

Multi-Tenant Deployment  
Oracle FLEXCUBE Universal Banking  
Release 14.2.0.0.1  
[January] [2019]



---

## Table of Contents

<b>1.</b>	<b>Oracle Multi-Tenant Architecture .....</b>	<b>4</b>
1.1	Overview of the Multitenant Architecture .....	4
1.1.1	Container Database.....	4
1.1.2	Application Root.....	4
1.1.3	Seed PDB .....	5
1.1.4	Application PDB .....	5
1.2	Application Maintenance .....	5
1.2.1	Application Installation .....	5
1.2.2	Application Upgrade .....	5
<b>2.</b>	<b>Proposed Deployment Model .....</b>	<b>7</b>
2.1	Shared Application .....	7
2.2	Shared Application and User Authentication.....	7
2.3	Shared Application with Shared Data - Default.....	8
2.4	Shared Application with Shared Data - Custom .....	8
<b>3.</b>	<b>Deployment and Installation Steps .....</b>	<b>10</b>
3.1	Creation of Application Template.....	11
3.1.1	Purpose.....	11
3.1.2	Steps to be followed.....	11
3.2	Creation of Application Root and Application Seed.....	12
3.2.1	Purpose.....	12
3.2.2	Steps to be followed.....	12
3.3	Creation of Application PDB .....	15
3.3.1	Purpose.....	15
3.3.2	Steps to be followed.....	15
3.4	Day Zero Setup.....	16
3.5	EAR Creation and Deployment.....	16
<b>4.</b>	<b>Step by Step Installation .....</b>	<b>17</b>
4.1	Approot Object Conversion: Shared Application .....	17
4.2	Approot Object Conversion: Shared Application and User Authentication .....	20

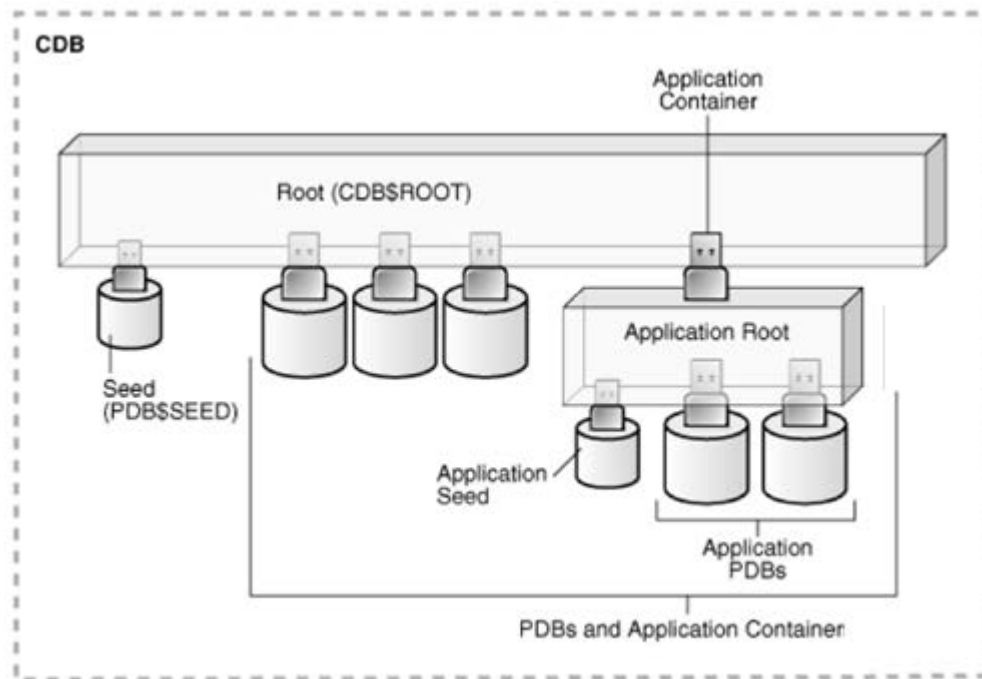
4.3	Approot Object Conversion: Shared Application and Shared Data - Default.....	23
4.4	Approot Object Conversion: Shared Application and Shared Data - Custom .....	25
<b>5.</b>	<b>Possible Issues / FAQ .....</b>	<b>31</b>
<b>6.</b>	<b>Annexure .....</b>	<b>32</b>
6.1	Default Approot Entities for Common Core .....	32
6.2	Default Approot Entities for FCUBS .....	33

---

---

# 1. Oracle Multi-Tenant Architecture

## Multi-Tenant Architecture



---

## 1.1 Overview of the Multitenant Architecture

---

### 1.1.1 Container Database

The CDB is a collection of schemas, schema objects, and non-schema objects to which all PDBs belong.

Every CDB has one and only one root container named CDB\$ROOT. The root stores the system metadata required to manage PDBs. All PDBs belong to the root. The system container is the CDB root and all PDBs that belong to this root.

The CDB root does not store user data. Oracle recommends that you do *not* add common objects to the root or modify Oracle-supplied schemas in the root. However, you can create common users and roles for database administration. A common user with the necessary privileges can switch between containers.

---

### 1.1.2 Application Root

Consider an application root as an application-specific root container. It serves as a repository for a master definition of an application back end, including common data and metadata. To create an application root, connect to the CDB root and specify the AS APPLICATION CONTAINER clause in a CREATE PLUGGABLE DATABASE statement.

### 1.1.3 Seed PDB

---

Unlike a standard PDB, a seed PDB is not intended to support an application. Rather, the seed is a *template* for the creation of PDBs that support applications. To accelerate creation of application PDBs within an application container, you can create an application seed. An application container contains either zero or one application seed.

### 1.1.4 Application PDB

---

An application PDB belongs to exactly one application container. Unlike PDBs plugged in to the CDB root, application PDBs can share a master application definition within an application container. For example, a `user_details` table in an application root might be a data-linked common object, which means it contains data accessible by all application PDBs plugged in to this root. PDBs that do not reside within the application container cannot access its application common objects.

## 1.2 Application Maintenance

---

Application maintenance refers to installing, uninstalling, upgrading, or patching an application.

Perform application installation, upgrade, and patching operations using an `ALTER PLUGGABLE DATABASE APPLICATION` statement.

The basic steps for application maintenance are as follows:

1. Log in to the application root.
2. Begin the operation with an `ALTER PLUGGABLE DATABASE APPLICATION ... BEGIN` statement in the application root.
3. Execute the application maintenance statements.
4. End the operation with an `ALTER PLUGGABLE DATABASE APPLICATION ... END` statement.

### 1.2.1 Application Installation

---

An application installation is the initial creation of a master application definition. A typical installation creates user accounts, tables, and PL/SQL packages.

To install the application, specify the following in the `ALTER PLUGGABLE DATABASE APPLICATION` statement:

- Name of the application
- Application version number

### 1.2.2 Application Upgrade

---

An application upgrade is a major change to an installed application.

Typically, an upgrade changes the physical architecture of the application. For example, an upgrade might add new user accounts, tables, and packages, or alter the definitions of existing objects.

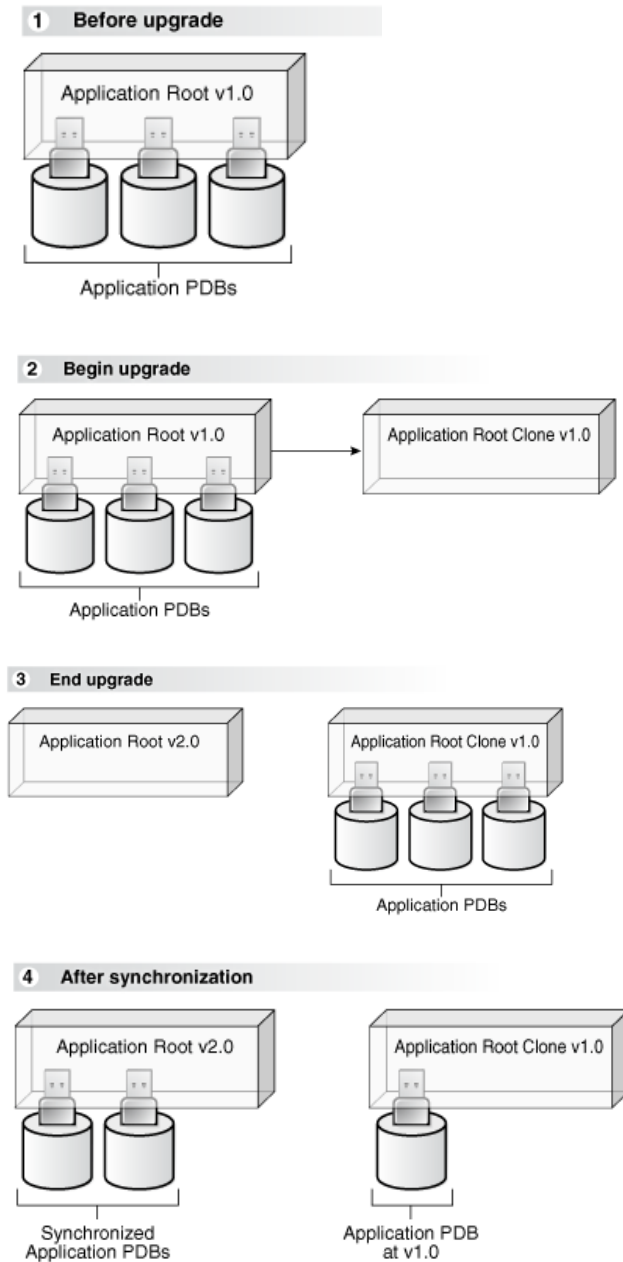
To upgrade the application, you must specify the following in the `ALTER PLUGGABLE DATABASE APPLICATION` statement:

- Name of the application

- Old application version number
- New application version number

During an application upgrade, the application remains available. To make this availability possible, Oracle Database clones the application root.

The following figure gives an overview of the application upgrade process.



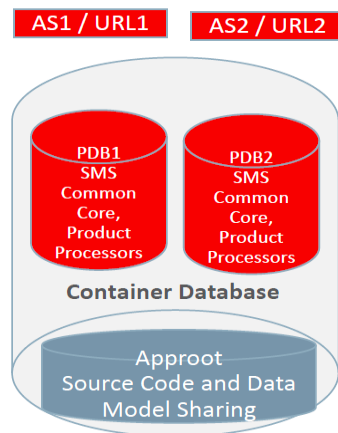
---

## 2. Proposed Deployment Model

### 2.1 Shared Application

---

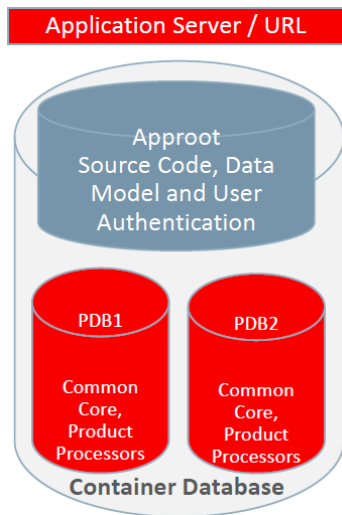
- ✓ In this model application would be deployed in an application container in 18C, Multiple front-end applications with URL is created per PDB.
  - Application would be deployed in an Application Container
  - Source code at Approot level shared with PDBs
  - Data Model at Approot level shared with PDBs
  - No sharing of data
  - Multiple frontend application with URL per PDB (with common EAR file)



### 2.2 Shared Application and User Authentication

---

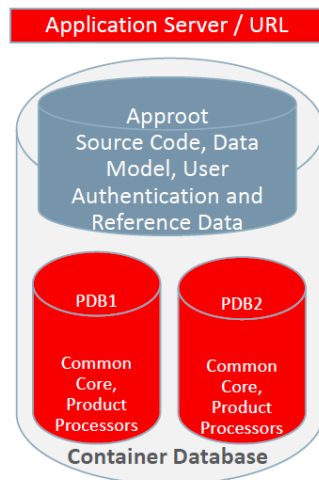
- ✓ In this model application would be deployed in an application container in 18C, Single front end application and an URL.
  - Application would be deployed in an Application Container
  - Source code at Approot level shared with PDBs
  - Data Model at Approot level shared with PDBs
  - Sharing of data related to User Authentication
  - Single Frontend Application and Single URL



## 2.3 Shared Application with Shared Data - Default

---

- ✓ This would be using Application Container in 18C, Single front end application and an URL. Sharing of Entities from Approot to individual PDBs.
  - Application would be deployed in an Application Container
  - Source code at Approot level shared with PDBs
  - Data Model at Approot level shared with PDBs
  - Single Frontend Application and Single URL
  - Sharing of Entities/data like
    - User Authentication, SMS Roles
    - Core Entities like Country, Currency, MIS Classes, UDFs
    - Chart of Account, Product, Account Class



## 2.4 Shared Application with Shared Data - Custom

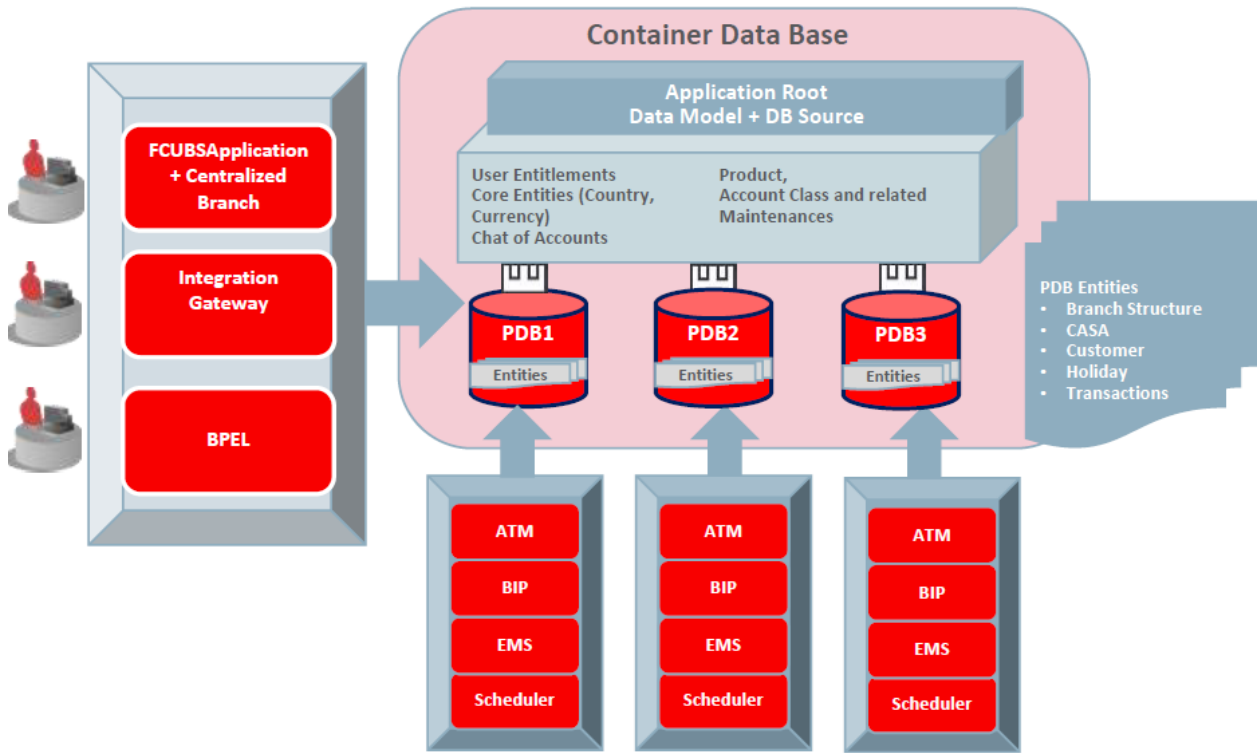
---

- ✓ This would be using Application Container in 18C, Single front end application and an URL. Sharing of Entities from Approot to individual PDBs.
  - Application would be deployed in an Application Container
  - Source code at Approot level shared with PDBs
  - Data Model at Approot level shared with PDBs
  - Single Frontend Application and Single URL
  - Sharing of Entities/data like
    - User Authentication, SMS Roles



- Core Entities like Country, Currency, MIS Classes, UDFs
- Chart of Account, Product, Account Class
- User can opt-out the entities which are not required to be the candidates of approot and move to PDB.

Sample of components deployed in Shared Application and Shared Data model is given below:



**Component Deployment Architecture**

Application and Gateway will be common and single URL will be available for the application. ATM, BIP, EMS, Scheduler has to be configured separately for each PDBs.

---

### 3. Deployment and Installation Steps

As a pre-requisite, DB server has to be created with 18c database installed along with CDB setup. Multi entity application root/PDB based application setup can be done by following below steps in sequential order, and detail of each steps explained as separate section subsequently.

1. Application Template PDB configuration
  - a. Application Template PDB is a normal PDB created under CDB to install the required DB objects for a product processor. This PDB will have a common schema and is used as a template for creating Application root through cloning.
2. Application root and Application Seed configuration
  - a. Application root
    - i. Application root is an application-specific root container and repositories for an application back end DB objects.
    - ii. Application root will be created through cloning from Application Template PDB.
  - b. Application Seed
    - i. Application seed is created to accelerate the creation of application PDBs within an application container.
    - ii. Application seed will be created from Application root through cloning and used as template to create one or more Application PDBs.
3. Application Installation
  - i. Application installation has to be done in the approot as version 1.0 with being user made explicit.
4. Application Root objects conversion
  - i. All the DB objects loaded in Application root will be converted as DATA LINK or METADATA LINK.
5. Application Seed Sync with the Application Root
  - a. Any changes deployed in Application Root will be available at Application PDB, if Application PDB sync with Application Root
6. Application PDB (entity) configuration from Application Seed
  - a. Application PDB is an associated PDB under Application Root. Application PDB will be created by clone from Application Seed.
7. Day Zero Setup
  - EAR Creation & Deployment
    - Co-Deployment – In case of Co-deployment all the product processor objects has to be loaded in the Application Template PDB, which will be cloned into Application Root and then subsequently cloned into Application Seed from Application Root inside an application container. Application Seed is used to accelerate the creation of application PDBs within an application container.
    - Stand-alone Deployment– In case of stand-alone deployment, application set up steps has to be followed separately. Installation of multiple product processors can be done inside the same CDB with separate Application containers which has the template PDB, Application Seed and Application PDBs of its own. Same set of installation can be done inside a different CDB.

## 3.1 Creation of Application Template

---

### 3.1.1 Purpose

---

Application Template PDB is a normal PDB created under CDB to install the required DB objects for a product processor. This PDB will have a common schema and is used as a template for creating Application root through cloning.

### 3.1.2 Steps to be followed

---

- Below steps to be followed to configure Application Template PDB
  - ✓ Application Template PDB Creation
  - ✓ Property File Creation pointing to Application Template PDB
  - ✓ Objects loading into the Application Template PDB.

#### 3.1.2.1 Application Template PDB Creation

---

- User has to login into CDB as a sys user.
- Application Template PDB has to be created under the CDB.
- This Application Template PDB will be kept as a gold copy and recommended to not to use for any other purpose.
- Application Template PDB can have one common schema which will be cloned to create further databases.

Below script will create the Application Template PDB with required grants under the CDB. DBA rights are required to perform this step.



Application\_Template\_PDB\_Creation.sql

**(Refer the Attachment panel of this document to view the script)**

Input sample for the script:

<b>CDB Schema User Name</b>	Sys
<b>CDB Schema Password</b>	Sys
<b>CDB Host</b>	1.1.1.1
<b>CDB Port</b>	1524
<b>CDB Name</b>	FC142CDB
<b>DB Mounted Path</b>	/scratch/db1800dat
<b>Template PDB Name</b>	Templatepdb
<b>Common User Name</b>	CMNUSER
<b>Common User Password</b>	CMNUSER

#### 3.1.2.2 Property file creation with Application Template PDB

---

- Existing installer will be used for the property file creation
- Property file has to be created with Application Template PDB schema details.

(Refer **FCUBS\_Property\_File\_Creation.docx**)

### 3.1.2.3 Loading objects into the Application Template PDB

---

- Objects have to be loaded in the Application Template PDB using bat file [E.g.: SMSDBCompileRun.bat, ROFCDBCompileRun.bat] by silent installer for respective product processor.
- Application Template PDB schema should be checked for sanity with zero invalids.

## 3.2 Creation of Application Root and Application Seed

---

### 3.2.1 Purpose

---

- Application Root
  - An application root shares some characteristics with the CDB root, because it can contain common objects, and some characteristics with a PDB, because it is created with the CREATE PLUGGABLE DATABASE statement.
- Application Seed
  - After Application Root creation, Application Seed to be created by clone from Application Root. Application seed to be synched with Application Root, whenever there is DB objects deployed in Application Root. i.e., Application seed will have latest DB references of Application Root. Application seed will be used as template to create (entity) Application PDBs.
  - An optional application PDB that serves as a template for creating other PDBs within an application container

### 3.2.2 Steps to be followed

---

- Below steps to be followed to configure Application Template PDB
  - ✓ Application Root and Application Seed Creation
  - ✓ Application Installation
  - ✓ Application Root objects conversion
  - ✓ Application Seed Sync with the Application Root

#### 3.2.2.1 Application Root and Application Seed Creation

---

- Application Root

Application Root will be created from Application Template PDB through clone. Application Root will hold all the DB objects as single source repository. Initially, the database sources will be copied Application Template PDB. On subsequent patch set upgrade, the database sources will be deployed in Application Root using upgrade mode.
- Application Seed

After Application Root creation, Application Seed to be created by clone from Application Root. Application seed to be synched with Application Root, whenever there is DB objects deployed in Application Root. i.e., Application seed will have latest DB references of Application Root. Application seed will be used as template to create (entity) Application PDBs.

Below script will create the Application root and Application seed. DBA rights are required to perform this step.



Approot\_AppSeed\_Creation.sql

**(Refer the Attachment panel of this document to view the script)**

Input sample for the script:

<b>CDB Schema User Name</b>	Sys
<b>CDB Schema Password</b>	Sys
<b>CDB Host</b>	1.1.1.1
<b>CDB Port</b>	1524
<b>CDB Name</b>	FC142CBD
<b>DB Mounted Path</b>	/scratch/db1800dat
<b>Template PDB Name</b>	Templatepdb
<b>Approot Name</b>	Approot1
<b>Pdb to app pdb path</b>	C:\app_18c\client\user\product\18.0.0\client_1\rdbms\admin\pdb_to_apppdb.sql
<b>Common User Name</b>	CMNUSER

### 3.2.2.2 Application Installation

Application installation has to be done in the approot as version 1.0 with being user made explicit.

This application name has to be used for further upgrade in case of object conversion and applying other patch set objects.

Below script will install the application in Application root. DBA rights are required to perform this step.



Application\_Installation.sql

**(Refer the Attachment Panel of this document to view the script)**

Input sample for the script:

<b>CDB Schema User Name</b>	Sys
<b>CDB Schema Password</b>	Sys
<b>CDB Host</b>	1.1.1.1
<b>CDB Port</b>	1524
<b>Application Root Name</b>	Approot1
<b>Common User Name</b>	CMNUSER

### 3.2.2.3 Application Root objects conversion

- By default sharing type of all DB objects loaded in the Application Root will be none.

### 3.2.2.3.1 Various Sharing type

- A static table will hold the information of selected tables for which the sharing type is DATA LINK. Other tables will be treated as METADATA LINK
- Sharing of object types such as INDEX, LOB, TABLE PARTITION, SEQUENCE and DYNAMIC PACKAGES will remain as NONE.
- All other object types such as SYNONYM, VIEW, TRIGGER FUNCTION, PROCEDURE, and PACKAGE would be converted as METADATA LINK.

### 3.2.2.4 Object Conversion

---

- With the above sharing type considerations, DB object types will be converted as DATA LINK and METADATA LINK as part of this application root object conversion step.
- User has to connect to Application Root as common user and then apply changes in upgrade mode with the same application name used in step 3.
- This step will be done from the installer and user will have 4 options to do the conversion as,
  - Shared Application
  - Shared Application and User Authentication
  - Shared Application and Shared Data – Default
  - Shared Application and Shared Data – Custom

#### Shared Application

Here all the function Ids will be available as PDB function ids.

#### Shared Application and User Authentication

SMS function ids will be available in Approot and the remaining all function ids will be available as PDB function ids.

#### Shared Application and Shared Data – Default

Identified list of entities will be available in approot and sharing of entities from Approot to individual PDBs is applicable in this model.

#### Shared Application and Shared Data – Custom

Identified list of entities will be available in approot and sharing of entities from Approot to individual PDBs is applicable in this model.

Additionally, User can opt-out the entities which are not required to be the candidates of approot and those function ids will be moved to PDB.

The application name and type of deployment will be stored in CSTB\_PARAM table in approot.

PARAM_NAME	PARAM_VAL
MULTI_TENANT_APP_NAME	FCUBS
MULTI_TENANT_DEPLOYMENT_MODEL	SA (or) SAUA (or) SASDD (or) SASDC

Object conversion is an one-time activity and if ti is tried again, system will validate based on the availability of cstb\_param values.

### 3.2.2.5 Application Seed Sync with the Application Root

---

- In Application Root, post conversion of object type as DATA LINK and METADATA LINK, user need to sync Application Root with Application Seed.
- Post sync, characteristic of objects will be available in Application seed and Application PDBs.
- Every patch set upgradation in Application Root,
  - User need to sync, Application Root with Application seed, to keep Application seed to hold the latest DB sources since Application seed will be used to create new PDBs further along.

Below Scripts can also be used to execute this step. This step can be performed from common user.



Approot\_AppSeed\_Sync.sql

**(Refer the Attachment panel of this document to view the script)**

Input sample for the script:

<b>Approot Schema Username</b>	CMNUSER
<b>Approot Schema Password</b>	CMNUSER
<b>Approot Host</b>	1.1.1.1
<b>Approot Port</b>	1524
<b>Application Root Name</b>	Approot1
<b>Application Name</b>	FCUBS

## 3.3 Creation of Application PDB

---

### 3.3.1 Purpose

---

- Application PDB (entity) to be created by clone from Application seed available under Application root. This is associated PDB under Application Root. Any DB sources changes deployed in Application Root, those changes to be synched with Application PDB, if required.
- Later if new Application PDB to be created, new Application PDB will be created by clone from Application seed. Since Application seed will hold latest DB sources by syncing with Application Root.

### 3.3.2 Steps to be followed

---

A PDB that is plugged in to an application container can be created from application seed through cloning.

Below script will be used to create Application PDB from Application Seed. DBA rights are required to perform this step.



Application\_PDB\_Creation.sql

**(Refer the Attachment panel of this document to view the script)**

Input sample for the script:

<b>CDB Name</b>	FC142CDB
<b>CDB Schema User Name</b>	Sys

<b>CDB Schema Password</b>	Sys
<b>CDB HOST</b>	1.1.1.1
<b>CDB PORT</b>	1522
<b>CDB Mounted Path</b>	/scratch/db1800dat/FC142CDB/templatePDB/users01.dbf
<b>Application Root Name</b>	FCAPPROOT
<b>Application PDB Name</b>	FCAPPPDB1
<b>PDB_TO_APPPDB</b>	C:\app_18c\client\user\product\18.0.0\client_1\rdbms\admin\pdb_to_apppdb.sql

### 3.4 Day Zero Setup

---

- Existing Installer can be used to do day zero setup with configuration mode as 'Application Root' and by selecting the radio button 'Utilities'. This step has to be executed for every entity PDB separately.  
(Refer: **FCUBS\_DB\_Setup.docx**)

### 3.5 EAR Creation and Deployment

---

- Existing installer file ROFCEarRun.bat can be used to create EAR.
- EAR deployment has to be deployed manually from console. During EAR deployment, JNDI connectivity details to be maintained for every Application PDB. JNDI details of Application PDB will be captured during Day Zero Setup.



## 4. Step by Step Installation

### 4.1 Approot Object Conversion: Shared Application

For multi-tenant deployment setup using the installer with deployment model as 'Shared Application', follow the steps given below.

1. Double-click 'FCUBSInstaller.bat' batch file to launch Oracle FLEXCUBE Universal Installer. The following screen is displayed. Select Utilities option, configuration mode as "Application Root" and click 'Next' button.

Oracle FLEXCUBE Universal Installer 12.5.0.0.0

### Oracle Banking Installer

ORACLE  
INSTALLER

Welcome To Oracle Universal Banking Installer

Prerequisites

- Oracle Database should be Installed.
- JDK should be Installed.

Please specify the JDK and Oracle Home path.

JDK Path

Oracle Home Path

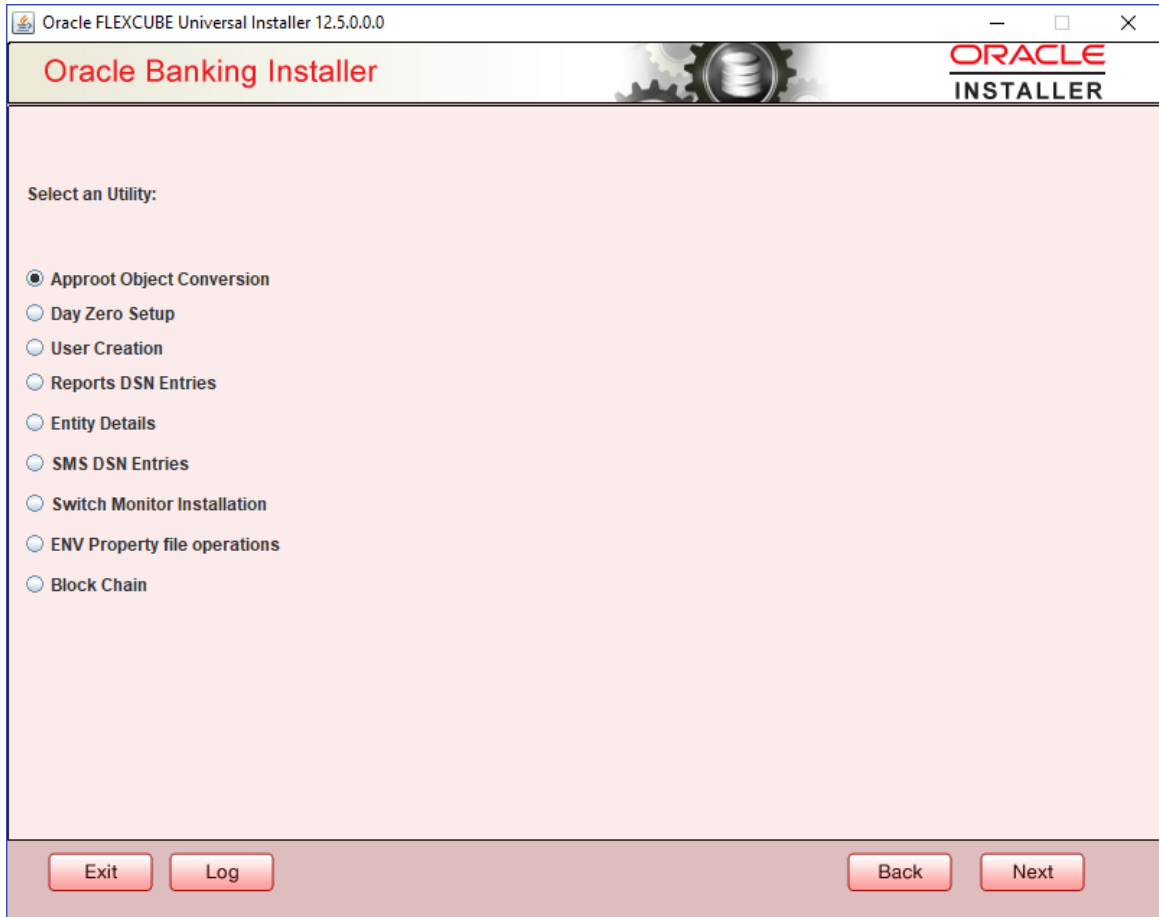
Configuration Mode

Please select any one of the below options:

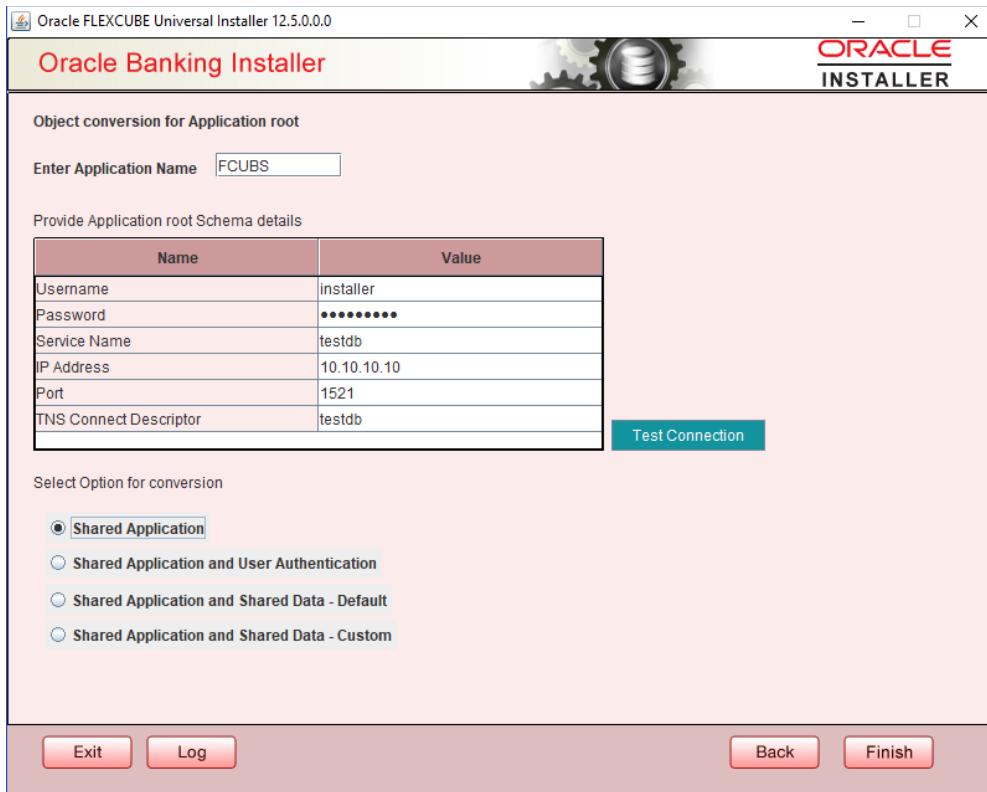
Property File creation

Utilities

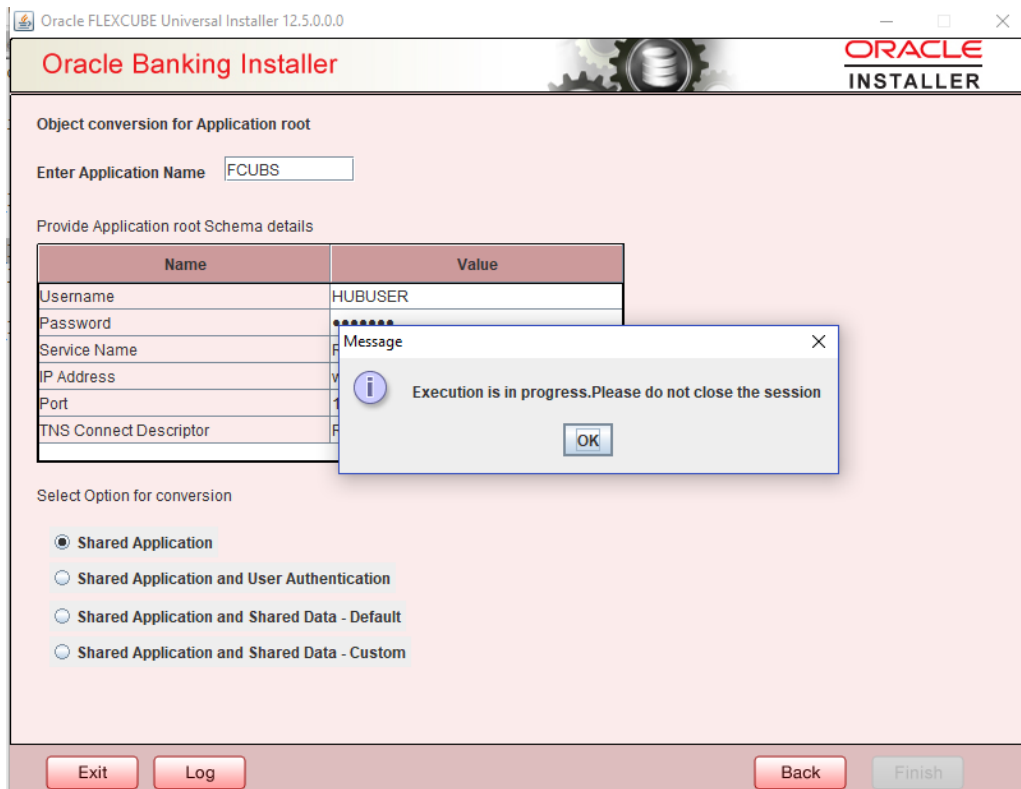
2. Select 'Approot object Conversion" in Utility Screen and click Next as shown below



3. In the Approot object conversion screen, enter Application name and the Application root schema details where the conversion has to be applied and click on 'Test Connection'.
4. Once the Connection is successful, 'Finish' button will be enabled.
5. User has to select the option '**Shared Application**' and click on the 'Finish' button to complete object conversion.



6. Execution will take few minutes and post completion, a dialog box displays 'Compilation Success' message in the front end.

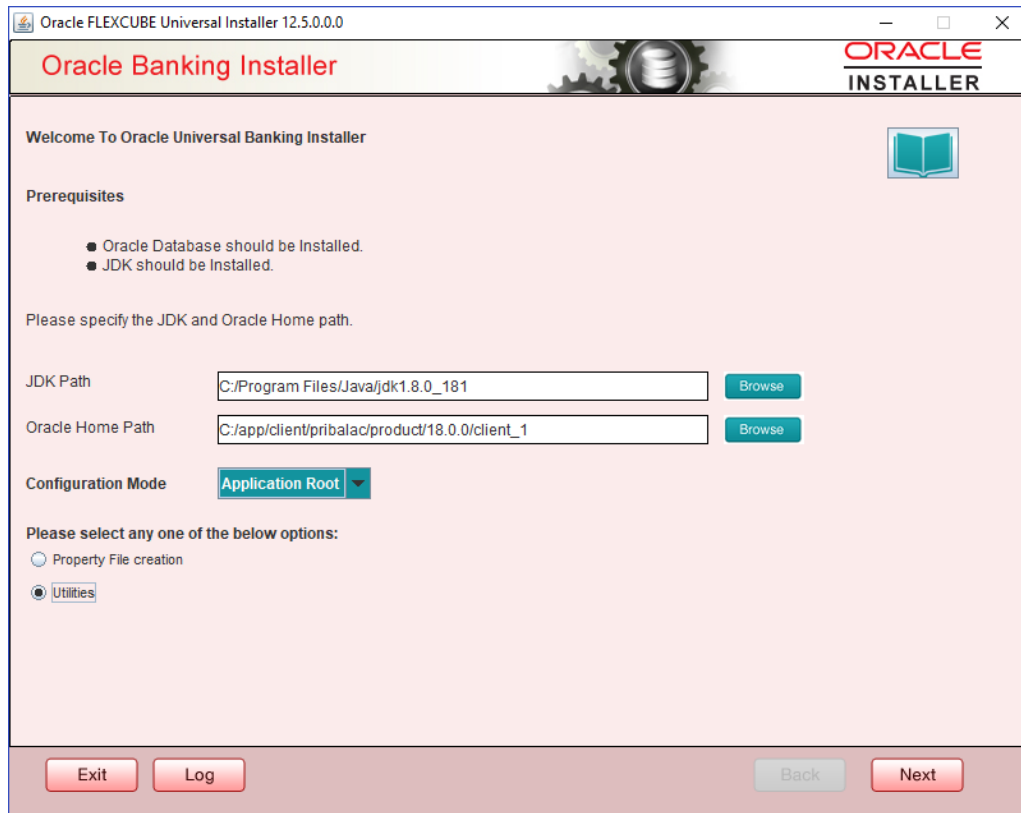


7. This completes the setup and user can click on Exit to close the session.

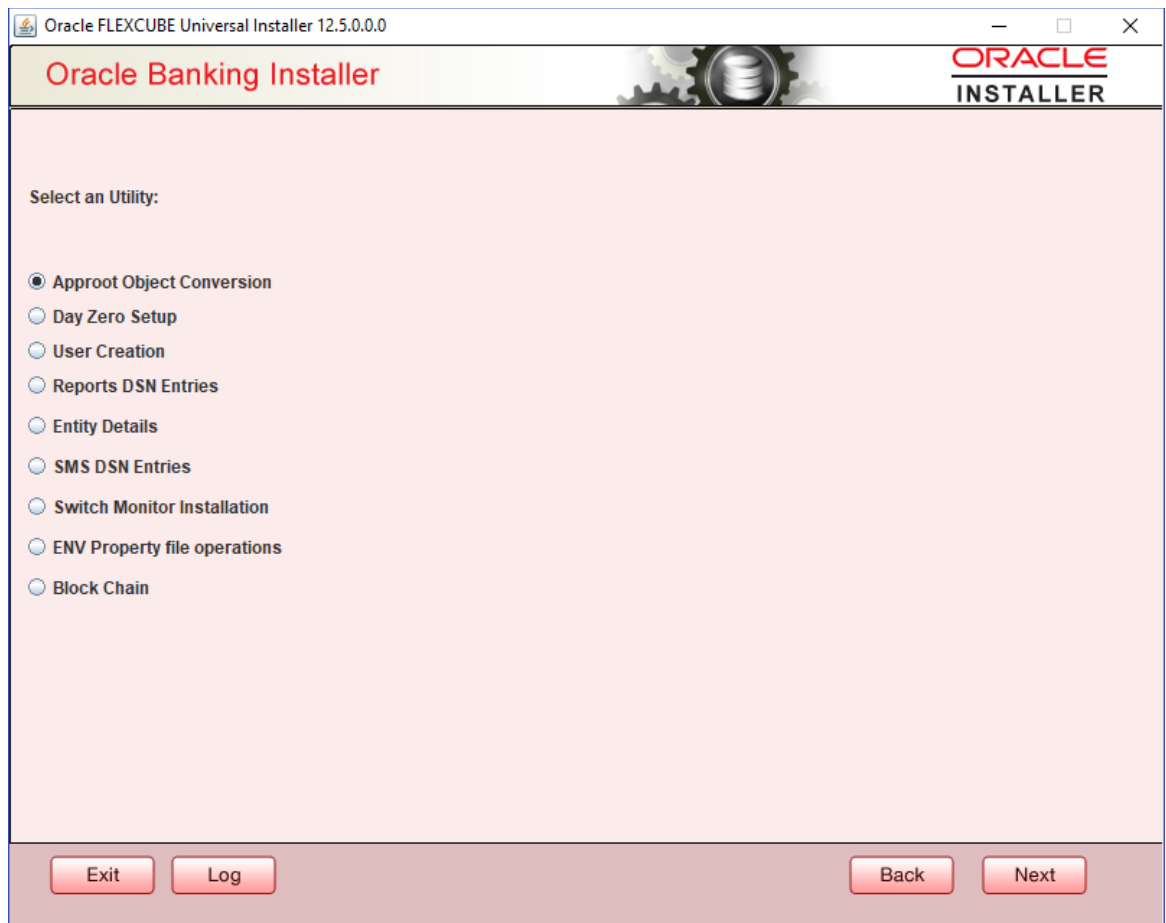
## 4.2 Approot Object Conversion: Shared Application and User Authentication

For multi-tenant deployment setup using the installer with deployment model as 'Shared Application and User Authentication', follow the steps given below.

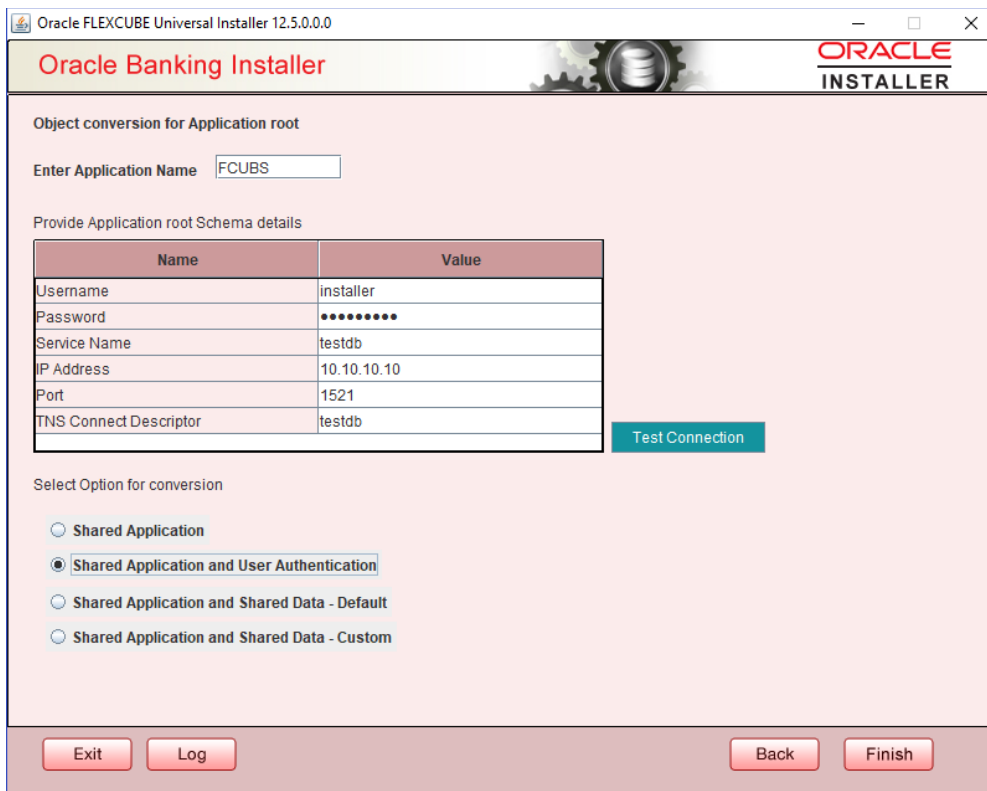
1. Double-click 'FCUBSInstaller.bat' batch file to launch Oracle FLEXCUBE Universal Installer. The following screen is displayed. Select Utilities option, configuration mode as "Application Root" and click 'Next' button.



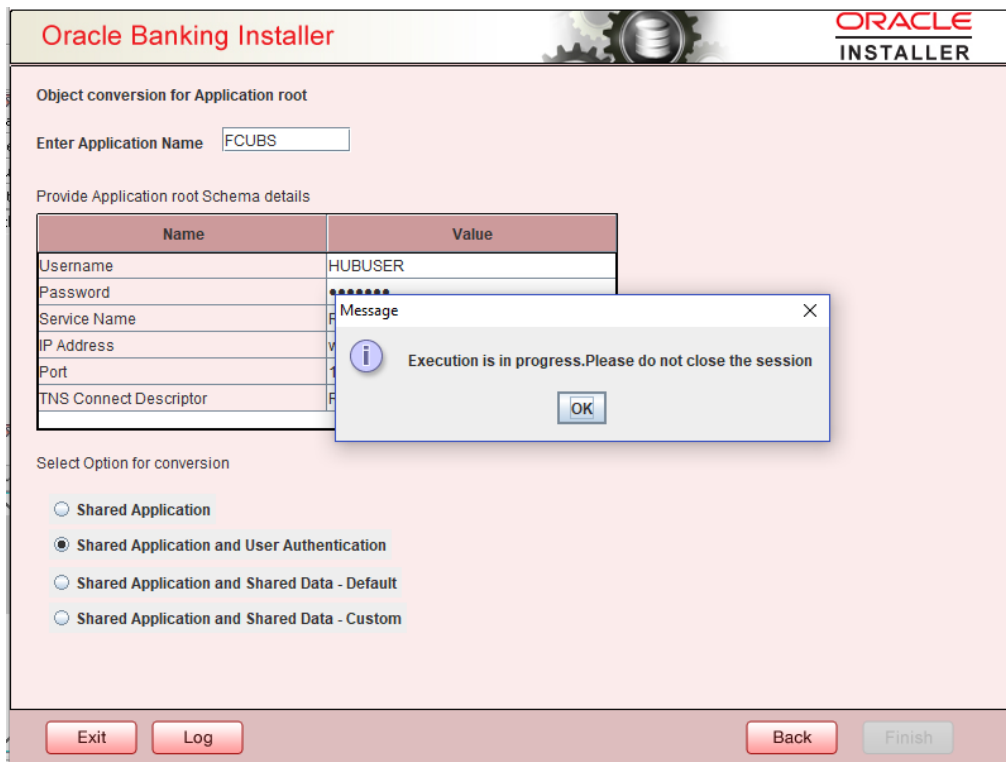
2. Select 'Approot object Conversion' in Utility Screen and click Next as shown below



3. In the Approot object conversion screen, enter Application name and the Application root schema details where the conversion has to be applied and click on 'Test Connection'.
4. Once the Connection is successful, 'Finish' button will be enabled.
5. User has to select the option '**Shared Application and User Authentication**' and click on the 'Finish' button to complete object conversion.



- Execution will take few minutes and post completion, a dialog box displays 'Compilation Success' message in the front end.

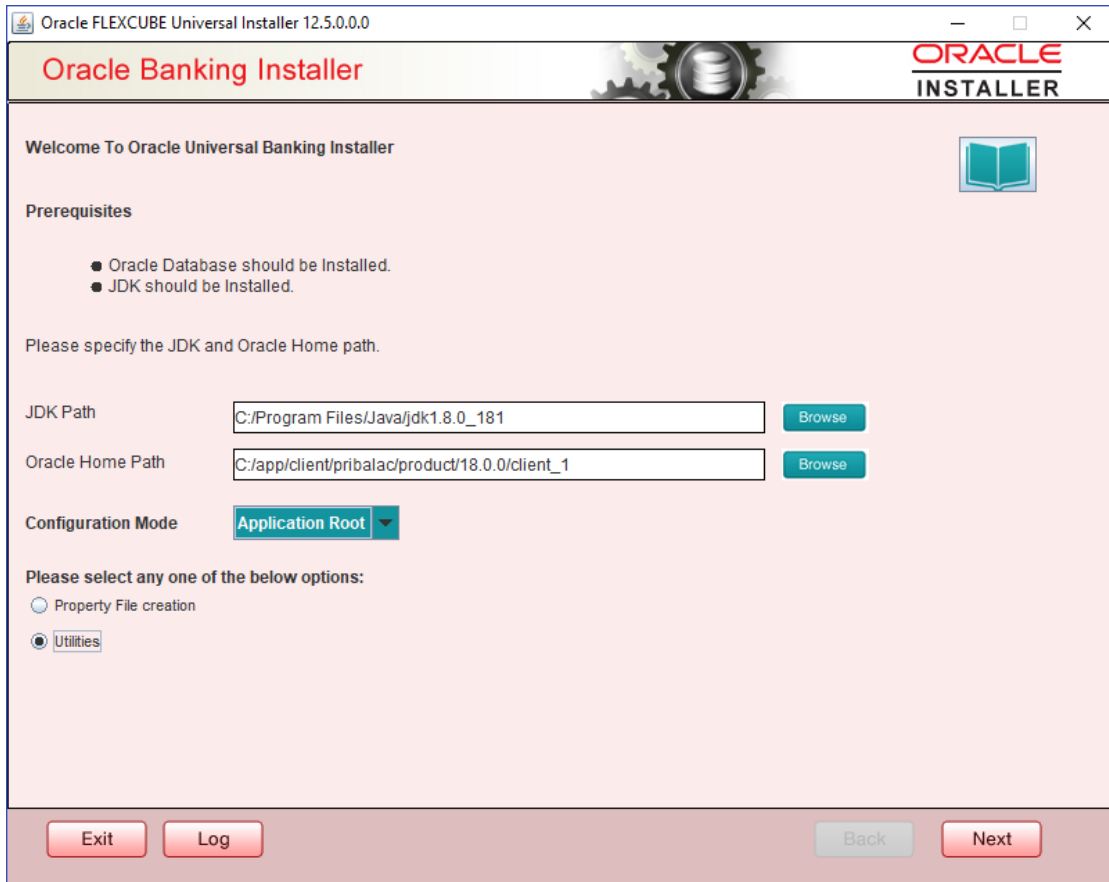


- This completes the setup and user can click on Exit to close the session.

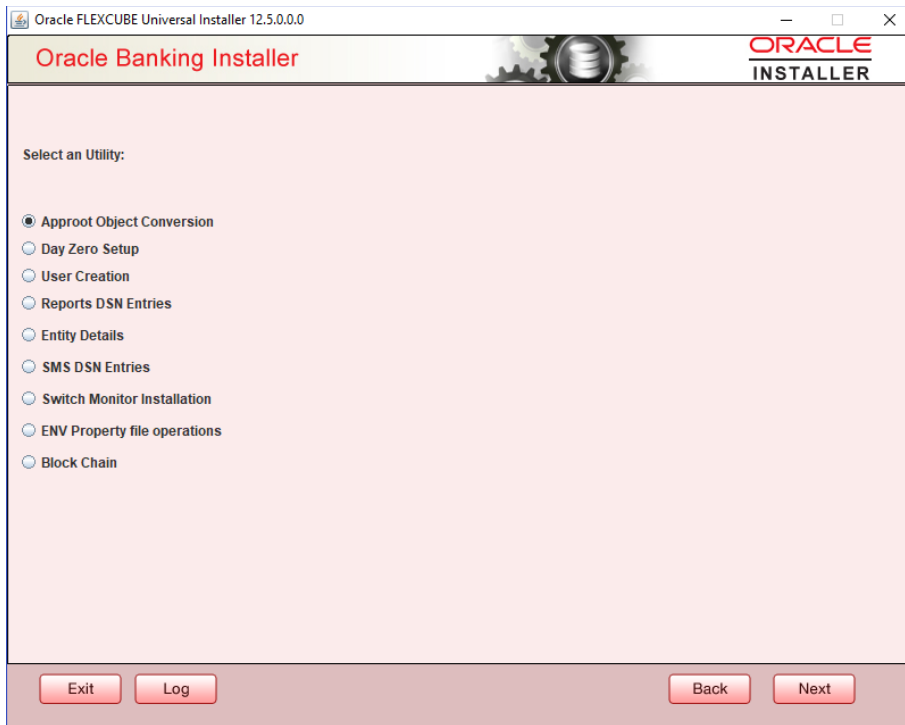
### 4.3 Approot Object Conversion: Shared Application and Shared Data - Default

For multi-tenant deployment setup using the installer with deployment model as 'Shared Application and Shared Data - Default', follow the steps given below.

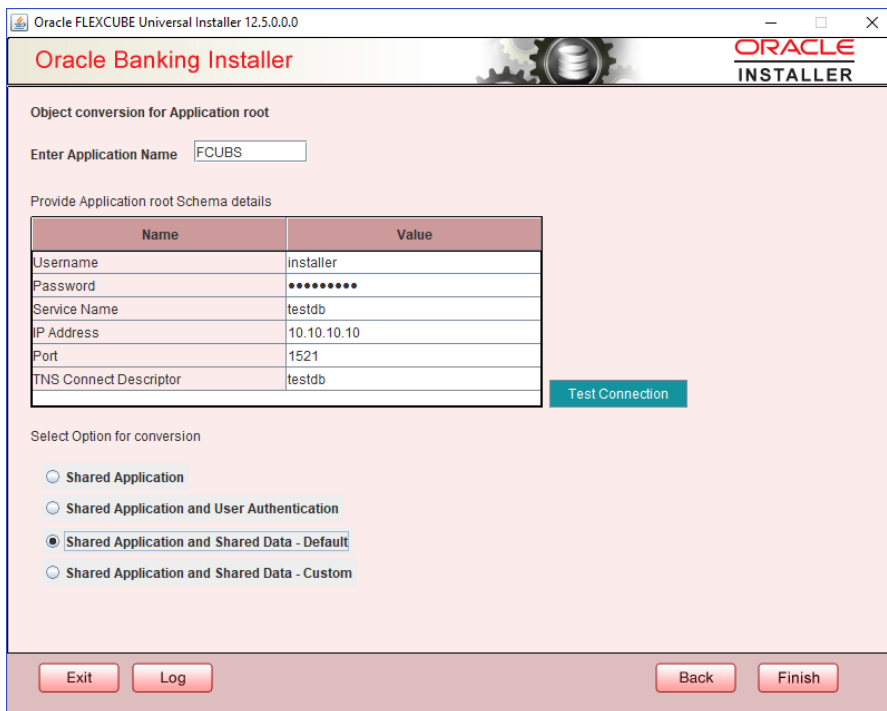
1. Double-click 'FCUBSInstaller.bat' batch file to launch Oracle FLEXCUBE Universal Installer. The following screen is displayed. Select Utilities option, configuration mode as "Application Root" and click 'Next' button.



2. Select 'Approot object Conversion' in Utility Screen and click Next as shown below

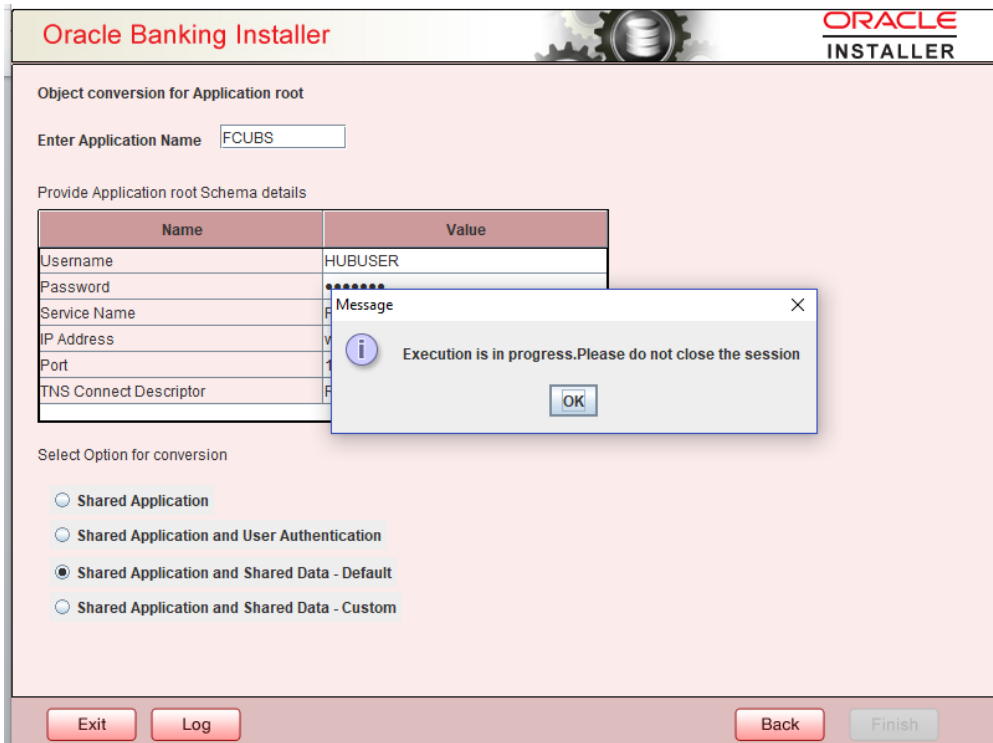


3. In the Approot object conversion screen, enter Application name and the Application root schema details where the conversion has to be applied and click on 'Test Connection'.
4. Once the Connection is successful, 'Finish' button will be enabled.
5. User has to select the option '**Shared Application and Shared Data - Default**' and click on the 'Finish' button to complete object conversion.





6. Execution will take few minutes and post completion, a dialog box displays 'Compilation Success' message in the front end.

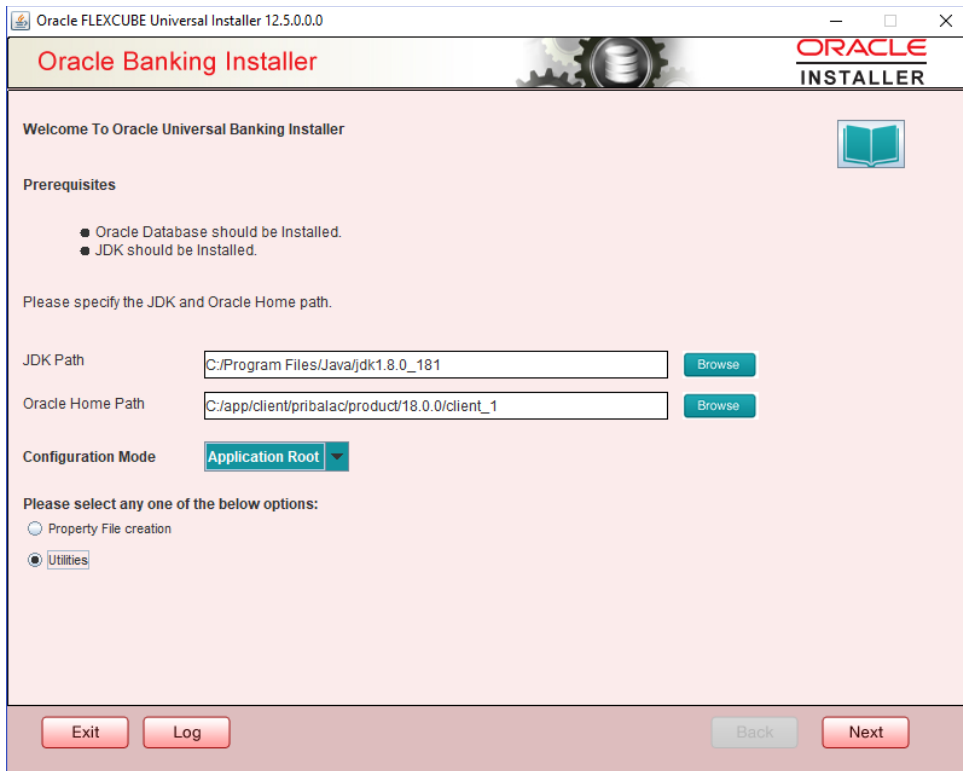


7. This completes the setup and user can click on Exit to close the session.

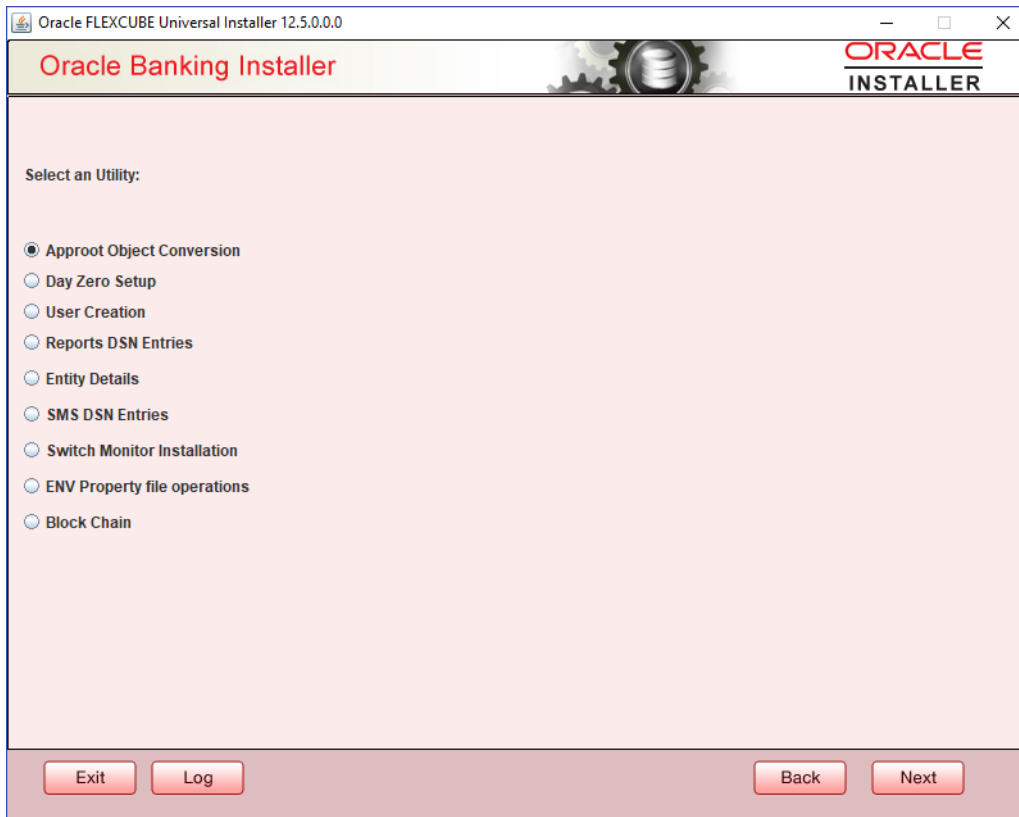
#### 4.4 Approot Object Conversion: Shared Application and Shared Data - Custom

For multi-tenant deployment setup using the installer with deployment model as 'Shared Application and Shared Data -Custom', follow the steps given below.

1. Double-click 'FCUBSInstaller.bat' batch file to launch Oracle FLEXCUBE Universal Installer. The following screen is displayed. Select Utilities option, configuration mode as "Application Root" and click 'Next' button.



2. Select 'Approot object Conversion' in Utility Screen and click Next as shown below



3. In the Approot object conversion screen, enter Application name and the Application root schema details where the conversion has to be applied and click on 'Test Connection'.

4. Once the Connection is successful, 'Next' button will be enabled.
5. User has to select the option '**Shared Application & Shared Data - Custom**' and click on the 'Next' button to take through the steps of movement of function ids to PDB.

Oracle FLEXCUBE Universal Installer 12.5.0.0.0

**Oracle Banking Installer** **ORACLE INSTALLER**

Object conversion for Application root

Enter Application Name

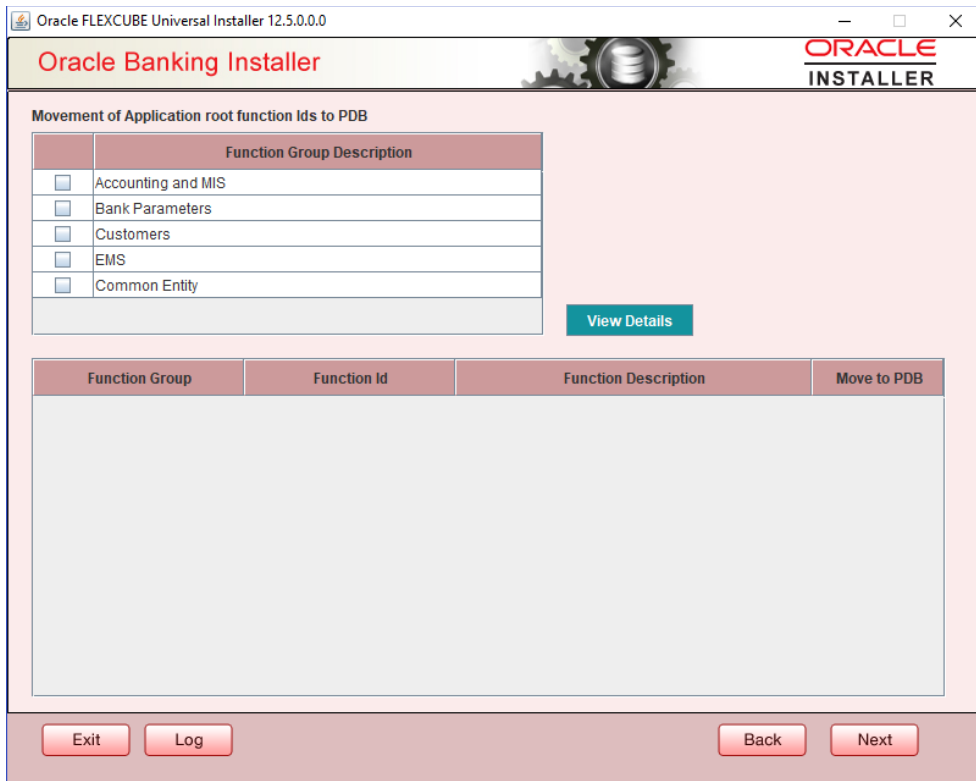
Provide Application root Schema details

Name	Value
Username	installer
Password	*****
Service Name	testdb
IP Address	10.10.10.10
Port	1521
TNS Connect Descriptor	testdb

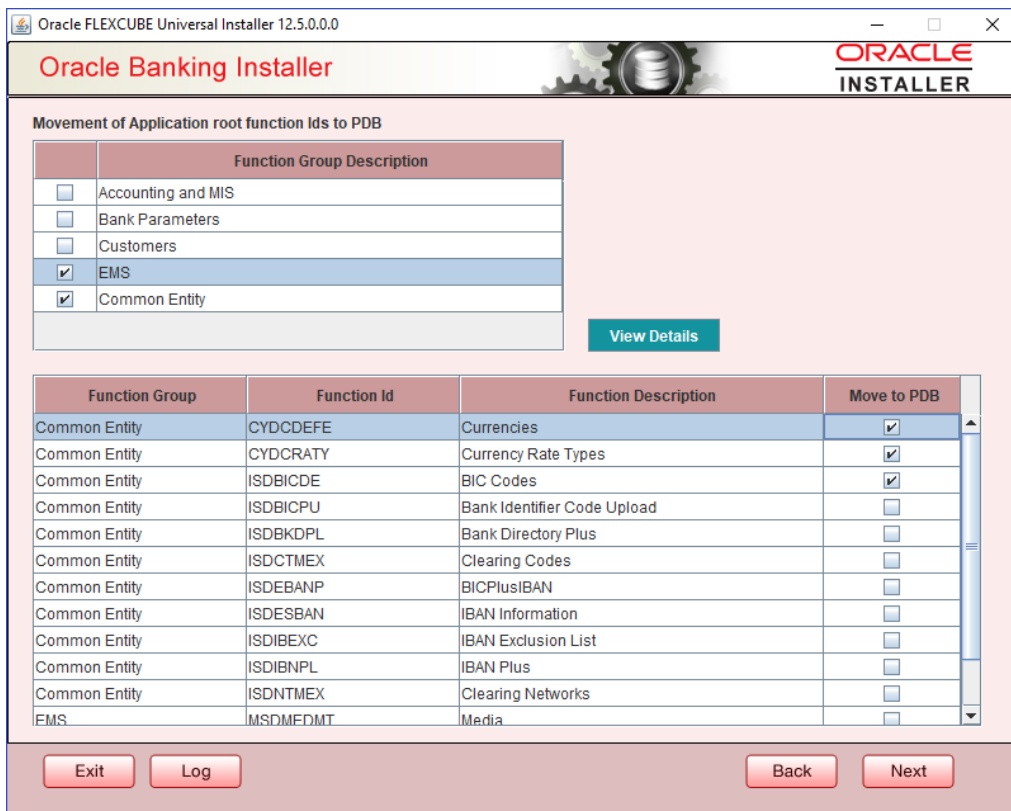
Select Option for conversion

Shared Application  
 Shared Application and User Authentication  
 Shared Application and Shared Data - Default  
 **Shared Application and Shared Data - Custom**

6. In the Next Screen, user can opt-out the entities which are not required to be the candidates of approot and those function ids will be moved to PDB.
7. There will be two multi blocks available.
  - a. First multi block will list the details of function groups which are the Approot candidates.
  - b. Second multi block will list the function ids corresponding to each of the function group in the first block.
8. User can select more than one function group and the respective function ids will also be appended to the second multi block against the function group on click of 'View Details' button.



9. Second multi block will have the check box 'Move to PDB' against each function ID.



10. Once the selection is completed, 'click on the Next button' to move to the next screen where the complete list of function ids.
11. The dependent function ids of the selected functions opted to move to PDB will be listed in the below section

**Oracle Banking Installer**
**ORACLE  
INSTALLER**

**Function Ids applicable for movement to PDB**

Function Id	Function Description
CYDCDEFE	Currencies
CYDCRATY	Currency Rate Types
ISDBICDE	BIC Codes

**Dependent Function Ids**

Function Id	Function Description
ISDNTMEX	Clearing Networks
MIDGRPMT	MIS Groups
ISDEBANP	BICPlusIBAN
ISDBICPU	Bank Identifier Code Upload
MIDXCODE	Cost Codes
CYDCDEFE	Currencies
STDCNMNT	Country Codes
STDHSTCD	Host Code
ISDIBNPL	IBAN Plus
ISDBICDE	BIC Codes

12. Object conversion can be completed by clicking on the Finish button.
13. Execution will take few minutes and post completion, a dialog box displays 'Compilation Success' message in the front end.



Function Ids applicable for movement to PDB

Function Id	Function Description
CYDCDEFE	Currencies
CYDCRATY	Currency Rate Types
ISDBICDE	BIC Codes

Dependent Function Ids

Function Id	Description
ISDNTMEX	
MIDGRPMT	
ISDEBANP	BIC Plus IBAN
ISDBICPU	Bank Identifier Code Upload
MIDXCODE	Cost Codes
CYDCDEFE	Currencies
STDCNMNT	Country Codes
STDHSTCD	Host Code
ISDIBNPL	IBAN Plus
ISDBICDE	BIC Codes

Message

Execution is in progress. Please do not close the session

OK

Exit

Log

Back

Finish

14. This completes the setup and user can click on Exit to close the session.

---

## 5. Possible Issues / FAQ

- ✓ Significance of the application name
  - The Application name provided at step 3 of the deployment will be used for any object modification like object conversion or patch-set application. Suggested name – FCUBS.
- ✓ Roles for the Common user
  - The common user should have DBA role while application install or upgrade. It can be revoked once the application maintenance is completed.
- ✓ Can there be multiple Applications available in case of Co- deployment?
  - It is recommended to have a single application as the Common core units can be released as part of any product processor and if the object can be linked to only one application.
  - Modification of the object belonging to one application cannot be modified in another application.
- ✓ Day zero –set up in multi- tenant:
  - Day zero set up has be done for each of the PDBs created under the approot. The record insertion will be based on the sharing type of the object.
  - If the sharing is METADATA LINK, then the record for the table will be inserted into PDB schema and if the sharing is DATA LINK, record insertion happens in the approot schema for that table.
- ✓ PDB creation possible errors

Encountered the below error when the template PDB has read only schemas also available additionally.

```
ORA-65005: missing or invalid file name pattern for file -  
/scratch/db1800dat/BRVCDB18C/SEEDFC142APPROOT/temp012018-01-08_16-05-42-077-PM.dbf
```

In such case, the FILE\_NAME\_CONVERT has to be provided with the full path till the temp file instead of the Approot and PDB path. Below link is referred to resolve this issue:

[https://mosemp.us.oracle.com/epmos/faces/DocumentDisplay?\\_afzLoop=188548547043444&id=1910646.1&displayIndex=1&\\_afzWindowMode=0&\\_adf.ctrl-state=2mboo8is2\\_4](https://mosemp.us.oracle.com/epmos/faces/DocumentDisplay?_afzLoop=188548547043444&id=1910646.1&displayIndex=1&_afzWindowMode=0&_adf.ctrl-state=2mboo8is2_4)

- ✓ Sync failure with the PDB
  - When synch with PDB fails, there is no definite solution available. Back up of the PDB can be taken before an upgrade and in case of synch failure; new PDB can be created and applied with the backup data.
  - Generally, for multi-tenant the recommendation is that objects will be compiled in a normal schema to check the sanity and to make sure the Invalids are zero. Once that is successful, the compilation will be done in Multi-tenant database.
- ✓ Sync with PDB at different time
  - Once the application upgrade is completed in approot, it can be synched up to the PDB. If the PDBs are not synched at the same time, there will be a mismatch between the front end and backend objects.
  - In such case when a single PDB is parked for synching afterwards , a separate front URL with backup EAR has to be created to point to the PDB schema.

### 6.1 Default Approot Entities for Common Core

---

1. Core Entities/Maintenances
  - a. Country Code
  - b. Host Code & Timezone
  - c. Currency
  - d. Currency Rate types
  - e. Language Code
  - f. Rate Code Definition\*\*
  
2. SMS Entities/Maintenances
  - a. Entity Maintenance
  - b. User Master (SSD)
  - c. Role Master (SSD)
  - d. Function Maintenance
  - e. PII & Mask Maintenance
  - f. SSO Parameters
  - g. Hot Keys
  - h. Customer Access group
  - i. Department Maintenance
  
3. External Entities
  - a. External Chart of Accounts
  - b. External Transaction Codes
  - c. External Credit Approval
  
4. MIS and UDF
  - a. MIS Class & Codes
  - b. MIS Group
  - c. MIS Cost Codes
  - d. MIS Pool
  - e. UDF Definition
  - f. UDF Function ID Mapping
  
5. Other Entities
  - a. BIC Codes and related maintenances
  - b. Process Definition
  - c. Amount Text
  - d. Media
  - e. Gateway Multi-Entity Function Ids \*
    - i. Upload Source
    - ii. External System
    - iii. Amendment Maintenance

\* New function IDs

\*\* Islamic Entities wherever applicable



## 6.2 Default Approval Entities for FCUBS

---

1. Core Entities and Services
  - a. Chart of Accounts
  - b. Revaluation Setup
  - c. Transaction Codes
  - d. Currency Denominations
  - e. Customer Categories, Prefixes, Groups, Ownership, Relation
  - f. Issuer Codes
  - g. Overrides
2. Subsystem and Classes
  - a. Commission, Interest, Charge, Tax Scheme Class
  - b. Status Codes
  - c. ICCF Rule master \*
  - d. Tax Rule Master\*
  - e. Tax Categories, Tax Scheme, Tax Rate codes
  - f. Product – UDF Mapping \*
  - g. Message Types, Media, Locations, SWIFT Tags
3. CASA and TD (Conventional and Islamic\*\*)
  - a. Account Class and Account Class Group
  - b. Interest and Charge Rule and Product
  - c. Interest and Charge SDEs
  - d. Standing Instruction Product
  - e. Structured Deposit Product
  - f. PDC Product
4. Retail Lending (Conventional and Islamic\*\*)
  - a. Retail Lending Product and related Maintenances
  - b. Leasing Product
  - c. Mortgage Product
  - d. Microfinance Product
  - e. Collection Product
5. Teller
  - a. Retail Teller Product
  - b. Corporate Teller Product
  - c. Utility Payment Product
6. Trade (Conventional and Islamic\*\*)
  - a. Letter of Credit Product and Related Maintenances
  - b. Bills and Collection Product and Related Maintenances
7. Treasury (Conventional and Islamic\*\*)
  - a. Foreign Exchange Product and Related Maintenances
  - b. Money Market Product and Related Maintenances
  - c. Securities Repo Product and Related Maintenances
  - d. Corporate Deposit Product and Related Maintenances
  - e. Securities Product and Related Maintenances
  - f. Derivatives Product and Related Maintenances

8. Other Modules (Conventional and Islamic\*\*)
  - a. Asset Management Fund Product
  - b. Fixed Assets Product
  - c. Expense Processing Product
  - d. Intermediary Product
  - e. Retail Bills Product

\* New function IDs

\*\* Islamic Entities wherever applicable



Multi-Tenant Deployment  
[January] [2019]  
Version 14.2.0.0.1

Oracle Financial Services Software Limited  
Oracle Park  
Off Western Express Highway  
Goregaon (East)  
Mumbai, Maharashtra 400 063  
India

Worldwide Inquiries:  
Phone: +91 22 6718 3000  
Fax: +91 22 6718 3001  
<https://www.oracle.com/industries/financial-services/index.html>

Copyright © 2007, 2019, Oracle and/or its affiliates. All rights reserved.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

**U.S. GOVERNMENT END USERS:** Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate failsafe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

This software or hardware and documentation may provide access to or information on content, products and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.