Practice- Simplified Data Migration Across Platforms

Target

In this practice, you will implement a few of the simplified PDB and tablespace migration across platforms introduced in Oracle database 23ai.

Before you start

Before starting with the practice, you **must** take a snapshot of the vm. You will restore the vm from this snapshot by the end of the practice.

Practice Setup

To setup for this practice, you will create a new PDB, user, tablespace, and populate it with some testing data.

1. Open Putty, connect to the root CDB as sys:

    ```
    unset TWO_TASK
    export ORACLE_SID=FREE sqlplus /
    as sysdba
    ```

2. Run the following to create a new PDB, a new tablespace insider the PDB, new user in it, and populate some testing data owned by the new user.

    ```
    -- Create a new pluggable database CREATE
    PLUGGABLE DATABASE NEWPDB1
        ADMIN USER pdbadmin IDENTIFIED BY Welcome123 ROLES = (DBA)
        FILE_NAME_CONVERT = ('/opt/oracle/oradata/FREE/pdbseed/',
                                      '/opt/oracle/oradata/FREE/newpdb1/');

    -- Open the new PDB
    ALTER PLUGGABLE DATABASE NEWPDB1 OPEN;

    -- Save state so it opens automatically on startup ALTER PLUGGABLE
    DATABASE NEWPDB1 SAVE STATE;

    -- Switch session to the new PDB
    ALTER SESSION SET CONTAINER = NEWPDB1;

    -- Create a new tablespace in the PDB CREATE
    TABLESPACE test_ts
        DATAFILE 'test_ts01.dbf' SIZE 50M
        AUTOEXTEND ON
        NEXT 10M MAXSIZE 10G;

    -- Create a new user and assign the default tablespace CREATE USER test_user IDENTIFIED
    BY User123
        DEFAULT TABLESPACE test_ts QUOTA
        UNLIMITED ON test_ts;

    -- Grant privileges to the user
    GRANT CONNECT, RESOURCE TO test_user;
    ```

```
-- Connect as the new user
CONNECT test_user/User123@localhost:1521/NEWPDB1

-- Create and populate a sample table CREATE TABLE
employees (
    id NUMBER PRIMARY KEY, name
    VARCHAR2(50),
    salary NUMBER
);

INSERT INTO employees VALUES (1, 'Alice', 5000); INSERT INTO employees
VALUES (2, 'Bob', 6000);
INSERT INTO employees VALUES (3, 'Charlie', 7000); COMMIT;
```

3. Enable the ARCHIVELOG mode in the database.

```
conn / as sysdba SHUTDOWN
IMMEDIATE; STARTUP MOUNT;
ALTER DATABASE ARCHIVELOG; ALTER
DATABASE OPEN;
```

Quickly Transport a PDB in NOCATALOG MODE

In this section of the practice, you will transport the new PDB (NEWPDB1) to the same CDB.

Note: Because we have only one CDB, we are transporting the PDB to the same CDB. But in real life, you would transport it to a new CDB.

4. Connect to the root as a user with the SYSDBA or SYSBACKUP privilege.

```
conn / as sysdba
```

5. Close the PDB that you want to transport to a destination platform. Observe that the application should be down at this point.

```
ALTER PLUGGABLE DATABASE newpdb1 CLOSE IMMEDIATE;
```

6. Exit from SQL*Plus.

7. Create an incremental level 0 backup of the PDB and unplug the PDB from the source CDB.

```
mkdir /tmp/backups

rman target / BACKUP
UNPLUG INTO '/tmp/backups/newpdb1_metadata.xml' INCREMENTAL LEVEL
0
PLUGGABLE DATABASE newpdb1
XML BACKUP FORMAT '/tmp/backups/newpdb1_unplug.bck' TAG
'newpdb1_lvl01';

# verify
SELECT STATUS FROM CDB_PDBS WHERE PDB_NAME='NEWPDB1';

LIST BACKUP TAG 'NEWPDB1_LVL01';
```

8. On the source CDB, use the RESTORE command with the PREVIEW option and the TO TRANSPORT FILE option to create a transport file. The transport file is an XML file that stores information about backups corresponding to the PDB being transported. RMAN requires the transport XML file to restore data files, roll forward, and plug in the PDB on the destination CDB.

```
RESTORE PREVIEW
TO TRANSPORT FILE '/tmp/backups/newpdb1_transportfile.xml' PLUGINTAG
'newpdb1_lvl01'
PLUGGABLE DATABASE newpdb1;
```

The command above in my environment hit the following error:

```
RMAN> RESTORE PREVIEW
TO TRANSPORT FILE '/tmp/backups/newpdb1_transportfile.xml'
PLUGIN TAG 'newpdb1_lvl01'
PLUGGABLE DATABASE newpdb1;
RESTORE PREVIEW
2> TO TRANSPORT FILE '/tmp/backups/newpdb1_transportfile.xml'
3> PLUGIN TAG 'newpdb1_lvl01'
4> PLUGGABLE DATABASE newpdb1;
Starting restore
using channel ORA_DISK_1

RMAN-00571: ===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============
RMAN-00571: ===========================================================
RMAN-03002: failure of restore command
RMAN-05680: datafile 33 with checkpoint SCN 42852485 not found in plugin
backup
```

After contacting Oracle support, they replied with the following message:

This error is caused due to below known Bug in 23.4 anf fixed in 25ai release

Bug 36656441 : RESTORE PREVIEW TO TRANSPORT LIST PLUGIN TAG 'PDBA_PTAG' PLUGGABLE DATABASE 'PDBA' FAILS WITH RMAN-05680

23ai is not released to onprem customers, so you might be using BETA version and there wont be interim patches for Beta version.

Please wait for 23ai to be released to onprem public to include all the fixes from beta

9. Stop the vm and restore it from the taken Snapshot.