

Oracle Utilities Smart Grid Gateway

Database Administrator's Guide

Release 2.1.0 Service Pack 1

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Preface

This guide provides instructions for installing and maintaining the database for Oracle Utilities Smart Grid Gateway.

This preface contains these topics:

- [Audience](#)
- [Related Documents](#)
- [Updates to this Documentation](#)
- [Conventions](#)

Audience

Oracle Utilities Smart Grid Gateway Database Administrator's Guide is intended for database administrators who will be installing and maintaining the database for Oracle Utilities Smart Grid Gateway.

Related Documents

For more information, see these Oracle documents:

- *Oracle Utilities Smart Grid Gateway Quick Install Guide*
- *Oracle Utilities Smart Grid Gateway Installation Guide*

Updates to this Documentation

This documentation is provided with the version of the product indicated. Additional and updated information about the operations and configuration of 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.

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.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Chapter 1

Database Overview

This section provides an overview of the Oracle Utilities Smart Grid Gateway database, including:

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

Supported Database Platforms

This section defines the platforms on which Oracle Utilities Smart Grid Gateway is verified to operate.

Supported Platforms Summary Table

Oracle Utilities Smart Grid Gateway is certified on the following platforms:

Platform	Database Version
AIX 7.1 (POWER 64-bit)	Oracle Database Server 11.2.0.1+ (64-bit)
Oracle Linux 6.3 (64-bit) x86_64 (64-bit)	Oracle Database Server 11.2.0.1+ (64-bit)
Red Hat Enterprise Linux 6.3 (64-bit) x86_64 (64-bit)	Oracle Database Server 11.2.0.1+ (64-bit)
Oracle Solaris 11 (SPARC 64-bit)	Oracle Database Server 11.2.0.1+ (64-bit)
Windows Server 2008 R2 (x86_64 64-bit)	Oracle Database Server 11.2.0.1+ (64-bit)

The following Oracle Database Server Edition is supported:

- Oracle Database Enterprise Edition

Note: Oracle Database Enterprise Edition and the Partitioning and Advanced Compression options are strongly recommended in all situations.

Refer to My Oracle Support for additional details.

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 of these components is 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 (that is, 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 in this document.

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 in anyway (altered, removed or added).
 - 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

Installing the Version 2.1.0.1 Database

This section provides the instructions for installing the Oracle Utilities Smart Grid Gateway version 2.1.0.1 database. This section includes:

- [Installation Overview](#)
- [Initial Install](#)
- [Upgrade Install](#)
- [Demo Install](#)
- [Populating Language Data](#)

Installation Overview

Refer to [Supported Database Platforms](#) for information about the supported platforms on which Oracle Utilities Smart Grid Gateway is verified to operate.

The following types of installation is available for Oracle Utilities Smart Grid Gateway:

- [Initial Install](#) — a database with no demo data.
- [Upgrade Install](#) — a database upgrade from version 2.0.0.9 to version 2.1.0.1.
- [Demo Install](#) — a database populated with demo data.

Initial Install

This section describes how to install the database components of Oracle Utilities Smart Grid Gateway, including:

- [Copying and Decompressing Install Media](#)
- [Creating the Database](#)
- [Installing the CISADM Schema](#)
- [Generating Database Statistics](#)

Copying and Decompressing Install Media

To copy and decompress the Oracle Utilities Smart Grid Gateway database:

1. Download the Oracle Utilities Smart Grid Gateway v2.1.0.1.0 Oracle database from the Oracle Software Delivery Cloud for the following adapters:
 - Oracle Utilities Smart Grid Gateway Adapter Development Kit
 - Oracle Utilities Smart Grid Gateway Adapter MV-90 Adapter for Itron
 - Oracle Utilities Smart Grid Gateway Adapter for Echelon
 - Oracle Utilities Smart Grid Gateway Adapter for Itron OpenWay
 - Oracle Utilities Smart Grid Gateway Adapter for Sensus
 - Oracle Utilities Smart Grid Gateway Adapter for Landis+Gyr
 - Oracle Utilities Smart Grid Gateway Adapter for Silver Spring Networks
2. Unzip the SGG-V2.1.0.1.0-Database.zip file to a temporary folder. This file contains the database components required to install the Oracle Utilities Smart Grid Gateway database.

Creating the Database

Note: You must have Oracle Database Server 11.2.0.1 or a higher version installed on your machine in order to create the database.

The database can be created using either the Database Configuration Assistant (DBCA) or you can create a database using the database creation tool (cdxdba.plx for UNIX or CDXDBA.exe for Windows) that is packaged with the product.

Using DBCA to Create the Database

It is recommended that you use the Database Configuration Assistant (DBCA) for creating an Initial Install or production database. Once the database is created the instance configuration can be done according to the environment needs and based on your production recommendations.

The script for creating the product users is located under the relevant database version subdirectory of the DatabaseCreation directory. To create the product users:

1. You must create tablespace CISTS_01 before running the script for creating the product users.
2. To create the product users, execute the ...\\SGG\\DatabaseCreation\\Unix\\11g\\users.sql after logging into the database as sys user.

Using the CDXDBA Utility to Create the Database

The CDXDBA utility provided in the DatabaseCreation folder may be used to automate the process. For an initial install, do not import the demo install data when you create the database.

The UNIX and Windows database creation utilities create an empty database with AL32UTF8 character set and at least one tablespace for storing the application objects before running the installation. The default name of the application tablespace is CISTS_01.

- [Creating the Database on Unix](#)
- [Creating the Database on Windows](#)

Creating the Database on Unix

The files for creating the database are located in the ../SGG/DatabaseCreation/Unix directory. Follow these steps to create a database:

1. FTP the contents of the DatabaseCreation folder to a temporary directory on the UNIX server.
2. Set the ORACLE_HOME and ORACLE_BASE variables.
3. Run the utility cdxdba.plx by executing the following command:
`perl cdxdba.plx`
4. Provide the following parameter values when prompted:
 - Instance name (DEMO):
 - ORACLE_BASE: the directory where the setup files for the database will be created (/orasw/app/oracle):
 - ORACLE_HOME: the folder where the current version of Oracle software is installed (/orasw/app/oracle/product/):
 - ORACLE_DATA: the directory where the data files for the database will be created (/db05/oradata):
 - Character set for the database (AL32UTF8):

Enter the parameter values based on the settings of your database server. You can also accept the default values displayed if they match your database server settings. You will be prompted to confirm the settings and then to select Y to create the database.

```
ORACLE_SID: DEMO
ORACLE_HOME: /orasw/app/oracle/product/
ORACLE_BASE: /orasw/app/oracle
ORACLE_DATA: /db05/oradata
Character Set: AL32UTF8
Do you want to continue (Y/N)?
```

5. When the database has been created, you will be prompted with the following question: Do you want to import a demo database dump into this database (Y/N)?
Select N to exit the database utility.

Creating the Database on Windows

The files for creating the database are located in the ../SGG/DatabaseCreation/Windows directory.

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.

Follow these steps to create the database:

1. From a command prompt, run the utility CDXDBA.exe, located in the Windows folder.

The utility displays the following options:

```
E - Export a schema from the database
R - Refresh a schema with a database dump
C - Create/Recreate a local database
```


H - See help for the command line options
Q - Quit

2. Select option C to create an empty database on your machine.

Provide the following values.

- Provide the instance name (DEMO): <DB Name> For example, SGG_DB
- Enter the character set of the database (AL32UTF8): AL32UTF8
- Enter ORACLE_BASE: the directory where the setup files for the database will be created (c:\oracle): <Oracle_Base> For example, c:\app\oracle
- Enter ORACLE_HOME: the folder where the current version of Oracle software is installed (c:\oracle\product\11.1.0.6\Db_1):< Oracle_Home> For example, c:\app\oracle\db_home
- Enter ORACLE_DATA: the directory where the data files for the database will be created (c:\app\oracle\oradata): <Directory where data files will be created>

3. Select option Q to exit the utility after the database is created.

Installing the CISADM Schema

You will install the Oracle Utilities Application Framework V4.2.0 and V4.2.0 service pack 1, and then Oracle Utilities Service and Measurement Data Foundation 2.1.0.1 prior to Oracle Utilities Smart Grid Gateway 2.1.0.1. The files for Oracle Utilities Application Framework installation are located in the FW420 and FW42010 folders.

Installing Oracle Utilities Application Framework 4.2.0

To install Oracle Utilities Application Framework 4.2.0, follow these steps:

1. Run CdxDBI.exe from the ..\FW420\Install-Upgrade directory. Please run the utility from the command prompt.

Note: Be sure to run CdxDBI.exe from a Window 32-bit or 64-bit desktop that has the Oracle Database 11g Release 2 Client (11.2.0.1), 32-bit and Java Development Kit Version 6.0 Update 20 or later installed. The database should already be listed in the local file tnsnames.ora.

The utility prompts you to enter values for the following parameters:

- Name of the target database:<DB NAME>
- Name of the owner of the Database Schema:<CISADM>Name of the owner of the Database Schema:<CISADM>
- Location of Java Home: <..\jdk1.6.0_20>
- Location of TUGBU Jar files: <..\FW420\jarfiles>
- Password for the user (in silent mode)
- Oracle user with read-write privileges to the Database Schema:<CISUSER>
- Oracle user with read-only privileges to the Database Schema:<CISREAD>
- 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>

Installing Oracle Utilities Application Framework 4.2.0 service pack 1

To install Oracle Utilities Application Framework v4.2.0 service pack 1, follow these steps:

1. Run OraDBI.exe from the ..\FW42010\Install-Upgrade directory. Please run the utility from the command prompt.

Note: Be sure to run OraDBL.exe from a Windows 32-bit or 64-bit desktop that has the Oracle Database 11g Release 2 Client (11.2.0.1), 32-bit and Java Development Kit Version 6.0 Update 20 or later installed. The database should already be listed in the local file tnsnames.ora

The utility prompts you to enter values for the following parameters:

- Name of the target database: <DB NAME>
- Name of the Database User Name: <CISADM>
- Password of the User Name: <Password for CISADM>
- Location of Java Home (e.g. C:\Java\jdk1.6.0_20): <Java Home>
- Location of TUGBU Jar files (e.g. C:\FW42010\JarFiles): <..\FW42010\jarfiles>
- Oracle User with read-write privileges to the Database Schema: <CISUSER>
- Oracle User with read-only privileges to the Database Schema: <CISREAD>
- 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>
- Name of the owner of the Database Schema: <CISADM>
- Enter the password for the CISADM schema (or hit ENTER to quit): <CISADM user's password>
- Re-enter the password: <CISADM user's password>

After setting up roles and users, the utility continues upgrading schema and system data definitions. If an error occurs while executing an SQL or another utility, it logs and displays the error message and allows you to re-execute the current step.

Installing Prerequisite Database Hot Fixes

Before installing Oracle Utilities Smart Grid Gateway, you must install Oracle Utilities Framework Prerequisite database hot fixes as described below.

Apply prerequisite Framework DB single fixes. See the *Oracle Utilities Smart Grid Gateway Installation Guide* for more details.

Apply prerequisite Framework database hot fixes by running the CDXPatch.exe utility.

The utility prompts you for the value of the following parameters:

- The target database type (O/M/D) [O]: O
- The name of the user that owns the database objects: <CISADM>
- The password for the user (in silent mode): <Password for CISADM user>
- The name of the Oracle database: <DB Name>

CDXPatch.exe can be executed by selecting it from Windows explorer, or by using a command line from a DOS window. Use the option “-h” to see the help.

After the patches are processed, if the utility prompts you to create security for new objects, enter “N” because security for new objects is generated in subsequent steps during installation of Oracle Utilities Smart Grid Gateway Base.

Installing Oracle Utilities Service and Measurement Data Foundation Database Component

Before installing Oracle Utilities Smart Grid Gateway, you must install Oracle Utilities Service and Measurement Data Foundation. The following procedure described below to install the database component of Oracle Utilities Service and Measurement Data Foundation database.

1. Run OraDBI.exe from the ..\SMDF\Install-Upgrade directory. The utility prompts you to enter values for the following parameters:
 - Name of the target database: <DB NAME>
 - Name of the Database User Name: <CISADM>
 - Password of the User Name: <Password for CISADM>
 - Location of Java Home (e.g. C:\Java\jdk1.6.0_20): <Java Home>
 - Location of TUGBU Jar files (e.g. C:\FW42010\JarFiles): <..\FW42010\jarfiles>
 - Oracle User with read-write privileges to the Database Schema: <CISUSER>
 - Oracle User with read-only privileges to the Database Schema: <CISREAD>
 - 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>
 - Name of the owner of the Database Schema: <CISADM>
 - Enter the password for the CISADM schema (or hit ENTER to quit): <CISADM user's password>
 - Re-enter the password: <CISADM user's password>

Installing Prerequisite Database Hot Fixes

Before installing Oracle Utilities Smart Grid Gateway, you must install Oracle Utilities Service and Measurement Data Foundation Prerequisite database hot fixes as described below.

Apply prerequisite Service and Measurement Data Foundation DB single fixes. See the *Oracle Utilities Smart Grid Gateway Installation Guide* for more details.

The utility prompts you for the value of the following parameters:

- The target database type (O/M/D) [O]: O
- The name of the user that owns the database objects: <CISADM>
- The password for the user (in silent mode): <Password for CISADM user>
- The name of the Oracle database: <DB Name>

CDXPatch.exe can be executed by selecting it from Windows explorer, or by using a command line from a DOS window. Use the option "-h" to see the help.

After the patches are processed, if the utility prompts you to create security for new objects, enter "N" because security for new objects is generated in subsequent steps during installation of Oracle Utilities Smart Grid Gateway.

Installing Oracle Utilities Smart Grid Gateway Database Component

Follow the procedure below to install the database component of Oracle Utilities Smart Grid Gateway.

1. Run OraDBI.exe from the ..\SGG\Install-Upgrade directory. The utility prompts you to enter values for the following parameters:
 - Name of the target database: <DB NAME>
 - Name of the Database User Name: <CISADM>
 - Password of the User Name: <Password for CISADM>
 - Location of Java Home (e.g. C:\Java\jdk1.6.0_20): <Java Home>
 - Location of TUGBU Jar files (e.g. C:\FW42010\JarFiles): <..\FW42010\jarfiles>
 - Oracle User with read-write privileges to the Database Schema: <CISUSER>

- Oracle User with read-only privileges to the Database Schema: <CISREAD>
- 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>
- Name of the owner of the Database Schema: <CISADM>
- Enter the password for the CISADM schema (or hit ENTER to quit): <CISADM user's password>
- Re-enter the password: <CISADM user's password>

If you chose to continue, OraDBI first checks for the existence of each of the users specified and prompts for their password, default tablespace, and temporary tablespace.

After setting up roles and users, the utility continues upgrading schema and system data definitions. If an error occurs while executing an SQL or another utility, it logs and displays the error message and allows you to re-execute the current step.

OraDBI Performs the Following Tasks

- 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, 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).
- Connects to the database as CISADM account, checks whether the user already has the application schema installed to verify whether this is an initial installation.
- 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 necessary mean a problem exists.
- Stores the Schema owner and password in the feature configuration table. The password is stored in encrypted format.

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.

Upgrade Install

This section describes how to upgrade the database components of Oracle Utilities Smart Grid Gateway, including:

- [Supported Upgrade Path](#)
- [Copying and Decompressing Install Media](#)
- [Installing the CISADM Schema](#)
- [Performing Post Installation Tasks](#)

Supported Upgrade Path

Direct upgrade to Oracle Utilities Smart Grid Gateway v2.1.0.1 is not supported for the following Smart Grid Gateway Adapters:

- Oracle Utilities Smart Grid Gateway Adapter for Echelon
- Oracle Utilities Smart Grid Gateway Adapter for Sensus

Direct upgrade to Oracle Utilities Smart Grid Gateway v2.1.0.1 is supported from the following versions:

- Oracle Utilities Smart Grid Gateway v2.0.0.9

Copying and Decompressing Install Media

To copy and decompress the Oracle Utilities Smart Grid Gateway database:

1. Download the Oracle Utilities Smart Grid Gateway v2.1.0.1.0 Oracle database from the Oracle Software Delivery Cloud.
2. Unzip the SGG-V2.1.0.1.0-Database.zip file to a temporary folder. This file contains the database components required to install the Oracle Utilities Smart Grid Gateway database.

Installing the CISADM Schema

Please back up your database before carrying out the upgrade process.

You will install the Oracle Utilities Application Framework V4.2.0 service pack 1, and then Oracle Utilities Service and Measurement Data Foundation 2.1.0.1 prior to Oracle Utilities Smart Grid Gateway. The files for Oracle Utilities Application Framework installation are located in the FW42010 folder. The installation process prompts you for the following information:

- A database user that will own the application schema (for example, CISADM).
- A database user that has read-write (select/update/insert/delete) privileges to the objects in the application schema. The application will access the database as this user. (for example, CISUSER).
- A database user with read-only privileges to the objects in the application schema. (for example, CISREAD).
- A database role that has read-write (select/update/insert/delete) privileges to the objects in the application schema (for example, CIS_USER).
- A database role with read-only privileges to the objects in the application schema (for example, CIS_READ)
- Location of the jar files (The jar files are bundled with the database package)
- Java Home (For example, C:\Java\jdk1.6.0_20)

Installing the Oracle Utilities Application Framework 4.2.0 Service Pack 1 Data-

base Component

To upgrade the Oracle Utilities Application Framework to v4.2.0.1, follow these steps:

1. Run OraDBL.exe from the ..\FW42010\Install-Upgrade directory. Please run the utility from the command prompt.

Note: Be sure to run OraDBL.exe from a Window 32-bit or 64-bit desktop that has the Oracle Database 11g Release 2 Client (11.2.0.1), 32-bit and Java Development Kit Version 6.0 Update 20 or later installed. The database should already be listed in the local file tnsnames.ora

The utility prompts you to enter values for the following parameters:

- Name of the target database: <DB NAME>
- Name of the Database User Name: <CISADM>
- Password of the User Name: <Password for CISADM>
- Location of Java Home (e.g. C:\Java\jdk1.6.0_20): <Java Home>
- Location of TUGBU Jar files (e.g. C:\Database-Install\JarFiles): <.. \FW42010\jarfiles>
- Oracle User with read-write privileges to the Database Schema: <CISUSER>
- Oracle User with read-only privileges to the Database Schema: <CISREAD>
- 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>
- Name of the owner of the Database Schema: <CISADM>
- Enter the password for the CISADM schema (or hit ENTER to quit): <CISADM user's password>
- Re-enter the password: <CISADM user's password>

After setting up roles and users, the utility continues upgrading schema and system data definitions. If an error occurs while executing an SQL or another utility, it logs and displays the error message and allows you to re-execute the current step.

Installing Prerequisite Database Hot Fixes

Before installing Oracle Utilities Smart Grid Gateway, you must install Oracle Utilities Framework Prerequisite database hot fixes as described below.

Apply prerequisite Framework database hot fixes by running the CDXPatch.exe utility from the ..DB\FW-V4.2.0.1.0-hotfixes\ORACLE directory.

Apply prerequisite Framework DB single fixes. See the *Oracle Utilities Smart Grid Gateway Installation Guide* for more details.

The utility prompts you for the value of the following parameters:

- The target database type (O/M/D) [O]: O
- The name of the user that owns the database objects: <CISADM>
- The password for the user (in silent mode): <Password for CISADM user>
- The name of the Oracle database: <DB Name>

CDXPatch.exe can be executed by selecting it from Windows explorer, or by using a command line from a DOS window. Use the option “-h” to see the help.

After the patches are processed, if the utility prompts you to create security for new objects, enter “N” because security for new objects is generated in subsequent steps during installation of Oracle Utilities Smart Grid Gateway.

Installing Oracle Utilities Service and Measurement Data Foundation Database Component

The follow the procedure described below to install the database component of Service and Measurement Data Foundation database.

1. Run OraDBI.exe from the ..\SMDF\Install-Upgrade directory. The utility prompts you to enter values for the following parameters:
 - Name of the target database: <DB NAME>
 - Name of the Database User Name: <CISADM>
 - Password of the User Name: <Password for CISADM>
 - Location of Java Home (e.g. C:\Java\jdk1.6.0_20): <Java Home>
 - Location of TUGBU Jar files (e.g. C:\FW42010\JarFiles): <..\FW42010\jarfiles>
 - Oracle User with read-write privileges to the Database Schema: <CISUSER>
 - Oracle User with read-only privileges to the Database Schema: <CISREAD>
 - 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>
 - Name of the owner of the Database Schema: <CISADM>
 - Enter the password for the CISADM schema (or hit ENTER to quit): <CISADM user's password>
 - Re-enter the password: <CISADM user's password>

Installing Prerequisite Database Hot Fixes

Before installing Oracle Utilities Smart Grid Gateway, you must install Oracle Utilities Service and Measurement Data Foundation Prerequisite database hot fixes as described below.

Apply prerequisite Service and Measurement Data Foundation DB single fixes. See the *Oracle Utilities Smart Grid Gateway Installation Guide* for more details.

The utility prompts you for the value of the following parameters:

- The target database type (O/M/D) [O]: O
- The name of the user that owns the database objects: <CISADM>
- The password for the user (in silent mode): <Password for CISADM user>
- The name of the Oracle database: <DB Name>

CDXPatch.exe can be executed by selecting it from Windows explorer, or by using a command line from a DOS window. Use the option "-h" to see the help.

After the patches are processed, if the utility prompts you to create security for new objects, enter "N" because security for new objects is generated in subsequent steps during installation of Oracle Utilities Smart Grid Gateway.

Installing Oracle Utilities Smart Grid Gateway Database Component

Follow the procedure below to install the database component of Oracle Utilities Smart Grid Gateway.

1. Run OraDBI.exe from the ..\SGG\Install-Upgrade directory. The utility prompts you to enter values for the following parameters:
 - Name of the target database: <DB NAME>
 - Name of the Database User Name: <CISADM>
 - Password of the User Name: <Password for CISADM>

- Location of Java Home (e.g. C:\Java\jdk1.6.0_20): <Java Home>
- Location of TUGBU Jar files (e.g. C:\FW42010\JarFiles): <.\FW42010\jarfiles>
- Oracle User with read-write privileges to the Database Schema: <CISUSER>
- Oracle User with read-only privileges to the Database Schema: <CISREAD>
- 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>
- Name of the owner of the Database Schema: <CISADM>
- Enter the password for the CISADM schema (or hit ENTER to quit): <CISADM user's password>
- Re-enter the password: <CISADM user's password>

If you chose to continue, OraDBI first checks for the existence of each of the users specified and prompts for their password, default tablespace, and temporary tablespace.

After setting up roles and users, the utility continues upgrading schema and system data definitions. If an error occurs while executing an SQL or another utility, it logs and displays the error message and allows you to re-execute the current step.

OraDBI performs the following tasks:

- 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 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).
- Connects to the database as CISADM account, checks whether the user already has the application schema installed to verify whether this is an initial installation.
- Verifies whether the upgrade path from the current release id to the target release id is supported by the upgrade.
- Verifies whether the tablespace names already exist in Storage.xml file (the process aborts, if not).
- Upgrades the schema, upgrades 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 necessary mean a problem exists.
- Stores the Schema owner and password in feature configuration table. The password will be stored in encrypted format.

Performing Post Installation Tasks

Populating Language Data

Please note that this database contains data in the ENGLISH language only. If you use any other supported language, you can run the F1-LANG batch program to duplicate the entries for new

language records. For more information on running this batch program, refer to the user documentation section “Defining Background Processes.”

Database Statistics Generation

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 using the DBMS_STATS package.

Demo Install

This section describes how to install the demo database components for Oracle Utilities Smart Grid Gateway, including:

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

Copying and Decompressing Install Media

To copy and decompress the Oracle Utilities Smart Grid Gateway database:

1. Download the Oracle Utilities Smart Grid Gateway v2.1.0.1.0 Oracle database from the Oracle Software Delivery Cloud for the following adapters:
 - Oracle Utilities Smart Grid Gateway Adapter Development Kit
 - Oracle Utilities Smart Grid Gateway Adapter for Echelon
 - Oracle Utilities Smart Grid Gateway Adapter for Itron OpenWay
 - Oracle Utilities Smart Grid Gateway Adapter for Landis+Gyr
 - Oracle Utilities Smart Grid Gateway Adapter for Sensus
 - Oracle Utilities Smart Grid Gateway Adapter for Silver Spring Networks
 - Oracle Utilities Smart Grid Gateway Adapter MV-90 Adapter for Itron
2. Unzip the SGG Database MultiPlatform.zip file to a temporary folder. This file contains the database components required to install the Oracle Utilities Smart Grid Gateway database.

Creating the Database and Importing Dump File

You can use the database creation tool (cdxdba.plx for UNIX or CDXDBA.exe for Windows) to create the demo database with AL32UTF8 character set.

The UNIX and Windows database creation utilities create an empty database with AL32UTF8 character set and at least one tablespace for storing the application objects before running the installation. The default name of the application tablespace is CISTS_01.

- [Creating the Demo Database on Unix](#)
- [Creating the Demo Database on Windows](#)

Creating the Demo Database on Unix

The files for creating the database are located in ../SGG/DatabaseCreation/Unix directory.

Follow these steps to create a database:

1. FTP the contents of the Database Creation folder to a temporary directory on the UNIX server.
2. Set the ORACLE_HOME and ORACLE_BASE variables.
3. Run the utility cdxdba.plx by executing the following command:

```
perl cdxdba.plx
```
4. When prompted, provide the following parameter values:
 - Instance name (DEMO):
 - ORACLE_BASE: the directory where the setup files for the database will be created (/orasw/app/oracle):

- ORACLE_HOME: the folder where the current version of Oracle software is installed (/orasw/app/oracle/product/):
- ORACLE_DATA: the directory where the data files for the database will be created (/db05/oradata):
- Character set for the database (AL32UTF8):

Enter the parameter values based on the settings of your database server. You can also accept the default values displayed if they match your database server settings. You will be prompted to confirm the settings and then to select Y or N to create the database.

```
ORACLE_SID: DEMO
ORACLE_HOME: /orasw/app/oracle/product/
ORACLE_BASE: /orasw/app/oracle
ORACLE_DATA: /db05/oradata
Character Set: AL32UTF8
Do you want to continue (Y/N)?
```

5. When the database has been created, you will be prompted with the following questions:

```
Do you want to import a demo database dump into this database (Y/N)?
```

Select Y to import the Demo Install data.

For the demo installation use the dump file exp_demo.dmp.

Note: The data_pump_dir must exist in the database created above before continuing with the import. You should also copy the exp_demo.dmp file to the data_pump_dir. Decompress the exp_demo.dmp.gz file first to extract the exp_demo.dmp file. This file is in ..\SGG\Demo directory.

```
Do you want to import a demo database dump into this database (Y/N)? Y
```

```
Enter the name of the dump file (exp_demo.dmp):
Enter the name of the dump file directory (data_pump_dir):
Enter the name of the log file (exp_demo.log):
```

6. Update the oratab file for the new database and then check the connectivity to this database from another server and from your desktop after updating local tnsnames.ora file.

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

1. Set the correct ORACLE_SID and ORACLE_HOME.
2. Run following command to import demo dump:

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

Creating the Demo Database on Windows

The files for creating the database are located in the ..\SGG\DatabaseCreation\Windows directory.

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.

Follow these steps to create the database:

1. From a command prompt, run the utility CDXDBA.exe, located in the Windows folder.

The utility displays the following options:

```
E - Export a schema from the database
R - Refresh a schema with a database dump
```

C - Create/Recreate a local database
H - See help for the command line options
Q - Quit

2. Select option C to create an empty database on your machine.

Provide the following values:

- Provide the instance name (DEMO): <DB Name> For example, SGG_DB
- Enter the character set of the database (AL32UTF8): AL32UTF8
- Enter ORACLE_BASE: the directory where the setup files for the database will be created (c:\oracle): <Oracle_Base> For example, c:\app\oracle
- Enter ORACLE_HOME: the folder where the current version of Oracle software is installed (c:\oracle\product\11.1.0.6\Db_1):< Oracle_Home> For example, c:\app\oracle\db_home
- Enter ORACLE_DATA: the directory where the data files for the database will be created (c:\app\oracle\oradata): <Directory where data files will be created>

3. Once the database has been created, select the R - Refresh a schema option with a database dump file to load the Demo Install data.

- Select an option: R
- Enter the instance name (DEMO): <DB name>
- Is it a LOCAL database (exists on the same machine) (Y/N): <Please provide Y or N>
- Enter the name of the Oracle account that owns that application schema (cisadm): CISADM
- Enter password for CISADM (cisadm): CISADM
- Enter the character set of the database (AL32UTF8): AL32UTF8
- Enter the name of data pump directory (DATA_PUMP_DIR): DATA_PUMP_DIR
- Enter the name of the dump file (exp_demo.dmp):exp_demo.dmp
- Enter the name of the log file (imp_demo.log):exp_demo.log

For the DB user **system**, the password is **manager**. Option R causes the utility to drop all the objects from the schema and import the schema from a database dump file. For the Demo Installation, use the dump file exp_demo.dmp.

Note: The data_pump_dir must exist in the database created above before continuing with the import. You should also copy the exp_demo.dmp file to the data_pump_dir. Decompress the exp_demo.dmp.gz file to extract the exp_demo.dmp file. This file is in the ..\SGG\Demo directory.

Check the connectivity to this database from another server and from your desktop after updating local tnsnames.ora file

Configuring Security

The configuration utility and scripts are located in the ..\SGG\Security folder. To configure security, follow these steps to execute the OraGenSec.bat utility:

Note: Database vault must be disabled before running.

1. Navigate to the ..\SGG\Security folder.

2. Edit the OraGenSec.bat file and replace the parameter *database-name* with the name of your database. This file is provided for your convenience and executes the Oragensec.exe utility based on the parameters passed into it.

Note: Be sure to run OraGenSec.bat from a Windows 32-bit desktop that has the Oracle 11.2.0.1 client installed. Your database should already be listed in the local file tnsnames.ora.

The script will execute as the following:

```
oragensec -d CISADM,CISADM,database-name -r  
CIS_READ,CIS_USER -a A -u  
CISUSER,CISREAD
```

3. Execute the edited OraGenSec.bat file.

The utility configures security for the CISADM schema objects

Populating Language Data

Please note that this database contains data in the ENGLISH language only. If you use any other supported language, you can run the F1-LANG batch program to duplicate the entries for new language records. For more information on running this batch program, refer to the user documentation section “Defining Background Processes.”

You can also install the language specific demo data packages (if available) into the database. Please contact your Oracle representative to receive information on these packages

Chapter 3

Database Design

This section provides a standard for database objects such as tables, columns, and indexes, for products using the Oracle Utilities Application Framework. This standard helps 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 section includes:

- [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. See “Indexes” on page 3 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. 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. Prior to Version 4.1.0 of the framework the leading character of the base Owner Flag was used. From 4.1.0 on the first two characters of product's owner flag value should be used. For client specific implementation of index, use CM for Owner Flag.
- 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.

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, Framework its F1. Other examples are W1, W2 etc.
- 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_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
```

- OF stands for Owner Flag. For example, the framework is F1. Other examples are W1, W2, etc.
- 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

- OF stands for Owner Flag. For example, the framework is F1. Other examples are W1, W2 etc.

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

Oracle Utilities Application Framework 4.1.0 Group Fix 2 and later versions support 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 added to FW410 Group Fix 2 fixes the metadata to make sure that the existing tables will not be affected.

This new feature only supports tables maintained by Java. 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 COBOL.

XML Type Support

Oracle Utilities Application Framework v4.2.0.0.0 onwards 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.

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 irrespective of the language used (COBOL or JAVA).

Chapter 4

Database Implementation Guidelines

The following section outlines the general implementation guidelines for the database components, including:

- [Configuration Guidelines](#)

Note: Refer to My Oracle Support for more information.

See [Appendix C: Partitioning Recommendations for Oracle Utilities Smart Grid Gateway](#) for additional information about configuring the Oracle Utilities Smart Grid Gateway database.

Configuration Guidelines

This section includes 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

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.

In an Oracle Utilities Application Framework environment, always make sure that the optimization parameters are set as follows:

```
optimizer_index_cost_adj=1  
optimizer_index_caching=100
```

This will make sure that the optimizer gives a higher priority to index scans.

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 the Final Measurement table (D1_MSRMT), keep the current table partition uncompressed. All of the older partitions will be compressed based on QUERY HIGH compression.
- For the Initial Measurement Data table (D1_INIT_MSMRT_DATA), always keep CLOBs in securefile and medium compressed. 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.

Database Vault Recommendations

We support Database Vault from the Oracle Utilities Application Framework 4.1.0. 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. Configuration is also supported beginning with the Oracle Utilities Application Framework 4.1.0 patch application with Database Vault.

Oracle Fuzzy Search Support

Oracle Utilities Application Framework version 4.2.0.0.0 onwards 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
/
```

Information Lifecycle Management Support

Oracle Utilities Application Framework version 4.2.0.0.0 onwards supports Information Lifecycle Management (ILM). ILM provides policies, processes, practices, and tools to align the business value of information with the most appropriate and cost effective IT infrastructure from the time information is conceived through its final disposition. Implementing ILM also helps in data archiving once data is managed effectively.

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 ensure that the “COMPRESS” flag is turned on by setting it to “Y” in Storage.xml.

See “Database Syntax” on page 5 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=3000
db_writer_processes=10
optimizer_index_cost_adj=1
optimizer_index_caching=100
db_files=1024
dbwr_io_slaves=10 (Only if Asynchronous IO is not Supported)
sessions=4500
memory_target=0
memory_max_target=0
sec_case_sensitive_logon=FALSE
processes=3000
dml_locks=48600
_b_tree_bitmap_plans=FALSE
```

Appendix A

Upgrades to the Oracle Utilities Application Framework Database

This document describes the database upgrade process for the Oracle Utilities Application Framework database from V4.1.0 Service Pack 1 to V4.2.0. 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 V4.2.0 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 document. The tasks that need to be performed after running the upgrade scripts are included.

The added functionality of V4.2.0 is not the scope of this documentation. The upgrade scripts do not turn on the newly added functionality by default. For new functionality, refer the V4.2.0 User Guides. In the last section of this document you will find a list of the new tables that are added in V4.2.0.

Automatic Data Upgrade

This section describes what the upgrade script will populate in new tables and columns to preserve the existing base product application functions of the previous version of Oracle Utilities Application Framework.

Nullable column support

Nullable columns are supported from Oracle Utilities Application Framework version 410 onwards. This means that the Oracle Utilities Application Framework writes NULLs instead of a blank space or zero (for numeric columns). NULLABLE_SW (which already exists) on CI_MD_TBL_FLD is used for achieving this. If the REQUIRED_SW is 'N' and the NULLABLE_SW is 'Y' then the framework writes a NULL in that column. The artifact generator creates hibernate mapping files with appropriate parameters so that the OUAF hibernate mapping types knows whether a given property supports null value or not.

NULLABLE_SW has existed for a while, but has only been actually read and used for certain fields (dates, and some string and number foreign-key columns). This means that there is the possibility that there is incorrect meta-data for some columns, and that turning on this new feature that uses the suspect meta-data could result in incorrect behavior. As a part of upgrade script all existing metadata will be fixed which will make sure that the existing tables are not affected with this change.

This new feature of allowing null values to be stored on table columns is only supported by Java maintained tables. Thus, enhancing any existing tables to use null columns must take place after ensuring that the tables are maintained directly by Java, and not COBOL code.

Date Time format for ext sys outbound msg type

To support different date time format for external system outbound, a new column date time format (DTTM_FORMAT_FLG) is added to the External System Outbound Message Type (F1_EXTSYS_OUTMSG_PROF) Table. The allowed values are F1OU and F1XS. The date time format (DTTM_FORMAT_FLG) is populated as 'F1OU' (OUAF format) wherever it is not populated as a part of the upgrade process.

Add char values to product owned char types

To support CM to add char values to product owned characteristic types, a new column custom switch (CUSTOM_SW) is added to char type (CI_CHAR_TYPE) table. The allowed values are customizable ('Y') and non-customizable ('N'). As a part of upgrade process, CUSTOM_SW is set as 'N' where this column is not populated.

Database Health Check

A database health utility has been introduced from Oracle Utilities Application Framework 4.2.0 onwards. This feature is shipped with Oracle Enterprise Manager. To support this feature, a new table named F1_DB_OBJECTS_REPO is introduced which stores metadata information which is not stored explicitly in the pre-existing tables. An upgrade script added in FW 420 adds the metadata information about indexes, sequences and triggers added by the customers into the F1_DB_OBJECTS_REPO table.

Table Classification Flags

Two new fields are added to CI_MD_TBL to make the classification of tables explicit. The first field is the table classification flag (TBL_CLASSIFICATION_FLG) and the second is the table volume flag (TBL_VOLUME_FLG). The valid values for the table classification flag are *Admin System Table* (F1AS), *Admin Non System Table* (F1AN), *Master Table* (F1MT), *Transaction Table* (F1TT) and *Unclassified* (F1UC). The valid values for the table Volume flag (which can be modified by the customer) are *Low Volume* (F1LV), *Medium Volume* (F1MV), *High Volume* (F1HV) and *Unclassified*

(F1UC). The user interface and the metadata for these columns are also added. As a part of the upgrade script initial values are populated in these columns.

Schema Change

New Tables

The following new tables are added to Oracle Utilities Application Framework V4.2.0.

Tables	Description
F1_MIGR_DATA_ST	Migration Data Set
F1_MIGR_DATA_ST_ALG	Migration Data Set Algorithm
F1_MIGR_DATA_ST_K	Migration Data Set Key
F1_MIGR_DATA_ST_LOG	Migration Data Set Log
F1_MIGR_DATA_ST_LOG_PARM	Migration Data Set Log Parameter
F1_MIGR_DATA_ST_TBL	Migration Data Set Table
F1_MIGR_OBJ	Migration Object
F1_MIGR_OBJ_ALG	Migration Object Algorithm
F1_MIGR_OBJ_CLOB	Migration Object CLOB
F1_MIGR_OBJ_K	Migration Object Key
F1_MIGR_OBJ_LOG	Migration Object Log
F1_MIGR_OBJ_LOG_PARM	Migration Object Log Parameter
F1_MIGR_OBJ_SQL	Migration Object SQL
F1_MIGR_PLAN	Migration Plan
F1_MIGR_PLAN_INSTR	Migration Plan Instruction
F1_MIGR_PLAN_INSTR_ALG	Migration Plan Instruction Algorithm
F1_MIGR_PLAN_INSTR_L	Migration Plan Instruction Language
F1_MIGR_PLAN_L	Migration Plan Language
F1_MIGR_REQ	Migration Request
F1_MIGR_REQ_INSTR	Migration Request Instruction
F1_MIGR_REQ_INSTR_ENTITY	Migration Request Instruction Entity
F1_MIGR_REQ_INSTR_L	Migration Request Instruction Language
F1_MIGR_REQ_L	Migration Request Language
F1_MIGR_TRANS	Migration Transaction
F1_MIGR_TRANS_K	Migration Transaction Key
F1_MIGR_TRANS_LOG	Migration Transaction Log
F1_MIGR_TRANS_LOG_PARM	Migration Transaction Log Parameter

Tables	Description
F1_MIGR_DATA_ST	Migration Data Set
F1_MIGR_DATA_ST_ALG	Migration Data Set Algorithm
F1_MIGR_DATA_ST_K	Migration Data Set Key
F1_MIGR_DATA_ST_LOG	Migration Data Set Log

New Views

View	Description
F1_ATTACHMENT_VW	Attachment View

Dropped Tables

The following tables are dropped in this release.

- CI_MD_LOOKUP

Unsupported Tables

None

Added Columns

The following table columns are added to Oracle Utilities Application Framework V4.2.0.

Table	Column	Required	Upgrade Note
CI_MD_MENU_IT EM	ACCESS_MODE	N	
CI_MD_MENU_IT EM	APP_SVC_ID	N	
CI_USR_ZONE	ZONE_DATA_AR EA	N	

Dropped Columns

None

Unsupported Table Columns

None

Column Format Change

Table Name	Column Name	From	To
CI_ARC_ROOT_PK	FIELD_VAL	VARCHAR2:50	VARCHAR2:254
CI_DATA_DIFF	DATA_DIFF_INFO	VARCHAR2:200	VARCHAR2:512
CI_DATA_DIFF_PK	FIELD_VAL	VARCHAR2:50	VARCHAR2:254
CI_ROOT_OBJ_PK	FIELD_VAL	VARCHAR2:50	VARCHAR2:254

New System Data

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

Algorithm Type

The following algorithm types are new to V4.2.0.

Algorithm Type	Description
F1-MGDEXPCMB	Migration Data Set Export - Combine Transactions
F1-MGDEXPSET	Migration Data Set Export - Set Up Data
F1-MGDEXPWRF	Migration Data Set Export - Write File
F1-MGDIMPAPP	Migration Data Set Import - Apply Changes
F1-MGDIMPCMP	Migration Data Set Import - Comparing Objects
F1-MGDIMPR2C	Migration Data Set Import - Ready to Compare
F1-MGDIMPRDY	Migration Data Set Import - Ready to Apply
F1-MGOEXPADT	Migration Object Export - Add Table Data
F1-MGOGENSQL	Generate SQLs for the migration object
F1-MGOIMPAPP	Migration Object Import - Apply Changes
F1-MGOIMPNRV	Migration Object Import - Needs Review
F1-MGPINFO	Migration Plan Information
F1-MGTCMP	Compare migration objects in the transaction

Algorithm Type	Description
F1-MGTEXPADO	Migration Transaction Export - Add Objects
F1-MGTIMPAPP	Migration Transaction Import - Apply Changes
F1-MIGDEXP	Migration Data Set Export Information Algorithm Type

Algorithm

The following Algorithms are Framework Owned system data in V4.2.0.

Algorithm	Description
F1-MGDEXPCMB	Migration Data Set Export - Combine Transactions
F1-MGDEXPSET	Migration Data Set Export - Set Up Data
F1-MGDEXPWRF	Migration Data Set Export - Write File
F1-MGDIMPAPP	Migration Data Set Import - Apply Changes
F1-MGDIMPCMP	Migration Data Set Import - Comparing Objects
F1-MGDIMPR2C	Migration Data Set Import - Ready to Compare
F1-MGDIMPRDY	Migration Data Set Import - Ready to Apply
F1-MGOEXPADT	Migration Object Export - Add Table Data
F1-MGOGENSQL	Generate SQLs for the migration object
F1-MGOIMPAPP	Migration Object Import - Apply Changes
F1-MGOIMPNRV	Migration Object Import - Needs Review
F1-MGPINFO	Migration Plan Information
F1-MGTCMP	Compare migration objects in the transaction
F1-MGTEXPADO	Migration Transaction Export - Add Objects
F1-MGTIMPAPP	Migration Transaction Import - Apply Changes
F1-MIGDEXP	Migration Data Set Export Information Algorithm

Application Service

The following Application Services are new to V4.2.0.

Application Service	Description
F1-MIGROBJBOAS	Migration Object Export BO
F1-MIGROBJIMP	Migration Object Import BO
F1-MIGRTXBOAS	Migration Transaction Export BO
F1BTCLSP	Batch Cluster
F1CLTHDP	Batch Cluster Thread Details
F1CLUSTP	Batch Cluster
F1MGDEXP	Migration Data Set Export
F1MGDEXS	Migration Data Set Export Query
F1MGDIMP	Migration Data Set Import
F1MGDIMS	Migration Data Set Import Query
F1MGOIMP	Migration Object Import
F1MGPLNM	Migration Plan
F1MGPLNS	Migration Plan Query
F1MGREQM	Migration Request
F1MGREQS	Migration Request Query
F1MIGRDEXP	Migration Data Set Export BO
F1MIGRDIMP	Migration Data Set Import BO
F1MIGRDS	Migration Data Set MO
F1MIGROBJ	Migration Object MO
F1MIGRPLAN	Migration Plan MO
F1MIGRREQ	Migration Request MO
F1MIGRTIMP	Migration Transaction Import BO
F1MIGRTX	Migration Transaction MO
F1MTXIMP	Migration Transaction Import

Batch Control

The following Batch Controls are new to V4.2.0.

Batch Control	Description
F1-MGDPR	Migration Data Set Monitor

Business Object

The following Business Objects are Framework Owned system data in V4.2.0.

Business Object	Description
F1-AccessGroupPhysicalBO	Physical BO for Access Group
F1-CountryPhysicalBO	Physical BO for Country
F1-CurrencyCodePhysicalBO	Physical BO for a Currency Code
F1-DataAccessSCPhysicalBO	Physical BO for Data Access Role-no users
F1-DisplayProfilePhysicalBO	Physical BO for Display Profile
F1-GenericAttachment	Generic attachment - schema only
F1-GeographicTypePhysicalBO	Physical BO for Geographic Type
F1-InstallAlgorithmPhysicalBO	Physical BO for Installation Algorithm
F1-MigrDataSetExport	Migration Data Set Export
F1-MigrDataSetImport	Migration Data Set Import
F1-MigrObjectExport	Migration Object Export
F1-MigrObjectImport	Migration Object Import
F1-MigrPlan	Migration Plan
F1-MigrPlanBundlingAddBO	Physical BO for Migration Plan
F1-MigrPlanPhysicalBO	Physical BO for Migration Plan
F1-MigrReq	Migration Request
F1-MigrRequestPhysicalBO	Physical BO for Migration Request
F1-MigrTransactionExport	Migration Transaction Export
F1-MigrTransactionImport	Migration Transaction Import
F1-MigrationAssistantConfig	Migration Assistant Configuration
F1-PhoneTypePhysicalBO	Physical BO for Phone Type
F1-ReportPhysicalBO	Physical BO for Report
F1-SchemaNodes	Graphical Schema Editor Control
F1-TimeZonePhysicalBO	Physical BO for Time Zone
F1-ToDoRoleSCPhysicalBO	Physical BO for To-Do Role SC (no users)
F1-ToDoTypePhysicalBO	Physical BO for To Do Type
F1-UserGroupPhysicalBO	Physical BO for User Group
F1-UserPhysicalBO	Physical BO for User
F1-UserSCPhysicalBO	Physical BO for User-SC (no user groups)
F1-WorkCalendarPhysicalBO	Physical BO for Work Calendar

FK Reference

The following FK References are new to V4.2.0.

FK Reference	Description
F1-BOMO	Business Object
F1-CNSTR	Constraint
F1-MGDEX	Migration Data Set Export
F1-MGDIM	Migration Data Set Import
F1-MGPLN	Migration Plan
F1-MGREQ	Migration Request
F1-MGTIM	Migration Transaction Import
F1-MOFLD	MO Field
F1DATAC	Data Access Role
F1GEOTYP	Geographic Type
F1INSALG	Installation Algorithm
F1USRINF	User Id Info

Lookups

The following Lookups are added to Oracle Utilities Application Framework V4.2.0.

Lookup Field Name	Field Value	Language	Description
ACCESS_MODE	F1MA	ENG	Migration Approved
ACCESS_MODE	F1MC	ENG	Migration Cancel Apply
ACCESS_MODE	F1MI	ENG	Migration Cannot Apply
ACCESS_MODE	F1MN	ENG	Migration Needs Review
ACCESS_MODE	F1MR	ENG	Migration Rejected
ALG_ENTTTY_FLG	F1M1	ENG	Migration - Export
ALG_ENTTTY_FLG	F1M2	ENG	Migration - Import
ALG_ENTTTY_FLG	F1MS	ENG	Migration - Select
ALG_PROC_TYPE_FLG	F1M1	ENG	Export

Lookup Field Name	Field Value	Language	Description
ALG_PROC_TYPE_FLG	F1M2	ENG	Import
BO_TR_COND_FLG	F1NR	ENG	Needs Review
CHAR_ENTTTY_FLG	F1MD	ENG	Migration Data Set Log
CHAR_ENTTTY_FLG	F1MO	ENG	Migration Object Log
CHAR_ENTTTY_FLG	F1MT	ENG	Migration Transaction Log
DATA_TYPE_FLG	XML	ENG	XML Type
DML_STMT_TYPE_FLG	F1DL	ENG	Delete
DML_STMT_TYPE_FLG	F1IN	ENG	Insert
DML_STMT_TYPE_FLG	F1UP	ENG	Update
ENV_TYPE_FLG	CUST	ENG	Custom SOAP Envelope
F1AW_OPT_TYP_FLG	F1LP	ENG	Lookup Patching Test DO NOT SHIP
F1_FLD_MERGE_TYPE_FLG	F1DE	ENG	Destructive
F1_FLD_MERGE_TYPE_FLG	F1KP	ENG	Keep
F1_FLD_MERGE_TYPE_FLG	F1ME	ENG	Merge
F1_LIST_MERGE_TYPE_FLG	F1DE	ENG	Destructive
F1_LIST_MERGE_TYPE_FLG	F1MD	ENG	Merge Delete Unreferenced
F1_LIST_MERGE_TYPE_FLG	F1ME	ENG	Merge
F1_RAW_MERGE_TYPE_FLG	F1DE	ENG	Destructive
F1_RAW_MERGE_TYPE_FLG	F1KP	ENG	Keep
F1_RAW_MERGE_TYPE_FLG	F1ME	ENG	Merge

Lookup Field Name	Field Value	Language	Description
F1_SE_APPSECURITY	F1SF	ENG	false
F1_SE_APPSECURITY	F1ST	ENG	true
F1_SE_DATA_TYPE	F1BL	ENG	boolean
F1_SE_DATA_TYPE	F1DA	ENG	date
F1_SE_DATA_TYPE	F1DT	ENG	dateTime
F1_SE_DATA_TYPE	F1LB	ENG	lookupBO
F1_SE_DATA_TYPE	F1LP	ENG	lookup
F1_SE_DATA_TYPE	F1MO	ENG	money
F1_SE_DATA_TYPE	F1NM	ENG	number
F1_SE_DATA_TYPE	F1ST	ENG	string
F1_SE_PAGEACT	F1AD	ENG	add
F1_SE_PAGEACT	F1CH	ENG	change
F1_SE_PAGEACT	F1DL	ENG	delete
F1_SE_PAGEACT	F1RD	ENG	read
F1_SE_SCOL_FLG	F1FW	ENG	fullWidth
F1_SE_SCOL_FLG	F1LT	ENG	left
F1_SE_SCOL_FLG	F1RT	ENG	right
F1_SE_SEARCHBY	F1A2	ENG	alt2
F1_SE_SEARCHBY	F1A3	ENG	alt3
F1_SE_SEARCHBY	F1AT	ENG	alt
F1_SE_SEARCHBY	F1MN	ENG	main
F1_SE_SUPPRESS	F1BL	ENG	blank
F1_SE_SUPPRESS	F1IN	ENG	input
F1_SE_SUPPRESS	F1TR	ENG	true
F1_SE_TRUEFALSE_FLG	F1FL	ENG	false

Lookup Field Name	Field Value	Language	Description
F1_SE_TRUEFALSE_FLG	F1TR	ENG	true
F1_SE_UIHINT_SELECTOR_OPEN	F1FL	ENG	false
F1_SE_VISIBLE_OPTION	F1DM	ENG	displayMap
F1_SE_VISIBLE_OPTION	F1IM	ENG	inputMap
F1_SE_XML_NAME_SPACE	F1UH	ENG	uiHint
INSTR_TYPE_FLG	F1PR	ENG	Primary
INSTR_TYPE_FLG	F1SD	ENG	Subordinate
MAINT_OBJ_OPTION_FLG	F1AM	ENG	Auxiliary Maint Object for Service (Y/N)
MANAG_CONTENT_TYPE_FLG	F1SD	ENG	XSD
MANAG_CONTENT_TYPE_FLG	F1XM	ENG	XML
MODULE_FLG	PD	ENG	Product Development Tools
NT_PROC_METHOD_FLG	S	ENG	SOA
OBJ_ACT_FLG	F1A	ENG	Add
OBJ_ACT_FLG	F1C	ENG	Change
OBJ_ACT_FLG	F1UC	ENG	Unchanged
OUTMSG_PROC_METHOD_FLG	SOA	ENG	SOA
PK_SELECT_TYPE_FLG	ALGM	ENG	Algorithm
PK_SELECT_TYPE_FLG	HRCN	ENG	Specific Key
PK_SELECT_TYPE_FLG	SQLS	ENG	SQL Statement
TBL_CLASSIFICATION_FLG	F1AN	ENG	Admin Non System Table
TBL_CLASSIFICATION_FLG	F1AS	ENG	Admin System Table

Lookup Field Name	Field Value	Language	Description
TBL_CLASSIFICATION_FLG	F1MT	ENG	Master Table
TBL_CLASSIFICATION_FLG	F1TT	ENG	Transaction Table
TBL_CLASSIFICATION_FLG	F1UC	ENG	Unclassified
TBL_VOLUME_FLG	F1HV	ENG	High Volume
TBL_VOLUME_FLG	F1LV	ENG	Low Volume
TBL_VOLUME_FLG	F1MV	ENG	Medium Volume
TBL_VOLUME_FLG	F1UC	ENG	Unclassified
TRAVERSAL_CRT_TYPE_FLG	F1CN	ENG	Constraint
TRAVERSAL_CRT_TYPE_FLG	F1SQ	ENG	SQL
TRAVERSAL_CRT_TYPE_FLG	F1XP	ENG	XPath

Maintenance Object

The following Maintenance Objects are new to V4.2.0.

MO code	Description
F1-MIGRDS	Migration Data Set
F1-MIGROBJ	Migration Object
F1-MIGRPLAN	Migration Plan
F1-MIGRREQ	Migration Request
F1-MIGRTX	Migration Transaction

Script

The following Scripts are Framework-owned system data in V4.2.0.

Script	Description
F1-AttchDtlU	Display Attachment via uiHints
F1-AttchPost	Attachment post-processing: restore data element

Script	Description
F1-AttchPre	Attachment pre-processing: clear data element
F1-MgPlnInf	Migration Plan Info String
F1-MgPlnMain	Migration Plan - Maintenance
F1-MgReqMain	Migration Request - Maintenance
F1-MgdObjZnV	Migration Data Set Object Zone Visibility
F1-OpaUrlSrh	OPA WSDL URL Search
F1-ViewThrhd	Cluster Thread Attributes Viewer
F1ExpMgReq	Export Migration Request
F1MTXImpDesc	Migration Transaction - Retrieve Status Description for Display
F1MgImpReq	Migration Import Request
F1MgOImpDesc	Migration Object - Retrieve Status Description for Display
F1MgOSqlShwZ	Migration Object - SQL List Zone Visibility
F1MgTXShwZn	Migration Transaction List Zone Visibility
F1MgdMnt	Migration Data Set Maintenance
F1MgoMnt	Migration Object - Maintenance
F1MigCfg	Retrieve Migration Assistant Configuration

To do Type

There are no new To Do Types in V4.2.0.

Portal

The following Portals are new to V4.2.0.

Portal	Description
F1MGDEXP	Migration Data Set Export
F1MGDEXS	Migration Data Set Export Query
F1MGDIML	Migration Data Set Log
F1MGDIMP	Migration Data Set Import
F1MGDIMS	Migration Data Set Import Query
F1MGOIML	Migration Object Log
F1MGOIMP	Migration Object Import

Portal	Description
F1MGPLNM	Migration Plan
F1MGPLNS	Migration Plan Query
F1MGREQM	Migration Request
F1MGREQS	Migration Request Query
F1MTXIML	Migration Transaction Log
F1MTXIMP	Migration Transaction Import

Portal Zone

The following Portal Zones are added to V4.2.0

Portal	Zone
F1MGDEXP	F1MGDEXP
F1MGDEXS	F1MGDEXS
F1MGDIML	F1MGDLOGL
F1MGDIMP	F1MGDIMP
F1MGDIMP	F1MGDOBJS
F1MGDIMP	F1MGDTXS
F1MGDIMS	F1MGDIMS
F1MGOIML	F1MGOLOGL
F1MGOIMP	F1MGOALGL
F1MGOIMP	F1MGOIMP
F1MGOIMP	F1MGOSQLL
F1MGPLNM	F1-MGPLNDISP
F1MGPLNS	F1-MGPLNQRY
F1MGREQM	F1-MGREQDISP
F1MGREQS	F1-MIGRREQ
F1MTXIML	F1MTXLOGL
F1MTXIMP	F1MTXIMP
F1MTXIMP	F1MTXOBJS
F1_SCHEMA_BO	F1-SE-GUI

UI Map

The following UI Maps are Framework Owned system data in V4.2.0.

Map	Description
F1-AddressMaintenanceFragment	Address Maintenance (with defaulting)
F1-AttachmentActions	Actions for Attachment BOs
F1-AttachmentIDFrag	Attachment ID Record Info Frag
F1-DisplayRecordActionsFusion	Record Actions HTML Fragment Fusion
F1-ExportMigrReqInput	Export Migration Request Input
F1-ExtendedLookupMaintScripts	Javascript for extended lookup maintenance
F1-MigrDataSetObjsFilter	Migration Objects Filter
F1-MigrDataSetTxFilter	Migration Data Set Transactions Filter
F1-MigrExportSearchFilter	Migration Data Set Export - Query Filters
F1-MigrImportSearchFilter	Migration Data Set Import - Query Filters
F1-MigrObjectImportDisplay	Migration Object Import Display
F1-MigrPlanDisplay	Migration Plan - Display
F1-MigrPlanMaintenance	Migration Plan Maintenance
F1-MigrPlanSearchFilter	Migration Plan - Query Filters
F1-MigrReqDisplay	Migration Request - Display
F1-MigrReqMaintenance	Migration Request - Maintenance
F1-MigrReqSearchFilter	Migration Request - Query Filters
F1-MigrTxImportDisplay	Migration Transaction Import Display
F1-MigrationImportRequest	Migration Request Import Input
F1-SE-Buttons	Buttons
F1-SE-FieldConditionalAtts	Field conditional attributes
F1-SE-FieldUIHintConditionAtts	Field uiHint conditional attributes
F1-SE-GLUIHintConditionalAtts	Group, list uiHint conditional attributes
F1-SE-Header	Schema Editor Zone Header
F1-SE-ListConditionalAtts	List conditional attributes
F1-SE-SchemaConditionalAtts	Root node conditional attributes

XAI Inbound Service

There are no new XAI Inbound Services new to V4.2.0.

Zone Type

The following zone types are new to V4.2.0.

Zone Handle Code	Description
F1-SE-GUI	GUI Schema Editor

Zone

The following new Zones are added to V4.2.0.

Zone	Zone Type	Description
F1-BNMGPS	F1-DE-QUERY	Migration Plan Search
F1-BNMGRS	F1-DE-QUERY	Migration Request Search
F1-BOSRCH2	F1-DE-QUERY	Business Object Search
F1-BSSRC	F1-DE-QUERY	Business Service Search
F1-CLSDETAIL	F1-MAPEXPL	Cluster Details
F1-CLSMEMBER	F1-MAPEXPL	Cluster Members
F1-CLSTHPOOL	F1-MAPEXPL	Cluster Thread Pools
F1-CLUSJOBS	F1-MAPEXPL	Batch Jobs
F1-CLUSTER	F1-MAPEXPL	Batch Cluster
F1-CLUSTHRD	F1-MAPEXPL	Batch Threads
F1-CNSTRSRCH	F1-DE	Constraint Search
F1-LKUPFS	F1-DE-QUERY	Field Search
F1-MGPLNDISP	F1-MAPDERV	Migration Plan
F1-MGPLNQ1	F1-DE-QUERY	Migration Plan
F1-MGPLNQRY	F1-DE-MULQRY	Migration Plan Search
F1-MGREQDISP	F1-MAPDERV	Migration Request
F1-MGRREQDSP	F1-MAPDERV	Migration Request to be deleted
F1-MIGRREQ	F1-DE-MULQRY	Migration Request Search
F1-MIGRREQ1	F1-DE-QUERY	Code / Description
F1-MOFLDS	F1-DE-QUERY	Field Search
F1-OPAWSSRCH	F1-DE-QUERY	OPA WSDL URL Search
F1-RETSTATES	F1-DE-SINGLE	Retrieves BO states for Access Modes
F1-SE-GUI	F1-SE-GUI	GUI Schema Editor
F1-SYNREQQ1	F1-DE-QUERY	Sync Request Id

Zone	Zone Type	Description
F1MGALGS	F1-DE-QUERY	Migration Selection Algorithms
F1MGDEXP	F1-MAPDERV	Migration Data Set Export Details
F1MGDEXS	F1-DE-MULQRY	Migration Data Set Export Query
F1MGDEXS1	F1-DE-QUERY	Migration Data Set Export Search
F1MGDIMP	F1-MAPDERV	Migration Data Set Import Details
F1MGDIMS	F1-DE-MULQRY	Migration Data Set Import Query
F1MGDIMS1	F1-DE-QUERY	Migration Data Set Import Search
F1MGDLOGL	F1-DE	Migration Data Set Logs
F1MGDOBJs	F1-DE	Migration Data Set Impacted Object Summary
F1MGDTXS	F1-DE	Migration Data Set Transactions
F1MGOALGL	F1-DE-SINGLE	Migration Object - Algorithms
F1MGOIMP	F1-MAPDERV	Migration Object Details
F1MGOLOGL	F1-DE	Migration Object Logs
F1MGOSQLL	F1-DE-SINGLE	Migration Object - List of SQL Statements
F1MTXIMP	F1-MAPDERV	Migration Transaction Import Details
F1MTXLOGL	F1-DE	Migration Transaction Logs
F1MTXLSTCNT	F1-DE-SINGLE	Migration Transaction List count
F1MTXOBJs	F1-DE	Migration Transaction Objects

Appendix B

Oracle Application Framework System Table Guide

This section lists the system tables owned by the Oracle Utilities Application Framework V4.2.0.1.0 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.
- The standards 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).

DB Process

Properties	Description
Tables	CI_DB_PROC, CI_DB_PROC_L, CI_DB_INSTR, CI_DB_INSTR_L, L, CI_DB_INSTR_OVRD
Initial Data	Copy DB Process (CL-COPDB). This DB process allows users to copy a DB process from one database to another using Config Lab utility.

Display Profile

The Display Profile Code is referenced in the User (SC_USER) table.

Properties	Description
Tables	CI_DISP_PROF, CI_DISP_PROF_L
Initial Data	North America (NORTHAM), HIJRI Format (HIJRI), and Europe (EURO).

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 11111.

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).

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 Smart Grid Gateway 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.

Starting with version 2.2 of the framework a new system data upgrade rule was introduced - 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, 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 care and billing products prior to version 2.0 will continue to use CI as a prefix for the application service.
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)
Customer Modification	Next Batch Number (NEXT_BATCH_NBR), Last Update Instance (LAST_UPDATE_INST), Last Update Date time (LAST_UPDATE_DTM) 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. Batch Parameter Value (BATCH_PARM_VAL) 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)
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)

Properties	Description
Customer Modification	Adhoc Characteristic Value Validation Rule (ADHOC_VAL_ALG_CD) on Characteristic Entity Table (CI_CHAR_ENTTTY)

Data Area

Properties	Description
Tables	F1_DATA_AREA, F1_DATA_AREA_L
Standard Data Fields	Data Area Code (DATA_AREA_CD)
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

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)

Lookup

Properties	Description
Tables	CI_LOOKUP_FIELD, CI_LOOKUP_VAL, CI_LOOKUP_VAL_L, F1_EXT_LOOKUP_VAL, F1_EXT_LOOKUP_VAL_L

Properties	Description
Standard Data Fields	<p>Field Name (FIELD_NAME)</p> <ul style="list-style-type: none"> 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. <p>Field Value (FIELD_VALUE)</p> <ul style="list-style-type: none"> 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. Product development can extend the Oracle Utilities Application Framework owned lookup field's value with caution. When it needs to be extended, prefix the first letter of the Owner Flag to the value. For example, when adding a new value to the algorithm entity flag (ALG_ENTITY_FLG), prefix with C1 if you are developing an Oracle Utilities Customer Care and Billing product. <p>Introduced in V 4.0.1: Value (F1_EXT_LOOKUP_VALUE)</p> <ul style="list-style-type: none"> This will allow storing longer value keys rather than the normal 4byte lookup values.
Customer Modification	Override Description (DESCR_OVRD) on Lookup Field Value Language Table (CI_LOOKUP_VAL_L)

A new Feature option is defined through adding a value to EXT_SYS_TYP_FLG. The field value for this look up field must be prefixed by the Owner flag value.

Map

Properties	Description
Tables	F1_MAP, F1_MAP_L
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"> 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. You must use only the assigned category for your product. Oracle Utilities Customer Care and Billing and Oracle Utilities Business Intelligence - 00001 thru 00100 Oracle Utilities Application Framework Java - 11001 thru 11100 Oracle Utilities Customer Care and Billing Java - 11101 thru 11200 Oracle Utilities Business Intelligence Java - 11201 thru 11300 Implementer COBOL - 90000 Implementer WSS - 90001 Implementer Java - 90002 Reserved for Tests - 99999 <p>Message Number (MESSAGE_NBR) for COBOL message categories</p> <ul style="list-style-type: none"> Message numbers below 1000 are reserved for common messages. Implementers must not use message numbers below 1000. <p>Message Number (MESSAGE_NBR) for Java message categories</p> <ul style="list-style-type: none"> Subsystem Standard Messages - 00001 thru 02000 Reserved - 02001 thru 09999 Published Messages - 10001 thru 11000 Package Messages - 10001 thru 90000 Reserved - 90001 thru 99999 Each package is allocated 100 message numbers, each starting from 101. 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 Reserved message number ranges are for future use and therefore must not be used by all products.

Properties	Description
Customer Modification	Override Description (DESCRLONG_OVRD), Message Text Override (MESSAGE_TEXT_OVRD)

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	<p>Table Name (TBL_NAME)</p> <ul style="list-style-type: none"> Table names must match with the physical table name or view name in the database. 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. 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)
Customer Modification	<p>Audit Switches (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.</p>

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"> Index Name for Primary Constraints <Index Name>Rnn for Foreign Key Constraints Where <ul style="list-style-type: none"> nn: integer, 01 through 99
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

Properties	Description
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

Migration Plan

Properties	Description
Tables	F1_MIGR_PLAN, F1_MIGR_PLAN_L, F1_MIGR_PLAN_INSTR, F1_MIGR_PLAN_INSTR_L, F1_MIGR_PLAN_INSTR_ALG
Standard Data Fields	Migration Plan (MIGR_PLAN_CD)
Customer Modification	None

Migration Request

Properties	Description
Tables	F1_MIGR_REQ, F1_MIGR_REQ_L, F1_MIGR_REQ_INSTR, F1_MIGR_REQ_INSTR_L, F1_MIGR_REQ_INSTR_ENTITY
Standard Data Fields	Migration Request (MIGR_REQ_CD)
Customer Modification	None

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

Portal and Zone

Properties	Description
Tables	CI_PORTAL, CI_PORTAL_L, CI_PORTAL_ZONE, 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"> A new Zone can be added to the Product owned Portal Pages. The existing Zones cannot be removed from the Product owned Portal Pages.
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).

Sequence

Properties	Description
Tables	CI_SEQ
Standard Data Fields	Sequence Name (SEQ_NAME)
Customer Modification	Sequence Number (SEQ_NBR) 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_PRMP, CI_SCR_PRMP_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)

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 XAI Option Table (CI_XAI_OPTION)

The following XAI tables might have system data installed upon the initial installation but a subsequence system data upgrade process will not update the content of these table unless the change is documented in the database upgrade guide: 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

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)

Oracle Utilities Application Framework Only Tables

All data of the tables in this group belong to the Oracle Utilities Application Framework. No data modification or addition is allowed for these tables by base product development and customer modification. When an environment is upgraded to the next release of the Oracle Utilities Application Framework, the upgrade process will refresh the data in these tables.

- CI_MD_AT_DTL / CI_MD_AT_DTL_L
- CI_MD_ATT_TY
- CI_MD_CTL / CI_MD_CTL_L
- CI_MD_CTL_TMPL
- CI_MD_ELTY / CI_MD_ELTY_L
- CI_MD_ELTY_AT
- CI_MD_LOOKUP / CI_MD_LOOKUP_F
- CI_MD_PDF / CI_MD_PDF_VAL
- CI_MD_MSG / CI_MD_MSG_L
- CI_MD_SRC_TYPE / CI_MD_SRC_TYPE_L
- CI_MD_TMPL / CI_MD_TMPL_L
- CI_MD_TMPL_ELTY
- CI_MD_TMPL_VAR / CI_MD_TMPL_VAR_L
- CI_MD_VAR / CI_MD_VAR_DTL / CI_MD_VAR_DTL_L
- CI_XAI_EXECUTER / CI_XAI_EXECUTER_L

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.

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	KP	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_CURRENCY_CD	KP	Currency Code
CI_CURRENCY_CD_L	KP	Currency Code Language
CI_DB_INSTR	KP	DB Process Instruction
CI_DB_INSTR_ALG	KP	DB Process Instruction Algorithm
CI_DB_INSTR_L	KP	DB Process Instruction Language
CI_DB_INST_OVRD	KP	DB Process Instruction Override
CI_DB_PROC	KP	DB Process
CI_DB_PROC_L	KP	DB Process Language
CI_DISP_ICON	MG	Display Icon
CI_DISP_ICON_L	MG	Display Icon Language
CI_DISP_PROF	KP	Display Profile
CI_DISP_PROF_L	KP	Display Profile 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_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_CONST	MG	Constraints
CI_MD_CONST_FLD	MG	Constraint Fields
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_FLD	MG	Field
CI_MD_FLD_L	MG	Field Language

Table Name	Upgrade Action	Description
CI_MD_LOOKUP	RF	MD Lookup Field Value
CI_MD_LOOKUP_F	RF	MD Lookup Field
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_MSG	RF	MD Message
CI_MD_MSG_L	RF	MD Message Language
CI_MD_NAV	MG	Navigation Key
CI_MD_PDF	RF	Predefined Fields
CI_MD_PDF_VAL	RF	Predefined Values
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
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

Table Name	Upgrade Action	Description
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_SRC_TYPE	RF	Source Type
CI_MD_SRC_TYPE_L	RF	Source Type Language
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_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_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

Table Name	Upgrade Action	Description
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
CI_PORTAL	MG	Portal
CI_PORTAL_L	MG	Portal Language
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_USR_NAV_LINK	MG	User Favorite Links
CI_USR_PORTAL	KP	User Portal
CI_USR_ZONE	KP	User Zone
CI_XAI_ADAPTER	MG	XAI Adapter
CI_XAI_ADAPTER_L	MG	XAI Adapter Lang
CI_XAI_CLASS	MG	XAI Class
CI_XAI_CLASS_L	MG	XAI Class Language

Table Name	Upgrade Action	Description
CI_XAI_ENV_HNDL	MG	XAI Envelope Handler
CI_XAI_ENV_HNDL_L	MG	XAI Envelope Handler 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
CI_XAI_IN_SVC	MG	XAI Inbound Service
CI_XAI_IN_SVC_L	MG	XAI Inbound Service Language
CI_XAI_JNDI_SVR	KP	XAI JNDI Server
CI_XAI_JNDI_SVR_L	KP	XAI JNDI Server Language
CI_XAI_OPTION	KP	XAI Option
CI_XAI_RCVR	KP	XAI Receiver
CI_XAI_RCVR_CTX	KP	XAI Receiver Context
CI_XAI_RCVR_L	KP	XAI Receiver Language
CI_XAI_RCVR_RGRP	KP	XAI Receiver Rule Group
CI_XAI_RCVR_RSP	KP	XAI Receiver Response
CI_XAI_SENDER	KP	XAI Sender
CI_XAI_SENDER_L	KP	XAI Sender Language
CI_XAI_SNDR_CTX	KP	XAI Sender Context
CI_XAI_SVC_PARM	MG	XAI Inbound Service Parameters
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

Table Name	Upgrade Action	Description
F1_BUS_OBJ_STATUS_AL G	MG	Business Object Status Algorithm
F1_BUS_OBJ_STATUS_L	MG	Business Object Status Language
F1_BUS_OBJ_STATUS_OP T	MG	Business Object Status Option
F1_BUS_OBJ_STATUS_RS N	MG	Status Reason
F1_BUS_OBJ_STATUS_RS N_CHAR	KP	Status Reason Characteristic
F1_BUS_OBJ_STATUS_RS N_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_EXT_LOOKUP_VAL	MG	Extendable Lookup
F1_EXT_LOOKUP_VAL_ L	MG	Extendable Lookup Language
F1_INSTALLATION	KP	Installation Option - Framework
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_INSTR	MG	Migration Request Instruction

Table Name	Upgrade Action	Description
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_SCHEMA	MG	Schema
SC_ACCESS_CNTL	MG	User Group Access Control
SC_APP_SERVICE	MG	Application Service
SC_APP_SERVICE_L	MG	Application Service Language
SC_USER	KP	User
SC_USER_GROUP	KP	User Group
SC_USER_GROUP_L	KP	User Group Language
SC_USR_GRP_PROF	MG	User Group Profile
SC_USR_GRP_USR	KP	User Group User

Appendix C

Partitioning Recommendations for Oracle Utilities Smart Grid Gateway

This section specifies the partitioning and compression strategies recommended for an initial Oracle Utilities Smart Grid Gateway database configuration on Exadata. It includes the following topics:

- [Partitioning Recommendations](#)
- [Compression Recommendations](#)

Partitioning Recommendations

In general, the recommendation is for a minimum of 'n' partitions for selective database objects, where 'n' is number of RAC nodes. The specific table level partitioning recommendations are as follows:

- The Table Partitioning scheme for Transaction tables is focused primarily on tables associated with Measurement MO, Measurement Log MO and Initial-Measurement-Data MO.
- D1_MSRMT, D1_MSRMT_CHAR, D1_MSRMT_LOG, D1_MSRMT_LOG_PARM tables can be partitioned by MSRMT_DTTM (smaller partition better performance). Begin with bi-weekly partitions. Subpartition these tables by MEASR_COMP_ID (8 subpartitions should be a good number to start with).
- D1_INIT_MSRMT_DATA table can be partitioned by D1_TO_DTTM (smaller partitions lead to better performance). Bi-weekly partitions is a good start. Subpartition D1_INIT_MSRMT_DATA table by MEASR_COMP_ID (8 subpartitions should be a good number to start with).
- D1_INIT_MSRMT_DATA_CHAR, D1_INIT_MSRMT_DATA_K, D1_INIT_MSRMT_DATA_LOG, D1_INIT_MSRMT_DATA_LOG_PARM tables can be partitioned by INIT_MSRMT_DATA_ID (8 sub partitions should be a good number to start with).

The following sections gives partition recommendation and can be used as reference. It includes the following:

- [D1_MSRMT](#)
- [D1_MSRMT_CHAR](#)
- [D1_MSRMT_LOG](#)
- [D1_MSRMT_LOG_PARM](#)
- [D1_INIT_MSRMT_DATA](#)
- [D1_INIT_MSRMT_DATA_CHAR](#)

- [D1_INIT_MSRMT_DATA_K](#)
- [D1_INIT_MSRMT_DATA_LOG](#)
- [D1_INIT_MSRMT_DATA_LOG_PARM](#)

D1_MSRMT

```
CREATE TABLE D1_MSRMT
(
    MEASR_COMP_ID CHAR(12 BYTE) NOT NULL ENABLE,
    MSRMT_DTTM DATE NOT NULL ENABLE,
    BO_STATUS_CD CHAR(12 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    MSRMT_COND_FLG CHAR(6 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    MSRMT_USE_FLG CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    MSRMT_LOCAL_DTTM DATE NOT NULL ENABLE,
    MSRMT_VAL NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    ORIG_INIT_MSRMT_ID CHAR(14 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    PREV_MSRMT_DTTM DATE,
    MSRMT_VAL1 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL2 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL3 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL4 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL5 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL6 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL7 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL8 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL9 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    MSRMT_VAL10 NUMBER(16,6) DEFAULT 0 NOT NULL ENABLE,
    BUS_OBJ_CD CHAR(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CRE_DTTM DATE NOT NULL ENABLE,
    STATUS_UPD_DTTM DATE NOT NULL ENABLE,
    USER_EDITED_FLG CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    VERSION NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE
) TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (MSRMT_DTTM)
SUBPARTITION BY range (MEASR_COMP_ID)
SUBPARTITION TEMPLATE(
    subpartition SUB1 values less than (124999999999),
    subpartition SUB2 values less than (249999999999),
    subpartition SUB3 values less than (374999999999),
    subpartition SUB4 values less than (499999999999),
    subpartition SUB5 values less than (624999999999),
    subpartition SUB6 values less than (744999999999),
    subpartition SUB7 values less than (874999999999),
    subpartition SUB8 values less than (maxvalue)
)
(PARTITION P1 VALUES LESS THAN(TO_DATE('15/12/2010 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P2 VALUES LESS THAN(TO_DATE('01/01/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P3 VALUES LESS THAN(TO_DATE('15/01/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P4 VALUES LESS THAN(TO_DATE('01/02/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P5 VALUES LESS THAN(TO_DATE('15/02/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P6 VALUES LESS THAN(TO_DATE('01/03/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P7 VALUES LESS THAN(TO_DATE('15/03/2011 00:00:01','DD/MM/YYYY HH24:MI:SS'))
);
```

```
CREATE UNIQUE INDEX D1T298P0 on D1_MSRMT (MEASR_COMP_ID, MSRMT_DTTM)
TABLESPACE <Tablespace_Name> local COMPRESS 1;
```

```
alter table D1_MSRMT ADD CONSTRAINT D1T298P0 PRIMARY
KEY(MEASR_COMP_ID, MSRMT_DTTM) USING INDEX TABLESPACE
<Tablespace_Name> ;
```

Note: For implementations on Exadata the following D1T298S1 Index is not required:

```
CREATE UNIQUE INDEX D1T298S1 on D1_MSRMT (MEASR_COMP_ID, MSRMT_DTTM,
MSRMT_COND_FLG, MSRMT_USE_FLG) TABLESPACE <Tablespace_Name> local
COMPRESS 1;
```

```
CREATE INDEX D1T298S2 ON D1_MSRMT ( ORIG_INIT_MSRMT_ID )
TABLESPACE<Tablespace_Name> local COMPRESS 1;
```

D1_MSRMT_CHAR

```
CREATE TABLE D1_MSRMT_CHAR
(
    MEASR_COMP_ID CHAR(12 BYTE) NOT NULL ENABLE,
    MSRMT_DTTM DATE NOT NULL ENABLE,
    CHAR_TYPE_CD CHAR(8 BYTE) NOT NULL ENABLE,
    SEQ_NUM NUMBER(3,0) NOT NULL ENABLE,
    CHAR_VAL CHAR(16 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    ADHOC_CHAR_VAL VARCHAR2(254 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK1 VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK2 VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK3 VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK4 VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK5 VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    SRCH_CHAR_VAL VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    VERSION NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE
) TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (MSRMT_DTTM)
SUBPARTITION BY range (MEASR_COMP_ID)
SUBPARTITION TEMPLATE(
    subpartition SUB1 values less than (124999999999),
    subpartition SUB2 values less than (249999999999),
    subpartition SUB3 values less than (374999999999),
    subpartition SUB4 values less than (499999999999),
    subpartition SUB5 values less than (624999999999),
    subpartition SUB6 values less than (744999999999),
    subpartition SUB7 values less than (874999999999),
    subpartition SUB8 values less than (maxvalue)
)
(PARTITION P1 VALUES LESS THAN(TO_DATE('15/12/2010 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P2 VALUES LESS THAN(TO_DATE('01/01/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P3 VALUES LESS THAN(TO_DATE('15/01/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P4 VALUES LESS THAN(TO_DATE('01/02/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P5 VALUES LESS THAN(TO_DATE('15/02/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P6 VALUES LESS THAN(TO_DATE('01/03/2011 00:00:01','DD/MM/YYYY HH24:MI:SS')),
PARTITION P7 VALUES LESS THAN(TO_DATE('15/03/2011 00:00:01','DD/MM/YYYY HH24:MI:SS'))
);

CREATE UNIQUE INDEX D1T299P0 ON D1_MSRMT_CHAR
(
    MEASR_COMP_ID, MSRMT_DTTM, CHAR_TYPE_CD, SEQ_NUM
) TABLESPACE <Tablespace_Name> LOCAL COMPRESS 1;

ALTER TABLE D1_MSRMT_CHAR ADD CONSTRAINT D1T299P0 PRIMARY KEY
(MEASR_COMP_ID, MSRMT_DTTM, CHAR_TYPE_CD, SEQ_NUM) USING INDEX
TABLESPACE <Tablespace_Name>;

CREATE INDEX D1T299S1 ON D1_MSRMT_CHAR (SRCH_CHAR_VAL) TABLESPACE
<Tablespace_Name> COMPRESS 1;
```

D1_MSRMT_LOG

```
CREATE TABLE D1_MSRMT_LOG
(
    MEASR_COMP_ID CHAR(12 BYTE),
    MSRMT_DTTM DATE,
    SEQNO                NUMBER(5,0),
    ORIG_INIT_MSRMT_ID CHAR(14 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    BUS_OBJ_CD           CHAR(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    BO_DATA_AREA CLOB,
    CHAR_TYPE_CD         CHAR(8 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL             CHAR(16 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    ADHOC_CHAR_VAL       VARCHAR2(254 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK1         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK2         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK3         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK4         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK5         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    DESCRLONG            VARCHAR2(4000 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    LOG_DTTM DATE NOT NULL ENABLE,
    MESSAGE_CAT_NBR      NUMBER(5,0) DEFAULT 0 NOT NULL ENABLE,
    MESSAGE_NBR          NUMBER(5,0) DEFAULT 0 NOT NULL ENABLE,
    USER_ID              CHAR(8 BYTE) DEFAULT ' ' NOT
NULL ENABLE,
    VERSION              NUMBER(5,0) DEFAULT 1 NOT NULL
ENABLE,
    MSRMT_LOG_ENTRY_TYPE_FLG CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE
)
TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (MSRMT_DTTM)
SUBPARTITION BY range (MEASR_COMP_ID)
SUBPARTITION TEMPLATE (
    subpartition SUB1 values less than (124999999999),
    subpartition SUB2 values less than (249999999999),
    subpartition SUB3 values less than (374999999999),
    subpartition SUB4 values less than (499999999999),
    subpartition SUB5 values less than (624999999999),
    subpartition SUB6 values less than (744999999999),
    subpartition SUB7 values less than (874999999999),
    subpartition SUB8 values less than (maxvalue)
)
(PARTITION P1 VALUES LESS THAN (TO_DATE('15/12/2010 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P2 VALUES LESS THAN (TO_DATE('01/01/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P3 VALUES LESS THAN (TO_DATE('15/01/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P4 VALUES LESS THAN (TO_DATE('01/02/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P5 VALUES LESS THAN (TO_DATE('15/02/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P6 VALUES LESS THAN (TO_DATE('01/03/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P7 VALUES LESS THAN (TO_DATE('15/03/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS'))
);
CREATE UNIQUE INDEX D1T300P0 ON D1_MSRMT_LOG
(
    MEASR_COMP_ID, MSRMT_DTTM, SEQNO
) TABLESPACE <Tablespace_Name> local COMPRESS 1;
```

```

ALTER TABLE D1_MSRMT_LOG ADD CONSTRAINT D1T300P0 PRIMARY KEY
(MEASR_COMP_ID, MSRMT_DTTM, SEQNO) USING INDEX TABLESPACE
<Tablespace_Name>;

CREATE INDEX D1T300S2 ON D1_MSRMT_LOG ( ORIG_INIT_MSRMT_ID )
TABLESPACE<Tablespace_Name> local COMPRESS 1;

```

D1_MSRMT_LOG_PARM

```

CREATE TABLE D1_MSRMT_LOG_PARM
(
    MEASR_COMP_ID CHAR(12 BYTE),
    MSRMT_DTTM DATE,
    SEQNO          NUMBER(5,0),
    PARM_SEQ       NUMBER(3,0),
    MSG_PARM_VAL   VARCHAR2(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    MSG_PARM_TYP_FLG CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    VERSION        NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE
)
TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
    PARTITION BY RANGE (MSRMT_DTTM)
SUBPARTITION BY range (MEASR_COMP_ID)
SUBPARTITION TEMPLATE(
    subpartition SUB1 values less than (124999999999),
    subpartition SUB2 values less than (249999999999),
    subpartition SUB3 values less than (374999999999),
    subpartition SUB4 values less than (499999999999),
    subpartition SUB5 values less than (624999999999),
    subpartition SUB6 values less than (744999999999),
    subpartition SUB7 values less than (874999999999),
    subpartition SUB8 values less than (maxvalue)
)
(PARTITION P1 VALUES LESS THAN(TO_DATE('15/12/2010 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P2 VALUES LESS THAN(TO_DATE('01/01/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P3 VALUES LESS THAN(TO_DATE('15/01/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P4 VALUES LESS THAN(TO_DATE('01/02/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P5 VALUES LESS THAN(TO_DATE('15/02/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P6 VALUES LESS THAN(TO_DATE('01/03/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P7 VALUES LESS THAN(TO_DATE('15/03/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS'))
);
CREATE UNIQUE INDEX D1T301P0 ON D1_MSRMT_LOG_PARM
(
    MEASR_COMP_ID, MSRMT_DTTM, SEQNO, PARM_SEQ
) INDEX TABLESPACE <Tablespace_Name> local COMPRESS 1;

ALTER TABLE D1_MSRMT_LOG_PARM ADD CONSTRAINT D1T301P0 PRIMARY KEY
(MEASR_COMP_ID, MSRMT_DTTM, SEQNO, PARM_SEQ) USING INDEX TABLESPACE
<Tablespace_Name>;

```

D1_INIT_MSRMT_DATA

```
CREATE TABLE D1_INIT_MSRMT_DATA
(
    INIT_MSRMT_DATA_ID CHAR(14 BYTE) NOT NULL ENABLE,
    MEASR_COMP_ID      CHAR(12 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    D1_FROM_DTTM DATE,
    D1_TO_DTTM DATE,
    DATA_SRC_FLG      CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    TIME_ZONE_CD      CHAR(10 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    BUS_OBJ_CD        CHAR(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    BO_STATUS_CD      CHAR(12 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    BO_STATUS_REASON_CD VARCHAR2(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    STATUS_UPD_DTTM DATE NOT NULL ENABLE,
    CRE_DTTM DATE NOT NULL ENABLE,
    VERSION          NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE,
    IMD_EXT_ID VARCHAR2(120 BYTE),
    IMD_BO_DATA_AREA CLOB,
    PREVEE_BO_DATA_AREA CLOB,
    POSTVEE_BO_DATA_AREA CLOB,
    TRACE_BO_DATA_AREA CLOB,
    RAW_BO_DATA_AREA CLOB
) TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
LOB (PREVEE_BO_DATA_AREA)
STORE AS SECUREFILE (ENABLE STORAGE IN ROW COMPRESS CACHE)
LOB ( POSTVEE_BO_DATA_AREA )
STORE AS SECUREFILE (ENABLE STORAGE IN ROW COMPRESS CACHE)
LOB (TRACE_BO_DATA_AREA)
STORE AS SECUREFILE (ENABLE STORAGE IN ROW COMPRESS CACHE)
LOB (RAW_BO_DATA_AREA)
STORE AS SECUREFILE (ENABLE STORAGE IN ROW COMPRESS CACHE)
LOB (IMD_BO_DATA_AREA)
STORE AS SECUREFILE (ENABLE STORAGE IN ROW COMPRESS CACHE)
PARTITION BY RANGE (D1_TO_DTTM)
SUBPARTITION BY range (MEASR_COMP_ID)
SUBPARTITION TEMPLATE(
    subpartition SUB1 values less than (12499999999),
    subpartition SUB2 values less than (24999999999),
    subpartition SUB3 values less than (37499999999),
    subpartition SUB4 values less than (49999999999),
    subpartition SUB5 values less than (62499999999),
    subpartition SUB6 values less than (74499999999),
    subpartition SUB7 values less than (87499999999),
    subpartition SUB8 values less than (maxvalue)
)
(PARTITION P1 VALUES LESS THAN(TO_DATE('15/12/2010 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P2 VALUES LESS THAN(TO_DATE('01/01/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P3 VALUES LESS THAN(TO_DATE('15/01/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P4 VALUES LESS THAN(TO_DATE('01/02/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P5 VALUES LESS THAN(TO_DATE('15/02/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P6 VALUES LESS THAN(TO_DATE('01/03/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P7 VALUES LESS THAN(TO_DATE('15/03/2011 00:00:01','DD/MM/
YYYY HH24:MI:SS')),
    PARTITION P8  VALUES LESS THAN (maxvalue)
);
```

```

CREATE UNIQUE INDEX D1T304P0 ON D1_INIT_MSRMT_DATA
(
    INIT_MSRMT_DATA_ID
) TABLESPACE <Tablespace_Name>
GLOBAL PARTITION BY RANGE (INIT_MSRMT_DATA_ID)
(PARTITION PART1 values less than (1249999999999),
PARTITION PART2 values less than (2499999999999),
PARTITION PART3 values less than (3749999999999),
PARTITION PART4 values less than (4999999999999),
PARTITION PART5 values less than (6249999999999),
PARTITION PART6 values less than (7449999999999),
PARTITION PART7 values less than (8749999999999),
PARTITION PART8 values less than (maxvalue));

ALTER TABLE D1_INIT_MSRMT_DATA ADD CONSTRAINT D1T304P0 PRIMARY KEY
(INIT_MSRMT_DATA_ID) USING INDEX TABLESPACE <Tablespace_Name>;

CREATE INDEX D1T304S1 ON D1_INIT_MSRMT_DATA
( MEASR_COMP_ID
,BO_STATUS_CD
,BUS_OBJ_CD
,D1_TO_DTTM
,D1_FROM_DTTM
) TABLESPACE <Tablespace_Name> LOCAL COMPRESS 1;

CREATE UNIQUE INDEX D1T304S2 ON D1_INIT_MSRMT_DATA
(INIT_MSRMT_DATA_ID,
BO_STATUS_CD,
BUS_OBJ_CD ) TABLESPACE <Tablespace_Name> COMPRESS 1;

CREATE UNIQUE INDEX D1T304S3 ON D1_INIT_MSRMT_DATA
(IMD_EXT_ID,
INIT_MSRMT_DATA_ID
) TABLESPACE <Tablespace_Name> COMPRESS 1;

```

D1_INIT_MSRMT_DATA_CHAR

```

CREATE TABLE D1_INIT_MSRMT_DATA_CHAR
(
    INIT_MSRMT_DATA_ID CHAR(14 BYTE),
    CHAR_TYPE_CD        CHAR(8 BYTE),
    SEQ_NUM              NUMBER(3,0),
    CHAR_VAL             CHAR(16 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    ADHOC_CHAR_VAL       VARCHAR2(254 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK1         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK2         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK3         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK4         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK5         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    SRCH_CHAR_VAL        VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    VERSION              NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE)
TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (INIT_MSRMT_DATA_ID)
(PARTITION PART1 values less than (1249999999999),
PARTITION PART2 values less than (2499999999999),
PARTITION PART3 values less than (3749999999999),
PARTITION PART4 values less than (4999999999999),
PARTITION PART5 values less than (6249999999999),

```

```

        PARTITION PART6 values less than (744999999999999),
        PARTITION PART7 values less than (874999999999999),
        PARTITION PART8 values less than (maxvalue));

CREATE UNIQUE INDEX D1T305P0 ON D1_INIT_MSRMT_DATA_CHAR
(
    INIT_MSRMT_DATA_ID, CHAR_TYPE_CD, SEQ_NUM
) TABLESPACE <Tablespace_Name> LOCAL COMPRESS 1;

ALTER TABLE D1_INIT_MSRMT_DATA_CHAR ADD CONSTRAINT D1T305P0 PRIMARY
KEY (INIT_MSRMT_DATA_ID, CHAR_TYPE_CD, SEQ_NUM) USING INDEX
TABLESPACE <Tablespace_Name>;

CREATE INDEX D1T305S1 ON D1_INIT_MSRMT_DATA_CHAR
(
    SRCH_CHAR_VAL
) TABLESPACE <Tablespace_Name> COMPRESS 1;

```

D1_INIT_MSRMT_DATA_K

```

CREATE TABLE D1_INIT_MSRMT_DATA_K
(
    INIT_MSRMT_DATA_ID CHAR(14 BYTE),
    ENV_ID                NUMBER(6,0) NOT NULL ENABLE,
    CONSTRAINT D1T314P0 PRIMARY KEY (INIT_MSRMT_DATA_ID, ENV_ID) ENABLE
)
ORGANIZATION INDEX    TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (INIT_MSRMT_DATA_ID)
(PARTITION PART1 values less than (124999999999999),
PARTITION PART2 values less than (249999999999999),
PARTITION PART3 values less than (374999999999999),
PARTITION PART4 values less than (499999999999999),
PARTITION PART5 values less than (624999999999999),
PARTITION PART6 values less than (744999999999999),
PARTITION PART7 values less than (874999999999999),
PARTITION PART8 values less than (maxvalue)) compress 1;

```

D1_INIT_MSRMT_DATA_LOG

```

CREATE TABLE D1_INIT_MSRMT_DATA_LOG
(
    INIT_MSRMT_DATA_ID CHAR(14 BYTE),
    SEQNO                NUMBER(5,0),
    BO_STATUS_CD         CHAR(12 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    BO_STATUS_REASON_CD VARCHAR2(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_TYPE_CD         CHAR(8 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL             CHAR(16 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    ADHOC_CHAR_VAL       VARCHAR2(254 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK1         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK2         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK3         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK4         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    CHAR_VAL_FK5         VARCHAR2(50 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    DESCRLONG            VARCHAR2(4000 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    LOG_DTTM DATE NOT NULL ENABLE,
    LOG_ENTRY_TYPE_FLG CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    MESSAGE_CAT_NBR      NUMBER(5,0) DEFAULT 0 NOT NULL ENABLE,
    MESSAGE_NBR          NUMBER(5,0) DEFAULT 0 NOT NULL ENABLE,
    USER_ID              CHAR(8 BYTE) DEFAULT ' ' NOT NULL ENABLE,

```

```

        VERSION                NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE
) TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (INIT_MSRMT_DATA_ID)
(PARTITION PART1 values less than (12499999999999),
PARTITION PART2 values less than (24999999999999),
PARTITION PART3 values less than (37499999999999),
PARTITION PART4 values less than (49999999999999),
PARTITION PART5 values less than (62499999999999),
PARTITION PART6 values less than (74499999999999),
PARTITION PART7 values less than (87499999999999),
PARTITION PART8 values less than (maxvalue)) ;

CREATE UNIQUE INDEX D1T306P0 ON D1_INIT_MSRMT_DATA_LOG
(
    INIT_MSRMT_DATA_ID, SEQNO
) TABLESPACE <Tablespace_Name>LOCAL COMPRESS 1;

ALTER TABLE D1_INIT_MSRMT_DATA_LOG ADD CONSTRAINT D1T306P0 PRIMARY KEY
(INIT_MSRMT_DATA_ID, SEQNO) USING INDEX TABLESPACE <Tablespace_Name>;

```

D1_INIT_MSRMT_DATA_LOG_PARM

```

CREATE TABLE D1_INIT_MSRMT_DATA_LOG_PARM
(
    INIT_MSRMT_DATA_ID CHAR(14 BYTE),
    SEQNO                NUMBER(5,0),
    PARM_SEQ             NUMBER(3,0),
    MSG_PARM_VAL         VARCHAR2(30 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    MSG_PARM_TYP_FLG     CHAR(4 BYTE) DEFAULT ' ' NOT NULL ENABLE,
    VERSION              NUMBER(5,0) DEFAULT 1 NOT NULL ENABLE
) TABLESPACE <Tablespace_Name>
ENABLE ROW MOVEMENT
PARTITION BY RANGE (INIT_MSRMT_DATA_ID)
(PARTITION PART1 values less than (12499999999999),
PARTITION PART2 values less than (24999999999999),
PARTITION PART3 values less than (37499999999999),
PARTITION PART4 values less than (49999999999999),
PARTITION PART5 values less than (62499999999999),
PARTITION PART6 values less than (74499999999999),
PARTITION PART7 values less than (87499999999999),
PARTITION PART8 values less than (maxvalue)) ;

CREATE UNIQUE INDEX D1T307P0 ON D1_INIT_MSRMT_DATA_LOG_PARM
( INIT_MSRMT_DATA_ID, SEQNO, PARM_SEQ) TABLESPACE <Tablespace_Name>
LOCAL COMPRESS 1;

ALTER TABLE D1_INIT_MSRMT_DATA_LOG_PARM ADD CONSTRAINT D1T307P0
PRIMARY KEY (INIT_MSRMT_DATA_ID, SEQNO, PARM_SEQ) USING INDEX
TABLESPACE <Tablespace_Name>;

```

Compression Recommendations

In general the recommendation is to do QUERY HIGH compression (a part of hybrid columnar compression) on Exadata.

For Final Measurement table (D1_MSRMT) keep current table partition uncompressed. The rest of the older partitions will be compressed based on QUERY HIGH compression.

For Initial Measurement Data table (D1_INIT_MSMRT_DATA) keep CLOBs always in securefile and Medium Compressed. In addition, keep current table partition uncompressed. the rest of the older partitions will be compressed based on QUERY HIGH compression.

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.

Load data into the uncompressed table partitions using a conventional load and then when data is loaded use CTAS operation to load into a temporary heap table. Then truncate the original partition. Alter original partition into HCC compressed and then partition exchange this with the temporary heap table.

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