

# Flashback and Point-in-time Recovery

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# Objectives

By the end of this lecture, you should be able to:

- Perform PITR in CDBs and PDBs
- Perform Flashback database on CDBs and PDBs



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# About Point-in-Time (PITR) Recovery

- You can recover to an SCN, time, log sequence number, or restore point.
- Flashback database is a better alternative.
- Prerequisites:
  - CDB is running in ARCHIVELOG mode
  - Backups before the recovery time
  - Archived logs between the backups and the target recovery point



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# Performing PITR of a whole CDB

1. Connect to the root as SYSDBA or SYSBACKUP
2. Determine the time, SCN, restore point, or log sequence
3. Mount the CDB
4. Restore to the determined point:

```
RUN { SET UNTIL SCN 1000;  
      RESTORE DATABASE;  
      RECOVER DATABASE; }
```

5. Open the database using the RESETLOGS option
6. Open the PDBs



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# About PITR of PDBs

- Can only performed from RMAN
- If Shared Undo (the only option in 12.1) is being used:
  - Backups of the root and the seed database are required
  - Auxiliary instance is automatically created by RMAN

```
SELECT PROPERTY_NAME, PROPTERY_VALUE FROM DATABASE_PROPERTIES  
WHERE PROPERTY_NAME LIKE 'LOCAL_UNDO_ENABLED';
```



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# Enabling Local Undo mode

- To enable the Local Undo option:

```
SQL> SHUTDOWN IMMEDIATE  
SQL> STARTUP UPGRADE  
SQL> ALTER DATABASE LOCAL UNDO ON;  
SQL> SHUTDOWN IMMEDIATE  
SQL> STARTUP
```

- Undo tablespaces will be created in PDBs when you open them.



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## Enabling Local Undo mode (cont.)

- Creating Undo tablespace in the seed

```
SQL> ALTER PLUGGABLE DATABASE PDB$SEED OPEN READ WRITE FORCE;  
SQL> ALTER SESSION SET CONTAINER=PDB$SEED;  
SQL> CREATE UNDO TABLESPACE LOCALUNDO DATAFILE SIZE 100M  
      AUTOEXTEND ON NEXT 100M;  
SQL> ALTER PLUGGABLE DATABASE PDB$SEED CLOSE;  
SQL> ALTER PLUGGABLE DATABASE PDB$SEED OPEN READ ONLY;
```



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# Performing PITR of PDBs

1. Connect to the root as SYSDBA or SYSBACKUP
2. Determine the time, SCN, restore point, or log sequence
3. Close the PDB
4. Restore to the determined point and then open it

```
ALTER PLUGGABLE DATABASE pdb1 CLOSE;  
Run { SET UNTIL SCN 3426;  
      RESTORE PLUGGABLE DATABASE pdb1;  
      RECOVER PLUGGABLE DATABASE pdb1  
          [AUXILIARY DESTINATION='/var/tmp']; }  
ALTER PLUGGABLE DATABASE pdb1 OPEN RESETLOGS;
```



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# About Flashback Database for CDBs and PDBs

- An efficient way of rewinding a database (faster than PITR)
- You can flashback the whole CDB
- Flashback specific PDB:
  - Local Undo: straight forward
  - Shared Undo: auxiliary instance required
- Target point in time can be a PDB restore point, a CDB restore point, an SCN, or a past time expression
- Backup files are still valid



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# Enabling Flashback Database

1. Connect to the root as SYSDBA or SYSBACKUP
2. Make sure the Fast Recovery Area is enabled

```
SHOW PARAMETER DB_RECOVERY_FILE_DEST_SIZE  
SHOW PARAMETER DB_RECOVERY_FILE_DEST
```

3. Set the length of the desired flashback window in minutes

```
ALTER SYSTEM SET DB_FLASHBACK_RETENTION_TARGET=4320 SCOPE=BOTH;
```

4. Enable the Flashback Database feature:

```
ALTER DATABASE FLASHBACK ON;
```



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# Creating Restore Points

- Create them before maintenance operations
- Can be created in the CDB and PDBs

```
CREATE RESTORE POINT end_of_year;  
ALTER SESSION SET CONTAINER=pdb1;  
CREATE RESTORE POINT pre_upgrade GUARANTEE FLASHBACK DATABASE;  
CREATE RESTORE POINT pre_upgrade FOR PLUGGABLE DATABASE pdb1;
```

- To query about existing restore points:

```
SELECT SCN, NAME, CON_ID, PDB_RESTORE_POINT,  
GUARANTEE_FLASHBACK_DATABASE, CLEAN_PDB_RESTORE_POINT  
FROM V$RESTORE_POINT;
```



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# Performing a Flashback Database Operation for a Whole CDB

1. Connect to the root as SYSDBA or SYSBACKUP
2. Determine the time, SCN, restore point, or log sequence
3. Mount the CDB
4. Flashback the CDB

```
FLASHBACK DATABASE TO SCN 343288;  
FLASHBACK DATABASE TO RESTORE POINT cdb_pre_upgrade;
```

5. Open the CDB in READ ONLY state and verify the status
6. Open the CDB using RESETLOGS option
7. Open the PDBs



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# Performing a Flashback Database Operation for PDBs (12.2)

1. Connect to the root as SYSDBA or SYSBACKUP
2. Determine the time, SCN, restore point, or log sequence
3. Close the PDB
4. Flashback the PDB

```
FLASHBACK PLUGGABLE DATABASE pdb1 TO SCN 343288;  
FLASHBACK PLUGGABLE DATABASE pdb1 TO RESTORE POINT pre_install;
```

5. Open the PDB with RESETLOGS option



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# Summary

In this lecture, you should have learnt how to:

- Perform PITR in CDBs and PDBs
- Perform Flashback database on CDBs and PDBs



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