Oracle® Financial Services Lending and Leasing

Database Installation Guide

Release 15.0.0.0.0
G42363-02
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Oracle Financial Services Lending and Leasing Database Installation Guide, Release 15.0.0.0.0

G42363-02

Contents

Preface

This topic contains following sub-topics:

Purpose

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 Administration19c.

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)
- Following database versions are supported and can be downloaded from http://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html
  - Oracle Database 19c (version 19.28.0.0.0)

Database installation is a two step process:

1. Create Database
2. Install the Application Database

After installing the application database, you need to:

1. Modify Application System Parameters
2. Set the Oracle JVM File Permissions

In additional, you can configure the following:

1. Optimize PS_TXN Table in Fusion Application
2. Perform Online Application Upgrade Using EBR
3. Machine Learning for Servicing Queue Creation

Audience

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

Documentation Accessibility

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

Conventions

The following text conventions are used in this document:

Table Convention

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

Screenshot Disclaimer

Personal information used in the interface or documents is dummy and does not exist in the real world. It is only for reference purposes.

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Setup and Configuration of the Database Server

The following section details how to setup and configure the database server.

- Create Database
- Install the Application Database
- Modify Application System Parameters
- Create Users and Granting Access
- Set the Oracle JVM File Permissions
- Advanced Queues
- Install Upgrade

1.1 Create Database

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

- Create the Database Server Users and Groups
- Creation of the Database

1.1.1 Create the Database Server Users and Groups

The following section deals with the creation of 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.

Table 1-1 Database Server Users and Groups

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.

Table 1-1 (Cont.) Database Server Users and Groups

Process Group	Description
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.
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:

Table 1-2 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.

1.1.2 Creation of the Database

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

- Set NLS Characterset as AL32UTF8.
- 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. 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.

For 19c database, go to $ORACLE_HOME/hs/admin/extproc.ora and set the parameter:- SET EXTPROC_DLLS=ANY

1.2 Install the Application Database

This section explains the steps involved in 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:

- Run the installation script
- Select the Install Type
- Set up the Installation Environment
- Create Application Home Directory
- Create Application Tablespaces
- Create the Application Owner User and Grant Tablespace Quotas
- Install Database Objects and Seed Data
- Install Library Objects
- Install Directory Objects

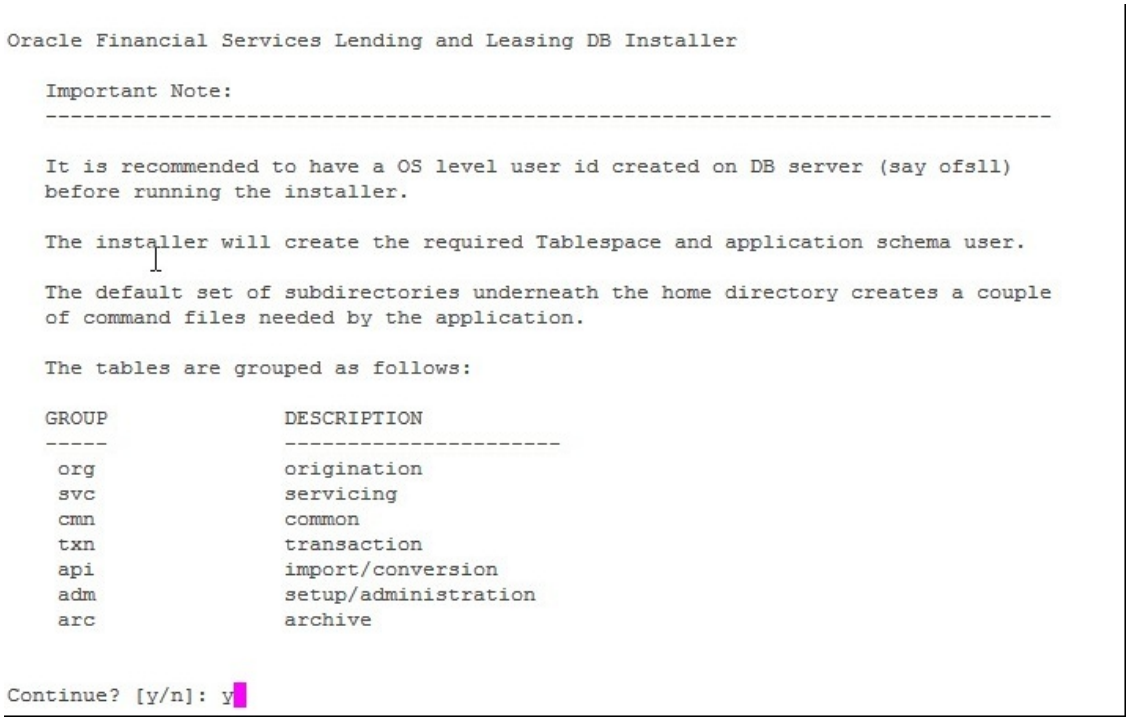
1.2.1 Run the installation script

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

Figure 1-1 Command prompt window 1

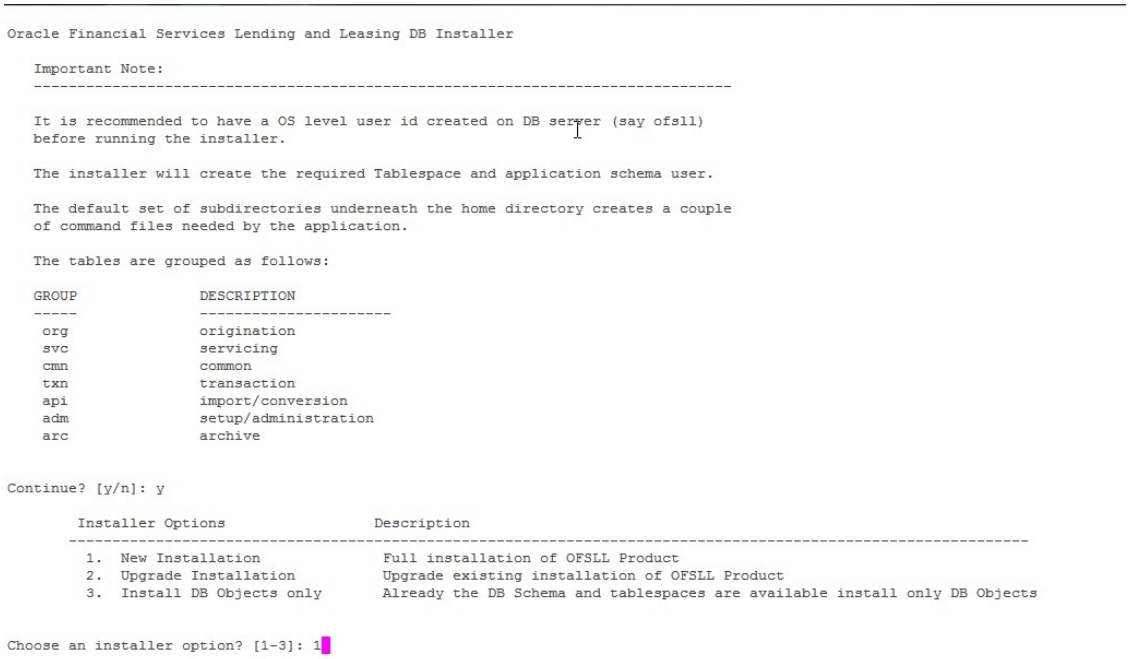


When the script prompts for confirmation, enter **y** to continue.

1.2.2 Select the Install Type

The script displays install option.

Figure 1-2 Command prompt window 2



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. Install 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.

1.2.3 Set 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.

Figure 1-3 Command prompt window 3

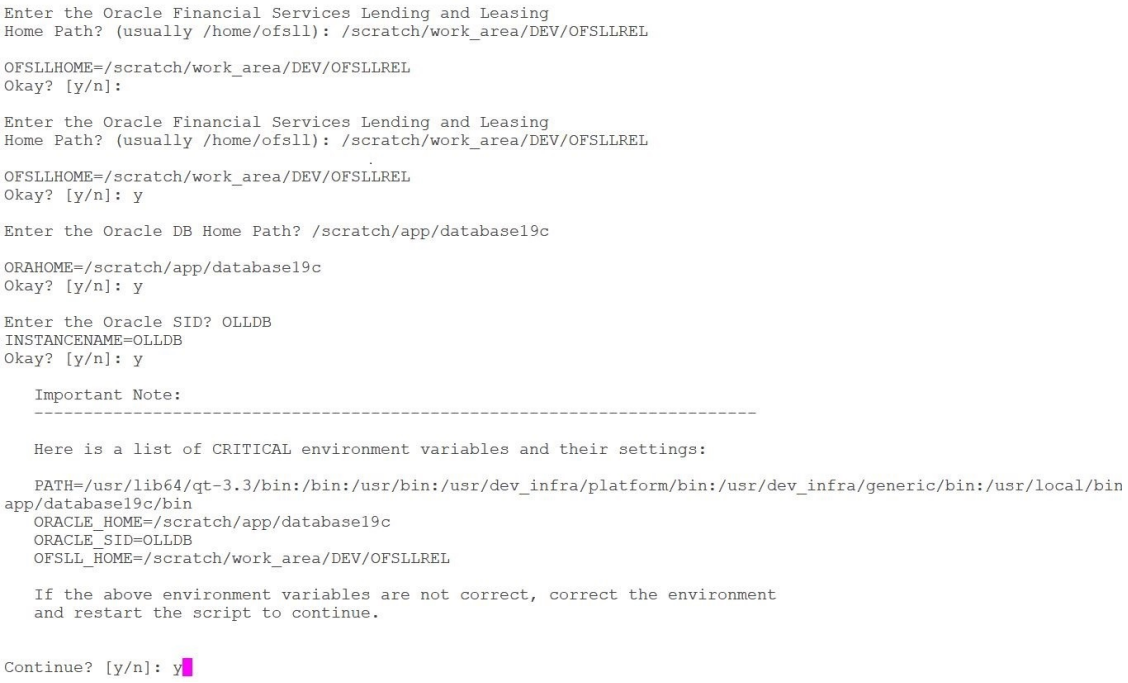


Table 1-3 Script Prompts

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

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

1.2.4 Create 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

Table 1-4 List of Directories

Directory	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

Table 1-4 (Cont.) List of Directories

Directory	Description
/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
/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.
/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.

Table 1-4 (Cont.) List of Directories

Directory	Description
/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.
input/icp/processed	Contains files that are already processed.
input/icc	Contains files for Collateral Management Upload.
input/icc/processed	Contains files that are already processed.
input/isc	Contains files for Securitization Pool Upload.
input/isc/processed	Contains files that are already processed.
input/iar	Contains Asset Billing Rate Setup Create/Update file upload.
input/iar/processed	Contains files that are already processed.
input/api	Contains Upload Legacy Account Information.
input/api/processed	Contains files that are already processed.
input/itr	Contains files for tracking attribute upload process.
input/itr/processed	Contains files that are already processed.
input/ipc	Contains files for Customer Payment Upload.
input/ipc/processed	Contains files that are already processed.
input/gls	Contains files for GL Attributes Upload.
input/gls/processed	Contains files that are already processed.
input/prp	Contains files for Product Pricing Upload.
input/prp/processed	Contains files that are already processed.
input/iuu	Contains files for User Upload.
input/iuu/processed	Contains files that are already processed.
input/ias	Contains files for Assets Upload.
input/ias/processed	Contains files that are already processed.
input/iav	Contains files for Asset Valuations Upload.
input/iav/processed	Contains files that are already processed.
input/iat	Contains files for Asset Tracking Attributes.
input/iat/processed	Contains files that are already processed.
input/iaa	Contains files for Asset Attributes.
input/iaa/processed	Contains files that are already processed.
input/iad	Contains files for Account Dues Upload.
input/iad/processed	Contains files that are already processed.

1.2.5 Create Application Tablespaces

The Oracle Financial Services Lending and Leasing table and index creation DDL allow for the use of up to 22 different tablespaces --11 for tables and 11 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.

Table 1-5 Application Tablespaces

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
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_table_ipf.sql storage_parms_index_ipf.sql	OFSLL_IPF_DATA OFSLL_IPF_INDEX	Input processing file	steady growth, potentially very large
Output Process	storage_parms_table_opf.sql storage_parms_index_opf.sql	OFSLL_OPF_DATA OFSLL_OPF_INDEX	Output processing file	steady growth, potentially very large
Logging	storage_parms_table_log.sql storage_parms_index_log.sql	OFSLL_LOG_DATA OFSLL_LOG_INDEX	Error Logging	steady growth

Table 1-5 (Cont.) Application Tablespaces

Tablespace	Storage Parameter File	Default Tablespace Name	Data	Comment
Audit	storage_parms_table_aud.sql storage_parms_index_aud.sql	OFSLL_AUD_DATA OFSLL_AUD_INDEX	Audit Logging	Growth depends on enabling number of audits fields.

Figure 1-4 Command prompt window 4

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

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

   PATH=/usr/lib64/qt-3.3/bin:/bin:/usr/bin:/usr/dev_infra/platform/bin:/usr/dev_infra/generic/bin:/usr/local/bin:
app/database19c/bin
   ORACLE_HOME=/scratch/app/database19c
   ORACLE_SID=OLLDB
   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

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

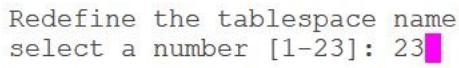
Figure 1-5 Command prompt window 5

```
      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   OFSLL_AUD_DATA          Audit data
      22   OFSLL_AUD_INDEX         Audit data index
      23.  Confirm Tablespace Values

      Note:
      ---------------------------------------------------------------------------------------------------------------
            To Change the Default Tablespace Name and Size
               a. Select a number from 1 to 22 to redefine each tablespace name and its size
               b. Select number 23 to confirm the redefined tablespace values


            To Accept the Default Tablespace Name and Size
               a. Select number 23 to confirm the default tablespace values

Redefine the tablespace name?
select a number [1-23]:
```

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

Accept default Tablespace Name and Size: Select # **21**

Figure 1-6 Command prompt window 6



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

Figure 1-7 Command prompt window 7

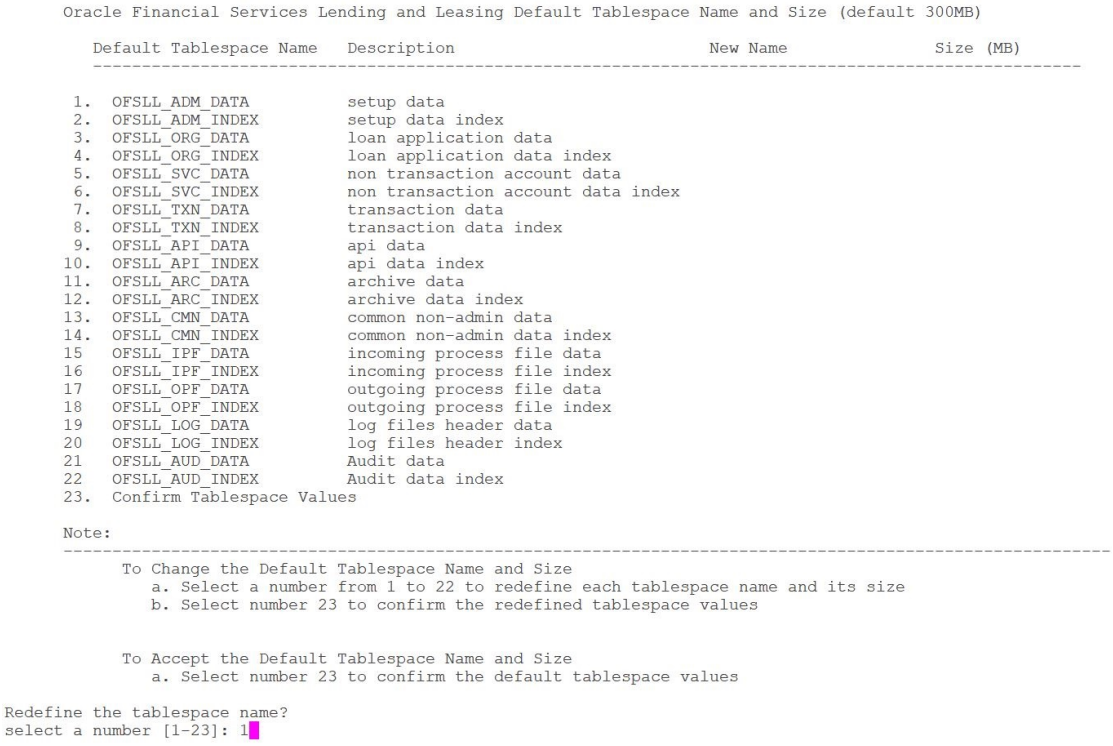
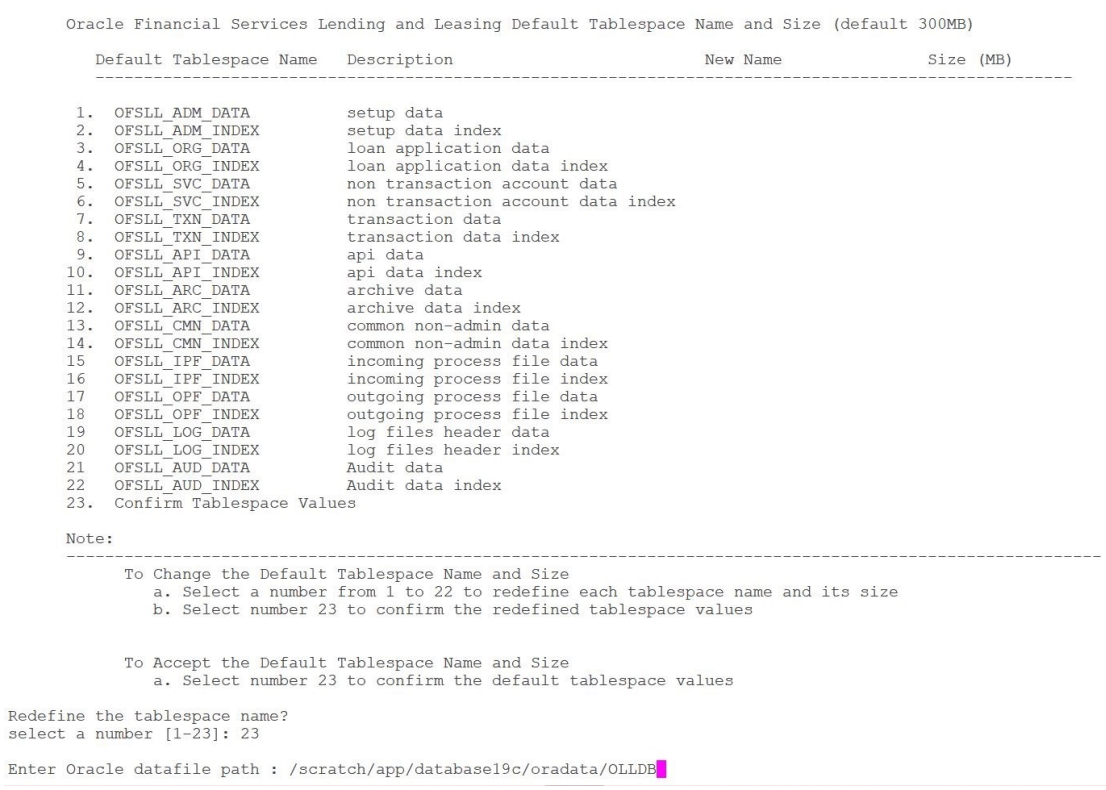


Table 1-6 Script Prompts

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

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

Figure 1-8 Command prompt window 8



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

Figure 1-9 Command prompt window 9

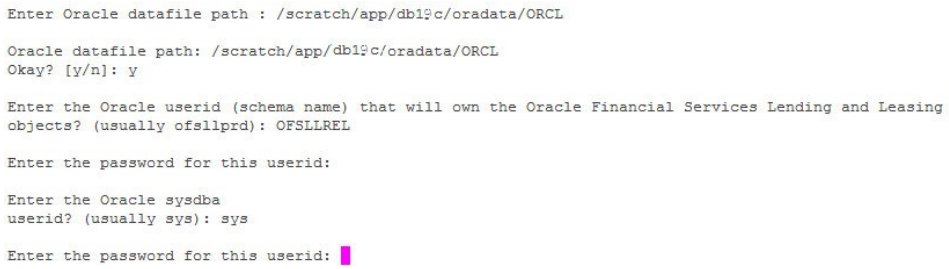


Table 1-7 Script Prompts

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

Table 1-7 (Cont.) Script Prompts

Script Prompts	Description and Action Required
Password for sysdba User ID	Valid Password

1.2.6 Create 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.

The user is then granted access to the application tablespaces.

1.2.7 Install 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.

Figure 1-10 Command prompt window 10

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

The following items are available for installation:

                      1.  database libraries      (3)
                      2.  database directories    (59)
                      3.  database tables         (1648)
                      4.  common database views   (5)
                      5.  engine views            (4053)
                      6.  form views              (1333)
                      7.  java views              (421)
                      8.  database types          (298)
                      9.  database package specs  (3678)
                     10.  database package bodies (3656)
                     11.  database indexes        (1999)
                     12.  System Seed Data        (67935)


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

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

Figure 1-11 Command prompt window 11

```
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.
```

1.2.8 Install Library Objects

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

Figure 1-12 Command prompt window 12

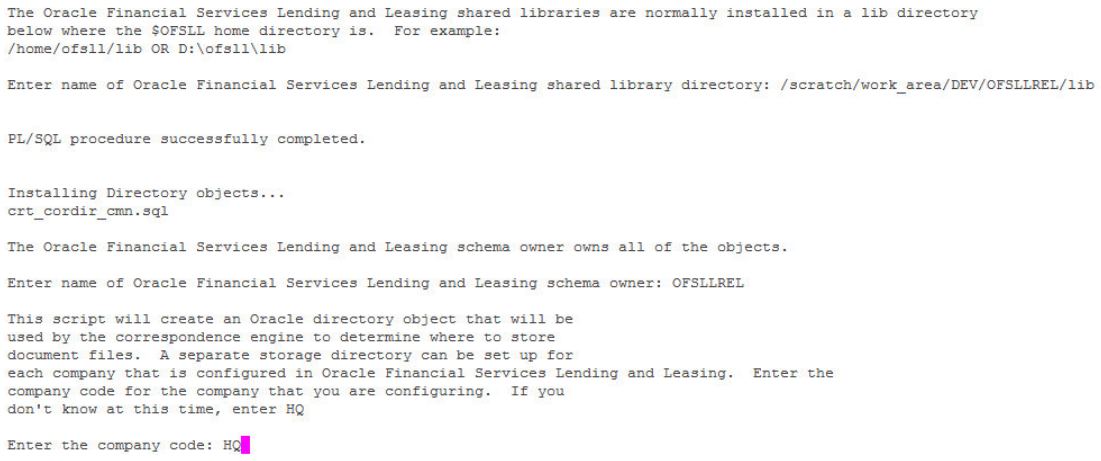


Figure 1-13 Command prompt window 13

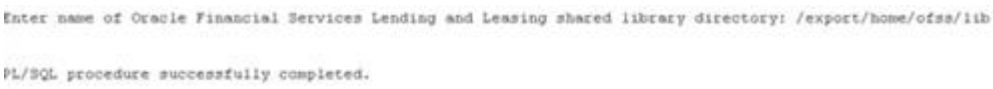


Table 1-8 Script Prompts

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

1.2.9 Install Directory Objects

The following section prompts for 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.

Figure 1-14 Command prompt window 14

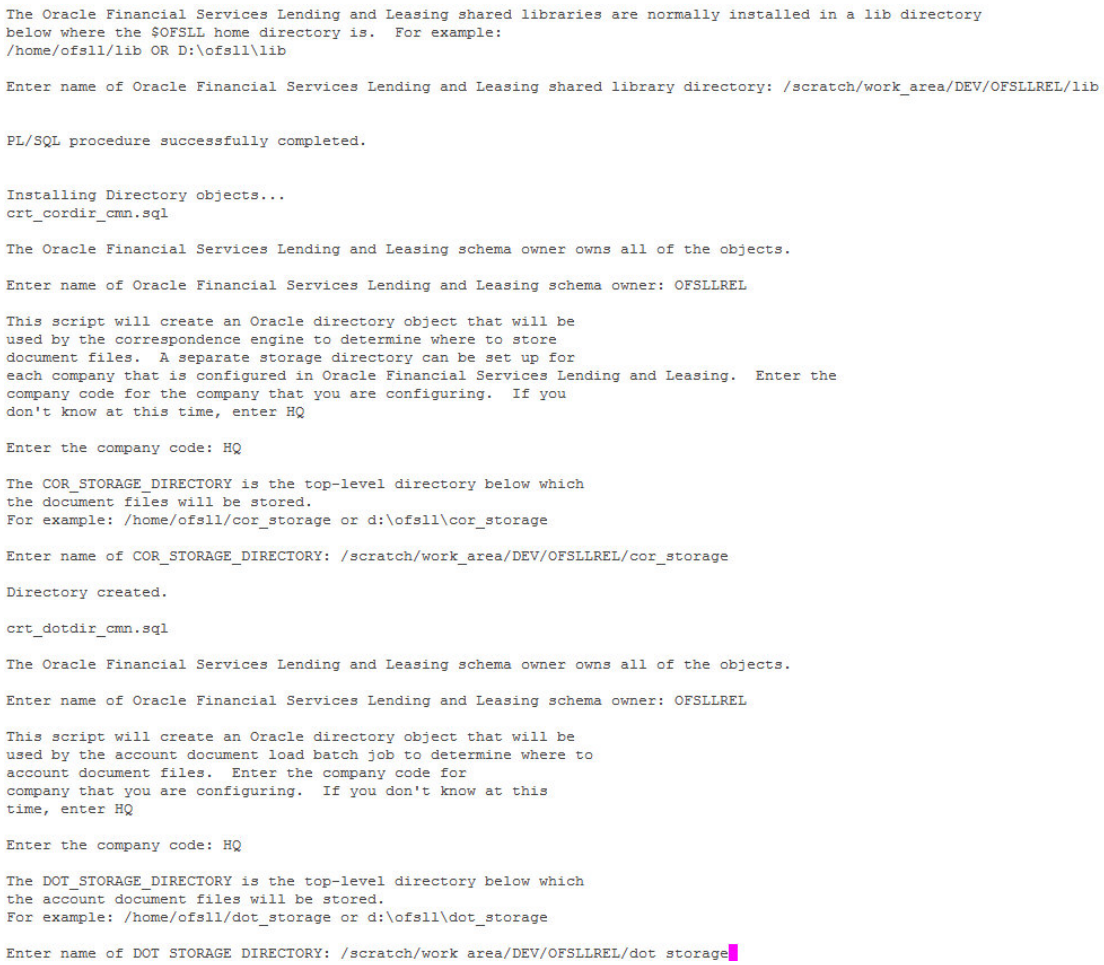
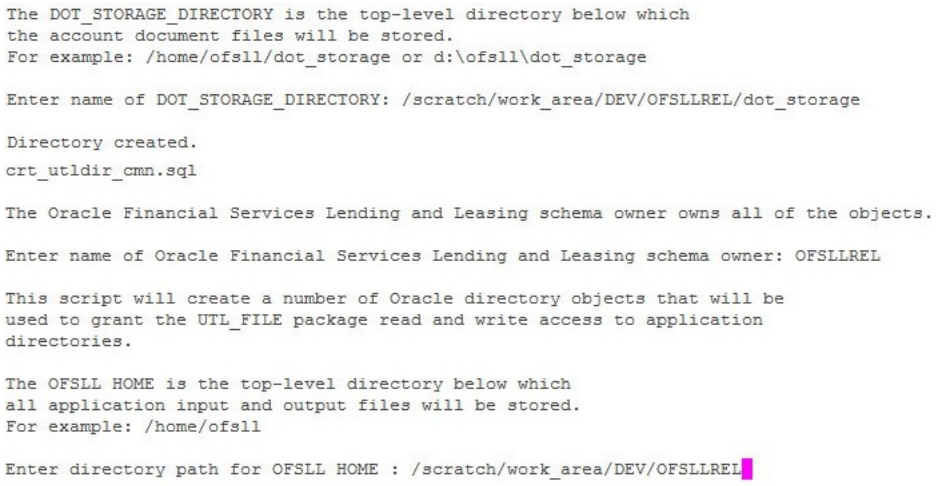


Figure 1-15 Command prompt window 15



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.

Table 1-9 Directory Object Types

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

Loading Seed Data

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

Figure 1-16 Command prompt window 16

```
Generating Seed Data...

Done.
```

1.3 Modify 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.

Setting the remaining system parameters manually or from the setup screen

Figure 1-17 Command prompt window 17

```
$ sqlplus

SQL*Plus: Release 19.0.0.0.0 Production on Fri Feb 12 15:28:17 2020
Copyright (c) 1982, 2019, Oracle. All rights reserved.

Enter user-name: OFSLL/OFSLL

Connected to:
Oracle Database 19c Enterprise Edition Release 19.3.0.0.0 - 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 (Weblogic Admin 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 Oracle Analytics 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

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 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.

1.4 Create Users and Granting Access

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.

Figure 1-18 Command prompt window 18

```
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 (New Installation only)

Post user creation, to access all the 'Screens' and 'web service' for a specific responsibility, login as an application schema owner and do the following:

1. Execute the below SQL statement:

TRUNCATE TABLE FLS_ACCESS_DETAILS;

Figure 1-19 Command prompt window 19

```
SQL> TRUNCATE TABLE FLS_ACCESS_DETAILS;

Table truncated
```

2. 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.

Figure 1-20 Command prompt window 20

```
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 customize the access through Setup > User > Access screen - **Screen** and **Webservice** tabs, as detailed in setup guide.

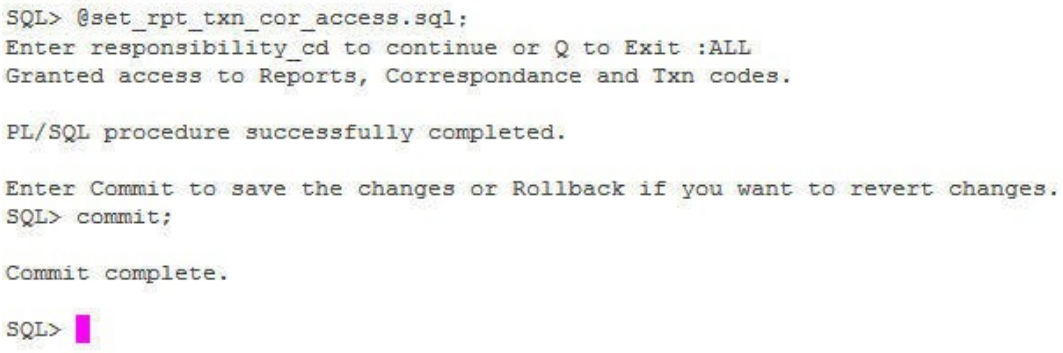
Granting user access to Reports, Transactions, & Correspondence.

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

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

Figure 1-21 Command prompt window 21



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

> **Note**
>
> In case where the application schema is created using an export and import utility, please reset the sequences by executing `upgrade_fix_reset_all_sequences.sql` file available in the data fix folder of the media. This helps to reset all the sequences to the current level.

1.5 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 execute 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.

1.6 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 using the sql file.

- SQL>setup_AQ_subscribe.sql.

4. Once the queue services are started, system subscribes and registers the queue for a notification so that whenever a data inserted into the queue it will notify the system.

To switch back to the existing file system mechanism:

5. To unsubscribe, de-register the queue and stops the queue services for notification, run the below sql file:

- SQL>setup_AQ_unsubscribe.sql

6. 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.

1.7 Install Upgrade

An upgrade is a process of updating an existing version to its higher version. For example, upgrading from Oracle Financial Services Lending and Leasing 14.12.0.0.0 to 15.0.0.0.0.

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 > OFSLL 14.7.0.0.0 > OFSLL 14.8.0.0.0 > OFSLL 14.9.0.0.0 > OFSLL 14.10.0.0.0 > OFSLL 14.11.0.0.0 > OFSLL 14.12.0.0.0 > 15.0.0.0.0.

Note

- Please refer to **Upgrade Installation Guide** for detailed information.
- If table compression feature is enabled in OFSLL, disable table compression prior to upgrade.

2

Security Features

The following section details the security features such as data encryption to secure stored data and data redaction for data masking.

- Enable Transparent Data Encryption to Secure Stored Data
- Data Redaction for Data Masking

2.1 Enable 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,

- 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);

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.

2.2 Data Redaction for Data Masking

Data Redaction is one of the new features available in 19c. 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.

3

Optimize PS_TXN Table in Fusion Application

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.

4

Perform Online Application Upgrade Using EBR

EBR (Edition-Based Redefinition) is a feature supported in Oracle Database which facilitates to upgrade the database component of an application while it is in use, thereby minimizing or eliminating downtime.

Upgrading by this process means, copying the database objects that comprise the application and redefining the copied objects in isolation. These changes do not affect application users and they continue to run the unchanged application. When you are sure that the changes are correct, you can make the upgraded application available to all users.

> **Note**
>
> Enabling EBR involves a set of configurations which are to be performed by system administrator who is well-versed with installation and upgrade of OFSLL environment. Since this is an irreversible process, ensure that you are familiar with EBR and take extra caution before you proceed. The information provided in this section is specific to EBR configuration process in OFSLL and for detailed information about EBR, refer to https://docs.oracle.com/en/database/oracle/oracle-database/19/adfns/editions.html#GUID-58DE05A0-5DEF-4791-8FA8-F04D11964906.

If you require EBR (Edition Based Redefinition) to be enabled, the same can be done after successful application database installation. To configure OFSLL with EBR, follow the below configuration process.

Before you begin,

- Place the executable file (`config_ebr.sh`) in staging folder.
- The procedures directory consists of sql files which are executed by the installation scripts to create procedures in the schema. Hence, create a directory for installation to write the sql files which will be used in subsequent steps.
- Ensure that the above mentioned directories have read, write and execute permissions before installation.
- Configuring EBR on OFSLL Schema

4.1 Configuring EBR on OFSLL Schema

The following section details the steps to be followed to Configure EBR on OFSLL Schema.

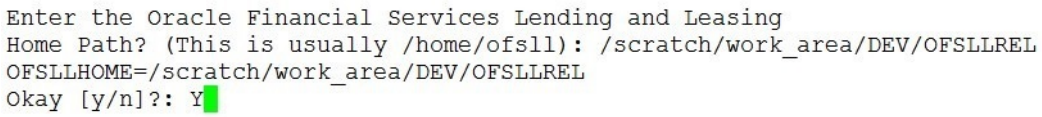
1. Navigate to staging directory and execute the installer script `config_ebr.sh`

Figure 4-1 Command prompt window 25

```
-bash-4.1$ ./config_ebr.sh
```

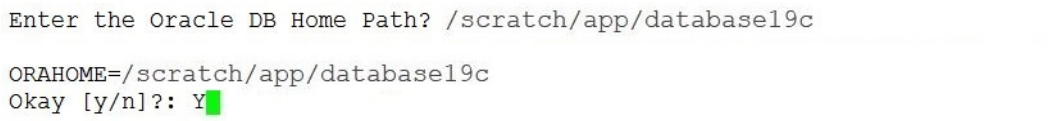
2. On seeing the below prompt, enter `OFSLL_HOME` path. When the script prompts for confirmation, enter **Y** to continue.

Figure 4-2 Command prompt window 26



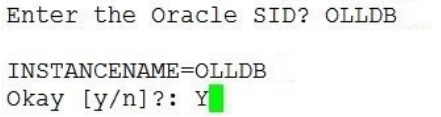
3. On seeing the below prompt, enter Oracle DB Home Path. When the script prompts for confirmation, enter **Y** to continue.

Figure 4-3 Command prompt window 27



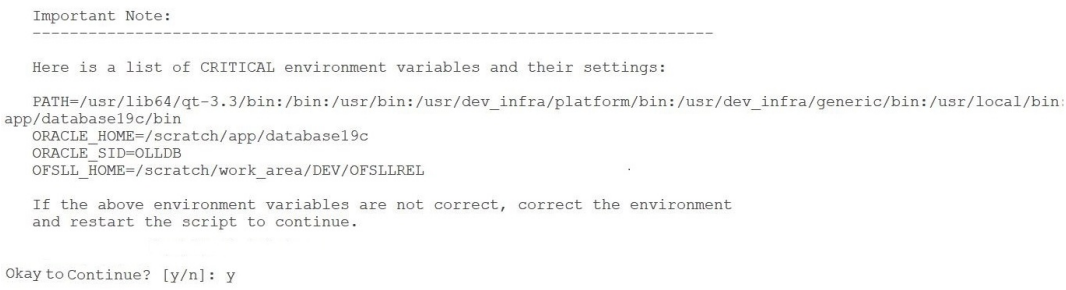
4. On seeing the below prompt, enter Oracle SID. When the script prompts for confirmation, enter **Y** to continue.

Figure 4-4 Command prompt window 28



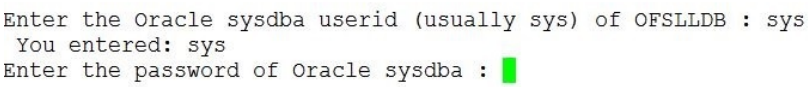
5. Verify the critical environment variables and confirm **y** to continue.

Figure 4-5 Command prompt window 29



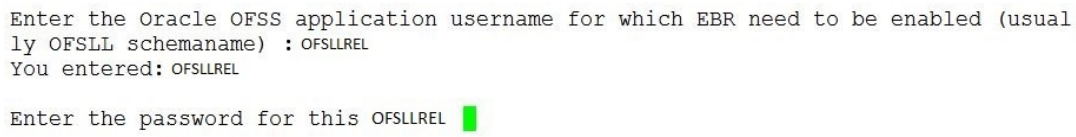
6. Enter Oracle sysdba user id and press **Enter**. You are prompted to enter password of Oracle sysdba. Enter the password and press **Enter**.

Figure 4-6 Command prompt window 30



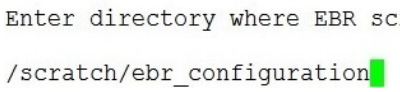
7. Enter User ID who owns OFSLL objects and press **Enter**. You are prompted to enter password for the user. Enter the password and press **Enter**.

Figure 4-7 Command prompt window 31



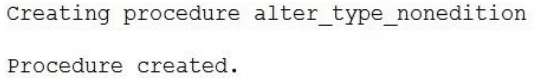
8. Enter the staging area path where EBR installation scripts reside and press **Enter**. The below screen is provided as an example.

Figure 4-8 Command prompt window 32



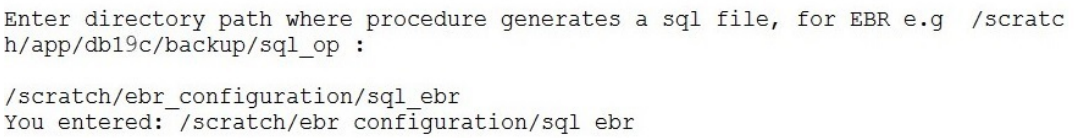
9. The installer creates required procedures in the schema.

Figure 4-9 Command prompt window 33



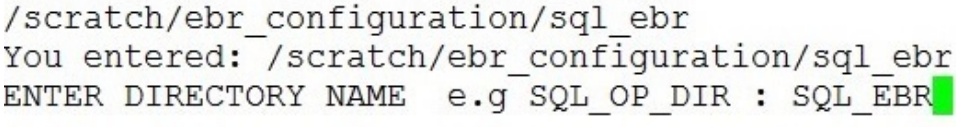
10. When prompted, enter the path of directory for procedures to write sql files and press **Enter**. This is the same directory which was created before starting the installation process.

Figure 4-10 Command prompt window 34



11. Enter name of the directory object that is to be created to access the above path and press **Enter**.

Figure 4-11 Command prompt window 35



12. The installation process starts and the installer creates the required procedures and executes them.

Figure 4-12 Command prompt window 36

```
Creating procedure create_edview.

Procedure created.

 Creating procedure recompile_objects to recompile_objects.

Procedure created.

new create edition view script file can now be created
```

The installation completes after recompiling all the invalid objects.

5

Transparent Application Continuity

This topic provides the information about the transparent application continuity.

Transparent Application Continuity (TAC) is a high-availability capability in Oracle Database that ensures uninterrupted workload processing during both planned maintenance activities and unexpected disruptions at the database tier. By seamlessly capturing and replaying in-flight requests, TAC enables applications to continue running without visible downtime or user errors. TAC is compatible with established applications as well as new deployments, providing robust protection across a broad range of application stacks — all without requiring any changes to application code.

This topic contains the following sub-topics:

- Configure TAC for OFSLL Application and Database
  This topic provides the information about the configure TAC for OFSLL application and batabase.

5.1 Configure TAC for OFSLL Application and Database

This topic provides the information about the configure TAC for OFSLL application and batabase.

- TAC is not enabled by default for Oracle RAC databases but can be enabled with simple configuration.
- No application code changes are required; TAC is driven by connection settings.
- TAC configurations are connection parameters and service attributes that enable replay of database requests via Application Continuity.

Database Configuration – Add TAC-Enabled Service (srvctl)

Use the following command to create a TAC-enabled service for the OFSLL PDB with appropriate failover, replay, and notification settings:

- Syntax:
  - srvctl add service -d <DB_UNIQUE_NAME> -s <SERVICE_NAME> -r <PREF_INST1>,<PREF_INST2> -pdb <PDB_NAME> -failovertype AUTO -failover_restore AUTO -commit_outcome TRUE -replay_init_time 600 -drain_timeout 300 -notification TRUE
- Example:
  - srvctl add service -d TEST_DB -s TEST_TAC -r TEST1,TEST2 -pdb PDBTEST -failovertype AUTO -failover_restore AUTO -commit_outcome TRUE -replay_init_time 600 -drain_timeout 300 -notification TRUE
- Describe each flag configures:
  - -d TEST_DB: Database unique name hosting the service.
  - -s TEST_TAC: Service name for TAC-enabled workload.
  - -r TEST1, TEST2: Preferred RAC instances for the service.

  - -pdb PDBTEST: Target PDB for the service.
  - -failovertype AUTO: Enables Application Continuity with automatic request replay.
  - -failover_restore AUTO: Restores session state automatically on replay.
  - -commit_outcome TRUE: Enables Transaction Guard commit outcome tracking.
  - -replay_init_time 600: Allows up to 600s to initiate replay after an interruption.
  - -drain_timeout 300: Drains existing sessions for up to 300s during relocation.
  - -notification TRUE: Enables FAN notifications to clients/pools.

After adding the service, start and verify it:

Start service:

- Syntax:
  - srvctl start service -d <DB_UNIQUE_NAME> -s <SERVICE_NAME>].
- Example:
  - srvctl start service -d TEST_DB -s TEST_TAC.

Check Status:

- Syntax:
  - srvctl status service -d <DB_UNIQUE_NAME> -s <SERVICE_NAME>].
- Example:
  - srvctl status service -d TEST_DB -s TEST_TAC.

Application (Client) Configuration – Connection Parameters:

- Enable Application Continuity/TAC via connection properties in JDBC/ODP.NET/UCP:
  - oracle.net.enableAC=true
  - oracle.jdbc.fanEnabled=true
  - replayInitiationTimeout=600
  - connectTimeout=10; loginTimeout=10
  - retryCount=3; retryDelay=3
- Always connect by SERVICE_NAME to TEST_TAC.

Grant KEEP privileges for mutables (to ensure deterministic replay):

- For sequences used by the application, grant keep sequence on <schema>.<sequence_name> to <APP_USER>.
- Repeat for all sequences accessed in replayed requests.

TNS Entry – Generic Syntax for TAC-enabled Service:

- Syntax:

Figure 5-1 TNS Entry

```
<SERVICE_ALIAS> =
 (DESCRIPTION =
  (ADDRESS =
   (PROTOCOL = TCP)
   (HOST = <SCAN_HOSTNAME>)
   (PORT = <PORT_NUMBER>)
  )
  (CONNECT_DATA =
   (SERVER = DEDICATED)
   (SERVICE_NAME = <FULL_SERVICE_NAME>)
  )
 )
```

Table 5-1 Detailed Description of Each Parameter

Placeholder / Parameter	Description
<SERVICE_ALIAS>	TNS Alias Name – Logical reference name used by clients to connect (e.g., TAC_SERVICE_TEST).
PROTOCOL	Communication protocol – typically TCP for standard connections or TCPS for SSL-secured connections.
<SCAN_HOSTNAME>	SCAN (Single Client Access Name) hostname for the RAC database cluster; provides load balancing and failover (e.g., cluster-scan.example.com).
<PORT_NUMBER>	Listener port number – Default is 1521 unless changed in the listener configuration.
SERVER = DEDICATED	Ensures each session uses a dedicated server process; typical for Application Continuity.
<FULL_SERVICE_NAME>	Global Service Name in the format <SERVICE_NAME>.<DB_DOMAIN>; must be a TAC-enabled service. The DB domain matches the database db_domain parameter.

- Example:

Figure 5-2 TNS Entry

```
TAC_SERVICE_TEST =
 (DESCRIPTION =
  (ADDRESS =
   (PROTOCOL = TCP)
   (HOST = scan-hostname-test.example.com)
   (PORT = 1521)
  )
  (CONNECT_DATA =
   (SERVER = DEDICATED)
   (SERVICE_NAME = TAC_SERVICE_TEST.example.com)
  )
 )
```

Oracle WebLogic Data source connection URL (TAC-enabled).

Setting up a JDBC connection to the data source.

Syntax:

- jdbc:oracle:thin:@//primary-scan:1521/YOUR_SERVICE

Example:

- jdbc:oracle:thin:@// scan-hostname-test.example.com:1521/ TAC_SERVICE_TEST

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Machine Learning for Servicing Queue Creation

OFSLL is equipped to leverage Oracle Data Mining capability to give additional Machine Learning features.

Oracle Data Mining provides a powerful, state-of-the-art data mining capability within Oracle Database. Machine Learning capability is leveraged to identify the Queue/Segmentation that can be created for the Account data. Intelligent Segmentation feature provides list of Clusters/ Queues using the Machine Learning Algorithm for a given account condition.

Orthogonal Partitioning Clustering (O-Cluster), an Oracle-proprietary Clustering algorithm, has been used to create Intelligent Segments/Clusters for a given condition. Clustering Algorithm will discover natural groupings in given data.

This helps to automate the manual process of queue creation which is otherwise done by identifying different segments of Accounts and assigning day to day Customer Service Activities.

The Intelligent Segmentation screen in OFSLL UI is developed using the Oracle Application Development Framework (Oracle ADF). For information on usability, refer to **Intelligent Segmentation** section in setup guide.

To enable Machine Learning Service Queue creation in OFSLL:

1. Provide Grant Mining Model privilege to the schema user.

GRANT CREATE MINING MODEL TO <Schema>;

2. Execute the sql script `upgrade_ML_dataset.sql` (Available in data fix folder of release bundle) to load service account's data on to ML table.

Following is a known issue:

- External tables are not applicable in ATP-D.

> **Note**
>
> Ensure that customer service accounts exist in the system so that based on the data present in accounts, account conditions and assets tables gets loaded on to ML table.

3. Enable menu access for **Intelligence Segmentation** screen with key column data.

'FLL.SET.JET.INTELLIGENTSEGMENTATION.MENU|SETUP_USER_MENU' from seed data setup screen.

For more information on Oracle Data Mining, refer to https://www.oracle.com/database/technologies/advanced-analytics/odm.html

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Oracle Autonomous Database for Transaction Processing

An autonomous database leverages AI and machine learning to provide full, end-to-end automation for provisioning, security, updates, availability, performance, change management, and error prevention. This is a Self-Driving, Self-Securing, Self-Repairing database service.

OFSLL can be deployed on Oracle Autonomous Transaction Processing Dedicated (ATP-D).

However, the following challenges / limitations exist:

- SQL loader utility is required to install the application schema seed data.
- Interface with Credit Bureaus (Support for Equifax only).

This topic contains the following sub-topics:

7.1 Installation

The following section explains the installation process.

Following are the pre-requisites before installation:

- It is assumed that the ATP-D is provisioned and have access to database **Admin credentials**.
- An application VM with Oracle instant client installed. SQL loader utility available along with the client.

Download and unzip OFSLL Release Bundle from e-delivery.

On Unix:

- `$ unzip atp-d_install.zip`
- `$ ./installofsllatpdb.sh`

For detailed information on database installation, refer to Run the installation script section and follow the steps up to section 2.2.7. Installing Database Objects and Seed Data.

For installing webservice database objects, refer to section **2. Installing WebServices Database Objects** in Web Service installation guide.

For more information on Autonomous Transaction Processing, refer to https://docs.oracle.com/en/cloud/paas/atp-cloud/index.html