

Oracle Utilities Work and Asset Management

Database Administrator's Guide

Release 2.2.0.4.0

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Oracle Utilities Work and Asset Management Database Administrator's Guide for Release 2.2.0.4.0

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Preface

Welcome to the Oracle Utilities Work and Asset Management Database Administrator's Guide.

This guide provides instructions for installing and maintaining the Oracle Utilities Work and Asset Management database and is intended for database administrators who will be installing and maintaining the database.

Related Documents

For more information on this release, refer to the following documents:

Installation Guides

- Oracle Utilities Work and Asset Management Release Notes
- Oracle Utilities Work and Asset Management Quick Install Guide
- Oracle Utilities Work and Asset Management Installation Guide
- Oracle Utilities Work and Asset Management Database Administrator's Guide
- Oracle Utilities Work and Asset Management Licensing Information User Manual

User Guides

- Oracle Utilities Work and Asset Management and Oracle Utilities Operational Device Management Business User's Guide
- Oracle Utilities Work and Asset Management and Oracle Utilities Operational Device Management Administrative User's Guide
- Oracle Utilities Work and Asset Management Mobile Application User's Guide

Supplemental Documents

- Oracle Utilities Work and Asset Management Server Administration Guide
- Oracle Utilities Work and Asset Management Security Guide

Updates to this Documentation

Additional and updated information about the product is available from the **Knowledge Base** section of **My Oracle Support** (<http://support.oracle.com>). Please refer to **My Oracle Support** for more information. Documentation updates are also posted on the Oracle Technology Network documentation page as they become available (http://docs.oracle.com/cd/E72219_01/documentation.html).

Conventions

The following text conventions are used in this document:

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

Chapter 1

Oracle Utilities Work and Asset Management Database Overview

This chapter provides an overview of the Oracle Utilities Work and Asset Management database, including:

- [Supported Database Platforms](#)
- [Database Maintenance Rules](#)

Supported Database Platforms

Oracle Utilities Work and Asset Management is certified on the following platforms:

Platform	Database Version
AIX 7.1 TL01	Oracle Database Server 12.1.0.1+
AIX 7.2 TL0 (POWER 64-bit)	Oracle Database Server 12.2.0.1.0
Oracle Enterprise Linux 6.x or 7.x (64-bit)	Oracle Database Server 12.1.0.1+
x86_64 (64-bit)/ Red Hat Enterprise Linux 6.x or 7.x (64-bit) x86_64 (64-bit)	Oracle Database Server 12.2.0.1.0
Oracle Solaris 11 (SPARC 64-bit)	Oracle Database Server 12.1.0.1+
	Oracle Database Server 12.2.0.1.0

Note: Windows Server is **not** supported for Production environments. Wherever Windows Server is referenced within this guide, it is supported for Test or Development environments **only**.

The following Oracle Database Server Editions are supported:

- Oracle Database Enterprise Edition
- Oracle Database Standard Edition

Note: Oracle Database Enterprise Edition and the Partitioning and Advanced Compression options are not mandatory but recommended. Standard Edition should only be considered suitable for environments where scalability, performance, and database size-on-disk are not important considerations. Oracle Database Enterprise Edition, including the Advanced Compression and Partitioning options, is strongly recommended in all other situations.

Refer to My Oracle Support for additional details.

Support for Software Patches and Upgrades

Due to the ongoing nature of software improvement, vendors will periodically issue patches and service packs for the operating systems, application servers and database servers on top of specific versions that Oracle products have already been tested against.

If it is necessary to apply an upgrade, please do so in a test environment that is running on the same platform as your production environment prior to updating the production environment itself. The exception to this is Hibernate software 4.1.0 which should not be upgraded.

Always contact Oracle Support prior to applying vendor updates that do not guarantee backward compatibility.

Database Maintenance Rules

The database supplied with the product consists of the following elements:

- A set of users to administrate, execute and read the database schema provided.

- A set of database roles to implement security for each of the users provided.
- A tablespace and a schema containing the base database objects used by the product.

The installation instructions are outlined in the installation section of this document.

Permitted Database Changes

During and after installation of the product the following changes may be performed by the database administrator personnel on site:

- Users supplied by product may be changed according to the site standards.
- Database objects may be added to the schema according to database naming standards outlined later in this document.
- Database views and indexes may be created against base database objects. Please make sure to prefix new items with “CM” (for customer modification).
- Database storage attributes for base indexes and base tables may be changed according to site standards and hardware used.
- Tablespace names, attributes and locations may be changed according to site standards.
- Database topology (base table/index to tablespace, tablespace to data file, data file to location) may be altered according to tuning and/or site standards.
- Database triggers may be created against base database objects unless they attempt to contravene base data integrity rules.
- Database initialization and parameter settings may be altered according to site standards unless otherwise advised by Oracle Support or outlined.

Non-Permitted Database Changes

In order to maintain operability and upgradeability of the product, during and after the installation of the product, the following changes may *not* be performed by the database administration personnel on site.

Base objects must not be removed or altered in the following ways:

- Columns in base tables must not be altered, removed or added in anyway.
- Columns in Indexes must not be altered or removed.
- Tables must not be renamed or removed.
- Base views must not be renamed or removed.
- Base Triggers and Sequences must not be renamed or removed.
- Base indexes must not be altered or removed.

Chapter 2

Oracle Utilities Work and Asset Management Database Installation Overview

This chapter provides an overview to the installation of the database for the Oracle Utilities Work and Asset Management, including:

- [Installation Overview](#)
- [Installation Types](#)

Installation Overview

Refer to [Supported Database Platforms](#) for information about the supported platforms on which Oracle Utilities Work and Asset Management is verified to operate.

The following types of installation are available for Oracle Utilities Work and Asset Management:

- Initial Install - a database with no demo data.
- Upgrade Install - a database upgrade to v2.2.0.4.0
- Demo Install - a database populated with demo data

Prerequisites

The database installation requires:

- Java Development Kit v8.0

This must be installed on the Windows or Linux machine where the install package will be staged and run.

Creating the Database

For an initial install or demo install you will create an empty database on the Unix or Windows database server on which you operate the production instance of Oracle Utilities Work and Asset Management.

1. Create the database using the Database Configuration Assistant (DBCA). Make sure to set character set for database as AL32UTF8.
2. Enable Mandatory Software Options.
 - Oracle Spatial OR Oracle Locator
 - Oracle Text

3. Run the SQL below to make sure it is successful.

```
SELECT COMP_NAME,STATUS FROM DBA_REGISTRY WHERE COMP_NAME IN
('Spatial','Oracle Text');
```

4. Create default tablespace CISTS_01 and required users and roles.

```
CREATE TABLESPACE CISTS_01 LOGGING DATAFILE '<db_file_location>/
cists01.dbf' SIZE 1024M REUSE AUTOEXTEND ON NEXT 8192K MAXSIZE
UNLIMITED EXTENT MANAGEMENT LOCAL UNIFORM SIZE 1M;
```

5. Create required roles.

```
CREATE ROLE CIS_USER;
CREATE ROLE CIS_READ;
```

6. Create users.

```
CREATE USER CISADM IDENTIFIED BY CISADM DEFAULT TABLESPACE CISTS_01
TEMPORARY TABLESPACE TEMP PROFILE DEFAULT;
GRANT UNLIMITED TABLESPACE TO CISADM WITH ADMIN OPTION;
GRANT SELECT ANY TABLE TO CISADM;
GRANT CREATE DATABASE LINK TO CISADM;
GRANT CONNECT TO CISADM;
```

```

GRANT RESOURCE TO CISADM;
GRANT DBA TO CISADM WITH ADMIN OPTION;
GRANT CREATE ANY SYNONYM TO CISADM;
GRANT SELECT ANY DICTIONARY TO CISADM;

CREATE USER CISUSER PROFILE DEFAULT IDENTIFIED BY CISUSER DEFAULT
TABLESPACE CISTS_01 TEMPORARY TABLESPACE TEMP;
GRANT SELECT ANY TABLE TO CISUSER;
GRANT CIS_USER TO CISUSER;
GRANT CIS_READ TO CISUSER;
GRANT CONNECT TO CISUSER;

CREATE USER CISOPR PROFILE DEFAULT IDENTIFIED BY OPRPLUS DEFAULT
TABLESPACE CISTS_01 TEMPORARY TABLESPACE TEMP;
GRANT CONNECT,RESOURCE,EXP_FULL_DATABASE TO CISOPR;

CREATE USER CISREAD IDENTIFIED BY CISREAD DEFAULT TABLESPACE
CISTS_01 TEMPORARY TABLESPACE TEMP;
GRANT SELECT ANY TABLE TO CISREAD;
GRANT CIS_READ TO CISREAD;
GRANT CONNECT TO CISREAD;

```

7. Review the Storage.xml file under the FW44000\Install-Upgrade folder prior to an initial install or upgrade install. This file allocates all base tables and indexes to the default tablespace CISTS_01 and the required users and roles. Information in this file is used by ORADBI.jar while installing the Oracle Utilities Work and Asset Management database objects. Refer to [Updating Storage.xml](#) for more details on updating this file.

Note: You will need to review the Storage.xml file, prior to an initial install, to update the default values to custom values (for e.g. TableSpace Name). OraDBI.jar can be executed by a non-schema owner in order to upgrade the database. The initial install still needs to be done by the schema owner.

If you decide to allocate some tables or indexes outside of the default tablespace, change the tablespace name from the default value to a custom value in the Storage.xml file.

For instance, if you decide to allocate table CI_ACCT in a tablespace MyTablespace, change Storage.xml as shown:

```

<CI_ACCT>
<TABLESPACE>MyTablespace</TABLESPACE>
</CI_ACCT>

```

For optimum storage allocation, database administrators should create multiple tablespaces with extents sized to store different types of tables/indexes. They can then edit the storage.xml file before install process, to spread tables and indexes across these tablespaces. Tables and indexes can be created in parallel by editing degree of parallelism. Tablespace, storage options, secure file options, Advanced Compression, and parallel information are used only for new objects. Therefore, for initial installs, information for each object should be reviewed. Be careful while editing this file. Make sure that tablespace names being used exist in the database. Do not change the basic format of this file.

Note: Prior to the installation of the database schema for the product, please verify that the Database Management System software is installed according to your site standards and the installation guide provided by

the database vendor. Also verify that you have necessary licenses to use some of the advanced database features such as Advanced Compression.

Optimizing Storage Allocation

To optimize storage allocation, database administrators should do the following:

1. Create multiple tablespaces with extents sized to store different types of tables/indexes.
2. Edit the Storage.xml file before the install process, to spread tables and indexes across these tablespaces.

Be very careful when editing this file and do not change the basic format. Tables and indexes can be created in parallel by editing the degree of parallelism. Tablespace, storage options, secure file options, Advanced Compression, and parallel information are used only for new objects. Therefore, for initial installs, information for each object should be reviewed. Make sure that tablespace names being used exist in the database.

Note: Prior to the installation of the database schema for the product, please verify that the Database Management System software is installed according to your site standards and the installation guide provided by the database vendor. Also verify that you have necessary licenses to use some of the advanced database features such as Advanced Compression.

Installation Types

The first step in the installation procedure is to determine the installation type that meets your business requirements. The following are the possible installation types:

- **Initial Install** - a database with no demo data
- **Upgrade Install** - a database upgrade from a previous release
- **Demo Install** - a database populated with demo data

Refer to [Supported Database Platforms](#) for information about the supported platforms on which Oracle Utilities Work and Asset Management is verified to operate.

Initial Install

Customers installing Oracle Utilities Work and Asset Management v2.2.0.0 for the first time, must refer to the [Installing Oracle Utilities Work and Asset Management - Initial Installation](#) section for complete instructions.

Upgrade Install

This is applicable for customers who already have Oracle Utilities Work and Asset Management v2.2.0.1.0, v2.2.0.2.0, or v2.2.0.3.0 installed.

To upgrade to Oracle Utilities Work and Asset Management v2.2.0.4.0, follow instructions in the [Upgrading the Oracle Utilities Work and Asset Management Database](#) section.

Demo Install

For a demo installation, follow the instructions in [Installing the Database - Demo Environment](#).

Installation Notes

When installing components using OraDBI.jar, you may receive the following message in the display output or logs:

```
- 2016-05-23 16:31:38,315 [main] ERROR
(common.cryptography.KeyStoreWrapperFactory) The keystore file
'<filename>' does not exist...
This file is either provided by the property
com.oracle.ouaf.system.keystore.file or expected to exist at the
default file location null Attempting to use the legacy
cryptography.
- 2016-05-23 16:31:38,566 [main] INFO  (oem.install.OraDBI)
```

These errors can be safely ignored and the process should proceed to completion.

Chapter 3

Installing the Oracle Utilities Work and Asset Management Database - Initial Installation

This chapter provides the instructions for installing the Oracle Utilities Work and Asset Management v2.2.0.4.0 database as part of initial installation. It describes how to install the database components of Oracle Utilities Work and Asset Management, including:

- [Copying and Decompressing Install Media](#)
- [Database Creation](#)
- [Installing the WAM Schema](#)
- [Generating Database Statistics](#)
- [Enable USER_LOCK Package](#)

Copying and Decompressing Install Media

To copy and decompress the database:

1. Download the Oracle Utilities Work and Asset Management v2.2.0.4.0 Oracle Database Multiplatform and Oracle Utilities Application Framework v4.4.0.0.0 Single Fix Prerequisite Database Rollup for Oracle Utilities Work and Asset Management v2.2.0.4.0 from the Oracle Software Delivery Cloud.
2. Unzip the 'WAM-V2.2.0.4.0-Database.zip' file to a temporary folder. This file contains Oracle Utilities Application Framework and Oracle Utilities Work and Asset Management folders with all the database components required to install the database.
3. Unzip the WAM-V22040-FW-PREREQ-DB.zip file to a temporary folder. This file contains Oracle Utilities Application Framework prerequisite single fix database patches for Oracle Utilities Work and Asset Management v2.2.0.4.0.

Database Creation

Make sure you have Oracle Database Server installed on your machine in order to create the database.

Creating the Database on UNIX

Create the database using the Database Configuration Assistant (DBCA).

Make sure to set character set for database as AL32UTF8.

Refer to [Creating the Database](#) for steps to create the database.

Creating the Database on Windows

You should be logged in as a user who is a member of the local ORA_DBA group on that server. The ORA_DBA group should have “administrator” privileges assigned to it.

Make sure to set character set for database as AL32UTF8.

Refer to [Creating the Database](#) for steps to create the database.

Database Globalization Support Consideration Storage BYTES/ CHARACTER

The Oracle Utilities Application Framework is a multilingual capable application that supports the storage, processing and retrieval of data in multiple languages by leveraging the Oracle Database globalization support architecture. Use of the AL32UTF8 Unicode character encoding system allows the database to support multiple languages. If your application will support multiple languages with any one of which being multibyte you should consider the use of Character Length Semantics to store data in database columns in terms of CHARACTERS rather than in terms of BYTES.

At this time Oracle Utilities Application Framework only supports CHAR NLS_LENGTH_SEMANTICS setting at the instance level. Since this is an instance wide setting great care should be taken and a thorough evaluation should be performed if custom or third party components utilize the same database instance as the Framework application.

Note that the use of MAX_STRING_SIZE of EXTENDED is not supported at this time.

By default the database is created with BYTE length semantics. If you are going to store data using CHARACTER length semantics then use following procedure.

Initial Install

1. Execute the following statement to set nls_length_semantics=CHAR

```
SQL> ALTER SYSTEM SET nls_length_semantics=CHAR SCOPE=BOTH;
```

2. Restart the database.
3. Verify that the nls_length_semantics is CHAR using following command:

```
SQL> SHOW PARAMETER nls_length_semantics
```

Note: For pluggable databases make sure to set nls_length_semantics=CHAR for both the container and pluggable database.

There are multiple ways to migrate a database from BYTE to CHAR length semantics:

1. By Script: Refer to Doc ID 313175.1 from Oracle Support.
2. Alternative procedure: The following is an alternate way to create a schema with character-length semantics, and then importing the data from a byte-based export.

Migrating from BYTE based storage to CHARACTER based storage:

1. Create a database using DBCA.
 2. Execute the following statement to set nls_length_semantics=CHAR
- ```
SQL> ALTER SYSTEM SET nls_length_semantics=CHAR SCOPE=BOTH;
```
3. Restart the database.
  4. Make sure nls\_length\_semantics is CHAR using the following command:

```
SQL> SHOW PARAMETER nls_length_semantics
```

**Note:** For pluggable databases make sure to set nls\_length\_semantics=CHAR for both the container and pluggable database.

5. Export the schema from database which has nls\_semantics\_length=BYTE using the following command:

```
expdp userid=system/ <code>@<SID> directory=<DIR_NAME>
schemas=<schema_name> dumpfile=<schema_name>.dmp
logfile=<schema_name>.log
```

6. Generate DDL from the dump file using the Oracle impdp utility:

```
impdp userid=system/ <code>@<SID> directory=<DIR_NAME>
DUMPFILE=<schema_name>.dmp SCHEMAS=<schema_name>
SQLFILE=<schema_name>_DDL.sql
```

7. Replace the word "Byte" with "Char" in <schema\_name>DDL.sql.

For vi editor in Linux environment use following command to replace “Byte” with “Char”:

```
:%s/BYTE/CHAR/g
```

8. Replace the schema name also if it is required for the environment.
9. Execute <schema\_name>DDL.sql, which was generated in step No.6, which will create objects in the schema.

Execute following command to make sure the number of objects at source and target are equal

```
SQL>select OWNER || ' ' || OBJECT_TYPE || ' ' || COUNT(*) || ' ' ||
STATUS FROM DBA_OBJECTS WHERE OWNER in ('<SCHEMA_NAME>') GROUP BY
OWNER, OBJECT_TYPE , STATUS ORDER BY OBJECT_TYPE;
```

10. If any object is missing for any reason create it, by fixing the DDL manually (DDL for each object is available in the file which was created in step No.6), and execute the DDL for the objects which were not created.
11. Generate s DDL to disable triggers using following command.

```
SQL> SELECT 'ALTER TABLE' || ' ' || TABLE_NAME || ' ' || 'DISABLE ALL
TRIGGERS;' FROM USER_TABLES;
```

12. Execute the script generated from step No.11 to disable all triggers.
13. Import data only. Use following command to import data only into the schema created to support CHAR-based database storage. Use following command to import data only.

```
impdp userid=system/<code>@<SID> dumpfile=<schema_name>.dmp
CONTENT=DATA_ONLY SCHEMAS=<schema_name>
LOGFILE=<schema_name>_import.log
```

14. Enable triggers. Use following command to generate a DDL for triggers.

```
SQL>SELECT 'ALTER TABLE' || ' ' || TABLE_NAME || ' ' || 'ENABLE ALL
TRIGGERS;' FROM USER_TABLES;
```

15. Execute the script generated from step No.14 to enable all triggers.

## Exclude Tables and Indexes

If you want to exclude an index or table during the upgrade process you can do it using the following procedure.

Edit the OraSchUpg.inp file in the Install-Upgrade directory to list the tables and indexes to be excluded. Specify the tables and indexes in the following format:

```
-INDEX: 'INDEX_NAME', 'INDEX_NAME'
-TABLE: 'TBALE1_NAME', 'TABLE2_NAME'
```

For Example if you want to exclude table F1\_WEB\_SVC then you can use

```
-TABLE: 'F1_WEB_SVC'
```

If there are multiple tables you can include them with separated coma, such as:

```
-TABLES: 'TABLE-1', 'TABLE_2', 'TABLE_3'
```

Similarly for indexes

```
-INDEX: ' F1C064S1 '
```

If there are multiple indexes you can include them with separated coma, such as

```
-INDEX: ' INDEX_1 ', INDEX_2 ', ' INDEX_3
```

## Installing the WAM Schema

You must install the Oracle Utilities Application Framework v4.4.0.0.0 and Oracle Utilities Application Framework v4.4.0.0.0 Single Fix Prerequisite Database Rollup for Oracle Utilities Work and Asset Management v2.2.0.4.0 prior to Oracle Utilities Work and Asset Management v2.2.0.4.0. The files for Oracle Utilities Application Framework installation are located in the FW44000 folder.

This section provides guidelines for:

- [Installing the Oracle Utilities Application Framework Database Component using OraDBI.jar](#)
- [Installing Oracle Utilities Application Framework Prerequisite Database Single Fixes](#)
- [Installing Oracle Utilities Work and Asset Management Database Component using OraDBI.jar](#)
- [Tasks Performed by ORADBI](#)

## Installing the Oracle Utilities Application Framework Database Component using OraDBI.jar

Prepare the following parameters before installation:

- The name of the database server in which the database is configured - DB\_SERVER
- The listener port number of the database - PORT
- The target database name in which the product is to be installed - SID
- A database user that will own the application schema (for example: CISADM) - DBUSER
- Password of the database user that will own the application schema - DBPASS
- A database user that has read-write (select/update/insert/delete) privileges to the objects in the application schema (for example: CISUSER). The application will access the database as this user - RWUSER
- A database user with read-only privileges to the objects in the application schema. (for example: CISREAD) - RUSER
- A database role that has read-write (select/update/insert/delete) privileges to the objects in the application schema. (for example: CIS\_USER) - RW\_USER\_ROLE
- A database role with read-only privileges to the objects in the application schema (for example: CIS\_READ) - R\_USER\_ROLE

- Location for jar files (the Jar files are bundled with the database package) - CLASSPATH
- The database user password with read-write privileges - RWUSER\_PASS
- The database user password with read-only privileges - RUSER\_PASS

## Granting Privileges to the Database Roles

Make sure to provide the CREATE SYNONYM grants to the database role with read-write and read-only privileges.

```
GRANT CREATE SYNONYM TO CIS_USER;
GRANT CREATE SYNONYM TO CIS_READ;
```

You can execute OraDBI.jar using either of the following methods:

- [Using Interactive Mode to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar](#)
- [Using the Command Line to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar](#)

## Using Interactive Mode to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar

The following procedure lists the steps to install the schema for Oracle Utilities Application Framework v4.4.0.0.0 using OraDBI.

Run the following commands with the defined parameters on the command prompt from the FW\FW44000\Install-Upgrade directory.

1. Open a command line prompt in the Windows environment.
2. Set Java Home.

In the following example, JDK 1.8 is installed in C:\Program Files\Java\jdk1.8.0\_101 directory.

```
SET JAVA_HOME=C:\Program Files\Java\jdk1.8.0_101
```

3. Set the class path.

In the following example, the required jarfiles, including OraDBI.jar, are available in the C:\InstallUpgrade\Jarfiles\\* directory.

```
SET CLASSPATH=C:\InstallUpgrade\Jarfiles*
```

4. Execute the following command:

```
"%JAVA_HOME%\bin\java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI
-p <RWUSER_PASS>,<RUSER_PASS>
```

(or)

```
"C:\Program Files\Java\jdk1.8.0_101\bin\java -Xmx1500M -cp
C:\InstallUpgrade\Jarfiles* com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

The utility prompts you to enter values for the following parameters as per your environment:

- Name of the database server: <DB SERVER>

- Port no: <PORT>
- Name of the target database: <SID>
- Name of the owner of the database schema: <DBUSER>
- Password of the user name: <DBPASS>
- Oracle user with read-write privileges to the Database Schema: <CISUSER>
- Password of the user with read-write privileges: <DBPASS>
- Oracle user with read-only privileges to the Database Schema: <CISREAD>
- Password of the user with read-only privileges: <DBPASS>
- Oracle database role with read-write privileges to the Database Schema: <CIS\_USER>
- Oracle database role with read-only privileges to the Database Schema: <CIS\_READ>
- Enter the name of the target schema where you want to install or upgrade: <CISADM>

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

**Note:** You can also run the OUAF install process on a Linux machine which has Java installed by exporting the JAVA\_HOME and CLASSPATH.

**Example:**

```
export JAVA_HOME=/scratch/spl/jdk1.8.0_92
export PATH=$JAVA_HOME/bin:$PATH

export CLASSPATH=/scratch/Candidate/FW-V4.4.0.0.0-Database/
jarfiles/*
(or)
export CLASSPATH=/scratch/Candidate/FW-V4.4.0.0.0-Database/
jarfiles/spl-shared-4.4.0.0.0.jar:/scratch/Candidate/FW-
V4.4.0.0.0-Database/jarfiles/ojdbc8-12.2.0.1.jar:/scratch/
Candidate/FW-V4.4.0.0.0-Database/jarfiles/log4j-core-2.11.0.jar:/
scratch/Candidate/FW-V4.4.0.0.0-Database/jarfiles/log4j-api-
2.11.0.jar:/scratch/Candidate/FW-V4.4.0.0.0-Database/jarfiles/
commons-collections-3.2.2.jar:/scratch/Candidate/FW-V4.4.0.0.0-
Database/jarfiles/commons-codec-1.9.jar:/scratch/Candidate/FW-
V4.4.0.0.0-Database/jarfiles/commons-cli-1.3.1.jar:/scratch/
Candidate/FW-V4.4.0.0.0-Database/jarfiles/oradbi.jar
```

In interactive mode, you can run the installer using the command:

```
java -Xmx1500M com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

## Using the Command Line to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar

Run the following commands with the defined parameters on the command prompt from .. FW\FW44000\Install-Upgrade directory:

```
"C:\Program Files\Java\jdk1.8.0_65\bin\java" -Xmx1500M -cp /
scratch/Candidate/FW-V4.4.0.0.0-Database/jarfiles/spl/*
com.oracle.ouaf.oem.install.OraDBI -d
jdbc:oracle:thin:@<DatabaseServer_Name>:1521/<DatabaseName>,
%DBUSER%,%DBPASS%, CISUSER, CISREAD, CIS_USER, CIS_READ, %DBUSER% -
l 1,2 -j "C:\Program Files\Java\jdk1.8.0_65" -p
<RWUSER_PASS>,<RUSER_PASS>
```

OR

```
"%JAVA_HOME%\bin\java" -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI -d jdbc:oracle:thin:@<Database
ServerName>:1521/
<Database_Name>,%DBUSER%,%DBPASS%,CISUSER,CISREAD,CIS_USER,CIS_REA
D,%DBUSER% -l 1,2 -j "%JAVA_HOME%" -p <RWUSER_PASS>,<RUSER_PASS>
```

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

This process can also be run on a Linux machine which has Java installed by exporting the JAVA HOME and CLASSPATH.

**Note:** The following error messages can be ignored during process:

```
- 2016-05-23 16:31:38,315 [main] ERROR
(common.cryptography.KeyStoreWrapperFactory) The keystore file
'<filename>' does not exist....
```

...

This file is either provided by the property com.oracle.ouaf.system.keystore.file or expected to exist at the default file location null Attempting to use the legacy cryptography.

```
- 2016-05-23 16:31:38,566 [main] INFO (oem.install.OraDBI)
```

## Installing Oracle Utilities Application Framework Prerequisite Database Single Fixes

Before installing Oracle Utilities Work and Asset Management, you must install Oracle Utilities Application Framework v4.4.0.0.0 Single Fix Prerequisite Database Rollup for Oracle Utilities Work and Asset Management v2.2.0.4.0.

### Applying Hot Fixes

**Note:** Java 8 JDK should be installed on the machine to use the command. make sure to install the JDK that is supported for your platform.

1. Copy db\_patch\_standalone.jar to any directory on your local machine under the dbpatch\_tools folder.

For steps to generate the jar file, see the **Database Patching** section in *Oracle Utilities Work and Asset Management Installation Guide v2.2.0.4*.

UNIX:

```
cd ../../dbpatch_tools
jar xvf db_patch_standalone.jar
```

WINDOWS:

```
cd c:..\dbpatch_tools
jar xvf db_patch_standalone.jar
```

## 2. SET TOOLSBIN.

UNIX:

```
export TOOLSBIN=../../dbpatch_tools/bin
```

WINDOWS:

```
SET TOOLSBIN=c:..\dbpatch_tools\bin
```

## 3. Apply prerequisite Oracle Utilities Application Framework database single fixes from ..\ WAM-V22040-FW-PREREQ-DB \FW44000-HFix folder.

UNIX:

- a. Change the permission of ouafDatabasePatch.sh tool.

```
chmod 755 ouafDatabasePatch.sh
```

- b. Run the ouafDatabasePatch.sh tool.

```
sh ouafDatabasePatch.sh (or) ./ ouafDatabasePatch.sh
```

WINDOWS:

- a. Run the ouafDatabasePatch.cmd tool.

```
ouafDatabasePatch.cmd
```

The utility prompts you to enter values for the parameters listed below:

- Enter the target database type (O/M/D) [O]: <O>
- Enter the username that owns the schema: <CISADM>
- Enter the password for the cisadm user: <CISADM Password>

Enter the name of the Oracle Database Connection String:

<DB\_Server:DBPORT:ORACLE\_SID>

## Installing Oracle Utilities Work and Asset Management Database Component using OraDBI.jar

Prepare the following parameters before installation:

- The name of the database server in which the database is configured - DB\_SERVER

- The listener port number of the database - PORT
- The target database name in which the product is to be installed - SID
- A database user that will own the application schema (for example: CISADM) - DBUSER
- Password of the database user that will own the application schema - DBPASS
- A database user that has read-write (select/update/insert/delete) privileges to the objects in the application schema (for example: CISUSER). The application will access the database as this user - RWUSER
- A database user with read-only privileges to the objects in the application schema. (for example: CISREAD) - RUSER
- A database role that has read-write (select/update/insert/delete) privileges to the objects in the application schema. (for example: CIS\_USER) - RW\_USER\_ROLE
- A database role with read-only privileges to the objects in the application schema. (for example: CIS\_READ) - R\_USER\_ROLE
- Location for jar files. (The Jar files are bundled with the database package) - CLASSPATH
- Java Home (for example: C:\Java\jdk1.8.0) - JAVA\_HOME
- The database user password with read-write privileges - RWUSER\_PASS
- The database user password with read-only privileges - RUSER\_PASS

You can execute OraDBI.jar using either of the following methods:

- [Using Interactive Mode to Install Using ORADBI.jar](#)
- [Using the Command Line to Install Using ORADBI.jar](#)

### Using Interactive Mode to Install Using ORADBI.jar

The following procedure lists the steps to install the schema for Oracle Utilities Work and Asset Management v2.2.0.4.0 using OraDBI.

Run the following commands with the defined parameters on the command prompt from ..WAM\Install-Upgrade directory:

1. Open a command line prompt in the Windows environment.
2. Set Java Home.

In the following example, JDK 1.8 is installed in C:\Program Files\Java\jdk1.8.0\_101 directory.

```
SET JAVA_HOME=C:\Program Files\Java\jdk1.8.0_101
```

3. Set the class path.

In the following example, the required jarfiles, including OraDBI.jar, are available in the C:\InstallUpgrade\Jarfiles\\* directory.

```
SET CLASSPATH=C:\InstallUpgrade\Jarfiles*
```

4. Execute the following command:

```
"%JAVA_HOME%\bin\java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI -p <RWUSER_PASS>,<RUSER_PASS>
```

(or)

```
"C:\Program Files\Java\jdk1.8.0_101"\bin\java -Xmx1500M -cp
C:\InstallUpgrade\Jarfiles* com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

The utility prompts you to enter values for the following parameters as per your environment:

- Name of the database server: <DB SERVER>
- Port no: <PORT>
- Name of the target database: <SID>
- Name of the owner of the database schema: <DBUSER>
- Password of the user name: <DBPASS>
- Oracle user with read-write privileges to the Database Schema: <CISUSER>
- Password of the user with read-write privileges: <DBPASS>
- Oracle user with read-only privileges to the Database Schema: <CISREAD>
- Password of the user with read-only privileges: <DBPASS>
- Oracle database role with read-write privileges to the Database Schema: <CIS\_USER>
- Oracle database role with read-only privileges to the Database Schema: <CIS\_READ>
- Enter the name of the target schema where you want to install or upgrade: <CISADM>

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

You can also run the process on a Linux machine which has Java installed by exporting the JAVA\_HOME and CLASSPATH.

In interactive mode, you can run the installer using the command:

```
java -Xmx1500M com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

### Using the Command Line to Install Using ORADBI.jar

Run the following commands with the defined parameters at the command prompt from the ..WAM\Install-Upgrade directory

```
"C:\Program Files\Java\jdk1.8.0_65\bin\java" -Xmx1500M -cp
%CLASSPATH% com.oracle.ouaf.oem.install.OraDBI -d
jdbc:oracle:thin:@<DatabaseServer_Name>:1521/<DatabaseName>,
%DBUSER%,%DBPASS%, CISUSER, CISREAD, CIS_USER, CIS_READ, %DBUSER% -
l 1,2 -j "C:\Program Files\Java\jdk1.8.0_65" -p
<RWUSER_PASS>,<RUSER_PASS>
```

OR

```
"%JAVA_HOME%\bin\java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI -d jdbc:oracle:thin:@<Database
ServerName>:1521/
```

```
<Database_Name>,%DBUSER%,%DBPASS%,CISUSER,CISREAD,CIS_USER,CIS_READ,%DBUSER% -l 1,2 -j "%JAVA_HOME%" -p <RWUSER_PASS>,<RUSER_PASS>
```

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

This process can also be run on a Linux machine which has Java installed by exporting the JAVA HOME and CLASSPATH.

## Tasks Performed by ORADBI

The following tasks are performed by ORADBI:

- Interacts with the user to collect information about the name of Oracle account that will own the application schema (for example, CISADM), password of this account, password of the SYSTEM account in the database, and the name of the Oracle account that the application user will use (for example, CISUSER), and the name of the Oracle account that will be assigned read-only privileges to the application schema (for example, CISREAD).
- Verifies whether tablespace names already exist in the Storage.xml file (if not, the process will abort).
- Installs the schema, installs the system data, and configures security.
- Maintains upgrade log tables in the database.
- Updates release ID when the upgrade is completed successfully.
- If an error occurs while executing a SQL script or another utility, it logs and displays the error message and allows you to re-execute the current step. Log files ORADBI###.log are created in the same folder as ORADBI and contains all the SQL commands executed against the database along with the results. The log files are incremental so that the results are never overwritten. If warning messages are generated during the upgrade, ORADBI prompts the user at the end of the process. Users should check the log files to verify the warning messages. Warning messages are only alerts and do not necessarily mean a problem exists.
- Stores the Schema owner and password in the feature configuration table. The password is stored in encrypted format.
- OraDBI can be executed by a non-schema owner.
- OraDBI automatically runs the Security Oragensec utility.

# Generating Database Statistics

During an install process new database objects may be added to the target database.

Before starting to use the database, generate the complete statistics for these new objects by using the DBMS\_STATS package.

## Enable USER\_LOCK Package

For inbound web services to work, the USER\_LOCK must be enabled at the database level. This is a one-time step. If this is not already enabled, enable it using the following steps:

1. Login as SYS user.
2. On SQL prompt run.  

```
@<ORACLE_HOME>/rdbms/admin/userlock.sql
```
3. Grant permission by running following SQL:  

```
grant execute on USER_LOCK to public;
```

Note that grant can also be made to the database user that the application connects to (for example, cisuser), instead of 'public'.

# Chapter 4

---

## Upgrading the Oracle Utilities Work and Asset Management Database

This chapter provides the instructions for upgrading the database to Oracle Utilities Work and Asset Management v2.2.0.4.0. It describes how to upgrade the database components of Oracle Utilities Work and Asset Management, including:

- [Copying and Decompressing Install Media](#)
- [Generating Database Statistics](#)
- [Enable USER\\_LOCK package](#)

# Copying and Decompressing Install Media

To copy and decompress the database:

1. Download the Oracle Utilities Work and Asset Management v2.2.0.4.0 Oracle Database Multiplatform and Oracle Utilities Application Framework v4.4.0.0.0 Single Fix Prerequisite Database Rollup for Oracle Utilities Work and Asset Management v2.2.0.4.0 from the Oracle Software Delivery Cloud.
2. Unzip the 'WAM-V2.2.0.4.0-Database.zip' file to a temporary folder. This file contains Oracle Utilities Application Framework and Oracle Utilities Work and Asset Management folders with all the database components required to install the database.
3. Unzip the WAM-V22040-FW-PREREQ-DB.zip file to a temporary folder. This file contains Oracle Utilities Application Framework prerequisite single fix database patches for Oracle Utilities Work and Asset Management v2.2.0.4.0.

## Upgrading the Schema

The following section assumes that you have Oracle Utilities Work and Asset Management v2.2.0.1.0, v2.2.0.2.0, or v2.2.0.3.0 installed.

**Note:** You must have Oracle Database Server 12.2.0.1+ installed on your machine to continue with the procedure. If you do not have Oracle Database Server 12.2.0.1+ installed, please upgrade to Oracle Database Server 12.2.0.1+ first before proceeding.

## Upgrading the Oracle Utilities Application Framework Database Component using OraDBI.jar

Prepare the following parameters before installation:

- The name of the database server in which the database is configured - DB\_SERVER
- The listener port number of the database - PORT
- The target database name in which the product is to be installed - SID
- A database user that will own the application schema (for example: CISADM) - DBUSER
- Password of the database user that will own the application schema - DBPASS
- A database user that has read-write (select/update/insert/delete) privileges to the objects in the application schema (for example: CISUSER). The application will access the database as this user - RWUSER
- A database user with read-only privileges to the objects in the application schema. (for example: CISREAD) - RUSER
- A database role that has read-write (select/update/insert/delete) privileges to the objects in the application schema. (for example: CIS\_USER) - RW\_USER\_ROLE

- A database role with read-only privileges to the objects in the application schema (for example: CIS\_READ) - R\_USER\_ROLE
- Location for jar files (the Jar files are bundled with the database package) - CLASSPATH
- The database user password with read-write privileges - RWUSER\_PASS
- The database user password with read-only privileges - RUSER\_PASS

## Granting Privileges to the Database Roles

Make sure to provide the CREATE SYNONYM grants to the database role with read-write and read-only privileges.

```
GRANT CREATE SYNONYM TO CIS_USER;
GRANT CREATE SYNONYM TO CIS_READ;
```

You can execute OraDBI.jar using either of the following methods:

- [Using Interactive Mode to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar](#)
- [Using the Command Line to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar](#)

## Using Interactive Mode to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar

The following procedure lists the steps to install the schema for Oracle Utilities Application Framework v4.4.0.0.0 using OraDBI.

Run the following commands with the defined parameters on the command prompt from the FW\FW44000\Install-Upgrade directory.

1. Open a command line prompt in the Windows environment.
2. Set Java Home.

In the following example, JDK 1.8 is installed in C:\Program Files\Java\jdk1.8.0\_101 directory.

```
SET JAVA_HOME=C:\Program Files\Java\jdk1.8.0_101
```

3. Set the class path.

In the following example, the required jarfiles, including OraDBI.jar, are available in the C:\InstallUpgrade\Jarfiles\\* directory.

```
SET CLASSPATH=C:\InstallUpgrade\Jarfiles*
```

4. Execute the following command:

```
"%JAVA_HOME%\bin\java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI
-p <RWUSER_PASS>,<RUSER_PASS>
```

(or)

```
"C:\Program Files\Java\jdk1.8.0_101\bin\java -Xmx1500M -cp
C:\InstallUpgrade\Jarfiles* com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

The utility prompts you to enter values for the following parameters as per your environment:

- Name of the database server: <DB SERVER>
- Port no: <PORT>
- Name of the target database: <SID>
- Name of the owner of the database schema: <DBUSER>
- Password of the user name: <DBPASS>
- Oracle user with read-write privileges to the Database Schema: <CISUSER>
- Password of the user with read-write privileges: <DBPASS>
- Oracle user with read-only privileges to the Database Schema: <CISREAD>
- Password of the user with read-only privileges: <DBPASS>
- Oracle database role with read-write privileges to the Database Schema: <CIS\_USER>
- Oracle database role with read-only privileges to the Database Schema: <CIS\_READ>
- Enter the name of the target schema where you want to install or upgrade: <CISADM>

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

**Note:** You can also run the OUAF install process on a Linux machine which has Java installed by exporting the JAVA\_HOME and CLASSPATH.

**Example:**

```
export JAVA_HOME=/scratch/sp1/jdk1.8.0_92
export PATH=$JAVA_HOME/bin:$PATH

export CLASSPATH=/scratch/Candidate/FW-V4.4.0.0.0-Database/
jarfiles/*
(or)
export CLASSPATH=/scratch/Candidate/FW-V4.4.0.0.0-Database/
jarfiles/sp1-shared-4.4.0.0.0.jar:/scratch/Candidate/FW-
V4.4.0.0.0-Database/jarfiles/ojdbc8-12.2.0.1.jar:/scratch/
Candidate/FW-V4.4.0.0.0-Database/jarfiles/log4j-core-2.11.0.jar:/
scratch/Candidate/FW-V4.4.0.0.0-Database/jarfiles/log4j-api-
2.11.0.jar:/scratch/Candidate/FW-V4.4.0.0.0-Database/jarfiles/
commons-collections-3.2.2.jar:/scratch/Candidate/FW-V4.4.0.0.0-
Database/jarfiles/commons-codec-1.9.jar:/scratch/Candidate/FW-
V4.4.0.0.0-Database/jarfiles/commons-cli-1.3.1.jar:/scratch/
Candidate/FW-V4.4.0.0.0-Database/jarfiles/oradbi.jar
```

In interactive mode, you can run the installer using the command:

```
java -Xmx1500M com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

## Using the Command Line to Install the Oracle Utilities Application Framework Database Component using OraDBI.jar

Run the following commands with the defined parameters on the command prompt from .. FW\FW44000\Install-Upgrade directory:

```
"C:\Program Files\Java\jdk1.8.0_65\bin\java" -Xmx1500M -cp /
scratch/Candidate/FW-V4.4.0.0-Database/jarfiles/spl/*
com.oracle.ouaf.oem.install.OraDBI -d
jdbc:oracle:thin:@<DatabaseServer_Name>:1521/<DatabaseName>,
%DBUSER%,%DBPASS%, CISUSER, CISREAD, CIS_USER, CIS_READ, %DBUSER% -
l 1,2 -j "C:\Program Files\Java\jdk1.8.0_65" -p
<RWUSER_PASS>,<RUSER_PASS>
```

OR

```
"%JAVA_HOME%\bin\java" -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI -d jdbc:oracle:thin:@<Database
ServerName>:1521/
<Database_Name>,%DBUSER%,%DBPASS%,CISUSER,CISREAD,CIS_USER,CIS_REA
D,%DBUSER% -l 1,2 -j "%JAVA_HOME%" -p <RWUSER_PASS>,<RUSER_PASS>
```

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

This process can also be run on a Linux machine which has Java installed by exporting the JAVA HOME and CLASSPATH.

**Note:** The following error messages can be ignored during process:

```
- 2016-05-23 16:31:38,315 [main] ERROR
(common.cryptography.KeyStoreWrapperFactory) The keystore file
'<filename>' does not exist....
```

...

This file is either provided by the property com.oracle.ouaf.system.keystore.file or expected to exist at the default file location null Attempting to use the legacy cryptography.

```
- 2016-05-23 16:31:38,566 [main] INFO (oem.install.OraDBI)
```

## Installing Oracle Utilities Application Framework Prerequisite Database Single Fixes

Before installing Oracle Utilities Work and Asset Management, you must install Oracle Utilities Application Framework v4.4.0.0 Single Fix Prerequisite Database Rollup for Oracle Utilities Work and Asset Management v2.2.0.4.0.

### Applying Hot Fixes

**Note:** Java 8 JDK should be installed on the machine to use the command. make sure to install the JDK that is supported for your platform.

1. Copy db\_patch\_standalone.jar to any directory on your local machine under the dbpatch\_tools folder.

For steps to generate the jar file, see the **Database Patching** section in *Oracle Utilities Work and Asset Management Installation Guide v2.2.0.4*.

UNIX:

```
cd ../../dbpatch_tools
jar xvf db_patch_standalone.jar
```

WINDOWS:

```
cd c:..\dbpatch_tools
jar xvf db_patch_standalone.jar
```

## 2. SET TOOLSBIN.

UNIX:

```
export TOOLSBIN=../../dbpatch_tools/bin
```

WINDOWS:

```
SET TOOLSBIN=c:..\dbpatch_tools\bin
```

## 3. Apply prerequisite Oracle Utilities Application Framework database single fixes from ..\ WAM-V22040-FW-PREREQ-DB \FW44000-HFix folder.

UNIX:

- a. Change the permission of ouafDatabasePatch.sh tool.

```
chmod 755 ouafDatabasePatch.sh
```

- b. Run the ouafDatabasePatch.sh tool.

```
sh ouafDatabasePatch.sh (or) ./ ouafDatabasePatch.sh
```

WINDOWS:

- a. Run the ouafDatabasePatch.cmd tool.

```
ouafDatabasePatch.cmd
```

The utility prompts you to enter values for the parameters listed below:

- Enter the target database type (O/M/D) [O]: <O>
- Enter the username that owns the schema: <CISADM>
- Enter the password for the cisadm user: <CISADM Password>

Enter the name of the Oracle Database Connection String:

<DB\_Server:DBPORT:ORACLE\_SID>

## Upgrading Oracle Utilities Work and Asset Management Database Component using OraDBI.jar

Prepare the following parameters before installation:

- The name of the database server in which the database is configured - DB\_SERVER
- The listener port number of the database - PORT

- The target database name in which the product is to be installed - SID
- A database user that will own the application schema (for example: CISADM) - DBUSER
- Password of the database user that will own the application schema - DBPASS
- A database user that has read-write (select/update/insert/delete) privileges to the objects in the application schema (for example: CISUSER). The application will access the database as this user - RWUSER
- A database user with read-only privileges to the objects in the application schema. (for example: CISREAD) - RUSER
- A database role that has read-write (select/update/insert/delete) privileges to the objects in the application schema. (for example: CIS\_USER) - RW\_USER\_ROLE
- A database role with read-only privileges to the objects in the application schema. (for example: CIS\_READ) - R\_USER\_ROLE
- Location for jar files. (The Jar files are bundled with the database package) - CLASSPATH
- Java Home (for example: C:\Java\jdk1.8.0) - JAVA\_HOME
- The database user password with read-write privileges - RWUSER\_PASS
- The database user password with read-only privileges - RUSER\_PASS

You can execute OraDBI.jar using either of the following methods:

- [Using Interactive Mode to Install Using ORADBI.jar](#)
- [Using the Command Line to Install Using ORADBI.jar](#)

### Using Interactive Mode to Install Using ORADBI.jar

The following procedure lists the steps to install the schema for Oracle Utilities Work and Asset Management v2.2.0.4.0 using OraDBI.

Run the following commands with the defined parameters on the command prompt from ..WAM\Install-Upgrade directory:

1. Open a command line prompt in the Windows environment.
2. Set Java Home.

In the following example, JDK 1.8 is installed in C:\Program Files\Java\jdk1.8.0\_101 directory.

```
SET JAVA_HOME=C:\Program Files\Java\jdk1.8.0_101
```

3. Set the class path.

In the following example, the required jarfiles, including OraDBI.jar, are available in the C:\InstallUpgrade\Jarfiles\\* directory.

```
SET CLASSPATH=C:\InstallUpgrade\Jarfiles*
```

4. Execute the following command:

```
"%JAVA_HOME%\bin\java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI -p <RWUSER_PASS>, <RUSER_PASS>
```

(or)

```
"C:\Program Files\Java\jdk1.8.0_101"\bin\java -Xmx1500M -cp
C:\InstallUpgrade\Jarfiles* com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

The utility prompts you to enter values for the following parameters as per your environment:

- Name of the database server: <DB SERVER>
- Port no: <PORT>
- Name of the target database: <SID>
- Name of the owner of the database schema: <DBUSER>
- Password of the user name: <DBPASS>
- Oracle user with read-write privileges to the Database Schema: <CISUSER>
- Password of the user with read-write privileges: <DBPASS>
- Oracle user with read-only privileges to the Database Schema: <CISREAD>
- Password of the user with read-only privileges: <DBPASS>
- Oracle database role with read-write privileges to the Database Schema: <CIS\_USER>
- Oracle database role with read-only privileges to the Database Schema: <CIS\_READ>
- Enter the name of the target schema where you want to install or upgrade: <CISADM>

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

You can also run the process on a Linux machine which has Java installed by exporting the JAVA\_HOME and CLASSPATH.

In interactive mode, you can run the installer using the command:

```
java -Xmx1500M com.oracle.ouaf.oem.install.OraDBI -p
<RWUSER_PASS>,<RUSER_PASS>
```

### Using the Command Line to Install Using ORADBI.jar

Run the following commands with the defined parameters at the command prompt from the ..WAM\Install-Upgrade directory

```
"C:\Program Files\Java\jdk1.8.0_65\bin\java" -Xmx1500M -cp
%CLASSPATH% com.oracle.ouaf.oem.install.OraDBI -d
jdbc:oracle:thin:@<DatabaseServer_Name>:1521/<DatabaseName>,
%DBUSER%,%DBPASS%, CISUSER, CISREAD, CIS_USER, CIS_READ, %DBUSER% -
l 1,2 -j "C:\Program Files\Java\jdk1.8.0_65" -p
<RWUSER_PASS>,<RUSER_PASS>
```

OR

```
"%JAVA_HOME%\bin\java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraDBI -d jdbc:oracle:thin:@<Database
ServerName>:1521/
<Database_Name>,%DBUSER%,%DBPASS%,CISUSER,CISREAD,CIS_USER,CIS_REA
D,%DBUSER% -l 1,2 -j "%JAVA_HOME%" -p <RWUSER_PASS>,<RUSER_PASS>
```

This process generates log files in the directory Install-Upgrade\logs. Check the log files for any errors. Refer to [Installation Notes](#) for more information.

This process can also be run on a Linux machine which has Java installed by exporting the JAVA HOME and CLASSPATH.

Tasks Performed by ORADBI

The following tasks are performed by ORADBI:

- Interacts with the user to collect information about the name of Oracle account that will own the application schema (for example, CISADM), password of this account, password of the SYSTEM account in the database, and the name of the Oracle account that the application user will use (for example, CISUSER), and the name of the Oracle account that will be assigned read-only privileges to the application schema (for example, CISREAD).
- Verifies whether tablespace names already exist in the Storage.xml file (if not, the process will abort).
- Installs the schema, installs the system data, and configures security.
- Maintains upgrade log tables in the database.
- Updates release ID when the upgrade is completed successfully.
- If an error occurs while executing a SQL script or another utility, it logs and displays the error message and allows you to re-execute the current step. Log files ORADBI###.log are created in the same folder as ORADBI and contains all the SQL commands executed against the database along with the results. The log files are incremental so that the results are never overwritten. If warning messages are generated during the upgrade, ORADBI prompts the user at the end of the process. Users should check the log files to verify the warning messages. Warning messages are only alerts and do not necessarily mean a problem exists.
- Stores the Schema owner and password in the feature configuration table. The password is stored in encrypted format.
- OraDBI can be executed by a non-schema owner.
- OraDBI automatically runs the Security Oragensec utility.

# Generating Database Statistics

During an install process new database objects may be added to the target database. Before starting to use the database, generate the complete statistics for these new objects by using the DBMS\_STATS package.

## Enable USER\_LOCK package

For inbound web services to work, the USER\_LOCK must be enabled at the database level. This is a one-time step. If this is not already enabled, enable it using the following steps:

1. Login as SYS user.
2. On SQL prompt run.  

```
@<ORACLE_HOME>/rdbms/admin/userlock.sql
```
3. Grant permission by running following SQL:  

```
grant execute on USER_LOCK to public;
```

Note that grant can also be made to the database user that the application connects to (for example, cisuser), instead of 'public'.

# Chapter 5

---

## Installing the Database - Demo Environment

This chapter provides instructions for installing the Oracle Utilities Work and Asset Management demo database. It describes how to install demo database components, including:

- [Copying and Decompressing Install Media](#)
- [Creating the Database](#)
- [Importing the WAM Demo Dump File](#)
- [Configuring Security](#)

# Copying and Decompressing Install Media

To copy and decompress the database:

1. Download the Oracle Utilities Work and Asset Management v2.2.0.4.0 Oracle Database Multiplatform and Oracle Utilities Application Framework v4.4.0.0.0 Single Fix Prerequisite Database Rollup for Oracle Utilities Work and Asset Management v2.2.0.4.0 from the Oracle Software Delivery Cloud.
2. Unzip the 'WAM-V2.2.0.4.0-Database.zip' file to a temporary folder. This file contains Oracle Utilities Application Framework and Oracle Utilities Work and Asset Management folders with all the database components required to install the database.
3. Unzip the WAM-V22040-FW-PREREQ-DB.zip file to a temporary folder. This file contains Oracle Utilities Application Framework prerequisite single fix database patches for Oracle Utilities Work and Asset Management v2.2.0.4.0.

**Note:** You must have Oracle Database Server 12.2.0.1+ installed on your machine to continue with the procedure below. If you do not have Oracle Database Server 12.2.0.1+ installed, please upgrade to Oracle Database Server 12.2.0.1+ first before proceeding.

## Creating the Database

It is strongly recommended that you use DBCA to create the database.

**Note:** You must have Oracle Database Server Enterprise Edition installed on your machine in order to create the database.

### UNIX

Create the database using the Database Configuration Assistant (DBCA).

### Windows

You should be logged in as a user who is a member of the local ORA\_DBA group on that server. The ORA\_DBA group should have “administrator” privileges assigned to it.

Make sure to set character set for database as AL32UTF8.

Refer to [Chapter 1: Creating the Database](#) for steps to create the database on either Unix or Windows.

## Importing the WAM Demo Dump File

After a successful database creation, demo data can be imported by following these steps:

1. Set the correct ORACLE\_SID and ORACLE\_HOME.
2. Run the following command to import the demo dump:

```
impdp directory= data_pump_dir dumpfile= expdp_WAM_demo.dmp
logfile=expdp_WAM_demo.log schemas=CISADM
```

**Note:** The data\_pump\_dir must exist in the database created above before continuing with the import. You should also copy the expdp\_WAM\_demo.dmp file to the data\_pump\_dir. Decompress the expdp\_WAM\_demo.dmp.gz file first to extract the expdp\_WAM\_demo.dmp file. This file is in the ..\WAM\Demo directory.

## Configuring Security

For interactive mode execution of OraGenSec Java Version, set the JAVA\_HOME and CLASSPATH environment variables as follows. Make sure to change path to your Java Home location and jarfiles location.

```
set JAVA_HOME=C:\Program Files\Java\jdk1.8.0_65
set CLASSPATH=C:\FW4.4.0.0.0\jarfiles*
```

Use the -h option to display the options available for OraGenSec.

For example:

```
C:\ Install-Upgrade>java -Xmx1500M -cp %CLASSPATH%
com.oracle.ouaf.oem.install.OraGenSec -h
```

To execute OraGenSec use the following:

```
java -Xmx1500M -cp C:\FW4.4.0.0.0\jarfiles*
com.oracle.ouaf.oem.install.OraGenSec -l oragensec.log -d
<DBUSER>,<DBPASS>,jdbc:oracle:thin:@<DB_Server>:PORT/
<SERVICE_NAME> -a A -r <RW_USER_ROLE>,<R_USER_ROLE> -u
<RWUSER>,<RUSER> -p <RWUSER_PASS>,<RUSER_PASS>
```

**Note:** Database vault must be disabled before running this utility.

# Chapter 6

---

## Database Design

The standard for database objects such as tables, columns, and indexes, for products using the Oracle Utilities Application Framework helps in smooth integration and upgrade processes by ensuring clean database design, promoting communications, and reducing errors.

Just as Oracle Utilities Application Framework goes through innovation in every release of the software, it is also inevitable that the product will take advantage of various database vendors' new features in each release. The recommendations in the database installation section include only the ones that have been proved by vigorous QA processes, field tests and benchmarks.

This chapter describes the following:

- [Database Object Standard](#)
- [Column Data Type and Constraints](#)
- [Standard Columns](#)

# Database Object Standard

This section discusses the rules applied to naming database objects and the attributes that are associated with these objects.

## Categories of Data

A table can belong to one of the three categories:

- Control (admin)
- Master
- Transaction

For purposes of physical table space design, metadata and control tables can belong to the same category.

Example of tables in each category:

- **Control:** SC\_USER, CI\_ADJ\_TYPE, F1\_BUS\_OBJ
- **Master:** CI\_PER, CI\_PREM,
- **Transaction:** F1\_FACT, CI\_FT

All tables have the category information in their index name. The second letter of the index carries this information. Refer to [Indexes](#) for more information.

## Naming Standards

The following naming standards must be applied to database objects.

### Table

Table names are prefixed with the owner flag value of the product. For customer modification **CM** must prefix the table name. The length of the table names must be less than or equal to 30 characters. A language table should be named by suffixing **\_L** to the main table. The key table name should be named by suffixing **\_K** to the main table.

It is recommended to start a table name with the 2-3 letter acronym of the subsystem name that the table belongs to. For example, **MD** stands for metadata subsystem and all metadata table names start with **CI\_MD**.

Some examples are:

- CI\_ADJ\_TYPE
- CI\_ADJ\_TYPE\_L

A language table stores language sensitive columns such as a description of a code. The primary key of a language table consists of the primary key of the code table plus language code (LANGAGUE\_CD).

A key table accompanies a table with a surrogate key column. A key value is stored with the environment id that the key value resides in the key table.

The tables prior to V2.0.0 are prefixed with CI\_ or SC\_.

## Columns

The length of a column name must be less than or equal to 30 characters. For customer modification, CM must prefix the column name. The following conventions apply when you define special types of columns in the database.

- Use the suffix **FLG** to define a lookup table field. Flag columns must be CHAR(4). Choose lookup field names carefully as these column names are defined in the lookup table (CI\_LOOKUP\_FLD) and must be prefixed by the product owner flag value.
- Use the suffix **CD** to define user-defined codes. User-defined codes are primarily found as the key column of the admin tables.
- Use the suffix **ID** to define system assigned key columns.
- Use the suffix **SW** to define Boolean columns. The valid values of the switches are 'Y' or 'N'. The switch columns must be CHAR(1)
- Use the suffix **DT** to define Date columns.
- Use the suffix **DTTM** to define Date Time columns.
- Use the suffix **TM** to define Time columns.

Some examples are:

- ADJ\_STATUS\_FLG
- CAN\_RSN\_CD

## Indexes

Index names are composed of the following parts:

[OF][*application specific prefix*][C/M/T]NNN[P/S]n

- **OF**- Owner Flag. The standard is to use the two characters of the product's owner flag. Note that there may be some older indexes that use only the first character of the owner flag. For client specific implementation of index, use CM for Owner Flag. If implementation creates a CM Index on table-columns for which the base product already provides an index, then the CM Index will be overridden by the based index.
- Application specific prefix could be C, F, T or another letter.
- **C/M/T** - The second character can be either C or M or T. C is used for control tables (Admin tables). M is for the master tables. T is reserved for the transaction tables.
- **NNN** - A three-digit number that uniquely identifies the table on which the index is defined.
- **P/S** - P indicates that this index is the primary key index. S is used for indexes other than primary keys.
- **n** is the index number, unique across all indexes on a given table (0 for primary and 1, 2, etc., for the secondary indexes).

Some examples are:

- F1C066P0
- F1C066S1

- CMT206S2

Warning! Do not use index names in the application as the names can change due to unforeseeable reasons.

### Updating Storage.xml

The storage.xml file that comes with the product allocates all base tables and indexes to the default tablespace CISTS\_01. If you decide to allocate some tables or indexes outside of the default tablespace, then this has to be reflected in the storage.xml file by changing the tablespace name from the default value to a custom value, according to the format shown below:

Format:

```
<Table_Name>
 <TABLESPACE>CISTS_01</TABLESPACE>
 <PARALLEL>1</PARALLEL>
- <LOB>
- <Column Name>
 <TABLESPACE>CISTS_01</TABLESPACE>
 <SECUREFILE>Y</SECUREFILE>
 <CHUNK>8192</CHUNK>
 <CACHE>N</CACHE>
 <LOGGING>Y</LOGGING>
 <INROW>Y</INROW>
 <COMPRESS>N</COMPRESS>
</Column Name>
</LOB>
</Table_Name>
```

Where Parallel defines the number of threads, that Oracle DB Server will use to access a table or create an index.

We recommend creating CLOBs stored as SECUREFILE with Medium compression and Cache enabled. Please note that by default, medium compression is turned-off and must only be enabled if you have the Advanced compression license.

For instance, if a DBA decided to allocate table CI\_ACCT in a tablespace MyTablespace, then they would have to change the storage.xml as follows:

```
<CI_ACCT>
<TABLESPACE>MyTablespace</TABLESPACE>
</CI_ACCT>
```

The oradbi process uses the storage.xml file to place the new database objects into defined tablespaces. A tablespace referenced in the storage.xml file must exist in the database.

The storage.xml file has to be adjusted before each upgrade and/or new installation as required to allocate the tables and indexes across those tablespaces.

Table name is included as a comment for each of the indexes for clarity.

For initial installs, information for each object should be reviewed by a DBA. For upgrades, only tablespace information for the objects added in the new release needs to be reviewed by a DBA.

Be careful while editing this file. Make sure that the tablespace names being used exist in the database. Do not change the basic format of this file.

## Sequence

The base sequence name must be prefixed with the owner flag value of the product. For customer modification **CM** must prefix the sequence name. The sequence numbers should be named as below:

1. If the Sequence is used for a specific table, then use the following sequence name:

[OF][C/M/T]NNN\_SEQ

- OF stands for Owner Flag. For example, for Framework its F1 and for WAM and ODM it is W1.
- C/M/T stands for Control (Admin)/Master/Transaction Tables.
- NNN is a three digit unique Identifier for a table on which the sequence is defined.

For e.g: F1T220\_SEQ

2. If more than one sequence is used for a specific table, then use the following Sequence Name:

[OF][C/M/T]NNN\_Column\_Name\_SEQ

- C/M/T stands for Control (Admin)/Master/Transaction tables.
- NNN is a three digit unique identifier for a table on which the sequence is defined.

For Example: F1T220\_BO\_STATUS\_CD\_SEQ and F1T220\_BUS\_OBJ\_CD\_SEQ

3. If sequence is used for a generic requirement and not specific to a table, then use the following sequence name.

[OF]Column\_Name\_SEQ

For Example: F1FKVALID\_SEQ

- For a customer modification, CM must prefix the sequence name.

## Trigger

The base trigger name must be prefixed with the owner flag value of the product.

When implementers add database objects, such as tables, triggers and sequences, the name of the objects should be prefixed by CM.

# Column Data Type and Constraints

This section discusses the rules applied to column data type and constraints, and the attributes that are associated with these objects.

## User Defined Code

User Defined Codes are defined as CHAR type. The length can vary by the business requirements but a minimum of eight characters is recommended. You will find columns defined in less than eight characters but with internationalization in mind, new columns should be defined as CHAR(10) or CHAR(12). Also note that when the code is referenced in the application the descriptions are shown to users in most cases.

## System Assigned Identifier

System assigned random numbers are defined as CHAR type. The length of the column varies to meet the business requirements. Number type key columns are used when a sequential key assignment is allowed or number type is required to interface with external software. For example, Notification Upload Staging ID is a Number type because most EDI software uses a sequential key assignment mechanism. For sequential key assignment implementation, the DBMS sequence generator is used in conjunction with Number Type ID columns.

## Date/Time/Timestamp

Date, Time and Timestamp columns are defined physically as DATE in Oracle. Non-null constraints are implemented only for the required columns.

## Number

Numeric columns are implemented as NUMBER type in Oracle. The precision of the number should always be defined. The scale of the number might be defined. Non-null constraints are implemented for all number columns.

## Fixed Length/Variable Length Character Columns

When a character column is a part of the primary key of a table define the column in CHAR type. For the non-key character columns, the length should be the defining factor. If the column length should be greater than 10, use VARCHAR2 type in Oracle.

## Null Column Support

The product supports Nullable columns. This means that the application can write NULLs instead of a blank space or zero (for numeric columns) by using NULLABLE\_SW on CI\_MD\_TBL\_FLD. If REQUIRED\_SW is set to 'N' and the NULLABLE\_SW is set to 'Y', the application will write a NULL in that column. The artifact generator will create hibernate mapping files with appropriate parameters so that the framework hibernate mapping types will know if a given property supports a null value.

NULLABLE\_SW is not new, but has previously been used for certain fields such as dates, and some string and number foreign-key columns. Because of this, there is the possibility that there is incorrect metadata for some columns, and that turning on this new feature could result in incorrect behavior when using that metadata. The upgrade script fixes the metadata to make sure that the existing tables will not be affected.

This new feature only supports tables maintained by Java but NOT a Java program converted from COBOL. Thus, enhancing any existing tables to use null columns must be done only after making sure that the tables are maintained by Java, and not Java converted COBOL programs.

## XML Type Support

The product supports XML Type. XML Type provides following advantages

1. The ability to use XQuery for querying nodes in the XML document stored within a column defined as XMLType.
2. The option to use the XML engine, which is built into the Oracle Database, to create indexes using nodes within the XML document stored in the XMLType column.

## Cache and Key Validation Flags

By default, the Cache Flag is set to NONE. For most of the admin tables the CACHE Flag should be 'Cached for Batch'. This specifies that the table is cached as L2 cache to reduce database trips.

By default the Key Validation Flag is set to ALL. For tables which have the user defined keys, the KEY\_VALIDATION\_FLG should be set as 'ALL'. This checks the existence of the key before inserting a new one.

## Table Classification and Table Volume Flags

There are multiple types of tables in the application, namely Admin system tables, Admin non-system tables, master tables and transaction tables. The Table Classification flag (TBL\_CLASSIFICATION\_FLG) sets the appropriate value for this lookup field to give a better view of the table classification.

Table Volume flag (TBL\_VOLUME\_FLG) is a customer modifiable field which is initially populated by product, but can be overridden by implementation. The field gives an idea of the relative data volume (categorized as highVolume, lowVolume and mediumVolume) of the table to make informed decisions.

## Default Value Setting

The rules for setting the database default values are as follows:

- When a predefined default value is not available, set the default value of Non-null CHAR or VARCHAR columns to blank except the primary key columns.
- When a predefined default value is not available, set the default value Non-null Number columns to 0 (zero) except the primary key columns.
- No database default values should be assigned to the Non Null Date, Time, and Timestamp columns.

## Foreign Key Constraints

Referential integrity is enforced by the application. In the database do not define FK constraints. Indexes are created on most of Foreign Key columns to increase performance.

# Standard Columns

This section discusses the rules applied to standard columns and the attributes that are associated with these objects.

## Owner Flag

Owner Flag (OWNER\_FLG) columns exist on the system tables that are shared by multiple products. Oracle Utilities Application Framework limits the data modification of the tables that have owner flag to the data owned by the product.

## Version

The Version column is used to for optimistic concurrency control in the application code. Add the Version column to all tables that are maintained by a Row Maintenance program.

# Chapter 7

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## Database Implementation Guidelines

The following sections outline the general implementation guidelines for the database components:

- [Configuration Guidelines](#)
- [Oracle Database Implementation Guidelines](#)

Refer to My Oracle Support for more information.

# Configuration Guidelines

This section describes the general recommendations for configuring various database objects and includes a brief syntax overview. It covers the general aspects of the database objects and does not cover any specific implementation requirements.

- [Index](#)
- [Table Partitioning Recommendations](#)
- [Transparent Data Encryption Recommendations](#)
- [Data Compression Recommendations](#)
- [Database Vault Recommendations](#)
- [Oracle Fuzzy Search Support](#)
- [Storage Recommendations](#)
- [Database Statistic](#)
- [Database Syntax](#)
- [Database Initialization Parameters](#)

## Index

Index recommendations specify points that need to be considered when creating indexes on a table.

1. Indexes on a table should be created according to the functional requirements of the table and not in order to perform SQL tuning.
2. The foreign keys on a table should be indexes.

**Note:** If the implementation creates a CM index on table-columns where the product already provides an index, then the CM index will be overridden by the base index.

## Table Partitioning Recommendations

Oracle Utilities recommends using a minimum of 'n' partitions for selective database objects, where 'n' is number of RAC nodes.

## Transparent Data Encryption Recommendations

Oracle Utilities supports Oracle Transparent Data Encryption (TDE). Oracle 11gR1 supports tablespace level encryption. The application supports tablespace level encryption for all application data. Make sure that the hardware resources are sufficiently sized for this as TDE uses additional hardware resources. The Oracle Advanced Security license is a prerequisite for using TDE.

Please consider the following when implementing TDE:

- Create a wallet folder to store the master key. By default, the wallet folder should be created under \$ORACLE\_BASE/admin/<sid>.

- The wallet containing the master key can be created using the following command:  

```
alter system set encryption key authenticated by "keypasswd"
```
- The wallet can be closed or opened using the following commands:  

```
alter system set wallet open identified by "keypasswd";
alter system set wallet close;
```
- Column level encryption can be achieved using the following commands:  

```
create table <table_name>
(name varchar2(200) default ' ' not null,
bo_data_area CLOB encrypt using 'AES128',
bo_status_cd char(12) encrypt using 'AES128')
lob (bo_data_area) store as securefile (cache compress)
tablespace <tablespace_name>;
```
- AES128 is the default encryption algorithm.
- Tablespace level encryption is also supported using the following command:  

```
Create tablespace <tablespace_name> logging datafile '<datafile
location>' size <initial size> reuse autoextend on next <next
size>
maxsize unlimited extent management local uniform size
<uniform size> encryption using 'AES128' default
storage(encrypt);
```
- Indexed columns can only be encrypted using the NO SALT Option. Salt is a way to strengthen the security of encrypted data. It is a random string added to the data before it is encrypted, causing repetition of text in the clear to appear different when encrypted.

## Data Compression Recommendations

Oracle Utilities supports Advanced Data Compression, available with Oracle 11gR1 onwards, to reduce the database storage footprint. Make sure that your resources are sufficiently sized for this as it uses additional system resources. Compression can be enabled at the Tablespace level or at the Table level.

### Exadata Hardware

For Exadata hardware the compression recommendations are:

- For high volume tables, keep the current table partition uncompressed. All of the older partitions will be compressed based on QUERY HIGH compression.
- For high volume tables with CLOBs, always keep the CLOBs in securefiles with MEDIUM compression. Also keep the current table partition uncompressed. All of the older partitions will be compressed based on QUERY HIGH compression.
- Load data into the uncompressed table partitions using a conventional load and then, once data is loaded using a CTAS operation, load into a temporary heap table. Then truncate the original partition. Alter the original partition into HCC compressed and then partition exchange this with the temporary heap table.

- All multi column Indexes (primary as well as secondary) will be compressed using the default compression. HCC or OLTP compression is not applicable on the top of compressed Indexes.

### **Non- Exadata Hardware**

For non-Exadata hardware the recommendations are the same as above, except that you cannot use HCC compression (it is only available in Exadata database machine). Instead of HCC you can use any other compression tool available to you for non-Exadata hardware.

### **CLOB Fields**

All CLOB fields should be stored as SecureFiles and Medium compressed. This requires a separate license for Advanced Data Compression. As a part of the schema, we create the product-owned tables with compression turned OFF at the LOB level. If you have the license for Advanced Data Compression, you can enable compression by updating the storage.xml.

### **Compression Guidelines**

- Admin and Metadata tables and their indexes will NOT be compressed.
- All Transactional Tables will be compressed.  
This includes ILM enabled MOs where applicable.
- Compression will be done at the tablespace level.
  - Different MOs will have different tablespaces.
  - Partitioned MOs will have one tablespace per partition.
  - Child tables will use reference partitioning with parent + children sharing the same tablespace. (parent and child will always be managed/archived together).
- All multicolumn indexes on transactional tables will be compressed.
  - Use 'compress advanced low'.
  - Local partitioned indexes will reside in the same tablespace as the table.
  - Each MO will have an index tablespace. All MO (Parent-Child Table) indexes will share this tablespace.
  - Do NOT specify standard index compression.
- Securefile medium compression in row for LOBs and CLOBs.

## **Database Vault Recommendations**

The product supports Database Vault. All non-application User IDs can be prevented from using DDL or DML statements against the application schema. So SYS and SYSTEM cannot issue DDL or DML statements against CISADM schema.

The application-specific administration account can issue DDL statements but should not be able to perform any DML or DCL statements.

Application user must be given DML only permissions.

Database Vault can be used to control access during patch process and Install/Upgrade process.

## Oracle Fuzzy Search Support

The product supports Oracle Fuzzy searches. To use this feature, Oracle Text must be installed. After Oracle Text is installed, an index must be created on the table where the fuzzy search needs to be performed from the application. This is only an Oracle database option and is not supported by other databases. Additionally, not all languages are supported. Refer to the Oracle database documentation for more information about fuzzy searching.

A typical syntax for implementation of fuzzy searching is as below. For the most updated syntax, please refer to Oracle Fuzzy documentation.

```
GRANT CTXAPP TO <Application schema owner e.g CISADM>;

GRANT EXECUTE ON CTX_DDL TO <Application schema owner e.g CISADM>;

create index <Application schema owner e.g CISADM>.<Index_Name> on
Application schema owner e.g CISADM>.<Table_Name> (<column_name>)
indextype is ctxsys.context parameters ('sync (on commit)');
begin
ctx_ddl.sync_index('Application schema owner e.g
CISADM>.<Index_Name>');
end
/
chapter
```

## Storage Recommendations

This section specifies recommended options for storing the database objects.

### SecureFile for Storing LOBs

Beginning with Oracle 11g, tables having fields with data type of CLOB or BLOBS should have the LOB Columns stored as SecureFiles.

- The storage options with SecureFiles for Heap Tables should be ENABLE STORAGE IN ROW, CACHE and COMPRESS.
- For the IOT Table the PCTTHRESHOLD 50 OVERFLOW clause should be specified and the storage options with SecureFiles should be ENABLE STORAGE IN ROW, CACHE and COMPRESS.
- The PCTTHRESHOLD should be specified as a percentage of the block size. This value defines the maximum size of the portion of the row that is stored in the Index block when an overflow segment is used.
- The CHUNK option for storage, which is the data size used when accessing or modifying LOB values, can be set to higher than one database block size if big LOBs are used in the IO Operation.
- For SecureFiles, make sure that the initialization parameter db\_securefile is set to ALWAYS.

- The Tablespace where you are creating the SecureFiles should be enabled with Automatic Segment Space Management (ASSM). In Oracle Database 11g, the default mode of Tablespace creation is ASSM so it may already be set for the Tablespace. If it's not, then you have to create the SecureFiles on a new ASSM Tablespace.

**Note:** To enable compression on SecureFiles, you must have an Oracle Advanced Compression license in addition to Oracle Database Enterprise Edition. This feature is not available for the standard edition of the Oracle database.

If you are using Oracle Database Enterprise Edition, please verify that the “COMPRESS” flag is turned on by setting it to “Y” in Storage.xml.

Refer to the [Database Syntax](#) section for more information on SecureFiles.

## Database Configuration Recommendations

This section specifies the recommended methods for configuring the database with a focus on specific functional area.

### Large Redo Log File Sizes

The Redo Log files are written by the Log Writer Background process. These log files are written in a serial manner. Once a log File is full, a log switch occurs and the next log file starts getting populated.

It is recommended that the size of the Redo log files should be sufficiently high so that you do not see frequent Log Switches in the alert logs of the database. Frequent Log Switches impact the IO performance and can be avoided by having a larger Redo log file size.

Frequent Log Switches impacts the IO performance and can be avoided by having a bigger Redo log File Size.

## Database Syntax

### SecureFile

```
CREATE TABLE <Table_Name>
(COLUMN1 ...,
 COLUMN2 (CLOB)
)
LOB(COLUMN2) STORE AS SECUREFILE (CACHE COMPRESS);

CREATE TABLE <Table_Name>
(COLUMN1 ...,
 COLUMN2 (CLOB)
 CONSTRAINT <> PRIMARY KEY(...)
)
ORGANIZATION INDEX PCTTHRESHOLD 50 OVERFLOW
LOB(COLUMN2) STORE AS SECUREFILE (ENABLE STORAGE IN ROW CHUNK CACHE
COMPRESS);
```

## Database Initialization Parameters

The recommended initialization parameters are given below. These parameters are a starting point for database tuning. An optimal value for a production environment may differ from one customer deployment to another.

```
db_block_size=8192
log_checkpoint_interval=0
db_file_multiblock_read_count=8
transactions=3000
open_cursors=30000
db_writer_processes=10
db_files=1024
dbwr_io_slaves=10 (Only if Asynchronous IO is not Supported)
sessions=4500
memory_target=0
memory_max_target=0
processes=3000
dml_locks=48600
_b_tree_bitmap_plans=FALSE
```

## Oracle Database Implementation Guidelines

This section provides specific guidelines for implementing the Oracle database.

### Oracle Partitioning

If you use a base index for the partitioning key, rename the index to CM\*\*.

If you use the primary key index of the table as the partitioning key:

- Make the index non-unique.
- Primary constraints should still exist.

The upgrade on the partitioned table works best if the partitioning key is not unique. This allows the upgrade tool to drop the PK constraints if the primary key columns are modified and recreate the PK constraints without dropping the index.

## Database Statistic

During an install process, new database objects may be added to the target database. Before starting to use the database, generate the complete statistics for these new objects by using the DBMS\_STATS package. You should gather statistics periodically for objects where the statistics become stale over time because of changing data volumes or changes in column values. New statistics should be gathered after a schema object's data or structure are modified in ways that make the previous statistics inaccurate. For example, after loading a significant number of rows into a table, collect new statistics on the number of rows. After updating data in a table, you do not need to collect new statistics on the number of rows, but you might need new statistics on the average row length.

A sample syntax that can be used is as following:

```
BEGIN
SYS.DBMS_STATS.GATHER_SCHEMA_STATS (
OwnName => 'CISADM'
,Degree => 16
,Cascade => TRUE
,Method_opt => 'FOR ALL COLUMNS SIZE AUTO'
, Granularity => 'ALL');
END;
/
```

## Materialized View

Oracle Enterprise Edition supports query rewrite Materialized view. If you use Oracle Enterprise Edition, you can create following Materialized Views to improve performance of the Monitor batch jobs.

### Prerequisites

Make sure to set up the following:

1. Set parameter QUERY\_REWRITE\_ENABLED=TRUE at database level.

```
ALTER SYSTEM SET QUERY_REWRITE_ENABLED=TRUE; OR
ALTER SYSTEM SET QUERY_REWRITE_ENABLED=TRUE SCOPE=BOTH;
```
2. To create a materialized view in another user's schema you must have the **CREATE ANY MATERIALIZED VIEW** system privilege. The owner of the materialized view must have the CREATE TABLE system privilege. The owner must also have access to any master tables of the materialized view that the schema owner does not own (for example: if the master tables are on a remote database) and to any materialized view logs defined on those master tables, either through a **SELECT** object privilege on each of the tables or through the **SELECT ANY TABLE** system privilege.
3. To create a refresh-on-commit materialized view (**ON COMMIT REFRESH** clause), in addition to the preceding privileges, you must have the **ON COMMIT REFRESH** object privilege on any master tables that you do not own or you must have the **ON COMMIT REFRESH** system privilege.

To create the materialized view with query rewrite enabled, in addition to the preceding privileges: If the schema owner does not own the master tables, then the schema owner must have the **GLOBAL QUERY REWRITE** privilege or the **QUERY REWRITE** object privilege on each table outside the schema.

To debug materialized views, refer the below URLs:

- Oracle 11g - [https://docs.oracle.com/cd/B28359\\_01/server.111/b28313/qrbasic.htm](https://docs.oracle.com/cd/B28359_01/server.111/b28313/qrbasic.htm)
- Oracle 12c - <https://docs.oracle.com/database/121/DWHSG/qrbasic.htm#DWHSG01813>
- Troubleshoot Materialized View - [http://docs.oracle.com/database/121/ARPLS/d\\_mview.htm#ARPLS67193](http://docs.oracle.com/database/121/ARPLS/d_mview.htm#ARPLS67193)

```
CREATE MATERIALIZED VIEW F1_BO_LIFECYCLE_STATUS_MVW
(
 BUS_OBJ_CD,
 LIFE_CYCLE_BO_CD,
 BO_STATUS_CD,
 BATCH_CD
)
BUILD IMMEDIATE REFRESH ON COMMIT ENABLE QUERY REWRITE AS
SELECT
 BO2.BUS_OBJ_CD,BO.LIFE_CYCLE_BO_CD,BOSA.BO_STATUS_CD,LCBOS.BATCH_CD as
 LC_BATCH_CD
FROM
 F1_BUS_OBJ BO2,
 F1_BUS_OBJ BO,
 F1_BUS_OBJ_STATUS LCBOS,
 F1_BUS_OBJ_STATUS_ALG BOSA
WHERE
 BO2.LIFE_CYCLE_BO_CD =BO.LIFE_CYCLE_BO_CD AND
 BO.BUS_OBJ_CD = BOSA.BUS_OBJ_CD AND
 BOSA.BO_STATUS_SEVT_FLG = 'F1AT' AND
 LCBOS.BUS_OBJ_CD = BO.LIFE_CYCLE_BO_CD AND
 LCBOS.BO_STATUS_CD = BOSA.BO_STATUS_CD
/
```

create synonym SPLUSR.F1\_BO\_LIFECYCLE\_STATUS\_MVW for  
SPLADM.F1\_BO\_LIFECYCLE\_STATUS\_MVW;

grant select on F1\_BO\_LIFECYCLE\_STATUS\_MVW to FW\_DEV;

grant select on F1\_BO\_LIFECYCLE\_STATUS\_MVW to SPL\_USER;

grant select on F1\_BO\_LIFECYCLE\_STATUS\_MVW to SPL\_READ;

For more information, refer to the following documents:

- Basic Query Rewrite (Oracle 11g) - [https://docs.oracle.com/cd/B28359\\_01/server.111/b28313/qrbasic.htm](https://docs.oracle.com/cd/B28359_01/server.111/b28313/qrbasic.htm)
- Basic Query Rewrite for Materialized Views (Oracle 12c) - <https://docs.oracle.com/database/121/DWHSG/qrbasic.htm#DWHSG01813>
- Troubleshooting Materialized Views - [http://docs.oracle.com/database/121/ARPLS/d\\_mview.htm#ARPLS67193](http://docs.oracle.com/database/121/ARPLS/d_mview.htm#ARPLS67193)
- Debugging materialized Views - [http://docs.oracle.com/cd/B28359\\_01/server.111/b28313/qradv.htm](http://docs.oracle.com/cd/B28359_01/server.111/b28313/qradv.htm)

## Known Issues

The following are some of the known issues at the time of release. For more information, refer to these articles on My Oracle Support:

- Query Did Not Rewrite For A User Other Than The Owner Of the Materialized View (Doc ID 1594725.1) - A patch is available for bug report 14772096 for some platforms.
- Query rewrite not working as expected with SELECT DISTINCT (Doc ID 7661113.8) for Oracle version – 11.2.0.1 and 11.1.0.7 Fixed in version - 12.1.0.1 (Base Release), 11.2.0.2 (Server Patch Set)

# Appendix A

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## Upgrades to the Oracle Utilities Work and Asset Management 2.2.0.4.0 Database

This section describes the database upgrade process for Oracle Utilities Work and Asset Management v2.2.0.4.0. It highlights changes made to the administrative tables and how those changes should be applied to the data in order for your current database to work with the v2.2.0.4.0 application, and to preserve the business logic implemented in the previous version of the application. The changes that do not require data upgrade are not described in this section of the document. The tasks that need to be performed after running the upgrade scripts are included.

The added functionality of v2.2.0.4.0 is not the scope of this documentation. The upgrade scripts do not turn on the newly added functionality by default. For new functionality, refer to the *Oracle Utilities Work and Asset Management User Guides* and *Release Notes*.

# New System Data

This section lists the new system data that are added for business process configuration.

## New Tables

The following tables are added to Oracle Utilities Work and Asset Management in this release:

| Table Name                   |
|------------------------------|
| W1_PERMIT                    |
| W1_PERMIT_ASSET_LOCATION     |
| W1_PERMIT_CHAR               |
| W1_PERMIT_DOCUMENT           |
| W1_PERMIT_EMPLOYEE_LOG       |
| W1_PERMIT_IDENTIFIER         |
| W1_PERMIT_LOG                |
| W1_PERMIT_LOG_PARM           |
| W1_PERMIT_NOTE               |
| W1_PERMIT_RESOURCE           |
| W1_PERMIT_CLASS              |
| W1_PERMIT_CLASS_CHAR         |
| W1_PERMIT_CLASS_L            |
| W1_PERMIT_TMPL               |
| W1_PERMIT_TMPL_CHAR          |
| W1_PERMIT_TMPL_CHKLIST       |
| W1_PERMIT_TMPL_DOCUMENT      |
| W1_PERMIT_TMPL_L             |
| W1_PERMIT_TMPL_NOTE          |
| W1_PERMIT_TMPL_RESRC         |
| W1_PERMIT_TMPL_SVC_HIST_TYPE |
| W1_SVC_HIST_PARTICIPANT      |

## Dropped Tables

There are no dropped tables in this Oracle Utilities Work and Asset Management release.

## New Fields

The following fields are added to Oracle Utilities Work and Asset Management in this release:

| Field Name                    | Attribute            |
|-------------------------------|----------------------|
| W1_CHKLIST_LINE_ITEM          | COMMENT_LONG         |
| W1_CHKLIST_LINE_ITEM          | PERMIT_ID            |
| W1_CHKLIST_TYP                | PERMIT_ITEM_ONLY_FLG |
| W1_CHKLIST_TYP_DFLT_LINE_ITEM | PERMIT_TMPL_CD       |
| W1_PERMIT                     | APPROVAL_PROF_CD     |
| W1_PERMIT                     | BO_DATA_AREA         |
| W1_PERMIT                     | BO_STATUS_CD         |
| W1_PERMIT                     | BO_STATUS_REASON_CD  |
| W1_PERMIT                     | BUS_OBJ_CD           |
| W1_PERMIT                     | CREATE_BY_USER       |
| W1_PERMIT                     | CRE_DTTM             |
| W1_PERMIT                     | DESCRLONG            |
| W1_PERMIT                     | EFF_DT               |
| W1_PERMIT                     | EXPIRATION_DT        |
| W1_PERMIT                     | FEE_AMOUNT           |
| W1_PERMIT                     | FEE_AMOUNT_PAID      |
| W1_PERMIT                     | FEE_REQUIRED_BY_DT   |
| W1_PERMIT                     | FEE_REQUIRED_FLG     |
| W1_PERMIT                     | OWNING_ACCESS_GRP_CD |
| W1_PERMIT                     | PERMIT_ID            |
| W1_PERMIT                     | PERMIT_NUM           |
| W1_PERMIT                     | PERMIT_TMPL_CD       |
| W1_PERMIT                     | REQ_EMPLOYEE_ID      |
| W1_PERMIT                     | STATUS_UPD_DTTM      |
| W1_PERMIT                     | VENDOR_LOC_ID        |
| W1_PERMIT                     | VERSION              |
| W1_PERMIT                     | WORK_LOC_ID          |
| W1_PERMIT                     | WORK_WIN_END_TM      |
| W1_PERMIT                     | WORK_WIN_START_TM    |
| W1_PERMIT_ASSET_LOCATION      | ASSET_ID             |

| Field Name               | Attribute             |
|--------------------------|-----------------------|
| W1_PERMIT_ASSET_LOCATION | NODE_ID               |
| W1_PERMIT_ASSET_LOCATION | PERMIT_ID             |
| W1_PERMIT_ASSET_LOCATION | VERSION               |
| W1_PERMIT_CHAR           | ADHOC_CHAR_VAL        |
| W1_PERMIT_CHAR           | CHAR_TYPE_CD          |
| W1_PERMIT_CHAR           | CHAR_VAL              |
| W1_PERMIT_CHAR           | CHAR_VAL_FK1          |
| W1_PERMIT_CHAR           | CHAR_VAL_FK2          |
| W1_PERMIT_CHAR           | CHAR_VAL_FK3          |
| W1_PERMIT_CHAR           | CHAR_VAL_FK4          |
| W1_PERMIT_CHAR           | CHAR_VAL_FK5          |
| W1_PERMIT_CHAR           | PERMIT_ID             |
| W1_PERMIT_CHAR           | SEQ_NUM               |
| W1_PERMIT_CHAR           | SRCH_CHAR_VAL         |
| W1_PERMIT_CHAR           | VERSION               |
| W1_PERMIT_CLASS          | BO_DATA_AREA          |
| W1_PERMIT_CLASS          | BUS_OBJ_CD            |
| W1_PERMIT_CLASS          | OWNING_ACCESS_GRP_CD  |
| W1_PERMIT_CLASS          | PERMIT_CLASS_CD       |
| W1_PERMIT_CLASS          | PERMIT_CLS_SOURCE_FLG |
| W1_PERMIT_CLASS          | ROLE_ID               |
| W1_PERMIT_CLASS          | TD_TYPE_CD            |
| W1_PERMIT_CLASS          | VERSION               |
| W1_PERMIT_CLASS          | W1_LEAD_DAYS          |
| W1_PERMIT_CLASS_CHAR     | ADHOC_CHAR_VAL        |
| W1_PERMIT_CLASS_CHAR     | CHAR_TYPE_CD          |
| W1_PERMIT_CLASS_CHAR     | CHAR_VAL              |
| W1_PERMIT_CLASS_CHAR     | CHAR_VAL_FK1          |
| W1_PERMIT_CLASS_CHAR     | CHAR_VAL_FK2          |
| W1_PERMIT_CLASS_CHAR     | CHAR_VAL_FK3          |
| W1_PERMIT_CLASS_CHAR     | CHAR_VAL_FK4          |
| W1_PERMIT_CLASS_CHAR     | CHAR_VAL_FK5          |
| W1_PERMIT_CLASS_CHAR     | PERMIT_CLASS_CD       |

| Field Name             | Attribute           |
|------------------------|---------------------|
| W1_PERMIT_CLASS_CHAR   | SEQ_NUM             |
| W1_PERMIT_CLASS_CHAR   | SRCH_CHAR_VAL       |
| W1_PERMIT_CLASS_CHAR   | VERSION             |
| W1_PERMIT_CLASS_L      | DESCR100            |
| W1_PERMIT_CLASS_L      | LANGUAGE_CD         |
| W1_PERMIT_CLASS_L      | PERMIT_CLASS_CD     |
| W1_PERMIT_CLASS_L      | VERSION             |
| W1_PERMIT_DOCUMENT     | ATTACHMENT_ID       |
| W1_PERMIT_DOCUMENT     | CRE_DTTM            |
| W1_PERMIT_DOCUMENT     | DOCUMENT_ID         |
| W1_PERMIT_DOCUMENT     | PERMIT_ID           |
| W1_PERMIT_DOCUMENT     | USER_ID             |
| W1_PERMIT_DOCUMENT     | VERSION             |
| W1_PERMIT_EMPLOYEE_LOG | EFF_DTTM            |
| W1_PERMIT_EMPLOYEE_LOG | EMPLOYEE_ID         |
| W1_PERMIT_EMPLOYEE_LOG | EMPLOYEE_LOG_DTTM   |
| W1_PERMIT_EMPLOYEE_LOG | PERMIT_ID           |
| W1_PERMIT_EMPLOYEE_LOG | USER_ID             |
| W1_PERMIT_EMPLOYEE_LOG | VERSION             |
| W1_PERMIT_EMPLOYEE_LOG | W1_ROLE_FLG         |
| W1_PERMIT_IDENTIFIER   | PERMIT_ID           |
| W1_PERMIT_IDENTIFIER   | PERMIT_ID_TYPE_FLG  |
| W1_PERMIT_IDENTIFIER   | VERSION             |
| W1_PERMIT_IDENTIFIER   | W1_ID_VALUE         |
| W1_PERMIT_K            | ENV_ID              |
| W1_PERMIT_K            | PERMIT_ID           |
| W1_PERMIT_LOG          | ADHOC_CHAR_VAL      |
| W1_PERMIT_LOG          | BO_STATUS_CD        |
| W1_PERMIT_LOG          | BO_STATUS_REASON_CD |
| W1_PERMIT_LOG          | CHAR_TYPE_CD        |
| W1_PERMIT_LOG          | CHAR_VAL            |
| W1_PERMIT_LOG          | CHAR_VAL_FK1        |
| W1_PERMIT_LOG          | CHAR_VAL_FK2        |

| Field Name         | Attribute          |
|--------------------|--------------------|
| W1_PERMIT_LOG      | CHAR_VAL_FK3       |
| W1_PERMIT_LOG      | CHAR_VAL_FK4       |
| W1_PERMIT_LOG      | CHAR_VAL_FK5       |
| W1_PERMIT_LOG      | DESCRLONG          |
| W1_PERMIT_LOG      | LOG_DTTM           |
| W1_PERMIT_LOG      | LOG_ENTRY_TYPE_FLG |
| W1_PERMIT_LOG      | MESSAGE_CAT_NBR    |
| W1_PERMIT_LOG      | MESSAGE_NBR        |
| W1_PERMIT_LOG      | PERMIT_ID          |
| W1_PERMIT_LOG      | SEQNO              |
| W1_PERMIT_LOG      | USER_ID            |
| W1_PERMIT_LOG      | VERSION            |
| W1_PERMIT_LOG_PARM | F1_MSG_PARM_VLONG  |
| W1_PERMIT_LOG_PARM | MSG_PARM_TYP_FLG   |
| W1_PERMIT_LOG_PARM | PARM_SEQ           |
| W1_PERMIT_LOG_PARM | PERMIT_ID          |
| W1_PERMIT_LOG_PARM | SEQNO              |
| W1_PERMIT_LOG_PARM | VERSION            |
| W1_PERMIT_NOTE     | NOTE_DTTM          |
| W1_PERMIT_NOTE     | NOTE_TYPE_FLG      |
| W1_PERMIT_NOTE     | NOTE_VALUE         |
| W1_PERMIT_NOTE     | PERMIT_ID          |
| W1_PERMIT_NOTE     | SEQNO              |
| W1_PERMIT_NOTE     | USER_ID            |
| W1_PERMIT_NOTE     | VERSION            |
| W1_PERMIT_RESOURCE | PERMIT_ID          |
| W1_PERMIT_RESOURCE | RESRC_TYPE_ID      |
| W1_PERMIT_RESOURCE | RESRC_UOM_CD       |
| W1_PERMIT_RESOURCE | VERSION            |
| W1_PERMIT_RESOURCE | W1_QUANTITY        |
| W1_PERMIT_RESOURCE | W1_RESRC_CLASS_FLG |
| W1_PERMIT_RESOURCE | W1_ROLE_FLG        |
| W1_PERMIT_TMPL     | BO_DATA_AREA       |

| Field Name              | Attribute              |
|-------------------------|------------------------|
| W1_PERMIT_TMPL          | BUS_OBJ_CD             |
| W1_PERMIT_TMPL          | OWNING_ACCESS_GRP_CD   |
| W1_PERMIT_TMPL          | PERMIT_BUS_OBJ_CD      |
| W1_PERMIT_TMPL          | PERMIT_CLASS_CD        |
| W1_PERMIT_TMPL          | PERMIT_CLS_SOURCE_FLG  |
| W1_PERMIT_TMPL          | PERMIT_TMPL_CD         |
| W1_PERMIT_TMPL          | PERMIT_TMPL_STATUS_FLG |
| W1_PERMIT_TMPL          | VERSION                |
| W1_PERMIT_TMPL_CHAR     | ADHOC_CHAR_VAL         |
| W1_PERMIT_TMPL_CHAR     | CHAR_TYPE_CD           |
| W1_PERMIT_TMPL_CHAR     | CHAR_VAL               |
| W1_PERMIT_TMPL_CHAR     | CHAR_VAL_FK1           |
| W1_PERMIT_TMPL_CHAR     | CHAR_VAL_FK2           |
| W1_PERMIT_TMPL_CHAR     | CHAR_VAL_FK3           |
| W1_PERMIT_TMPL_CHAR     | CHAR_VAL_FK4           |
| W1_PERMIT_TMPL_CHAR     | CHAR_VAL_FK5           |
| W1_PERMIT_TMPL_CHAR     | PERMIT_TMPL_CD         |
| W1_PERMIT_TMPL_CHAR     | SEQ_NUM                |
| W1_PERMIT_TMPL_CHAR     | SRCH_CHAR_VAL          |
| W1_PERMIT_TMPL_CHAR     | VERSION                |
| W1_PERMIT_TMPL_CHKLIST  | CHECKLIST_TYPE_CD      |
| W1_PERMIT_TMPL_CHKLIST  | PERMIT_TMPL_CD         |
| W1_PERMIT_TMPL_CHKLIST  | VERSION                |
| W1_PERMIT_TMPL_DOCUMENT | ATTACHMENT_ID          |
| W1_PERMIT_TMPL_DOCUMENT | CRE_DT_TM              |
| W1_PERMIT_TMPL_DOCUMENT | DOCUMENT_ID            |
| W1_PERMIT_TMPL_DOCUMENT | PERMIT_TMPL_CD         |
| W1_PERMIT_TMPL_DOCUMENT | USER_ID                |
| W1_PERMIT_TMPL_DOCUMENT | VERSION                |
| W1_PERMIT_TMPL_L        | DESCR100               |
| W1_PERMIT_TMPL_L        | DESCRLONG              |
| W1_PERMIT_TMPL_L        | LANGUAGE_CD            |
| W1_PERMIT_TMPL_L        | PERMIT_TMPL_CD         |

| Field Name                   | Attribute             |
|------------------------------|-----------------------|
| W1_PERMIT_TMPL_L             | VERSION               |
| W1_PERMIT_TMPL_NOTE          | NOTE_DTTM             |
| W1_PERMIT_TMPL_NOTE          | NOTE_TYPE_FLG         |
| W1_PERMIT_TMPL_NOTE          | NOTE_VALUE            |
| W1_PERMIT_TMPL_NOTE          | PERMIT_TMPL_CD        |
| W1_PERMIT_TMPL_NOTE          | SEQNO                 |
| W1_PERMIT_TMPL_NOTE          | USER_ID               |
| W1_PERMIT_TMPL_NOTE          | VERSION               |
| W1_PERMIT_TMPL_RESRC         | PERMIT_TMPL_CD        |
| W1_PERMIT_TMPL_RESRC         | RESRC_TYPE_ID         |
| W1_PERMIT_TMPL_RESRC         | RESRC_UOM_CD          |
| W1_PERMIT_TMPL_RESRC         | VERSION               |
| W1_PERMIT_TMPL_RESRC         | W1_QUANTITY           |
| W1_PERMIT_TMPL_RESRC         | W1_RESRC_CLASS_FLG    |
| W1_PERMIT_TMPL_RESRC         | W1_ROLE_FLG           |
| W1_PERMIT_TMPL_SVC_HIST_TYPE | PERMIT_TMPL_CD        |
| W1_PERMIT_TMPL_SVC_HIST_TYPE | SVC_HIST_TYPE_CD      |
| W1_PERMIT_TMPL_SVC_HIST_TYPE | SVC_HIST_TYPE_REQ_FLG |
| W1_PERMIT_TMPL_SVC_HIST_TYPE | VERSION               |
| W1_SVC_HIST                  | PERMIT_ID             |
| W1_SVC_HIST_PARTICIPANT      | ATTACHMENT_ID         |
| W1_SVC_HIST_PARTICIPANT      | EMPLOYEE_ID           |
| W1_SVC_HIST_PARTICIPANT      | END_DTTM              |
| W1_SVC_HIST_PARTICIPANT      | LOG_BY_USER           |
| W1_SVC_HIST_PARTICIPANT      | PARTICIPANT_LOG_DTTM  |
| W1_SVC_HIST_PARTICIPANT      | SEQ_NUM               |
| W1_SVC_HIST_PARTICIPANT      | START_DTTM            |
| W1_SVC_HIST_PARTICIPANT      | SVC_HIST_ID           |
| W1_SVC_HIST_PARTICIPANT      | VERSION               |
| W1_SVC_HIST_PARTICIPANT      | W1_FIRST_NAME         |
| W1_SVC_HIST_PARTICIPANT      | W1_LAST_NAME          |
| W1_TMPL_ACT                  | WORK_CATEGORY_CD      |
| W1_TMPL_ACT                  | WORK_CLASS_CD         |

## Updated Fields

The following fields are updated in this Oracle Utilities Work and Asset Management release:

| Table Name     | Field Name                | Attribute     | Value  |
|----------------|---------------------------|---------------|--------|
| W1_PI_CNT_LINE | ADJUSTED_<br>SYSTEM_COUNT | FLD_PRECISION | (13,5) |
| W1_PI_CNT_LINE | FIRST_COUNT               | FLD_PRECISION | (13,5) |
| W1_PI_CNT_LINE | RECOUNT                   | FLD_PRECISION | (13,5) |
| W1_PI_CNT_LINE | SYSTEM_COUNT              | FLD_PRECISION | (13,5) |

## Dropped Fields

No fields are dropped in this Oracle Utilities Work and Asset Management release:

## New Indexes

The following indexes are added to Oracle Utilities Work and Asset Management in this release:

| Table_name                   | Index      | Column_name     |
|------------------------------|------------|-----------------|
| W1_PERMIT                    | W1T872P0   | PERMIT_ID       |
| W1_PERMIT_ASSET_<br>LOCATION | W1M875P0   | ASSET_ID        |
| W1_PERMIT_ASSET_<br>LOCATION | W1M875P0   | NODE_ID         |
| W1_PERMIT_ASSET_<br>LOCATION | W1M875P0   | PERMIT_ID       |
| W1_PERMIT_CHAR               | W1M879P0   | CHAR_TYPE_CD    |
| W1_PERMIT_CHAR               | W1M879P0   | PERMIT_ID       |
| W1_PERMIT_CHAR               | W1M879P0   | SEQ_NUM         |
| W1_PERMIT_CLASS              | W1C869P0P0 | PERMIT_CLASS_CD |
| W1_PERMIT_CLASS_CHAR         | W1C870P0   | CHAR_TYPE_CD    |
| W1_PERMIT_CLASS_CHAR         | W1C870P0   | PERMIT_CLASS_CD |
| W1_PERMIT_CLASS_CHAR         | W1C870P0   | SEQ_NUM         |
| W1_PERMIT_CLASS_L            | W1C871P0P0 | LANGUAGE_CD     |
| W1_PERMIT_CLASS_L            | W1C871P0P0 | PERMIT_CLASS_CD |
| W1_PERMIT_DOCUMENT           | W1M877P0   | ATTACHMENT_ID   |
| W1_PERMIT_DOCUMENT           | W1M877P0   | DOCUMENT_ID     |
| W1_PERMIT_DOCUMENT           | W1M877P0   | PERMIT_ID       |

| Table_name              | Index    | Column_name        |
|-------------------------|----------|--------------------|
| W1_PERMIT_EMPLOYEE_LOG  | W1M873P0 | EFF_DTTM           |
| W1_PERMIT_EMPLOYEE_LOG  | W1M873P0 | EMPLOYEE_ID        |
| W1_PERMIT_EMPLOYEE_LOG  | W1M873P0 | PERMIT_ID          |
| W1_PERMIT_EMPLOYEE_LOG  | W1M873P0 | W1_ROLE_FLG        |
| W1_PERMIT_IDENTIFIER    | W1M880P0 | PERMIT_ID          |
| W1_PERMIT_IDENTIFIER    | W1M880P0 | PERMIT_ID_TYPE_FLG |
| W1_PERMIT_K             | W1T883P0 | ENV_ID             |
| W1_PERMIT_K             | W1T883P0 | PERMIT_ID          |
| W1_PERMIT_LOG           | W1M881P0 | PERMIT_ID          |
| W1_PERMIT_LOG           | W1M881P0 | SEQNO              |
| W1_PERMIT_LOG_PARM      | W1M882P0 | PARM_SEQ           |
| W1_PERMIT_LOG_PARM      | W1M882P0 | PERMIT_ID          |
| W1_PERMIT_LOG_PARM      | W1M882P0 | SEQNO              |
| W1_PERMIT_NOTE          | W1M878P0 | PERMIT_ID          |
| W1_PERMIT_NOTE          | W1M878P0 | SEQNO              |
| W1_PERMIT_RESOURCE      | W1M874P0 | PERMIT_ID          |
| W1_PERMIT_RESOURCE      | W1M874P0 | RESRC_TYPE_ID      |
| W1_PERMIT_RESOURCE      | W1M874P0 | W1_ROLE_FLG        |
| W1_PERMIT_TMPL          | W1C872P0 | PERMIT_TMPL_CD     |
| W1_PERMIT_TMPL_CHAR     | W1C874P0 | CHAR_TYPE_CD       |
| W1_PERMIT_TMPL_CHAR     | W1C874P0 | PERMIT_TMPL_CD     |
| W1_PERMIT_TMPL_CHAR     | W1C874P0 | SEQ_NUM            |
| W1_PERMIT_TMPL_CHAR     | W1C874S1 | SRCH_CHAR_VAL      |
| W1_PERMIT_TMPL_CHKLIST  | W1C875P0 | CHECKLIST_TYPE_CD  |
| W1_PERMIT_TMPL_CHKLIST  | W1C875P0 | PERMIT_TMPL_CD     |
| W1_PERMIT_TMPL_DOCUMENT | W1C878P0 | ATTACHMENT_ID      |
| W1_PERMIT_TMPL_DOCUMENT | W1C878P0 | DOCUMENT_ID        |
| W1_PERMIT_TMPL_DOCUMENT | W1C878P0 | PERMIT_TMPL_CD     |
| W1_PERMIT_TMPL_L        | W1C873P0 | LANGUAGE_CD        |
| W1_PERMIT_TMPL_L        | W1C873P0 | PERMIT_TMPL_CD     |
| W1_PERMIT_TMPL_NOTE     | W1C879P0 | PERMIT_TMPL_CD     |

| Table_name                       | Index    | Column_name      |
|----------------------------------|----------|------------------|
| W1_PERMIT_TMPL_NOTE              | W1C879P0 | SEQNO            |
| W1_PERMIT_TMPL_RESRC             | W1C876P0 | PERMIT_TMPL_CD   |
| W1_PERMIT_TMPL_RESRC             | W1C876P0 | RESRC_TYPE_ID    |
| W1_PERMIT_TMPL_RESRC             | W1C876P0 | W1_ROLE_FLG      |
| W1_PERMIT_TMPL_SVC_HIST<br>_TYPE | W1C877P0 | PERMIT_TMPL_CD   |
| W1_PERMIT_TMPL_SVC_HIST<br>_TYPE | W1C877P0 | SVC_HIST_TYPE_CD |
| W1_SVC_HIST_PARTICIPANT          | W1T868P0 | SEQ_NUM          |
| W1_SVC_HIST_PARTICIPANT          | W1T868P0 | SVC_HIST_ID      |

## Updated Indexes

There are no indexes that are updated in this Oracle Utilities Work and Asset Management release.

## Dropped Indexes

No indexes are dropped in this Oracle Utilities Work and Asset Management release.

# Appendix B

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## Upgrades to the Oracle Utilities Application Framework Database

This section describes the database upgrade process for the Oracle Utilities Application Framework database since the last release. It highlights changes made to the administrative tables and how those changes should be applied to the data in order for your current database to work with the Oracle Utilities Application Framework application, and to preserve the business logic implemented in the previous version of the application. The changes that do not require data upgrade are not described in this document. The tasks that need to be performed after running the upgrade scripts are included.

**Note:** Upgrade scripts do not automatically enable the newly added functionality by default. Please refer to the release notes for more information.

- [Upgrades to Oracle Utilities Application Framework v4.3.0.3.0](#)
- [Upgrades to Oracle Utilities Application Framework v4.3.0.4.0](#)
- [Upgrades to Oracle Utilities Application Framework v4.3.0.5.0](#)
- [Upgrades to Oracle Utilities Application Framework v4.3.0.6.0](#)
- [Upgrades to Oracle Utilities Application Framework v4.4.0.0.0](#)

# Upgrades to Oracle Utilities Application Framework

## v4.3.0.3.0

### New Tables

| Table                    | Type of Table                          |
|--------------------------|----------------------------------------|
| F1_LGCY_OBJ              | Legacy Object                          |
| F1_PERF_TGT              | Performance Target                     |
| F1_PERF_TGT_CHAR         | Performance Target Characteristic      |
| F1_PERF_TGT_L            | Performance Target Language            |
| F1_PERF_TGT_LOG          | Performance Target Log                 |
| F1_PERF_TGT_LOG_PARM     | Performance Target Log Parameter       |
| F1_PERF_TGT_REL_OBJ      | Performance Target Related Object      |
| F1_PERF_TGT_TYPE         | Performance Target Type                |
| F1_PERF_TGT_TYPE_CHAR    | Performance Target Type Characteristic |
| F1_PERF_TGT_TYPE_L       | Performance Target Type Language       |
| F1_STATS                 | Statistics Control                     |
| F1_STATS_CHAR            | Statistics Control Characteristic      |
| F1_STATS_L               | Statistics Control Language            |
| F1_STATS_LOG             | Statistics Control Log                 |
| F1_STATS_LOG_PARM        | Statistics Control Log Parameter       |
| F1_STATS_REL_OBJ         | Statistics Control Related Object      |
| F1_STATS_SNPSHT          | Statistics Snapshot                    |
| F1_STATS_SNPSHT_CHAR     | Statistics Snapshot Characteristic     |
| F1_STATS_SNPSHT_LOG      | Statistics Snapshot Log                |
| F1_STATS_SNPSHT_LOG_PARM | Statistics Snapshot Log Parameter      |
| F1_STATS_SNPSHT_REL_OBJ  | Statistics Snapshot Related Object     |
| F1_SVC_CATALOG           | Web Service Catalog                    |

### New Views

None

### Dropped Tables

None

### Unsupported Tables

None

**Added Columns**

| Table                 | Column         | Required |
|-----------------------|----------------|----------|
| F1_EXTSYS_OUTMSG_PROF | NAMESPACE_FLG  | N        |
| F1_EXTSYS_OUTMSG_PROF | WSDL_FILE_NAME | N        |

**Dropped Columns**

None

**Unsupported Table Columns**

None

**Column Format Change**

None

**Primary Key Change**

None

# Upgrades to Oracle Utilities Application Framework

## v4.3.0.4.0

### New Tables

| Table                | Type of Table              |
|----------------------|----------------------------|
| F1_MIGR_REQ_INCL_REQ | Migration request Grouping |

### New Views

None

### Dropped Tables

None

### Unsupported Tables

None

### Added Columns

| Table                     | Column             | Required |
|---------------------------|--------------------|----------|
| CI_BATCH_CTRL             | APP_SVC_ID         | Y        |
| CI_XAI_RCVR_CTX           | SEQNO              | Y        |
| CI_XAI_SNDR_CTX           | SEQNO              | Y        |
| F1_IWS_SVC_ANN            | SEQ_NUM            | Y        |
| F1_MIGR_REQ               | MIGR_REQ_CAT_XFLG  | N        |
| F1_MIGR_REQ               | MIGR_REQ_CLASS_FLG | Y        |
| F1_MIGR_REQ_INSTR_ENTTITY | COMMENT_LONG       | N        |
| F1_MIGR_REQ_INSTR_ENTTITY | EXT_REFERENCE_ID   | N        |

### Dropped Columns

| Table           | Column   |
|-----------------|----------|
| CI_XAI_RCVR_CTX | CTXT_VAL |

**Unsupported Table Columns**

None

**Column Format Change**

| Table Name                 | Column Name             | From             | To                |
|----------------------------|-------------------------|------------------|-------------------|
| F1_EXT_LOOKUP_<br>VAL_CHAR | F1_EXT_LOOKUP_<br>VALUE | VARCHAR2<br>(30) | VARCHAR2<br>(254) |

**Primary Key Change**

| Table           | Primary Key Columns  |
|-----------------|----------------------|
| CI_XAI_RCVR_CTX | XAI_RCVR_ID, SEQNO   |
| CI_XA_SNDR_CTX  | XAI_SENDER_ID, SEQNO |

# Upgrades to Oracle Utilities Application Framework

## v4.3.0.5.0

### New Tables

| Table                       | Description                               | Type of Table  |
|-----------------------------|-------------------------------------------|----------------|
| F1_DEPLOYMENT               | Deployment                                | Transaction    |
| F1_DEPLOYMENT_ITEM          | Deployment Item                           | Transaction    |
| F1_DEPLOYMENT_ITEM_METADATA | Deployment Item Meta Data                 | Transaction    |
| F1_DEPLOYMENT_PART          | Deployment Part                           | Master         |
| F1_DEPLOYMENT_PART_L        | Deployment Part Language                  | Master         |
| F1_DEPLOYMENT_TYPE          | Deployment Type                           | Master         |
| F1_DEPLOYMENT_TYPE_L        | Deployment Type Language                  | Master         |
| F1_DEPTYP_DEPPART           | Deployment Type / Deployment Part         | Transaction    |
| F1_DEPTYP_MDT_TYPE          | Deployment Type / MDT Type                | Transaction    |
| F1_DEPTYP_MSG_CAT           | Deployment Type Message Category          | Transaction    |
| F1_DEPTYP_USR_GRP           | Deployment Type User Group                | Transaction    |
| F1_MDT                      | Mobile Data Terminal                      | Transaction    |
| F1_MDT_CHAR                 | Mobile Data Terminal Characteristics      | Transaction    |
| F1_MDT_TYPE                 | Mobile Data Terminal Type                 | Master         |
| F1_MDT_TYPE_CHAR            | Mobile Data Terminal Type Characteristics | Master         |
| F1_MDT_TYPE_L               | Mobile Data Terminal Type Language        | Master         |
| F1_MOB_COMP_CHAR            | Mobile Component Characteristics          | Admin - System |
| F1_MOB_COMP_CNT             | Mobile Component Content                  | Admin - System |
| F1_MOBILE_COMPONENT         | Mobile Component                          | Admin - System |
| F1_MOBILE_COMPONENT_L       | Mobile Component Language                 | Admin - System |

|                        |                                          |                |
|------------------------|------------------------------------------|----------------|
| F1_REMOTE_MSG          | Remote Message                           | Transaction    |
| F1_REMOTE_MSG_CHAR     | Remote Message Characteristics           | Transaction    |
| F1_REMOTE_MSG_LOG      | Remote Message Log                       | Transaction    |
| F1_REMOTE_MSG_LOG_PARM | Remote Message Log Parameters            | Transaction    |
| F1_WEB_CAT_L           | Web Service Category Language            | Admin - System |
| F1_WEB_CAT_INCL_SVC    | Web Service Category - Included Services | Admin - System |
| F1_WEB_CAT             | Web Service Category                     | Admin - System |

Note that in addition, the following table was added to 4.3.0.4.0 via a hot fix, but was not included in 4.3.0.5.0 until after the final build and is therefore added as a hot fix. Clients upgrading to 4.3.0.5.0 may see that the table is dropped via the blueprint and then reinstated after applying the bug fixes.

| Table              | Description                      | Type of Table |
|--------------------|----------------------------------|---------------|
| F1_MIGR_OBJ_SQL_PK | Migration Object SQL Primary Key | Transaction   |

### New Views

None

### Dropped Tables

| Table                |
|----------------------|
| F1_IWS_ANN_CHAR      |
| F1_IWS_ANN_TYPE_CHAR |

### Unsupported Tables

None

### Added Columns

| Table          | Column           | Required |
|----------------|------------------|----------|
| CI_MD_SVC      | APP_SVC_ID       | N        |
| F1_OUTMSG      | BO_XML_DATA_AREA | N        |
| F1_OUTMSG_TYPE | OUTMSG_PRIOR_FLG | Y        |
| F1_OUTMSG_TYPE | OWNER_FLG        | N        |
| F1_OUTMSG_TYPE | TYPE_BUS_OBJ_CD  | N        |

| Table            | Column    | Required |
|------------------|-----------|----------|
| F1_OUTMSG_TYPE_L | OWNER_FLG | N        |

**Dropped Columns**

None

**Unsupported Table Columns**

None

**Column Format Change**

None

**Primary Key Change**

None

**Index Changes**

Index S1C675S1 for table F1\_EXT\_LOOKUP\_VAL\_CHAR has been renamed to F1C675S1.

# Upgrades to Oracle Utilities Application Framework

## v4.3.0.6.0

### New Tables

| Table                     | Description                           | Table Type  |
|---------------------------|---------------------------------------|-------------|
| F1_ATTACHMENT_K           | Attachment Key                        | Transaction |
| F1_CRYPTOKEY              | Key Ring Key                          | Admin       |
| F1_CRYPTOKEYRING          | Key Ring                              | Admin       |
| F1_CRYPTOKEYRING_L        | Key Ring Language                     | Admin       |
| F1_CRYPTOKEYRING_LOG      | Key Ring Log                          | Admin       |
| F1_CRYPTOKEYRING_LOG_PARM | Key Ring Log Parameter                | Admin       |
| F1_CUBE_TYPE              | Cube Type                             | Admin       |
| F1_CUBE_TYPE_L            | Cube Type Language                    | Admin       |
| F1_CUBE_VIEW              | Cube View                             | Transaction |
| F1_CUBE_VIEW_L            | Cube View Language                    | Transaction |
| F1_CUBE_VIEW_LOG          | Cube View Log                         | Transaction |
| F1_CUBE_VIEW_LOG_PARM     | Cube View Log Parameters              | Transaction |
| F1_DEPLOYMENT_K           | Deployment Key                        | Transaction |
| F1_ERASURE_SCHED          | Object Erasure Schedule               | Transaction |
| F1_ERASURE_SCHED_K        | Object Erasure Schedule Key           | Transaction |
| F1_ERASURE_SCHED_LOG      | Object Erasure Schedule Log           | Transaction |
| F1_ERASURE_SCHED_LOG_PARM | Object Erasure Schedule Log Parameter | Transaction |
| F1_MDT_K                  | Mobile Data Terminal Key              | Transaction |
| F1_MIGR_OBJ_SQL_PK        | Migration Object SQL Primary Key      | Transaction |
| F1_PROC_DEFN              | Process Flow Type                     | Admin       |
| F1_PROC_DEFN_L            | Process Flow Type Language            | Admin       |
| F1_PROC_NEXT_PANEL        | Next Panel                            | Admin       |
| F1_PROC_PANEL             | Process Panel                         | Admin       |
| F1_PROC_STORE             | Process Flow                          | Transaction |

| Table                      | Description                  | Table Type  |
|----------------------------|------------------------------|-------------|
| F1_PROC_STORE_DTL_ELEMENTS | Process Flow Detail Elements | Transaction |
| F1_PROC_STORE_K            | Process Flow Key             | Transaction |
| F1_PROC_STORE_LOG          | Process Flow Log             | Transaction |
| F1_PROC_STORE_LOG_PARM     | Process Flow Log Parameters  | Transaction |
| F1_REMOTE_MSG_K            | Mobile Remote Message Key    | Transaction |
| F1_STATS_SNPSHT_K          | Statistics Snapshot Key      | Transaction |

Note that the following tables have system generated keys but do not have a separate key table. Per the new table list, the key tables are provided and these tables are updated accordingly.

| Table           | Description           |
|-----------------|-----------------------|
| F1_ATTACHMENT   | Attachment            |
| F1_DEPLOYMENT   | Deployment            |
| F1_MDT          | Mobile Data Terminal  |
| F1_REMOTE_MSG   | Mobile Remote Message |
| F1_STATS_SNPSHT | Statistics Snapshot   |

### New Views

None

### Dropped Tables

| Table             |
|-------------------|
| F1_IWS_SVC_OPER_L |

### Unsupported Tables

The table below has been added for future functionality and is not currently in use.

| Table                 |
|-----------------------|
| F1_CRYPTOKEYRING_LINK |

### Added Columns

| Table        | Column   | Required |
|--------------|----------|----------|
| CI_BATCH_RUN | END_DTTM | N        |

| Table           | Column               | Required |
|-----------------|----------------------|----------|
| CI_BATCH_RUN    | START_DTTM           | N        |
| CI_COUNTRY      | ADDR1_USG_FLG        | Y        |
| CI_COUNTRY      | ADDR2_USG_FLG        | Y        |
| CI_COUNTRY      | ADDR3_USG_FLG        | Y        |
| CI_COUNTRY      | ADDR4_USG_FLG        | Y        |
| CI_COUNTRY      | CITY_USG_FLG         | Y        |
| CI_COUNTRY      | COUNTY_USG_FLG       | Y        |
| CI_COUNTRY      | GEO_CODE_USG_FLG     | Y        |
| CI_COUNTRY      | HOUSE_TYPE_USG_FLG   | Y        |
| CI_COUNTRY      | IN_CITY_LIM_USG_FLG  | Y        |
| CI_COUNTRY      | NUM1_USG_FLG         | Y        |
| CI_COUNTRY      | NUM2_USG_FLG         | Y        |
| CI_COUNTRY      | POSTAL_USG_FLG       | Y        |
| CI_COUNTRY      | STATE_USG_FLG        | Y        |
| F1_ATTACHMENT   | ATTACHMENT_EXT_ID    | N        |
| F1_ATTACHMENT   | COMMENT_LONG         | N        |
| F1_IWS_SVC      | RESOURCE_CAT_XFLG    | N        |
| F1_IWS_SVC      | WEB_SVC_CLASS_FLG    | Y        |
| F1_IWS_SVC_OPER | RESOURCE_URI         | N        |
| F1_IWS_SVC_OPER | REST_HTTP_METHOD_FLG | N        |
| F1_SVC_CATALOG  | WEB_SVC_CLASS_FLG    | Y        |

**Dropped Columns**

None

**Column Format Change**

None

**Primary Key Change**

None

**Index Changes**

None

**New Tables**

| Table                       | Description                               | Type of Table  |
|-----------------------------|-------------------------------------------|----------------|
| F1_DEPLOYMENT               | Deployment                                | Transaction    |
| F1_DEPLOYMENT_ITEM          | Deployment Item                           | Transaction    |
| F1_DEPLOYMENT_ITEM_METADATA | Deployment Item Meta Data                 | Transaction    |
| F1_DEPLOYMENT_PART          | Deployment Part                           | Master         |
| F1_DEPLOYMENT_PART_L        | Deployment Part Language                  | Master         |
| F1_DEPLOYMENT_TYPE          | Deployment Type                           | Master         |
| F1_DEPLOYMENT_TYPE_L        | Deployment Type Language                  | Master         |
| F1_DEPTYP_DEPPART           | Deployment Type / Deployment Part         | Transaction    |
| F1_DEPTYP_MDT_TYPE          | Deployment Type / MDT Type                | Transaction    |
| F1_DEPTYP_MSG_CAT           | Deployment Type Message Category          | Transaction    |
| F1_DEPTYP_USR_GRP           | Deployment Type User Group                | Transaction    |
| F1_MDT                      | Mobile Data Terminal                      | Transaction    |
| F1_MDT_CHAR                 | Mobile Data Terminal Characteristics      | Transaction    |
| F1_MDT_TYPE                 | Mobile Data Terminal Type                 | Master         |
| F1_MDT_TYPE_CHAR            | Mobile Data Terminal Type Characteristics | Master         |
| F1_MDT_TYPE_L               | Mobile Data Terminal Type Language        | Master         |
| F1_MOB_COMP_CHAR            | Mobile Component Characteristics          | Admin - System |
| F1_MOB_COMP_CNT             | Mobile Component Content                  | Admin - System |
| F1_MOBILE_COMPONENT         | Mobile Component                          | Admin - System |
| F1_MOBILE_COMPONENT_L       | Mobile Component Language                 | Admin - System |
| F1_REMOTE_MSG               | Remote Message                            | Transaction    |
| F1_REMOTE_MSG_CHAR          | Remote Message Characteristics            | Transaction    |

|                        |                                          |                |
|------------------------|------------------------------------------|----------------|
| F1_REMOTE_MSG_LOG      | Remote Message Log                       | Transaction    |
| F1_REMOTE_MSG_LOG_PARM | Remote Message Log Parameters            | Transaction    |
| F1_WEB_CAT_L           | Web Service Category Language            | Admin - System |
| F1_WEB_CAT_INCL_SVC    | Web Service Category - Included Services | Admin - System |
| F1_WEB_CAT             | Web Service Category                     | Admin - System |

Note that in addition, the following table was added to 4.3.0.4.0 via a hot fix, but was not included in 4.3.0.5.0 until after the final build and is therefore added as a hot fix. Clients upgrading to 4.3.0.5.0 may see that the table is dropped via the blueprint and then reinstated after applying the bug fixes.

| Table              | Description                      | Type of Table |
|--------------------|----------------------------------|---------------|
| F1_MIGR_OBJ_SQL_PK | Migration Object SQL Primary Key | Transaction   |

### New Views

None

### Dropped Tables

| Table                |
|----------------------|
| F1_IWS_ANN_CHAR      |
| F1_IWS_ANN_TYPE_CHAR |

### Unsupported Tables

None

### Added Columns

| Table            | Column           | Required |
|------------------|------------------|----------|
| CI_MD_SVC        | APP_SVC_ID       | N        |
| F1_OUTMSG        | BO_XML_DATA_AREA | N        |
| F1_OUTMSG_TYPE   | OUTMSG_PRIOR_FLG | Y        |
| F1_OUTMSG_TYPE   | OWNER_FLG        | N        |
| F1_OUTMSG_TYPE   | TYPE_BUS_OBJ_CD  | N        |
| F1_OUTMSG_TYPE_L | OWNER_FLG        | N        |

### Dropped Columns

None

**Unsupported Table Columns**

None

**Column Format Change**

None

**Primary Key Change**

None

**Index Changes**

Index S1C675S1 for table F1\_EXT\_LOOKUP\_VAL\_CHAR has been renamed to F1C675S1.

# Upgrades to Oracle Utilities Application Framework v4.4.0.0.0

**New Tables**

None

**New Views**

None

**Dropped Tables**

None

**Unsupported Tables**

None

**Added Columns**

None

**Dropped Columns**

None

**Column Format Change**

None

**Primary Key Change**

None

**Index Changes**

create index XT039S8 on

CI\_TD\_ENTRY(ENTRY\_STATUS\_FLG,TD\_TYPE\_CD,MESSAGE\_CAT\_NBR,MESSAGE\_NBR)

# Appendix C

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## Oracle Application Framework System Table Guide

This section lists the system tables owned by the Oracle Utilities Application Framework V4.4.0.0.0 and explains the data standards of the system tables. The data standards are required for the installation of Oracle Utilities Application Framework, development within the Oracle Utilities Application Framework, and the configuration and customization of Oracle Utilities products. Adhering to the data standards is a prerequisite for seamless upgrade to future releases.

This section includes:

- [About the Application Framework System Tables](#)
- [System Table Standards](#)
- [Guidelines for System Table Updates](#)
- [System Table List](#)

# About the Application Framework System Tables

System tables are a subset of the tables that must be populated at the time the product is installed. They include metadata and configuration tables. The data stored in the system tables are the information that Oracle Utilities Application Framework product operations are based on.

As the product adds more functionality, the list of system tables can grow. The complete list of the system tables can be found in the [System Table List](#) section.

## System Table Standards

System table standards must be observed for the following reasons:

- The product installation and upgrade process and customer modification data extract processes depend on the data prefix and owner flag values to determine the system data owned by each product.
- The standards ensure that there will be no data conflict in the product being developed and the future Oracle Utilities Application Framework release. They also ensure that there will be no data conflict between customer modifications and future Oracle Utilities product releases.
- The data prefix is used to prevent test data from being released to production.

**Developer's Note:** All test data added to the system data tables must be prefixed by ZZ (all upper case) in order for the installation and upgrade utility to recognize them as test data.

# Guidelines for System Table Updates

This section describes guidelines regarding the updating of the system table properties.

## Business Configuration Tables

The majority of data in the tables in this group belongs to the customer. But these tables are shipped with some initial data in order for the customer to login to the system and begin configuring the product. Unless specified otherwise, the initial data is maintained by Oracle Utilities Application Framework and subject to subsequent upgrade.

### Application Security and User Profile

These tables define the access rights of a User Group to Application Services and Application Users.

| Properties   | Description                                                                                                                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables       | SC_ACCESS_CNTL, SC_USER, SC_USR_GRP_PROF, SC_USR_GRP_USR, SC_USER_GROUP, SC_USER_GROUP_L                                                                                                                                |
| Initial Data | User Group ALL_SERVICES and default system user SYSUSER. Upon installation the system default User Group ALL_SERVICES is given unrestricted accesses to all services defined in Oracle Utilities Application Framework. |

**Developer's Note:** When a new service is added to the system, all actions defined for the service must be made available to the User Group ALL\_SERVICES.

### Currency Code

The ISO 4217 three-letter codes are taken as the standard code for the representation of each currency.

| Properties   | Description                      |
|--------------|----------------------------------|
| Tables       | CI_CURRENCY_CD, CI_CURRENCY_CD_L |
| Initial Data | United States Dollar (USD)       |

### Display Profile

The Display Profile Code is referenced in the User (SC\_USER) table.

| Properties | Description                  |
|------------|------------------------------|
| Tables     | CI_DISP_PROF, CI_DISP_PROF_L |

| Properties   | Description                                                                                                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Initial Data | North America (NORTHAM) and Europe (EURO) and HIJRI Format (HIJRI)                                                                                                          |
|              | <b>Configuration Note:</b> In order to use HIJRI Format display profile, additional configuration is needed to define the mappings between Hijri dates and Gregorian dates. |
|              | Refer to the Display Profile documentation for more information.                                                                                                            |

**Configuration Note:** In order to use HIJRI Format display profile, additional configuration is needed to define the mappings between Hijri dates and Gregorian dates.

Refer to the Display Profile documentation for more information.

## Installation Options

Installation Option has only one row that is shipped with the initial installation of the Oracle Utilities Application Framework. The updatable columns in these tables are customer data and will not be overridden by the upgrade process unless a special script is written and included in the upgrade process.

| Properties   | Description                                                                        |
|--------------|------------------------------------------------------------------------------------|
| Tables       | F1_INSTALLATION, CI_INSTALL_ALG, CI_INSTALL_MSG, CI_INSTALL_MSG_L, CI_INSTALL_PROD |
| Initial Data | Option 1111                                                                        |

**Developer's Note:** The system data owner of an environment is defined in the Installation Option. This Owner Flag value is stamped on all system data that is added to this environment. The installation default value is Customer Modification (CM). This value must be changed in the base product development environments.

## Language Code

Language Code must be a valid code defined in ISO 639-2 Alpha-3. Adding a new language code to the table without translating all language dependent objects in the system can cause errors when a user chooses the language.

| Properties   | Description   |
|--------------|---------------|
| Tables       | CI_LANGUAGE   |
| Initial Data | English (ENG) |

## Time Zone

The installation options require a valid time zone. A value for UTC (Coordinated Universal Time) is provided. Implementations should define the appropriate time zone and update the installation option value accordingly.

| Properties   | Description                  |
|--------------|------------------------------|
| Tables       | CI_TIME_ZONE, CI_TIME_ZONE_L |
| Initial Data | UTC                          |

## To Do Priority and Role

New To Do Types released will be linked to the default To Do Role and set to the product assigned priority value initially. These initial settings can be overridden by the implementation.

| Properties   | Description                |
|--------------|----------------------------|
| Tables       | CI_ROLE(L), CI_TD_VAL_ROLE |
| Initial Data | F1_DFLT                    |

## Development and Implementation System Tables

This section defines the standards for the system tables that contain data for application development. The data in these tables implement business logic and UI functions shared by various products and product extensions in the same database.

### Standards

When adding new data, the owner flag value of the environment must prefix certain fields of these tables. For example, when a developer adds a new algorithm type to an Oracle Utilities Work and Asset Management environment, C1 should prefix the new Algorithm Type code. The fields that are subject to this rule are listed in Standard Data Fields property.

The data that is already in these tables cannot be modified if the data owner is different than the environment owner. This prevents the developers from accidentally modifying system data that belongs to the Oracle Utilities Application Framework or the base products. However, some fields are exempt from this rule and can be modified by Customer Modification. These fields are listed in the Customer Modification Fields property.

Note that the system supports a system upgrade rule called Override Owner flag. If duplicate data rows (data row with same primary key values) are found at the time of upgrade, the owner flag values will get overridden. The lower level application system data will override the upper level system data. For example, F1 overrides C1, F1&C1 override CM, and so on. This rule will be applied to the following tables: CI\_CHAR\_ENTITY, CI\_MD\_MO\_ALG, C1\_PORTAL\_OPT, F1\_BUS\_OBJ\_ALG, F1\_BUS\_OBJ\_STATUS\_ALG, CI\_MD\_MO\_OPT, F1\_BUS\_OBJ\_OPT, F1\_BUS\_OBJ\_STATUS\_OPT, F1\_BUS\_OBJ\_STATUS, F1\_BUS\_OBJ\_STATUS\_L

## Algorithm Type

| Properties            | Description                                                    |
|-----------------------|----------------------------------------------------------------|
| Tables                | CI_ALG_TYPE, CI_ALG_TYPE_L, CI_ALG_TYPE_PRM, CI_ALG_TYPE_PRM_L |
| Standard Data Fields  | Algorithm Type (ALG_TYPE_CD)                                   |
| Customer Modification | None                                                           |

## Algorithm

| Properties            | Description                               |
|-----------------------|-------------------------------------------|
| Tables                | CI_ALG, CI_ALG_L, CI_ALG_PARM, CI_ALG_VER |
| Standard Data Fields  | Algorithm (ALG_CD)                        |
| Customer Modification | None                                      |

## Application Security

| Properties            | Description                                      |
|-----------------------|--------------------------------------------------|
| Tables                | SC_APP_SERVICE, SC_APP_SERVICE_L, CI_APP_SVC_ACC |
| Standard Data Fields  | Application Service ID (APP_SVC_ID).             |
| Customer Modification | None                                             |

## Batch Control

| Properties           | Description                                                        |
|----------------------|--------------------------------------------------------------------|
| Tables               | CI_BATCH_CTRL, CI_BATCH_CTRL_L, CI_BATCH_CTRL_P, CI_BATCH_CTRL_P_L |
| Standard Data Fields | Batch Process (BATCH_CD), Program Name (PROGRAM_NAME)              |

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Customer Modification | Next Batch Number (NEXT_BATCH_NBR), Last Update Instance (LAST_UPDATE_INST), Last Update Date time (LAST_UPDATE_DTTM) and the batch process update these columns. Time Interval (TIMER_INTERVAL), Thread Count (BATCH_THREAD_CNT), Maximum Commit Records (MAX_COMMIT_RECS), User (USER_ID), Language (LANGUAGE_CD), Email Address (EMAILID), Start program debug tracing (TRC_PGM_STRT_SW), End Program Debug trace (TRC_PGM_END_SW), SQL debug tracing (TRC_SQL_SW) and Standard debug tracing (TRC_STD_SW) on CI_BATCH_CTRL Table.<br>Batch Parameter Value (BATCH_PARM_VAL) and Security flag (TEXT_SECURITY_FLG) on Batch Control Parameters Table (CI_BATCH_CTRL_P) |

## Business Object

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | F1_BUS_OBJ, F1_BUS_OBJ_L, F1_BUS_OBJ_ALG, F1_BUS_OBJ_OPT, F1_BUS_OBJ_STATUS, F1_BUS_OBJ_STATUS_L, F1_BUS_OBJ_STATUS_ALG, F1_BUS_OBJ_STATUS_OPT, F1_BUS_OBJ_STATUS_RSN, F1_BUS_OBJ_STATUS_RSN_L, F1_BUS_OBJ_STATUS_RSN_CHAR, F1_BUS_OBJ_TR_RULE, F1_BUS_OBJ_TR_RULE_L                                                                                                                |
| Standard Data Fields  | Business Object (BUS_OBJ_CD), Status Reason (BO_STATUS_REASON_CD)                                                                                                                                                                                                                                                                                                                   |
| Customer Modification | Batch Control (BATCH_CD), Alert (BO_ALERT_FLG), Sequence (SORT_SEQ5), Status Reason (STATUS_REASON_FLG) fields on Business Object Status Table (F1_BUS_OBJ_STATUS). Instance Control (INSTANCE_CTRL_FLG), Application Service (APP_SVC_ID) on Business Object Table (F1_BUS_OBJ). Status Reason Selection (STATUS_REASON_SELECT_FLG) on Status Reason Table (F1_BUS_OBJ_STATUS_RSN) |

## Business Service

| Properties            | Description                      |
|-----------------------|----------------------------------|
| Tables                | F1_BUS_SVC, F1_BUS_SVC_L         |
| Standard Data Fields  | Business Service (BUS_SVC_CD)    |
| Customer Modification | Application Service (APP_SVC_ID) |

## Characteristics

| Properties            | Description                                                                                                                                                                                                                                                                |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_CHAR_TYPE, CI_CHAR_TYPE_L, CI_CHAR_ENTITY, CI_CHAR_VAL, CI_CHAR_VAL_L                                                                                                                                                                                                   |
| Standard Data Fields  | Characteristic Type (CHAR_TYPE_CD)<br>Characteristic Value (CHAR_VAL) on CI_CHAR_VAL<br><br>If the characteristic type is customizable, Customer Modification can insert new characteristic values. CM must prefix when implementers introduce a new characteristic value. |
| Customer Modification | Adhoc Characteristic Value Validation Rule (ADHOC_VAL_ALG_CD), Allow Search by Characteristic Value (SEARCH_FLG)                                                                                                                                                           |

## Configuration Migration Assistant

| Properties            | Description                                                                                                                                                                                                        |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | F1_MIGR_PLAN, F1_MIGR_PLAN_L, F1_MIGR_PLAN_INSTR, F1_MIGR_PLAN_INSTR_L, F1_MIGR_PLAN_INSTR_ALG, F1_MIGR_REQ, F1_MIGR_REQ_L, F1_MIGR_REQ_INSTR, F1_MIGR_REQ_INSTR_L, F1_MIGR_REQ_INSTR_ENTITY, F1_MIGR_REQ_INCL_REQ |
| Standard Data Fields  | Migration Plan Code (MIGR_PLAN_CD), Migration Request Code (MIGR_REQ_CD)                                                                                                                                           |
| Customer Modification | None                                                                                                                                                                                                               |

## Data Area

| Properties            | Description                   |
|-----------------------|-------------------------------|
| Tables                | F1_DATA_AREA, F1_DATA_AREA_L  |
| Standard Data Fields  | Data Area Code (DATA_AREA_CD) |
| Customer Modification | None                          |

## Deployment Part

| Properties            | Description                                                  |
|-----------------------|--------------------------------------------------------------|
| Tables                | F1_DEPLOYMENT_PART, F1_DEPLOYMENT_PART_L, F1_DEPLOYMENT_ITEM |
| Standard Data Fields  | Deployment ID (F1_DEPLOYMENT_ID)                             |
| Customer Modification | None                                                         |

## Display Icon

| Properties            | Description                      |
|-----------------------|----------------------------------|
| Tables                | CI_DISP_ICON, CI_DISP_ICON_L     |
| Standard Data Fields  | Display Icon Code (DISP_ICON_CD) |
| Customer Modification | None                             |

## Extendable Lookup

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | F1_EXT_LOOKUP_VAL, F1_EXT_LOOKUP_VAL_L, F1_EXT_LOOKUP_VAL_CHAR                                                                                                                                                                                                                                                                                                                                    |
| Standard Data Fields  | Business Object (BUS_OBJ_CD), Extendable Lookup Value (F1_EXT_LOOKUP_VALUE)                                                                                                                                                                                                                                                                                                                       |
| Customer Modification | Business Object Data Area (BO_DATA_AREA)<br>Override Description (DESCR_OVRD) on Extendable Lookup Field Value Language Table (F1_EXT_LOOKUP_VAL_L)<br><b>Note:</b> When the product releases base owned records in Extendable Lookup, if there are additional elements the business object will map the element to the BO_DATA_AREA if the value is allowed to be modified by an implementation. |

## Foreign Key Reference

| Properties            | Description                                  |
|-----------------------|----------------------------------------------|
| Tables                | CI_FK_REF, CI_FK_REF_L                       |
| Standard Data Fields  | FK reference code (FK_REF_CD)                |
| Customer Modification | Info Program Name (INFO_PRG), Zone (ZONE_CD) |

## Inbound Web Service

| Properties           | Description                                                                                                                                                                               |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables               | F1_IWS_SVC_L, F1_IWS_SVC, F1_IWS_SVC_OPER_L, F1_IWS_SVC_OPER, F1_IWS_ANN_L, F1_IWS_ANN_PARM, F1_IWS_ANN, F1_IWS_ANN_TYPE_L, F1_IWS_ANN_TYPE, F1_IWS_ANN_TYPE_PARM, F1_IWS_ANN_TYPE_PARM_L |
| Standard Data Fields | Webservice Name (IN_SVC_NAME), Annotation (ANN_CD), Annotation Type (ANN_TYPE_CD)                                                                                                         |

| Properties            | Description                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------|
| Customer Modification | Debug (DEBUG_SW), Active (ACTIVE_SW), Trace (TRACE_SW), Request XSL (REQUEST_XSL), Response XSL (RESPONSE_XSL) |

## Unsupported Metadata

| Properties            | Description             |
|-----------------------|-------------------------|
| Tables                | F1_LGCY_OBJ             |
| Standard Data Fields  | Object ID (LGCY_OBJ_ID) |
| Customer Modification | None                    |

## Lookup

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_LOOKUP_FIELD, CI_LOOKUP_VAL, CI_LOOKUP_VAL_L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Standard Data Fields  | <p>Field Name (FIELD_NAME)</p> <ul style="list-style-type: none"> <li>A lookup field name must have corresponding field metadata. The name of the lookup field column must be assigned to avoid conflicts among different products. If you follow the standards for database field names, a Customer Modification lookup field name will be automatically Customer Modification prefixed.</li> </ul> <p>Field Value (FIELD_VALUE)</p> <ul style="list-style-type: none"> <li>If a lookup field is customizable, Customer Modification can insert new lookup values. X or Y must prefix when implementers introduce a new lookup value.</li> <li>Product development may add lookup values to a Oracle Utilities Application Framework owned lookup field's value. When extended new value is added, the Owner Flag is used to prefix the value.</li> </ul> |
| Customer Modification | Override Description (DESCR_OVRD) on Lookup Field Value Language Table (CI_LOOKUP_VAL_L)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Map

| Properties | Description      |
|------------|------------------|
| Tables     | F1_MAP, F1_MAP_L |

| Properties            | Description     |
|-----------------------|-----------------|
| Standard Data Fields  | UI Map (MAP_CD) |
| Customer Modification | None            |

## Managed Content

| Properties            | Description                          |
|-----------------------|--------------------------------------|
| Tables                | F1_MANAG_CONTENT, F1_MANAG_CONTENT_L |
| Standard Data Fields  | Managed Content (MANAG_CONTENT_CD)   |
| Customer Modification | None                                 |

## Messages

| Properties | Description                                          |
|------------|------------------------------------------------------|
| Tables     | CI_MSG_CATEGORY, CI_MSG_CATEGORY_L, CI_MSG, CI_MSG_L |

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard Data Fields  | <p>Message Category (MESSAGE_CAT_NBR)</p> <ul style="list-style-type: none"> <li>Messages are grouped in categories and each category has message numbers between 1 and 99999. A range of message categories is assigned to a product. An implementation may only use categories assigned for customization use.</li> <li>Implementer Message Categories are 80000 and 90000</li> <li>Reserved for Tests - 99999</li> </ul> <p>Message Number (MESSAGE_NBR) for message categories</p> <ul style="list-style-type: none"> <li>Message numbers below 1000 are reserved for common messages. Implementers must not use message numbers below 1000.</li> </ul> <p>Message Number (MESSAGE_NBR) for Java message categories</p> <ul style="list-style-type: none"> <li>Subsystem Standard Messages - 00001 thru 02000</li> <li>Reserved - 02001 thru 09999</li> <li>Published Messages - 10001 thru 11000</li> <li>Package Messages - 10001 thru 90000</li> <li>Reserved - 90001 thru 99999</li> <li>Each package is allocated 100 message numbers, each starting from 101.</li> <li>Published Messages are messages that are special-interest messages that implementations need to know about and are therefore published in the user docs. Examples of these include messages that are highly likely to be changed for an implementation, or messages that are embedded into other texts/messages and therefore the message number is never shown</li> <li>Reserved message number ranges are for future use and therefore must not be used by all products.</li> </ul> |
| Customer Modification | <p>Override Description (DESCRLONG_OVRD), Message Text Override (MESSAGE_TEXT_OVRD)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Meta Data - Table and Field

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_MD_TBL, CI_MD_TBL_FLD, CI_MD_TBL_L, CI_MD_TBL_FLD_L, CI_MD_FLD, CI_MD_FLD_L, F1_DB_OBJECTS_REPO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Standard Data Fields  | Table Name (TBL_NAME) <ul style="list-style-type: none"> <li>Table names must match with the physical table name or view name in the database.</li> <li>Field Name (FLD_NAME) Field name must match with the physical column name in the database unless the field is a work field. Field name does not have to follow the prefixing standard unless the field is a work field or customer modification field.</li> <li>F1_DB_OBJECTS_REPO Table stores information about Indexes, Sequences, Triggers and other database objects excluding Tables and Fields (as they are already stored in the other Metadata tables)</li> </ul> |
| Customer Modification | AuditSwitches(AUDIT_INSERT_SW,AUDIT_UPDATE_SW, AUDIT_DELETE_SW), Override label (OVRD_LABEL) on MD Table Field Table (CI_MD_TBL_FLD). Audit Program Name (AUDIT_PGM_NAME), Audit Table Name (AUDIT_TBL_NAME), Audit Program Type (AUDIT_PGM_TYPE_FLG), Key Validation (KEY_VALIDATION_FLG) and Caching strategy (CACHE_FLG) on MD Table (CI_MD_TBL). Override Label (OVRD_LABEL) and Customer Specific Description (DESCRLONG_OVRD) on Field Table.                                                                                                                                                                                |

## Meta Data - Constraints

| Properties            | Description                                                                                                                                                                                                                                                                |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_MD_CONST, CI_MD_CONST_FLD                                                                                                                                                                                                                                               |
| Standard Data Fields  | Constraint Id (CONST_ID) <ul style="list-style-type: none"> <li>Index Name for Primary Constraints</li> <li>&lt;Index Name&gt;Rnn for Foreign Key Constraints Where               <ul style="list-style-type: none"> <li>nn: integer, 01 through 99</li> </ul> </li> </ul> |
| Customer Modification | None                                                                                                                                                                                                                                                                       |

## Meta Data - Menu

Menus can be extended to support multiple products by adding a new menu line to an existing menu. The sequence number on the menu line language table

(CI\_MD\_MENU\_LINE\_L) determines the order the menu lines appear. Within the same sequence, alphabetic sorting is used.

| Properties            | Description                                                                                      |
|-----------------------|--------------------------------------------------------------------------------------------------|
| Tables                | CI_MD_MENU, CI_MD_MENU_L, CI_MD_MENU_ITEM, CI_MD_MENU_ITEM_L, CI_MD_MENU_LINE, CI_MD_MENU_LINE_L |
| Standard Data Fields  | Menu Name (MENU_NAME), Menu Item Id (MENU_ITEM_ID), Menu Line Id (MENU_LINE_ID)                  |
| Customer Modification | Override Label (OVRD_LABEL) on Menu Line Language Table (CI_MD_MENU_LINE_L)                      |

## Meta Data - Program, Location and Services

| Properties            | Description                                                                                                                                                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_MD_PRG_COM, CI_MD_PRG_LOC, CI_MD_SVC, CI_MD_SVC_L, CI_MD_SVC_PRG, CI_MD_PRG_MOD, CI_MD_PRG_EL_AT, CI_MD_PRG_ELEM, CI_MD_PRG_SEC, CI_MD_PRG_SQL, CI_MD_PRG_VAR, CI_MD_PRG_TAB |
| Standard Data Fields  | Program Component Id (PROG_COM_ID), Location Id (LOC_ID), Program Component Name (PROG_COM_NAME), Service Name (SVC_NAME), Navigation Key (NAVIGATION_KEY)                      |
| Customer Modification | User Exit Program Name (USER_EXIT_PGM_NAME) on Program Components Table (CI_MD_PRG_COM),                                                                                        |

## Meta Data - Maintenance Object

| Properties            | Description                                                    |
|-----------------------|----------------------------------------------------------------|
| Tables                | CI_MD_MO, CI_MD_MO_L, CI_MD_MO_TBL, CI_MD_MO_OPT, CI_MD_MO_ALG |
| Standard Data Fields  | Maintenance Object (MAINT_OBJ_CD)                              |
| Customer Modification | None                                                           |

## Meta Data - Work Tables

| Properties            | Description                                                    |
|-----------------------|----------------------------------------------------------------|
| Tables                | CI_MD_WRK_TBL, CI_MD_WRK_TBL_L, CI_MD_WRK_TBLFLD, CI_MD_MO_WRK |
| Standard Data Fields  | Work Table Name (WRK_TBL_NAME)                                 |
| Customer Modification | None                                                           |

## Meta Data - Search Object

| Properties            | Description                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_MD_SO, CI_MD_SO_L, CI_MD_SO_RSFLD, CI_MD_SO_RSFLDAT, CI_MD_SOCG, CI_MD_SOCG_FLD, CI_MD_SOCG_FLDAT, CI_MD_SOCG_L, CI_MD_SOCG_SORT |
| Standard Data Fields  | Search Object (SO_CD)                                                                                                               |
| Customer Modification | None                                                                                                                                |

## Mobile Component

| Properties            | Description                                                                      |
|-----------------------|----------------------------------------------------------------------------------|
| Tables                | F1_MOBILE_COMPONENT, F1_MOBILE_COMPONENT_L, F1_MOB_COMP_CNT, F1_MOBILE_COMP_CHAR |
| Standard Data Fields  | Mobile Component Code (F1_MOB_COMP_TYPE_CD)                                      |
| Customer Modification | Expiration Days (F1_EXPIRATION_TIME_DUR)                                         |

## Navigation Option

| Properties            | Description                                                          |
|-----------------------|----------------------------------------------------------------------|
| Tables                | CI_NAV_OPT, CI_NAV_OPT_L, CI_NAV_OPT_CTXT, CI_NAV_OPT_USG, CI_MD_NAV |
| Standard Data Fields  | Navigation Option Code (NAV_OPT_CD), Navigation Key (NAVIGATION_KEY) |
| Customer Modification | None                                                                 |

## Outbound Message Type

| Properties            | Description                                 |
|-----------------------|---------------------------------------------|
| Tables                | F1_OUTMSG_TYPE, F1_OUTMSG_TYPE_L            |
| Standard Data Fields  | Outbound Message Type Code (OUTMSG_TYPE_CD) |
| Customer Modification | Priority (OUTMSG_PRIOR_FLG)                 |

## Portal and Zone

| Properties            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_PORTAL, CI_PORTAL_L, CI_PORTAL_ZONE, CI_PORTAL_OPT, CI_ZONE, CI_ZONE_L, CI_ZONE_PRM, CI_ZONE_HDL, CI_ZONE_HDL_L, CI_ZONE_HDL_PRM, CI_ZONE_HDL_PRM_L, CI_UI_ZONE                                                                                                                                                                                                                                                                                                                                |
| Standard Data Fields  | Portal Code (PORTAL_CD), Zone Code (ZONE_CD), Zone Type Code (ZONE_HDL_CD) <ul style="list-style-type: none"> <li>A new Zone can be added to the Product owned Portal Pages.</li> <li>The existing Zones cannot be removed from the Product owned Portal Pages.</li> </ul>                                                                                                                                                                                                                        |
| Customer Modification | Sort Sequence (SORT_SEQ) on Context Sensitive Zone Table (CI_UI_ZONE). Show on Portal Preferences (USER_CONFIG_FLG) on Portal Table (CI_PORTAL). Override Sequence (SORT_SEQ_OVRD) on Portal Zone Table (CI_PORTAL_ZONE). Customer Specific Description (DESCRLONG_OVRD) on Zone Language Table (CI_ZONE_L). Override Parameter Value (ZONE_HDL_PARM_OVRD) on Zone Type Parameters Table (CI_ZONE_HDL_PRM). Override Parameter Value (ZONE_PARM_VAL_OVRD) on Zone Parameters Table (CI_ZONE_PRM). |

## Process Flow Type

| Properties            | Description                                                           |
|-----------------------|-----------------------------------------------------------------------|
| Tables                | F1_PROC_DEFN<br>F1_PROC_DEFN_L<br>F1_PROC_NEXT_PANEL<br>F1_PROC_PANEL |
| Standard Data Fields  | Process Flow Type (PROCESS_CD)                                        |
| Customer Modification | None                                                                  |

## Sequence

| Properties            | Description                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------|
| Tables                | CI_SEQ                                                                                                        |
| Standard Data Fields  | Sequence Name (SEQ_NAME)                                                                                      |
| Customer Modification | Sequence Number (SEQ_NBR)<br>This field is updated by the application process and must be set to 1 initially. |

## Schema

| Properties            | Description               |
|-----------------------|---------------------------|
| Tables                | F1_SCHEMA                 |
| Standard Data Fields  | Schema Name (SCHEMA_NAME) |
| Customer Modification | None                      |

## Script

| Properties            | Description                                                                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_SCR, CI_SCR_L, CI_SCR_CRT, CI_SCR_CRT_GRP, CI_SCR_CRT_GRP_L, CI_SCR_DA, CI_SCR_FLD_MAP, CI_SCR_PRMPPT, CI_SCR_PRMPPT_L, CI_SCR_STEP, CI_SCR_STEP_L |
| Standard Data Fields  | Script (SCR_CD)                                                                                                                                       |
| Customer Modification | None                                                                                                                                                  |

## To Do Type

| Properties            | Description                                                                                                                           |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_TD_TYPE, CI_TD_TYPE_L, CI_TD_SRTKEY_TY, CI_TD_DRLKEY_TY, CI_TD_SRTKEY_TY_L                                                         |
| Standard Data Fields  | To Do Type Code (TD_TYPE_CD)                                                                                                          |
| Customer Modification | Creation Batch Code (CRE_BATCH_CD), Route Batch Code (RTE_BATCH_CD), Priority Flag (TD_PRIORITY_FLG) on To Do Type Table (CI_TD_TYPE) |

## Web Service Category

| Properties            | Description                                   |
|-----------------------|-----------------------------------------------|
| Tables                | F1_WEB_CAT, F1_WEB_CAT_L, F1_WEB_CAT_INCL_SVC |
| Standard Data Fields  | Web Service Category code (WEB_SVC_CAT_CD)    |
| Customer Modification | None                                          |

## XAI Configuration

| Properties            | Description                                                                                                                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_XAI_ADAPTER, CI_XAI_ADAPTER_L, CI_XAI_CLASS, CI_XAI_CLASS_L, CI_XAI_ENV_HNDL, CI_XAI_ENV_HNDL_L, CI_XAI_FORMAT, CI_XAI_FORMAT_L, CI_XAI_RCVR, CI_XAI_RCVR_L, CI_XAI_RCVR_CTX, CI_XAI_RCVR_RSP, CI_XAI_RCVR_RGRP, CI_XAI_SENDER, CI_XAI_SERNDER_L, CI_XAI_SNDR_CTX, CI_XAI_OPTION |
| Standard Data Fields  | Adapter Id (XAI_ADAPTER_ID), Class Id (XAI_CLASS_ID), Envelope Handler Id (XAI_ENV_HNDL_ID), XAI Format Id (XAI_FORMAT_ID), Receiver Id (XAI_RCVR_ID), Sender Id (XAI_SENDER_ID)                                                                                                    |
| Customer Modification | Option Value (OPTION_VALUE) on Message Option Table (CI_XAI_OPTION)                                                                                                                                                                                                                 |

## XAI Services

| Properties            | Description                                                                                                                                                                                                                |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tables                | CI_XAI_IN_SVC, CI_XAI_IN_SVC_L, CI_XAI_SVC_PARM                                                                                                                                                                            |
| Standard Data Fields  | XAI Inbound Service Id (XAI_IN_SVC_ID), XAI Inbound Service Name (XAI_IN_SVC_NAME)                                                                                                                                         |
| Customer Modification | XAI Version (XAI_VERSION_ID), Trace (TRACE_SW), Debug (DEBUG_SW), Request XSL (INPUT_XSL), Response XSL (RESPONSE_XSL), Record XSL (RECORD_XSL and Post Error (POST_ERROR_SW) on XAI Inbound Service Table (CI_XAI_IN_SVC) |

# System Table List

This section contains names of system tables, upgrade actions, and a brief description of tables. The upgrade actions are explained below.

**Keep (KP):** The data in the table in the customer's database is kept untouched. No insert or delete is performed to this table by the upgrade process. The initial installation will add necessary data for the system

**Merge (MG):** The non-base product data in the table in the database is kept untouched. If the data belongs to the base product, any changes pertaining to the new version of the software are performed.

**Refresh (RF):** The existing data in the table is replaced with the data from the base product table. The product does not support customer specific data in these tables.

**Note.** New product data is also inserted into tables marked as 'Merge'. If implementers add rows for a customer specific enhancement, it can cause duplication when the system data gets upgraded to the next version. We strongly recommend following the guidelines on how to use designated range of values or prefixes to segregate the implementation data from the base product data.

| Table Name        | Upgrade Action | Description                        |
|-------------------|----------------|------------------------------------|
| CI_ALG            | MG             | Algorithm                          |
| CI_ALG_L          | MG             | Algorithm Language                 |
| CI_ALG_PARM       | MG             | Algorithm Parameters               |
| CI_ALG_TYPE       | MG             | Algorithm Type                     |
| CI_ALG_TYPE_L     | MG             | Algorithm Type Language            |
| CI_ALG_TYPE_PRM   | MG             | Algorithm Type Parameter           |
| CI_ALG_TYPE_PRM_L | MG             | Algorithm Type Parameter Language  |
| CI_ALG_VER        | MG             | Algorithm Version                  |
| CI_APP_SVC_ACC    | MG             | Application Service Access Mode    |
| CI_BATCH_CTRL     | MG             | Batch Control                      |
| CI_BATCH_CTRL_ALG | MG             | Batch Control Algorithm            |
| CI_BATCH_CTRL_L   | MG             | Batch Control Language             |
| CI_BATCH_CTRL_P   | MG             | Batch Control Parameters           |
| CI_BATCH_CTRL_P_L | MG             | Batch Control Parameters Language  |
| CI_CHAR_ENTITY    | MG             | Characteristic Type Entity         |
| CI_CHAR_TYPE      | MG             | Characteristic Type                |
| CI_CHAR_TYPE_L    | MG             | Characteristic Type Language       |
| CI_CHAR_VAL       | MG             | Characteristic Type Value          |
| CI_CHAR_VAL_L     | MG             | Characteristic Type Value Language |

| Table Name        | Upgrade Action | Description                    |
|-------------------|----------------|--------------------------------|
| CI_DISP_ICON      | MG             | Display Icon                   |
| CI_DISP_ICON_L    | MG             | Display Icon Language          |
| CI_FK_REF         | MG             | Foreign Key Reference          |
| CI_FK_REF_L       | MG             | Foreign Key Reference Language |
| CI_LANGUAGE       | MG             | Language Code                  |
| CI_LOOKUP_FIELD   | MG             | Lookup Field                   |
| CI_LOOKUP_VAL     | MG             | Lookup Field Value             |
| CI_LOOKUP_VAL_L   | MG             | Lookup Field Value Language    |
| CI_MD_CONST       | MG             | Constraints                    |
| CI_MD_CONST_FLD   | MG             | Constraint Fields              |
| CI_MD_FLD         | MG             | Field                          |
| CI_MD_FLD_L       | MG             | Field Language                 |
| CI_MD_MENU        | MG             | Menu Information               |
| CI_MD_MENU_IMOD   | MG             | Menu Item Module Maint         |
| CI_MD_MENU_ITEM   | MG             | Menu Item                      |
| CI_MD_MENU_ITEM_L | MG             | Menu Item Language             |
| CI_MD_MENU_L      | MG             | Menu Language                  |
| CI_MD_MENU_LINE   | MG             | Menu Line                      |
| CI_MD_MENU_LINE_L | MG             | Menu Line Language             |
| CI_MD_MENU_MOD    | MG             | Menu Product Components        |
| CI_MD_MO          | MG             | Maintenance Object             |
| CI_MD_MO_ALG      | MG             | Maintenance Object Algorithm   |
| CI_MD_MO_L        | MG             | Maintenance Object Language    |
| CI_MD_MO_OPT      | MG             | Maintenance Object Option      |
| CI_MD_MO_TBL      | MG             | Maintenance Object Table       |
| CI_MD_MO_WRK      | MG             | Maintenance Object Work Tables |
| CI_MD_NAV         | MG             | Navigation Key                 |
| CI_MD_PRG_COM     | MG             | Program Components             |
| CI_MD_PRG_ELEM    | MG             | UI Page Elements               |
| CI_MD_PRG_EL_AT   | MG             | UI Page Element Attributes     |
| CI_MD_PRG_LOC     | MG             | Program Location               |
| CI_MD_PRG_MOD     | MG             | Program Module                 |

| Table Name        | Upgrade Action | Description                             |
|-------------------|----------------|-----------------------------------------|
| CI_MD_PRG_SEC     | MG             | UI Page Sections                        |
| CI_MD_PRG_SQL     | MG             | MD SQL Meta Data                        |
| CI_MD_PRG_TAB     | MG             | UI Tab Meta Data                        |
| CI_MD_PRG_VAR     | MG             | Program Variable                        |
| CI_MD_SO          | MG             | Search Object                           |
| CI_MD_SOCG        | MG             | Search Object Criteria Group            |
| CI_MD_SOCG_FLD    | MG             | Search Object Criteria Group Field      |
| CI_MD_SOCG_FLDAT  | MG             | Search Criteria Group Field Attribute   |
| CI_MD_SOCG_L      | MG             | Search Object Criteria Group Language   |
| CI_MD_SOCG_SORT   | MG             | Search Criteria Group Result Sort Order |
| CI_MD_SO_L        | MG             | Search Object Language                  |
| CI_MD_SO_RSFLD    | MG             | Search Object Result Field              |
| CI_MD_SO_RSFLDAT  | MG             | Search Object Result Field Attribute    |
| CI_MD_SVC         | MG             | MD Service                              |
| CI_MD_SVC_L       | MG             | MD Service Language                     |
| CI_MD_SVC_PRG     | MG             | MD Service Program                      |
| CI_MD_TAB_MOD     | MG             | UI Tab Module                           |
| CI_MD_TBL         | MG             | MD Table                                |
| CI_MD_TBL_FLD     | MG             | MD Table Field                          |
| CI_MD_TBL_FLD_L   | MG             | MD Table Field Language                 |
| CI_MD_TBL_L       | MG             | MD Table Language                       |
| CI_MD_WRK_TBL     | MG             | Work Table                              |
| CI_MD_WRK_TBLFLD  | MG             | Work Table Field                        |
| CI_MD_WRK_TBL_L   | MG             | Work Table Language                     |
| CI_MSG            | MG             | Message                                 |
| CI_MSG_CATEGORY   | MG             | Message Category                        |
| CI_MSG_CATEGORY_L | MG             | Message Category Language               |
| CI_MSG_L          | MG             | Message Language                        |
| CI_NAV_OPT        | MG             | Navigation Option                       |
| CI_NAV_OPT_CTXT   | MG             | Navigation Option Context               |
| CI_NAV_OPT_L      | MG             | Navigation Option Language              |
| CI_NAV_OPT_USG    | MG             | Navigation Option Usage                 |

| Table Name        | Upgrade Action | Description                    |
|-------------------|----------------|--------------------------------|
| CI_PORTAL         | MG             | Portal                         |
| CI_PORTAL_L       | MG             | Portal Language                |
| CI_PORTAL_OPT     | MG             | Portal Option                  |
| CI_PORTAL_ZONE    | MG             | Portal Zone                    |
| CI_SCR            | MG             | Script                         |
| CI_SCR_CRT        | MG             | Script Criteria                |
| CI_SCR_CRT_GRP    | MG             | Script Criteria Group          |
| CI_SCR_CRT_GRP_L  | MG             | Script Criteria Group Language |
| CI_SCR_DA         | MG             | Script Data Area               |
| CI_SCR_FLD_MAP    | MG             | Script Field Mapping           |
| CI_SCR_L          | MG             | Script Language                |
| CI_SCR_PRMP       | MG             | Script Prompt                  |
| CI_SCR_PRMP_L     | MG             | Script Prompt Language         |
| CI_SCR_STEP       | MG             | Script Step                    |
| CI_SCR_STEP_L     | MG             | Script Step Language           |
| CI_SEQ            | MG             | Sequence                       |
| CI_TD_DRLKEY_TY   | MG             | To Do Type Drill Key           |
| CI_TD_SRTKEY_TY   | MG             | To Do Type Sort Key            |
| CI_TD_SRTKEY_TY_L | MG             | To Do Type Sort Key Language   |
| CI_TD_TYPE        | MG             | To Do Type                     |
| CI_TD_TYPE_L      | MG             | To Do Type Language            |
| CI_UI_ZONE        | MG             | Context Sensitive Zone         |
| CI_USR_NAV_LINK   | MG             | User Favorite Links            |
| CI_XAI_ADAPTER    | MG             | XAI Adapter                    |
| CI_XAI_ADAPTER_L  | MG             | XAI Adapter Lang               |
| CI_XAI_CLASS      | MG             | Message Class                  |
| CI_XAI_CLASS_L    | MG             | Message Class Language         |
| CI_XAI_ENV_HNDL   | MG             | XAI Envelope Handler           |
| CI_XAI_ENV_HNDL_L | MG             | XAI Envelope Handler Language  |
| CI_XAI_IN_SVC     | MG             | XAI Inbound Service            |
| CI_XAI_IN_SVC_L   | MG             | XAI Inbound Service Language   |
| CI_XAI_SVC_PARM   | MG             | XAI Inbound Service Parameters |

| Table Name              | Upgrade Action | Description                              |
|-------------------------|----------------|------------------------------------------|
| CI_ZONE                 | MG             | Zone                                     |
| CI_ZONE_HDL             | MG             | Zone Type                                |
| CI_ZONE_HDL_L           | MG             | Zone Type Language                       |
| CI_ZONE_HDL_PRM         | MG             | Zone Type Parameters                     |
| CI_ZONE_HDL_PRM_L       | MG             | Zone Type Parameters Language            |
| CI_ZONE_L               | MG             | Zone Language                            |
| CI_ZONE_PRM             | MG             | Zone Parameters                          |
| F1_BUS_OBJ              | MG             | Business Object                          |
| F1_BUS_OBJ_ALG          | MG             | Business Object Algorithm                |
| F1_BUS_OBJ_L            | MG             | Business Object Language                 |
| F1_BUS_OBJ_OPT          | MG             | Business Object Option                   |
| F1_BUS_OBJ_STATUS       | MG             | Business Object Status                   |
| F1_BUS_OBJ_STATUS_ALG   | MG             | Business Object Status Algorithm         |
| F1_BUS_OBJ_STATUS_L     | MG             | Business Object Status Language          |
| F1_BUS_OBJ_STATUS_OPT   | MG             | Business Object Status Option            |
| F1_BUS_OBJ_STATUS_RSN   | MG             | Status Reason                            |
| F1_BUS_OBJ_STATUS_RSN_L | MG             | Status Reason Language                   |
| F1_BUS_OBJ_TR_RULE      | MG             | Business Object Transition Rule          |
| F1_BUS_OBJ_TR_RULE_L    | MG             | Business Object Transition Rule Language |
| F1_BUS_SVC              | MG             | Business Service                         |
| F1_BUS_SVC_L            | MG             | Business Service Language                |
| F1_DATA_AREA            | MG             | Data Area                                |
| F1_DATA_AREA_L          | MG             | Data Area Language                       |
| F1_DB_OBJECTS_REPO      | MG             | Database Objects Repository              |
| F1_DEPLOYMENT_ITEM      | MG             | Deployment Part Item                     |
| F1_DEPLOYMENT_PART      | MG             | Deployment Part                          |
| F1_DEPLOYMENT_PART_L    | MG             | Deployment Part Language                 |
| F1_EXT_LOOKUP_VAL       | MG             | Extendable Lookup                        |
| F1_EXT_LOOKUP_VAL_L     | MG             | Extendable Lookup Language               |
| F1_EXT_LOOKUP_VAL_CHAR  | MG             | Extendable Lookup Characteristics        |
| F1_IWS_ANN              | MG             | Web Service Annotation                   |

| Table Name               | Upgrade Action | Description                                    |
|--------------------------|----------------|------------------------------------------------|
| F1_IWS_ANN_L             | MG             | Web Service Annotation Language                |
| F1_IWS_ANN_PARM          | MG             | Web Service Annotation Parameter               |
| F1_IWS_ANN_TYPE          | MG             | Web Service Annotation Type                    |
| F1_IWS_ANN_TYPE_L        | MG             | Web Service Annotation Type Language           |
| F1_IWS_ANN_TYPE_PARM     | MG             | Web Service Annotation Type Parm               |
| F1_IWS_ANN_TYPE_PARM_L   | MG             | Web Service Annotation Type Parameter Language |
| F1_IWS_SVC               | MG             | Inbound Web Service                            |
| F1_IWS_SVC_L             | MG             | Inbound Web Service Language                   |
| F1_IWS_SVC_OPER          | MG             | Inbound Web Service Operations                 |
| F1_MANAG_CONTENT         | MG             | Managed Content                                |
| F1_MANAG_CONTENT_L       | MG             | Managed Content Language                       |
| F1_MAP                   | MG             | UI Map                                         |
| F1_MAP_L                 | MG             | UI Map Language                                |
| F1_MIGR_PLAN             | MG             | Migration Plan                                 |
| F1_MIGR_PLAN_INSTR       | MG             | Migration Plan Instruction                     |
| F1_MIGR_PLAN_INSTR_ALG   | MG             | Migration Plan Instruction Algorithm           |
| F1_MIGR_PLAN_INSTR_L     | MG             | Migration Plan Instruction Language            |
| F1_MIGR_PLAN_L           | MG             | Migration Plan Language                        |
| F1_MIGR_REQ              | MG             | Migration Request                              |
| F1_MIGR_REQ_INCL_REQ     | MG             | Migration Request Grouping                     |
| F1_MIGR_REQ_INSTR        | MG             | Migration Request Instruction                  |
| F1_MIGR_REQ_INSTR_ENTITY | MG             | Migration Request Instruction Entity           |
| F1_MIGR_REQ_INSTR_L      | MG             | Migration Request Instruction Language         |
| F1_MIGR_REQ_L            | MG             | Migration Request Language                     |
| F1_MOBILE_COMPONENT      | MG             | Mobile Component                               |
| F1_MOBILE_COMPONENT_L    | MG             | Mobile Component Language                      |
| F1_MOB_COMP_CHAR         | MG             | Mobile Component Characteristics               |
| F1_MOB_COMP_CNT          | MG             | Mobile Component Content                       |
| F1_OUTMSG_TYPE           | MG             | Outbound Message Type                          |
| F1_OUTMSG_TYPE_L         | MG             | Outbound Message Type Language                 |

| Table Name                 | Upgrade Action | Description                            |
|----------------------------|----------------|----------------------------------------|
| F1_PROC_DEFN               | MG             | Process Flow Type                      |
| F1_PROC_DEFN_L             | MG             | Process Flow Type Language             |
| F1_PROC_NEXT_PANEL         | MG             | Next Panel                             |
| F1_PROC_PANEL              | MG             | Process Panels                         |
| F1_SCHEMA                  | MG             | Schema                                 |
| F1_WEB_CAT                 | MG             | Web Service Category                   |
| F1_WEB_CAT_L               | MG             | Web Service Category Language          |
| F1_WEB_CAT_INCL_SVC        | MG             | Web Service Category Included Services |
| SC_ACCESS_CNTL             | MG             | User Group Access Control              |
| SC_APP_SERVICE             | MG             | Application Service                    |
| SC_APP_SERVICE_L           | MG             | Application Service Language           |
| SC_USR_GRP_PROF            | MG             | User Group Profile                     |
| CI_CURRENCY_CD             | KP             | Currency Code                          |
| CI_CURRENCY_CD_L           | KP             | Currency Code Language                 |
| CI_DISP_PROF               | KP             | Display Profile                        |
| CI_DISP_PROF_L             | KP             | Display Profile Language               |
| CI_TIME_ZONE               | KP             | Time Zone                              |
| CI_TIME_ZONE_L             | KP             | Time Zone Language                     |
| CI_USR_PORTAL              | KP             | User Portal                            |
| CI_XAI_JNDI_SVR            | KP             | XAI JNDI Server                        |
| CI_XAI_JNDI_SVR_L          | KP             | XAI JNDI Server Language               |
| CI_XAI_OPTION              | KP             | Message Option                         |
| CI_XAI_SENDER              | KP             | Message Sender                         |
| CI_XAI_SENDER_L            | KP             | Message Sender Language                |
| CI_XAI_SNDR_CTX            | KP             | Message Sender Context                 |
| F1_BUS_OBJ_STATUS_RSN_CHAR | KP             | Status Reason Characteristic           |
| F1_INSTALLATION            | KP             | Installation Option - Framework        |
| SC_USER                    | KP             | User                                   |
| SC_USER_CHAR               | KP             | User Characteristic                    |
| SC_USER_GROUP              | KP             | User Group                             |
| SC_USER_GROUP_L            | KP             | User Group Language                    |

| Table Name        | Upgrade Action | Description                               |
|-------------------|----------------|-------------------------------------------|
| SC_USR_GRP_USR    | KP             | User Group User                           |
| CI_MD_ATT_TY      | RF             | MD Element Attribute Type                 |
| CI_MD_AT_DTL      | RF             | MD Element Attribute Type Detail          |
| CI_MD_AT_DTL_L    | RF             | MD Element Attribute Type Detail Language |
| CI_MD_CTL         | RF             | Generator Control                         |
| CI_MD_CTL_L       | RF             | Generator Control Language                |
| CI_MD_CTL_TMPL    | RF             | Generator Control Template                |
| CI_MD_ELTY        | RF             | MD Element Type                           |
| CI_MD_ELTY_AT     | RF             | Element Type Attributes                   |
| CI_MD_ELTY_L      | RF             | Element Type Language                     |
| CI_MD_LOOKUP_F    | RF             | MD Lookup Field                           |
| CI_MD_MSG         | RF             | MD Message                                |
| CI_MD_MSG_L       | RF             | MD Message Language                       |
| CI_MD_PDF         | RF             | Predefined Fields                         |
| CI_MD_PDF_VAL     | RF             | Predefined Values                         |
| CI_MD_SRC_TYPE    | RF             | Source Type                               |
| CI_MD_SRC_TYPE_L  | RF             | Source Type Language                      |
| CI_MD_TMPL        | RF             | Template                                  |
| CI_MD_TMPL_ELTY   | RF             | Template Element Types                    |
| CI_MD_TMPL_L      | RF             | Template Language                         |
| CI_MD_TMPL_VAR    | RF             | Template Variable                         |
| CI_MD_TMPL_VAR_L  | RF             | Template Variable Language                |
| CI_MD_VAR         | RF             | Variable                                  |
| CI_MD_VAR_DTL     | RF             | Variable Detail                           |
| CI_MD_VAR_DTL_L   | RF             | Variable Detail Language                  |
| CI_XAI_EXECUTER   | RF             | XAI Executer                              |
| CI_XAI_EXECUTER_L | RF             | XAI Executer Language                     |
| CI_XAI_FORMAT     | RF             | XAI Format                                |
| CI_XAI_FORMAT_L   | RF             | XAI Format Language                       |
| F1_LGCY_OBJ       | RF             | Unsupported Metadata                      |