DB Installation Guide

Oracle Financial Services Lending and Leasing

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DB Installation Guide
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1. Preface

This document contains notes and installation steps involved in installation and setup of Oracle Financial Services Lending and Leasing. Oracle Financial Services Lending and Leasing relies on several pieces of Oracle software in order to run and this document is in no way meant to replace Oracle documentation supplied with these Oracle products or available via Oracle technical support. The purpose of this document is only meant to supplement the Oracle documentation and to provide Oracle Financial Services Lending and Leasing specific installation instructions.

For recommendations on security configuration, refer Security Configuration Guide.

> **Note**
>
> It is assumed that anyone installing Oracle Financial Services Lending and Leasing will have a thorough knowledge and understanding of Oracle Database Administration12cR1.

1.1 Pre-requisites

The following software is required to install Oracle Financial Services Lending and Leasing application database. They are available from the following source:

- Oracle Software Delivery Cloud
  - http://edelivery.oracle.com/
- Oracle Technology Network (OTN)
  - Oracle 12c R1(version 12.1.0.2.0) or 12c R2 (version 12.2.0.1.0) RDBMS Enterprise Edition can be downloaded from http://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html
- You need to configure the default Database Java JVM version 1.6 to JVM version 1.7 in order to support the Transport Layer Security (TLS) 1.2 protocol for Credit Bureau.
- Oracle Fusion Middleware requires that the database used to store its metadata must support the AL32UTF8 character set.

Database installation is a two step process:

1. Creating Database
2. Installing the Application Database

After installing the application database, you need to:

3. Modifying Application System Parameters
4. Set the Oracle JVM File Permissions
5. Fine-Grained Access to Network Services in Oracle Database

1.2 Audience

This document is intended for system administrators or application developers who install Oracle Financial Services Lending and Leasing Application.

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1.3 Conventions Used

Term	Refers to
Home Directory/ $OFSLL_HOME	Oracle Financial Services Lending and Leasing Home Directory
Application	Oracle Financial Services Lending and Leasing

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2. Setup and Configuration of the Database Server

2.1 Creating Database

The first step in the database creation is the creation of Database Server Users and Groups. The below sections are a guide to:

1. Creating the Database Server Users and Groups

2. Creating Database

3. Modifying the Oracle system parameters after creating Database

2.1.1 Creating the Database Server Users and Groups

The software and processes on the database server can be broken into three groups of ownership. These are; the Oracle processes, the Oracle external procedure processes, and the home directory. Some of this information applies only to UNIX server installations. The typical Windows server Application installation does not make use of separate users and groups, for the various processes and instead runs everything as the system user.

Process Group	Description
Oracle	The Oracle processes are the database processes (excluding the listener process) responsible for database operations. Normally, the Oracle processes are owned by a user named oracle and a group called dba. Some of the processes use an internal Oracle PL/SQL utility called UTL_FILE to read and/or write to files in the home directory. The UTL_FILE program will perform its functions as the oracle user, hence, add the oracle user to the Oracle Financial Services Lending and Leasing user's group.
Oracle External Procedures	Oracle Financial Services Lending and Leasing uses external procedures to perform tasks that cannot (or does not want to) be performed inside the database. Such as, interfacing with the credit bureaus, writing files, or converting images. Oracle implements external procedures through its listener process. Multiple listeners can be defined (one for "normal" database connections and one for external procedures) or run a single listener that handles both types of requests. Regardless of what is done, the external procedures will need access to files and directories that are within the home directory. It is recommended that the owner of the listener process handling external procedures is either the Oracle Financial Services Lending and Leasing user or a part of the same group.

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Process Group	Description
Oracle Financial Services Lending and Leasing home directory	The home directory is a top-level directory under which some application files are stored. For example, log files, document templates, email templates, temporary files, and output files. There are no processes or programs that run (outside of the Oracle external procedure processes) as the Oracle Financial Services Lending and Leasing user, this is the location where the server side application files reside. Oracle Financial Services Lending and Leasing administrator can log into the server and perform the administrative functions without needing any special system superuser or administrative privileges. The home directory is needed for each application instance (production, test, development) installed on the server.

Keeping this information in mind, here are the recommended users and groups for the server:

User	Group(s)	Description
ofsll	ofsll	Owns the home directory. Set up the directory with, group write privileges so that other application related processes can access the files and directories below it.
oracle	dba, ofsll	Owns the Oracle database processes.
ofsllext	ofsll	Owns the Oracle listener process or just the external procedure listener process. If the latter, run the "normal" SQL*Net listener process as the oracle user.

2.1.2 Creating the Database

Create a database as per corporate standards and/or Oracle best practices with the following recommendations/guidelines.

- Use an undo tablespace, not rollback segments. Size accordingly for expected number of users and retention period.
- Use system managed undo
- Create a SYSTEM tablespace of at least 2GB. The application objects require approximately 1GB.
- Create a true temporary TEMP tablespace
- Set the java_pool_size to at least 64MB
- Ensure that the external procedure listener has been configured. Set the EXTPROC_DLLS environment variable so that the external procedure listener can access the Oracle Financial Services Lending and Leasing external procedure shared libraries. A section from a *listener.ora* file and a *tnsnames.ora* file is given below as an example. This sets up the external procedure listener as a separate listener named LEXT. See the Oracle Net Services documentation for more information on setting up an external procedure listener.

listener.ora

For Unix

```
LEXT =
  (DESCRIPTION_LIST =
     (DESCRIPTION =
        (ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC0))
        (PROTOCOL_STACK =
           (PRESENTATION = TTC)
           (SESSION = NS)
        )
     )
  )

SID_LIST_LEXT =
(SID_LIST =
   (SID_DESC =
      (SID_NAME = PLSExtProc)
      (ORACLE_HOME = /opt/app/oracle/product/12.1.0)
      (PROGRAM = extproc)

(ENVS="EXTPROC_DLLS=ANY,LD_LIBRARY_PATH=/opt/app/oracle/product/12.1.0/lib")
   )
)
```

Note

Values of the following parameters in the above example, differ for different servers on which the database is run:

– For UNIX servers, ensure that the LD_LIBRARY_PATH environment variable is set in the external procedure listener's environment. LD_LIBRARY_PATH must include the database ORACLE_HOME/lib directory (ORACLE_HOME/lib32 for 64-bit Solaris installations). Set the environment variable in the user environment responsible for starting the external procedure listener (where it will be inherited by the listener process), or set it in the *listener.ora* file in the ENVS line. If running the Solaris operating system and a 64-bit Oracle database, then substitute *extproc32* for *extproc* on the PROGRAM line in the listener.ora.

2.2   Installing the Application Database

Download and unzip the Application Database file (ofslldb.zip) to a staging folder.

The application database software consists of tables, indexes, types, directories, libraries, views, and packages. A script program creates the application home directory structure, database user, the required tablespaces, database objects and loads the seed data. Snap shots of the script are provided after each step, to enable easy understanding. The steps involved in installing the application database are:

1. Running the installation script

2. Selecting the Install Type

3. Setting up the Installation Environment

4. Creating Application Home directory

5. Creating Application Tablespaces

6. Creating the Application Owner User and Grant Tablespace Quotas

7. Installing Database Objects and Seed Data

8. Installing Library Objects

9. Installing Directory Objects

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2.2.1   Running the installation script

From the unzipped 'Application Database file' folder, run the install script from a UNIX shell prompt and follow the on screen prompts to install the Oracle Financial Services Lending and Leasing infrastructure database objects.

On Unix:

$ ./installofslldb.sh

```
Oracle Financial Services Lending and Leasing DB Installer

    Important Note:
    --------------------------------------------------------------------------------

    It is recommended to have a OS level user id created on DB server (say ofsll)
    before running the installer.

    The installer will create the required Tablespace and application schema user.

    The default set of subdirectories underneath the home directory creates a couple
    of command files needed by the application.

    The tables are grouped as follows:

    GROUP              DESCRIPTION
    -----              ---------------------
     org               origination
     svc               servicing
     cmn               common
     txn               transaction
     api               import/conversion
     adm               setup/administration
     arc               archive


Continue? [y/n]: y
```

When the script prompts for confirmation, enter 'y' to continue.

2.2.2   Selecting the Install Type

The script displays install option..

```
Oracle Financial Services Lending and Leasing DB Installer

    Important Note:
    ----------------------------------------------------------------------------

    It is recommended to have a OS level user id created on DB server (say ofsll)
    before running the installer.

    The installer will create the required Tablespace and application schema user.

    The default set of subdirectories underneath the home directory creates a couple
    of command files needed by the application.

    The tables are grouped as follows:

    GROUP              DESCRIPTION
    -----              ---------------------
     org               origination
     svc               servicing
     cmn               common
     txn               transaction
     api               import/conversion
     adm               setup/administration
     arc               archive


Continue? [y/n]: y

        Installer Options              Description
        ---------------------------------------------------------------------------------------------------
        1.  New Installation           Full installation of OFSLL Product
        2.  Upgrade Installation       Upgrade existing installation of OFSLL Product
        3.  Install DB Objects only    Already the DB Schema and tablespaces are available install only DB Objects


Choose an installer option? [1-3]: 1
```

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The script prompts to 'Choose an installer option? [1-3]'.

- Enter '1' for complete installation of Product. When entered, the script runs installer for the complete installation of the product. The below sections guide you on the process, in detail.
- Enter '2' for upgrade installation. When entered, the script runs installer to upgrade the existing version of the product. Installing Upgrade section guides you on the upgrade installation.
- Enter '3' for only DB Object installation. When entered, the script runs installer to install all the OFSLL database objects. The script assumes that the user (OFSLL schema owner) and the tablespaces are created and all the required privileges are granted to the schema.

2.2.3 Setting up the Installation Environment

The installation script requires a properly set up environment in order to run. The script requests for few details. Enter the values as listed below. The script requests confirmation after each entry, enter 'y' to confirm.

```
Enter the Oracle Financial Services Lending and Leasing
Home Path? (usually /home/ofsll): /scratch/work_area/DEV/OFSLLREL

OFSLLHOME=/scratch/work_area/DEV/OFSLLREL
Okay? [y/n]: y

Enter the Oracle DB Home Path? /scratch/app/db12c/product/12.1.0/dbhome_1

ORAHOME=/scratch/app/db12c/product/12.1.0/dbhome_1
Okay? [y/n]: y

Enter the Oracle SID? ORCL
INSTANCENAME=ORCL
Okay? [y/n]: y

    Important Note:
    --------------------------------------------------------------------

    Here is a list of CRITICAL environment variables and their settings:

    PATH=/usr/lib64/qt-3.3/bin:/usr/kerberos/sbin:/usr/kerberos/bin:/bin:/usr/bin:/usr/dev_infra/platform/bin:/usr/dev_infra/generic/bin
11R6/bin:/usr/local/ade/bin:/scratch/app/db12c/product/12.1.0/dbhome_1/bin
    ORACLE_HOME=/scratch/app/db12c/product/12.1.0/dbhome_1
    ORACLE_SID=ORCL
    OFSLL_HOME=/scratch/work_area/DEV/OFSLLREL

    If the above environment variables are not correct, correct the environment
    and restart the script to continue.

Continue? [y/n]: y
```

Script Prompts	Description and Action Required
Oracle Financial Services Lending and Leasing Home Path	Enter the path to the application home directory. This is referred to as $OFSLL_HOME.
Oracle DB Home Path	Enter the path to the Oracle DB home directory. This is referred to as $ORACLE_HOME
Oracle SID	Enter the Name of Oracle Instance. In case of multitenant environment, enter the PDB name'
Path	Sets the path that includes $ORACLE_HOME/bin as the installation script requires SQL*Plus utility

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When the script prompts for the confirmation, enter 'y' to continue.

2.2.4 Creating Application Home directory

The *install* script will create a proper directory structure for the application below the user's home directory and will set the proper permissions on the directories.

$OFSLL_HOME

Variable	Description
/api	Stores the captured Applications/Account data from any third party Origination/Servicing System and setup the account in OFSLL
/acct_doc_load	Input load directory for account documents
/bin	Contains executable scripts
/cor_storage	Top level directory for generated correspondences
/doc_templates	Correspondence document template load directory
/email_templates	Contains email message templates
/fin_storage	Top level directory for faxed-in images
/dot_storage	Top level directory for account documents
/cus_dot_storage	Top level directory for customer/business documents
/images	Contains fax / document images uploaded to OFSLL screen
/lib	Contains external procedure shared libraries
/logs	Contains all Oracle Financial Services Lending and Leasing log files
/output	Destination for Oracle Financial Services Lending and Leasing output data files.
/rs_archive	Top level directory for archived reports
/sql	Directory contain SQL scripts used for creating database objects, recompiling packages, and various utility functions.
/tmp	Temporary directory used by some external procedures.
/input	Repository for data files needed as input to Oracle Financial Services Lending and Leasing processes
/input/lockbox	Contains files for lockbox processing.
/input/lockbox/processed	Contains files that are already processed.
/input/adr	Contains incoming adr files.
/input/adr/processed	Contains files that are already processed.
/input/cac	Contains incoming call activity files.

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Variable	Description
/input/cac/processed	Contains files that are already processed.
/input/ifd	Contains incoming lien title tracking files.
/input/ifd/processed	Contains files that are already processed.
/input/itu	Contains incoming ITU files.
/input/itu/processed	Contains files that are already processed.
/input/ivr	Contains incoming IVR files.
/input/ivr/processed	Contains files that are already processed.
/input/wfp	Contains incoming wholesale floor planning files.
/input/wfp/processed	Contains files that are already processed.
/input/ibn	Contains incoming BANKO_NEW files.
/input/ibn/processed	Contains files that are already processed.
/input/ibu	Contains incoming BANKO_UPDATE files.
/input/ibu/processed	Contains files that are already processed.
/input/ice	Contains currency exchange files.
/input/ice/processed	Contains files that are already processed.
/input/icl	Contains cure letter files.
/input/icl/processed	Contains files that are already processed.
/input/ipr	Contains AP Transaction History files.
/input/ipr/processed	Contains files that are already processed.
/input/ist	Contains files for Input Sale Transfer.
/input/ist/processed	Contains files that are already processed.
/input/ipu	Contains files for Payment Upload.
/input/ipu/processed	Contains files that are already processed.
/input/ipi	Contains files for Personally Identifiable Information (PII).
/input/ipi/processed	Contains files that are already processed.
input/iuh	Contains files for Input Usage History.
input/iuh/processed	Contains files that are already processed.
input/ifc	Contains files for Offline Cross Upsell Activity Posting.
input/ifc/processed	Contains files that are already processed.
input/icp	Contains files for Customer Based Payment Upload.

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Variable	Description
input/icp/processed	Contains files that are already processed.

2.2.5 Creating Application Tablespaces

The Oracle Financial Services Lending and Leasing table and index creation DDL allow for the use of up to 20 different tablespaces --10 for tables and 10 for indexes. The DDL commands reference a set of files that contain storage parameter information. These files allow mapping of logical tablespace names to physical tablespaces. Create as many of these tablespaces as necessary depending on the storage resources. Use locally managed tablespaces with a uniform extent policy. The following table describes different tablespaces, their content, and their expected growth pattern.

Tablespace	Storage Parameter File	Default Tablespace Name	Data	Comment
Admin	storage_parms_ table_adm.sql storage_parms_ index_adm.sql	OFSLL_ADM_DATA OFSLL_ADM_INDEX	setup data	low growth, low change.
Origination	storage_parms_ table_org.sql storage_parms_ index_org.sql	OFSLL _ORG_DATA OFSLL _ORG_INDEX	loan application data	growth varies by customer, few updates.
Servicing	storage_parms_ table_svc.sql storage_parms_ index_svc.sql	OFSLL _SVC_DATA OFSLL _SVC_INDEX	non transaction account data	growth varies by customer, few updates.
Transactions	storage_parms_ table_txn.sql storage_parms_ index_txn.sql	OFSLL _TXN_DATA OFSLL _TXN_INDEX	transaction data	high growth (relative to account and application data table spaces)
API	storage_parms_ table_api.sql storage_parms_ index_api.sql	OFSLL _API_DATA OFSLL _API_INDEX	application/ account data used during imports/ conversions	high growth, one time usage, data can be removed after loading
Archive	storage_parms_ table_arc.sql storage_parms_ index_arc.sql	OFSLL _ARC_DATA OFSLL _ARC_INDEX	Archived application/ account data	steady growth, potentially very large

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Tablespace	Storage Parameter File	Default Tablespace Name	Data	Comment
Common	storage_parms_table_cmn.sql storage_parms_index_cmn.sql	OFSLL _CMN_DATA OFSLL_CMN_INDEX	common non-admin data	generally low growth, some tables can be periodically truncated
Input Process	storage_parms_index_ipf.sql storage_parms_table_ipf.sql	OFSLL_IPF_DATA OFSLL_IPF_INDEX	Input processing file	steady growth, potentially very large
Output Process	storage_parms_index_opf.sql storage_parms_table_opf.sql	OFSLL_OPF_DATA OFSLL_OPF_INDEX	Output processing file	steady growth, potentially very large
Logging	storage_parms_index_log.sql storage_parms_table_log.sql	OFSLL_LOG_DATA OFSLL_LOG_INDEX	Error Logging	steady growth

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```
    Important Note:
    ----------------------------------------------------------------------

    Here is a list of CRITICAL environment variables and their settings:

    PATH=/usr/lib64/qt-3.3/bin:/usr/kerberos/sbin:/usr/kerberos/bin:/bin:/usr/bin:/usr/dev_infra/platform/bin
11R6/bin:/usr/local/ade/bin:/scratch/app/db12c/product/12.1.0/dbhome_1/bin
    ORACLE_HOME=/scratch/app/db12c/product/12.1.0/dbhome_1
    ORACLE_SID=ORCL
    OFSLL_HOME=/scratch/work_area/DEV/OFSLLREL

    If the above environment variables are not correct, correct the environment
    and restart the script to continue.


Continue? [y/n]: y
find: `/scratch/work_area/DEV/OFSLLREL': No such file or directory

Data already exists in /scratch/work_area/DEV/OFSLLREL,
Continue with override data? [y/n]: y

    Oracle Financial Services Lending and Leasing Default Tablespace Name and Size (default 300MB)

        Default Tablespace Name   Description                         New Name            Size (MB)
        --------------------------------------------------------------------------------------------

     1.  OFSLL_ADM_DATA          setup data
     2.  OFSLL_ADM_INDEX         setup data index
     3.  OFSLL_ORG_DATA          loan application data
     4.  OFSLL_ORG_INDEX         loan application data index
     5.  OFSLL_SVC_DATA          non transaction account data
     6.  OFSLL_SVC_INDEX         non transaction account data index
     7.  OFSLL_TXN_DATA          transaction data
     8.  OFSLL_TXN_INDEX         transaction data index
     9.  OFSLL_API_DATA          api data
    10.  OFSLL_API_INDEX         api data index
    11.  OFSLL_ARC_DATA          archive data
    12.  OFSLL_ARC_INDEX         archive data index
    13.  OFSLL_CMN_DATA          common non-admin data
    14.  OFSLL_CMN_INDEX         common non-admin data index
    15   OFSLL_IPF_DATA          incoming process file data
    16   OFSLL_IPF_INDEX         incoming process file index
    17   OFSLL_OPF_DATA          outgoing process file data
    18   OFSLL_OPF_INDEX         outgoing process file index
    19   OFSLL_LOG_DATA          log files header data
    20   OFSLL_LOG_INDEX         log files header index
    21.  Confirm Tablespace Values

    Note:
    --------------------------------------------------------------------------------------------------------
        To Change the Default Tablespace Name and Size
            a. Select a number from 1 to 20 to redefine each tablespace name and its size
            b. Select number 21 to confirm the redefined tablespace values

        To Accept the Default Tablespace Name and Size
            a. Select number 21 to confirm the default tablespace values

Redefine the tablespace name?
select a number [1-21]: 21
```

When prompted to 'Select a number' to redefine the tablespace name, you have 2 options:

Accept default Tablespace Name and Size: Select # 21

```
        Redefine the tablespace name?
        select a number [1-21]: 21
```

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Modify the default Tablespace Name and Size: Select the number of the tablespace, between 1–20, you need to modify

```
Oracle Financial Services Lending and Leasing Default Tablespace Name and Size (default 300MB)

    Default Tablespace Name   Description                              New Name          Size (MB)
    -----------------------------------------------------------------------------------------------
    1.  OFSLL_ADM_DATA         setup data
    2.  OFSLL_ADM_INDEX        setup data index
    3.  OFSLL_ORG_DATA         loan application data
    4.  OFSLL_ORG_INDEX        loan application data index
    5.  OFSLL_SVC_DATA         non transaction account data
    6.  OFSLL_SVC_INDEX        non transaction account data index
    7.  OFSLL_TXN_DATA         transaction data
    8.  OFSLL_TXN_INDEX        transaction data index
    9.  OFSLL_API_DATA         api data
    10. OFSLL_API_INDEX        api data index
    11. OFSLL_ARC_DATA         archive data
    12. OFSLL_ARC_INDEX        archive data index
    13. OFSLL_CMN_DATA         common non-admin data
    14. OFSLL_CMN_INDEX        common non-admin data index
    15  OFSLL_IPF_DATA         incoming process file data
    16  OFSLL_IPF_INDEX        incoming process file index
    17  OFSLL_OPF_DATA         outgoing process file data
    18  OFSLL_OPF_INDEX        outgoing process file index
    19  OFSLL_LOG_DATA         log files header data
    20  OFSLL_LOG_INDEX        log files header index
    21. Confirm Tablespace Values

    Note:
    -----------------------------------------------------------------------------------------------
        To Change the Default Tablespace Name and Size
            a. Select a number from 1 to 20 to redefine each tablespace name and its size
            b. Select number 21 to confirm the redefined tablespace values

        To Accept the Default Tablespace Name and Size
            a. Select number 21 to confirm the default tablespace values

Redefine the tablespace name?
select a number [1-21]: 1
```

Script Prompts	Description and Action Required
Enter new tablespace name	Enter tablespace name you need to assign to the default tablespace you have selected.
Enter tablespace size (in MB)	Enter the size (in MB) you need to assign to the new tablespace name you have entered

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Repeat this process for all the tablespace names you need to modify

```
Oracle Financial Services Lending and Leasing Default Tablespace Name and Size (default 300MB)

    Default Tablespace Name   Description                                    New Name              Size (MB)
    ----------------------------------------------------------------------------------------------------------------
    1.  OFSLL_ADM_DATA        setup data
    2.  OFSLL_ADM_INDEX       setup data index
    3.  OFSLL_ORG_DATA        loan application data
    4.  OFSLL_ORG_INDEX       loan application data index
    5.  OFSLL_SVC_DATA        non transaction account data
    6.  OFSLL_SVC_INDEX       non transaction account data index
    7.  OFSLL_TXN_DATA        transaction data
    8.  OFSLL_TXN_INDEX       transaction data index
    9.  OFSLL_API_DATA        api data
    10. OFSLL_API_INDEX       api data index
    11. OFSLL_ARC_DATA        archive data
    12. OFSLL_ARC_INDEX       archive data index
    13. OFSLL_CMN_DATA        common non-admin data
    14. OFSLL_CMN_INDEX       common non-admin data index
    15  OFSLL_IPF_DATA        incoming process file data
    16  OFSLL_IPF_INDEX       incoming process file index
    17  OFSLL_OPF_DATA        outgoing process file data
    18  OFSLL_OPF_INDEX       outgoing process file index
    19  OFSLL_LOG_DATA        log files header data
    20  OFSLL_LOG_INDEX       log files header index
    21. Confirm Tablespace Values

    Note:
    ----------------------------------------------------------------------------------------------------------------
        To Change the Default Tablespace Name and Size
            a. Select a number from 1 to 20 to redefine each tablespace name and its size
            b. Select number 21 to confirm the redefined tablespace values

        To Accept the Default Tablespace Name and Size
            a. Select number 21 to confirm the default tablespace values

Redefine the tablespace name?
select a number [1-21]: 21

Enter Oracle datafile path : /scratch/app/db12c/oradata/ORCL
```

Enter # 21 to redefine and to apply changes for the tablespaces you modified.

```
Enter Oracle datafile path : /scratch/app/db12c/oradata/ORCL

Oracle datafile path: /scratch/app/db12c/oradata/ORCL
Okay? [y/n]: y

Enter the Oracle userid (schema name) that will own the Oracle Financial Services Lending and Leasing
objects? (usually ofsllprd): OFSLLREL

Enter the password for this userid:

Enter the Oracle sysdba
userid? (usually sys): sys

Enter the password for this userid:
```

Script Prompts	Description and Action Required
Oracle tablespace path	Installed Database path that stores DBF files. Once entered the script prompts for confirmation. Enter 'y', if it is ok
Oracle User ID that will own the Oracle Financial Services Lending and Leasing objects	Valid User ID
Password for this User ID	Valid Password
Oracle sysdba User ID	Valid User ID
Password for sysdba User ID	Valid Password

2.2.6 Creating the Application Owner User and Grant Tablespace Quotas

Oracle Financial Services Lending and Leasing application requires a single Oracle user (or schema) and this user is the application owner. The application owner user owns all of the tables, indexes, views, sequences, packages, etc. that make up the application.

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The user is then granted access to the application tablespaces.

2.2.7 Installing Database Objects and Seed Data

Once the User ID is created, the script initiates the database object installation and lists the objects available for installation.

```
Oracle Financial Services Lending and Leasing Database Object Installation

The following items are available for installation:

                         1.  database libraries      (3)
                         2.  database directories     (46)
                         3.  database tables          (1300)
                         4.  common database views    (4)
                         5.  engine views             (3444)
                         6.  form views               (1319)
                         7.  java views               (396)
                         8.  database types           (289)
                         9.  database package specs   (3504)
                        10.  database package bodies  (3483)
                        11.  database indexes         (1832)
                        12.  System Seed Data         (54946)


Continue with Installation? [y/n] :
```

When the script prompts for the confirmation, enter 'y' to continue.

```
The Oracle Financial Services Lending and Leasing shared libraries are normally installed in a lib directory
below where the $OFSLL home directory is.  For example:
/home/ofsll/lib OR D:\ofsll\lib

Enter name of Oracle Financial Services Lending and Leasing shared library directory: /home/oracle/scratch/OFSLL/OFSLL143/lib


PL/SQL procedure successfully completed.
```

2.2.8 Installing Library Objects

Once the confirmation is received, the script initiates installation of library objects. A sample of the script is given below.

```
The Oracle Financial Services Lending and Leasing shared libraries are normally installed in a lib directory
below where the $OFSLL home directory is.  For example:
/home/ofsll/lib OR D:\ofsll\lib

Enter name of Oracle Financial Services Lending and Leasing shared library directory: /scratch/work_area/DEV/OFSLLREL/lib


PL/SQL procedure successfully completed.


Installing Directory objects...
crt_cordir_cmn.sql

The Oracle Financial Services Lending and Leasing schema owner owns all of the objects.

Enter name of Oracle Financial Services Lending and Leasing schema owner: OFSLLREL

This script will create an Oracle directory object that will be
used by the correspondence engine to determine where to store
document files.  A separate storage directory can be set up for
each company that is configured in Oracle Financial Services Lending and Leasing.  Enter the
company code for the company that you are configuring.  If you
don't know at this time, enter HQ

Enter the company code: HQ
```

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```
Enter name of Oracle Financial Services Lending and Leasing shared library directory: /export/home/ofss/lib

PL/SQL procedure successfully completed.
```

Script Prompts	Description and Action Required
Shared Library Directory	The path for the library directory. The default value is $OFSLL_HOME/lib

2.2.9 Installing Directory Objects

The fax images, correspondence documents, and the account document images are stored as BFILE objects. With BFILE, the image or document is physically stored outside the database on a file system available either on the database server or to the database server. A pointer to the file consisting an Oracle directory object and a file name is stored in the database. Application programs that create the BFILEs use application parameters to determine the specific directory object name. The application parameters are company level parameters, hence, a different directory object can be created for each defined company and branch.

```
The Oracle Financial Services Lending and Leasing shared libraries are normally installed in a lib directory
below where the $OFSLL home directory is.  For example:
/home/ofsll/lib OR D:\ofsll\lib

Enter name of Oracle Financial Services Lending and Leasing shared library directory: /scratch/work_area/DEV/OFSLLREL/lib

PL/SQL procedure successfully completed.

Installing Directory objects...
crt_cordir_cmn.sql
The Oracle Financial Services Lending and Leasing schema owner owns all of the objects.

Enter name of Oracle Financial Services Lending and Leasing schema owner: OFSLLREL

This script will create an Oracle directory object that will be
used by the correspondence engine to determine where to store
document files.  A separate storage directory can be set up for
each company that is configured in Oracle Financial Services Lending and Leasing.  Enter the
company code for the company that you are configuring.  If you
don't know at this time, enter HQ

Enter the company code: HQ

The COR_STORAGE_DIRECTORY is the top-level directory below which
the document files will be stored.
For example: /home/ofsll/cor_storage or d:\ofsll\cor_storage

Enter name of COR_STORAGE_DIRECTORY: /scratch/work_area/DEV/OFSLLREL/cor_storage

Directory created.

crt_dotdir_cmn.sql

The Oracle Financial Services Lending and Leasing schema owner owns all of the objects.

Enter name of Oracle Financial Services Lending and Leasing schema owner: OFSLLREL

This script will create an Oracle directory object that will be
used by the account document load batch job to determine where to
account document files.  Enter the company code for
company that you are configuring.  If you don't know at this
time, enter HQ

Enter the company code: HQ

The DOT_STORAGE_DIRECTORY is the top-level directory below which
the account document files will be stored.
For example: /home/ofsll/dot_storage or d:\ofsll\dot_storage

Enter name of DOT_STORAGE_DIRECTORY: /scratch/work_area/DEV/OFSLLREL/dot_storage

The DOT_STORAGE_DIRECTORY is the top-level directory below which
the account document files will be stored.
For example: /home/ofsll/dot_storage or d:\ofsll\dot_storage

Enter name of DOT_STORAGE_DIRECTORY: /scratch/work_area/DEV/OFSLLREL/dot_storage

Directory created.

crt_findir_cmn.sql

The Oracle Financial Services Lending and Leasing schema owner owns all of the objects.

Enter name of Oracle Financial Services Lending and Leasing schema owner: OFSLLREL

The FIN_STORAGE_DIRECTORY is the top-level directory below which
the faxed-in image GIF files will be stored.
For example: /home/ofsll/fin_storage or d:\ofsll\fin_storage

Enter name of FIN_STORAGE_DIRECTORY: /scratch/work_area/DEV/OFSLLREL/fin_storage

Directory created.

crt_utldir_cmn.sql

The Oracle Financial Services Lending and Leasing schema owner owns all of the objects.

Enter name of Oracle Financial Services Lending and Leasing schema owner: OFSLLREL

This script will create a number of Oracle directory objects that will be
used to grant the UTL_FILE package read and write access to application
directories.

The OFSLL HOME is the top-level directory below which
all application input and output files will be stored.
For example: /home/ofsll

Enter directory path for OFSLL HOME : /scratch/work_area/DEV/OFSLLREL
```

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Choose a name that identifies the usage, company, and branch for the directory object. Since directory objects are for the entire database and not just for the application, it is suggested that the schema name or identifier is used in the name to identify it from other directory objects. Choose a directory path with enough storage space to handle the expected volume of correspondences.

Directory Object Types	Abbreviation for Object Types	Suggested installation Location in $OFSLL_HOME
Correspondence interface directory objects	COR	*cor_storage*
Account documents interface directory objects	DOT	*dot_storage*
Fax-in interface directory objects	FIN	*fin_storage*

Loading Seed Data

The factory shipped seed data is automatically uploaded during installation and once complete, a confirmation message is displayed as indicated below:

```
Generating Seed Data...

Done.
```

2.3 Modifying Application System Parameters

Several system parameters in the seed data require modification to fit the local installation environment. One such parameter must be set manually. You can modify the rest using the application system parameter setup screen (Setup > Administration > System > System Parameter).

Setting the CMN_SERVER_HOME parameter values

As mentioned, the CMN_SERVER_HOME parameters must be set manually before the application screens can be used to set other parameters.

CMN_SERVER_HOME

Set it to the $**OFSLL_HOME** directory.

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Setting the remaining system parameters manually or from the setup screen

```
$ sqlplus

SQL*Plus: Release 12.1.0.2.0 Production on Fri Feb 12 15:28:17 2017
Copyright (c) 1982, 2014, Oracle. All rights reserved.

Enter user-name: OFSLL/OFSLL

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing
options

SQL> update system_parameters set syp_value = '$OFSLL_HOME' where
syp_parameter_cd = 'CMN_SERVER_HOME';

1 row updated.
SQL> commit;
```

Set the below parameters which are located on the
Setup→Administration→System→System Parameters screen. This is not a complete list of
system parameters, but is a list of system parameters related to installation details. The other
parameters are related to application business functionality. The values for many of these
parameters are known only after the installation and configuration of application server.

1. CMN_SER_ENVIRONMENT_FILE

   – Set it to the full path of the text file that contains environment settings that will be
     used when running external commands from the job service. For example,
     $OFSLL_HOME/ofsllenv

2. CMN_SERVER_TEMP_DIR

   – Set it to the full path of a directory that will be used to store temporary files needed
     during certain procedures. This is typically a directory named "*tmp*" underneath the
     $OFSLL_HOME directory (ex. $OFSLL_HOME*tmp* or $OFSLL_HOME*/tmp*).

3. ADMIN_SERVER_URL

   – This parameter is used to enable changing the user-level passwords. The default
     parameter value will generally have the form:

   Set the t3://hostname:port/console (Host name and Port) where application is installed

4. UIX_DEFAULT_IMAGE_PATH

   – Set the path to the fax / document images that are uploaded to OFSLL screen.
     Typically, it is $OFSLL_HOME/images.

5. Update system parameters with Oracle directory objects used by the application.

   – Login as an application schema owner and execute the following sql file from the
     dba_utils folder - 'update_sys_parms.sql'.

Modifying BI Publisher Parameters

1. JSV_REPORTS_SERVER_URL

Set this to the URL to the job service should use when running a report. Reports are all
submitted as a background job (either by a user or by the job scheduler). These reports will
be sent to a printer/file system as chosen by the user or as configured in the job setup. The
parameter value will generally have the form: http://hostname:port/ (Host name and Port
number of xmlp server where BIP is installed)

2. JSV_USE_REPORTS_SERVER

Set to 'Yes

3. JSV_REPORT_ARCHIVE_DIRECTORY

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Set to a directory that will be used to store OFSLL report PDFs. Typically it is $OFSLL_HOME/rs_archive

Batch reports can be configured to print to a special "archive" printer that will create a PDF of the report and store it below the JSV_REPORT_ARCHIVE_DIRECTORY. This directory must be accessible to the database server machine. All archived reports are stored by a process running on the database server machine and not by a process running on the report server machine.

The report PDFs are stored below the JSV_REPORT_ARCHIVE_DIRECTORY in a subdirectory representing the type of report (report or correspondence), the year, the month, and the day that the report was printed. For example, if a report was printed on December 15, 2013, the PDF file will be located in: JSV_REPORT_ARCHIVE_DIRECTORY/reports/2013/12/15

4. JSV_ARCHIVE_SERVER_URL

Set this to the URL that the job service should use when running an archived report. Archive reports are all reports submitted as a background job (either by a user or by the job scheduler) to a special printer named ARCHIVE. The parameter value will generally have the form: http://hostname:port/ (Host name and Port number of xmlp server where BIP is installed)

This can have the same value as the JSV_REPORTS_SERVER_URL parameter. This additional parameter is supplied in case there are multiple report servers and it is desirable to send archive requests to a different server than the other report requests.

5. JSV_SMTP_SERVER - smtp mail router of organization

6. JSV_USE_BI_PUBLISHER - Set to YES (Y)

7. JSV_BI_USER - set as the BI Publisher Admin User Name *(Required only if the system parameter 'OUTBOUND_CALL_Q' is set to 'N')*.

8. JSV_BI_PASSWORD - set as the BI Publisher Admin Password *(Required only if the system parameter 'OUTBOUND_CALL_Q' is set to 'N')*.

9. UIX_REPORTS_SERVER_URL

Set this to the URL that user interface should use when running a report. The parameter value will generally have the form: http://hostname:port/ (Host name and Port number of xmlp server where BIP is installed). This can have the same value as the JSV_REPORTS_SERVER_URL parameter.

Setting the fax-in interface company parameters manually or from the setup screen.

If the fax-in service will be used, set these parameters located on the Setup→Administration→Company→System Parameters screen. These parameters are company level parameters, which mean that a fax-in service can be configured for each company in Oracle Financial Services Lending and Leasing.

1. FIN_POP_SERVER

Set to the name of the POP server that the fax-in service will communicate with to retrieve email messages containing faxed in images.

2. FIN_POP_USERNAME

Set to the username/account on the POP server that the fax-in service will retrieve the email messages from.

3. FIN_POP_PASSWORD

Set to the password for the FIN_POP_USERNAME on the POP server that the fax-in service will retrieve the email messages from.

4. FIN_STORAGE_DIRECTORY

Set to the name of the Oracle *directory object,* created during installation, which defines where the faxed-in images will be stored. The image files are stored in the database as a BFILE which means that only a reference to an external file is stored in the database and the actual file is stored outside on the operating system's file system in a path defined by an Oracle directory object. This parameter is the name of the Oracle object, not the actual directory path. Typical naming convention used for FIN directory objects is - FIN_DIR_<application owner name>_company_branch. For example: FIN_DIR_OFSLLREL_HQ

5. FIN_TEMP_DIRECTORY

Set to the name of a directory that the fax-in service can use during conversion of the email attachment TIF file into a GIF file. This is typically set to $OFSLL_HOME*/tmp*.

Setting the correspondence interface company parameters manually or from the setup screen.

If using the correspondence interface, set these additional parameters located on the Setup→Administration→Company→System Parameters screen. These parameters are company level parameters, which means that a correspondence interface can be configured for each company in Oracle Financial Services Lending and Leasing.

COR_STORAGE_DIRECTORY

Set to the name of the Oracle *directory object,* created during installation, which defines where the generated correspondences will be stored. The correspondence files are stored in the database as a BFILE which means that only a reference to an external file is stored in the database and the actual file is stored outside on the operating system's file system in a path defined by an Oracle directory object. This parameter is the name of the Oracle object, not the actual directory path. Typical naming convention used for COR directory objects is - COR_DIR_<application owner name>_company_branch. For example: COR_DIR_OFSLLREL_HQ

Setting the account documents interface company parameters manually or from the setup screen.

If using the account documents interface, set these additional parameters located on the Setup→Administration→Company→System Parameters screen. These parameters are company level parameter, which means that an account documents interface can be configured for each company in Oracle Financial Services Lending and Leasing.

DOT_STORAGE_DIRECTORY

Set to the name of the Oracle *directory object,* created during installation, which defines where the account documents will be stored. The account document files are stored in the database as a BFILE which means that only a reference to an external file is stored in the database and the actual file is stored on the operating system's file system in a path defined by an Oracle directory object. This parameter is the name of the Oracle object, not the actual directory path. Typical naming convention used for DOT directory objects is - DOT_DIR_<application owner name>_company_branch. For example: DOT_DIR_OFSLLREL_HQ

Creating the user 'INTERNAL'

This user is required for batch job process, webservices and to start services.

A script is provided in the distribution media in the dba_utils folder to create an user. Run the script "crt_app_user.sql script" as a OFSLL application owner user.

```
SQL> @crt_app_user.sql;
Enter the name of the OFSLL App user Id you
Want to create user: INTERNAL
Enter the First Name for this user: OFSLL
Enter the Last Name for this user: RELEASE
Enter the Phone Number for this user: 1234567891
Enter the Fax Number for this user: 1234567891

1 row created.


1 row created.


1 row created.
```

Granting OFSLL Screen / Web Service Access to Application Users

Post user creation, to access all the 'Screens' and 'web service' for a specific responsibility, login as an application schema owner and execute the following db script available in dba_utils folder.

set_screen_access.sql

In the prompt, enter the user responsibility. You can also specify 'ALL' to provide screen / web service access to all the created users in bulk.

In the next prompt 'source(UI/WS)', enter one of the following:

- 'UI' to provide screen access to either All or specific user responsibility.
- 'WS' to provide web service access to either All or specific user responsibility.

```
SQL> @set_screen_access.sql;
Enter responsibility_cd to continue or Q to Exit. :ALL
Enter source(UI/WS) to continue or Q to Exit. :UI
Granted access to ALL
No of rows inserted :7

PL/SQL procedure successfully completed.

Enter Commit to save the changes or Rollback if you want to revert changes.
SQL> COMMIT;

Commit complete.
```

Further, you can customized the access through Setup > User > Access screen - 'Screen' and 'Webservice' tabs, as detailed in setup guide.

Granting user access to Reports, Transactions, & Correspondence

Post user creation, to access all the Reports, Transactions, Correspondence for a specific responsibility, login as an application schema owner and execute the following db script available in dba_utils folder.

set_rpt_txn_cor_access.sql

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In the prompt, enter the user responsibility. You can also specify 'ALL' to provide screen access to all the created users in bulk.

```
SQL> @set_rpt_txn_cor_access.sql;
Enter responsibility_cd to continue or Q to Exit :ALL
Granted access to Reports, Correspondance and Txn codes.

PL/SQL procedure successfully completed.

Enter Commit to save the changes or Rollback if you want to revert changes.
SQL> commit;

Commit complete.

SQL> █
```

Further, you can customized the access through Setup > User > Access screen as detailed in setup guide.

2.4 After Creating the Database

After the database has been created, some Oracle system parameters may have to be modified due to application requirements. See the previous section about *Creating the Database* for more details.

Set the utl_file_dir system parameter

Application uses the Oracle UTL_FILE utility for reading from and writing to files for some of the datafile interfaces, as well as when log files and debugging files are written. The UTL_FILE utility uses an Oracle system parameter to restrict the directories that can be written to or read from. Set this parameter to * (meaning all directories on the server), or set it to a list of directories. At this time, those directories are $OFSLL_HOME/*logs*, $OFSLL_HOME/*sql*, $OFSLL_HOME/*output*, $OFSLL_HOME/*input*, $OFSLL_HOME/*input/ lockbox* and $OFSLL_HOME/*input/lockbox/processed/ (note the trailing slash)*. Over time this list may grow (or shrink) as new versions of Oracle Financial Services Lending and Leasing are released. This parameter cannot be set dynamically.

The database must be restarted for the above values to take effect.

Example 1

alter system set utl_file_dir='*' scope=spfile;

Example 2

alter system set utl_file_dir='$OFSLL_HOME\logs', '$OFSLL_HOME\sql', '$OFSLL_HOME\output', '$OFSLL_HOME\input', '$OFSLL_HOME\input\lockbox', '$OFSLL_HOME\input\lockbox\processed\' scope=spfile;

Set the job_queue_process system parameter

The application job service and job scheduler make heavy use of the DBMS_JOB facility. This value will represent the number of simultaneous jobs that can be running on the server at a point of time. The various services that are required to be running to make the Oracle Financial Services Lending and Leasing software function, will account for 6 job queue processes. Anything above 6 is such that the online and nightly batch jobs can run in parallel. This parameter can be set again at any time without having to restart the database, if there be a need to add to or cut back on the number of running processes.

Example

alter system set job_queue_processes=10 scope=both;

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2.5   Set the Oracle JVM File Permissions

The application correspondence interface uses the built-in Oracle Java Virtual Machine (JVM) to create subdirectories below the top-level correspondence/document storage directory (defined by the application's COR_STORAGE_DIRECTORY, DOT_STORAGE_DIRECTORY parameters). In order to do this, the JVM's security policy needs to be updated by the Oracle built-in DBMS_JAVA package to allow directories to be created and accessed. A SQL script named *set_java_perms.sql* has been supplied on the installation media in the *dba_utils* directory for this purpose. The script will select all directory object names defined for the application COR_STORAGE_DIRECTORY and DOT_STORAGE_DIRECTORY parameters and will provide read, write, and delete privileges to the directory named by the directory object and all directories below it.

Running the set_java_perms.sql script.

After the system and company parameters have been set up, run SQL*Plus as the SYS user and run the *set_java_perms.sql* script to set the file permissions.

Similarly, in case of any java permission access issues to directories, provide the required read, write or delete privileges.

2.6   Advanced Queues

Queuing feature is used in OFSLL for writing debugs into the XMLTYPE column of LOG_FILES_HEADER table instead of writing into the file system.

Also, in OFSLL, Outbound database calls are routed through application server through AQ JMS bridge. The MDB deployed in Middleware, reads the AQ message remotely which has all information required to make the call to Bureau or RO /DT.

The MDB deployed in Middleware, reads the AQ message ('OFSLL_OUTBOUND_TOPIC') remotely which has information about job set and job set status code, which has been initiated by job scheduler.

To enable alert and debug message queue:

1. Set the system parameter "CMN_DEBUG_METHOD" with syp_value = 4.
   – SQL> update system_parameters set syp_value = '4' where syp_parameter_cd = 'CMN_DEBUG_METHOD';

To enable MDB EJB queue:

2. Set the system parameter and credit bureau parameter in "OUTBOUND_CALL_Q" with syp_value = Y.
   – UPDATE SYSTEM_PARAMETERS SET SYP_VALUE='Y' WHERE SYP_PARAMETER_CD='OUTBOUND_CALL_Q' AND SYP_ENABLED_IND='Y'
   – UPDATE CREDIT_BUREAU_PARAMETERS SET CRP_VALUE='Y' WHERE CRP_PARAMETER_CD='OUTBOUND_CALL_Q'

3. Start the queue services by the following commands:
   – SQL> EXECUTE dbms_aqadm.start_queue('OFSLL_DEBUG_MSG_QUEUE',TRUE,TRUE);
   – SQL> EXECUTE dbms_aqadm.start_queue('OFSLL_ALERT_MSG_QUEUE', TRUE,TRUE);
   – SQL> EXECUTE dbms_aqadm.start_queue('OFSLL_OUTBOUND_Q',TRUE,TRUE);

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- SQL> EXECUTE
  dbms_aqadm.start_queue('OFSLL_OUTBOUND_TOPIC',TRUE,TRUE);
- SQL > EXECUTE
  dbms_aqadm.start_queue('OFSLL_EVENTS_QUEUE',TRUE,TRUE);

4. Once the queue services are started, subscribe and register the queue for a notification so that whenever a data inserted into the queue it will notify the system.
   - SQL>setup_AQ_subscribe.sql

To switch back to the existing file system mechanism:

1. To un subscribe and register the queue for a notification
   - SQL>setup_AQ_unsubscribe.sql

2. Stop the queue services by the following commands:
   - SQL> EXECUTE
     dbms_aqadm.stop_queue('OFSLL_DEBUG_MSG_QUEUE',TRUE,TRUE,
     FALSE);
   - SQL> EXECUTE dbms_aqadm.stop_queue ('OFSLL_ALERT_MSG_QUEUE',
     TRUE, TRUE, FALSE);
   - SQL> EXECUTE
     dbms_aqadm.stop_queue('OFSLL_OUTBOUND_Q',TRUE,TRUE,FALSE);
   - SQL> EXECUTE
     dbms_aqadm.stop_queue('OFSLL_OUTBOUND_TOPIC',TRUE,TRUE,FALSE);

3. Set the system parameter "CMN_DEBUG_METHOD"with syp_value= 1.
   - SQL> update system_parameters set syp_value = '1' where syp_parameter_cd = 'CMN_DEBUG_METHOD';

Note

- Please do not delete any queue or queue table from the schema.
- When you unsubscribe the queue, MDB queue is also stopped. You need to start 'OFSLL_OUTBOUND_Q' and 'OFSLL_OUTBOUND_TOPIC' to continue with MDB flow.
- Ensure that you have granted 'dbms_aqin' privileges to the schema user.

2.7   Fine-Grained Access to Network Services in Oracle Database

Oracle allows access to external network services using several PL/SQL APIs (UTL_TCP, UTL_SMTP, UTL_MAIL, UTL_HTTP and UTL_INADDR), all of which are implemented using the TCP protocol.

An Access Control Entry can be limited to specific PL/SQL APIs (UTL_TCP, UTL_INADDR, UTL_HTTP, UTL_SMTP, and UTL_MAIL).

In a multitenant environment, Access Control Entries (ACEs) can be created at the CDB or PDB level. For the examples in this article, all the host ACLs and host ACEs will be created at the PDB level. The following code creates two test users in a PDB.

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Append an Access Control List (ACE)

Host ACL are never created directly. Instead, they are implicitly created when we append a host Access Control Entry (ACE) using the DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACE procedure. If we append a new ACE to a host that has no existing host ACL, a new host ACL is implicitly created. If the host already has an ACL, the new host ACE will be appended to the existing host ACL.

Login to SQL*Plus as the SYS user.

```
BEGIN
  DBMS_NETWORK_ACL_ADMIN.append_host_ace (
    host       => ' 192.168.2.3 ',
    lower_port => 80,
    upper_port => 80,
    ace        => xs$ace_type(privilege_list => xs$name_list('http', 'connect'),
                           principal_name => 'OFSLL',
                           principal_type => xs_acl.ptype_db));
END;
/
```

Append a second host to the existing ACL

```
BEGIN
  DBMS_NETWORK_ACL_ADMIN.APPEND_HOST_ACL (
    host       => 192.168.2.3 ',
    lower_port => 80,
    upper_port => 80,
    acl        => 'NETWORK_ACL_02B9BC669CA6110CE0536638A8C05D8A');
END;
/
```

Parameter Definitions

The parameters used in the procedures and functions above

Parameters	Description
host	Any valid host name or IP address. Wildcards are allowed.
lower_port	Specific port number, or lower part of a range of ports.
upper_port	Upper part of a range of ports. If NULL, it defaults to the lower_port value.
ace	The access control entry, defined using the XS$ACE_TYPE type.

The XS$ACE_TYPE type has the following definition.

```
xs$ace_type(privilege_list => xs$name_list('privilege1', 'privilege2'),
          principal_name => 'user-or-role',
          principal_type => xs_acl.ptype_db)
```

Parameters	Description
privilege_list	The list of privileges available to the ACE.
princi-pal_name	The database user the ACE applies to.
principal_-type	You will always use XS_ACL.PTYPE_DB for these network ACEs as they apply to users and roles.

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The privilege_list specifies one or more privileges in a comma separated list. The available privileges are shown below.

Parameters	Description
http	Access restricted to the UTL_HTTP package and the HttpUriType type.
http_proxy	Needed in conjunction with http if HTTP access is via a proxy.
smtp	Access restricted to the UTL_SMTP and UTL_MAIL packages.
resolve	Access restricted to the UTL_INADDR packages.
connect	Opens access to the UTL_TCP, UTL_SMTP, UTL_MAIL, UTL_HTTP, and DBMS_LDAP packages and the HttpUriType type.
jdwp	Enables Java Debug Wire Protocol debugging operations.

2.8   <u>Installing Upgrade</u>

An upgrade is a process of updating an existing version to its higher version. For example, upgrading from Oracle Financial Services Lending and Leasing 14.5.0.0.0 to 14.6.0.0.0.

The following upgrade path is recommended for existing Daybreak customers:

DLS 11.6.0.0.23 > OFSLL 14.0.0.0.0 > OFSLL 14.1.0.0.0 > OFSLL 14.2.0.0.0 > OFSLL 14.3.0.0.0 > OFSLL 14.3.1.0.0 > OFSLL 14.4.0.0.0 > OFSLL 14.5.0.0.0 > OFSLL 14.6.0.0.0

Note

- – Please refer to 'Upgrade Installation Guide' for availability of direct upgrades.
- – If table compression feature is enabled in OFSLL, disable table compression prior to upgrade.

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If you choose '2' as the installer option at the 'Selecting the Install Type' stage, then the script runs the upgrade installer.

```
Oracle Financial Services Lending and Leasing DB Upgrade
It is recommended to run this upgrade by logging to "ofsll" user created
Continue? [y/n]: y

Enter the Oracle Financial Services Lending and Leasing
Home Path? (This is usually /home/ofsll): /scratch/work_area/DEV/OFSLLREL
OFSLLHOME=/scratch/work_area/DEV/OFSLLREL
Okay [y/n]?: y

Enter the Oracle DB Home Path? /scratch/app/db12c/product/12.1.0/dbhome_1

ORAHOME=/scratch/app/db12c/product/12.1.0/dbhome_1
Okay [y/n]?: y

Enter the Oracle SID? ORCL

INSTANCENAME=ORCL
Okay [y/n]?: y

Important Note:
--------------------------------------------------------------------------------------
This will install database objects used by Oracle Financial Services Lending and Leasing.

Here is a list of CRITICAL environment variables and their settings:

PATH=/usr/lib64/qt-3.3/bin:/usr/kerberos/sbin:/usr/kerberos/bin:/bin:/usr/bin:/usr/dev_infra/platform/bin:/usr/d
ev_infra/generic/bin:/usr/local/bin:/usr/X11R6/bin:/usr/local/ade/bin:/scratch/app/db12c/product/12.1.0/dbhome_1
/bin
ORACLE_HOME=/scratch/app/db12c/product/12.1.0/dbhome_1
ORACLE_SID=ORCL
OFSLL_HOME=/scratch/work_area/DEV/OFSLLREL

If the above environment variables are not correct, correct the environment and restart
the script to continue.

Okay to continue? [y/n]: y
..............
Oracle Financial Services Lending and Leasing Database Object Patch

The following items are available for installation:

                    1.  database libraries
                    2.  database directories
                    3.  database tables
                    4.  common database views
                    5.  engine views
                    6.  form views
                    7.  java views
                    8.  database types
                    9.  database package specs
                    10. database package bodies
                    11. database indexes
                    12. System Seed Data

Continue with Installation? [y/n] : █
```

```
..............
Oracle Financial Services Lending and Leasing Database Object Installation

The following items are available for installation:

                    1.  database libraries        (6)
                    2.  database directories       (4)
                    3.  database tables            (56)
                    4.  common database views      (4)
                    5.  engine views               (1507)
                    6.  form views                 (1299)
                    7.  java views                 (456)
                    8.  database types             (276)
                    9.  database package specs    (3336)
                    10. database package bodies   (3315)
                    11. database indexes          (135)
                    12. System Seed Data          (   51777)


Continue with Installation? [y/n] : █
```

Respond to the prompts and continue (For details, refer sections Setting up the Installation Environment *to* Installing Directory Objects*).*

While installing the upgrade, the installer performs the following tasks:

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1. Stop the running services, if any.

```
Enter the Oracle userid (schema name) that will own the Oracle Financial Services Lending and Le
asing
objects? (This is usually ofsllprd): ofsllrel

Enter the password for this userid:

Services are still running, cannot load objects.
Stop the Services? [y/n]y

Shutdown the Job Services...

Installing Type objects...
crt_type_cmn.sql

Type dropped.
```

2. Install the upgrade

```
PL/SQL procedure successfully completed.


PL/SQL procedure successfully completed.


Commit complete.


Commit complete.


Inserting Version Details...

1 row created.


Commit complete.
```

3. Recompile the invalid objects and complete installation.

```
Oracle Financial Services Lending and Leasing DB Object Upgrade Complete.
Log files are located in /scratch/work_area/DEV/OFSLLREL/logs/ofsll_patch_logs
-bash-4.1$
```

Note

Post upgrade, if there are any invalid java stored procedures noticed, please recompile the respective units manually.

Granting OFSLL Screen / Web Services Access to Application Users

Post upgrade, you need to execute the following db script available in dba_utils folder.

- To provide access to all the new 'Screens' and/or 'Web Services' for a specific responsibility, execute set_screen_access.sql
- To provide access to all the new Reports, Transactions, Correspondence for a specific responsibility, execute set_rpt_txn_cor_access.sql

In the prompt, enter the user responsibility. You can also specify 'ALL' to provide screen access to all the users in bulk.

Further, you can customized the access through Setup > User > Access screen as detailed in setup guide.

2.9 Enabling Transparent Data Encryption to Secure Stored Data

Oracle Database uses authentication, authorization, and auditing mechanisms to secure data in the database. The operating system data files where data is stored is not used. To protect these data files, Oracle Database provides Transparent Data Encryption (TDE). TDE encrypts sensitive data stored in data files. Encrypted data is transparently decrypted for a database user or application that has access to data.

OFSLL application processes sensitive data. Hence, it is recommended to use a TDE to protect confidential data, such as credit card and social security numbers, stored in table columns.

A script is provided along with the distribution media to encrypt the sensitive columns in the table. You can follow the steps below to enable TDE for column encryption:

To start using TDE, the security administrator must create a wallet and set a master key. The wallet can be the default database wallet shared with other Oracle Database components, or a separate wallet specifically used by TDE. Oracle strongly recommends that you use a separate wallet to store the master encryption key.

Specifying a Wallet Location for Transparent Data Encryption

If you wish to use a wallet specifically for TDE, then you must specify a wallet location in the sqlnet.ora file by using the ENCRYPTION_WALLET_LOCATION parameter. Oracle recommends that you use the ENCRYPTION_WALLET_LOCATION parameter to specify a wallet location for TDE.

ENCRYPTION_WALLET_LOCATION = (SOURCE =

(METHOD = FILE)

(METHOD_DATA =

(DIRECTORY =

 /etc/ORACLE/WALLETS/oracle)))

If no wallet location is specified in the sqlnet.ora file, then the default database wallet location is used. The default database wallet location is ORACLE_BASE/admin/DB_UNIQUE_NAME/ wallet or ORACLE_HOME/admin/DB_UNIQUE_NAME/wallet. Here, DB_UNIQUE_NAME is the unique name of the database specified in the initialization parameter file.

Setting the Master Encryption Key

The master encryption key is stored in an external security module, and is used to protect the table keys and tablespace encryption keys. By default, the master encryption key is a random key generated by Transparent Data Encryption (TDE). It can also be an existing key pair from a PKI certificate designated for encryption. To use TDE with PKI key pairs, the issuing certificate authority must be able to issue X.509v3 certificates with the key usage field marked for encryption.

To set the master encryption key, use the following command:

SQL> ALTER SYSTEM SET ENCRYPTION KEY IDENTIFIED BY 'password'

where,

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- password is the mandatory wallet password for the security module, with no default setting. It is case sensitive. Enclose the password string in double quotation marks (" ").
- The wallet location specified by the ENCRYPTION_WALLET_LOCATION parameter, in the sqlnet.ora parameter file, is used to create the master encryption key. If the ENCRYPTION_WALLET_LOCATION parameter is not present in the sqlnet.ora file, then the WALLET_LOCATION value is used. A new wallet is created in case of no wallet.
- If no wallet location is specified in the sqlnet.ora file, then the default database wallet location is used. The default database wallet location is ORACLE_BASE/admin/DB_UNIQUE_NAME/wallet or ORACLE_HOME/admin/DB_UNIQUE_NAME/wallet. Here, DB_UNIQUE_NAME is the unique name of the database specified in the initialization parameter file.
- If an existing auto login wallet is present at the expected wallet location, then a new wallet is not created.

Resetting the Master Encryption Key

Reset/Regenerate the master encryption key only if it has been compromised or as per the security policies of the organization. You should back up the wallet before resetting the master encryption key.

Use the ALTER SYSTEM command to set or reset (rekey) the master encryption key.

Opening and Closing the Encrypted Wallet

The database must load the master encryption key into memory before it can encrypt or decrypt columns/tablespaces. Opening the wallet allows the database to access the master encryption key. Use the following ALTER SYSTEM command to explicitly open the wallet:

SQL> ALTER SYSTEM SET ENCRYPTION WALLET OPEN IDENTIFIED BY "password"; where password is the password to open the wallet. You should enclose the password string in double quotation marks (" ").

Once the wallet has been opened, it remains open until you shut down the database instance, or close it explicitly by issuing the following command:

SQL> ALTER SYSTEM SET ENCRYPTION WALLET CLOSE IDENTIFIED BY "password"

Encrypting Columns in Existing Tables

To add an encrypted column to an existing table, or to encrypt or decrypt an existing column, you use the ALTER TABLE SQL command with the ADD or MODIFY clause.

SQL> ALTER TABLE applicants MODIFY (apl_gender_cd ENCRYPT USING 'AES256');

Encrypting the indexed columns:

SQL> ALTER TABLE applicants MODIFY (apl_ssn ENCRYPT USING 'AES256' NO SALT);

Disabling Encryption on a Column

You may want to disable encryption for reasons of compatibility or performance. To disable column encryption, use the ALTER TABLE MODIFY command with the DECRYPT clause.

Example 7-11 Turning Off Column Encryption:

SQL> ALTER TABLE applicants MODIFY (apl_gender_cd DECRYPT);

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A Set of scripts are provided on the installation media in the dba_utils directory to encrypt the recommended columns in OFSLL.

upgrade_tb_tde_enable_ofsll.sql to encrypt base table columns.

upgrade_tb_opur_tde_enable_ofsll.sql to encrypt archive table columns.

upgrade_tb_api_tde_enable_ofsll.sql to encrypt api table columns.

Login as an OFSLL user and execute the scripts to encrypt the columns.

Note

Refer Oracle® Database Advanced Security Administrator's Guide, section on Securing Stored Data Using Transparent Data Encryption for details.

2.10 Data Redaction

Data Redaction is one of the new features available in 12c. Data Redaction is in Advanced Security option of enterprise edition.

Oracle Advanced Security Data Redaction provides selective, on-the-fly redaction of sensitive data in SQL query results prior to display by applications so that unauthorized users cannot view the sensitive data.

OFSLL application processes sensitive data. Hence, it is recommended to use a Data Redaction to protect confidential data, such as credit card and social security numbers, stored in table columns.

There are different types of redaction; full, partial, regexp, random and none. Please refer Oracle® Database Advanced Security Administrator's Guide, section on Configuring Oracle Data Redaction Policies for details.

2.11 Optimize PS_TXN

Oracle Fusion Applications use the PS_TXN table to store the intermediate processing state. When there are many concurrent users, this table receives a high number of inserts and could suffer from concurrency issues.

Follow the steps outlined in note ID 1444959.1 in My Oracle Support to alleviate the contention.

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