)
- [Supported Configurations with Oracle Data Guard](#)

Supported Configurations with Oracle Real Application Clusters (RAC)

Oracle Clinical was re-architected in Release 5.0 to support Oracle Real Application Clusters (RAC). The Parameterized Submission process (PSUB), which runs and schedules most jobs in Oracle Clinical, no longer uses DBMS pipes, which can only be used within a single database instance, for communication between the user session and the PSUB service. It now uses Oracle Advanced Queuing.

Because databases have traditionally been constrained to run only on a single server, customers have typically followed a hardware "scale-up" strategy for the database tier: Whenever the database server becomes a bottleneck to overall application performance, the server is replaced with a larger, faster machine. While this approach is well understood, it can be highly disruptive to ongoing business.

Oracle Real Application Clusters (RAC) provides an alternative approach for scaling database performance. It is designed to tolerate server failures with little impact to mission-critical applications and users. As workloads and user connections are increased, additional nodes (servers) can be easily added to the cluster. Each server runs against the same database simultaneously. This approach is less disruptive to ongoing business operations, more reliable, and less expensive to implement.

RAC nodes can be individual computers in a network or nodes on an Oracle Exadata machine. RAC shares the database internally among all nodes so that even if the node where the database was originally installed goes down, the other nodes can still access the database. You can configure RAC nodes as follows:

- [Node 1: Install and Set Up Everything Required for Oracle Clinical](#)
- [Node 2: Install the Minimum Required as a RAC Node](#)
- [Node 3: Install Everything Required for Oracle Clinical as Backup](#)

Node 1: Install and Set Up Everything Required for Oracle Clinical

- Oracle Real Application Clusters (RAC)—installed with Oracle Database
- Oracle Thesaurus Management System database server code

- Oracle Thesaurus Management System database(s)
- Run the Oracle Clinical PSUB service on this node (one per database)
- Create user-specific PSUB log file directories for randomization, batch data load, and labs batch jobs that require input files
- Enter PSUB-related values in local reference codelist OCL_STATE
- Install SAS 9.3 (Optional)

Node 2: Install the Minimum Required as a RAC Node

Install Oracle Database with Oracle Real Application Clusters (RAC).

You can have multiple nodes set up this way, each accessing the same database(s). Additional nodes set up this way improve database performance.

Node 3: Install Everything Required for Oracle Clinical as Backup

In case either the PSUB service or Node 1 itself fails, install all required software on another node so that you can start the PSUB service as quickly as possible to continue normal operation. PSUB can run on only one server at a time.

A node set up this way also improves performance but requires additional maintenance; any Oracle Thesaurus Management System database server patches you install on the primary node (Node 1 in this example) must also be installed on this node.

- Install Oracle Real Application Clusters (RAC) and Oracle Database
- Install Oracle Thesaurus Management System database server code (includes PSUB server code)
- Create the same PSUB directory structure as on Node 1 so that the OCL_STATE reference codelist values on the middle tier still work. If you use NFS to share the files, users will still be able to access files for jobs performed on the other node unless the node itself fails. For more information see the PSUB chapter in the Oracle Clinical Installation Guide.

 **Note:**

You do not need to reinstall the Oracle Thesaurus Management System database.

You can have multiple nodes set up this way, each accessing the same database(s).

Recommended Options for RAC

Oracle Thesaurus Management System is supported with an Oracle Real Applications Cluster (RAC) distributed database installation on UNIX. Oracle recommends:

- Configuring a Maximum Availability Architecture (MAA) in which you use Oracle RAC for both your primary and standby database, synchronized using Oracle Data Guard.
- Using the Single Client Access Name (SCAN) option. This RAC feature provides a single name for clients to access Oracle databases running in a cluster. The

benefit is that the client's connect information does not need to change if you add or remove nodes in the cluster. Having a single name to access the cluster allows clients to use the EZConnect client and the simple JDBC thin URL to access any database running in the cluster, independent of which server(s) in the cluster the database is active. SCAN provides load balancing and failover for client connections to the database. The SCAN works as a cluster alias for databases in the cluster.

- SCAN is configured during the installation of Oracle Grid Infrastructure that is distributed with Oracle Database. Oracle Grid Infrastructure is a single Oracle Home that contains Oracle Clusterware and Oracle Automatic Storage Management (ASM). You must install Oracle Grid Infrastructure first in order to use Oracle RAC.
- *Oracle® Database 2 Day + Real Application Clusters Guide* both at <https://docs.oracle.com/en/database/oracle/oracle-database/19/clustering.html>
- *Grid Infrastructure Single Client Access Name (SCAN) Explained* (My Oracle Support Article ID 887522.1).
- Oracle Data Guard and other high availability documentation at <https://docs.oracle.com/en/database/oracle/oracle-database/19/sbydb/index.html>

Supported Configurations with Oracle Data Guard

The following Oracle Data Guard configurations are supported. All Oracle Thesaurus Management System components (database server, database) must be installed on each node.

- Standalone server with Oracle Data Guard failover
- Oracle Clusterware for One Node with Oracle Data Guard failover
- Oracle RAC One Node with Oracle Data Guard failover
- Multi-node RAC with Oracle Data Guard failover

Oracle Data Guard is included in Oracle Database Enterprise Edition.

Download the Software

This section includes:

- [Create Staging Areas](#)
- [Download the Oracle Thesaurus Management System 5.4 Media Pack](#)
- [Download Patches from My Oracle Support](#)
- [Download Oracle Java Development Kit](#)
- [Download the Java Runtime Environment](#)
- [Download Adobe Reader](#)
- [Download Oracle Critical Patch Updates](#)

Create Staging Areas

1. Create one staging area each on the database server and on the application server.
2. Create one directory, in each staging area, for each media pack disk, patch, or other software unit, and give the directory a logical name.

Table 1-4 Software to Download to the Database Server Staging Area

Disk or Patch Name	Source
Oracle Thesaurus Management System 5.4.0 Documentation	https://docs.oracle.com/en/industries/health-sciences/thesaurus-system/5.4/index.html
Oracle Thesaurus Management System 5.4	Media Pack
Oracle Database 19c (19.3.0.0) — Linux x86-64	Media Pack – Oracle Database 19.3.0.0.0
Oracle Database 19c (19.3.0.0) — Solaris Sparc 64	Media Pack – Oracle Database 19.3.0.0.0
Oracle Database 19c (19.3.0.0) — HP IA	Media Pack – Oracle Database 19.3.0.0.0
Oracle Database 19c (19.3.0.0) — Windows x64	Media Pack – Oracle Database 19.3.0.0.0

Table 1-5 Software to Download to the Application Server Staging Area

Disk or Patch Name	Source
Oracle Thesaurus Management System 5.4 Documentation	https://docs.oracle.com/en/industries/health-sciences/thesaurus-system/5.4/index.html
Oracle Thesaurus Management System 5.4	Media Pack
Oracle WebLogic Server 12c (12.2.1.4)	Media Pack – Oracle WebLogic Server 12.2.1.4.0
Oracle Fusion Middleware 12c Infrastructure	Media Pack – Oracle Fusion Middleware 12c Infrastructure 12.2.1.4.0
Oracle Forms and Reports (12.2.1.4)	Media Pack – Oracle Forms and Reports 12.2.1.4.0
Oracle Java Development Kit (JDK) 1.8; see Download Oracle Java Development Kit	My Oracle Support
Java Runtime Environment (JRE) 1.8; see Download the Java Runtime Environment	https://www.oracle.com
Adobe Reader; see Download Adobe Reader	http://www.adobe.com/
Microsoft Visual C++ in Microsoft Visual Studio 2010 (10.0.30319)	https://www.microsoft.com/en-us/download/details.aspx?id=26999
Microsoft Visual C++ 2012 Redistributable (x64) - 11.0.61030	https://www.microsoft.com/en-us/download/details.aspx?id=30679
Patch 33691226	My Oracle Support (Apply only after applying OCT 2021 CPU) Download the patch for Release 12.2.1.4.x
Patch 32720458	My Oracle Support (Apply only after applying OCT 2021 CPU) Download the patch for Release 12.2.1.4.0

Download the Oracle Thesaurus Management System 5.4 Media Pack

Note:

To receive a physical media pack with all the required DVDs, contact Health Sciences Support through call or open a Service Request (SR) by selecting the problem category **Version Update Request**.

To download the software:

1. Go to <https://edelivery.oracle.com> and log in.
2. From the drop-down next to the search field, select **Download Package**.
3. In the search field, type *Oracle Thesaurus Management System*.
4. From the search result, select **Oracle Thesaurus Management System 5.4.0.0.0**.
5. Click **Continue**.
6. Select the appropriate platform for which you want to download the media pack.
7. Click **Continue**.
8. Read the license agreement and select the checkbox to accept the license agreement.
9. Click **Continue**.
10. Review the media pack components you want to download.
11. Click **Download**.
12. Select the location where you want to save the `Oracle_SSN_DLM_*.exe` file.
13. Run the `Oracle_SSN_DLM_*.exe` file.
14. Select a location in the appropriate staging area to download the zip files of the media pack.
15. Click **Next**.
16. Extract each `part_number.zip` file into a meaningfully named directory.

Download Patches from My Oracle Support

Note:

If you have already performed these steps for Oracle Clinical, skip to the next section.

To download each required patch indicated in [Create Staging Areas](#) from My Oracle Support:

1. Go to My Oracle Support at <https://support.oracle.com> and sign in.
2. Click the **Patches & Updates** tab, then enter the patch number in the **Patch Name or Number is** field and click **Search**.

3. Click the link for your operating system and download the patch file to the appropriate directory in the staging area.
4. Extract the .zip file.

Download Oracle Java Development Kit

To download and install JDK:

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: 1439822.1
A page appears with a list of documents.
3. Click the link *All Java SE Downloads on MOS* [Doc ID 1439822.1].
4. Scroll down to the list of JDK versions to **Oracle JDK 8 Update 251** (public) (Patch 30884160).

Note:

Check Oracle Health Sciences Applications Supported Technology Stack (Article ID 180430.1) on My Oracle Support to see if a more recent JDK version is supported.

5. Click the patch number link.
6. Select Microsoft Windows x64 (64-bit) and click **ReadMe** to read the release notes and **Download** to download the patch to the staging area.

Installation instructions are in [Install Oracle Java Development Kit](#) .

Download the Java Runtime Environment

You must make Java Standard Edition (SE) Runtime Environment (JRE) 1.8.0_311 available for download to user computers so that they can use Oracle Thesaurus Management System. You will configure the Launch page to allow users to download JRE in [Making the Java Runtime Environment Available for Download](#). In preparation for this, download JRE to the application server.

To download JRE:

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: 1439822.1
A page appears with a list of documents.
3. Click the **All Java SE Downloads on MOS** link (Doc ID 1439822.1).
4. Scroll down to the list of JRE versions to **Oracle JRE 8 Update 311 (Public) or later version**.

 **Note:**

Check Oracle Health Sciences Applications Supported Technology Stack (Article ID 180430.1) on My Oracle Support to see if a more recent JRE version is supported.

5. Click the patch number link.
6. Select Microsoft Windows x64 (64-bit) and click **ReadMe** to read the release notes and **Download** to download the patch to the staging area.

Download Adobe Reader

Adobe Reader is required on the client computers. At this time, no particular version is required.

Download Adobe Reader from <http://www.adobe.com>.

Download Oracle Critical Patch Updates

Every quarter, Oracle provides Critical Patch Updates (CPUs) to address security vulnerabilities. The latest CPU patch contains all the fixes from previous patches.

Check My Oracle Support article ID 180430.1, *Oracle Health Sciences Supported Technology Stacks*, for the latest CPU patch tested with Oracle Health Sciences applications. The article includes a link to separate articles about each one. Download the required patches on every computer with an Oracle Home.

Use the Silent Installer (Optional)

You can run any of the Oracle Universal Installers—including the Oracle Thesaurus Management System Installers—in silent mode. This may be useful to promote uniform installations in many sites or on many computers.

TMS ships with .rsp (response) files that include the parameter prompts and sample parameter values for each component. They are located on the media pack's Oracle Thesaurus Management System 5.4.0 disk in TMS\TMS_Win_MiddleTier_Installer.zip\Disk1\stage\Response, and include:

Table 1-6 Response Files and Parameter Information

Component Installed	Response File	Parameter Information
TMS DB Server	oracle.pharma.tms.server.Complete.rsp	Gather Required Information for TMS Database Server
TMS Database	oracle.pharma.tms.db.install.Master.rsp	Gather Required Information for TMS Database Objects
TMS Database Registration	oracle.pharma.tms.db.register.Custom.rsp	Attend to the TMS Database Registration Screens
TMS Front End	oracle.pharma.tms.frontend.Custom.rsp	Gather Required Information for TMS Front End

Table 1-6 (Cont.) Response Files and Parameter Information

Component Installed	Response File	Parameter Information
TMS Reports Server	oracle.pharma.tms.reportserver.Complete.rsp	Gather Required Information for TMS Reports Server
TMS Upgrade	oracle.pharma.tms.db.upgrade.Master.rsp	Gather Required Information to Upgrade TMS Database

1. Open the file in a text editor and enter values directly.
2. Run the file.

In Windows (as an administrator):

```
setup.exe -responseFile response_file_name
```

3. When you run the file at each location, edit the local parameters as required.

Alternatively, you can run the installer once, entering values manually, and record the process to create a response file.

Run the file.

In Windows (as an administrator):

```
setup.exe -record -destinationFile response_file_name
```

For more information see Oracle Universal Installer documentation at https://docs.oracle.com/cd/E24628_01/em.121/e37799/ch3_response_file.htm#OUICG183

Choose a Character Set

Note:

If you have already installed or upgraded Oracle Clinical, you should have already selected a character set and can skip this section.

Oracle Health Sciences supports certain character sets for each product or each combination of integrated products. For TMS, **Oracle strongly recommends that you use the AL32UTF8 character set**. TMS also supports UTF8, US7ASCII, WE8ISO8859P1, or any single byte character set.

TMS uses the NLS_LANG environment variable to control the **language, territory, and character set** used for database connections. The NLS_LANG variable concatenates the three components as LANGUAGE_TERRITORY.CHARSET.

You must select **AL16UTF16- Unicode UTF-16 Universal character set** as the National Character Set.

Restrictions:

- You must use the **same character set on the database tier and the application tier**. Otherwise, Oracle Clinical may store some special characters incorrectly in the database.

- You must set the LANGUAGE_TERRITORY components of the NLS_LANG variable to **american_america**.
- You must set the CHARSET component of the NLS_LANG variable to **match the character set of the database**.

Download the Latest TMS Patches

Check Oracle Thesaurus Management System Summary of Patches Available on My Oracle Support for any TMS patches for this release and download them. You will apply these patches in [Patch TMS](#).

Integrate TMS with Other Products and Options

You can integrate TMS with other products and options and develop applications that read data from TMS. Each product listed below must be purchased separately.

- [Oracle Clinical Remote Data Capture Onsite](#)
- [Oracle Clinical](#)
- [Oracle Health Sciences Data Management Workbench and Oracle Life Sciences Data Hub](#)
- [Custom Applications for TMS](#)

Oracle Clinical Remote Data Capture Onsite

Oracle Clinical Remote Data Capture Onsite (RDC Onsite) is an electronic data capture (EDC) Web application that works with studies that are defined and designed using Oracle Clinical. You can use RDC Onsite to collect, perform immediate validation on, review, verify, approve, and report clinical data collected during a patient visit in a clinical study. Patient data is stored in the Oracle Clinical database. You can use Oracle Clinical features including batch validation, discrepancy management, mass changes, and data extract with data collected using RDC Onsite.

Oracle Clinical

When fully integrated with Oracle Clinical, TMS processes new and updated patient data during each Oracle Clinical batch validation and either automatically codes incoming data—those that match standard terms exactly or match previously manually coded terms exactly—or creates an omission that must be manually coded in TMS. TMS can return to Oracle Clinical related terms from one or more levels of the standard terminology—for example the preferred term and system organ class in MedDRA, or the preferred name and Anatomical-Therapeutic-Chemical Level 1 term in WHO-Drug—for each coded term, associated with the correct RDCI (collected CRF).

You can install TMS and Oracle Clinical on the same application tier or on different application tiers. You must install both products on the same database if you want integrate the two systems. Oracle recommends installing Oracle Clinical before TMS.

For more information, see the Oracle Thesaurus Management System Installation Guide and the Oracle Thesaurus Management System User's Guide.

Oracle Health Sciences Data Management Workbench and Oracle Life Sciences Data Hub

Oracle Health Sciences Data Management Workbench (DMW) allows you to do data management on InForm and lab data in a single location. You can integrate TMS with DMW to code InForm and lab terms in TMS.

When fully integrated with Oracle Life Sciences Data Hub (LSH), TMS processes new and updated patient data during each Oracle LSH transformation and either automatically codes incoming data—those that match standard terms exactly or match previously manually coded terms exactly—or creates an omission that must be manually coded in TMS and a discrepancy in Oracle LSH. TMS can return to Oracle LSH related terms from one or more levels of the standard terminology—for example the preferred term and system organ class in MedDRA, or the preferred name and Anatomical-Therapeutic-Chemical Level 1 term in WHO-Drug—for each coded term, associated with the collected CRF.

Custom Applications for TMS

You can build custom applications for TMS:

See the Oracle Thesaurus Management System Technical Reference Manual for proprietary information about data access, internal tables, and APIs. Contact Health Sciences Support to obtain a free electronic copy of the manual. You must be a licensed customer.

2

Install Oracle Database

TMS is certified on Oracle Database 19c (19.3.0).

If you are upgrading TMS, skip to [Upgrading Oracle Thesaurus Management System to Release 5.4.0](#).

If you have already performed these steps as part of installing Oracle Clinical Release 5.4 or upgrading Oracle Clinical Release 5.2.2 to Oracle Clinical Release 5.4, skip to [Install and Configure the Oracle Application Tier](#).

If you are using Oracle Real Application Clusters (RAC) or Oracle Data Guard, see [Supported Configurations with Oracle Data Guard and RAC](#).

This chapter includes:

- [Get the Oracle Database Installation Guide](#)
- [Download and Extract the Oracle Database Software](#)
- [Performing Prerequisite Tasks for Installing Oracle Database](#)
- [Install Oracle Database](#)
- [Install Oracle Database Examples](#)
- [Install Oracle Critical Patch Update](#)

Get the Oracle Database Installation Guide

Get the required Oracle Database Installation Guide.

- Linux: <https://docs.oracle.com/en/database/oracle/oracle-database/19/ladbi/index.html>
- Solaris: <https://docs.oracle.com/en/database/oracle/oracle-database/19/ssdbi/index.html>
- HP: <https://docs.oracle.com/en/database/oracle/oracle-database/19/hpdbi/index.html>
- Windows: <https://docs.oracle.com/en/database/oracle/oracle-database/19/ntdbi/index.html>

Download and Extract the Oracle Database Software

To download and extract the Oracle Database 19.3.0 software:

- Follow instructions in the *Oracle Database Installation Guide*.

Oracle Thesaurus Management System requires Oracle Database Enterprise Edition.

Oracle Database Grid Infrastructure is optional.

Performing Prerequisite Tasks for Installing Oracle Database

To ensure that your platform meets the minimum requirement for installing Oracle Database 19c (19.3.0), you must perform the following preparatory tasks:

- [Create Owners, Groups, and Mount Points](#)
- [Configure Kernel Resources and Adjust Operating System Environment](#)
- [Install Latest Operating System Patches](#)

Create Owners, Groups, and Mount Points

To create the software owner, required groups, and mount points:

1. Create the software owner and groups:
 - Create a UNIX user to own the Oracle software. Typically, the user name is **oracle**.
 - Create two groups: one is the Oracle Inventory group; the other is the operating system DBA group. Typically, the group names are **oinstall** and **dba**, respectively.
2. Create mount points owned by the oracle user:
 - Create a software mount point of at least 10 GB.
 - Create mount points to hold the database files, control files, and log files, respectively.
3. Test permissions. Ensure that the `oracle` user can write to the new mount points and all subdirectories.

Configure Kernel Resources and Adjust Operating System Environment

The performance of Oracle Database relies on proper tuning of operating system parameters. In addition, if you are creating several Oracle instances, you might have to increase the amount of shared memory and semaphores on the system by setting kernel parameters.

For details, see the "Configure Kernel Parameters" section of the Oracle Database 19c Installation Guide for your operating system.

Install Latest Operating System Patches

Download and install the latest operating system patches required for Oracle, if necessary. Review the latest platform-specific install bulletins for Oracle Database 19c (19.3.0).

Install Oracle Database

To install Oracle Database 19.3.0, follow the instructions in the respective *Oracle Database Installation Guide*, making selections appropriate for TMS as noted in the following sections.

TMS requires:

- Oracle Database Enterprise Edition
- Oracle Database Text Option

Oracle Database Grid Infrastructure is optional.

You can configure database(s) as part of the database software installation or after, using the Database Configuration Assistant (DBCA).

Oracle Thesaurus Management System supports installation on either a Container Database (CDB) containing a Pluggable Database (PDB) or a non-CDB database.

For information on pluggable and container databases, see:

- *Oracle Database New Features Guide* at <https://docs.oracle.com/en/database/oracle/oracle-database/19/newft/index.html>.
- *Oracle Database Concepts* at <https://docs.oracle.com/en/database/oracle/oracle-database/19/cncpt/index.html>.

For an explanation of which options require an additional license, see the *Database Licensing Information User Manual* at <https://docs.oracle.com/en/database/oracle/oracle-database/19/dblic/index.html>.

For more information, see:

- [Install and Configure Oracle Database](#)
- [Modify the tnsnames.ora File on the Database Server](#)
- [Create the oinstall User Group](#)
- [Check Required Tablespaces](#)
- [Performance Tuning Step for Pluggable Databases](#)

Install and Configure Oracle Database

Oracle recommends that you set up a new database instance so that neither Oracle Thesaurus Management System nor its installation process interferes with other applications. However, you can install Oracle Thesaurus Management System on an existing database instance.

When you configure the database, select the following options for Oracle Thesaurus Management System:

- Custom Database template (recommended)
- Oracle JVM (required)
- Oracle Text (required for TMS only)
- Check that **required tablespaces** exist, and have Autoextend on:
 - SYSTEM

- TEMP
 - UNDOTBS1
 - USERS
 - SYSAUX
- **Initialization Parameters.** Table 2-1 shows the required or recommended values for Oracle Thesaurus Management System. For parameters that accept a value within a range, the minimum values are given.

 **Tip:**

Parameters are listed in alphabetical order. In the Database Configuration Assistant, you can click the Parameter column to display the parameters in the same order. You may need to select Advanced Parameters to see all of them.

 **Note:**

If you make any changes to the initialization parameters, restart the database for the new settings to take effect.

- Automatic Memory Management (recommended)
- Sizing: From the Block Size drop-down, select 16384 Bytes.
- Character Set: See [Choose a Character Set](#) .

The following get installed by default in Oracle Database 19.3.0 with the Custom Database template selected:

- Distributed Database Option and Advanced Replication Option (only if you are using Oracle Clinical Distributed Study Conduct (Replication))
- Oracle Partitioning
- Oracle XML DB
- Oracle Text, Java Virtual Machine (JVM), and Oracle XML DB are configured automatically if you select the Custom Database template.

Table 2-1 Required and Recommended Initialization Values in the init.ora File

Parameter	Value	Comments
COMPATIBLE	19.0.0.0	Specifies the release with which the Oracle server must maintain compatibility.
DB_BLOCK_SIZE	16384 bytes	You cannot change this value after you create the database.
DB_CACHE_SIZE	150 MB	Recommended value for 50 to 60 concurrent users. Adjust this value according to your organization's needs.
DB_DOMAIN	null	DO NOT set this value.

Table 2-1 (Cont.) Required and Recommended Initialization Values in the init.ora File

Parameter	Value	Comments
DB_FILES	200	Oracle adds needed space to the control files up to the number specified in the DB_FILES parameter.
EVENT	31151 trace name context forever, level 0x100	Required for HTML generation. NOTE: Do not include the EVENT parameter when you create the database. Once the database is created, you can add the EVENT parameter to the init.ora file.
JAVA_POOL_SIZE	50 MB	Recommended value for 50 to 60 concurrent users. You can change the value of this parameter after installation.
JOB_QUEUE_PROCESSES	10	Developer-specific parameter. You can change the value of this parameter after installation.
LARGE_POOL_SIZE	50 MB	Recommended value for 50 to 60 concurrent users.
MEMORY_MAX_TARGET	1000 MB (minimum)	Adjust this value according to your organization's needs.
MEMORY_TARGET	1000 MB (minimum)	Adjust this value according to your organization's needs.
NLS_DATE_FORMAT	DD-MON-RRRR (default value)	Determines the format in which client applications running on the Windows server transfer date information to and from the database. The format must specify the year as RRRR.
NLS_LENGTH_SEMANTICS	BYTE	The CHAR value for this parameter is not supported.
OPEN_CURSORS	800 or greater	You can change the value of this parameter after installation.
OPTIMIZER_DYNAMIC_SAMPLING	2 or greater	The default setting is 2. Oracle recommends using dynamic sampling for Batch Data Load temporary tables; see the Oracle Clinical Administrator's Guide.
OPTIMIZER_FEATURES_ENABLE	19.1.0.0	Acts as an umbrella for enabling a series of optimizer features based on an Oracle release number.
OPTIMIZER_ADAPTIVE_STATISTICS	FALSE	Controls adaptive statistics. Setting this parameter to false disables the following adaptive features: SQL plan directives, Statistics feedback for joins, and Adaptive dynamic sampling for parallel execution.
OPTIMIZER_ADAPTIVE_PLANS	FALSE	Controls adaptive plans. Adaptive plans are execution plans built with alternative choices that are decided at run time based on statistics collected as the query executes.
PGA_AGGREGATE_TARGET	200 MB	Recommended value for 50 to 60 concurrent users. You can change the value of this parameter after installation.
REMOTE_LOGIN_PASSWORDFILE	EXCLUSIVE	The database must be set up to use password file authentication.
SEC_CASE_SENSITIVE_LOGON	FALSE	Lets you enter passwords without case sensitivity.
SESSIONS	500 or greater	You can change the value of this parameter after installation.
SGA_MAX_SIZE	600 MB (minimum)	Recommended value for 50 to 60 concurrent users. Adjust this value according to your organization's needs.
SGA_TARGET	600 MB (minimum)	Recommended value for 50 to 60 concurrent users. Adjust this value according to your organization's needs.

Table 2-1 (Cont.) Required and Recommended Initialization Values in the init.ora File

Parameter	Value	Comments
SHARED_POOL_SIZE	150 MB (minimum)	Recommended value for 50 to 60 concurrent users. You can change the value of this parameter after installation.
UNDO_MANAGEMENT	AUTO	Specifies which undo space management mode the system uses. When set to AUTO, the instance starts in Automatic Undo Management (AUM) mode.

Modify the tnsnames.ora File on the Database Server

There is a tnsnames.ora file in at least two locations in the installation. Oracle recommends maintaining a master file and copying it to each location whenever you add a database. See [Modify the tnsnames.ora File on the Application Server](#) for the application server locations.

1. Navigate to the tnsnames.ora file in the following directory on the database server:
Oracle_Home/network/admin
2. Enter a connect string for each database that matches the database's service name.
3. If there are multiple Oracle homes, maintain tns entries for all databases in a central location; for example: /etc/tnsnames.ora.

Create the oinstall User Group

Use instructions in the Oracle Database 19.3.0 Installation Guide chapter "Configuring Users, Groups and Environments for Oracle Database."

1. Check if the **oinstall** user group exists.
2. If it does not exist, create it.

Check Required Tablespaces

[Table 2-2](#) lists the tablespaces, along with their minimum size, required for Oracle Clinical. Make sure the database contains these tablespaces. The best practice is to create them with the *Autoextend On* option, to avoid running out of space.

In addition, you may need to increase the minimum sizes for your installation.

Table 2-2 Required Tablespaces and Sizes

Tablespace	Minimum Size
SYSTEM	900 MB
TEMP	100 MB
UNDOTBS1	700 MB
USERS	500 MB
SYSAUX	600 MB

Performance Tuning Step for Pluggable Databases

To prevent performance issues, specifically with accessing `dba_synonyms` view, take these steps. See My Oracle Support doc ID 2033658.1 for more information.

1. Run the following statement:

```
alter system set "_common_data_view_enabled" = false scope=both;
```

2. Restart the database.

Install Oracle Database Examples

Oracle Database Examples includes the following items:

- Oracle JDBC Development Drivers (required)
- Oracle Database Examples (required)
- Oracle Product Demonstrations (optional)

Note:

You do not need to install any of the sample schemas. They are not required for either Oracle Clinical or TMS. You can add them later if you change your mind.

To install Oracle Database Examples:

1. Extract the zip file containing Oracle Database Examples in the `examples` directory.
2. Start Oracle Universal Installer from the `examples` directory.

```
./runInstaller
```

Or, if the database server has multiple Oracle Homes, then enter:

```
./runInstaller -invPtrLoc ORACLE_HOME/oraInst.loc
```

3. Accept all the default values during the installation.

For more information, see the *Oracle Database Examples Installation Guide* at <https://docs.oracle.com/en/database/oracle/oracle-database/>, and select the DB version for which you need the documentation.

Install Oracle Critical Patch Update

1. Check My Oracle Support article ID 180430.1, *Oracle Health Sciences (Life Sciences/ Pharmaceutical/Healthcare) Applications Supported Technology Stacks*, for the latest quarterly Oracle CPU patches tested with Oracle Health Sciences applications.
2. Install these patches on every computer with an Oracle Home.

3

Install and Configure the Oracle Application Tier

This chapter describes how to install Oracle Application Server, which includes the Oracle Fusion Middleware Infrastructure Software, Oracle Forms Server and the Oracle Reports Server, and Oracle WebLogic Server.

This chapter includes:

- [Before You Start](#)
- [Gather Required Information](#)
- [Install Oracle Java Development Kit](#)
- [Install Oracle WebLogic Server 12.2.1.4](#)
- [Install the Oracle Fusion Middleware Infrastructure Software](#)
- [Install the Oracle Forms and Reports Servers](#)
- [Create the Repository Creation Utility](#)
- [Configure the FRDomain](#)
- [Enable SSL Between a Browser and Oracle HTTP Server](#)
- [Apply Patch on the Application Server](#)
- [Modify the tnsnames.ora File on the Application Server](#)
- [Configure Firewall on the Application Tier](#)
- [Test Connectivity to Databases for Forms and Reports Servers](#)
- [Restart the Computer](#)

Before You Start

Follow instructions in these topics:

- [Identify a Single Account to Perform All Application Tier Installation Tasks](#)
- [Get a CA Certificate for HTTPS](#)
- [Permanent IP Address](#)

Identify a Single Account to Perform All Application Tier Installation Tasks

- Install all application tier components using the same user account.
The account must have administrator privileges on the server computer.

Get a CA Certificate for HTTPS

To support HTTPS:

1. Request a certificate from a Certificate Authority (CA) vendor, such as Thawte, Entrust, or Verisign.
 - a. Generate an encoded plain text certificate request file. See [Create an Oracle Wallet and Generate a Certificate Request](#) for more information.
 - b. Email the certificate request file to the CA vendor.

The vendor will sign the file, and send you a Trusted Certificate and a User Certificate. Allow some time for the certificates to be issued.
2. Import the certificate into the Oracle Wallet for the Oracle Application Server.



Note:

If your intention is to install an environment that will never be taken into production, you can skip this step and create a self-signed demo certificate for testing purposes; see [Enable SSL Between a Browser and Oracle HTTP Server With Self Signing](#).

Permanent IP Address

- Make sure every computer on which either the Oracle Clinical Forms or Reports Server is installed has a permanent IP address.

Gather Required Information

Have the following information ready.

Install the Oracle WebLogic Server

- Home directory path; for example:
C:\Oracle\Middleware\Oracle_Home
- Email address to receive security updates specific to your installation
- My Oracle Support password if you wish to receive the security updates through My Oracle Support

Install the Oracle Fusion Middleware Infrastructure Software

- Home directory path; for example:
C:\Oracle\Middleware\Oracle_Home
- Email address to receive security updates specific to your installation
- My Oracle Support password if you wish to receive the security updates through My Oracle Support

Install the Oracle Forms and Reports Servers

Home directory path; for example:

C:\Oracle\Middleware\Oracle_Home

Create the Repository Creation Utility

- Database details:
 - *Server.Domain*; for example:
servername.your_company.com
 - Port number
 - Database service name
 - Database administrator username and password
- RCU Schema password

Configure the FRDomain

- Domain home path; for example:
C:\Oracle\Middleware\Oracle_Home\user_projects\domains\FRDomain
- Application location; for example:
C:\Oracle\Middleware\Oracle_Home\user_projects\applications\FRDomain
- WebLogic Domain administration username and password
- RCU Database connection:
 - DBMS/ Service name
 - *Server.Domain*; for example:
servername.your_company.com
 - Port number
 - Schema owner name and password
- Node Manager credentials: Username and password
- Oracle HTTP Server details:
 - Administrator host's IP address
 - Administrator port number
 - Listen address
 - Listen port number
 - SSL listen port number
 - Server name

Install Oracle Java Development Kit

To install Oracle Java Development Kit (JDK):

1. If you have not already done so, follow instructions in [Download the Software](#).
2. Follow instructions in the release notes to apply the patch.

 **Note:**

Do not use the default installation location. By default, the installation directory is C:\Program Files\java\jdk. "Program Files" includes a space, which can cause problems. Oracle recommends specifying a **directory with no spaces in the name**. Also, we recommend not to include the JDK version in the directory name (for example, C:\app\jdk18016) in order to have the directory name valid if JDK needs to be upgraded in the future.

In addition, the directory name **must have no more than 8 characters**; for example, C:\app\java\jdk.

3. Make a note of the directory in which you install JDK. You will need it when you install WebLogic Server.

Install Oracle WebLogic Server 12.2.1.4

1. In the staging area where you downloaded the media pack (see [Download the Software](#)), locate the directory where you downloaded Oracle WebLogic Server 12.2.1.4 Generic and Coherence and extract the WebLogic Server .zip file (V983364-01.zip) if you have not already done so.
2. Log in as the user you selected in [Identify a Single Account to Perform All Application Tier Installation Tasks](#).
3. Install Oracle WebLogic Server using a Generic Package installer—This type of installer is a .jar file; fmw_12.2.1.4.0_wls.jar.

For instructions, see *Oracle® Fusion Middleware Installing and Configuring Oracle WebLogic Server and Coherence* for Release 12.2.1.4, at <https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/wlsig/installing-oracle-weblogic-server-and-coherence-software.html#GUID-11F2824A-997D-4EDC-85EC-D0E3D1F0617A>.

The complete documentation set for Oracle WebLogic Server 12.2.1.4 is available at: <https://docs.oracle.com/en/middleware/fusion-middleware/weblogic-server/12.2.1.4/index.html>.

You can accept most default values, with the exceptions noted below.

 **Note:**

You can change the default value of the *middleware_home* directory, which is C:\Oracle\Middleware\Oracle_Home, if you want, but some code examples in this guide use that value to make it easier to copy and paste, so remember to change these if you change the value.

You must NOT change the names for any of the middleware home's subdirectories, including `wlserver` and `oracle_common`.

 **Note:**

Make sure you have installed Visual C++ in Microsoft Visual Studio 2012 (x64 distributed). This is required for Oracle WebLogic Server 12c (12.2.1.4) and Oracle Forms and Reports 12c (12.2.1.4) Servers to invoke Data Capture API methods from custom clients.

Choose the "WebLogic Server" Install Type

1. Select **WebLogic Server**.

This is required in order to create a Node Manager.

Security Updates

 **Note:**

Even if you accept this option, you should check My Oracle Support for quarterly Oracle Critical Patch Update (CPU) security patches certified for use with Oracle Clinical and/or Oracle Thesaurus Management System.

1. Specify whether you want to register the product installation with My Oracle Support.
If you register, My Oracle Support emails you immediately of any security updates that are specific to your installation.
2. Follow instructions on the screen to register or to reject the option.

 **Note:**

Continue to click **Next** until you are finished. After the Installation Summary, the processing may take a few minutes. You can deselect the Automatically Launch Configuration Wizard check box and click Finish to complete the 12c WebLogic Server installation.

Install the Oracle Fusion Middleware Infrastructure Software

1. In the staging area where you downloaded the media pack (see [Download the Software](#)), locate the directory where you downloaded the Oracle Fusion Middleware Infrastructure Software and extract the V983368-01.zip file if you have not already done so.
2. Log in as the user you selected in [Identify a Single Account to Perform All Application Tier Installation Tasks](#).
3. Install the Oracle Fusion Middleware Infrastructure Software using a Generic Package installer—This type of installer is a .jar file; fmw_12.2.1.4.0_infrastructure.jar.

 **Note:**

Use the same install directory that you specified when you installed WebLogic Server in [Install Oracle WebLogic Server 12.2.1.4](#).
Select "Fusion Middleware Infrastructure" as the installation type.

For instructions, see *Installing and Configuring the Oracle Fusion Middleware Infrastructure*, at <https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/infm/installing-infrastructure-software.html#GUID-943F11B4-DD9E-4631-8F5F-80B3ADC06F26>.

Install the Oracle Forms and Reports Servers

1. In the staging area where you downloaded the media pack (see [Download the Software](#)), locate the directory where you downloaded Oracle Forms and Reports 12c (12.2.1.4) for Microsoft Windows (64-bit) and extract the V983393-01.zip file if you have not already done so.
2. Log in as the user you selected in [Identify a Single Account to Perform All Application Tier Installation Tasks](#).
3. Install the Oracle Forms and Reports 12c (12.2.1.4) using a Generic Package installer—This type of installer is an .exe file; `setup_fmww_12.2.1.4.0_fr_win64.exe`.

When asked, to choose an installation type, select **Forms and Reports Deployment**.

 **Note:**

Use the same install directory that you specified when you installed WebLogic Server in [Install Oracle WebLogic Server 12.2.1.4](#).

For instructions, see *Oracle® Fusion Middleware Installing Oracle Forms and Reports* for Release 12.2.1.4, at <https://docs.oracle.com/en/middleware/developer-tools/forms/12.2.1.4/install-fnr/installing-and-configuring-oracle-forms1.html#GUID-EBBA8709-F563-469C-9D2F-F308AF4E60C5>.

Create the Repository Creation Utility

For this task, you need the following database server details:

- Host name
- Port
- Service name
- Password for the SYS account

For instructions, see *Oracle® Fusion Middleware Installing Oracle Forms and Reports* for Release 12.2.1.4, at <https://docs.oracle.com/en/middleware/developer-tools/forms/12.2.1.4/install-fnr/installing-and-configuring-oracle->

[forms1.html#GUID-26210D99-290E-446D-B972-A81EA5C90CF9](#). In this link, read the first step as "Run FMW_HOME/oracle_common/bin/rcu.bat."

You can accept most default values, with the exception noted below.

Select Components

1. Select the option **Oracle Platform Security Services**.
2. Enter the prefix name for the domains in the following format:

`servernameFR`

Schema Password

- Provide a schema password and make note of the schema name and password because they are required to configure the FRDomain.

Configure the FRDomain

For instructions, see *Oracle® Fusion Middleware Installing Oracle Forms and Reports for Release 12.2.1.4*, at <https://docs.oracle.com/en/middleware/developer-tools/forms/12.2.1.4/install-fnr/installing-and-configuring-oracle-forms1.htm#GUID-E3EC8981-780D-4D15-AA01-1FF91CDDCF59>.

Make sure you type `FRDomain` (case-sensitive) in the desired domain home path.

When configuring the FRDomain, it is recommended to use the default port 7001 for Admin Server and 9001 or 9002 for managed servers (`WLS_FORMS` and `WLS_REPORTS`).

You can accept most default values, with the exception noted below.

After completing the FRDomain configuration, follow instructions in [Run ohs_updateInstances](#).

Templates

1. Select the check box for the following templates:
 - Oracle Forms [forms]
 - Oracle Reports Application [reports]
 - Oracle Enterprise manager [em]
 - Oracle HTTP Server (Collocated) [ohs]
 - Oracle Reports Tools [ReportsToolsComponent]
 - Oracle Reports Server [ReportsServerComponent]
 - Oracle Reports Bridge [ReportsBridgeComponent]
 - Oracle JRF [oracle_common]
 - Weblogic Coherence Cluster Extension [wlserver]

Add Administrator Account

1. Provide a password for the WebLogic user account and make note of this password because it is required to install Oracle Thesaurus Management System and/or Oracle Clinical.

Domain Mode and JDK

1. Select the **Production** option under Domain Mode.

Database Configuration Type

1. Provide the Repository Creation Utility schema name that you defined in [Create the Repository Creation Utility](#) and add `_STB` to this name. For example, if the schema name you defined was `OCRDCDEV`, provide `OCRDCDEV_STB`.
2. Provide the schema password that you defined in [Create the Repository Creation Utility](#).
3. Click **Get RCU Configuration** to continue.

Advanced Configuration

1. Select all check boxes.

Administration Server

1. Select the **Enable SSL** check box.

Node Manager

1. Define the Node Manager username and password and make note of them because they are required to install Oracle Thesaurus Management System and/or Oracle Clinical.

Managed Servers

1. Select the **Enable SSL** check box for all managed servers.

Assign Servers to Machines

1. Move AdminServer from the Servers list to the Machines list.

System Components

1. Click **Add** to add the OHS component.
 - a. For System Component, specify **ohs1**.
 - b. For the Component Type, select **OHS**.

OHS Server

 **Note:**

It is recommended to use the standard HTTP/HTTPS ports 80 or 443. If you plan to use other ports, these need to be modified accordingly during the installation process.

1. For Listen Address, specify the machine name, including the domain.
2. Change the Listen Port value to **80**.
3. Change the SSL Listen Port value to **443**.

Domain Frontend Host

1. Copy the URL from the **Plain** field and paste it in the **SSL** field.
2. In the **SSL** field, change `http` to `https`, and add the SSL port if the non-standard port 443 is used.

3. Select the **SSL** as the default option.

Assign System Components

1. Move **ohs1** from the System Component list to the Machines list.

For more information, see:

- [Run ohs_updateInstances](#)

Run ohs_updateInstances

Perform the following steps:

1. Start the Node Manager.
`$ORACLE_HOME\user_projects\domains\FRDomain\bin\startNodeManager.cmd`
2. Start the admin server.
`$ORACLE_HOME\user_projects\domains\FRDomain\bin\startWebLogic.cmd`
3. Run WLST.
`$ORACLE_HOME\oracle_common\common\bin\wlst.cmd`
4. Connect to admin server.
`connect('adminserver_username','adminserver_password','t3://
host_name:FRDomain_adminserver_port')`
5. Run the following command:
`ohs_updateInstances()`

Enable SSL Between a Browser and Oracle HTTP Server

Create the following SSL (HTTP Secure Socket Layer) configuration: from users' browsers, HTTPS to Oracle HTTP Server (Web proxy), then HTTP to Oracle WebLogic Server.

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

- [Enable SSL Between a Browser and Oracle HTTP Server Using a Certificate Authority](#)
- [Enable SSL Between a Browser and Oracle HTTP Server With Self Signing](#)
This may be useful if you want to set up HTTPS with a demo certificate for internal testing purposes.

Enable SSL Between a Browser and Oracle HTTP Server Using a Certificate Authority

An Oracle Wallet is a container that stores your credentials, such as certificates, trusted certificates, certificate requests, and private keys.

The Oracle Thesaurus Management System Installer automatically enables traffic from Oracle HTTP Server to Oracle WebLogic Server.

 **Note:**

Do all steps in this section with the same user account you have used in the previous steps in this chapter. You must have administrator privileges on the machine.

Follow these steps in order:

- [Create an Oracle Wallet and Generate a Certificate Request](#)
- [Obtain Trusted Certificate and User Certificate from Certificate Authority](#)
- [Add the User Certificate and Trusted Certificate to an Oracle Wallet](#)
- [Edit the Oracle HTTP Server Configuration File](#)

Create an Oracle Wallet and Generate a Certificate Request

To create an Oracle Wallet:

1. Create an Oracle Wallet: <https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/asadm/managing-keystores-wallets-and-certificates.html#GUID-DA49F413-AB8F-46E6-924C-EC4CD8F96AC1>
2. Generate a Certificate Request: <https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/asadm/managing-keystores-wallets-and-certificates.html#GUID-70174F92-035D-4829-9DB8-8118964BFA9D>

Obtain Trusted Certificate and User Certificate from Certificate Authority

 **Note:**

Certificate signed using MD5 algorithm is no longer supported in Oracle HTTP Server (12.2.1.4). You must get the certificate signed using Secure Hashing Algorithm 2 (SHA-2).

1. Obtain the certificates from the Certificate Authority as described in [Get a CA Certificate for HTTPS](#).

Depending on the Certificate Authority, you will need to send either the certificate request file generated in the previous section or you will need to copy and paste the text in that file.

Add the User Certificate and Trusted Certificate to an Oracle Wallet

For information, see <https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/asadm/managing-keystores-wallets-and-certificates.html#GUID-70174F92-035D-4829-9DB8-8118964BFA9D>

Edit the Oracle HTTP Server Configuration File

WebLogic Server installation creates a default, unsigned SSL wallet file for OHS. Its location is specified in the configuration file (`ssl.conf`) loaded at startup from the `oracle_instance\config\OHS\ohs1` directory.

1. Make a backup copy of `ssl.conf`, which is located where Fusion Middleware is installed in `%ORACLE_HOME%`:

```
%ORACLE_HOME%\user_projects\domains\FRDomain\config\fmwconfig\components\OHS\ohs1

%ORACLE_HOME%
\user_projects\domains\FRDomain\config\fmwconfig\components\OHS\instances\ohs1
```

2. Open `ssl.conf` in a text editor.
3. Find the string `#Path to the wallet` and comment out the default location that follows it.

```
SSLWallet ${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/keystores/
default
```

4. Replace the above string (in bold) with the path to the directory you created:

```
SSLWallet %ORACLE_HOME%
\user_projects\domains\FRDomain\config\fmwconfig\components\OHS\ohs1\keystores
```

5. Stop and start Oracle HTTP Server (OHS) to load the configuration change:

- a. To stop OHS:

```
%ORACLE_HOME%\user_projects\domains\FRDomain\bin\stopComponent ohs1
```

- b. To start OHS:

```
%ORACLE_HOME%\user_projects\domains\FRDomain\bin\startComponent ohs1
```

Note:

`ohs1` is the name of OHS component provided while configuring `FRDomain`.
`%ORACLE_HOME%` is the location of installed FMW.

6. Test that you can connect from a browser to your virtual host in HTTPS URL:

```
https://host.your_company_domain
```

Enable SSL Between a Browser and Oracle HTTP Server With Self Signing

This may be useful if you want to set up HTTPS with a demo certificate for internal testing purposes.

For more information, see *How to create a Self Signed Certificate to enable SSL between the Browser and HTTP Server in Oracle Clinical 5.2* (Document ID 2473240.1) on My Oracle Support.

For more information, see:

- [Edit the Oracle HTTP Server Configuration File](#)

Edit the Oracle HTTP Server Configuration File

WebLogic Server installation creates a default, unsigned SSL wallet file for OHS. Its location is specified in the configuration file (`ssl.conf`) loaded at startup from the `oracle_instance\config\OHS\ohs1` directory.

1. Make a backup copy of `ssl.conf`, which is located where Fusion Middleware is installed in `%ORACLE_HOME%`:

```
%ORACLE_HOME%\user_projects\domains\FRDomain\config\fmwconfig\components\OHS\ohs1
```

```
%ORACLE_HOME%\user_projects\domains\FRDomain\config\fmwconfig\components\OHS\instances\ohs1
```

2. Open `ssl.conf` in a text editor.
3. Find the string `#Path to the wallet` and comment out the default location that follows it.

```
SSLWallet  ${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/keystores/default
```

4. Replace the above string (in bold) with the path to the directory you created:

```
SSLWallet %ORACLE_HOME%\user_projects\domains\FRDomain\config\fmwconfig\components\OHS\ohs1\keystores
```

5. Stop and start Oracle HTTP Server (OHS) to load the configuration change:

- a. To stop OHS:

```
%ORACLE_HOME%\user_projects\domains\FRDomain\bin\stopComponent ohs1
```

- b. To start OHS:

```
%ORACLE_HOME%\user_projects\domains\FRDomain\bin\startComponent ohs1
```

Note:

`ohs1` is the name of OHS component provided while configuring FRDomain.

`%ORACLE_HOME%` is the location of installed FMW.

6. Test that you can connect from a browser to your virtual host in HTTPS URL:

```
https://host.your_company_domain
```

Apply Patch on the Application Server



Note:

Apply these patches only after applying OCT CPU 2021.

Apply the following patches:

- Oracle Java Database Connectivity (Patch 32720458)
- Oracle WebLogic Server (Patch 33691226)

For instructions on applying a patch, see the corresponding Readme in My Oracle Support.

Modify the tnsnames.ora File on the Application Server

1. Go to the following tnsnames.ora location on the application server:
%ORACLE_HOME%\user_projects\domains\FRDomain\config\fmwconfig
2. Make sure the tnsnames.ora file has an entry for each database that matches the database's service name.
3. Copy the edited tnsnames.ora file from FRDomain_Home to %ORACLE_HOME%\network\admin (for example, to C:\Oracle\Middleware\Oracle_Home\network\admin).

Configure Firewall on the Application Tier

If you have a firewall in your environment:

- Open the following ports:
 - HTTP: 80 (or listen from httpd.conf)
 - HTTPS: 443 (or listen from ssl.conf)
 - TMS Browser/RDC Onsite: 7221
 - Oracle Forms: 9001
 - Oracle Reports: 9002
 - Forms Admin Server: 7001
 - OPADomain Admin Server: 7101

Test Connectivity to Databases for Forms and Reports Servers

The Oracle Thesaurus Management System database must be able to communicate with the application servers.

For more information, see:

- [Test the Connection from the Application Servers to the Database](#)
- [Troubleshoot Network Connection Issues](#)

Test the Connection from the Application Servers to the Database

To ensure that you can connect to the database from each application server:

1. Open a Microsoft DOS command window.
2. Use SQL*Plus to verify that you can connect to the database:

```
sqlplus system/password@dbname
```

Troubleshoot Network Connection Issues

If the system returns a connection error, you must resolve this problem before continuing with the installation of Oracle Thesaurus Management System.

Possible causes of errors include:

- The computer is not physically connected to the network.
- One of the databases does not exist.
- The network protocol software is not loaded on the computer. Try a remote login to check.
- The database or SQL*Net listener process is not started on the server.
- An incorrect connect string (service name), user ID, or password was entered.
- The tnsnames.ora file is not present in the correct directory or does not contain the correct entries.

Restart the Computer

To ensure that all configuration changes for the Oracle Application Server are initialized:

- Restart the computer before you continue with the next task in the installation process.

4

Creating a TMS Database

This chapter includes:

- [Install the TMS Database Server](#)
- [Review Database Requirements and Recommendations](#)
- [Install TMS Database Objects](#)
- [Create a TMS Administrator User Account](#)
- [Register Databases Integrated with Oracle Clinical](#)
- [Load Dictionaries](#)

Install the TMS Database Server

The Oracle Thesaurus Management System Database Server code must be installed on Windows on the same computer as the TMS Application Tier. You must install the server first, then create one or more databases, and then install the Application Tier.

For more information, see:

- [Gather Required Information for TMS Database Server](#)
- [Start the TMS Database Server Installer](#)
- [Attend to the TMS Database Server Code Installation Screens](#)

Gather Required Information for TMS Database Server

Make sure you have the information below, which is arranged in the order it is prompted for by the Installer during a fresh installation. The order for upgrades is somewhat different.

 **Note:**

You must install the Oracle Thesaurus Management System database server before you install or upgrade the Oracle Thesaurus Management System database.

- **OPA Home:** the directory where Oracle Thesaurus Management System will be installed; by default:
c:\opa_home

 **Note:**

- If TMS is integrated with Oracle Clinical 5.4.0 and Oracle Clinical has already been installed, OPA_HOME may already exist and set to something other than c:\opa_home. You must continue using the already created OPA_HOME with the value set by the previous installation.
- Same OPA_HOME or similar application home name was already created when Oracle Thesaurus Management Database Server was installed. You must continue using the already created OPA_HOME with the value set by the previous installation.

Start the TMS Database Server Installer

To install the TMS Database Server:

1. Log in as a user with system administrator privileges.
2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the following file as an administrator:

Disk1\install\setup.exe

The Installer opens to the Welcome screen.

 **Note:**

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

 **Note:**

Although the Welcome screen also shows a button for deinstalling products, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

4. In the Select a Product to Install page, select **Oracle Thesaurus Management System Database Server 5.4.0.0.x**.

Attend to the TMS Database Server Code Installation Screens

The Installer guides you through the installation and configuration of the TMS database server. Provide the information you assembled in "[Gather Required Information for TMS Database Server](#)."

Review Database Requirements and Recommendations

A TMS database can be installed on Windows, UNIX, Solaris, or Itanium. You must install the TMS Database Server (always on Windows on the Application Tier where TMS Front End will be installed) before installing a TMS database.

Before you install the TMS database component, review the following requirements and recommendations for each TMS database you plan to install.

- [Start with a New Database Instance](#)
- [Accept Connections as a Service](#)
- [Check Required Tablespaces](#)
- [Use the Database Configuration Assistant](#)
- [Select Required Components](#)
- [Use Automatic Memory Management](#)
- [Set Initialization Parameters](#)

Start with a New Database Instance

Oracle recommends that you set up a new database instance so that neither TMS nor its installation process interferes with other applications. However, you can install TMS on an existing database instance.

Accept Connections as a Service

Choose to configure the database to accept connections as a service instead of a SID. Service name **requirements** for Oracle Thesaurus Management System include:

- The service name must be less than 15 characters long.
- It must not include the domain.
- It must be **all lowercase**.

Check Required Tablespaces

[Table 4-1](#) lists the tablespaces, along with their minimum size, required for TMS. Make sure the database contains these tablespaces. The best practice is to create them with the *Autoextend On* option, to avoid running out of space.

In addition, you may need to increase the minimum sizes for your installation.

Table 4-1 Required Tablespaces and Sizes

Tablespace	Minimum Size
SYSTEM	900 MB
TEMP	100 MB
UNDOTBS1	700 MB
USERS	500 MB

Table 4-1 (Cont.) Required Tablespaces and Sizes

Tablespace	Minimum Size
SYSAUX	600 MB

Use the Database Configuration Assistant

To create a new database, use the Oracle Database Configuration Assistant. For instructions about the Database Configuration Assistant, see the Oracle Database 19c Release (19.3.0.0) documentation, including online help and the Oracle Database Installation Guide for the appropriate version and operating system.

Notes:

- Use the Custom Database installation option.
- The following parameters are not listed under All Initialization Parameters. Click **Show Advanced Parameters** to set the following parameters as described in [Set Initialization Parameters](#) :
 - Db_cache_size
 - Db_files
 - Java_pool_size
 - Job_queue_process
 - Large_pool_size
- The Custom installation option allows access to the Database Storage screen, where you can expand the Tablespaces folder in the tree on the left side of the screen and edit the following tablespaces as required; see [Check Required Tablespaces](#)

Select Required Components

When you create a TMS database, select the following mandatory components:

- Oracle Text
- Oracle JVM
- Oracle XML DB

Use Automatic Memory Management

Oracle recommends that you use the Oracle Database Automatic Memory Management feature for a new or an upgraded TMS database.

Set Initialization Parameters

For information, see details under Initialization Parameters option in [Install and Configure Oracle Database](#).

Install TMS Database Objects

This section describes how to add TMS database objects to each Oracle database that you will use for TMS.

For more information, see:

- [Unlock Accounts Before Installing the TMS Database](#)
- [Gather Required Information for TMS Database Objects](#)
- [Stop the PSUB Process \(If Integrated with Oracle Clinical\)](#)
- [Start the Installer](#)
- [Attend to the TMS Database Installer Screens](#)
- [Check the Database Log File](#)

Unlock Accounts Before Installing the TMS Database

The Installer prompts you for passwords to several system accounts. In Oracle Database, some accounts are locked. Before you run the Installer, check these accounts. Unlock them if necessary. You will need to set their passwords when you run the Installer.

Make sure the following accounts are unlocked: SYSTEM, CTXSYS, and SYS.

When you have finished installing the database, relock any accounts that were locked except for SYSTEM and SYS, which should not be locked.

Gather Required Information for TMS Database Objects

Before you start the installer, be sure you have the following information:

1. Home Details: The full path to the OPA_HOME or similar application home name on your application server; by default:

c:\opa_home

Note:

- If TMS is integrated with Oracle Clinical 5.4.0 and Oracle Clinical has already been installed, OPA_HOME may already exist and set to something other than C:\opa_home. You must continue using the already created OPA_HOME with the value set by the previous installation.
 - Same OPA_HOME or similar application home name was already created when Oracle Thesaurus Management Database Server was installed. You must continue using the already created OPA_HOME with the value set by the previous installation.
2. Oracle Database Client Home: Full path to ORACLE_HOME. For example, C:\Oracle\Middleware\Oracle_Home.
 3. TMS Database Server Code Home Directory: The system detects the location and enters the value for you. By default, it is C:\opa_home\tms.

4. Database Details: Enter the database server name, database port number, and database service name. It must be a valid TNS entry in your tnsnames.ora file.
5. NLS Settings: Enter the NLS settings for the database; see [Choose a Character Set](#) . Oracle strongly recommends that you use UTF8. The default values are:
 - American_America.UTF8
 - DD-MON_RRRR
6. Directory for data tablespace data files: Enter the path to the directory on the database server where the data tablespace datafiles for the application should be created during the installation. The Installer does not validate the value and you must use the following syntax, including a trailing slash, depending on your operating system; for example:
 - UNIX: */u01/oradata/dbname/*
 - Windows: *drive:\oradata\dbname*
7. Directory for index tablespace data files: Enter the path to the directory on the database server where the index tablespace datafiles for the application should be created during the installation. The Installer does not validate the value and you must use the following syntax, including a trailing slash, depending on your operating system; for example:
 - UNIX: */u01/oradata/dbname/*
 - Windows: *drive:\oradata\dbname*
8. Enter and confirm passwords for the following accounts:
 - SYS
 - SYSTEM
 - CTXSYS
 - OPA
 - RXC
 - TMS
 - TMSPROXY
9. Ignore tablespace creation errors:
 - Select **Yes** if the database already has the TMS tablespaces created.
 - Select **No** if the TMS tablespaces do not exist.
10. The Installer gives you information that you should make a note of.

Stop the PSUB Process (If Integrated with Oracle Clinical)

If your TMS installation is integrated with Oracle Clinical, you must stop the PSUB process before upgrading the database. See the Oracle Clinical Administrator's Guide for instructions.

Start the Installer

To install a TMS database:

1. Log in as a user with system administrator privileges in the application tier.

2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the file as an administrator:

```
Disk1\install\setup.exe
```

The Installer opens to the Welcome screen.

 **Note:**

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

 **Note:**

Although there is a button for deinstalling products on the Welcome screen, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

4. In the Select a Product to Install page, select **TMS Database Install 5.4.0.0.x**.

Attend to the TMS Database Installer Screens

The Installer guides you through the installation and configuration of the TMS database.

Check the Database Log File

For each database installation you perform, the Installer creates the following log file in the INSTALL directory (<OPA_HOME>\tms\54\install):

```
tmsinst_database_name.log
```

Always check the log file for status, messages, or errors.

Create a TMS Administrator User Account

This section describes creating an administrator-level TMS user, which is defined as a user with the OPA_ADMIN role. Users with this role have access to the Define Users window in TMS, which enables them to create additional users in the database.

To create a new Oracle account for a user:

1. Connect to SQL*Plus as system and run the following script:

```
<OPA_HOME>\tms\54\install\tmsadduser.sql
```
2. Enter a user ID.
3. Enter a password for this user. Do not use the identified externally clause; explicitly assign a password.
4. Grant the OPA_ADMIN role to the user:

```
grant OPA_ADMIN to user_id
```

Register Databases Integrated with Oracle Clinical

If you are installing TMS in the same database as Oracle Clinical, register the database by running the TMS Installer.

For more information, see:

- [Gather Required Information to Register Databases](#)
- [Start the Installer](#)
- [Attend to the TMS Database Registration Screens](#)

Gather Required Information to Register Databases

Before you start the installer, be sure you have the following information:

1. Home Details: The full path to the OPA Home location on your application server; by default:
C:\opa_home
2. Oracle Database Client Home: Full path to ORACLE_HOME; for example:
C:\Oracle\Middleware\Oracle_Home
3. TMS Server Code Home Directory: The system detects the location and enters the value for you. By default, it is c:\opa_home\tms.
4. Enter and confirm passwords for the following accounts:
 - SYS
 - RXC
 - TMS
5. Global name: Enter the global name of the TMS database; for example:
service_name
To find out the global name, log in to SQL*Plus and enter:

```
select * from global_name
```
6. Global name: Enter the global name of the OC database.

Start the Installer

To register your TMS database for use with Oracle Clinical:

1. Log in to the application tier server as a user with system administrator privileges.
2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the following file as an administrator:
Disk1\install\setup.exe
The Installer opens to the Welcome screen.

 **Note:**

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

 **Note:**

Although there is a button for deinstalling products on the Welcome screen, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

Attend to the TMS Database Registration Screens

The Installer guides you through registering a TMS database.

1. Product to install: **TMS Database Registration 5.4.0.0.x**.
2. Follow the instructions on the installation screens, providing the information you gathered in [Gather Required Information to Register Databases](#).
3. The Installer gives you information that you should make a note of.
4. When you are ready, install.

Load Dictionaries

See the Oracle Thesaurus Management System User's Guide for information about loading dictionaries.

5

Installing Oracle Thesaurus Management System Application Components

The Oracle Thesaurus Management System Front End includes:

- The Oracle Thesaurus Management System Forms Server, which is required for the primary Oracle Thesaurus Management System application
- The OPAXDO service for reports generation

You must install the TMS Server code and database objects before you install the Front End.

If Oracle Clinical Front End or previous versions of TMS Front End (which are supported for Front End upgrade) was already installed on the application server, follow instructions in [Upgrade the TMS Front End](#) as the needed components were already created by previous Oracle Clinical or TMS Front End installation.



Note:

Before installing TMS Front End, you must start the FRDomain services (AdminServer, WLS_FORMS, and WLS_REPORTS) so that all required components will be created. After the FRDomain services have started, stop all these as the TMS Front End installation require to have all the FRDomain services stopped.

This section includes:

- [Restart Computer and Stop All Servers](#)
- [Installing the TMS Front End](#)
- [Make the Java Runtime Environment Available for Download](#)
- [Installing the TMS Reports Server](#)
- [Verifying the Application Tier Installation](#)
- [Verify and Fix Environment Variables](#)
- [Set Up Automatic Startup](#)
- [How to Start Servers Manually](#)
- [Verify the Application Tier Installation](#)
- [Stopping Servers](#)

Restart Computer and Stop All Servers

Restart the computer and then stop all FRDomain services in case these are running:

1. Restart the computer.

2. Stop all servers in case autostart is configured. For instructions, see [Stopping Servers](#).

Installing the TMS Front End

TMS Front End installation processes require that the FRDomain Admin Server, node manager, and managed servers are stopped.

The TMS Report Server must be installed on the same machine as the TMS Front End and requires that the WebLogic FRDomain Admin Server and node manager are running during installation.

For more information, see:

- [Gather Required Information for TMS Front End](#)
- [Start the Installer](#)
- [Attend to the TMS Front End Installer Screens](#)
- [Find the Installation Log Files](#)
- [Restart the Computer](#)
- [Add WebLogic Data Sources If Using Multiple Databases](#)

Gather Required Information for TMS Front End

Have the following information ready to enter in the Installer screens:

- Home Details: Enter the following:
 - Name: OPA_HOME
 - Path: c:\opa_home or any desired path

Note:

- * OPA_HOME was created after you installed the TMS Database Server (see "[Install the TMS Database Server](#)").
- * If TMS 5.2.x/5.3.x or Oracle Clinical 5.2.x/5.4 has already been installed on this application server, OPA_HOME may already be set to C:\opapps52 or similar path, and you must use this for TMS 5.4.x too. Do not create a new OPA_HOME if this was already created. The TMS 5.4.x components will be placed by the installer under this OPA_HOME at the specified location for the TMS 5.4.x release.

- Java home is the location where JDK 1.8.0_251 or higher was installed.
- Oracle Fusion Middleware home directory; for example:
C:\Oracle\Middleware\Oracle_Home
- Oracle Fusion Middleware User Projects directory; for example:
C:\Oracle\Middleware\Oracle_Home\user_projects

- OPA home directory should be the same path as OPA_HOME; by default:
C:\opa_home
- OPADomain Administration Server configuration details:
 - Listen address
 - Listen port number
 - SSL listen port number
 - OPADomain WebLogic username
 - OPADomain WebLogic password
- OPADomain Node Manager configuration details:
 - Listen address
 - Listen port number
 - WebLogic username
 - WebLogic Server password
- OPADomain Default Coherence Cluster Listener Port: Installer default value is 7575. For FRDomain, the default value is 7574. Default Coherence Cluster Listener Port should be different between FRDomain and OPADomain.
- Database details (this will be used to create a data source under OPADomain):
 - *Server.Domain*; for example:
servername.your_company.com
 - Port number
 - Database service name
 - TMS Proxy Password (tmsproxy)—the password you created when installing Oracle Thesaurus Management System database objects.
- Oracle Fusion Middleware Repository Creation Utility (RCU) configuration details:
 - Database host
 - Database port
 - Service name
 - Schema prefix
 - Database administrator username and password
 - RCU schema password
- Wallet location: for the Wallet you created in [Enable SSL Between a Browser and Oracle HTTP Server](#). (You can browse for it on screen.)
- Managed Server configuration details:
 - Number of Managed Servers
 - Listen port start index
- Online help URL: If you have customized the online help, the URL where the customized online help is located.

Start the Installer

To install the TMS Front End:

1. Log in as a user with system administrator privileges.
2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the following file as an administrator:

```
Disk1\install\setup.exe
```

The Installer opens to the Welcome screen.

 **Note:**

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

 **Note:**

Although there is a button for deinstalling products on the Welcome screen, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

Attend to the TMS Front End Installer Screens

The Oracle Universal Installer guides you through the installation and configuration of the TMS Front End.

1. Select a Product to install: **Oracle Thesaurus Management System Front End 5.4.0.0.x**.
2. Choose Install Type: Select **Yes** to install a Oracle Thesaurus Management Front End.
3. Available Product Components: Select **Oracle Thesaurus Management System Front End 5.4.0.0.x**.

 **Note:**

Although the Installer gives you the option install the TMS Server (database server code) at the same time, do not select this option. You must install the TMS Server first, then the database objects, and then the Front End.

4. Follow the instructions on the installation screens, providing the information you assembled in [Gather Required Information for TMS Front End](#).

5. **Summary:** The Summary screen provides information about the global settings, languages, space requirements, and products for this installation.

Review the installation details to verify that they are correct. To revisit earlier installation screens and make changes, click **Back**.

When you are ready to continue, click **Install**.

6. **Install:** The Installer copies the files onto the server, completes the setup and configuration tasks, and generates a log file of this installation.

In addition, the Install screen displays the **location of the log file** that records the results of the installation activities for this session. Make a note of this information so you can view the log file after the installation.

7. **End of Installation:** The End of Installation screen reports whether the installation was successful. In addition, this screen lists the URLs that you use to access the TMS application.

The Installer saves the URL information in the following file:

```
%OPA_HOME%\log\setup.txt
```

When you have finished reviewing the installation information, click **Exit**.

Find the Installation Log Files

During the installation of an Oracle Health Sciences component, the Oracle Universal Installer generates the following log file:

```
installActionstimestamp.log
```

On a Windows installation, the log files are located at:

```
\Oracle\Inventory\logs
```

For example:

```
C:\Program Files\Oracle\Inventory\logs
```

All generated log files have a timestamp appended to the name. For example:

```
installActions2013-04-30_11-22-52AM.log
```

If you encounter any error, contact Health Sciences Support.

Restart the Computer

To ensure that all configuration changes are initialized, you must restart the computer before you continue with the next task in the installation process or before you install Oracle Thesaurus Management System Reports Server.

Add WebLogic Data Sources If Using Multiple Databases

If you plan to use more than one database, you must create a WLS data source for each additional database. The same data source connection can be used for running TMS reports.

Instructions are in the Oracle Thesaurus Management System User's Guide and the Oracle Clinical Remote Data Capture Onsite Administrator's Guide.

Make the Java Runtime Environment Available for Download

Oracle Thesaurus Management System requires that Java Standard Edition (SE) Runtime Environment (JRE) exist on the user's computer.

The Oracle Thesaurus Management System Launch page is configured to prompt users to install JRE if it does not exist on their computer. To make this work, you need to download JRE into the `OPA_HOME\html` directory and rename it.

1. If you have not already done so, download the software following instructions in [Download the Java Runtime Environment](#) .
See that section if you are using the 64-bit version.
2. Copy the downloaded file from the staging area to `OPA_HOME\html`.
3. Rename the file to `sunjpi.exe`.

Installing the TMS Reports Server

This section describes installing and configuring a Reports Server. The TMS Reports Server runs on Oracle Forms and Reports 12c (12.2.1.4). It schedules batch jobs such as synchronization.

You must install the TMS Front End before installing the TMS Report Server.

Note:

If you have already installed the Oracle Clinical Reports Server on this machine, you do not need to install the TMS Reports Server.

The Installer prevents you from installing two Reports Servers with the same name.

For more information, see:

- [Start the WebLogic FRDomain Admin Server](#)
- [Gather Required Information for TMS Reports Server](#)
- [Start the TMS Report Server Installer](#)
- [Attend to the TMS Reports Server Installation Screens](#)
- [Review the Installation Log File](#)
- [Start the TMS Report Server](#)

Start the WebLogic FRDomain Admin Server

The WebLogic FRDomain Node Manager and Admin Server must be running when you install the Reports Server.

At the DOS command prompt, do the following:

1. Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run the `startWebLogic.cmd`.
2. Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `startNodeManager.cmd`.

Gather Required Information for TMS Reports Server

Have the following information ready to enter in the Installer screens:

- Home Details: Enter the following:
 - Name: `OPA_HOME`
 - Path: `c:\opa_home` or the path defined for `OPA_HOME`
- Oracle Fusion Middleware home directory; for example:
`C:\Oracle\Middleware\Oracle_Home`
- Oracle Fusion Middleware User Projects directory; for example:
`C:\Oracle\Middleware\Oracle_Home\user_projects`
- OPA home directory; for example:
`c:\opa_home` or the path defined for `OPA_HOME`
- WebLogic username and password
- Report Server name
- Report Server output directory

Start the TMS Report Server Installer

To install the TMS Report Server:

1. Log in as a user with system administrator privileges.
2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the following file as an administrator:

```
Disk1\install\setup.exe
```

The Installer opens to the Welcome screen.

Note:

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

 **Note:**

Although there is a button for deinstalling products on the Welcome screen, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

4. In the Select a Product to Install page, select **Oracle Thesaurus Management System Report Server 5.4.0.0.x**.

Attend to the TMS Reports Server Installation Screens

The Oracle Universal Installer guides you through the installation and configuration of the TMS Reports Server.

1. Follow instructions on the installation screens, providing the information you gathered [Gather Required Information for TMS Reports Server](#).
2. Choose Install Type: Select **Yes** to install a fresh instance of Oracle Thesaurus Management System Report Server.
3. For the question "Do you want to create Report Server Component?", select **Yes**.
4. Report Server name: Enter a unique name across your installation. If you try to create a second Reports Server with the same name as the first, the Installer detects it and prevents it.
5. Summary: The Summary screen provides information about the global settings, languages, space requirements, and products for this installation.

Review the installation details to verify that they are correct. To revisit earlier installation screens and make changes, click **Back**.

When you are ready to continue, click **Install**.

Review the Installation Log File

Review the generated installation log file, `installActionstimestamp.log`, for errors.

This is the name of the most current log file. Earlier files have a timestamp appended to the name.

Location: `\Oracle\Inventory\logs`

For example:

`C:\Program Files\Oracle\Inventory\logs`

If you encounter any error, contact Health Sciences Support.

Start the TMS Report Server

After you install the TMS Report Server, you must start it. Also, start the FRDomain WLS_FORMS and WLS_REPORTS services.

1. Start the WLS_FORMS and WLS_REPORTS services in the WebLogic Forms console at `http://host:7001/console`.

2. To start the report server, go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `startComponent.cmd` for *report_server_name*.

Where, *report_server_name* is the name you had used when the Reports Server was installed.

Verifying the Application Tier Installation

Verify that the following URL works and you can log into the application:



Note:

Before accessing the URL, make sure the OHS instance and all services are running. For information on how to start the required services, see [How to Start Servers Manually](#).

- Forms-based TMS—`https://host/opa54/launch.htm`

Verify and Fix Environment Variables

Check values and correct them, if required, as mentioned below:

- [Check Values](#)
- [Correct Values](#)

Check Values

To check variable values:

1. Open a DOS prompt window.
2. Run:

```
ORACLE_HOME\user_projects\domains\OPADomain\bin\setDomainEnv.cmd
```

For example:

```
C:\Oracle\Middleware\Oracle_Home\user_projects\domains\OPADomain\bin\setDomianEnv.c  
md
```

The script should run with no errors.

3. Inspect the value of `JAVA_HOME`:
 - a. At the DOS command prompt, type: `set JAVA_HOME`. You should see the location where you installed JDK following instructions in [Install Oracle Java Development Kit](#).
 - b. Enter: `dir %java_home%`. You should see the directory specified as your `JAVA_HOME` containing a file called `src.zip` and four subdirectories: **jre**, **lib**, **bin**, and **include**.

If you do not see these things, you will need to add them as directed in [Correct Values](#).

If JAVA_HOME contains any spaces or if any of the directories in its path are greater than 8 characters, you will need to correct them as directed in [Correct Values](#).

4. Inspect the value of JAVA_VM. At the command prompt, enter: `set JAVA_VM`. You should see something like `JAVA_VM=-server`. If not, correct as directed in [Correct Values](#).

Correct Values

To correct any of the above problems:

1. Navigate to `ORACLE_HOME\oracle_common\common\bin`.
2. Back up `commEnv.cmd`.
3. Open `commEnv.cmd` in a text editor.
4. The first `set` command in the file, before any other `set` command, must identify the JAVA_HOME value. For example:

```
set JAVA_HOME=c:\app\java\jdk
```
5. Find:

```
set JAVA_VM=-client
```

change it to:

```
set JAVA_VM=-server
```
6. Close the DOS window and open a new one, then repeat the steps in [Check Values](#).

Set Up Automatic Startup

It is possible to configure any Windows service to restart itself upon failure. These are standard options available when configuring a Windows service in the context of Windows Services Manager.

However, it is important to understand that Windows Services Manager only monitors the service's JVM process. If the JVM process fails (shuts down), then Windows Services Manager will attempt to restart it. But there are some scenarios where the WebLogic Admin Server or Managed Server may go into an unhealthy or failed state while the JVM is still running. The Windows Service Manager will not know to restart the process in these cases, whereas if the Admin Server and Managed Server had been started using the WebLogic Node Manager, Node Manager would recognize such a state and restart the process.

Oracle recommends starting the Admin and Managed Servers through the Node Manager using python scripts and then configuring the Windows server to execute the python scripts at startup.

To start servers manually, see [How to Start Servers Manually](#).

This section includes:

- [Create boot.properties](#)
- [Increase the Delay for Auto Start OPADomain and FRDomain](#)
- [Set Up Scripts to Execute Automatically at Machine Startup](#)

- [Test Autostart](#)

Create boot.properties

Check if the boot.properties file exists in
Oracle_Home\user_projects\domains\FRDomain\servers\AdminServer\security.

If not, create it as a plain text file with the following contents:

```
username = weblogic_user_name
password = weblogic_user_password
```

By default, the WebLogic user name is *weblogic*. This user name and password will get encrypted after all services are started.

Increase the Delay for Auto Start OPADomain and FRDomain

For OPADomain and FRDomain to start successfully, depending on the performance in your environment, you may want to increase the delay by which OPADomain and FRDomain start to allow time for Node Manager to start first.

1. Go to *OPA_HOME\config\opa_setup_scripts* directory.
2. Open the *autostartfrdomain.cmd* and *autostartopadomain.cmd* files.
3. In each file, find the line `PING 127.0.0.1 -n 30`, and change the value from 30 to 60.
4. Save and close the files.

Set Up Scripts to Execute Automatically at Machine Startup

Set up the Task Scheduler to start the FRDomain and OPADomain at startup:

1. From **Start**, then **Control Panel**, then **Administrative Tools**, open **Task Scheduler**.
2. Select **Create Basic Task** on the right side of the Task Scheduler.
3. Enter the following values:
Name: Oracle FRDomainNM Autostart
Trigger: When the computer starts
Action: Start a program
Select: *opa_home\config\opa_setup_scripts\autostartfrdomainNM.cmd*
4. Click **Next** and then **Finish** to complete creation of the scheduled task.
5. Find the task **Oracle Domain Autostart** under the Task Scheduler Library list. Right-click on the task you just created and select **Properties**.
6. On the **General** tab, select **Run whether user is logged on or not**.
7. Click **OK**.
8. When prompted, enter the user name and password.
9. Repeat the above steps for OPADomain Node Manager, OPADomain, and FRDomain, except for step 3 enter:
 - For OPADomain Node Manager:

Name: Oracle OPADomainNM Autostart

Select: *opa_home*\config\opa_setup_scripts\autostartopadomainNM.cmd

- For OPADomain:

Name: Oracle OPADomainMS Autostart

Select: *opa_home*\config\opa_setup_scripts\autostartOPADomain.cmd

- For FRDomain:

Name: Oracle FRDomainMS Autostart

Select: *opa_home*\config\opa_setup_scripts\autostartfrdomain.cmd

Test Autostart

To test:

1. Restart the computer.
2. Allow some time for the services to start.
3. Verify that the following URL works and you can log into the application:
 - TMS: <https://host/opa54/launch.htm>

If the URLs do not work after several minutes, check files in *opa_home*\log:

- autostartfrdomain2.log
- autostartfrdomain2.err
- autostartopadomain2.log
- autostartopadomain2.cmd

How to Start Servers Manually

If you have not set up automatic startup, you can start the required servers manually using the instructions in this section.

For information about these servers, see [Architecture](#).

This section includes:

- [Start the FRDomain Node Manager](#)
- [Start the FRDomain Admin Server](#)
- [Start the Forms Server](#)
- [Start the Reports Server](#)
- [Start the OPADomain Node Manager](#)
- [Start the OPADomain Admin Server](#)
- [Start the Managed Server of OPADomain](#)
- [Start the OHS Server](#)
- [Start the TMS Reports Server](#)

Start the FRDomain Node Manager

- Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `startNodeManager.cmd`.

Start the FRDomain Admin Server

The Oracle FRDomain Admin Server is located on the WebLogic Server domain, and we recommend you to name it as FRDomain and use port number 7001. You must start the Admin Server before you can start either the Oracle Forms Server or the Oracle Reports Server.

At the DOS command prompt, do the following:

- Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run the `startWebLogic.cmd`.



Note:

You cannot start it from the Admin Console because if the server is not running, the FRDomain Admin Console is not available.

Start the Forms Server

The Oracle Forms Server is located on the WebLogic Server domain, and we recommend you to name it as FRDomain and use port number 7001. You must start the FRDomain Admin Server before the Forms Server.

To start the Forms Server (WLS_FORM), do one of the following:

- Start the Forms Server in the Admin Console at `http://host:7001/console`.



Note:

The Admin Console is available only if the Admin Server is running.

- Open a DOS prompt, and run the following:

```
ORACLE_HOME\user_projects\domains\FRDomain\bin\startManagedWeblogic WLS_FORMS
```

Start the Reports Server

The Oracle Reports Server is located on the WebLogic Server domain, and we recommend you to name it as FRDomain and use port number 7001. You must start the FRDomain Admin Server before the Reports Server.

To start the Reports Server (WLS_REPORTS), do one of the following:

- Start the Reports Server in the Admin Console at `http://host:7001/console`.

 **Note:**

The Admin Console is available only if the Admin Server is running.

- Open a DOS prompt, and run the following:

```
ORACLE_HOME\user_projects\domains\FRDomain\bin\startManagedWeblogic  
WLS_REPORTS
```

Start the OPADomain Node Manager

- Go to `ORACLE_HOME\user_projects\domains\OPADomain\bin` and run `startNodeManager.cmd`.

Start the OPADomain Admin Server

The Oracle OPADomain Admin Server is located on the WebLogic Server domain, and we recommend you to name it as OPADomain, and use port number 7101. You must start the Admin Server before you can start the Managed Server of OPADomain.

To start the OPADomain Admin Server:

- Go to `ORACLE_HOME\user_projects\domains\OPADomain\bin` and run `startWebLogic.cmd`.

 **Note:**

You cannot start from the Admin Console because if the server is not running, the OPADomain Admin Console is not available.

Start the Managed Server of OPADomain

The Managed Server of OPADomain is located on the WebLogic Server domain, and we recommend you to name it as OPADomain and use port number 7101. The Managed Server of OPADomain runs on Oracle ADF and supports RDC Onsite, the TMS Browser, and TMS reports. It also contains the database connections.

You must start the OPADomain Admin Server before the Managed Server of OPADomain.

To start the Managed Server of OPADomain, use the Admin Console at either:

- `http://host:7101/console`
- `https://host/opaconsole` (if configured)

Start the OHS Server

- Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run the `startComponent.cmd` for ohs1.

Start the TMS Reports Server

To start the TMS Reports Server:

- Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run the `startComponent.cmd` for `report_server_name`.

Where, `report_server_name` is the name you had used when the Reports Server was installed.

Verify the Application Tier Installation

Verify that the following URL works and you can log into the application:

- <https://host/opa54/launch.htm>

Stopping Servers

You can stop each server either in the appropriate WLS Admin Console or from DOS prompt with specific commands.



Note:

These instructions are provided for your information; you do not need to do them now.

For more information, see:

- [Stopping the Forms Server](#)
- [Stopping the Reports Server](#)
- [Stopping the FRDomain Admin Server](#)
- [Stopping the OPADomain Admin Server](#)
- [Stopping the Managed Server of OPADomain](#)
- [Stop the OHS Server](#)
- [Stop the TMS Reports Server](#)
- [Stop the FRDomain Node Manager](#)
- [Stop the OPADomain Node Manager](#)

Stopping the Forms Server

The Oracle Forms Server is located on the WebLogic Server domain, and we recommend you to name it as FRDomain and use port number 7001.

To stop the Forms Server, do either:

- Stop WLS_FORMS by running `ORACLE_HOME\user_projects\domains\FRDomain\bin>stopManagedWebLogic.cmd WLS_FORMS` from a command prompt started as an administrator.
- Use the Admin Console at <http://host:7001/console>.

 **Note:**

The Admin Console is available only if the Admin Server is running.

Stopping the Reports Server

The Oracle Reports Server is located on the WebLogic Server domain, and we recommend you to name it as FRDomain and use port number 7001.

To stop the Reports Server, do either:

- Stop WLS_REPORTS by running `ORACLE_HOME\user_projects\domains\FRDomain\bin>stopManagedWebLogic.cmd WLS_REPORTS` from a command prompt started as an administrator.
- Use the Admin Console at <https://host:7001/console>.

 **Note:**

The Admin Console is available only if the Admin Server is running.

Stopping the FRDomain Admin Server

The Oracle FRDomain Admin Server is located on the WebLogic Server domain, and we recommend you to name it as FRDomain and use port number 7001.

To stop the Admin Server, do either:

- Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `stopWebLogic.cmd`.
- Use the Admin Console at <https://host:7001/console>.

Stopping the OPADomain Admin Server

The Oracle OPADomain Admin Server is located on the WebLogic Server domain, and we recommend you to name it as OPADomain and use port number 7101.

To stop the Admin Server, do the following:

- Go to `ORACLE_HOME\user_projects\domains\OPADomain\bin` and run the `stopWebLogic.cmd`.

Stopping the Managed Server of OPADomain

The managed server of OPADomain is located on the WebLogic Server domain named OPADomain, which must use port number 7101.

To stop the managed server of OPADomain, use the Admin Console at either:

- `http://host:7101/console`
- `https://host/opaconsole` (if configured)

 **Note:**

The Admin Console is available only if the Admin Server is running.

Stop the OHS Server

Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `stopComponent.cmd ohs1`.

Stop the TMS Reports Server

Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `stopComponent.cmd` for `<report_server_name>`.

Where, `<report_server_name>` is the name you used while installing the TMS Reports Server (see [Installing the TMS Reports Server](#)).

Stop the FRDomain Node Manager

Go to `ORACLE_HOME\user_projects\domains\FRDomain\bin` and run `stopNodeManager.cmd`.

Stop the OPADomain Node Manager

Go to `ORACLE_HOME\user_projects\domains\OPADomain\bin` and run `stopNodeManager.cmd`.

6

Upgrading Oracle Thesaurus Management System to Release 5.4.0

This chapter describes the recommended approach to upgrade an existing Oracle Thesaurus Management System installation to Release 5.4.0. Supported upgrade paths for TMS Database include:

- Release 5.0.1 or 5.0.2
- Release 5.1, 5.1.1, or 5.1.2
- Release 5.2.1
- Release 5.2.2, 5.2.3, or 5.2.4
- Release 5.3
- Release 5.3.1

Since the architecture of the technology stack changed, the supported upgrade paths for TMS Front End and TMS Report Server include:

- Release 5.2.2, 5.2.3 or 5.2.4
- Release 5.3 or 5.3.1

For other older TMS releases, a fresh installation of application tier technology stack (see [Install and Configure the Oracle Application Tier](#)), and TMS Front End and TMS Report Server (see [Installing Oracle Thesaurus Management System Application Components](#)) are required.

Be sure you are using the latest documentation:

- Check My Oracle Support Article ID 1572864.1 for any known installation issues.
- Check the Oracle Thesaurus Management System documentation page on the Oracle Help Center at <https://docs.oracle.com/en/industries/health-sciences/thesaurus-system/5.4/index.html> to be sure you have the latest version of this guide.
- Check My Oracle Support Article ID 2854539.1 for the latest *Oracle Thesaurus Management System Release 5.4 Release Notes*.

Review [Prepare to Install Oracle Thesaurus Management System](#) for system requirements and planning information.

Critical Patch Updates: See [Download Oracle Critical Patch Updates](#).

Oracle Database 19c (19.3.0.0) include many new features including multitenancy, which allows you to create one or more **pluggable databases** (PDBs) contained in a single **root** or **container** database (CDB). You can install Oracle Thesaurus Management System on either a pluggable database or a non-CDB database (as in 11g). For more information on multitenancy, see <https://docs.oracle.com/en/database/oracle/oracle-database/19/multi/introduction-to-the-multitenant-architecture.html#GUID-267F7D12-D33F-4AC9-AA45-E9CD671B6F22>.

For information about upgrading and migrating your existing database, see the "Installing and Upgrading" document at <https://docs.oracle.com/en/database/oracle/oracle-database/19/install-and-upgrade.html>:

For more information about new features, see Oracle Database 19c Introduction and Overview White Paper at <https://www.oracle.com/a/tech/docs/database19c-wp.pdf>. For details on 19c version, see Oracle Database 19c What's New at <https://docs.oracle.com/en/database/oracle/oracle-database/19/whats-new.html>.



Note:

Distributed environments are no longer supported in this release.

This chapter includes:

- [Upgrade Oracle Clinical \(If Integrated with Oracle Clinical\)](#)
- [Back Up Your Database\(s\)](#)
- [Upgrade the Database to Oracle Database 19c \(19.3.0\)](#)
- [Upgrade and Configure the Application Tier Technology Stack](#)
- [Install the TMS Database Server Code](#)
- [Upgrade a TMS Database](#)
- [Upgrade Cloned Databases](#)
- [Run Scripts to Gather Schema Statistics for the 19c Optimizer](#)
- [Upgrade the TMS Front End](#)
- [Upgrade the TMS Reports Server](#)

Upgrade Oracle Clinical (If Integrated with Oracle Clinical)

If you are upgrading both Oracle Clinical and TMS in an integrated installation, **upgrade Oracle Clinical first**. See the *Oracle Clinical Installation Guide* or *Oracle Clinical Upgrade Guide*.

Back Up Your Database(s)

Oracle recommends you to back up your database(s) at this point.

Upgrade the Database to Oracle Database 19c (19.3.0)

If your Oracle database version is 11.2.0.4 or 12.1.0.2, you can upgrade the database to the 19c version.

 **Note:**

TMS 5.1.2, 5.2.2, and 5.3 are certified on Oracle Database 11g Release 2 (11.2.0.4) for Oracle Health Sciences Data Management Workbench (DMW) 2.x integrations. When integrated with DMW, upgrading from TMS 5.1.2, 5.2.2 and 5.3 to TMS 5.4.0 will require first to upgrade the Oracle Database 11g to Oracle Database 19c. For installation instructions, see *Oracle Health Sciences Data Management Workbench Installation Guide Release 3.x*.

Do one of the following:

- [Upgrade in Place from Oracle Database 11.2.0.4 or 12.1.0.2 to 19c](#)
- [Clone Your Database on a Oracle Database 19c](#)
- [Review Initialization Parameters](#)

Upgrade in Place from Oracle Database 11.2.0.4 or 12.1.0.2 to 19c

Follow instructions in the *Oracle Database Upgrade Guide - 19c* at <https://docs.oracle.com/en/database/oracle/oracle-database/19/upgrd/> using the Database Upgrade Assistant (DBUA) option.

For more information, see Method 1 in the *Upgrade and Migrate to Oracle Database 19c* White Paper at <https://www.oracle.com/a/tech/docs/twp-upgrade-oracle-database-19c.pdf>.

Clone Your Database on a Oracle Database 19c

To clone your database on a Oracle Database 19c:

1. Install Oracle Database 19c. For instructions, see [Install Oracle Database](#).
2. Create an Oracle Database Container Database (CDB) to use one or more pluggable databases.

 **Note:**

If you are upgrading multiple databases, you still need only one CDB.

3. Update the listener and tnsnames.ora.
4. Clone your database. For instructions, see *Cloning Oracle Clinical and TMS Databases* White Paper (Doc ID 883213.1) on My Oracle Support.

Review Initialization Parameters

To review the list of the initialization parameters, see [Table 2-1](#).

Upgrade and Configure the Application Tier Technology Stack

This section describes how to upgrade Oracle Application Server, which includes the Oracle WebLogic Server, Oracle Fusion Middleware Infrastructure Software, Oracle Forms Server, and the Oracle Reports Server.

- For releases 5.0.1, 5.0.2, 5.1, 5.1.1, 5.1.2, and 5.2.1, upgrade of the technology stack is not supported. Follow instructions in [Install and Configure the Oracle Application Tier](#) for installing a new application server.
- For release 5.4.0, you can upgrade the application tier from releases 5.2.x and 5.3.x.
- For the upgrade from releases 5.2.2, 5.2.3, and 5.3, upgrade the application tier technology stack from 12.2.1.3 to 12.2.1.4.
- For the upgrade from releases 5.2.4 and 5.3.1, upgrade the application tier technology stack is not needed as it is already at version 12.2.1.4.
- If upgrade from 12.2.1.2 to 12.2.1.3 was already done on the environment, then upgrading to 12.2.1.4 application tier technology stack is not supported and a fresh environment is needed.

For more information, see [Oracle Fusion Middleware - Upgrade Common Tasks 12.2.1.4.0](#) and [Upgrading Oracle Forms from a Previous 12c Release](#).

For more information, see:

- [Before You Start](#)
- [Gather Required Information to Upgrade the Application Tier Technology Stack](#)
- [Restart Computer and Stop All Servers](#)
- [Install Oracle Application Tier 12.2.1.4](#)
- [Run Pre-Upgrade Readiness Check](#)
- [Upgrade the Domain Schema](#)
- [Run the Reconfiguration Wizard](#)
- [Upgrade the Forms Server](#)
- [Complete the Upgrade for FRDomain](#)
- [Start all components of FRDomain and OPADomain](#)

Before You Start

Consider the following:

- [Identify a Single Account to Perform All Application Tier Installation Tasks](#)

Identify a Single Account to Perform All Application Tier Installation Tasks

Install all application tier components using the same user account you had when you installed version 12.2.1.3.

The account must have administrator privileges on the server computer.

Gather Required Information to Upgrade the Application Tier Technology Stack

Have the following information ready.

Note:

A new ORACLE_HOME needs to be created, the 12.2.1.4 upgrade is an out-of-place upgrade.

The existing domains remain in the same place, FRDomain and OPADomain do not change their paths. The domain and component upgrade are in-place as the domain directory remains the same in the initial 12.2.1.3 ORACLE_HOME.

Note:

For OHS 12.2.1.3 or later on Windows, it is required to have both Microsoft Visual C++ 2010 Redistributable and Microsoft Visual C++ 2012 Redistributable installed. Otherwise, there will be errors when starting the ohs component and trying to access forms. For more information, see *Oracle HTTP Server Start Failed With 'exit status = -1073741515' In New Installation of FMW 12.2.1.3 on Windows Server* (Doc ID 2314112.1) on My Oracle Support.

These libraries may already be installed, In this case, there will be an error message when trying to install them.

Install the 12.2.1.4 Oracle WebLogic Server

- Home directory path for FMW 12.2.1.4; for example:
C:\Oracle12214\Middleware\Oracle_Home
- Email address to receive the security updates specific to your installation
- My Oracle Support password if you wish to receive the security updates through My Oracle Support

Install the Oracle Fusion Middleware Infrastructure Software

- Home directory path for FMW 12.2.1.4; for example: C:\Oracle12214\Middleware\Oracle_Home
- Email address to receive the security updates specific to your installation
- My Oracle Support password if you wish to receive the security updates through My Oracle Support

Install the Oracle Forms and Reports Servers

- Home directory path for FMW 12.2.1.4; for example: C:\Oracle12214\Middleware\Oracle_Home

Restart Computer and Stop All Servers

1. Restart the computer before starting the upgrade to 12.2.1.4.
2. Before starting the upgrade to 12.2.1.4, stop all servers and components.
For FRDomain, make sure Admin Server, WLS_FORMS, WLS_REPORTS, OHS, report server instance, and Node Manager are stopped.
For OPADomain, make sure Admin Server, managed server, and Node Manager are stopped.

Install Oracle Application Tier 12.2.1.4

Install Oracle WebLogic Server, Oracle Fusion Middleware Infrastructure Software, and Oracle Forms and Reports Server in the new 12.2.1.4 ORACLE_HOME.

1. To install Oracle WebLogic Server, see [Install Oracle WebLogic Server 12.2.1.4](#).
2. To install Oracle Fusion Middleware Infrastructure Software, see [Install the Oracle Fusion Middleware Infrastructure Software](#).
3. To install Oracle Forms and Reports Server, see [Install the Oracle Forms and Reports Servers](#).

Run Pre-Upgrade Readiness Check

To identify potential issues with the upgrade, Oracle recommends that you run a readiness check before you start the upgrade process. Be aware that the readiness check may not be able to discover all potential issues with your upgrade. An upgrade may still fail, even if the readiness check reports success.

The Upgrade Assistant readiness check performs a read-only, pre-upgrade review of your Fusion Middleware schemas and WebLogic domain configurations that are at a supported starting point. The review is a read-only operation.

The readiness check generates a formatted, time-stamped readiness report so you can address potential issues before you attempt the actual upgrade. If no issues are detected, you can begin the upgrade process. Oracle recommends that you read this report thoroughly before performing an upgrade.

Once the new 12.2.1.4 ORACLE_HOME is created and Oracle WebLogic Server, Oracle Fusion Middleware Infrastructure Software, and Oracle Forms and Reports Servers are installed, run a pre-upgrade readiness check. You must run this check separately for FRDomain and OPADomain.

1. Run the following command to start the pre-upgrade readiness check:

```
<12.2.1.4_Oracle_Home>\oracle_common\upgrade\bin\ua.bat -readiness
```

 - a. Select the **Domain Based** option and enter the domain location.
 - b. Select the **Include checks for all schemas** and **Include checks for all configurations** check boxes.
2. Enter the WebLogic domain directory where schemas and configurations will be checked. This will be the path to the domains directory from

<12.2.1.3_Oracle_Home>. For example,
C:\Oracle\Middleware\Oracle_Home\user_projects\domains\FRDomain.

3. Check schemas and configuration in FRDomain.

Schemas to be checked:

- Oracle Platform Security Services – OPSS
- Oracle Audit Services – IAU
- Common Infrastructure Services – STB
- Oracle WebLogic Server - WLS_RUNTIME

Configuration to be checked:

- System Components Infrastructure
- Oracle HTTP Server
- Oracle JRF
- Common Infrastructure Services
- Oracle Forms Services
- Oracle Reports Services

4. Check schemas and configuration in OPADomain.

Schemas to be checked:

- Oracle Platform Security Services – OPSS
- Oracle Audit Services – IAU
- Common Infrastructure Services – STB
- Oracle WebLogic Server - WLS_RUNTIME

Configuration to be checked:

- System Components Infrastructure
- Oracle HTTP Server
- Oracle JRF
- Common Infrastructure Services
- Oracle Forms Services

5. Enter the administrator database account credentials for checking the RCU OPSS schema. The account need to have DBA privileges (can be system account).

 **Note:**

Click **Connect** to make sure the credentials you entered are valid.

6. Enter the administrator database account credentials for checking account credentials for the RCU IAU and STB schemas. The account need to have DBA privileges (can be system account).

7. In the Readiness Progress screen, check that all the components should have a green status – upgrade not necessary or ready for upgrade.

For OPADomain in the Readiness Progress screen all the components should have a green status – upgrade not necessary or ready for upgrade; except for Oracle Forms Services. The Oracle Forms Service component for OPADomain will be marked as Failure but this can be ignored as Oracle Forms Service is not a part of OPADomain.

Upgrade the Domain Schema

When upgrading the application technology stack from 12.2.1.3 to 12.2.1.4 version, the upgrade of the domain schema is not needed.

Run the Reconfiguration Wizard

Run the Reconfiguration Wizard For FRDomain

1. Open a DOS prompt and run:

```
<12.2.1.4_Oracle_Home>\oracle_common\common\bin\reconfig.cmd -log  
<path_to_log_file>\FRDomain_log.txt -log_priority=ALL
```

You can accept most default values, with the exception noted below.

Select Domain

1. Select the FRDomain location; for example:
C:\Oracle\Middleware\Oracle_Home\user_projects\domains\FRDomain

Database Configuration Type

1. Select the **RCU data** check box under Specify AutoConfiguration Options Using.
2. Make sure the RCU database is correct.
3. Click **Get RCU Configuration**.

Component Datasources

1. Select all RCUs.
2. Click **Next**.

Advanced Configuration

1. Select only the **Topology** check box in the Advanced Configuration in the Reconfiguration Wizard.

Do not select the System Components check box. Those are automatically configured/updated by the Upgrade Assistant in the next steps.

Make a note of the FRDomain defaultCoherenceCluster port because for OPADomain a different port needs to be used. By default, it is 7574.

Note:

In the Configuration Summary, ignore the warning "CFGFWK-40326: Invalid coherence server address."

Run the Reconfiguration Wizard For OPADomain

1. Open a DOS prompt and run:

```
<12.2.1.4_Oracle_Home>\oracle_common\common\bin\reconfig.cmd -log  
<path_to_log_file>\OPADomain_log.txt -log_priority=ALL
```

You can accept most default values, with the exception noted below.

Select Domain

1. Select the OPADomain location; for example:
C:\Oracle\Middleware\Oracle_Home\user_projects\domains\OPADomain

Datasources

1. Select the existing data sources.

Database Configuration Type

1. Select the **RCU data** check box under Specify AutoConfiguration Options Using.
2. Make sure the RCU database is correct.
3. Click **Get RCU Configuration**.

Component Datasources

1. Select all RCUs.
2. Click **Next**.

Advanced Configuration

1. Select all check boxes.

Default Coherence Cluster

1. Use a different port number other than the one used for FRDomain. For example, 7575.

Domain Frontend Host

- Deselect the **Configure Domain Frontend Host** check box.

Upgrade the Forms Server

Start the upgrade assistant in the new 12.2.1.4 Oracle Home to upgrade the Forms installation.

1. Run the following command:

```
<12.2.1.4_Oracle_Home>\oracle_common\upgrade\bin\ua.bat
```
2. Select the **All Configurations Used by a Domain** check box, and provide the FRDomain location.
3. Upgrade the components in FRDomain:
 - System Components Infrastructure
 - Oracle HTTP Server
 - Oracle JRF
 - Oracle Forms Services
 - Oracle Reports Services
4. In the Prerequisites screen, select all the check boxes.

5. In the Examine screen, make sure all the checks have the status "ready for upgrade" or "upgrade not necessary".
6. Click **Upgrade**.

Complete the Upgrade for FRDomain

Do the following:

- [Check EXTRA_JAVA_PROPERTIES for setDomainEnv.cmd](#)
- [Run WLST to Provide Grant for Forms Application Keystore and Update OHS](#)
- [Update OHS Instance Files](#)

Check EXTRA_JAVA_PROPERTIES for setDomainEnv.cmd

Check if setDomainEnv.cmd file from <FRDomain_Home>\bin contains Dforms.userid.encrypted.enabled=true for EXTRA_JAVA_PROPERTIES. If it does not contain, create the script setUserOverridesLate.cmd under <FRDomain_Home>\bin (this script is executed when startWeblogic.cmd is executed):

```
echo ""
echo "*****"
echo "*** Executing setUserOverridesLate.cmd "
echo "*****"
rem specify additional java command line options for all servers
set EXTRA_JAVA_PROPERTIES =%EXTRA_JAVA_PROPERTIES% -
Dforms.userid.encrypted.enabled=true
echo "USER_MEM_ARGS=\"%USER_MEM_ARGS%\""
echo "EXTRA_JAVA_PROPERTIES=\"%EXTRA_JAVA_PROPERTIES%\""
echo ""
echo "*****"
echo "*** End of setUserOverridesLate.cmd "
echo "*****"
echo ""
```

Run WLST to Provide Grant for Forms Application Keystore and Update OHS

1. Start the FRDomain Node Manager.


```
<FRDomain_Home>\bin\startNodeManager.cmd
```
2. Start the FRDomain admin server.


```
<FRDomain_Home>\bin\startWebLogic.cmd
```
3. Run WLST.


```
<12.2.1.4_ORACLE_HOME>\oracle_common\common\bin\wlst.cmd
```
4. Connect to admin server.


```
connect('adminserver_username','adminserver_password','t3://
host_name:FRDomain_adminserver_port')
```
5. Run the following WLST (online mode) commands to provide grants to the forms application or mbeans to access the Forms application keystore:


```
grantPermission(codeBaseURL="file:${common.components.home}/../forms/
provision/forms-config-mbeans.jar",
```

```
permClass="oracle.security.jps.service.keystore.KeyStoreAccessPermission",permTarget="stripeName=formsapp,keystoreName=formsks,alias=*", permActions="**")
```

```
grantPermission(codeBaseURL="file:${domain.home}/servers/${weblogic.Name}/tmp/_WL_user/formsapp_12.2.1/-",
permClass="oracle.security.jps.service.keystore.KeyStoreAccessPermission",
permTarget="stripeName=formsapp, keystoreName=formsks,alias=*",permActions="**")
```

6. Run the following WLST (online mode) command for the OHS instance update:

```
ohs_updateInstances()
```

7. Exit WLST.

```
exit()
```

8. Stop the FRDomain admin server.

```
<FRDomain_Home>\bin\stopWebLogic.cmd
```

9. Stop the FRDomain Node Manager.

```
<FRDomain_Home>\bin\stopNodeManager.cmd
```

Update OHS Instance Files

1. Update the httpd.conf file to have only one Listen directive.

Make sure the httpd.conf files have only one Listen directive for one specific port: Listen <machine_name>:<port_number>

The httpd.conf files can be found under:

- <FRDomain_Home>\config\fmwconfig\components\OHS\instances\ohs1\
 - <FRDomain_Home>\config\fmwconfig\components\OHS\ohs1\
2. In the following ohs.plugins.nodemanager.properties files, replace '\ ' with '/' for the value of nm-wallet path to avoid "MALFORMED \UXXXX ENCODING" error when starting ohs1 instance:
 - <FRDomain_Home>\config\fmwconfig\components\OHS\ohs1\ohs.plugins.nodemanager.properties
 - <FRDomain_Home>\config\fmwconfig\components\OHS\instances\ohs1\ohs.plugins.nodemanager.properties

Start all components of FRDomain and OPADomain

To make sure the application technology stack upgrade was successful, start all components from FRDomain (nodemanager, admin server, WLS_FORMS, WLS_REPORTS, and ohs1) and OPADomain (nodemanager, admin server, and managed server), except for the report server instance created for TMS 5.2.x/5.3 or OC 5.2.x.

Install the TMS Database Server Code

Follow instructions in [Install the TMS Database Server](#).

Upgrade a TMS Database

Follow the instructions in this section to upgrade each TMS database as mentioned below:

- [Back Up Database Objects](#)
- [Prevent Access to Oracle Thesaurus Management System Databases](#)
- [Gather Required Information to Upgrade TMS Database](#)
- [Stop PSUB Process \(If Integrated with Oracle Clinical\)](#)
- [Start the Installer](#)
- [Attend to the TMS Database Upgrade Installer Screens](#)
- [Set Initialization Parameters](#)
- [Check Installation Log for Errors](#)
- [Configure DSI Import](#)
- [Load Dictionaries](#)
- [Integration with Oracle Clinical](#)

Back Up Database Objects

Back up the following packages if you have customized them:

- tms_ud_activation_rules
- tms_sup_srchobj

Prevent Access to Oracle Thesaurus Management System Databases

You must ensure that no data entry is performed, and no jobs that update data (such as batch validation) run during the upgrade process.

To prevent users from accessing the data, place the database in restricted mode. Provide restricted session access to the following accounts:

- SYSTEM
- SYS
- OPA
- RXC
- TMS
- CTXSYS
- OPS\$TMSBROWSER
- TDX

After you complete the upgrade, remove the restricted access from the databases and user accounts.

Note:

The OPS\$TMSBROWSER account is replaced by the account TMSPROXY from TMS 5.2.1. You do not need to remove restricted access for the TMSPROXY account.

Gather Required Information to Upgrade TMS Database

Before you start the Installer, be sure you have the information it prompts for:

1. Home Details: The full path to the OPA_HOME or similar application home name on your application server; by default:

c:\opa_home

 **Note:**

If TMS 5.2.x/5.3.x or Oracle Clinical 5.2.x/5.4.0 has already been installed on this application server, OPA_HOME may already be set to C:\opapps52 or similar path and you must use this for TMS 5.4.0 too. Do not create a new OPA_HOME if this was already created. The TMS 5.4.0 components will be placed by the installer under this OPA_HOME at the specified location for the TMS 5.4.0 release.

2. Oracle Database Client Home: Full path to ORACLE_HOME. For example, C:\Oracle\Middleware\Oracle_Home.

If you upgraded the technology stack from version 12.2.1.3 to 12.2.1.4, use the new 12.2.1.4_ORACLE_HOME you created.

 **Note:**

Make sure the tnsnames.ora from your ORACLE_HOME\network\admin has an entry for your database.

3. TMS Server Code Home Directory: The system detects the location and enters the value for you. By default, it is <OPA_HOME>\tms.
4. Database Details: Enter the database server name, database port number and database service name. It must be a valid TNS entry in your tnsnames.ora file.
5. NLS Settings: Enter the NLS settings for the database; see [Choose a Character Set](#) . Oracle strongly recommends that you use UTF8. The default values are:
 - American_America.UTF8
 - DD-MON-RRRR
6. Directory for data tablespace data files: Enter the path to the directory on the database server where the data tablespace datafiles for the application should be created during the installation. The Installer does not validate the value and you must use the following syntax, including a trailing slash, depending on your operating system; for example:
 - UNIX: /u01/oradata/dbname/
 - Windows: drive:\oradata\dbname\
7. Enter and confirm passwords for the following accounts:
 - SYS
 - SYSTEM

- RXC
- OPA
- TMS
- CTXSYS
- TMSPROXY

Stop PSUB Process (If Integrated with Oracle Clinical)

If your TMS installation is integrated with Oracle Clinical, you must stop the PSUB process before upgrading the database. See the Oracle Clinical Administrator's Guide for instructions.

Start the Installer

To upgrade a TMS database:

1. Log in to the application server as a user with system administrator privileges.
2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the following file as an administrator:

```
Disk1\install\setup.exe
```

The Installer opens to the Welcome screen.

Note:

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

Note:

Although there is a button for deinstalling products on the Welcome screen, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

4. In the Select a Product to Install page, select **TMS Database Upgrade 5.4.0.0.x**.

Attend to the TMS Database Upgrade Installer Screens

The Oracle Universal Installer guides you through the database upgrade. Provide the information you assembled in [Gather Required Information to Upgrade TMS Database](#).

Ignore tablespace creation errors:

- Select **Yes** if the database already has the TMS tablespaces created.
- Select **No** if the TMS tablespaces do not exist.

The Installer gives you information that you should make a note of.

Set Initialization Parameters

After the upgrade completes, set the init.ora parameters according to the instructions in [Install and Configure Oracle Database](#).

You must stop and then start the database to activate the changed init.ora parameters.



Note:

Do NOT SET the DB_DOMAIN parameter. In Release 5.1 and above this causes problems.

If you set up the EVENT parameter in the init.ora file to trace unique key constraints before upgrading, you should set the event parameter back to its required value.

Check Installation Log for Errors

When you upgrade, the installation log file may report the following error:

```
". . . . .  
Connected.  
BEGIN tms_dsi_xml_schema.InstallSchemas; END  
  
*  
ERROR at line 1:  
ORA-02303: cannot drop or replace a type with type or table dependents  
ORA-06512: at "XDB.DBMS_XMLSCHEMA_INT", line 3  
ORA-06512: at "XDB.DBMS_XMLSCHEMA", line 14  
ORA-06512: at "TMS.TMS_DSI_XML_SCHEMA", line 35  
ORA-06512: at line 1  
  
finished TMSUPG  
TMS will now attempt to validate any invalidate objects...  
...."
```

This error occurs because the tmsupg.sql upgrade script executes tms_dsi_xml_schema.InstallSchemas before attempting to validate any invalid objects. Execution of tms_dsi_xml_schema.InstallSchemas fails if the database has invalid objects.

If this error occurs, you need to:

1. Run compile invalid until all database objects have been made valid.
2. Run tms_dsi_xml_schema.InstallSchemas manually. See [Configure DSI Import](#) for details.

Configure DSI Import

If you plan to use disconnected system integration (DSI), enter following commands:

```
set LOCAL=databasename  
sqlplus tms/password
```

```
exec tms_dsi_xml_schema.InstallSchemas;
```

Load Dictionaries

You can load dictionaries at any time. See the *Oracle Thesaurus Management System User's Guide* for information about loading dictionaries.

Integration with Oracle Clinical

When a TMS database is cloned and TMS is integrated with Oracle Clinical, force rederivation must be executed for all Oracle Clinical studies.

Upgrade Cloned Databases

If you have cloned a database, see *Cloning Oracle Clinical and Oracle Thesaurus Management System Databases* (Article ID 883213.1) on My Oracle Support:

Be sure to follow all the instructions in the document, including running the `tmschown.sql` script, the `opachown.sql` script, and, if you are using Oracle Clinical with TMS, the `occhown.sql` script, *before* doing the upgrade.

Run Scripts to Gather Schema Statistics for the 19c Optimizer

After upgrading to Release 5.4.0 and setting initialization parameter **optimizer_features_enable** to 19.1.0.0 (see [Set Initialization Parameters](#)), you must gather statistics required for the Oracle Optimizer to be effective for accounts used internally by TMS.

Scripts `opastats.sql` and `tmsstats.sql` are available for this purpose. Failure to execute these scripts can negatively impact performance.

If your database contains large amounts of data, the scripts may take a long time to run. You may want to edit the scripts. For information the scripts' parameters see documentation of the Oracle DBMS_STATS package that they call: http://docs.oracle.com/cd/B19306_01/appdev.102/b14258/d_stats.htm#i1036456.

tmsstats.sql: Because TMS already has a procedure, `AnalyzeTable` in `tmspb_user_analyze.sql`, that runs as part of every activation job, you may prefer to edit it if required and call it from `tmsstats.sql` to keep the two synchronized.

The `tmsstats.sql` script prompts for the password of the account it processes: TMS.

To change how TMS analyzes tables and ensure that `tmsstats` and `AnalyzeTable` remain in synch:

1. Update the "tmspb_user_analyze.sql.IAnalyzeTable" procedure to use different parameters in the call to "dbms_stats.gather_table_stats" to improve the performance in your environment.
2. Edit `tmsstats.sql` to call `tms_user_analyze.AnalyzeTable`. The package `tms_user_analyze` and the script `tmsstats.sql` needs to be in sync. To do so, replace last line "exec dbms_stats.gather_schema_stats;" in `tmsstats.sql` with "exec tms_user_analyze.AnalyzeTables;".

```
exec tms_user_analyze.AnalyzeTables
```

3. Run tmsstats.sql.

opastats.sql captures new statistics in the OPA application account used by TMS. It prompts for the OPA password. It is also used by Oracle Clinical and RDC Onsite.

Upgrade the TMS Front End

For TMS 5.4.0, Front End upgrade is supported from releases 5.2.2, 5.2.3, 5.2.4, 5.3.0, and 5.3.1.

When upgrading TMS Front End from release 5.2.2, 5.2.3, or 5.3, upgrade of the application tier technology stack from version 12.2.1.3 to 12.2.1.4. For information, see [Upgrade and Configure the Application Tier Technology Stack](#).

When upgrading TMS Front End from release 5.2.4 or 5.3.1, the application tier technology stack version is already 12.2.1.4.

For TMS 5.4.0 Front End upgrade, OPADomain node manager, admin server, and managed server must be running. For FRDomain report server instance, ohs1, WLS_FORMS, and WLS_REPORTS must be stopped. The node manager and admin server can be in running state.

If Oracle Clinical Front End 5.4.0 was already installed on the application server, follow instructions below to install TMS 5.4.0 Front End. In this case, the upgrade option for TMS Front End will be used.

For more information, see:

- [Gather Required Information to Upgrade TMS Front End](#)
- [Start the Installer](#)
- [Attend to the TMS Front End Installer Screens](#)
- [Find the Installation Log Files](#)
- [Set Remote Method Invocation \(RMI\) JDBC Security to Secure](#)

Gather Required Information to Upgrade TMS Front End

Have the following information ready to enter in the Installer screens:

- Home Details: Enter the following:
 - Name: OPA_HOME
 - Path: c:\opa_home

Note:

If TMS 5.2.x/5.3.x or Oracle Clinical 5.2.x/5.4.0 has already been installed on this application server, OPA_HOME may already be set to C:\opapps52 or similar path and you must use this for TMS 5.4.0 too. Do not create a new OPA_HOME if this was already created. The TMS 5.4.0 components will be placed by the installer under this OPA_HOME at the specified location for the TMS 5.4.0 release.

- Java Home is the location where JDK 1.8.0_251 or higher was installed
- Oracle Fusion Middleware home directory:
 - If the technology stack has been upgraded from version 12.2.1.3 to 12.2.1.4, use the new 12.2.1.4 Oracle Home (post upgrade one). The upgrade to 12.2.1.4 is an out-of-place upgrade and a new oracle_home is created; for example, C:\Oracle12214\Middleware\Oracle_Home.
 - If the technology stack was fresh installed at version 12.2.1.4, for example if TMS 5.3.1 or OC 5.2.2/5.4.0 Front End was already installed use the Oracle Home you had at the time of technology stack installation; for example, C:\Oracle\Middleware\Oracle_Home.
- Oracle Fusion Middleware User Project directory:
 - If the technology stack has been upgraded from version 12.2.1.3 to 12.2.1.4, use the initial 12.2.1.3 Oracle Home (pre upgrade one) to select the user projects directory. The upgrade to 12.2.1.4 is an out-of-place upgrade and the domains reside in the 12.2.1.3 oracle home; for example, C:\Oracle\Middleware\Oracle_Home\user_projects.
 - If the technology stack was fresh installed at version 12.2.1.4, for example if TMS 5.3.1 or OC 5.2.2/5.4.0 Front End was already installed, use the Oracle Home you had at the time of technology stack installation; for example, C:\Oracle\Middleware\Oracle_Home\user_projects.
- OPA home directory: By default, it is c:\opa_home.
- OPADomain Administration Server configuration details:
 - Listen address
 - OPADomain Listen port number
 - OPADomain SSL listen port number
 - OPADomain WebLogic username
 - OPADomain WebLogic password
- OPADomain Node Manager configuration details:
 - Listen address
 - OPA Domain NodeManager Listen port number
 - WebLogic username
 - WebLogic Server password
- Database details (database used for data source created under OPADomain):
 - Server.Domain: for example, *servername.your_company.com*
 - Port number
 - Database service name
 - TMS Proxy Password (tmsproxy)—the password you created when installing Oracle Thesaurus Management System database objects.
- Managed Server configuration details:
 - Number of Managed Servers
 - Listen port start index

- Online help URL: If you have customized the online help, the URL where the customized online help is located.

Start the Installer

To install the TMS Front End:

1. Log in as a user with system administrator privileges.
2. In the staging area, locate the directory where you downloaded and extracted Oracle Thesaurus Management System (see [Download the Software](#)).
3. Run the following file as an administrator:

```
Disk1\install\setup.exe
```

The Installer opens to the Welcome screen.

Note:

See [Use the Silent Installer \(Optional\)](#) for instructions for running the Installer as a file with pre-entered parameter values.

Note:

Although there is a button for deinstalling products on the Welcome screen, Oracle does not support using the Installer to deinstall Oracle Thesaurus Management System.

Attend to the TMS Front End Installer Screens

The Oracle Universal Installer guides you through the installation and configuration of the TMS Front End.

1. Select a Product to install: **Oracle Thesaurus Management System Front End 5.4.0.0.x**.
2. Home Details: From the **Directory** drop-down, select the OPA Home that corresponds to the Oracle Thesaurus Management System home (for example, c:\opa_home). When you select the directory, the value in the Home drop-down changes automatically.
3. Available Product Components: Select **Oracle Thesaurus Management System Front End 5.4.0.0.x– Install status – Upgrade**.

Note:

Although the Installer gives you the option install the TMS Server (database server code) at the same time, do not select this option. You must install the TMS Server first, then the database objects, and then the Front End.

4. Choose Install Type: Select **No**.

5. Follow the instructions on the installation screens, providing the information you assembled in [Gather Required Information to Upgrade TMS Front End](#).
6. **Summary:** The Summary screen provides information about the global settings, languages, space requirements, and products for this installation.

Review the installation details to verify that they are correct. To revisit earlier installation screens and make changes, click **Back**.

When you are ready to continue, click **Install**.
7. **Install:** The Installer copies the files onto the server, completes the setup and configuration tasks, and generates a log file of this installation.

In addition, the Install screen displays the **location of the log file** that records the results of the installation activities for this session. Make a note of this information so you can view the log file after the installation.
8. **End of Installation:** The End of Installation screen reports whether the installation was successful.

The Installer saves the URL information in the following file:

`%OPA_HOME%\log\setup.txt`

When you have finished reviewing the installation information, click **Exit**.

Find the Installation Log Files

During the installation of an Oracle Health Sciences component, the Oracle Universal Installer generates the following log file:

```
installActionstimestamp.log
```

On a Windows installation, the log files are located at:

```
\Oracle\Inventory\logs
```

For example:

```
C:\Program Files\Oracle\Inventory\logs
```

All generated log files have a timestamp appended to the name. For example:

```
installActions2013-04-30_11-22-52AM.log
```

If you encounter any error, contact Health Sciences Support.

Set Remote Method Invocation (RMI) JDBC Security to Secure

1. Log in to the OPADomain WebLogic Server.
2. Go to **Summary of Servers**, select **Managed Server of OPADomain**, select **General**, and click **Advanced**.
3. Change the **RMI JDBC Security** setting to **Secure**.
4. Click **Save**.
5. Click **Activate Changes**.

Upgrade the TMS Reports Server

To upgrade the TMS Reports Server, follow instructions in [Installing the TMS Reports Server](#) with the exceptions noted below:

- For Choose Install Type, select **No** for the question "Would you like to perform a fresh install of Oracle Thesaurus Management System Report Server?". This is required if the technology stack was updated from version 12.2.1.3 to 12.2.1.4.
- Installer will detect the report server name and will populate it. This can not be changed.

7

Post-Installation Steps for the New Installation or Upgrade

This chapter includes:

- [Patch TMS](#)
- [Test the TMS Forms Server](#)
- [Configure WebLogic Server Data Sources](#)
- [Making the Java Runtime Environment Available for Download](#)
- [Define and Load Dictionaries](#)
- [Setting Up Client Computers](#)

Patch TMS

Check Oracle Thesaurus Management System Summary of Patches Available (Article ID 132626.1) on My Oracle Support for information about any patch sets and patches available for Release 5.4.0. If any, download and apply them now. See the patch release notes (readme) for details about the patch and installation instructions.

Test the TMS Forms Server

Confirm that you can start TMS from this Forms Server before you set up each TMS client.

To test the deployment:

1. Open a browser.
2. Connect to the Oracle Health Sciences URL to start TMS.

The URL has the following syntax:

- `https://computer_name.domain/opa54/launch.htm`

3. Click the **Launch** hyperlink, which initiates the download of the Java Virtual Machine (JVM).

Configure WebLogic Server Data Sources

When you run the TMS Installer, it sets up a connection, or data source, for TMS Browser from the WebLogic Server to the database that you specify in the Installer screens.

Confirm that the data source exists in the WebLogic Server Administration Console and then enter its JNDI name in the REPORT_CONFIG local reference codelist.

For more information, see:

- [Confirm the TMS Data Source Value in WebLogic Server Admin Console](#)

- [Set REPORT_CONFIG Reference Codelist Value](#)
- [Add Data Source \(Required Only If Using Multiple Databases\)](#)

Confirm the TMS Data Source Value in WebLogic Server Admin Console

To check this:

1. Log in to the WebLogic Server Administration Console at:
`http://host:7101/console`
2. Navigate to **Services** under Domain Structure, then **Data Sources**.
3. Confirm that a data source with JNDI name: `jdbc/tms` exists.

Set REPORT_CONFIG Reference Codelist Value

Update local reference codelist REPORT_CONFIG with the data source JNDI name:

1. Log in to TMS.
`https://computer_name.host/opa54/launch.htm`
2. Navigate to Definition, then Local Reference Codelists.
3. Query for the REPORT_CONFIG codelist:
 - a. Press F7.
 - b. Enter REPORT_CONFIG in the Name field.
 - c. Press F8. The system displays the short value JDBC_DATA_SRC.
4. Enter the JNDI name value `jdbc/tms` as the long value.
5. Save.

Add Data Source (Required Only If Using Multiple Databases)

When you run the TMS Installer, it sets up a data source connection for TMS Reports Generation from the WebLogic Server to the database you specify in the Installer screens.

If you plan to use more than one database, you must create a data source for each additional database. This data source can be used to run TMS reports for the new database after REPORT_CONFIG Reference Codelist Value will be updated with the new JNDI name as explained in [Set REPORT_CONFIG Reference Codelist Value](#).

For complete set of instructions, see *Oracle Thesaurus Management System User's Guide*.

Making the Java Runtime Environment Available for Download

Oracle Thesaurus Management System requires that the Java Runtime Environment (JRE) exists on the user's computer.

The TMS Launch page is configured to prompt users to install JRE if it does not exist on their computer. To make this work, you need to download JRE into the `OPA_HOME\html` directory and rename it.

 **Note:**

If you have already installed Oracle Clinical on the same machine, you do not need to do this again and can skip to the next section.

To download the latest version of the JRE and then position the software so your users can install it directly from the Downloads page:

1. If you have not already done so, download the software following instructions in [Download the Java Runtime Environment](#).
2. Copy the downloaded file from the staging area to `OPA_HOME\html`.
3. Rename the file `sunjpi.exe`.

If your users need to have both JRE 6 and 7 installed to support different versions of Oracle Thesaurus Management System, check My Oracle Support article 1570682.1 for guidance.

Define and Load Dictionaries

See the Oracle Thesaurus Management System User's Guide for information about defining TMS dictionaries in the user interface and loading dictionary data.

For sample load scripts, download the following document from My Oracle Support:

Title: *Sample Maintenance Scripts for MedDRA, MedDRA Primary Path, MedDRA SMQ, SNOMED, and WHODrug Formats B2, B3, and C3*

Article ID: 258975.1

 **Note:**

If you are upgrading an existing TMS installation, you do not need to redefine and reload the dictionaries you are already using.

Setting Up Client Computers

This section includes:

- [Set Up for Proxy Usage on Fully Qualified Application Tier Names](#)
- [Download Required Applications](#)
- [Log In to the Application](#)

Set Up for Proxy Usage on Fully Qualified Application Tier Names

You must configure your client proxy settings if one of the following conditions is true for your installation:

- You connect to the application tier with its fully qualified name (*server_name.domain_name*).
- You use proxies.

To configure your Windows client proxy settings:

1. In Windows, open Settings.
2. Search and open Proxy Settings.
3. Under Manual proxy setup, turn on the **Use a proxy server** toggle.
4. Enter the address and port number.
5. Click **Save**.

Download Required Applications

This section describes how to download and install the following applications:

- Java Runtime Environment (JRE)
- Adobe Reader
- Java Virtual Machine

Instructions for setting up downloads from the Oracle Thesaurus Management System Launch page are included in [Making the Java Runtime Environment Available for Download](#).

For more information, see:

- [Download the Java Runtime Environment](#)
- [Configure Java Security Settings for TMS](#)
- [Download Adobe Reader](#)

Download the Java Runtime Environment

TMS requires the Java Runtime Environment (JRE) version 8 (1.8.0.311 or above).

If you have older versions of JRE and do not need them, uninstall these versions before installing the new version. By uninstalling old versions, you avoid receiving the following message when starting an Oracle Health Sciences application:

The Application requires an earlier version of JRE. Do you want to continue?

To download and install the JRE onto a client:

1. Open a browser and enter the URL to open the Launch page for TMS. For example:

```
https://server.domain:port/opa54/launch.htm
```


2. Click **Install JRE Plug-in** on the Launch page.
3. Follow the on-screen instructions to download and install the JRE.

During the installation, you must accept all prompts to accept signed jar files.

The system downloads the JRE from your Forms Server. When you set up the Forms Server, you installed the latest version of the JRE. See [Making the Java Runtime Environment Available for Download](#) for more information.

Configure Java Security Settings for TMS

If you are applying the latest Critical Patch Update, you may encounter an error while launching the TMS application. To avoid this error, follow the instructions below:

1. Go to **Control Panel**, and click **Java**.
2. Click the **Advanced** tab.
3. Under Advanced Security Settings:
 - Deselect the **Use TLS 1.0** check box.
 - Select the **Use TLS 1.1** and **Use TLS 1.2** check boxes.
4. Click **OK**.

Download Adobe Reader

TMS supports Adobe Acrobat Reader DC 21 or Adobe Acrobat Reader 2020 (Classic Track). However, this requirement may change during the life of this document. Check My Oracle Support for the latest requirements.

To download the free Adobe Reader:

1. Go to the Adobe Corporation Web site:
<https://get.adobe.com/reader/>
2. Follow the on-screen instructions to download the latest version of the Adobe Reader.

Log In to the Application

To log in to the TMS application:

To log in to Forms-based Oracle Thesaurus Management System, use the following URL:

1. Open a supported browser.
2. Enter the URL:
`https://computer_name.domain/opa54/launch.htm`

where:

- *computer_name* is the network name for the application server
 - *domain* is the network domain name for your organization
3. Click **Login**.
 4. Enter your user name, your password, and the database name.
 5. Click **Connect** to start the session.