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Preface

This guide provides instructions for installing and maintaining the database for Oracle Utilities Customer Care and Billing.

Audience

Oracle Utilities Customer Care and Billing Database Administrator's Guide is intended for database administrators who will be installing and maintaining the database for Oracle Utilities Customer Care and Billing.

Related Documents

For more information, refer to these Oracle documents:

Installation Guides and Release Notes

- Oracle Utilities Customer Care and Billing V2.5.0 Release Notes
- Oracle Utilities Customer Care and Billing V2.5.0 Quick Install Guide
- Oracle Utilities Customer Care and Billing V2.5.0 Installation Guide
- Oracle Utilities Customer Care and Billing V2.5.0 Database Administrator's Guide
- Oracle Utilities Customer Care and Billing V2.5.0 Optional Product Installation Guide
- Oracle Utilities Application Framework V4.3.0.0 Release Notes

Administration and Business Process Guides

- Oracle Utilities Customer Care and Billing V2.5.0 Administration Guide
- Oracle Utilities Customer Care and Billing V2.5.0 Business Process Guide
- Oracle Utilities Application Framework V4.3.0.0 Administration Guide
- Oracle Utilities Application Framework V4.3.0.0 Business Process Guide

Supplemental Documents

- Oracle Utilities Customer Care and Billing V2.5.0 Server Administration Guide
- Oracle Utilities Customer Care and Billing V2.5.0 Security 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:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>boldface</strong></td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td><code>monospace</code></td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>
Chapter 1

Database Overview

This section provides an overview of the Oracle Utilities Customer Care and Billing database, including:

- Supported Database Platforms
- Database Maintenance Rules
Supported Database Platforms

This section defines the platforms on which Oracle Utilities Customer Care and Billing is verified to operate.

Supported Platforms Summary Table

Oracle Utilities Customer Care and Billing is supported on the following platforms:

<table>
<thead>
<tr>
<th>Platform</th>
<th>Database Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX 7.1 TL1 (POWER 64-bit)</td>
<td>Oracle Database Server 12.1.0.1+ (64-bit)</td>
</tr>
<tr>
<td>Oracle Linux 6.5 or 7.0 (64-bit)</td>
<td>Oracle Database Server 12.1.0.1+ (64-bit)</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 6.5 or 7.0 (64-bit)</td>
<td>Oracle Database Server 12.1.0.1+ (64-bit)</td>
</tr>
<tr>
<td>Oracle Solaris 11 (SPARC 64-bit)</td>
<td>Oracle Database Server 12.1.0.1+ (64-bit)</td>
</tr>
<tr>
<td>Windows Server 2012 (64-bit)</td>
<td>Oracle Database Server 12.1.0.1+ (64-bit)</td>
</tr>
<tr>
<td>HP-UX 11.31 (64-bit)</td>
<td>Oracle Database Server 12.1.0.1+ (64-bit)</td>
</tr>
</tbody>
</table>

* Oracle Utilities Customer Care and Billing is tested and supported on the versions of Oracle Linux specified. Because Oracle Linux is 100% userspace-compatible with Red Hat Enterprise Linux, Oracle Utilities Customer Care and Billing also is supported on Red Hat Enterprise Linux for this release.

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

Refer to My Oracle Support for additional details.
Support for Software Patches and Upgrades

Due to the ongoing nature of software improvement, vendors will issue patches and service packs for the operating systems, application servers and database servers on top of specific versions that Oracle Utilities Customer Care and Billing has been tested with.

If it is necessary to apply an upgrade, please do so in a test environment that is running on the same platform as your production environment prior to updating the Oracle Utilities Customer Care and Billing production environment.

The exception from this rule is Hibernate software version 4.1 GA. This version should not be upgraded.

Always contact Oracle Utilities Customer Care and Billing support prior to applying vendor updates that do not guarantee backward compatibility.
Database Maintenance Rules

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

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

The installation 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 2.5.0 Database

This section provides the instructions for installing or upgrading the Oracle Utilities Customer Care and Billing database. This section includes:

- Installation Overview
- Oracle Database Installation
Installation Overview

Refer to Supported Database Platforms for information about the supported platforms on which Oracle Utilities Customer Care and Billing is verified to operate.

The following types of installation are available for Oracle Utilities Customer Care and Billing:

- **Initial Install** — a database with no demo data.
- **Upgrade Install** — a database upgrade to version 2.5.0 from versions 1.5.10, 1.5.15, 1.5.20, 2.0.5, 2.1.0, 2.2.0, 2.2.0.10, 2.3.1.10, 2.4.0.0, 2.4.0.1 and 2.4.0.2.
- **Demo Install** — a database populated with demo data.

The database installation requires a supported version of the Java Development Kit Version 6.0 Update 20 or later and Oracle 12.1.0.1 32-bit client installed on the Windows 64-bit or 32-bit desktop where the install package is staged and run from.

Creating the Database

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

1. Create the database using the Database Configuration Assistant (DBCA). Refer to the article Master Note: Overview of Database Configuration Assistant (DBCA) (Doc ID 1488770.1) on My Oracle Support for more information. Make sure to set character set for database as AL32UTF8.

   Note: While prior versions of the product have included the cdxdba programs (cdxdba.plx for UNIX or CDXDBA.exe for Windows), this is no longer supported going forward, and the Database Configuration Assistant should be used instead.

2. Enable Mandatory Software Options
   - Oracle Spatial OR Oracle Locator
   - Oracle Text

3. Run following SQL to make sure it is successful

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

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

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

5. Create required roles as follows:

   CREATE ROLE CIS_USER;
   CREATE ROLE CIS_READ;

6. Create users as follows:

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

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

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

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

7. Review the Storage.xml file under the FW43001\Install-Upgrade folder prior to an initial
install or upgrade install. This file allocates all base tables and indexes to the default tablespace
CISTS_01 and the required users and roles. Information in this file is used by ORADBI while
installing the Oracle Utilities Customer Care and Billing database objects. Refer to Updating
Storage.xml for more details on updating this file.

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

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

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

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

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

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

This section describes how to install the Oracle Database for Oracle Utilities Customer Care and Billing 2.5.0. It contains the following topics:

- Database Scripts and Utilities
- Initial Install, or Installing Version 2.5.0 for the First Time
- Upgrade Install
- Demo Install

Note: The installation tools outlined in this guide run on Windows and UNIX/Linux only. Please refer to Supported Database Platforms for more information on supported platforms.

Database Scripts and Utilities

Follow these steps before you begin installing the database:

1. Copy the CCB-V2.5.0.0.0-Oracle-Database-MultiplatForm directory to your local machine.
   The database folder contains several files that will be referred to in the installation process.
2. Set up a Microsoft Windows desktop with the Oracle Client installed.

Initial Install, or Installing Version 2.5.0 for the First Time

This section describes an initial installation of the v2.5.0 database:

Note: You must have a supported version of the Java Development Kit installed on the Windows desktop where you stage and run the database installation package. Refer to the Oracle Utilities Customer Care and Billing Installation Guide for more information.

This section includes:

- Copying and Decompressing Install Media
- Database Creation
- Installing the CISADM Schema

Copying and Decompressing Install Media

To copy and decompress the Oracle Utilities Customer Care and Billing database:

1. Download the Oracle Utilities Customer Care and Billing v2.5.0 Oracle database from the Oracle Software Delivery Cloud.
2. Copy the CCB-V2.5.0.0.0-Oracle-Database-MultiplatForm directory to your local machine.
   This file contains all the database components required to install the Oracle Utilities Customer Care and Billing database.
**Database Creation**

**Note:** You must have Oracle Database Server 12.1.0.1 or above installed on your machine in order to create the database. This step is not required if you are performing a database upgrade from a previous version of Oracle Utilities Customer Care and Billing.

**Creating the Database on UNIX**

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

Refer to the article *Master Note: Overview of Database Configuration Assistant (DBCA) (Doc ID 1488770.1)* on My Oracle Support for more information. Make sure to set character set for database as AL32UTF8.

Refer to *Creating the Database* for steps to create the database.

**Creating the Database on Windows**

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

Refer to the article *Master Note: Overview of Database Configuration Assistant (DBCA) (Doc ID 1488770.1)* on My Oracle Support for more information. Make sure to set character set for database as AL32UTF8.

Refer to *Creating the Database* for steps to create the database.

**Installing the CISADM Schema**

You will install the Oracle Utilities Application Framework V4.3.0.0.1 prior to Oracle Utilities Customer Care and Billing 2.5.0. The files for Oracle Utilities Application Framework installation are located in the FW\FW43001 folder. The installation process will prompt you for the following information:

- The target database name in which the product is to be installed.
- 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. (for example, CISUSER). The application will access the database as this user.
- 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. The application will access the database as this user. (for example, CIS_USER).
- A database role with read-only privileges to the objects in the application schema. (for example, CIS_READ).
- Location for jar files. (The Jar files are bundled with the database package.)
- Java Home (For example, C:\Java\jdk1.7.0_21)

**Installing the Oracle Utilities Application Framework Database Component**

To install the schema for Oracle Utilities Application Framework 4.3.0.0.1, follow these steps:

1. Run OraDBI.exe from the ..\FW\FW43001\Install-Upgrade directory. Please run the utility from the command prompt.

   **Note:** Be sure to run OraDBI.exe from a Window 32-bit or 64-bit desktop that has the Oracle 12.1.0.1 32-bit client and Java Development Kit Version 6.0
Update 20 or later. 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>
- Password for the user (in silent mode)
- Location of Java Home: <..\jdk1.7.0_21>
- Location of UGBU Jar files: <..\FW\FW43001\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>
- Password for the user (in silent mode)
- Password for the user (in silent mode)

Installing Prerequisite Database Single Fixes

Before installing Oracle Utilities Customer Care and Billing, you must install Oracle Utilities Framework Prerequisite DB Hot Fixes.

For instructions on applying the database hot fixes, refer to section “Installing Prerequisite Patches” of the Oracle Utilities Customer Care and Billing Installation Guide.

Installing the Oracle Utilities Customer Care and Billing Database Component

To install the database component of Oracle Utilities Customer Care and Billing, follow these steps.

1. Run ORADB1.exe from the ..\CCB\Upgrade\Install-Upgrade directory. 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>
   - Password for the user (in silent mode)
   - Location of Java Home: <..\jdk1.7.0_21>
   - Location of UGBU Jar files: <..\CCB\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>
   - Password for the user (in silent mode)
   - Password for the user (in silent mode)

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).
- 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.
- OraDBI can be executed by a non-schema owner.

Post-installation Tasks

- Enable USER_LOCK Package
- Generating Database Statistics

Enable USER_LOCK Package

For inbound web services to work the USER_LOCK must be enabled at the database level. This is a one time step. If this is not already enabled please do so using the following steps.

1. Login as SYS user
2. On SQL prompt run:
   @?/rdbms/admin/userlock.sql
3. Grant permission by running the following SQL:
   grant execute on USER_LOCK to public;

Please note that grant can also be made to the database user which the Application connects to only instead of to public. For example, cisuser.

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 for Oracle Utilities Customer Care and Billing, including:

- Copying and Decompressing Install Media
- Upgrading the CISADM Schema to Version 2.5.0

Copying and Decompressing Install Media

To copy and decompress the Oracle Utilities Customer Care and Billing database:

1. Download the Oracle Utilities Customer Care and Billing v2.5.0.0.0 Oracle database from the Oracle Software Delivery Cloud.
2. Copy the CCB-V2.5.0.0.0-Oracle-Database-Multiplatform directory to your local machine. This file contains all the database components required to install the Oracle Utilities Customer Care and Billing database.

Upgrading the CISADM Schema to Version 2.5.0

This section assumes an existing Oracle Utilities Customer Care and Billing on top of Oracle Utilities Application Framework. The following upgrade paths are described:

- Upgrading from Version 2.4.0.2 to 2.5.0
- Upgrading from Version 2.4.0.1 to 2.5.0
- Upgrading from Version 2.4.0.0 to 2.5.0
- Upgrading from Version 2.3.1.10 to 2.5.0
- Upgrading from Version 2.2.0.10 to 2.5.0
- Upgrading from Version 2.2.0 to 2.5.0
- Upgrading from Version 2.1.0 to 2.5.0
- Upgrading from Version 2.0.5 to 2.5.0
- Upgrading from Version 1.5.20 to 2.5.0
- Upgrading from Version 1.5.10 or 1.5.15 to 2.5.0

Upgrading from Version 2.4.0.2 to 2.5.0

You must install the Oracle Utilities Application Framework version 4.3.0.0.1 prior to Oracle Utilities Customer Care and Billing 2.5.0. The files for Oracle Utilities Application Framework installation are located in the FW/FW43001 folder.

Upgrading the Database as Non-Schema Owner

The product allows Non-Schema owners to run the database upgrade.

To perform upgrade, the non-schema owner must have the following database grants:

- grant connect, CREATE SESSION to <Non-Schema owner>;
- grant select on <Schema owner>.CI_WFM to <Non-Schema owner>;
- grant select on <Schema owner>.CI_WFM_OPT to <Non-Schema owner>;

Installing the Oracle Utilities Application Framework Database Component

To install the schema for Oracle Utilities Application Framework 4.3.0.0.1, follow these steps:

1. Run ORADBI.exe from the ..\FW\FW43001\Install-Upgrade directory. Please run the utility from the command prompt.
Note: Be sure to run ORADBI.exe from a Window 32-bit or 64-bit desktop that has the Oracle 12.1.0.1 32-bit Client, 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>
- Password for the user (in silent mode)
- Location of Java Home: <..\jdk1.7.0_21>
- Location of UGBU Jar file: <..\FW\FW43001\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>
- Password for the user (in silent mode)
- Password for the user (in silent mode)

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 Single Fixes

Before installing Oracle Utilities Customer Care and Billing, you must install Oracle Utilities Framework Prerequisite DB Hot Fixes.

For instructions on applying the database hot fixes, refer to section “Installing Prerequisite Patches” of the Oracle Utilities Customer Care and Billing Installation Guide.

Installing the Oracle Utilities Customer Care and Billing Database Component

To install the database component of Oracle Utilities Customer Care and Billing, follow these steps.

1. Run ORADBI.exe from the ..\CCB\Upgrade\Install-Upgrade directory. 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>
   - Password for the user (in silent mode)
   - Location of Java Home: <..\jdk1.7.0_21>
   - Location of UGBU Jar file: <..\FW\FW43001\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>
   - Password for the user (in silent mode)
• Password for the user (in silent mode)

After setting up roles and users, the utility continues to upgrading the 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.

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.

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, password of the SYSTEM account in the database, and the name of the Oracle account that the application user will use (for example, CISUSER), and the name of the Oracle account that will be assigned read-only privileges to the application schema (for example, CISREAD).

• Verifies whether tablespace names already exist in the Storage.xml file (if not, the process will abort).

• Installs the schema, installs the system data, and configures security. Maintains upgrade log tables in the database.

• Updates release ID when the upgrade is completed successfully.

• If an error occurs while executing a SQL script or another utility, it logs and displays the error message and allows you to re-execute the current step. Log files ORADBI###.log are created in the same folder as ORADBI and contains all the SQL commands executed against the database along with the results. The log files are incremental so that the results are never overwritten. If warning messages are generated during the upgrade, ORADBI prompts the user at the end of the process. Users should check the log files to verify the warning messages. Warning messages are only alerts and do not necessary mean a problem exists.

• Stores the Schema owner and password in the feature configuration table. The password is stored in encrypted format.

Upgrading from Version 2.4.0.1 to 2.5.0

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 2.4.0.1 to version 2.5.0.0. The files for this upgrade are located in the following directory ..\CCB\Upgrade\Upgrade-From-v2400-v2401\.

1. Apply Framework version 4.2.0 Service Pack 2 and Customer Care and Billing 2.4.0 Service Pack 2 from Step_1_Upgrade_to_v2402 folder:
   a. Apply Framework version 4.2.0 Service Pack 2 by running ORADBI.exe from the \01_FW420_SP2 folder.
   b. Apply Framework version 4.2.0 Service Pack 2 Rollup by running CDXPATCH.exe from the \02_FW420_SP2_Rollup folder.
   c. Execute the CCB2402_Trim_SRCH_CHAR_VAL.sql script from \03_CCB_TRIM_SRCH_VAL folder.

1. Login as CISADM user.

2. On SQL prompt, run CCB2402_Trim_SRCH_CHAR_VAL.sql
   @CCB2402_Trim_SRCH_CHAR_VAL.sql
   This will generate a file called CCB_TRIM_SRCH_CHAR_VAL.sql

3. Run the generated CCB_TRIM_SRCH_CHAR_VAL.sql script
   @CCB_TRIM_SRCH_CHAR_VAL.sql
d. Apply Customer Care and Billing 2.4.0 Service Pack 2 by running the ORADBI.exe from the \04_CCB240_SP2 folder.

e. Execute the FW4202_Trim_SRCH_CHAR_VAL.sql script from \05_FW_TRIM_SRCH_VAL folder.

1. Login as CISADM user.
2. On SQL prompt, run FW4202_Trim_SRCH_CHAR_VAL.sql
   @FW4202_Trim_SRCH_CHAR_VAL.sql
   This will generate a file called TRIM_SRCH_CHAR_VAL.sql

3. Run the generated TRIM_SRCH_CHAR_VAL.sql script
   @TRIM_SRCH_CHAR_VAL.sql

f. Enable USER_LOCK Package:

   For In-bound web services to work the USER_LOCK must be enabled at the database level. This is a one time step. If this is not already enabled please do so using the following steps.

1. Login as SYS user. On SQL prompt run:
   @?/rdbms/admin/userlock.sql
2. Grant permission by running the following SQL:
   grant execute on USER_LOCK to public;
   Please note that grant can also be made to the database user which the Application connects to only instead of to public. For example, cisuser.

2. Upgrade to Customer Care and Billing 2.5.0.0.0 by following the steps in the Section Upgrading from Version 2.4.0.2 to 2.5.0.

**Upgrading from Version 2.4.0.0 to 2.5.0**

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 2.4.0.0 to version 2.5.0. The files for this upgrade are located in the following directory
\CCB\Upgrade\Upgrade-From-v2400-v2401\n
1. Apply Framework version 4.2.0 Service Pack 2 and Customer Care and Billing 2.4.0 Service Pack 2 from Step_1_Upgrade_to_v2402 folder:

   a. Apply Framework version 4.2.0 Service Pack 2 by running ORADBI.exe from the \01_FW420_SP2 folder.

   b. Apply Framework version 4.2.0 Service Pack 2 Rollup by running CDXPATCH.exe from the \02_FW420_SP2_Rollup folder.

   c. Execute the CCB2402_Trim_SRCH_CHAR_VAL.sql script from \03_CCB_TRIM_SRCH_VAL folder.

1. Login as CISADM user.
2. On SQL prompt, run CCB2402_Trim_SRCH_CHAR_VAL.sql
   @CCB2402_Trim_SRCH_CHAR_VAL.sql
   This will generate a file called CCB_TRIM_SRCH_CHAR_VAL.sql

3. Run the generated CCB_TRIM_SRCH_CHAR_VAL.sql script
   @CCB_TRIM_SRCH_CHAR_VAL.sql

   d. Apply Customer Care and Billing 2.4.0 Service Pack 2 by running the ORADBI.exe from the \04_CCB240_SP2 folder.
1. Execute the FW4202_Trim_SRCH_CHAR_VAL.sql script from \05_FW_TRIM_SRCH_VAL folder.

2. Login as CISADM user.

3. On SQL prompt, run FW4202_Trim_SRCH_CHAR_VAL.sql
   @FW4202_Trim_SRCH_CHAR_VAL.sql
   This will generate a file called TRIM_SRCH_CHAR_VAL.sql

4. Run the generated TRIM_SRCH_CHAR_VAL.sql script
   @TRIM_SRCH_CHAR_VAL.sql

5. Enable USER_LOCK Package:
   For In-bound web services to work the USER_LOCK must be enabled at the database level. This is a one time step. If this is not already enabled please do so using the following steps.
   1. Login as SYS user. On SQL prompt run:
      @?/rdbms/admin/userlock.sql
   2. Grant permission by running the following SQL:
      grant execute on USER_LOCK to public;
      Please note that grant can also be made to the database user which the Application connects to only instead of to public. For example, cisuser.

2. Upgrade to Oracle Utilities Customer Care and Billing 2.5.0 by following the steps in the Section Upgrading from Version 2.4.0.2 to 2.5.0.

Upgrading from Version 2.3.1.10 to 2.5.0
To upgrade Oracle Utilities Customer Care and Billing version 2.3.1.10 to version 2.5.0, you must install the Oracle Utilities Application Framework version 4.3.0.0.1 prior to Oracle Utilities Customer Care and Billing 2.5.0. The files for the Oracle Utilities Application Framework 4.3.0.0.1 installation are located in the FW43001 folder.

Upgrading the Database as Non-Schema Owner
The product allows Non-Schema owners to run the database upgrade.
To perform upgrade, the non-schema owner must have the following database grants:

- grant connect, CREATE SESSION to <Non-Schema owner>;
- grant select on <Schema owner>.CI_WFM to <Non-Schema owner>;
- grant select on <Schema owner>.CI_WFM_OPT to <Non-Schema owner>;

Installing the Oracle Utilities Application Framework 4.3.0.0.1 Database Component
To install the schema for Oracle Utilities Application Framework 4.3.0.0.1, follow these steps:

1. Run ORADBI.exe from the ..\FW\FW43001\Install-Upgrade directory. Please run the utility from the command prompt.
   
   **Note:** Be sure to run OraDBI.exe from a Window 32-bit or 64-bit desktop that has the Oracle 12.1.0.1 32-bit client 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>
- Password for the user (in silent mode)
Installing the Version 2.5.0 Database

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Installing Prerequisite Database Single Fixes

Before installing Oracle Utilities Customer Care and Billing, you must install Oracle Utilities
Framework Prerequisite DB Hot Fixes.

For instructions on applying the database hot fixes, refer to section “Installing Prerequisite
Patches” of the Oracle Utilities Customer Care and Billing Installation Guide.

Optional: Execute CCB2401_BpSchema2.SQL

This step is recommended to improve the performance of the upgrade process.

Before executing this script, please verify the script and make a note that these operations are
long-running and the script specifies a default level of parallelism that can be tailored to the
implementation's hardware. Also, note that CCB2401_BpSchema2.SQL can be executed well in
advance of the upgrade to CCB 2.4.0.2 as these changes are compatible with Oracle Utilities
Customer Care and Billing 2.2.0 and 2.3.1.

1. Open a command prompt.
2. Change directory to ..\CCB\Upgrade\Install-Upgrade.
3. Connect to SQLPLUS.
4. Execute the file as follows:
   
   @CCB2401_BpSchema2.SQL

Optional: Execute CCB2401_BpSchema3.SQL

This step is recommended to improve the performance of the upgrade process.

Before executing this script, please verify the script and make a note that these operations are
long-running and the script specifies a default level of parallelism that can be tailored to the
implementation's hardware.

1. Open a command prompt.
2. Change directory to ..\CCB\Upgrade\Install-Upgrade.
3. Connect to SQLPLUS.
4. Execute the file as follows:
   
   @CCB2401_BpSchema3.SQL

Installing the Oracle Utilities Customer Care and Billing Database Component

To install the database component of Oracle Utilities Customer Care and Billing, follow these
steps.

1. Run ORADBI.exe from the ..\CCB\Upgrade\Install-Upgrade directory. The utility prompts
   you to enter values for the following parameters:

   - Location of Java Home: <..\jdk1.7.0_21>
   - Location of UGBU Jar files: <..\CCB\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>
   - Password for the user (in silent mode)
   - Password for the user (in silent mode)
• Name of the target database: <DB NAME>
• Name of the owner of the Database Schema: <CISADM>
• Password for the user (in silent mode)
• Location of Java Home: <..\jdk1.7.0_21>
• Location of UGBU Jar files: <..\FW43001\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>
• Password for the user (in silent mode)
• Password for the user (in silent mode)

After setting up roles and users, the utility continues to upgrading the 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, password of the SYSTEM account in the database, and the name of the Oracle account that the application user will use (for example, CISUSER), and the name of the Oracle account that will be assigned read-only privileges to the application schema (for example, CISREAD).

• Verifies whether tablespace names already exist in the Storage.xml file (if not, the process will abort).

• Installs the schema, installs the system data, and configures security. Maintains upgrade log tables in the database.

• Updates release ID when the upgrade is completed successfully.

• If an error occurs while executing a SQL script or another utility, it logs and displays the error message and allows you to re-execute the current step. Log files ORADBI###.log are created in the same folder as ORADBI and contains all the SQL commands executed against the database along with the results. The log files are incremental so that the results are never overwritten. If warning messages are generated during the upgrade, ORADBI prompts the user at the end of the process. Users should check the log files to verify the warning messages. Warning messages are only alerts and do not necessary mean a problem exists.

• Stores the Schema owner and password in the feature configuration table. The password is stored in encrypted format.

**Execute CCB2401_APDATA1.sql**

Before executing this script, please verify the script and make a note that these SQLs can be run in chunks across multiple sqlplus sessions in parallel. The execution process below explains how to run the script at once.

1. Open a command prompt.
2. Change directory to ..\CCB\Upgrade\Install-Upgrade
3. Connect to SQLPLUS.
4. Execute the file as follows:
Installing the upgrade script to trim the SRCH_CHAR_VAL column on the char tables

1. Login as CISADM user.
2. On SQL prompt, run FW4202_Trim_SRCH_CHAR_VAL.sql from the ..\FW42020\Install-Upgrade directory
   

This will generate a file called TRIM_SRCH_CHAR_VAL.sql

3. Run the generated TRIM_SRCH_CHAR_VAL.sql script

Enable USER_LOCK Package

For In-bound web services to work the USER_LOCK must be enabled at the database level. This is a one-time step. If this is not already enabled please do so using the following steps.

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

3. Grant permission by running the following SQL:

   grant execute on USER_LOCK to public;

Please note that grant can also be made to the database user which the Application connects to only instead of to public. For example, cisuser.

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.

Upgrading from Version 2.2.0.10 to 2.5.0

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 2.2.0.10 to version 2.5.0. The files for this upgrade are located in the following directory:

\CCB\Upgrade\Upgrade-From-v210-v220\From-v220-Upgrade-to-v2500.

1. Apply Framework version 4.2.0.2 from the \Step_2_Upgrade_to_v2402 folder:
   a. Apply Framework version 4.2.0 Service Pack 2 by running OraDBI.exe from the \01_FW420_SP2 folder.
   b. Apply Framework version 4.2.0 Service Pack 2 rollup by running CDXPATCH.exe from the \02_FW420_SP2_Rollup folder.
2. Optional: Execute CCB2401_BpSchema2.SQL

   This step is recommended to improve the performance of the upgrade process. Refer to the section “Upgrading from Version 2.3.1.10 to 2.5.0” on how to execute this step.
3. Optional: Execute CCB2401_BpSchema3.SQL

   This step is recommended to improve the performance of the upgrade process. Refer to the section “Upgrading from Version 2.3.1.10 to 2.5.0” on how to execute this step.
4. Installing the upgrade script to trim the SRCH_CHAR_VAL column on the char tables.
   Execute the CCB2402_Trim_SRCH_CHAR_VAL.sql
Refer to the section “Upgrading from Version 2.3.1.10 to 2.5.0.0” on how to execute this step.

5. Apply Customer Care and Billing 2.4.0 Service Pack 2 by running the OraDBI.exe from the \04_CCB240_SP2 folder.

6. Execute CCB2401_APDATA1.sql

   Before executing this script, please verify the script and make a note that these

   Refer to the section “Upgrading from Version 2.3.1.10 to 2.5.0.0” on how to execute this step.

7. Installing the upgrade script to trim the SRCH_CHAR_VAL column on the char tables.

   Execute the FW4202_Trim_SRCH_CHAR_VAL.sql

   Refer to the section “Upgrading from Version 2.4.0.0 to 2.5.0” on how to execute this step.

8. Enable USER_LOCK Package

   Refer to the section “Upgrading from Version 2.3.1.10 to 2.5.0” on how to execute this step.

9. Upgrade to Oracle Utilities Customer Care and Billing 2.5.0 by following the steps in the Section “Upgrading from Version 2.4.0.2 to 2.5.0”.

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Upgrading from Version 2.2.0 to 2.5.0

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 2.2.0 to version 2.5.0. The files for this upgrade are located in the following directory:

..\CCB\Upgrade\Upgrade-From-v210-v220\From-v220-Upgrade-to-v2500.

1. Apply Framework version 2.2.0 and Customer Care and Billing 2.2.0 Service Packs from the \Step_1_Apply_v220_SP10 folder:
   a. Apply Framework version 2.2.0 Service Pack 1 by running CDXDBI.exe from the \01_FW22_SP1 folder.
   b. Apply Framework version 2.2.0 Service Pack 18 by running CDXPATCH.exe from the \02_FW_220_SP18 folder.
   c. Apply Framework version 220 Service Pack 18 Rollup by running the CDXPATCH.exe from the \03_FW_220_SP18_Rollup folder.
   d. Apply Customer Care and Billing 2.2.0 Service Pack 10 by running the CDXPATCH.exe from the \04_CCB_220_SP10 folder.

2. Upgrade to Customer Care and Billing 2.5.0.0.0 by following the steps in the Section “Upgrading from Version 2.2.0.10 to 2.5.0”.

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Upgrading from Version 2.1.0 to 2.5.0

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 2.1.0 to version 2.5.0. The files for this upgrade are located in the following directory:

..\CCB\Upgrade\Upgrade-From-v210-v220\From-v210-Upgrade-to-v2500.

1. Apply the Framework 2.1.0 and Customer Care 2.1.0 current rollups from the \Step_1_Apply_210_Current_Rollup folder:
   a. Apply the Framework version 2.1.0 current rollup by running CDXPATCH.exe from the \01_FW210SP7_plus_Rollup folder.
   b. Apply the Customer Care and Billing version 2.1.0 current rollup by running CDXPATCH.exe from the \02_CCB210SP7_plus_Rollup folder.

2. Upgrade to Framework version 2.2.0 and Customer Care and Billing version 2.2.0 by running CDXDBI.exe from the \Step_2_Upgrade_to_v220\Upgrade-Install folder.

3. Apply Framework version 2.2.0 and Customer Care and Billing 2.2.0 Service Packs from the \Step_3_Apply_v220_SP10 folder.
a. Apply Framework version 2.2.0 Service Pack 1 by running CDXDBI.exe from the \01_FW22_SP1 folder.

b. Apply Framework version 2.2.0 Service Pack 18 by running CDXPATCH.exe from the \02_FW_220_SP18 folder.

c. Apply Framework version 220 Service Pack 18 Rollup by running the CDXPATCH.exe from the \03_FW_220_SP18_Rollup folder.

d. Apply Customer Care and Billing 2.2.0 Service Pack 10 by running the CDXPATCH.exe from the \04_CCB_220_SP10 folder.

4. Upgrade to Customer Care and Billing 2.5.0 by following the steps in the Section Upgrading from Version 2.2.0.10 to 2.5.0.

Upgrading from Version 2.0.5 to 2.5.0

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 2.0.5 to version 2.5.0. The files for this upgrade are located in the following directory:

..\CCB\Upgrade\Upgrade-From-v205\

1. Upgrade to Customer Care and Billing 2.1.0 by running CDXDBI.exe from \Step_1_Upgrade_to_v210\Upgrade-Install folder.

2. Apply the Framework 2.1.0 and Customer Care and Billing 2.1.0 current rollups from the \Step_2_Apply_210_Current_Rollup folder:
   a. Apply the Framework version 2.1.0 current rollup by running CDXPATCH.exe from the \01_FW210SP7_plus_Rollup folder.
   b. Apply the Customer Care and Billing version 2.1.0 current rollup by running CDXPATCH.exe from the \02_CCB210SP7_plus_Rollup folder.

3. Upgrade to Framework version 2.2.0 and Customer Care and Billing version 2.2.0 by running CDXDBI.exe from the \Step_3_Upgrade_to_v220\Upgrade-Install folder.

4. Apply Framework version 2.2.0 and Customer Care and Billing 2.2.0 Service Packs from the \Step_4_Apply_v220_SP10 folder:
   a. Apply Framework version 2.2.0 Service Pack 1 by running CDXDBI.exe from the \01_FW22_SP1 folder.
   b. Apply Framework version 2.2.0 Service Pack 18 by running CDXPATCH.exe from the \02_FW_220_SP18 folder.
   c. Apply Framework version 220 Service Pack 18 Rollup by running the CDXPATCH.exe from the \03_FW_220_SP18_Rollup folder.
   d. Apply Customer Care and Billing 2.2.0 Service Pack 10 by running the CDXPATCH.exe from the \04_CCB_220_SP10 folder.

5. Upgrade to Customer Care and Billing 2.5.0 by following the steps in the Section Upgrading from Version 2.2.0.10 to 2.5.0.

Upgrading from Version 1.5.20 to 2.5.0

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 1.5.20 to version 2.5.0. The files for this upgrade are located in the following directory:

..\CCB\Upgrade\Upgrade-From-v1.5.10-v1.5.15\

1. Apply Customer Care and Billing 1.5.20 Service Pack 1 by running CDXPATCH.exe from \Step_2_Apply_ServicePack_v15201 folder.

2. Upgrade to Customer Care and Billing 2.0.5 by executing the following steps from \Step_3_Upgrade_to_v205\Upgrade-Install folder.
a. **Pre-Install**: Run CDXDBI.exe from \01_Pre-Install Folder. During this process, Owner Flag information will be upgraded from C1 to C1 or F1 on system data.

b. **Install**: Run CDXDBI.exe from \02_Install Folder. This process will complete upgrade of rest of the system data to CCB V2.0.5.

3. Upgrade to Customer Care and Billing 2.1.0 by running CDXDBI.exe from \Step_4_Upgrade_to_v210\Upgrade-Install folder.

4. Apply the Framework 2.1.0 and Customer Care and Billing 2.1.0 current rollups from the \Step_5_Apply_210_Current_Rollup folder:
   a. Apply the Framework version 2.1.0 current rollup by running CDXPATCH.exe from the \01_FW210SP7_plus_Rollup folder.
   b. Apply the Customer Care and Billing version 2.1.0 current rollup by running CDXPATCH.exe from the \02_CCB210SP7_plus_Rollup folder.

5. Upgrade to Framework version 2.2.0 and Customer Care and Billing version 2.2.0 by running CDXDBI.exe from the \Step_6_Upgrade_to_v220\Upgrade-Install folder.

6. Apply Framework version 2.2.0 and Customer Care and Billing 2.2.0 Service Packs from the \Step_7_Apply_v220_SP10 folder:
   a. Apply Framework version 2.2.0 Service Pack 1 by running CDXDBI.exe from the \01_FW22_SP1 folder.
   b. Apply Framework version 2.2.0 Service Pack 18 by running CDXDBI.exe from the \02_FW_220_SP18 folder.
   c. Apply Framework version 220 Service Pack 18 Rollup by running the CDXPATCH.exe from the \03_FW_220_SP18_Rollup folder.
   d. Apply Customer Care and Billing 2.2.0 Service Pack 10 by running the CDXPATCH.exe from the \04_CCB_220_SP10 folder.

7. Upgrade to Oracle Utilities Customer Care and Billing 2.5.0 by following the steps in the Section Upgrading from Version 2.2.0.10 to 2.5.0.

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**Upgrading from Version 1.5.10 or 1.5.15 to 2.5.0**

This section describes the steps for upgrading Oracle Utilities Customer Care and Billing version 1.5.10 or 1.5.15 to version 2.5.0. The files for this upgrade are located in the following directory:

```
..\CCB\Upgrade\Upgrade-From-v1.5.10-v1.5.15\
```

1. Upgrade to Customer Care and Billing 1.5.20 by executing the steps below from \Step_1_Upgrade_to_v1520\Upgrade-Install folder.

   a. **Pre-Install Steps**

      The clean-up scripts for each task consist of a "select" SQL and a "delete" SQL script. The "select" SQL script when executed will display the data that will be deleted by the "delete" SQL script. All the clean-up scripts spool their results in output files that have same names as the scripts but with an ".out" extension.

      To execute these scripts, users must log in as a database user with delete privileges on the CC&B schema using SQLPLUS.

      1. Open a command prompt.
      2. Change directory to ..\01_Pre-Install Folder.
      3. Connect to SQLPLUS.
      4. Execute the file as follows:

         @ delete_mdf1.sql.sql
         @ delete_tddrl.sql
@ delete_tdsrt.sql
@ delete_tde.sql

Users must “commit” the data cleanup transaction explicitly and roll it back if the script fails
for some reason.

The following scripts are included in the \01_Pre-Install Folder:

- select_mdfl.sql and delete_mdfl.sql
- select_tddrl.sql and delete_tddrl.sql
- select_tdsrt.sql and delete_tdsrt.sql
- select_tde.sql and delete_tde.sql

After completion of this follow the Install steps below:

b. **Install Steps**

   Upgrade to Customer Care and Billing version 1.5.20 by running CDXDBI.exe from
   \02_Install Folder.

c. **Post-Install Steps**

   The following steps are included in the post-install process:

   **Sequence synchronization**

   In release 1.4.5, two new sequences CI_MRSTGUPID_SEQ, CI_NTUPID_SEQ were added to ID the primary key columns of CI_MR_STAGE_UP and CI_NT_UP tables. Because these tables existed in previous versions of CC&B, we must adjust the "last number" value of the new sequences to either an existing sequence that you have already been using for the same purpose or the maximum value of the primary key column of the table(s). If you have already set these sequences in Release 1.4.5 or later, skip this step and continue from the next step (if any).

   Following are the steps involved in the adjust sequences process:

   1. Execute the AdjustSequences.bat utility file under \03_Post-Install folder, by double-clicking it or running it from command line. The utility prompts you to enter values for following parameters:

       Enter the username that owns the CC&B schema (e.g. CISADM):
       Enter the password for the CC&B schema owner:
       Enter the name of the Oracle Database:

   2. The utility connects to the database and prompts you to continue the processing.

   3. The utility checks for the two new sequences in the database and for each sequence, prompts you to enter the name of an existing sequence that you have already been using to ID the primary key column of its corresponding table. You can press Enter if you are not using any existing sequence (the utility sets its value to the maximum value of the primary key in that case).

   If you choose to adjust a new sequence to an existing sequence, the utility sets the new sequence to the current "last number" value of the existing sequence, drops the existing sequence, and creates a synonym for the dropped sequence. This way the existing sequence is replaced with a CC&B sequence without breaking any existing code that may be referring to the existing sequence.

   4. After sequences are adjusted, the utility reconfigures the security in the database and prompts you to enter the values for following parameters:

       Enter the Oracle user that owns the schema (e.g. CISADM):
       Enter the password for the CC&B schema:
Oracle Database Installation

Installing the Version 2.5.0 Database

2. Enter a comma-separated list of Oracle users in which synonyms need to be created (e.g. cisuser,cisread):

3. Enter the name of the Oracle Database:

This completes the adjust sequences process. The process generates a log file (AdjustSequences.log). You can review the log for the actions performed and any errors that may have occurred during the process.

2. Apply Customer Care and Billing 1.5.20 Service Pack 1 by running CDXPATCH.exe from \Step_2_Apply_ServicePack_v15201 folder.

3. Upgrade to Customer Care and Billing 2.0.5 by executing the following steps from \Step_3_Upgrade_to_v205\Upgrade-Install folder:
   a. **Pre-Install:** Run CDXDBI.exe from \01_Pre-Install Folder. During this process, Owner Flag information will be upgraded from CI to C1 or F1 on system data.
   b. **Install:** Run CDXDBI.exe from \02_Install Folder. This process will complete upgrade of rest of the system data to C&C&B V2.0.5.

4. Upgrade to Customer Care and Billing 2.1.0 by running CDXDBI.exe from \Step_4_Upgrade_to_v210\Upgrade-Install folder.

5. Apply the Framework 2.1.0 and Customer Care and Billing 2.1.0 current rollups from the \Step_5_Apply_210_Current_Rollup folder:
   a. Apply the Framework version 2.1.0 current rollup by running CDXPATCH.exe from the \01_FW210SP7_plus_Rollup folder.
   b. Apply the Customer Care and Billing version 2.1.0 current rollup by running CDXPATCH.exe from the \02_CCB210SP7_plus_Rollup folder.

6. Upgrade to Framework version 2.2.0 and Customer Care and Billing version 2.2.0 by running CDXDBI.exe from the \Step_6_Upgrade_to_v220\Upgrade-Install folder.

7. Apply Framework version 2.2.0 and Customer Care and Billing 2.2.0 Service Packs from the \Step_7_Apply_v220_SP10 folder:
   a. Apply Framework version 2.2.0 Service Pack 1 by running CDXDBI.exe from the \01_FW22_SP1 folder.
   b. Apply Framework version 2.2.0 Service Pack 18 by running CDXPATCH.exe from the \02_FW_220_SP18 folder.
   c. Apply Framework version 220 Service Pack 18 Rollup by running the CDXPATCH.exe from the \03_FW_220_SP18_Rollup folder.
   d. Apply Customer Care and Billing 2.2.0 Service Pack 10 by running the CDXPATCH.exe from the \04_CCB_220_SP10 folder.

8. Upgrade to Oracle Utilities Customer Care and Billing 2.5.0 by following the steps in the Section Upgrading from Version 2.2.0.10 to 2.5.0.
Demo Install

This section describes how to install the demo database components for Oracle Utilities Customer Care and Billing, including:

- Copying and Decompressing Install Media
- Creating the Database
- Importing the Demo Dump File
- Configuring Security

Copying and Decompressing Install Media

To copy and decompress the Oracle Utilities Customer Care and Billing database:

1. Download the Oracle Utilities Customer Care and Billing v2.5.0 Oracle database from the Oracle Software Delivery Cloud.
2. Copy the CCB-V2.5.0.0.0-Oracle-Database-Multiplatform directory to your local machine.

The database folder contains several files that will be referred to in the installation process.

Creating the Database

Note: You must have Oracle Database Server 12.1.0.1+ Enterprise Edition installed on your machine in order to create the database.

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

Creating the Database on UNIX

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

Refer to the article Master Note: Overview of Database Configuration Assistant (DBCA) (Doc ID 1488770.1) on My Oracle Support for more information. Make sure to set character set for database as AL32UTF8.

Refer to Creating the Database for steps to create the database.

Creating the Database on Windows

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

Refer to the article Master Note: Overview of Database Configuration Assistant (DBCA) (Doc ID 1488770.1) on My Oracle Support for more information. Make sure to set character set for database as AL32UTF8.

Refer to Creating the Database for steps to create the database.

Importing the Demo Dump 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:

   NOTE: Ensure the ./CCB/Demo/exp_demo.dmp.gz file is extracted and available in data_pump_dir's location before running the below import command.

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

Configuring Security
The configuration utility and scripts are located in the \CCB\Security folder. To configure security, follow these steps:

1. Execute the OraGenSec.exe utility.

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

   The script will prompt you for parameter values:

   - Enter the application read-only user or Schema Owner in the database (e.g. CISADM or CISREAD): CISADM
   - Enter the password for the user: CISADM
   - Enter the name of the Oracle Database: database name
   - Enter a comma-separated list of Oracle users in which synonyms need to be created (e.g. cisuser,cisread): cisuser,cisread
   - Select the following options: A
     - (A/a): Generate security for All objects in the Database (e.g. A or a for all objects)
     - (O/o): Generate security for specific Objects inputted in this terminal (e.g. CI_ACCT,CI_ACCT_K)
     - Generate security for specific objects generated from an input File (e.g. Security_Objects.txt)

   The utility configures security for the application owner schema objects.

   If you run Oragensec in Interactive Mode (without using the command line options), it will by default grant permissions to CIS_USER and CIS_READ Role. If you prefer to use site-specific roles then execute Oragensec after providing command line options.

   For example:

   `(OraGenSec.exe -d [Schema Owner],[Schema Owner's Password],[Database Name] -u [Read/Write User],[Read Only User] -r [Read Only Role],[Read Write Role] -a A -l [Logfile Name])`
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. For customer modification, CM must prefix the column name. The following conventions apply when you define special types of columns in the database.
• Use the suffix **FLG** to define a lookup table field. Flag columns must be CHAR(4). Choose lookup field names carefully as these column names are defined in the lookup table (CI_LOOKUP_FLD) and must be prefixed by the product owner flag value.

• Use the suffix **CD** to define user-defined codes. User-defined codes are primarily found as the key column of the admin tables.

• Use the suffix **ID** to define system assigned key columns.

• Use the suffix **SW** to define Boolean columns. The valid values of the switches are 'Y' or 'N'. The switch columns must be CHAR(1)

• Use the suffix **DT** to define Date columns.

• Use the suffix **DTTM** to define Date Time columns.

• Use the suffix **TM** to define Time columns.

Some examples are:

• ADJ_STATUS_FLG

• CAN_RSN_CD

**Indexes**

Index names are composed of the following parts:

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

- **OF** - Owner Flag. The standard is to use the two characters of the product's owner flag. Note that there may be some older indexes that use only the first character of the owner flag. For client specific implementation of index, use CM for Owner Flag. If implementation creates a CM Index on table-columns for which the base product already provides an index, then the CM Index will be overridden by the based index.

- **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

• XT206C2

• 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:**
Database Object Standard

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

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

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

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

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

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

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

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

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

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

Sequence

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

1. If the Sequence is used for a specific table, then use the following sequence name:
   `[OF][C/M/T]NNN_SEQ`
   - OF stands for Owner Flag. For example, for Framework its F1. Other examples are M1,C1,D1,D2, 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 e.g: FIT220_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, for framework is F1. Other examples are M1,C1,D1,D2 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, for framework is F1. Other examples are M1,C1,D1,D2, 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

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

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

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

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

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

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

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

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

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

• When a predefined default value is not available, set the default value of Non-null CHAR or VARCHAR columns to blank except the primary key columns.

• When a predefined default value is not available, set the default value Non-null Number columns to 0 (zero) except the primary key columns.

• No database default values should be assigned to the Non Null Date, Time, and Timestamp columns.

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

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

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

The Version column is used to for optimistic concurrency control in the application code. Add the Version column to all tables that are maintained by a Row Maintenance program.
Chapter 4

Database Implementation Guidelines

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

- Configuration Guidelines
- Oracle Database Implementation Guidelines
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. This section includes:

- Index
- Table Partitioning Recommendations
- Transparent Data Encryption Recommendations
- Data Compression Recommendations
- Database Vault Recommendations
- Oracle Fuzzy Search Support
- Information Lifecycle Management (ILM) and Data Archiving Support
- Storage Recommendations
- Database Configuration Recommendations
- Database Syntax
- Database Initialization Parameters

Index

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

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

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.

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

Table Partitioning Recommendations

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

Transparent Data Encryption Recommendations

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

Please consider the following when implementing TDE:

- Create a wallet folder to store the master key. By default, the wallet folder should be created under $ORACLE_BASE/admin/<sid>.
- The wallet containing the master key can be created using the following command:
  ```sql
  alter system set encryption key authenticated by "keypasswd"
  ```
- The wallet can be closed or opened using the following commands:
  ```sql
  alter system set wallet open identified by "keypasswd";
  alter system set wallet close;
  ```
- Column level encryption can be achieved using the following commands:
  ```sql
  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:
  ```sql
  Create tablespace <tablespace_name> logging datafile '<datafile location>' size <initial size> reuse autoextend on next <next size> maxsize unlimited extent management local uniform size <uniform size> encryption using 'AES128' default storage(encrypt)
  ```
- Indexed columns can only be encrypted using the NO SALT Option. Salt is a way to strengthen the security of encrypted data. It is a random string added to the data before it is encrypted, causing repetition of text in the clear to appear different when encrypted.

## Data Compression Recommendations

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

### Exadata Hardware

For Exadata hardware the compression recommendations are:

- For high volume tables, keep the current table partition uncompressed. All of the older partitions will be compressed based on QUERY HIGH compression.
- For high volume tables with CLOBs ensure to 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

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

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

Application user must be given DML only permissions.

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

Oracle Fuzzy Search Support

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

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

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

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

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

Information Lifecycle Management (ILM) and Data Archiving Support

The product provides support for Data Archiving based on Information Lifecycle Management (ILM).

Information Lifecycle Management is a methodology designed to manage data over its lifecycle. The implementation of ILM involves Oracle Utilities Application Framework based processes for high volume transactional objects. These processes evaluate eligible historical records and mark them eligible/not-eligible for archiving. Records marked eligible for archiving can then be migrated to lower cost storage or archived without compromising referential integrity in the production database. These processes are highly customizable in order to cater to an implementation's particular requirements.

Detailed guidelines for setting up the configuration to support Information Lifecycle Management are outlined in the white paper “Information Lifecycle Management (ILM) and Data Archiving Solution for Oracle Utilities Customer Care and Billing” and can be downloaded from My Oracle Support (https://support.oracle.com). The whitepaper also includes best practices for the initial setup and ongoing maintenance of the information lifecycle management based solution.
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>
CREATE TABLE <Table_Name>
(
  COLUMN1 ...,
  COLUMN2 (CLOB)
);
LOB(COLUMN2) STORE AS SECUREFILE (CACHE COMPRESS);

ORGANIZATION INDEX PCTTHRESHOLD 50 OVERFLOW
LOB(COLUMN2) STORE AS SECUREFILE (ENABLE STORAGE IN ROW CHUNK CACHE COMPRESS);

Database Initialization Parameters

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

db_block_size=8192
log_checkpoint_interval=0
db_file_multiblock_read_count=8
transactions=3000
open_cursors=30000
db_writer_processes=10
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
processes=3000
dml_locks=48600
_b_tree_bitmap_plans=FALSE
Oracle Database Implementation Guidelines

This section provides specific guidelines for implementing the Oracle database.

Oracle Partitioning

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

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

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

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

Database Statistic

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

A sample syntax that can be used is as following:

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

Materialized View

Oracle Enterprise Edition supports query rewrite Materialized view. If you use Oracle Enterprise Edition, you can create following Materialized Views to improve performance of the batch job BATCH CI-TRMDD:

```sql
CREATE MATERIALIZED VIEW F1_BO_LIFECYCLE_STATUS_MVW
  (BUS_OBJ_CD,
   LIFE_CYCLE_BO_CD,
   BO_STATUS_CD,
   BATCH_CD)
BUILDMATERIALIZED VIEW AS
SELECT BO2.BUS_OBJ_CD, BO.LIFE_CYCLE_BO_CD, BOSA.BO_STATUS_CD, LCBOS.BATCH_CD as LC_BATCH_CD
FROM F1_BUS_OBJ BO2,
F1_BUS_OBJ BO,
```
F1_BUS_OBJ_STATUS LCBOS,
F1_BUS_OBJ_STATUS_ALG BOSA
WHERE
BO2.LIFE_CYCLE_BO_CD = BO.LIFE_CYCLE_BO_CD AND
BO.BUS_OBJ_CD = BOSA.BUS_OBJ_CD AND
BOSA.BO_STATUS_SEVT_FLG = 'F1AT' AND
LCBOS.BUS_OBJ_CD = BO.LIFE_CYCLE_BO_CD AND
LCBOS.BO_STATUS_CD = BOSA.BO_STATUS_CD
/
This section describes the following database conversion tools:

- Database Configuration
- Script Installation
- Preparing the Production Database
- Preparing the Staging Database

Note: All database related single fixes and service packs need to be applied against the production schema. Staging schema should not be updated with database single fixes or service packs. Staging schema need to be rebuilt for any fixes that contain DDL to create new database objects in production schema.
Database Configuration

The Conversion Tool Kit requires at least two sets of schema. One is to hold the staging data that the conversion tool gets the data from and performs validations. We call this schema the staging database. The target schema, which is referred to as the production database, is where the conversion tool inserts the validated data. Both the production database and the staging databases can reside in a single Oracle database or in different databases that are connected via a database link. Only the single database configuration is supported.

The following schematic diagram shows a sample configuration of both the production and staging environments in which the Conversion Tool Kit operates. The production and staging databases must be the same release level.

All the tables and views for the application are defined in the production database. The staging database has the same set of tables and views as the production database, except the tables that are grouped as part of the business configuration (control tables). Details on the differences of the tables of the two databases and of the conversion tool functionality are found in the Conversion Tool document.

Script Installation

The Conversion Setup Utility, ConvSetup.exe, is provided in this release of Oracle Utilities Customer Care and Billing to set up conversion schemas.

1. Install the Oracle Client 12c on Windows desktop and configure SQLNet to connect to the target database.

The Conversion folder contains the conversion setup utility: ConvSetup.exe and Conversion.bat. This section of this document describes how to create the databases for the conversion tool kit.
Preparing the Production Database

If the production database does not exist create the database under the production schema owner (CISADM).

If the production database is upgraded from the previous version of the application make sure all public synonyms that are created on the application tables are deleted. Instead, each application user should have private synonyms created on the application tables in order for the conversion tool configuration to work.

Preparing the Staging Database

Once you have created a staging owner (STGADM), application user (STGUSER) and read access user (STGREAD), install the initial database option in the staging schema. The rest of the steps are listed below.

Run ConvSetup.exe from under the Conversion folder. The script prompts you for the following values:

- Database Platform: Oracle (O)
- Database connection information
- Database Name
- System Password
- Production Schema Name
- Staging Schema Name
- Read-Write user for Staging Schema.

ConvSetup.exe performs following tasks:

- Creates cx* views on the master/transaction tables in the production database.
- Grants the privileges on the master/transaction tables in the production database to the staging owner.
- Drops control tables and creates views on production control tables in the staging database.
- Grants privileges on the control tables to the staging owner.
- Grants privileges on the cx* views to the staging application user.
- Creates generated key tables.
- Creates generated table primary key and secondary indexes.

In addition to above tasks ConvSetup.exe also generates the following SQL scripts:

- create_cxviews.sql
- create_ctlviews.sql
- createck_tbls.sql
- create_grants.sql
- createck_pkix.sql
- createck_secix.sql

By default the conversion.bat updates all changes to the staging schema. If you want to generate only the above sql scripts and not apply changes to staging schema then update conversion.bat by removing “-u”. The sql scripts can be applied to the staging schema later. The sqls scripts need to be executed in the same order as described above using SQL*PLus.
Once the staging schema has been set up, generate the security for the staging user using:

```
oragensec.exe -d stgadm,schemapassword,database_name -r
            stg_read,stg_user -u stguser
```
Appendix A

Upgrades to the Oracle Utilities Customer Care and Billing 2.5.0 Database

This document describes the database upgrade process for the Oracle Utilities Customer Care and Billing V2.5.0. It highlights changes made to the administrative tables and how those changes should be applied to the data in order for your current database to work with the V2.5.0 application, and to preserve the business logic implemented in the previous version of the application. The changes that do not require data upgrade are not described in this section of the document. The tasks that need to be performed after running the upgrade scripts are included.

The added functionality of V2.5.0 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 V2.5.0 User Guides. In the last section of this document you will find a list of the new tables that are added in V2.5.0

This section includes:

- Schema Changes
- New System Data

Schema Changes

Column Format Change

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Column Name</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI_SP_RTE</td>
<td>SVC_CYC_CD</td>
<td>CHAR(4)</td>
<td>CHAR(16)</td>
</tr>
<tr>
<td>CI_SP_RTE</td>
<td>SVC_RTE_CD</td>
<td>CHAR(8)</td>
<td>CHAR(16)</td>
</tr>
<tr>
<td>CI_SVC_RTE_STG_DWN</td>
<td>SVC_CYC_CD</td>
<td>CHAR(4)</td>
<td>CHAR(16)</td>
</tr>
<tr>
<td>CI_SVC_RTE_STG_DWN</td>
<td>SVC_RTE_CD</td>
<td>CHAR(8)</td>
<td>CHAR(16)</td>
</tr>
</tbody>
</table>
## Index Modification

<table>
<thead>
<tr>
<th>Index Name</th>
<th>Table Name</th>
<th>Column Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>XT069S0</td>
<td>CI_COLI_EVT</td>
<td>TRIGGER_BP_SW</td>
</tr>
<tr>
<td>XT069S0</td>
<td>CI_COLI_EVT</td>
<td>COLL_PROC_ID</td>
</tr>
<tr>
<td>XT069S0</td>
<td>CI_COLI_EVT</td>
<td>EVT_SEQ</td>
</tr>
<tr>
<td>XT069S0</td>
<td>CI_COLI_EVT</td>
<td>COLL_EVT_TYP_CD</td>
</tr>
</tbody>
</table>
New System Data

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

New Index

<table>
<thead>
<tr>
<th>Index Name</th>
<th>Table Name</th>
<th>Column Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>XT064S1</td>
<td>CI_BAL_CTL_GRP</td>
<td>BALANCING_STAT_FLG</td>
</tr>
<tr>
<td>XT064S1</td>
<td>CI_BAL_CTL_GRP</td>
<td>BAI_CTL_GRP_ID</td>
</tr>
</tbody>
</table>
Appendix B

Upgrades to the Oracle Utilities Application Framework 4.3.0.0.1 Database

This section describes the database upgrade process for the Oracle Utilities Application Framework database from V4.2.0.2.0 to V4.3.0.0.1. 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 V4.3.0.0.1 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 V4.3.0.0.1 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 V4.3.0.0.1 User Guides. In the last section of this appendix, you will find a list of the new tables that are added in V4.3.0.0.1.

This section includes:

- Automatic Data Upgrade
- Schema Change
- New System Data
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.

Schema Change

New Tables

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

<table>
<thead>
<tr>
<th>Tables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI_PORTAL_OPT</td>
<td>Portal Option</td>
</tr>
<tr>
<td>CI_USR_BOOKMARK</td>
<td>User Bookmarks</td>
</tr>
<tr>
<td>CI_USR_ZONE_SAVE</td>
<td>User Zone Save</td>
</tr>
<tr>
<td>F1_REQ_CHAR</td>
<td>Request Characteristics</td>
</tr>
</tbody>
</table>

New Views

None

Dropped Tables

None

Unsupported Tables

None

Added Columns

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

<table>
<thead>
<tr>
<th>Table</th>
<th>Column</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI_SCR_L</td>
<td>DESCR4000</td>
<td>Y</td>
</tr>
<tr>
<td>CI_NAV_OPT</td>
<td>MULTI_QUERY_ZONE_CD</td>
<td>N</td>
</tr>
<tr>
<td>CI_NAV_OPT</td>
<td>SUB_QUERY_ZONE_CD</td>
<td>N</td>
</tr>
<tr>
<td>CI_SCR_L</td>
<td>DESCR4000</td>
<td>N</td>
</tr>
<tr>
<td>CI_ZONE_L</td>
<td>DESCR_OVRD</td>
<td>N</td>
</tr>
<tr>
<td>F1_OBJ_REV</td>
<td>ILM_ARCH_SW</td>
<td>N</td>
</tr>
<tr>
<td>F1_OBJ_REV</td>
<td>ILM_DT</td>
<td>N</td>
</tr>
<tr>
<td>F1_OUTMSG</td>
<td>ILM_ARCH_SW</td>
<td>N</td>
</tr>
<tr>
<td>F1_OUTMSG</td>
<td>ILM_DT</td>
<td>N</td>
</tr>
<tr>
<td>F1_SVC_TASK</td>
<td>ILM_ARCH_SW</td>
<td>N</td>
</tr>
</tbody>
</table>
Dropped Columns

None

Unsupported Table Columns

None

Column Format Change

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Column Name</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1_SVC_TASK</td>
<td>ILM_DT</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>F1_SYNC_REQ</td>
<td>ILM_ARCH_SW</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>F1_SYNC_REQ</td>
<td>ILM_DT</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>F1_SYNC_REQ_IN</td>
<td>ILM_ARCH_SW</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>F1_SYNC_REQ_IN</td>
<td>ILM_DT</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Column Name</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL_MSG_LOGPARM</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CL_NT_DWN_EXP</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CL_NT_UP_EXCP</td>
<td>MESSAGE_PARM1</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CL_NT_UP_EXCP</td>
<td>MESSAGE_PARM2</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CL_NT_UP_EXCP</td>
<td>MESSAGE_PARM3</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_ROOT_OBJ_EXP</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_TD_MSG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_VAL_ERR</td>
<td>MESSAGE_PARM1</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_VAL_ERR</td>
<td>MESSAGE_PARM2</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_VAL_ERR</td>
<td>MESSAGE_PARM3</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_VAL_ERR</td>
<td>MESSAGE_PARM4</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_VAL_ERR</td>
<td>MESSAGE_PARM5</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_VAL_ERR</td>
<td>MESSAGE_PARM6</td>
<td>VARCHAR2:30</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CL_VAL_ERR</td>
<td>MESSAGE_PARM7</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td>CL_VAL_ERR</td>
<td>MESSAGE_PARM8</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CL_VAL_ERR</td>
<td>MESSAGE_PARM9</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_WF_EVT_EXP</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_WF_PROC_MSGP</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_XAL_DWN_EXP</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>CI_XML_STGUPEXP</td>
<td>MESSAGE_PARM</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_BNDL_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_BUS_EVT_LOG_MSG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_FACT_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_IWS_SVC_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_MIGR_DATA_STLOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_MIGR_OBJ_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_MIGR_TRANS_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_OBJ_REV_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_OUTMSG_ERRPARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_REQ_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_REQ_TYPE_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_SVC_TASK_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_SYNC_REQ_IN_EXCP_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_SYNC_REQ_IN_LOG_P</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_SYNC_REQ_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
<tr>
<td>F1_WEB_SVC_LOG_PARM</td>
<td>MSG_PARM_VAL</td>
<td>VARCHAR2:30:</td>
<td>VARCHAR2:2000:</td>
</tr>
</tbody>
</table>
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 Oracle Utilities Application Framework.

<table>
<thead>
<tr>
<th>Algorithm Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-ILMELIG</td>
<td>ILM Eligibility Based on Status</td>
</tr>
<tr>
<td>F1-VALIDOWNR</td>
<td>Extendable Lookup - Validate Owner</td>
</tr>
</tbody>
</table>

Algorithm

The following Algorithms are Oracle Utilities Application Framework owned system data.

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-ILMELIG</td>
<td>ILM Eligibility Based on Status</td>
</tr>
<tr>
<td>F1-VALIDOWNR</td>
<td>Extendable Lookup - Validate Owner</td>
</tr>
</tbody>
</table>

Application Service

The following application services are added after Oracle Utilities Application Framework.

<table>
<thead>
<tr>
<th>Application Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-BOOKMARKS</td>
<td>Bookmarks</td>
</tr>
<tr>
<td>F1ANNTYP</td>
<td>Web Service Annotation Type MO</td>
</tr>
<tr>
<td>F1_USRFAVSCH</td>
<td>Favorite Searches Zone</td>
</tr>
</tbody>
</table>

Access Mode Added to Application Service

The following access modes are added to existing application services.

<table>
<thead>
<tr>
<th>Application Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1IWSDPLY</td>
<td>Inbound Web Service DeploymentExecute (FIEX)</td>
</tr>
</tbody>
</table>

Batch Control

The following batch controls are added.

<table>
<thead>
<tr>
<th>Batch Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-ILMIN</td>
<td>ILM Crawler Initiator</td>
</tr>
<tr>
<td>F1-ORCRL</td>
<td>ILM Crawler - Object Revision</td>
</tr>
<tr>
<td>F1-OUCRL</td>
<td>ILM Crawler - Outbound Message</td>
</tr>
<tr>
<td>F1-SICRL</td>
<td>ILM Crawler - Inbound Sync Request</td>
</tr>
</tbody>
</table>
### Business Object

The following Business Objects are Oracle Utilities Application Framework owned system data in V4.3.0.0.1.

<table>
<thead>
<tr>
<th>Business Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-DeviceDisplayTypes</td>
<td>UI Device Display Types</td>
</tr>
<tr>
<td>F1-ILMMSConfig</td>
<td>ILM Configuration</td>
</tr>
</tbody>
</table>

### FK Reference

The following FK References are new to Oracle Utilities Application Framework in this release.

<table>
<thead>
<tr>
<th>FK Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-TODO</td>
<td>To Do Entry</td>
</tr>
<tr>
<td>F1PA-PO</td>
<td>Portal Option - Page Actions Menu</td>
</tr>
<tr>
<td>F1PK-PO</td>
<td>Portal Option - Page Info FK Reference</td>
</tr>
<tr>
<td>FIBC-MO</td>
<td>MO Option - Batch Control ILM</td>
</tr>
</tbody>
</table>

### Lookups

The following Lookups are added to Oracle Utilities Application Framework.

<table>
<thead>
<tr>
<th>Lookup Field Name</th>
<th>Field Value</th>
<th>Language</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALG_ENTITY_FLG</td>
<td>F1CZ</td>
<td>ENG</td>
<td>Zone</td>
</tr>
<tr>
<td>ALG_ENTITY_FLG</td>
<td>F1GD</td>
<td>ENG</td>
<td>Installation - Guaranteed Delivery</td>
</tr>
<tr>
<td>ALG_ENTITY_FLG</td>
<td>F1L</td>
<td>ENG</td>
<td>Deprecated Value - Do not use</td>
</tr>
<tr>
<td>BO_OPT_FLG</td>
<td>F1AT</td>
<td>ENG</td>
<td>Allow Manual Monitor</td>
</tr>
<tr>
<td>CHAR_ENTITITY_FLG</td>
<td>F1RQ</td>
<td>ENG</td>
<td>Request</td>
</tr>
<tr>
<td>F1_BATCH_CTGY_FLG</td>
<td>F1IL</td>
<td>ENG</td>
<td>ILM</td>
</tr>
<tr>
<td>F1_CAL_ITEM_TYP_CLR</td>
<td>BL</td>
<td>ENG</td>
<td>LightSkyBlue</td>
</tr>
<tr>
<td>F1_CAL_ITEM_TYP_CLR</td>
<td>GL</td>
<td>ENG</td>
<td>Gold</td>
</tr>
</tbody>
</table>
### Maintenance Object

None

### Script

The following scripts are owned by Oracle Utilities Application Framework and added in this release.

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-IlmDisp</td>
<td>ILMMasterConfigurationDisplayDetails</td>
</tr>
<tr>
<td>F1-IlmMstCfg</td>
<td>Master Configuration - Maintain</td>
</tr>
<tr>
<td>F1-ReqMain</td>
<td>Request - Maintain</td>
</tr>
<tr>
<td>F1-ValidOwnr</td>
<td>Extendable Lookup - Validate Owner</td>
</tr>
</tbody>
</table>

### To do Type

Upgrades to the Oracle Utilities Application Framework 4.3.0.1 Database B-7
Portal

None

Portal Zone

The following Portal Zones are added in this release.

<table>
<thead>
<tr>
<th>Portal</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL_DASHBOARD</td>
<td>F1-BOOKMARKS</td>
</tr>
</tbody>
</table>

UI Map

The following UI Maps are Oracle Utilities Application Framework owned system data in this release.

<table>
<thead>
<tr>
<th>Map</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-BookmarkPopup</td>
<td>Bookmark Popup</td>
</tr>
<tr>
<td>F1-DisplayBookmarks</td>
<td>Display Bookmarks</td>
</tr>
<tr>
<td>F1-GenerateBsSchemaContext</td>
<td>Generate a Business Service Schema</td>
</tr>
</tbody>
</table>

XAI Inbound Service

There are no new XAI Inbound Services new to Oracle Utilities Application Framework.

Zone Type

The following zone types are new in this release

<table>
<thead>
<tr>
<th>Map</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-Calendar</td>
<td>Calendar</td>
</tr>
</tbody>
</table>

Zone

The following new Zones are added to Oracle Utilities Application Framework V4.3.0.0.1.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Zone Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1-BOOKMARKS</td>
<td>F1-MAPEXPL</td>
<td>Bookmarks</td>
</tr>
<tr>
<td>F1-GENBSCHM</td>
<td>F1-MAPEXPL</td>
<td>Generate Schema</td>
</tr>
<tr>
<td>F1-GETBKMRKS</td>
<td>F1-DE-SINGLE</td>
<td>Get Bookmarks</td>
</tr>
<tr>
<td>F1-USRFAVSCH</td>
<td>F1-DE-SINGLE</td>
<td>Retrieve User's Favorite Searches</td>
</tr>
</tbody>
</table>
Appendix C

Oracle Application Framework System Table Guide

This section lists the system tables owned by the Oracle Utilities Application Framework V4.3.0.0.1 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.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>SC_ACCESS_CNTL, SC_USER, SC_USR_GRP_PROF, SC_USR_GRP_USR, SC_USER_GROUP, SC_USER_GROUP_L</td>
</tr>
<tr>
<td>Initial Data</td>
<td>User Group All SERVICES and default system user SYSUSER. Upon installation the system default User Group All SERVICES is given unrestricted access to all services defined in Oracle Utilities Application Framework.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_CURRENCY_CD, CI_CURRENCY_CD_L</td>
</tr>
<tr>
<td>Initial Data</td>
<td>United States Dollar (USD).</td>
</tr>
</tbody>
</table>

Display Profile

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

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_DISP_PROF, CI_DISP_PROF_L</td>
</tr>
<tr>
<td>Initial Data</td>
<td>North America (NORTHAM) and Europe (EURO) and HIJRI Format (HIJRI).</td>
</tr>
</tbody>
</table>

**Configuration Note:** In order to use HIJRI Format display profile, additional configuration is needed to define the mappings between Hijri dates and Gregorian dates. Refer to the Display Profile documentation for more information.

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

Refer to the Display Profile documentation for more information.

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

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_INSTALLATION, CI_INSTALL_ALG, CI_INSTALL_MSG, CI_INSTALL_MSG_L, CI_INSTALL_PROD</td>
</tr>
<tr>
<td>Initial Data</td>
<td>Option 11111.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_LANGUAGE</td>
</tr>
<tr>
<td>Initial Data</td>
<td>English (ENG).</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_ROLE(L), CI_TD_VAL_ROLE</td>
</tr>
<tr>
<td>Initial Data</td>
<td>F1_DFLT</td>
</tr>
</tbody>
</table>

**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 <Product Name> environment, C1 should prefix the new Algorithm Type code. The fields that are subject to this rule are listed in Standard Data Fields property.
The data that is already in these tables cannot be modified if the data owner is different than the environment owner. This prevents the developers from accidentally modifying system data that belongs to the Oracle Utilities Application Framework or the base products. However, some fields are exempt from this rule and can be modified by Customer Modification. These fields are listed in the Customer Modification Fields property.

Note that the system supports a system upgrade rule called Override Owner flag. If duplicate data rows (data row with same primary key values) are found at the time of upgrade, the owner flag values will get overridden. The lower level application system data will override the upper level system data. For example, F1 overrides C1, F1&C1 override CM, and so on. This rule will be applied to the following tables: CI_CHAR_ENTITY, CI_MD_MO_ALG, CI_PORTAL_OPT, F1_BUS_OBJ_ALG, F1_BUS_OBJ_STATUS_ALG, CI_MD_MO_OPT, F1_BUS_OBJ_OPT, F1_BUS_OBJ_STATUS_OPT, F1_BUS_OBJ_STATUS, F1_BUS_OBJ_STATUS_L.

### Algorithm Type

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_ALG_TYPE, CI_ALG_TYPE_L, CI_ALG_TYPE_PRM,</td>
</tr>
<tr>
<td></td>
<td>CI_ALG_TYPE_PRM_L</td>
</tr>
<tr>
<td>Standard Data</td>
<td>Algorithm Type (ALG_TYPE_CD)</td>
</tr>
<tr>
<td>Fields</td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td>None</td>
</tr>
<tr>
<td>Modification</td>
<td></td>
</tr>
</tbody>
</table>
## Algorithm

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_ALG, CI_ALG_L, CI_ALG_PARM, CI_ALG_VER</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Algorithm (ALG_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

## Application Security

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>SC_APP_SERVICE, SC_APP_SERVICE_L, CI_APP_SVC_ACC</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Application Service ID (APP_SVC_ID).</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

## Batch Control

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_BATCH_CTRL, CI_BATCH_CTRL_L, CI_BATCH_CTRL_P, CI_BATCH_CTRL_P_L</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Batch Process (BATCH_CD), Program Name (PROGRAM_NAME)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>Next Batch Number (NEXT_BATCH_NBR), Last Update Instance (LAST_UPDATE_INST), Last Update Date time (LAST_UPDATE_DTTM) and the batch process update these columns. Time Interval (TIMER_INTERVAL), Thread Count (BATCH_THREADS_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)</td>
</tr>
</tbody>
</table>
### Business Object

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>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</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Business Object (BUS_OBJ_CD), Status Reason (BO_STATUS_REASON_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>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)</td>
</tr>
</tbody>
</table>

### Business Service

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_BUS_SVC, F1_BUS_SVC_L</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Business Service (BUS_SVC_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>Application Service (APP_SVC_ID)</td>
</tr>
</tbody>
</table>

### Characteristics

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_CHAR_TYPE, CI_CHAR_TYPE_L, CI_CHAR_ENTITY, CI_CHAR_VAL, CI_CHAR_VAL_L</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Characteristic Type (CHAR_TYPE_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>Adhoc Characteristic Value Validation Rule (ADHOC_VAL_ALG_CD)</td>
</tr>
</tbody>
</table>

### Configuration Migration Assistant

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_MIGR_PLAN, F1_MIGR_PLAN_L, F1_MIGR_PLAN_INSTR, F1_MIGR_PLAN_INSTR_L, F1_MIGR_PLAN_INSTR_ALG, F1_MIGR_REQ, F1_MIGR_REQ_L, F1_MIGR_REQ_INSTR, F1_MIGR_REQ_INSTR_L, F1_MIGR_REQ_INSTR_ENTITY</td>
</tr>
</tbody>
</table>
### Data Area

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Data Fields</td>
<td>Migration Plan Code (MIGR_PLAN_CD), Migration Request Code (MIGR_REQ_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
<tr>
<td>Tables</td>
<td>F1_DATA_AREA, F1_DATA_AREA_L</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Data Area Code (DATA_AREA_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>
### Display Icon

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_DISP_ICON, CI_DISP_ICON_L</td>
</tr>
</tbody>
</table>

- **Standard Data Fields**: Display Icon Code (DISP_ICON_CD)
- **Customer Modification**: None

### Extendable Lookup

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_EXT_LOOKUP_VAL, F1_EXT_LOOKUP_VAL_L</td>
</tr>
</tbody>
</table>

- **Standard Data Fields**: Business Object (BUS_OBJ_CD), Extendable Lookup Value (F1_EXT_LOOKUP_VALUE)
- **Customer Modification**: Override Description (DESCR_OVRD) on Extendable Lookup Field Value Language Table (F1_EXT_LOOKUP_VAL_L)

### Foreign Key Reference

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_FK_REF, CI_FK_REF_L</td>
</tr>
</tbody>
</table>

- **Standard Data Fields**: FK reference code (FK_REF_CD)
- **Customer Modification**: Info Program Name (INFO_PRG), Zone (ZONE_CD)

### Inbound Web Service

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_IWS_SVC_L, F1_IWS_SVC, F1_IWS_SVC_OPER_L, F1_IWS_SVC_OPER, F1_IWS_SVC_ANN_L, F1_IWS_SVC_ANN_PARM, F1_IWS_SVC_ANN, F1_IWS_SVC_ANN_TYPE_L, F1_IWS_SVC_ANN_TYPE_PARM, F1_IWS_SVC_ANN_TYPE_PARM_L</td>
</tr>
</tbody>
</table>

- **Standard Data Fields**: Webservice Name (IN_SVC_NAME), Annotation (ANN_CD), Annotation Type (ANN_TYPE_CD)
- **Customer Modification**: Debug (DEBUG_SW), Active (ACTIVE_SW), Trace (TRACE_SW), Post Error (POST_ERROR_SW), Request XSL (REQUEST_XSL), Response XSL (RESPONSE_XSL)

### Lookup

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_LOOKUP_FIELD, CI_LOOKUP_VAL, CI_LOOKUP_VAL_L</td>
</tr>
</tbody>
</table>
Guidelines for System Table Updates

**Standard Data Fields**

- **Field Name (FIELD_NAME)**
  - 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.

- **Field Value (FIELD_VALUE)**
  - 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 may add lookup values to a Oracle Utilities Application Framework owned lookup field's value. When extended new value is added, the Owner Flag is used to prefix the value. For example, when the Oracle Utilities Customer Care and Billing product adds a new value to the algorithm entity flag (ALG_ENTITY_FLG), it is prefixed with C1.

**Customer Modification Override Description (DESCR_OVRD) on Lookup Field Value Language Table (CI_LOOKUP_VAL_L)**
## Map

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_MAP, F1_MAP_L</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>UI Map (MAP_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

## Managed Content

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_MANAG_CONTENT, F1_MANAG_CONTENT_L</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Managed Content (MANAG_CONTENT_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

## Messages

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_MSG_CATEGORY, CI_MSG_CATEGORY_L, CI_MSG, CI_MSG_L</td>
</tr>
</tbody>
</table>
Guidelines for System Table Updates

Standard Data Fields

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Category (MESSAGE_CAT_NBR)</td>
<td>• Messages are grouped in categories and each category has message numbers between 1 and 99999. A range of message categories is assigned to a product. An implementation may only use categories assigned for customization use.</td>
</tr>
<tr>
<td>Implementer Message Categories</td>
<td>80000 and 90000</td>
</tr>
<tr>
<td>Reserved for Tests</td>
<td>99999</td>
</tr>
<tr>
<td>Message Number (MESSAGE_NBR) for message categories</td>
<td>• Message numbers below 1000 are reserved for common messages. Implementers must not use message numbers below 1000.</td>
</tr>
<tr>
<td>Message Number (MESSAGE_NBR) for Java message categories</td>
<td>• Subsystem Standard Messages - 00001 thru 02000</td>
</tr>
<tr>
<td>Reserved</td>
<td>02001 thru 09999</td>
</tr>
<tr>
<td>Published Messages</td>
<td>10001 thru 11000</td>
</tr>
<tr>
<td>Package Messages</td>
<td>10001 thru 90000</td>
</tr>
<tr>
<td>Reserved</td>
<td>90001 thru 99999</td>
</tr>
<tr>
<td>Each package is allocated 100 message numbers, each starting from 101.</td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
</tr>
<tr>
<td>Reserved message number ranges are for future use and therefore must not be used by all products.</td>
<td></td>
</tr>
</tbody>
</table>

Customer Modification

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Override Description (DESCRLONG_OVRD), Message Text Override (MESSAGE_TEXT_OVRD)</td>
<td></td>
</tr>
</tbody>
</table>
Meta Data - Table and Field

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_MD_TBL, CI_MD_TBL_FLD, CI_MD_TBL_L, CI_MD_TBL_FLD_L, F1_DB_OBJECTS_REPO</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Table Name (TBL_NAME)</td>
</tr>
<tr>
<td></td>
<td>• Table names must match with the physical table name or view name in the database.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• 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)</td>
</tr>
</tbody>
</table>

| Customer Modification | 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. |

Meta Data - Constraints

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_MD_CONST, CI_MD_CONST_FLD</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Constraint Id (CONST_ID)</td>
</tr>
<tr>
<td></td>
<td>• Index Name for Primary Constraints</td>
</tr>
<tr>
<td></td>
<td>• &lt;Index Name&gt;Rnn for Foreign Key Constraints Where</td>
</tr>
<tr>
<td></td>
<td>• nn: integer, 01 through 99</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>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</td>
</tr>
</tbody>
</table>
Guidelines for System Table Updates

Meta Data - Program, Location and Services

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Data Fields</td>
<td>Menu Name (MENU_NAME), Menu Item Id (MENU_ITEM_ID), Menu Line Id (MENU_LINE_ID)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>Override Label (OVRD_LABEL) on Menu Line Language Table (CI_MD_MENU_LINE_L)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>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</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Program Component Id (PROG_COM_ID), Location Id (LOC_ID), Program Component Name (PROG_COM_NAME), Service Name (SVC_NAME), Navigation Key (NAVIGATION_KEY)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>User Exit Program Name (USER_EXIT_PGM_NAME) on Program Components Table (CI_MD_PRG_COM),</td>
</tr>
</tbody>
</table>

Meta Data - Maintenance Object

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_MD_MO, CI_MD_MO_L, CI_MD_MO_TBL, CI_MD_MO_OPT, CI_MD_MO_ALG</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Maintenance Object (MAINT_OBJ_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>
Meta Data - Work Tables

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_MD_WRK_TBL, CI_MD_WRK_TBL_L, CI_MD_WRK_TBLFLD, CI_MD_MO_WRK</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Work Table Name (WRK_TBL_NAME)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

Meta Data - Search Object

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_MD_SO, CI_MD_SO_L, CI_MD_SO_RSFLD, CI_MD_SO_RSFLDAT, CI_MD_SOCG, CI_MD_SOCG_FLDA, CI_MD_SOCG_FLDAT, CI_MD_SOCG_I, CI_MD_SOCG_SORT</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Search Object (SO_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

Navigation Option

<table>
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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_NAV_OPT, CI_NAV_OPT_L, CI_NAV_OPT_CTXT, CI_NAV_OPT_USG, CI_MD_NAV</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Navigation Option Code (NAV_OPT_CD), Navigation Key (NAVIGATION_KEY)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

Portal and Zone

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_PORTAL, CI_PORTAL_L, CI_PORTAL_ZONE, CI_PORTAL_OPT, CI_ZONE, CI_ZONE_L, CI_ZONE_PRM, CI_ZONE_HDL, CI_ZONE_HDL_L, CI_ZONE_HDL_PRM, CI_ZONE_HDL_PRM_L, CI_UI_ZONE</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Portal Code (PORTAL_CD), Zone Code (ZONE_CD), Zone Type Code (ZONE_HDL_CD)</td>
</tr>
<tr>
<td></td>
<td>• A new Zone can be added to the Product owned Portal Pages.</td>
</tr>
<tr>
<td></td>
<td>• The existing Zones cannot be removed from the Product owned Portal Pages.</td>
</tr>
</tbody>
</table>

• A new Zone can be added to the Product owned Portal Pages.
• The existing Zones cannot be removed from the Product owned Portal Pages.
<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Modification</td>
<td>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).</td>
</tr>
</tbody>
</table>
### Sequence

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_SEQ</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Sequence Name (SEQ_NAME)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>Sequence Number (SEQ_NBR)  This field is updated by the application process and must be set to 1 initially.</td>
</tr>
</tbody>
</table>

### Schema

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>F1_SCHEMA</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Schema Name (SCHEMA_NAME)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

### Script

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_SCR, CI_SCR_I, CI_SCR_CRT, CI_SCR_CRT_GRP, CI_SCR_CRT_GRP_I, CI_SCR_DA, CI_SCR_FLD_MAP, CI_SCR_PRMPT, CI_SCR_PRMPT_I, CI_SCR_STEP, CI_SCR_STEP_I.</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>Script (SCR_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>None</td>
</tr>
</tbody>
</table>

### To Do Type

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CL_TD_TYPE, CL_TD_TYPE_I, CL_TD_SRTKEY_TY, CL_TD_DRLKEY_TY, CL_TD_SRTKEY_TY_I.</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>To Do Type Code (TD_TYPE_CD)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>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)</td>
</tr>
</tbody>
</table>
### XAI Configuration

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>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_SENDER_L, CI_XAI_SNDR_CTX, CI_XAI_OPTION</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>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)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>Option Value (OPTION_VALUE) on Message Option Table (CI_XAI_OPTION)</td>
</tr>
</tbody>
</table>

### XAI Services

<table>
<thead>
<tr>
<th>Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tables</td>
<td>CI_XAI_IN_SVC, CI_XAI_IN_SVC_L, CI_XAI_SVC_PARM</td>
</tr>
<tr>
<td>Standard Data Fields</td>
<td>XAI Inbound Service Id (XAI_IN_SVC_ID), XAI Inbound Service Name (XAI_IN_SVC_NAME)</td>
</tr>
<tr>
<td>Customer Modification</td>
<td>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)</td>
</tr>
</tbody>
</table>
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_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>
<thead>
<tr>
<th>Table Name</th>
<th>Upgrade Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI_ALG</td>
<td>MG</td>
<td>Algorithm</td>
</tr>
<tr>
<td>CI_ALG_L</td>
<td>MG</td>
<td>Algorithm Language</td>
</tr>
<tr>
<td>CI_ALG_PARM</td>
<td>MG</td>
<td>Algorithm Parameters</td>
</tr>
<tr>
<td>CI_ALG_TYPE</td>
<td>MG</td>
<td>Algorithm Type</td>
</tr>
<tr>
<td>CI_ALG_TYPE_L</td>
<td>MG</td>
<td>Algorithm Type Language</td>
</tr>
<tr>
<td>CI_ALG_TYPE_PRM</td>
<td>MG</td>
<td>Algorithm Type Parameter</td>
</tr>
<tr>
<td>CI_ALG_TYPE_PRM_L</td>
<td>MG</td>
<td>Algorithm Type Parameter Language</td>
</tr>
<tr>
<td>CI_ALG_VER</td>
<td>MG</td>
<td>Algorithm Version</td>
</tr>
<tr>
<td>CI_APP_SVC_ACC</td>
<td>MG</td>
<td>Application Service Access Mode</td>
</tr>
<tr>
<td>CI_BATCH_CTRL</td>
<td>MG</td>
<td>Batch Control</td>
</tr>
<tr>
<td>CI_BATCH_CTRL_ALG</td>
<td>MG</td>
<td>Batch Control Algorithm</td>
</tr>
<tr>
<td>CI_BATCH_CTRL_L</td>
<td>MG</td>
<td>Batch Control Language</td>
</tr>
<tr>
<td>CI_BATCH_CTRL_P</td>
<td>MG</td>
<td>Batch Control Parameters</td>
</tr>
<tr>
<td>CI_BATCH_CTRL_P_L</td>
<td>MG</td>
<td>Batch Control Parameters Language</td>
</tr>
<tr>
<td>CI_CHAR_ENTITY</td>
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<td>Characteristic Type Entity</td>
</tr>
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<tr>
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<td>Characteristic Type Value Language</td>
</tr>
<tr>
<td>CI_DISP_ICON</td>
<td>MG</td>
<td>Display Icon</td>
</tr>
<tr>
<td>Table Name</td>
<td>Upgrade Action</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>CI_DISP_ICON_L</td>
<td>MG</td>
<td>Display Icon Language</td>
</tr>
<tr>
<td>CI_FK_REF</td>
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<td>Foreign Key Reference</td>
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</tr>
<tr>
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<td>Lookup Field Value</td>
</tr>
<tr>
<td>CI_LOOKUP_VAL_L</td>
<td>MG</td>
<td>Lookup Field Value Language</td>
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<tr>
<td>CI_MD_CONST</td>
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<td>Constraints</td>
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<td>MG</td>
<td>Constraint Fields</td>
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<td>Menu Language</td>
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<td>Menu Line</td>
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<td>Menu Line Language</td>
</tr>
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<td>CI_MD_MENU_MOD</td>
<td>MG</td>
<td>Menu Product Components</td>
</tr>
<tr>
<td>CI_MD_MO</td>
<td>MG</td>
<td>Maintenance Object</td>
</tr>
<tr>
<td>CI_MD_MO_ALG</td>
<td>MG</td>
<td>Maintenance Object Algorithm</td>
</tr>
<tr>
<td>CI_MD_MO_L</td>
<td>MG</td>
<td>Maintenance Object Language</td>
</tr>
<tr>
<td>CI_MD_MO_OPT</td>
<td>MG</td>
<td>Maintenance Object Option</td>
</tr>
<tr>
<td>CI_MD_MO_TBL</td>
<td>MG</td>
<td>Maintenance Object Table</td>
</tr>
<tr>
<td>CI_MD_MO_WRK</td>
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<td>Maintenance Object Work Tables</td>
</tr>
<tr>
<td>CI_MD_NAV</td>
<td>MG</td>
<td>Navigation Key</td>
</tr>
<tr>
<td>CI_MD_PRG_COM</td>
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<td>Program Components</td>
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<td>CI_MD_PRG_ELEM</td>
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<td>UI Page Elements</td>
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<td>UI Page Element Attributes</td>
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<td>Program Location</td>
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<td>Program Module</td>
</tr>
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<td>CI_MD_PRG_SEC</td>
<td>MG</td>
<td>UI Page Sections</td>
</tr>
<tr>
<td>Table Name</td>
<td>Upgrade Action</td>
<td>Description</td>
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<tr>
<td>CI_MD_PRG_SQL</td>
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<td>UI Tab Meta Data</td>
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<td>CI_MD_PRG_VAR</td>
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<td>Search Object</td>
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<td>Search Object Criteria Group</td>
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<td>Search Object Criteria Group Field</td>
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