

Oracle® Banking Corporate Lending Multi-Tenant Patch-set Deployment



Release 14.7.3.0.0

F93809-01

February 2024

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Preface

This topic contains the following sub-topics:

- [Introduction](#)
- [Audience](#)
- [Conventions](#)
- [List Of Topics](#)
- [Related Resources](#)

Introduction

This manual is designed to help you quickly get acquainted with the Oracle Multi Tenant Patchset deployment in Oracle Banking Corporate Lending.

Audience

This manual is intended for the following User/User Roles

Table 1 Audience

Role	Function
Implementation team	Implementation of Oracle Banking Corporate Lending Solution
Presales team	Install Oracle Banking Corporate Lending for demo purpose
Bank personnel	Who installs Oracle Banking Corporate Lending

This guide is intended for IT administrators, developers, WebLogic admin or ops-web team who are responsible for installing OFSS Banking Products. The user of this manual is expected to have basic understanding of Application servers like Oracle Weblogic and Oracle Database.

Conventions

The following text conventions are used in this document:

Table 2 Conventions and Meaning

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.

Table 2 (Cont.) Conventions and Meaning

Convention	Meaning
<i>italic</i>	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.

List Of Topics

This guide is organized into the following topics.

Table 3 List of Topics

Topics	Description
Overview of Applications in an Application Container	This topic provides an overview of the Patchset Multitenant Architecture.
Patch-set Application Steps	This topic provides information on patchset deployment and installation steps
Step by Step Execution	This topic provides systematic instructions to patch-set application step by step with screenshots.
Annexure	This topic provides list of script for patchset

Related Resources

For more information, refer *Multi-Tenant Deployment User Manual*.

1

Overview of Applications in an Application Container

This topic contains following sub-topics:

- [Managing Applications in an Application Container](#)
In an application container, an application is the named, versioned set of application common objects stored in the application root. In this context, “application” means “application back-end.” Application common objects include user accounts, tables, PL/SQL packages, and so on. An application can be shared with the application PDBs that belong to the application root.
- [Application Maintenance](#)
Application maintenance refers to installing, uninstalling, upgrading, or patching an application.

1.1 Managing Applications in an Application Container

In an application container, an application is the named, versioned set of application common objects stored in the application root. In this context, “application” means “application back-end.” Application common objects include user accounts, tables, PL/SQL packages, and so on. An application can be shared with the application PDBs that belong to the application root.

On performing application changes, application PDBs can synchronize with the application in the application root. The application container also manages the versions of the application and the patches to the application:

- While installing an application, user must specify the application version number.
- While upgrading an application, user must specify the old application version number and the new application version number.

As the application evolves, the application container maintains all of the versions that are applied.

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.

These statements can be issued in the same user session or in different user sessions.

- [Application Installation](#)
- [Application Upgrade](#)

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.

Refer *Multi-Tenant Deployment* document for more details on the application installation.

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 tables, and packages, or alter the definitions of existing objects.

To upgrade the application, 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.

Figure 1-1 Begin Upgrade

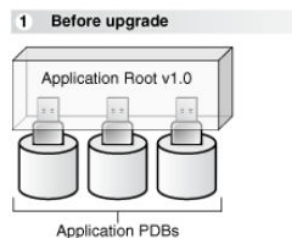
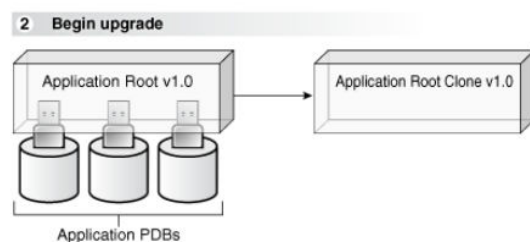
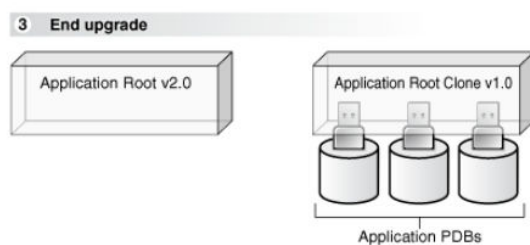
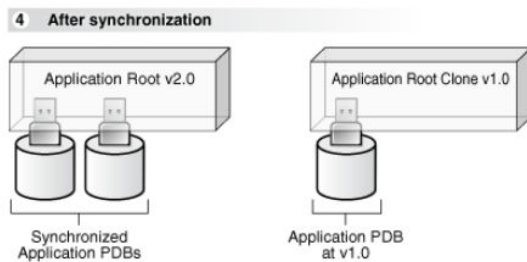


Figure 1-2 Begin Upgrade**Figure 1-3 End Upgrade****Figure 1-4 After synchronization**

When an application is upgraded, Oracle Database automatically clones the application root.

During the upgrade, application PDBs point to the clone and applications continue to run during the upgrade. Application PDBs can perform DML on metadata-linked tables and views and query data-linked tables.

After the upgrade, the application root clone remains and continues to support any application PDB that still uses the pre-upgrade version of the application in the clone.

Application PDBs that are synchronized are pointed to the upgraded application root. Application PDBs that are not synchronized might continue to use the clone.

2

Patch-set Application Steps

Multi entity application root/PDB based setup has to be available to perform 18c database application upgrade for applying the patch-set. Refer Multi-Tenant_Deployment.docx for the deployment and installation steps.

Patch-set can be applied by following below steps in sequential order, and detail of each steps explained as separate sections subsequently.

- Application Upgrade
- Synchronize application PDBs

Patch-set Deployment Pre-requisites:

Download the required patch-set zip file and unzip it in a local path.

Verify whether the property files (fcubs.properties and env.properties) have the application root schema details where the application is available, if not update the approot schema details through installer (Refer Property_File_Creation document for more details) and re-generate the files.

Make sure to set the flag PATCHSET_INSTALLATION to 'Y'.

- [Purpose](#)
- [Steps to be Followed](#)
- [Synchronize application PDBs](#)

2.1 Purpose

Synchronizing an application updates the application in the application PDB to the latest version in the application root. When an application is upgraded in an application root, an application PDB that belongs to the application root is not changed until it is synchronized.

Application PDBs synchronize with an application by running an ALTER PLUGGABLE DATABASE statement with the SYNC clause.

2.2 Steps to be Followed

Below steps to be followed to initiate application upgrade:

- [Start Application Upgrade](#)
- [Compiling Incremental Units](#)
- [Recompilation of invalids](#)
- [End Application upgrade](#)
- [Start Application upgrade](#)
- [Application Root Objects Conversion for New Objects](#)
- [Application Root Objects Conversion for Existing Objects](#)

- [Recompilation of Invalids](#)
- [End Application Upgrade](#)

2.2.1 Start Application Upgrade

An ALTER PLUGGABLE DATABASE APPLICATION statement has to be issued to upgrade an application in the application root.

Each upgrade must be associated with an application name, starting version number, and ending version number.

- The common user must have the DBA privilege, and the privilege must be commonly granted in the application root.
- The application root must be in open read/write.
- Run the below script for initiating an application upgrade. This will initiate the application from current version to the next version (patch-set version).

[01_Start_Upgrade.sql](#)

Input sample for the script:

Table 2-1 Input sample for the script:

Spool Path	<< Any local path>>
Application next version	14.4.0.0.0

2.2.2 Compiling Incremental Units

Patch-set objects have to be loaded using bat file [E.g.: SMSDBCompileRun.bat, TFDBCompileRun.bat] by silent installer for respective product processor.

Compile the incremental SMS units using /INSTALLER/SOFT/SMSDBCompileRun.sh for UNIX installations or /INSTALLER/SOFT/SMSDBCompileRun.bat for Windows installations.

Compile the incremental OBCL units using /INSTALLER/SOFT/TFDBCompileRun.sh for UNIX installations or /INSTALLER/SOFT/TFDBCompileRun.bat for Windows installations.

2.2.3 Recompilation of invalids

As the sharing property of most of the objects are modified other than NONE, recompilation of objects is not allowed outside an application.

Recompilation of objects will be initiated inside the application upgrade for sanity with zero invalids with the below script:

[03_Invalids_Recompilation_Inside_Upgrade.sql](#)

2.2.4 End Application upgrade

Application upgrade can be performed in the application root only and end of the upgrade is performed with an ALTER PLUGGABLE DATABASE APPLICATION END UPGRADE statement.

Run the below script for ending an application upgrade for patch-set.

[04_End_Upgrade.sql](#)

And run the invalid script by connecting to the common user in approot outside the upgrade.

[04_Invalids_Recompilation_Outside_Upgrade.sql](#)

2.2.5 Start Application upgrade

Run the below script for initiating another application upgrade for object conversion. This will initiate the application from current version to the next version (patch-set version).

[05_Start_Upgrade.sql](#)

Input sample for the script:

Table 2-2 Input sample for the script:

Spool Path	<< Any local path>>
Application next version	14.4.0.0.0

2.2.6 Application Root Objects Conversion for New Objects

As part of patch-set when there are new tables added which has to be converted as DL or when there is a new function id which is identified to be an approot function is provided, otherwise no conversion will happen as part of this step

Below script takes care of converting the new DL objects during patch-set based on the deployment model of the application during installation.

[06_New_Object_Conversion.sql](#)

Input sample for the script:

Table 2-3 Input sample for the script

Spool Path	<< Any local path>>
Application next version	14.4.0.0.0

2.2.7 Application Root Objects Conversion for Existing Objects

Various Sharing types of objects during installation:

- A static table will hold the information of selected table sharing as Data link. Other tables will be treated as Meta Data 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 Packages, Procedures, Functions, and Synonyms would be converted as Meta Data Link sharing.

Sharing during upgrade:

Sharing of existing database objects will remain the same.

Below script takes care of converting the modified MDL objects when there is a re-creation [objects with Create or Replace command during creation] happens during patch-set.

[07_Object_Conversion.sql](#)

Input sample for the script:

Spool Path	<< Any local path>>
Application next version	14.4.0.0.0

When there are new tables introduced as part of patch-set which has to be converted into DL will be done separately. The recommendation for the same will be provided as part of patch-set instructions for this case.

2.2.8 Recompilation of Invalids

As the sharing property of most of the objects are modified other than NONE, recompilation of objects is not allowed outside an application.

Recompilation of objects will be initiated inside the application upgrade for sanity with zero invalids with the below script:

[08_Invalids_Recompilation_Inside_Upgrade](#)

2.2.9 End Application Upgrade

Application upgrade can be performed in the application root only and end of the upgrade is performed with an ALTER PLUGGABLE DATABASE APPLICATION END UPGRADE statement.

Run the below script for ending an application upgrade for patch-set.

[09_End_Upgrade.sql](#)

And run the invalid script by connecting to the common user in approot outside the upgrade.

[09_Invalids_Recompilation_Outside_Upgrade.sql](#)

2.3 Synchronize application PDBs

This topic contains following sub-topics:

- [Purpose](#)
- [Steps to be Followed](#)

2.3.1 Purpose

Synchronizing an application updates the application in the application PDB to the latest version in the application root. When an application is upgraded in an application root, an application PDB that belongs to the application root is not changed until it is synchronized.

Application PDBs synchronize with an application by running an ALTER PLUGGABLE DATABASE statement with the SYNC clause.

2.3.2 Steps to be Followed

Prerequisites

- The current user must have ALTER PLUGGABLE DATABASE system privilege.
- Ensure that the current container is the application PDB.
- Run an ALTER PLUGGABLE DATABASE APPLICATION statement with the SYNC clause.
- Run the below script to synchronize the PDBs with the latest application changes in the application root.

[10_PDB_Sync.sql](#)

3

Step by Step Execution

This topic contains following sub-topics:

- [Pre-Requisites](#)
This topic provides systematic instructions for pre-requisites.
- [Patch-set Application Step by Step with Screenshots](#)
This topic provides systematic instructions to patch-set application step by step with screenshots.

3.1 Pre-Requisites

This topic provides systematic instructions for pre-requisites.

1. Before applying the patch-set, we have to make sure the release is updates with the base version of the patch-set.

For Example, If the first patch-set of 14.2 is yet to applied, the release has to be updated as '14.2.0.0.0'. It can be verified with the below queries.
`select param_name, param_val from CSTB_PARAM WHERE PARAM_NAME = 'RELEASE';`
`select module_group_id, release from SMTB_MODULES_GROUP;`

2. Another significant parameter is the values of application name and deployment type in CSTB_PARAM.

This value will be updated from the installer during Aproot Object Conversion utility as part of deployment.
`select param_name, param_val from cstb_param where PARAM_NAME in ('MULTI_TENANT_APP_NAME', 'MULTI_TENANT_DEPLOYMENT_MODEL');`

The Application name of multi-tenant deployment will be stored in CSTB_PARAM as

Table 3-1 Parm name and Parm Val

Param_Name	Param_Val
MULTI_TENANT_APP_NAME	OBCL

The type of object conversion will be stored in CSTB_PARAM as

Table 3-2 Parm name and Parm Val

Param_Name	Param_Val
MULTI_TENANT_DEPLOYMENT_MODEL	SA (or) SAUA (or) SASDD (or) SASDC

- SA - Shared Application
- SAUA - Shared Application User Authentication
- SASDD - Shared Application Shared Data - Default
- SASDC - Shared Application Shared Data – Custom

3.2 Patch-set Application Step by Step with Screenshots

This topic provides systematic instructions to patch-set application step by step with screenshots.

1. Start Application upgrade

- a. Login into the Aproot Schema as Common user.
- b. Run 01_Start_Upgrade.sql for initiating the application upgrade.
- c. User input has to be inputted for the below:

Table 3-3 Input sample for the script

Input Type	User Input
Pool Path	<< Any local path>>
Application next version	14.4.0.0.0

- d. Script will be executed as in the screen shot below and keep the SQL Plus session open for upcoming steps.

Execution Screenshot:

Figure 3-1 Start Application Upgrade

```

C:\app\client\gribalac\product\18.0.0\client_1\bin\sqlplus.exe
SQL> SPOOL ON
SQL> SET SQLBLANKLINES ON
SQL> SET SERVEROUTPUT ON
SQL> SET ERRORLOGGING ON
SQL> SET ECHO ON
SQL> prompt Welcome to Application PDB Configuration
Welcome to Application PDB Configuration
SQL> SPOOL "&SPOOL_PATH"
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\WAVALS\01Spool.txt
SQL>
SQL> DECLARE
2     l_app_name          VARCHAR2(128);
3     l_app_currver      VARCHAR2(30);
4     l_sql              VARCHAR2(256);
5 BEGIN
6
7     BEGIN
8         SELECT app_name
9             INTO l_app_name
10            FROM dba_applications
11             WHERE app_implicit <> 'Y'
12             AND app_name = (SELECT param_val FROM cstb_param WHERE Param_name = 'MULTI_TENANT_APP_NAME');
13     EXCEPTION
14     WHEN NO_DATA_FOUND THEN
15         dbms_output.put_line('Error Nodata-->||SQLERRM');
16     WHEN OTHERS THEN
17         dbms_output.put_line('Error others-->||SQLERRM');
18     END;
19     SELECT MAX(app_version)
20         INTO l_app_currver
21        FROM dba_app_versions
22         WHERE app_name = l_app_name;
23
24     l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name || ' BEGIN UPGRADE ''' || l_app_currver || ''' TO ''' || '&APPLICATION_NEXTVER' || '''';
25     dbms_output.put_line('l_sql: ' || l_sql);
26     EXECUTE IMMEDIATE l_sql;
27
28     l_sql := 'ALTER SYSTEM SET DEFAULT_SHARING = NONE';
29     dbms_output.put_line('l_sql: ' || l_sql);
30     EXECUTE IMMEDIATE l_sql;
31
32 EXCEPTION
33     WHEN OTHERS THEN

```


Figure 3-2 Start Application Upgrade

```

14      WHEN NO_DATA_FOUND THEN
15          dbms_output.put_line('Error Nodata-->'||SQLERRM);
16      WHEN OTHERS THEN
17          dbms_output.put_line('Error others-->'||SQLERRM);
18      END;
19      SELECT MAX(app_version)
20      INTO l_app_currver
21      FROM dba_app_versions
22      WHERE app_name = l_app_name;
23
24      l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name || ' BEGIN UPGRADE ''' || l_app_currver || ''' TO ''' || '&P_APPLICATION_NEXTVER' || '''';
25      dbms_output.put_line('l_sql: ' || l_sql);
26      EXECUTE IMMEDIATE l_sql;
27
28      l_sql := 'ALTER SYSTEM SET DEFAULT_SHARING = NONE';
29      dbms_output.put_line('l_sql: ' || l_sql);
30      EXECUTE IMMEDIATE l_sql;
31
32  EXCEPTION
33      WHEN OTHERS THEN
34          dbms_output.put_line('Error -->'||SQLERRM);
35  END;
36  /

Enter value for p_application_nextver: 14.2.0.0.2
14 24:   l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name || ' BEGIN UPGRADE ''' || l_app_currver || ''' TO ''' || '&P_APPLICATION_NEXTVER' || '''';
15 24:   l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name || ' BEGIN UPGRADE ''' || l_app_currver || ''' TO ''' || '14.2.0.0.2' || '''';
16 24:   l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION FCUBS BEGIN UPGRADE '14.2.0.0.1' TO '14.2.0.0.2'
17 24:   l_sql := 'ALTER SYSTEM SET DEFAULT_SHARING = NONE
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```

2. **Compiling Incremental Units**

- a. Make sure that the fcubs.properties and env.properties are updated with aproot schema details.
- b. Run the <Product Processor>DBCompileRun.bat from <Patchset>\INSTALLER\SOFT directory. DDL Compilation, Object Compilation and Static Data load will be done.

For Example: OBCL INSTALLATION

First load SMS objects first and then OBCL objects. i.e. Run SMSDBCompileRun.bat and after SMS object loading is completed, then initiate OBCL compilation Run TFDBCompileRun.bat

3. **Recompilation of invalids**

- a. Login into the Aproot Schema as Common user
- b. Run 03_Invalids_Recompilation.sql **for recompiling the invalids during application upgrade.**
- c. No user input is required for this step.
- d. Script will be executed as in the screen shot below and keep the SQL Plus session open for upcoming steps.

Execution Screenshot:

Figure 3-3 Recomp

```

C:\app\client\prdbalac\product\18.0.0\client_1\bin\sqlplus.exe
SQL> prompt Welcome to Application Upgrade Invalids Recompilation
Welcome to Application Upgrade Invalids Recompilation
SQL> SPOOL "E:\SPOOL_PATH"
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\AVAILS\055pool.txt
SQL>
SQL> DECLARE
2   inval_cnt NUMBER := 0;
3 BEGIN
4   WHILE inval_cnt < 3 LOOP
5     --SCRIPT
6     FOR J IN (select 'alter ' || object_type || ' ' || object_name || ' compile' invalidobject
7              FROM user_objects
8              WHERE status = 'INVALID'
9              AND object_type IN ('VIEW','SYNONYM','PROCEDURE','FUNCTION','PACKAGE','TRIGGER')
10             )
11     LOOP
12       DBMS_OUTPUT.PUT_LINE(chr(10));
13       EXECUTE IMMEDIATE J.invalidobject;
14     END LOOP;
15     inval_cnt := inval_cnt + 1;
16   END LOOP;
17 END;
18 /

PL/SQL procedure successfully completed.
SQL>
SQL> DECLARE

```

Figure 3-4 Recomp

```

C:\app\client\prdbalac\product\18.0.0\client_1\bin\sqlplus.exe

PL/SQL procedure successfully completed.
SQL> select count(*) From user_objects Where status = 'INVALID';

COUNT(*)
-----
0
1 row selected.

SQL>
SQL> SET ERRORLOGGING OFF
SQL> SPOOL OFF
SQL>
SQL>
SQL>
SQL> _

```

4. End Application upgrade

- a. Login into the Aapproot Schema as Common user.
- b. Run 06_End_Upgrade.sql for recompiling the invalids during application upgrade.
- c. No user input is required for this step.
- d. Script will be executed as in the screen shot below.

Execution Screenshot:

Figure 3-5 End Application Upgrade

```

C:\app\client\pribala\product\18.0.0\client_1\bin\sqlplus.exe
SQL> prompt Welcome to Application PDB Configuration
Welcome to Application PDB Configuration
SQL> SPOOL 'spool_path'
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\AVATLS\065pool.txt
SQL>
SQL> DECLARE
2   l_app_name   VARCHAR2(128);
3   l_sql        VARCHAR2(256);
4 BEGIN
5
6   SELECT app_name
7     INTO l_app_name
8    FROM dba_applications
9   WHERE app_implicit <> 'Y'
10  AND app_name = (SELECT param_val FROM cstab_param WHERE param_name = 'MULTI_TENANT_APP_NAME');
11 EXCEPTION
12 WHEN NO_DATA_FOUND THEN
13   dbms_output.put_line('Error1 Nodata-->'||SQLERRM);
14 WHEN OTHERS THEN
15   dbms_output.put_line('Error1 others-->'||SQLERRM);
16 END;
17 l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name || ' END UPGRADE ';
18 dbms_output.put_line('l_sql: ' || l_sql);
19 EXECUTE IMMEDIATE l_sql;
20
21
22 EXCEPTION
23 WHEN OTHERS THEN
24   dbms_output.put_line('Error -->'||SQLERRM);
25 END;
26 /
l_sql: ALTER PLUGGABLE DATABASE APPLICATION FCUBS END UPGRADE
PL/SQL procedure successfully completed.
SQL>
SQL> SET ERRORLOGGING OFF
SQL> SPOOL OFF
SQL>

```

5. Start Application upgrade

- a. Login into the Approot Schema as Common user.
- b. Run `05_Start_Upgrade.sql` for initiating the application upgrade.
- c. User input has to be inputted for the below:

Table 3-4 Input sample for the script

Input Type	User Input
Spool Path	<< Any local path>>
Application next version	14.4.0.0.0

- d. Script will be executed similar to step 1 above and keep the SQL Plus session open for upcoming steps.

6. Application Root objects conversion for new objects

- a. Login into the Approot Schema as Common user.
- b. Run `06_New_Object_Conversion.sql` for converting new approot objects added during patch-set as DL
- c. User input has to be inputted for the below:

Table 3-5 Input sample for the script

Input Type	User Input
Spool Path	<< Any local path>>
Application next version	HUBUSER (common user name)

Execution Screenshot:

Figure 3-6 Application Root objects conversion for new objects

```

C:\app\client\gribalac\product\18.0.0\client_1\bin\sqlplus.exe
SQL> prompt Welcome to Application PDB Configuration
Welcome to Application PDB Configuration
SQL> SPOOL "E:\SPool_PATH"
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\AVAILS\02spool.txt
SQL>
SQL> DECLARE
  2   l_count NUMBER;
  3   l_app_deployment VARCHAR2(30);
  4 BEGIN
  5   SELECT count(*)
  6   INTO l_count
  7   FROM user_objects
  8   WHERE sharing = 'NONE' --to get the new set of DL approot objects if any
  9   AND object_name IN (SELECT DISTINCT a.object_name
10                      FROM cstm_approot_objects a
11                      WHERE sharing = 'DL'
12                      AND UPPER(object_type) = 'TABLE'
13                      AND EXISTS (SELECT 1
14                                 FROM user_objects b
15                                 WHERE b.object_name = a.object_name)
16                      AND EXISTS (SELECT 1
17                                 FROM cstm_approot_functions_menu c
18                                 WHERE c.function_id = a.function_id
19                                 AND c.modifiable IN ('Y', 'S')));
20   dbms_output.put_line('l_count: ' || l_count);
21   IF l_count > 0 THEN
22     dbms_output.put_line('New DL objects are available');
23     SELECT param_val
24     INTO l_app_deployment
25     FROM cstb_param
26     WHERE param_name = 'MULTI_TENANT_DEPLOYMENT_MODEL';
27     dbms_output.put_line('l_app_deployment: ' || l_app_deployment);
28
29     IF l_app_deployment IS NOT NULL AND l_app_deployment = 'SAUA' THEN
30       UPDATE smtb_menu menu
31       SET menu.approot_flg = 'Y'
32       WHERE menu.function_id IN
33       (SELECT function_id
34        FROM cstm_approot_functions_menu
35        WHERE modifiable = 'S'
36        UNION
37        SELECT summary_fn_id
38        FROM cstm_approot_functions_menu
39        WHERE modifiable = 'S'
40        AND summary_fn_id IS NOT NULL) --SMS function id 'S'

```

Figure 3-7 Application Root objects conversion for new objects

```

ction_id
AND c.modifiable IN ('Y', 'S'))
90
91
92 LOOP
93   DBMS_OUTPUT.PUT_LINE(chr(10));
94   EXECUTE IMMEDIATE l_sqlobject;
95   DBMS_OUTPUT.PUT_LINE(1.sqlobject);
96 END LOOP;
97 EXCEPTION
98   WHEN OTHERS THEN
99     DBMS_OUTPUT.PUT_LINE('Error --->'||SQLERRM);
100 END;
101 ELSE
102   dbms_output.put_line('No new DL objects available');
103 END IF;
104 EXCEPTION
105   WHEN OTHERS THEN
106     dbms_output.put_line('Error --->'||SQLERRM);
107 END;
108
109 /
Enter value for p_approot_user: HUBUSER
old 77: FOR I IN (SELECT 'BEGIN ' || chr(10) || 'DBMS_PDB.SET_DATA_LINKED('&P_APPROOT_USER'' ||
new 77: FOR I IN (SELECT 'BEGIN ' || chr(10) || 'DBMS_PDB.SET_DATA_LINKED('HUBUSER'' ||
l_count: 1
New DL objects are available
l_app_deployment: SASAU

BEGIN
DBMS_PDB.SET_DATA_LINKED('HUBUSER', 'CSTM_CHECK2', 1);
EXCEPTION
WHEN OTHERS then
DBMS_OUTPUT.PUT_LINE('ERROR ->' || SQLERRM);
END;

PL/SQL procedure successfully completed.

SQL>
SQL> SET ERRORLOGGING OFF
SQL> SPOOL OFF
SQL>

```

7. Application Root objects conversion for existing objects

- a. Login into the Aproot Schema as Common user.
- b. Run 07_Object_Conversion.sql for initiating the application upgrade.
- c. User input has to be inputted for the below:

Table 3-6 Input sample for the script

Input Type	User Input
Spool Path	<< Any local path >>
Application next version	HUBUSER (common user name)

Execution Screenshot:

Figure 3-8 Application Root objects conversion for existing objects

```

C:\app\client\primalac\product\18.0.0\client_1\bin\sqlplus.exe
SQL> SET SERVEROUTPUT ON
SQL> SET ERRORLOGGING ON
SQL> SET ECHO ON
SQL> prompt Welcome to Upgrade object conversion
Welcome to Upgrade object conversion
SQL> SPOOL &SPOOL_PATH
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\VAVALS\04Spool.txt
SQL>
SQL> DECLARE
2   l_app_name          VARCHAR2(128);
3
4   BEGIN
5       BEGIN
6           SELECT app_name
7             INTO l_app_name
8             FROM dba_applications
9             WHERE app_implicit <> 'Y'
10            AND app_name = (SELECT param_val FROM cstb_param WHERE Param_name = 'MULTI_TENANT_APP_NAME');
11       EXCEPTION
12         WHEN NO_DATA_FOUND THEN
13           dbms_output.put_line('Error! Nodata-->'||SQLERRM);
14         WHEN OTHERS THEN
15           dbms_output.put_line('Error! others-->'||SQLERRM);
16       END;
17       FOR I IN (SELECT 'BEGIN ' || chr(10) ||
18                  'DBMS_PDB.SET_METADATA_LINKED('&p_approot_user' || ',' || chr(10) ||
19                  'Object Name || ',' || Namespace || ');' || chr(10) ||
20                  'EXCEPTION ' || chr(10) || 'WHEN OTHERS then ' || chr(10) ||
21                  'DBMS_OUTPUT.PUT_LINE(''ERROR ->' || SQLERRM);' ||
22                  chr(10) || 'END;' sqlobject
23                FROM user_objects
24                WHERE sharIng = 'NONE'
25                AND object_type NOT IN ('INDEX', 'LOB', 'TABLE PARTITION', 'SEQUENCE')
26                AND (object_name NOT LIKE '%%' )
27                AND (created_appid = (select app_id from dba_applications where app_name = l_app_name) OR
28                    modified_appid = (select app_id from dba_applications where app_name = l_app_name)) ) LOOP
29         DBMS_OUTPUT.PUT_LINE(chr(10));
30         EXECUTE IMMEDIATE I.sqlobject;
31       END LOOP;
32     EXCEPTION
33     WHEN OTHERS THEN
34       DBMS_OUTPUT.PUT_LINE('Error --->'||SQLERRM);
35   END;
36 /

```

Figure 3-9 Application Root objects conversion for existing objects

```

C:\app\client\primalac\product\18.0.0\client_1\bin\sqlplus.exe
5   SELECT app_name
6     INTO l_app_name
7     FROM dba_applications
8     WHERE app_implicit <> 'Y'
9     AND app_name = (SELECT param_val FROM cstb_param WHERE Param_name = 'MULTI_TENANT_APP_NAME');
10  EXCEPTION
11    WHEN NO_DATA_FOUND THEN
12      dbms_output.put_line('Error! Nodata-->'||SQLERRM);
13    WHEN OTHERS THEN
14      dbms_output.put_line('Error! others-->'||SQLERRM);
15  END;
16
17  FOR I IN (SELECT 'BEGIN ' || chr(10) ||
18             'DBMS_PDB.SET_METADATA_LINKED('&p_approot_user' || ',' || chr(10) ||
19             'Object Name || ',' || Namespace || ');' || chr(10) ||
20             'EXCEPTION ' || chr(10) || 'WHEN OTHERS then ' || chr(10) ||
21             'DBMS_OUTPUT.PUT_LINE(''ERROR ->' || SQLERRM);' ||
22             chr(10) || 'END;' sqlobject
23          FROM user_objects
24          WHERE sharIng = 'NONE'
25          AND object_type NOT IN ('INDEX', 'LOB', 'TABLE PARTITION', 'SEQUENCE')
26          AND (object_name NOT LIKE '%%' )
27          AND (created_appid = (select app_id from dba_applications where app_name = l_app_name) OR
28              modified_appid = (select app_id from dba_applications where app_name = l_app_name)) ) LOOP
29    DBMS_OUTPUT.PUT_LINE(chr(10));
30    EXECUTE IMMEDIATE I.sqlobject;
31  END LOOP;
32  EXCEPTION
33  WHEN OTHERS THEN
34    DBMS_OUTPUT.PUT_LINE('Error --->'||SQLERRM);
35  END;
36 /
Enter value for p_approot_user: HUBUSER
old 18:          'DBMS_PDB.SET_METADATA_LINKED('&p_approot_user' || ',' || chr(10) ||
new 18:          'DBMS_PDB.SET_METADATA_LINKED(''HUBUSER' || ',' || chr(10) ||

PL/SQL procedure successfully completed.
SQL>
SQL> SET ERRORLOGGING OFF
SQL> SPOOL OFF
SQL>

```

8. **Recompilation of invalids**

- a. Login into the Aproot Schema as Common user.
- b. Run 08_Invalids_Recompilation.sql for recompiling the invalids during application upgrade.
- c. No user input is required for this step.
- d. Script will be executed as in the screen shot below and keep the SQL Plus session open for upcoming steps.

Execution Screenshot:

Figure 3-10 Recompilation of Invalids

```

C:\app\client\prdbalac\product\18.0.0\client_1\bin\sqlplus.exe
SQL> prompt Welcome to Application Upgrade Invalids Recompilation
Welcome to Application Upgrade Invalids Recompilation
SQL> spool &spool_path
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\AVAILS\055pool.txt
SQL>
SQL> DECLARE
2   inval_cnt NUMBER := 0;
3   BEGIN
4     WHILE inval_cnt < 3 LOOP
5       --SCRIPT
6       FOR J IN (select 'alter ' || object_type || ' ' || object_name || ' compile' invalidobject1
7                 FROM user_objects
8                 WHERE status = 'INVALID'
9                 AND object_type IN ('VIEW', 'SYNONYM', 'PROCEDURE', 'FUNCTION', 'PACKAGE', 'TRIGGER')
10                )
11       LOOP
12         DBMS_OUTPUT.PUT_LINE(chr(10));
13         EXECUTE IMMEDIATE J.invalidobject1;
14       END LOOP;
15       inval_cnt := inval_cnt + 1;
16     END LOOP;
17 END;
18 /

PL/SQL procedure successfully completed.
SQL>
SQL> DECLARE

```

Figure 3-11 Recompilation of Invalids

```

C:\app\client\prdbalac\product\18.0.0\client_1\bin\sqlplus.exe

PL/SQL procedure successfully completed.
SQL> select count(*) From user_objects where status = 'INVALID';

COUNT(*)
-----
0
1 row selected.

SQL>
SQL> SET ERRORLOGGING OFF
SQL> SPOOL OFF
SQL>
SQL>
SQL>
SQL>

```

9. End Application upgrade

- a. Login into the Apropot Schema as Common user.
- b. Run `06_End_Upgrade.sql` for recompiling the invalids during application upgrade.
- c. No user input is required for this step.
- d. Script will be executed as that of step 4.

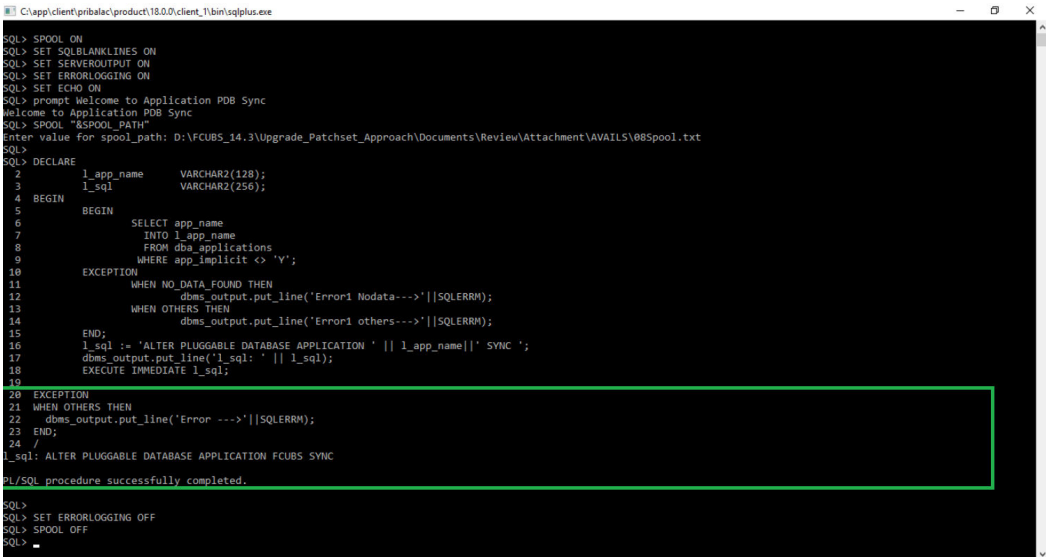
10. Synchronize application PDBs

- a. Login into the PDB Schema as Common user. For each PDB, this steps has to be done individually.
- b. Run `07_PDB_Sync.sql` for synching the application upgrade with PDBs.
- c. No user input is required for this step.

- d. Script will be executed as in the screen shot below.

Execution Screenshot:

Figure 3-12 synch



```
C:\app\client\primalac\product\18.0.0\client_1\bin\sqlplus.exe
SQL> SPOOL ON
SQL> SET SQLBLANKLINES ON
SQL> SET SERVEROUTPUT ON
SQL> SET ERRORLOGGING ON
SQL> SET ECHO ON
SQL> prompt Welcome to Application PDB Sync
Welcome to Application PDB Sync
SQL> SPOOL "&SPOOL_PATH"
Enter value for spool_path: D:\FCUBS_14.3\Upgrade_Patchset_Approach\Documents\Review\Attachment\AVAILS\08spool.txt
SQL>
SQL> DECLARE
  2   l_app_name  VARCHAR2(128);
  3   l_sql       VARCHAR2(256);
  4 BEGIN
  5   BEGIN
  6     SELECT app_name
  7     INTO l_app_name
  8     FROM dba_applications
  9     WHERE app_implicit <> 'Y';
 10  EXCEPTION
 11  WHEN NO_DATA_FOUND THEN
 12     dbms_output.put_line('Error1 Nodata-->'||SQLERRM);
 13  WHEN OTHERS THEN
 14     dbms_output.put_line('Error1 others-->'||SQLERRM);
 15  END;
 16  l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name||' SYNC ';
 17  dbms_output.put_line('l_sql: ' || l_sql);
 18  EXECUTE IMMEDIATE l_sql;
 19
 20 EXCEPTION
 21 WHEN OTHERS THEN
 22     dbms_output.put_line('Error -->'||SQLERRM);
 23 END;
 24 /
l_sql: ALTER PLUGGABLE DATABASE APPLICATION FCUBS SYNC
PL/SQL procedure successfully completed.
SQL>
SQL> SET ERRORLOGGING OFF
SQL> SPOOL OFF
SQL>
```

4

Annexure

01_Start_Upgrade.sql

```
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP ';'
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application Upgrade initiation
SPOOL "&SPOOL_PATH"

DECLARE
    l_app_name      VARCHAR2(128);
    l_app_currver   VARCHAR2(30);
    l_sql           VARCHAR2(256);
BEGIN
    BEGIN
        SELECT app_name
            INTO l_app_name
            FROM dba_applications
            WHERE app_implicit <> 'Y'
            AND app_name = (SELECT param_val FROM cstb_param WHERE Param_name =
'MULTI_TENANT_APP_NAME');
        EXCEPTION
            WHEN NO_DATA_FOUND THEN
                dbms_output.put_line('Error1 Nodata--->'||SQLERRM);
            WHEN OTHERS THEN
                dbms_output.put_line('Error1 others--->'||SQLERRM);
    END;

    BEGIN
        SELECT MAX(app_version)
            INTO l_app_currver
            FROM dba_app_versions
            WHERE app_name = l_app_name;
```



```

EXCEPTION
    WHEN NO_DATA_FOUND THEN
        dbms_output.put_line('Error2 Nodata--->'||SQLERRM);
    WHEN OTHERS THEN
        dbms_output.put_line('Error2 others--->'||SQLERRM);
END;

    l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name||'
BEGIN UPGRADE '''|| l_app_currver || ''' TO '''||
'&P_APPLICATION_NEXTVER' ||'''';
    dbms_output.put_line('l_sql: ' ||
l_sql);
    EXECUTE IMMEDIATE l_sql;

    l_sql := 'ALTER SYSTEM SET DEFAULT_SHARING = NONE';
    dbms_output.put_line('l_sql: ' || l_sql);
    EXECUTE IMMEDIATE l_sql;

EXCEPTION
    WHEN OTHERS THEN
        dbms_output.put_line('Error --->'||SQLERRM);
END;
/

SET ERRORLOGGING OFF
SPOOL OFF

```

03_Invalids_Recompilation_Inside_Upgrade.sql

```

/* Script for Shared Application + Shared Data */
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP '; '
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application Upgrade Invalids Recompilation
SPOOL "&SPOOL_PATH"

DECLARE
    inval_cnt          NUMBER := 0;
    l_object_name      VARCHAR2(240);
BEGIN

```

```

        WHILE inval_cnt < 3 LOOP
            --SCRIPT
            FOR J IN (Select 'alter ' || object_type || ' ' || object_name ||'
compile' invalidobject1,
                    object_name
                    FROM user_objects
                    WHERE status = 'INVALID'
                    AND created_appid IS NOT NULL
                    AND object_type IN
('VIEW','SYNONYM','PROCEDURE','FUNCTION','PACKAGE','TRIGGER','MATERIALIZED
VIEW'))
                LOOP
                    BEGIN
                        l_object_name := j.object_name;
                        dbms_output.put_line(chr(10));
                        EXECUTE IMMEDIATE J.invalidobject1;
                    EXCEPTION
                        WHEN OTHERS THEN
                            dbms_output.put_line('failed for -->' || l_object_name);
                    END;
                END LOOP;
            inval_cnt := inval_cnt + 1;
        END LOOP;
    EXCEPTION
        WHEN OTHERS THEN
            dbms_output.put_line('FAILED FOR -->' || l_object_name);
    END;
/
DECLARE
    inval_cnt1          NUMBER := 0;
    l_object_name       VARCHAR2(240);
BEGIN
    WHILE inval_cnt1 < 3 LOOP
        --SCRIPT
        FOR k IN (Select 'alter package '|| object_name||' compile body'
invalidobject2,
                object_name
                FROM user_objects
                WHERE status = 'INVALID'
                AND created_appid IS NOT NULL
                AND object_type IN ('PACKAGE BODY'))
            LOOP
                BEGIN
                    l_object_name := k.object_name;
                    dbms_output.put_line(chr(10));
                    EXECUTE IMMEDIATE k.invalidobject2;
                EXCEPTION
                    WHEN OTHERS THEN
                        dbms_output.put_line('FAILED FOR -->' || l_object_name);
                END;
            END LOOP;
        inval_cnt1 := inval_cnt1 + 1;
    END LOOP;
    EXCEPTION
    WHEN OTHERS THEN

```

```

        dbms_output.put_line('FAILED FOR -->' || l_object_name);
    END;
/
select count(*) From user_objects Where status = 'INVALID';

SET ERRORLOGGING OFF
SPOOL OFF

```

04_End_Upgrade.sql

```

/* Pre-requisites: Step 3 on Application associated pdb creation is
completed */
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP '; '
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application end Upgrade
SPOOL "&SPOOL_PATH"

DECLARE
    l_app_name    VARCHAR2(128);
    l_sql         VARCHAR2(256);
BEGIN
    BEGIN
        SELECT app_name
            INTO l_app_name
            FROM dba_applications
            WHERE app_implicit <> 'Y'
            AND app_name = (SELECT param_val FROM cstab_param WHERE
param_name = 'MULTI_TENANT_APP_NAME');
    EXCEPTION
        WHEN NO_DATA_FOUND THEN
            dbms_output.put_line('Error1 Nodata--->'||SQLERRM);
        WHEN OTHERS THEN
            dbms_output.put_line('Error1 others--->'||SQLERRM);
    END;
    l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name||'
END UPGRADE ' ;
    dbms_output.put_line('l_sql: ' || l_sql);

    EXECUTE IMMEDIATE l_sql;

```

```

EXCEPTION
WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('Error --->' || SQLERRM);
END;
/

SET ERRORLOGGING OFF
SPOOL OFF

```

04_Invalids_Recompilation_Outside_Upgrade.sql

```

/* Script for Shared Application + Shared Data */
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP '; '
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application Upgrade Invalids Recompilation
SPOOL "&SPOOL_PATH"

DECLARE
    inval_cnt          NUMBER := 0;
    l_object_name      VARCHAR2(240);
BEGIN
    WHILE inval_cnt < 3 LOOP
        --SCRIPT
        FOR J IN (Select 'alter ' || object_type || ' ' || object_name || '
compile' invalidobject1,
                    object_name
                    FROM user_objects
                    WHERE status = 'INVALID'
                    AND created_appid IS NULL
                    AND object_type IN
('VIEW', 'SYNONYM', 'PROCEDURE', 'FUNCTION', 'PACKAGE', 'TRIGGER', 'MATERIALIZED
VIEW'))
        LOOP
            BEGIN
                l_object_name := j.object_name;
                dbms_output.put_line(chr(10));
                EXECUTE IMMEDIATE J.invalidobject1;
            EXCEPTION

```

```

                WHEN OTHERS THEN
                    dbms_output.put_line('failed for -->' ||
l_object_name);
                END;
            END LOOP;
            inval_cnt := inval_cnt + 1;
        END LOOP;
    EXCEPTION
        WHEN OTHERS THEN
            dbms_output.put_line('FAILED FOR -->' || l_object_name);
    END;
/
DECLARE
    inval_cnt1          NUMBER := 0;
    l_object_name       VARCHAR2(240);
BEGIN
    WHILE inval_cnt1 < 3 LOOP
        --SCRIPT
        FOR k IN (Select 'alter package ' || object_name || ' compile
body' invalidobject2,
                object_name
                FROM user_objects
                WHERE status = 'INVALID'
                AND created_appid IS NULL
                AND object_type IN ('PACKAGE BODY'))
        LOOP
            BEGIN
                l_object_name := k.object_name;
                dbms_output.put_line(chr(10));
                EXECUTE IMMEDIATE k.invalidobject2;
            EXCEPTION
                WHEN OTHERS THEN
                    dbms_output.put_line('FAILED FOR -->' ||
l_object_name);
            END;
        END LOOP;
        inval_cnt1 := inval_cnt1 + 1;
    END LOOP;
    EXCEPTION
    WHEN OTHERS THEN
        dbms_output.put_line('FAILED FOR -->' || l_object_name);
    END;
/
select count(*) From user_objects Where status = 'INVALID';

SET ERRORLOGGING OFF
SPOOL OFF

```

05_Start_Upgrade.sql

```

SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1

```

```

SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP ';'
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application Upgrade initiation
SPOOL "&SPOOL_PATH"

DECLARE
    l_app_name    VARCHAR2(128);
    l_app_currver VARCHAR2(30);
    l_sql         VARCHAR2(256);
BEGIN

    BEGIN
        SELECT app_name
            INTO l_app_name
            FROM dba_applications
            WHERE app_implicit <> 'Y'
            AND app_name = (SELECT param_val FROM cstb_param WHERE Param_name =
'MULTI_TENANT_APP_NAME');
    EXCEPTION
        WHEN NO_DATA_FOUND THEN
            dbms_output.put_line('Error1 Nodata--->'||SQLERRM);
        WHEN OTHERS THEN
            dbms_output.put_line('Error1 others--->'||SQLERRM);
    END;

    BEGIN
        SELECT MAX(app_version)
            INTO l_app_currver
            FROM dba_app_versions
            WHERE app_name = l_app_name;
    EXCEPTION
        WHEN NO_DATA_FOUND THEN
            dbms_output.put_line('Error2 Nodata--->'||SQLERRM);
        WHEN OTHERS THEN
            dbms_output.put_line('Error2 others--->'||SQLERRM);
    END;

    l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name||' BEGIN
UPGRADE '''|| l_app_currver || ''' TO '''|| '&P_APPLICATION_NEXTVER' ||'''';
    dbms_output.put_line('l_sql: ' || l_sql);
    EXECUTE IMMEDIATE l_sql;

    l_sql := 'ALTER SYSTEM SET DEFAULT_SHARING = NONE';
    dbms_output.put_line('l_sql: ' || l_sql);

```

```

EXECUTE IMMEDIATE l_Sql;

EXCEPTION
  WHEN OTHERS THEN
    dbms_output.put_line('Error --->'||SQLERRM);
END;
/

SET ERRORLOGGING OFF
SPOOL OFF

```

06_New_Object_Conversion.sql

```

/*      Script      for      Shared      Object      Conversion      for      patch-
set      */
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP ';'
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Upgrade New object Conversion
SPOOL    "&SPOOL_PATH"

DECLARE
  l_count          NUMBER;
  l_app_deployment VARCHAR2(30);
BEGIN
  SELECT count(*)
  INTO l_count
  FROM user_objects
  WHERE sharing = 'NONE' --to get the new set of DL approot objects
if any
  AND object_name IN
  (SELECT DISTINCT a.object_name
   FROM cstm_approot_objects a
   WHERE sharing = 'DL'
   AND UPPER(object_type) = 'TABLE'
   AND EXISTS (SELECT 1
                FROM user_objects b
                WHERE b.object_name = a.object_name)
   AND EXISTS (SELECT 1
                FROM cstm_approot_functions_menu c

```

```

        WHERE c.function_id = a.function_id
              AND c.modifiable IN ('Y', 'S'));
dbms_output.put_line('l_count:      ' || l_count);

IF l_count > 0 THEN
  dbms_output.put_line('New DL objects are available');
  SELECT param_val
         INTO l_app_deployment
         FROM cstb_param
        WHERE param_name = 'MULTI_TENANT_DEPLOYMENT_MODEL';
  dbms_output.put_line('l_app_deployment: ' || l_app_deployment);

  IF l_app_deployment IS NOT NULL AND l_app_deployment = 'SAUA' THEN
    UPDATE smtb_menu menu
       SET menu.aproot_flg = 'Y'
      WHERE menu.function_id IN
        (SELECT function_id
         FROM cstm_aproot_functions_menu
        WHERE modifiable = 'S'
        UNION
         SELECT summary_fn_id
         FROM cstm_aproot_functions_menu
        WHERE modifiable = 'S'
         AND summary_fn_id IS NOT NULL) --SMS function id 'S'
        AND menu.aproot_flg <> 'Y'; --excluding the already modified
  aproot function ids in menu.
  ELSIF l_app_deployment IS NOT NULL AND l_app_deployment = 'SASDD'
  THEN
    UPDATE smtb_menu menu
       SET menu.aproot_flg = 'Y'
      WHERE menu.function_id IN
        (SELECT function_id
         FROM cstm_aproot_functions_menu
        UNION
         SELECT summary_fn_id
         FROM cstm_aproot_functions_menu
        WHERE summary_fn_id IS NOT NULL)
        AND menu.aproot_flg <> 'Y'; --excluding the already modified
  aproot function ids in menu.
  ELSIF l_app_deployment IS NOT NULL AND l_app_deployment = 'SASDC'
  THEN
    /*Assumption new table cstm_aproot_menu_custom_movedtopdb will be
    available
       and is populated with the function ids which are moved to PDB as
    part of custom deployment
       It has 2 columns FUNCTION_ID and SUMMARY_FN_ID*/

    UPDATE smtb_menu menu
       SET menu.aproot_flg = 'Y'
      WHERE menu.function_id IN
        (SELECT function_id
         FROM cstm_aproot_functions_menu
        UNION
         SELECT summary_fn_id
         FROM cstm_aproot_functions_menu

```



```

        WHERE summary_fn_id IS NOT NULL)
        AND menu.function_id NOT IN --excluding the function
ids moved to PDB already.
        (SELECT function_id
         FROM cstm_aproot_menu_movedtopdb
        UNION
        SELECT summary_fn_id
         FROM cstm_aproot_menu_movedtopdb
         WHERE summary_fn_id IS NOT NULL)
        AND menu.aproot_flg <> 'Y'; --excluding the already
modified aproot function ids in menu.
    END IF;

    BEGIN
        FOR I IN (SELECT 'BEGIN ' || chr(10) ||
'DBMS_PDB.SET_DATA_LINKED('&P_APPROOT_USER'' || ',''' ||
        Object_Name || ',''' || Namespace || '); '
|| chr(10) ||
        'EXCEPTION ' || chr(10) ||
        'WHEN OTHERS THEN ' || chr(10) ||
        'DBMS_OUTPUT.PUT_LINE(''ERROR ->''||
SQLERRM); ' ||
        chr(10) || 'END;' sqlobject
        FROM user_objects
        WHERE sharing = 'NONE' --to get the new set of DL
aproot objects if any
        AND object_name IN
        (SELECT DISTINCT a.object_name
         FROM cstm_aproot_objects a
         WHERE sharing = 'DL'
         AND UPPER(object_type) = 'TABLE'
         AND EXISTS (SELECT 1
                     FROM user_objects b
                     WHERE b.object_name =
a.object_name)
        AND EXISTS
        (SELECT 1
         FROM cstm_aproot_functions_menu
c
         WHERE c.function_id =
a.function_id
         AND c.modifiable IN ('Y',
'S')))) LOOP
        DBMS_OUTPUT.PUT_LINE(chr(10));
        EXECUTE IMMEDIATE I.sqlobject;
        DBMS_OUTPUT.PUT_LINE(I.sqlobject);
    END LOOP;
    EXCEPTION
    WHEN OTHERS THEN
        DBMS_OUTPUT.PUT_LINE('Error --->' || SQLERRM);
    END;
    ELSE
        dbms_output.put_line('No new DL objects available');
    END IF;

```

```

EXCEPTION
  WHEN OTHERS THEN
    dbms_output.put_line('Error --->'||SQLERRM);
END;
/

SET ERRORLOGGING OFF
SPOOL OFF

```

07_Object_Conversion.sql

```

SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP '; '
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Upgrade object conversion
SPOOL "&SPOOL_PATH"
BEGIN
  FOR I IN (SELECT 'BEGIN ' || chr(10) ||
    'DBMS_PDB.SET_METADATA_LINKED('&P_APPROOT_USER'' ' ||
    ', '' ' ||
    Object_Name || ', ' || Namespace || '); ' || chr(10)
    ||
    'EXCEPTION ' || chr(10) || 'WHEN OTHERS then ' ||
chr(10) ||
    'DBMS_OUTPUT.PUT_LINE(''ERROR ->'|| SQLERRM); ' ||
chr(10) || 'END;' sqlobject
  FROM user_objects
  WHERE sharing = 'NONE'
    AND object_type NOT IN ('INDEX', 'LOB', 'TABLE
PARTITION', 'SEQUENCE', 'JOB', 'MATERIALIZED VIEW', 'MATERIALIZED VIEW LOG')
    AND application = 'Y'
    AND (object_name,object_type) NOT IN (SELECT
object_name,object_type
FROM
cstm_approot_objects
WHERE function_id
= 'DYNAMIC'
AND sharing
= 'NONE'
)

```

```

        ) LOOP
        dbms_output.put_line(chr(10));
        EXECUTE IMMEDIATE I.sqlobject;
        dbms_output.put_line(I.sqlobject);
    END LOOP;
EXCEPTION
WHEN OTHERS THEN
    dbms_output.put_line('Error --->'||SQLERRM);
END;
/
SET ERRORLOGGING OFF
SPOOL OFF

```

08_Invalids_Recompilation_Inside_Upgrade.sql

```

/* Script for Shared Application + Shared Data */
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP '; '
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application Upgrade Invalids Recompilation
SPOOL "&SPOOL_PATH"

DECLARE
    inval_cnt          NUMBER := 0;
    l_object_name      VARCHAR2(240);
BEGIN
    WHILE inval_cnt < 3 LOOP
        --SCRIPT
        FOR J IN (Select 'alter ' || object_type || ' ' || object_name
|| ' compile' invalidobject1,
                object_name
                FROM user_objects
                WHERE status = 'INVALID'
                AND created_appid IS NOT NULL
                AND object_type IN
('VIEW','SYNONYM','PROCEDURE','FUNCTION','PACKAGE','TRIGGER','MATERIALI
ZED VIEW'))
        LOOP
            BEGIN
                l_object_name := j.object_name;

```

```

        dbms_output.put_line(chr(10));
        EXECUTE IMMEDIATE J.invalidobject1;
    EXCEPTION
        WHEN OTHERS THEN
            dbms_output.put_line('failed for -->' || l_object_name);
    END;
END LOOP;
inval_cnt := inval_cnt + 1;
END LOOP;
EXCEPTION
    WHEN OTHERS THEN
        dbms_output.put_line('FAILED FOR -->' || l_object_name);
END;
/
DECLARE
    inval_cnt1          NUMBER := 0;
    l_object_name       VARCHAR2(240);
BEGIN
    WHILE inval_cnt1 < 3 LOOP
        --SCRIPT
        FOR k IN (Select 'alter package ' || object_name || ' compile body'
invalidobject2,
                object_name
                FROM user_objects
                WHERE status = 'INVALID'
                AND created_appid IS NOT NULL
                AND object_type IN ('PACKAGE BODY'))
        LOOP
            BEGIN
                l_object_name := k.object_name;
                dbms_output.put_line(chr(10));
                EXECUTE IMMEDIATE k.invalidobject2;
            EXCEPTION
                WHEN OTHERS THEN
                    dbms_output.put_line('FAILED FOR -->' || l_object_name);
            END;
        END LOOP;
        inval_cnt1 := inval_cnt1 + 1;
    END LOOP;
EXCEPTION
    WHEN OTHERS THEN
        dbms_output.put_line('FAILED FOR -->' || l_object_name);
END;
/
select count(*) From user_objects Where status = 'INVALID';

SET ERRORLOGGING OFF
SPOOL OFF

```

09_End_Upgrade.sql

```

/* Pre-requisites: Step 3 on Application associated pdb creation is
completed */
SET VERIFY ON

```

```

SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP ','
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application end Upgrade
SPOOL "&SPOOL_PATH"

DECLARE
    l_app_name VARCHAR2(128);
    l_sql VARCHAR2(256);
BEGIN
    BEGIN
        SELECT app_name
            INTO l_app_name
            FROM dba_applications
            WHERE app_implicit <> 'Y'
            AND app_name = (SELECT param_val FROM cstb_param WHERE
param_name = 'MULTI_TENANT_APP_NAME');
    EXCEPTION
        WHEN NO_DATA_FOUND THEN
            dbms_output.put_line('Error1 Nodata--->'||SQLERRM);
        WHEN OTHERS THEN
            dbms_output.put_line('Error1 others--->'||SQLERRM);
    END;
    l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name||'
END UPGRADE ';
    dbms_output.put_line('l_sql: ' || l_sql);

    EXECUTE IMMEDIATE l_sql;

EXCEPTION
WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('Error --->'||SQLERRM);
END;
/

SET ERRORLOGGING OFF
SPOOL OFF

```

09_Invalids_Recompilation_Outside_Upgrade.sql

```

/* Script for Shared Application + Shared Data */
SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP ';'
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application Upgrade Invalids Recompilation
SPOOL "&SPOOL_PATH"

DECLARE
    inval_cnt          NUMBER := 0;
    l_object_name      VARCHAR2(240);
BEGIN
    WHILE inval_cnt < 3 LOOP
        --SCRIPT
        FOR J IN (Select 'alter ' || object_type || ' ' || object_name || '
compile' invalidobject1,
                object_name
                FROM user_objects
                WHERE status = 'INVALID'
                AND created_appid IS NULL
                AND object_type IN
('VIEW','SYNONYM','PROCEDURE','FUNCTION','PACKAGE','TRIGGER','MATERIALIZED
VIEW'))
        LOOP
            BEGIN
                l_object_name := j.object_name;
                dbms_output.put_line(chr(10));
                EXECUTE IMMEDIATE J.invalidobject1;
            EXCEPTION
                WHEN OTHERS THEN
                    dbms_output.put_line('failed for -->' || l_object_name);
            END;
        END LOOP;
        inval_cnt := inval_cnt + 1;
    END LOOP;
EXCEPTION
    WHEN OTHERS THEN
        dbms_output.put_line('FAILED FOR -->' || l_object_name);
END;

```

```

/
DECLARE
    inval_cnt1          NUMBER := 0;
    l_object_name       VARCHAR2(240);
BEGIN
    WHILE inval_cnt1 < 3 LOOP
        --SCRIPT
        FOR k IN (Select 'alter package '|| object_name||' compile
body' invalidobject2,
                object_name
                FROM user_objects
                WHERE status = 'INVALID'
                AND created_appid IS NULL
                AND object_type IN ('PACKAGE BODY'))
        LOOP
            BEGIN
                l_object_name := k.object_name;
                dbms_output.put_line(chr(10));
                EXECUTE IMMEDIATE k.invalidobject2;
            EXCEPTION
                WHEN OTHERS THEN
                    dbms_output.put_line('FAILED FOR -->' ||
l_object_name);
            END;
        END LOOP;
        inval_cnt1 := inval_cnt1 + 1;
    END LOOP;
EXCEPTION
WHEN OTHERS THEN
    dbms_output.put_line('FAILED FOR -->' || l_object_name);
END;
/
select count(*) From user_objects Where status = 'INVALID';

SET ERRORLOGGING OFF
SPOOL OFF

```

10_PDB_Sync.sql

```

SET VERIFY ON
SET HEAD ON
SET FEEDBACK 1
SET ARRAY 1
SET LINESIZE 10000
SET PAGESIZE 50000
SET LONG 10000
SET ECHO ON
SET TRIMSPOOL ON
SET COLSEP ';'
SET SERVEROUT OFF
clear screen
SPOOL ON
SET SQLBLANKLINES ON
SET SERVEROUTPUT ON

```

```
SET ERRORLOGGING ON
SET ECHO ON
prompt Welcome to Application PDB Sync
SPOOL "&SPOOL_PATH"

DECLARE
    l_app_name VARCHAR2(128);
    l_sql VARCHAR2(256);
BEGIN
    BEGIN
        SELECT app_name
            INTO l_app_name
            FROM dba_applications
            WHERE app_implicit <> 'Y';
    EXCEPTION
        WHEN NO_DATA_FOUND THEN
            dbms_output.put_line('Error1 Nodata--->'||SQLERRM);
        WHEN OTHERS THEN
            dbms_output.put_line('Error1 others--->'||SQLERRM);
    END;
    l_sql := 'ALTER PLUGGABLE DATABASE APPLICATION ' || l_app_name||' SYNC ';
    dbms_output.put_line('l_sql: ' || l_sql);
    EXECUTE IMMEDIATE l_sql;

EXCEPTION
WHEN OTHERS THEN
    dbms_output.put_line('Error --->'||SQLERRM);
END;
/

SET ERRORLOGGING OFF
SPOOL OFF
```


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