**Practices for Lesson 4:**

**Managing Tablespaces and**

**Users in a CDB and PDBs**

**Practices for Lesson 4**

**Practices Overview**

In this practice, you will manage the tablespaces, users, privileges, and roles.

**Assumptions**

Practice 2-1 successfully created cdb2.

Practice 2-3 successfully created pdb2\_1.

Practice 3-4 successfully renamed pdb2\_1 to pdb2.

$

**Practice 4-1: Managing Tablespaces**

**Overview**

In this practice, you will manage the tablespaces in the CDB and PDBs.

**Tasks**

1. View permanent and temporary tablespace properties in cdb2.

$ **. oraenv**

ORACLE\_SID = [cdb2] ? **cdb2**

The Oracle base remains unchanged with value /oracle/app

$ **sqlplus / as sysdba**

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.0.2 -

64bit Production

With the Partitioning, OLAP, Data Mining and Real Application

Testing options

SQL> **col PROPERTY\_NAME format a30**

SQL> **col PROPERTY\_VALUE format a25**

SQL> **SELECT property\_name, property\_value**

2 **FROM database\_properties**

3 **WHERE property\_name LIKE 'DEFAULT\_%TABLE%';**

PROPERTY\_NAME PROPERTY\_VALUE

------------------------------ -------------------------------

DEFAULT\_TEMP\_TABLESPACE TEMP

DEFAULT\_PERMANENT\_TABLESPACE USERS

SQL> **SELECT tablespace\_name, CON\_ID from CDB\_TABLESPACES;**

TABLESPACE\_NAME CON\_ID

------------------------------ ----------

SYSTEM 1

SYSAUX 1

UNDOTBS1 1

TEMP 1

USERS 1

SYSTEM 2

SYSAUX 2

TEMP 2

SYSTEM 3

SYSAUX 3

TEMP 3

SYSTEM 4

SYSAUX 4

TEMP 4

SYSTEM 5

SYSAUX 5

TEMP 5

USERS 5

EXAMPLE 5

SYSTEM 6

SYSAUX 6

TEMP 6

USERS 6

EXAMPLE 6

24 rows selected.

SQL> **SELECT tablespace\_name, CON\_ID from CDB\_TABLESPACES**

2 **WHERE TABLESPACE\_NAME LIKE 'TEMP%';**

TABLESPACE\_NAME CON\_ID

------------------------------ ----------

TEMP 1

TEMP 2

TEMP 3

TEMP 4

TEMP 5

TEMP 6

6 rows selected.

SQL>

The number of tablespaces may differ from your result and the one shown in the first

statement. It depends if PDBs are created with or without the EXAMPLE and the USERS

tablespaces.

Manage permanent tablespaces.

a. Create a permanent tablespace CDATA in the root container.

SQL> **CREATE TABLESPACE CDATA**

2 **DATAFILE '/oracle/app/oradata/cdb2/cdata\_01.dbf'**

Tablespace created.

SQL> **SELECT tablespace\_name, CON\_ID from CDB\_TABLESPACES**

2 **WHERE TABLESPACE\_NAME = 'CDATA';**

TABLESPACE\_NAME CON\_ID

------------------------------ ----------

CDATA 1

SQL>

b. Make the CDATA tablespace the default tablespace in the root container.

SQL> **ALTER DATABASE DEFAULT TABLESPACE CDATA ;**

Database altered.

SQL> **SELECT property\_name, property\_value**

2 **FROM database\_properties**

3 **WHERE property\_name LIKE 'DEFAULT\_%TABLE%';**

PROPERTY\_NAME PROPERTY\_VALUE

------------------------------ -------------------------------

DEFAULT\_TEMP\_TABLESPACE TEMP

DEFAULT\_PERMANENT\_TABLESPACE **CDATA**

SQL>

c. Create permanent tablespace, LDATA in PDB2.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **CREATE TABLESPACE ldata DATAFILE**

2 '**/oracle/app/oradata/cdb2/pdb2\_1/ldata\_01.dbf**'

**3 SIZE 10M ;**

Tablespace created.

SQL>

d. Make the LDATA tablespace the default tablepace in the PDB2 container.

SQL> **ALTER PLUGGABLE DATABASE DEFAULT TABLESPACE LDATA ;**

Pluggable database altered.

SQL> **SELECT property\_name, property\_value**

2 **FROM database\_properties**

**3 WHERE property\_name LIKE** '**DEFAULT\_%TABLE%**'**;**

PROPERTY\_NAME PROPERTY\_VALUE

------------------------------ -------------------------------

DEFAULT\_TEMP\_TABLESPACE TEMP

DEFAULT\_PERMANENT\_TABLESPACE **LDATA**

SQL>

3. Manage temporary tablespaces (**optional**).

a. Create a temporary tablespace TEMP\_ROOT in the root container.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **CREATE TEMPORARY TABLESPACE TEMP\_ROOT**

2 **TEMPFILE** '**/oracle/app/oradata/cdb2/temproot\_01.dbf**'

**3 SIZE 100M ;**

Tablespace created.

SQL>

b. Make TEMP\_ROOT the default temporary tablespace in the root container.

SQL> **ALTER DATABASE DEFAULT TEMPORARY TABLESPACE TEMP\_ROOT ;**

Database altered.

SQL> **SELECT property\_name, property\_value**

2 **FROM database\_properties**

**3 WHERE property\_name LIKE** '**DEFAULT\_%TABLE%**'**;**

PROPERTY\_NAME PROPERTY\_VALUE

------------------------------ -------------------------------

DEFAULT\_TEMP\_TABLESPACE **TEMP\_ROOT**

DEFAULT\_PERMANENT\_TABLESPACE CDATA

SQL>

c. Create a temporary tablepace TEMP\_PDB2 in PDB2.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **CREATE TEMPORARY TABLESPACE TEMP\_PDB2 TEMPFILE**

2 '**/oracle/app/oradata/cdb2/pdb2\_1/temppdb2\_01.dbf**'

3 **SIZE 100M ;**

Tablespace created.

SQL>

d. Make TEMP\_PDB2 the default temporary tablespace in PDB2.

SQL> **ALTER DATABASE DEFAULT TEMPORARY TABLESPACE TEMP\_PDB2 ;**

Database altered.

SQL> **SELECT property\_name, property\_value**

2 **FROM database\_properties**

3 **WHERE property\_name LIKE** '**DEFAULT\_%TABLE%**'**;**

PROPERTY\_NAME PROPERTY\_VALUE

------------------------------ -------------------------------

DEFAULT\_TEMP\_TABLESPACE **TEMP\_PDB2**

DEFAULT\_PERMANENT\_TABLESPACE LDATA

SQL>

Note that you could also use the ALTER PLUGGABLE DATABASE command.

e. Create a temporary tablespace MY\_TEMP in PDB2.

SQL> **CREATE TEMPORARY TABLESPACE MY\_TEMP TEMPFILE**

2 '**/oracle/app/oradata/cdb2/pdb2\_1/my\_temp\_pdb2\_01.dbf**'

3 **SIZE 10M;**

Tablespace created.

SQL>

f. Display default tablespaces of another PDB in cdb2.

SQL> **connect system/oracle\_4U@PDB\_ORCL2**

Connected.

SQL> **SELECT property\_name, property\_value**

2 **FROM database\_properties**

3 **WHERE property\_name LIKE** '**DEFAULT\_%TABLE%**'**;**

PROPERTY\_NAME PROPERTY\_VALUE

------------------------------ -------------------------------

DEFAULT\_TEMP\_TABLESPACE **TEMP**

DEFAULT\_PERMANENT\_TABLESPACE **USERS**

SQL>

4. Manage default permanent and temporary tablespaces of users.

a. Create a common user C##U.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **CREATE USER c##u IDENTIFIED BY x;**

User created.

SQL>

b. View the default tablespace and temporary tablespace assignment for user CU in all

containers.

SQL> **COLUMN username format A12**

SQL> **COLUMN default\_tablespace format A18**

SQL> **COLUMN temporary\_tablespace format A20**

SQL> **COLUMN con\_id format 999**

SQL> **SELECT username, default\_tablespace,**

2 **temporary\_tablespace, con\_id**

3 **FROM CDB\_USERS**

4 **WHERE username =** '**C##U**'**;**

USERNAME DEFAULT\_TABLESPACE TEMPORARY\_TABLESPACE CON\_ID

------------ ------------------ ---------------------- ------

C##U CDATA TEMP\_ROOT 1

C##U LDATA TEMP\_PDB2 3

C##U SYSTEM TEMP 4

C##U USERS TEMP 5

C##U USERS TEMP 6

SQL>

c. Create a local user LU in PDB2.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **CREATE USER lu IDENTIFIED BY x;**

User created.

SQL>

d. View the default tablespace and temporary tablespace assignment for user LU.

SQL> **SELECT username, default\_tablespace, temporary\_tablespace**

2 **FROM DBA\_USERS**

3 **WHERE username =** '**LU**'**;**

USERNAME DEFAULT\_TABLESPACE TEMPORARY\_TABLESPACE

------------ ------------------ --------------------

LU LDATA TEMP\_PDB2

SQL>

e. Change the temporary tablespace assignment for user LU to MY\_TEMP in PDB2.

SQL> **ALTER USER LU TEMPORARY TABLESPACE MY\_TEMP;**

User altered.

SQL>

f. View the default temporary tablespace assignment for user LU.

SQL> **SELECT username, default\_tablespace, temporary\_tablespace**

2 **FROM DBA\_USERS**

3 **WHERE username =** '**LU**'**;**

USERNAME DEFAULT\_TABLESPACE TEMPORARY\_TABLESPACE

------------ ------------------ --------------------

LU LDATA MY\_TEMP

SQL>

5. Manage UNDO tablespaces (**optional**).

a. Display the UNDO tablespace used in the CDB.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **col NAME format A12**

SQL> **select FILE#, ts.name, ts.ts#, ts.con\_id**

**2 from v$datafile d, v$tablespace ts**

**3 where d.ts#=ts.ts#**

**4 and d.con\_id=ts.con\_id**

**5 and ts.name like** '**UNDO%**'**;**

FILE# NAME TS# CON\_ID

---------- ------------ ---------- ----------

4 **UNDOTBS1** 2 **1**

SQL>

b. Create an UNDO tablespace in a PDB and set it as the UNDO\_TABLESPACE of the

CDB.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **CREATE UNDO TABLESPACE UNDO\_PDB2 DATAFILE**

2 '**/oracle/app/oradata/cdb2/pdb2/undo\_pdb2\_01.dbf**'

3 **SIZE 10M;**

Tablespace created.

**SQL> alter system set undo\_tablespace='UNDO\_PDB2' scope=both;**

alter system set undo\_tablespace='UNDO\_PDB2' scope=both

\*

ERROR at line 1:

ORA-65040: operation not allowed from within a pluggable

database

SQL>

Notice that the statement fails because the UNDO tablespace can only be set at CDB level.

**Practice 4-2: Managing Common and Local Users**

**Overview**

In this practice, you will manage common and local users in the CDB and PDBs.

**Tasks**

1. View all common and local users in cdb2.

SQL> **connect / as sysdba**

Connected.

SQL> **col username format a20**

SQL> **select USERNAME,COMMON,CON\_ID from cdb\_users;**

USERNAME COM CON\_ID

-------------------- --- ------

SYS YES 1

SYSTEM YES 1

C##U YES 1

…

C##U YES 3

JONES NO 3

ADAMS NO 3

SCOTT NO

…

C##U YES 4

…

DVSYS YES 4

AUDSYS YES 4

SI\_INFORMTN\_SCHEMA YES 4

OLAPSYS YES 4

239 rows selected.

SQL> **select USERNAME,COMMON,CON\_ID from cdb\_users**

2 **where username='SYSTEM';**

USERNAME COM CON\_ID

-------------------- --- ------

SYSTEM YES 1

SYSTEM YES 2

SYSTEM YES 3

SYSTEM YES 4

SYSTEM YES 5

SYSTEM YES 6

6 rows selected.

SQL> **select distinct username from cdb\_users**

2 **where common='YES';**

USERNAME

--------------------

DVF

SYSKM

DIP

XS$NULL

OUTLN

SYSBACKUP

SYSTEM

ORACLE\_OCM

DVSYS

AUDSYS

DBSNMP

…

C##U

XDB

APPQOSSYS

SYSDG

ANONYMOUS

SYS

SI\_INFORMTN\_SCHEMA

ANONYMOUS

LBACSYS

WMSYS

37 rows selected.

SQL> **select username,con\_id from cdb\_users**

2 **where common='NO';**

USERNAME CON\_ID

-------------------- ------

PDB2-1-ADMIN 3

LU 3

PDB2\_1\_ADMIN 4

SCOTT 5

BI 5

PM 5

IX 5

SH 5

OE 5

HR 5

PDBADMIN 6

HR 6

OE 6

SH 6

IX 6

PM 6

BI 6

SCOTT 6

18 rows selected.

SQL>

2. Create a common user C##\_USER.

SQL> **create user C##\_USER identified by x CONTAINER=ALL;**

User created.

SQL>

3. View the new common user C##\_USER.

SQL> **select distinct username from cdb\_users**

2 **where username='C##\_USER';**

USERNAME

--------------------

C##\_USER

SQL>

Notice that the common user exists in each container.

4. Grant CREATE SESSION as a common privilege

SQL> **GRANT CREATE SESSION TO c##\_user CONTAINER=ALL;**

Grant succeeded.

SQL>

5. Connect to root, PDB2, and PDB2\_2 as c##\_user user.

SQL> **connect c##\_user/x@pdb2**

Connected.

SQL> **connect c##\_user/x@pdb2\_2**

Connected.

SQL> **connect c##\_user/x@cdb2**

Connected.

SQL>

6. Create a local user LOCAL\_USER in the root container.

SQL> **connect / as sysdba**

Connected.

SQL> **create user local\_user identified by x**

2 **CONTAINER=CURRENT;**

create user local\_user identified by x

\*

ERROR at line 1:

ORA-65049: creation of local user or role is not allowed in

CDB$ROOT

SQL>

Notice that no local user is authorized in the root.

7. Create a local user LOCAL\_USER\_PDB2 in PDB2.

a. View all users of PDB2.

SQL> **connect sys/oracle\_4U@PDB2 as sysdba**

Connected.

SQL> **col username format a25**

SQL> **select USERNAME,COMMON,CON\_ID from cdb\_users;**

USERNAME COM CON\_ID

-------------------- --- ----------

SYS YES 3

SYSTEM YES 3

OLAPSYS YES 3

SI\_INFORMTN\_SCHEMA YES 3

DVSYS YES 3

AUDSYS YES 3

GSMUSER YES 3

ORDPLUGINS YES 3

C##\_USER YES 3

SPATIAL\_WFS\_ADMIN\_US YES 3

SPATIAL\_CSW\_ADMIN\_US YES 3

……..

ORDDATA YES 3

SYSBACKUP YES 3

MDDATA YES 3

……….

PDB2\_1\_ADMIN NO 3

WMSYS YES 3

…………

LU NO 3

DVF YES 3

FLOWS\_FILES YES 3

39 rows selected.

SQL>

Notice that you view all common and local users of the current PDB.

SQL> **select USERNAME,COMMON from dba\_users;**

Notice that you view the same list.

b. Attempt to create a common user C##\_USER\_PDB2 in PDB2.

SQL> **create user c##\_user\_pdb2 identified by x**

2 **CONTAINER=ALL;**

create user c##\_user\_pdb2 identified by x CONTAINER=ALL

\*

ERROR at line 1:

ORA-65050: Common DDLs only allowed in CDB$ROOT

SQL>

Notice that no common user can be created except from the root.

c. Create the local user LOCAL\_USER\_PDB2 in PDB2.

SQL> **create user local\_user\_pdb2 identified by x**

2 **CONTAINER=CURRENT;**

User created.

SQL> **select USERNAME,COMMON,CON\_ID from cdb\_users**

2> **order by username;**

USERNAME COM CON\_ID

-------------------- --- ----------

ANONYMOUS YES 3

APEX\_040200 YES 3

APEX\_PUBLIC\_USER YES 3

APPQOSSYS YES 3

AUDSYS YES 3

C##U YES 3

C##\_USER YES 3

CTXSYS YES 3

LU NO 3

MDDATA YES 3

MDSYS YES 3

OJVMSYS YES 3

OLAPSYS YES 3

PDB2\_1\_ADMIN NO 3

SI\_INFORMTN\_SCHEMA YES 3

WMSYS YES 3

XDB YES 3

XS$NULL YES 3

40 rows selected.

SQL> **grant create session to local\_user\_pdb2;**

Grant succeeded.

SQL>

d. Connect to PDB2 as LOCAL\_USER\_PDB2.

SQL> **connect local\_user\_pdb2/x@PDB2**

Connected.

SQL>

e. Connect to PDB2\_2 as LOCAL\_USER\_PDB2.

SQL> **connect local\_user\_pdb2/x@PDB2\_2**

ERROR:

ORA-01017: invalid username/password; logon denied

Warning: You are no longer connected to ORACLE.

SQL>

Notice that it fails because LOCAL\_USER\_PDB2 does not exist in PDB2\_2.

SQL> **connect local\_user\_pdb2/x@cdb2**

ERROR:

ORA-01017: invalid username/password; logon denied

SQL>

Notice that it fails because LOCAL\_USER\_PDB2 does not exist in root.

f. Overview of common and local users from a PDB.

SQL> **connect sys/password@PDB2\_2 as sysdba**

Connected.

SQL> **col username format a20**

SQL> **select USERNAME, COMMON, CON\_ID from cdb\_users**

2> **order by username;**

USERNAME COM CON\_ID

-------------------- --- ------

ANONYMOUS YES 4

APPQOSSYS YES 4

APPS NO 4

…

C##\_USER YES 4

…

SYSTEM YES 4

…

XS$NULL YES 4

39 rows selected.

SQL>

Notice that you view all common and local users of the current PDB.

SQL> **select USERNAME, COMMON from dba\_users order by username;**

USERNAME COM

-------------------- ---

ANONYMOUS YES

APPQOSSYS YES

APPS NO

…

C##\_USER YES

…

SYSTEM YES

…

XS$NULL YES

39 rows selected.

SQL>

Notice that you view the same list.

**Practice 4-3: Managing Local and Common Roles**

**Overview**

In this practice, you will manage roles created as common or local, and granted as common

and/or local in CDB and PDBs.

**Assumptions**

C##\_USER and LOCAL\_USER\_PDB2 are successfully created from the previous Practice 5-2 in

cdb2 PDB2.

**Tasks**

1. Manage creation of roles in CDB and PDBs.

a. List all predefined roles in CDB.

SQL> **connect / as sysdba**

Connected.

SQL> **col role format a30**

SQL> **select ROLE, COMMON, CON\_ID from cdb\_roles order by role;**

ROLE COM CON\_ID

------------------------------ --- ------

ADM\_PARALLEL\_EXECUTE\_TASK YES 2

ADM\_PARALLEL\_EXECUTE\_TASK YES 1

ADM\_PARALLEL\_EXECUTE\_TASK YES 3

ADM\_PARALLEL\_EXECUTE\_TASK YES 4

ADM\_PARALLEL\_EXECUTE\_TASK YES 5

ADM\_PARALLEL\_EXECUTE\_TASK YES 6

…

DBA YES 3

DBA YES 1

DBA YES 4

DBA YES 2

DBA YES 5

DBA YES 6

…

PDB\_DBA YES 3

PDB\_DBA YES 4

PDB\_DBA YES 6

…

495 rows selected.

SQL>

You can view all common and local roles of the root and PDBs.

b. List all predefined roles in root.

SQL> **select ROLE, COMMON from dba\_roles order by role;**

ROLE COM

------------------------------ ---

ADM\_PARALLEL\_EXECUTE\_TASK YES

APEX\_ADMINISTRATOR\_ROLE YES

AQ\_ADMINISTRATOR\_ROLE YES

AQ\_USER\_ROLE YES

…

XS\_CACHE\_ADMIN YES

XS\_NSATTR\_ADMIN YES

XS\_RESOURCE YES

XS\_SESSION\_ADMIN YES

82 rows selected.

SQL>

Notice that all roles of the root are common: there cannot be any local roles in the root.

c. Create a common C##\_ROLE in root.

SQL> **create role c##\_role container=ALL;**

Role created.

SQL>

d. Create a local LOCAL\_ROLE in root.

SQL> **create role local\_role container=CURRENT;**

create role local\_role container=CURRENT

\*

ERROR at line 1:

ORA-65049: creation of local user or role is not allowed in

CDB$ROOT

SQL>

You get an error message because no local role is authorized in the root.

e. List all predefined roles in PDB PDB2.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **col role format a30**

SQL> **select ROLE, COMMON, CON\_ID from cdb\_roles;**

ROLE COM CON\_ID

------------------------------ --- ------

CONNECT YES 3

RESOURCE YES 3

DBA YES 3

AUDIT\_ADMIN YES 3

…

C##\_ROLE YES 3

DV\_REALM\_RESOURCE YES 3

DV\_REALM\_OWNER YES 3

PDB\_DBA YES 3

84 rows selected.

SQL>

You can view all common and local roles of the PDB only.

SQL> **select ROLE,COMMON from dba\_roles order by role;**

ROLE COM

------------------------------ ---

CONNECT YES

RESOURCE YES

DBA YES

AUDIT\_ADMIN YES

…

PDB\_DBA YES

…

XDB\_WEBSERVICES YES

XDB\_WEBSERVICES\_OVER\_HTTP YES

XDB\_WEBSERVICES\_WITH\_PUBLIC YES

XS\_CACHE\_ADMIN YES

XS\_NSATTR\_ADMIN YES

XS\_RESOURCE YES

XS\_SESSION\_ADMIN YES

84 rows selected.

SQL>

You view the same list.

f. Create a common role in PDB2.

SQL> **create role c##\_role\_PDB2 container=ALL;**

create role c##\_role\_PDB2 container=ALL

\*

ERROR at line 1:

ORA-65050: Common DDLs only allowed in CDB$ROOT

SQL>

You get an error message because no common role can be created from a PDB.

g. Create a local role in PDB2.

SQL> **create role local\_role\_PDB2 container=CURRENT;**

Role created.

SQL> **select ROLE,COMMON from dba\_roles order by role;**

ROLE COM

------------------------------ ---

ADM\_PARALLEL\_EXECUTE\_TASK YES

APEX\_ADMINISTRATOR\_ROLE YES

AQ\_ADMINISTRATOR\_ROLE YES

…

LOCAL\_ROLE\_PDB2 NO

…

XS\_NSATTR\_ADMIN YES

XS\_RESOURCE YES

XS\_SESSION\_ADMIN YES

85 rows selected.

SQL>

2. Grant common or local roles as common or local.

a. Grant a common role to a common user from the root.

SQL> **connect / as sysdba**

Connected.

SQL> **grant c##\_role to c##\_user;**

Grant succeeded.

SQL> **col grantee format A16**

SQL> **col GRANTED\_ROLE format A16**

SQL> **select GRANTEE, GRANTED\_ROLE, COMMON, CON\_ID**

2 **from cdb\_role\_privs where grantee='C##\_USER';**

GRANTEE GRANTED\_ROLE COM CON\_ID

---------------- ---------------- --- ------

C##\_USER C##\_ROLE NO 1

SQL>

Note that the common role is granted locally to the common user. The granted role is only

applicable in the root.

SQL> **connect c##\_user/x**

Connected.

SQL> **select \* from session\_roles;**

ROLE

------------------------------

C##\_ROLE

SQL>

SQL> **connect c##\_user/x@PDB2**

Connected.

SQL> **select \* from session\_roles;**

no rows selected

SQL>

b. Now grant the common role to a common user from the root as common, to be

applicable in all containers.

SQL> **connect / as sysdba**

Connected.

SQL> **grant c##\_role to c##\_user container=all;**

Grant succeeded.

SQL> **select GRANTEE, GRANTED\_ROLE, COMMON, CON\_ID**

2 **from cdb\_role\_privs where grantee='C##\_USER';**

GRANTEE GRANTED\_ROLE COM CON\_ID

---------------- ---------------- --- ------

C##\_USER C##\_ROLE NO 1

C##\_USER C##\_ROLE YES 1

C##\_USER C##\_ROLE YES 3

C##\_USER C##\_ROLE YES 4

C##\_USER C##\_ROLE YES 5

C##\_USER C##\_ROLE YES 6

SQL>

SQL> **connect c##\_user/x**

Connected.

SQL> **select \* from session\_roles;**

ROLE

------------------------------

C##\_ROLE

SQL>

SQL> **connect c##\_user/x@PDB2**

Connected.

SQL> **select \* from session\_roles;**

ROLE

------------------------------

C##\_ROLE

SQL>

c. Revoke the common role from the common user so that the role cannot be used in any

container.

SQL> **connect / as sysdba**

Connected.

SQL> **revoke c##\_role from c##\_user container=all;**

Revoke succeeded.

SQL> **connect c##\_user/x**

Connected.

SQL> **select \* from session\_roles;**

ROLE

------------------------------

C##\_ROLE

SQL>

SQL> **connect c##\_user/x@PDB2**

Connected.

SQL> **select \* from session\_roles;**

no rows selected

SQL>

d. Grant a common role to a local user from the root.

SQL> **connect / as sysdba**

Connected.

SQL> **grant c##\_role to local\_user\_pdb2;**

grant c##\_role to local\_user\_pdb2

\*

ERROR at line 1:

ORA-01917: user or role 'LOCAL\_USER\_PDB2' does not exist

SQL>

Note that the user is unknown in root. It is a local user in PDB2.

e. Grant a common role to a local user from PDB2.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **grant c##\_role to local\_user\_PDB2;**

Grant succeeded.

SQL> **select GRANTEE, GRANTED\_ROLE, COMMON, CON\_ID**

2 **from cdb\_role\_privs where grantee='LOCAL\_USER\_PDB2';**

GRANTEE GRANTED\_ROLE COM CON\_ID

---------------- ---------------- --- ------

LOCAL\_USER\_PDB2 C##\_ROLE NO 3

SQL>

Note that the user is granted a common role locally (common column = NO) applicable only

in the PDB PDB2.

f. Test the connection as the local user.

SQL> **connect local\_user\_pdb2/x@PDB2**

Connected.

SQL> **select \* from session\_roles;**

ROLE

------------------------------

C##\_ROLE

SQL>

g. Grant a common role to a local user from PDB2 applicable in all containers.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **grant c##\_role to local\_user\_pdb2 container=all;**

grant c##\_role to local\_user\_pdb2 container=all

\*

ERROR at line 1:

ORA-65030: one may not grant a Common Privilege to a Local User

or Role

SQL>

Notice that a common role cannot be granted globally from a PDB.

h. Grant a local role to a local user from PDB2.

SQL> **grant local\_role\_pdb2 to local\_user\_pdb2;**

Grant succeeded.

SQL> **select GRANTEE, GRANTED\_ROLE, COMMON, CON\_ID**

2 **from cdb\_role\_privs where grantee='LOCAL\_USER\_PDB2';**

GRANTEE GRANTED\_ROLE COM CON\_ID

---------------- ---------------- --- ------

LOCAL\_USER\_PDB2 C##\_ROLE NO 3

LOCAL\_USER\_PDB2 LOCAL\_ROLE\_PDB2 NO 3

SQL>

i. Test the connection as the local user.

SQL> **connect local\_user\_pdb2/x@PDB2**

Connected.

SQL> **select \* from session\_roles;**

ROLE

------------------------------

C##\_ROLE

LOCAL\_ROLE\_PDB2

SQL>

**Practice 4-4: Managing Local and Common Privileges**

**Overview**

In this practice, you will manage privileges granted as common and/or local in the CDB and

PDBs.

**Assumptions**

C##\_USER and LOCAL\_USER\_PDB2 are successfully created from the previous Practice 5-2 in

cdb2 PDB2.

**Tasks**

1. Check whether privileges are created as common or local.

SQL> **connect / as sysdba**

Connected.

SQL> **desc sys.system\_privilege\_map**

Name Null? Type

------------------------------------ -------- -----------

PRIVILEGE NOT NULL NUMBER

NAME NOT NULL VARCHAR2(40)

PROPERTY NOT NULL NUMBER

SQL> **desc sys.table\_privilege\_map**

Name Null? Type

------------------------------------- -------- -----------

PRIVILEGE NOT NULL NUMBER

NAME NOT NULL VARCHAR2(40)

SQL>

Notice that there is no COMMON column. Privileges are not created as common or local, but

they can be granted as common or local.

2. Check how the CREATE SESSION system privilege was granted to C##\_USER and

LOCAL\_USER\_PDB2 users.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **col grantee format a18**

SQL> **col privilege format a14**

SQL> **select GRANTEE, PRIVILEGE, COMMON, CON\_ID**

2 **from cdb\_sys\_privs**

3 **where grantee in ('C##\_USER', 'LOCAL\_USER\_PDB2');**

GRANTEE PRIVILEGE COM CON\_ID

------------------ -------------- --- ------

C##\_USER CREATE SESSION YES 1

C##\_USER CREATE SESSION YES 3

LOCAL\_USER\_PDB2 CREATE SESSION NO 3

C##\_USER CREATE SESSION YES 4

C##\_USER CREATE SESSION YES 5

C##\_USER CREATE SESSION YES 6

6 rows selected.

SQL>

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **select GRANTEE, PRIVILEGE, COMMON**

2 **from dba\_sys\_privs**

3 **where grantee in ('C##\_USER', 'LOCAL\_USER\_PDB2');**

GRANTEE PRIVILEGE COM

------------------ -------------- ---

LOCAL\_USER\_PDB2 CREATE SESSION NO

C##\_USER CREATE SESSION YES

SQL>

3. Grant the system privileges CREATE TABLE and UNLIMITED TABLESPACE to common

user C##\_USER to be applicable in any container. This will be a common privilege.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **grant CREATE TABLE, UNLIMITED TABLESPACE to C##\_USER**

2 **CONTAINER=ALL;**

Grant succeeded.

SQL> **col grantee format a12**

SQL> **col privilege format a30**

SQL> **select GRANTEE, PRIVILEGE, COMMON, CON\_ID**

2 **from cdb\_sys\_privs**

3 **where grantee = 'C##\_USER';**

GRANTEE PRIVILEGE COM CON\_ID

------------ ------------------------------ --- ------

C##\_USER CREATE TABLE YES 1

C##\_USER CREATE SESSION YES 1

C##\_USER UNLIMITED TABLESPACE YES 1

C##\_USER CREATE TABLE YES 3

C##\_USER CREATE SESSION YES 3

C##\_USER UNLIMITED TABLESPACE YES 3

C##\_USER CREATE TABLE YES 4

C##\_USER CREATE SESSION YES 4

C##\_USER UNLIMITED TABLESPACE YES 4

C##\_USER CREATE TABLE YES 5

C##\_USER CREATE SESSION YES 5

C##\_USER UNLIMITED TABLESPACE YES 5

C##\_USER CREATE TABLE YES 6

C##\_USER CREATE SESSION YES 6

C##\_USER UNLIMITED TABLESPACE YES 6

15 rows selected.

SQL>

4. Grant the system privilege CREATE SEQUENCE to common user C##\_USER to be

applicable in root only. This will be a local privilege.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **col grantee format a12**

SQL> **grant CREATE SEQUENCE to C##\_USER CONTAINER=CURRENT;**

Grant succeeded.

SQL> **select GRANTEE, PRIVILEGE, COMMON, CON\_ID**

2 **from cdb\_sys\_privs**

3 **where grantee = 'C##\_USER';**

GRANTEE PRIVILEGE COM CON\_ID

------------ ------------------------------ --- ------

C##\_USER CREATE SEQUENCE NO 1

C##\_USER CREATE TABLE YES 1

C##\_USER CREATE SESSION YES 1

C##\_USER UNLIMITED TABLESPACE YES 1

C##\_USER CREATE TABLE YES 3

C##\_USER CREATE SESSION YES 3

C##\_USER UNLIMITED TABLESPACE YES 3

C##\_USER CREATE TABLE YES 4

C##\_USER CREATE SESSION YES 4

C##\_USER UNLIMITED TABLESPACE YES 4

C##\_USER CREATE TABLE YES 5

C##\_USER CREATE SESSION YES 5

C##\_USER UNLIMITED TABLESPACE YES 5

C##\_USER CREATE TABLE YES 6

C##\_USER CREATE SESSION YES 6

C##\_USER UNLIMITED TABLESPACE YES 6

16 rows selected.

SQL>

5. Grant the system privilege CREATE SYNONYM to common user C##\_USER to be applicable

in PDB2 only. This will be a local privilege.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **col grantee format a18**

SQL> **grant CREATE SYNONYM to C##\_USER CONTAINER=CURRENT;**

Grant succeeded.

SQL> **select GRANTEE, PRIVILEGE, COMMON, CON\_ID**

2 **from cdb\_sys\_privs**

3 **where grantee = 'C##\_USER';**

GRANTEE PRIVILEGE COM CON\_ID

------------------ ------------------------------ --- ------

C##\_USER CREATE SYNONYM NO 3

C##\_USER CREATE TABLE YES 3

C##\_USER CREATE SESSION YES 3

C##\_USER UNLIMITED TABLESPACE YES 3

SQL>

6. Grant the system privilege CREATE VIEW to common user C##\_USER to be applicable in

root only, but connected in PDB2.

SQL> **col grantee format a18**

SQL> **grant CREATE VIEW to C##\_USER CONTAINER=ALL;**

grant CREATE VIEW to C##\_USER CONTAINER=ALL

\*

ERROR at line 1:

ORA-65050: Common DDLs only allowed in CDB$ROOT

SQL>

Note that you cannot grant a common privilege from a PDB.

7. Grant the system privilege CREATE ANY TABLE to local user LOCAL\_USER\_PDB2 to be

applicable in any container.

SQL> **connect system/oracle\_4U**

Connected.

SQL> **col grantee format a18**

SQL> **grant CREATE ANY TABLE to LOCAL\_USER\_PDB2 CONTAINER=ALL;**

grant CREATE ANY TABLE to LOCAL\_USER\_PDB2 CONTAINER=ALL

\*

ERROR at line 1:

ORA-01917: user or role 'LOCAL\_USER\_PDB2' does not exist

SQL>

Notice that the user is unknown in root. It is a local user in PDB2.

8. Grant the system privilege CREATE ANY SEQUENCE to local user LOCAL\_USER\_PDB2 to

be applicable in root only.

SQL> **grant CREATE ANY SEQUENCE to LOCAL\_USER\_PDB2**

2 **CONTAINER=CURRENT;**

grant CREATE ANY SEQUENCE to LOCAL\_USER\_PDB2

\*

ERROR at line 1:

ORA-01917: user or role 'LOCAL\_USER\_PDB2' does not exist

SQL>

Notice that the user is unknown in root. It is a local user in PDB2.

9. Grant the system privilege UNLIMITED TABLESPACE to local user LOCAL\_USER\_PDB2 to

be applicable in PDB2 only. This will be a local privilege.

SQL> **connect system/oracle\_4U@PDB2**

Connected.

SQL> **col grantee format a18**

SQL> **grant UNLIMITED TABLESPACE to LOCAL\_USER\_PDB2;**

Grant succeeded.

SQL> **select GRANTEE, PRIVILEGE, COMMON, CON\_ID**

2 **from cdb\_sys\_privs**

3 **where grantee = 'LOCAL\_USER\_PDB2';**

GRANTEE PRIVILEGE COM CON\_ID

------------------ ------------------------------ --- ------

LOCAL\_USER\_PDB2 CREATE SESSION NO 3

LOCAL\_USER\_PDB2 UNLIMITED TABLESPACE NO 3

SQL>

10. Grant the system privilege DROP ANY VIEW to local user LOCAL\_USER\_PDB2 to be

applicable in root only but connected in PDB2.

SQL> **grant DROP ANY VIEW to LOCAL\_USER\_PDB2 CONTAINER=ALL;**

grant DROP ANY VIEW to LOCAL\_USER\_PDB2 CONTAINER=ALL

\*

ERROR at line 1:

ORA-65030: one may not grant a Common Privilege to a Local User

or Role

SQL> **EXIT**

$

Notice that you cannot grant a local privilege that will be applicable in another container.