Flashback Database

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Objectives

By the end of this lecture, you will learn how to perform the following:

- Describe and configure Flashback Database
- Perform Flashback Database operations
- Describe and manage the restore points

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Flashback Database

- Works like a rewind button for the database
- Can be used to recover from logical data corruptions made by users or undo changes made on the database.

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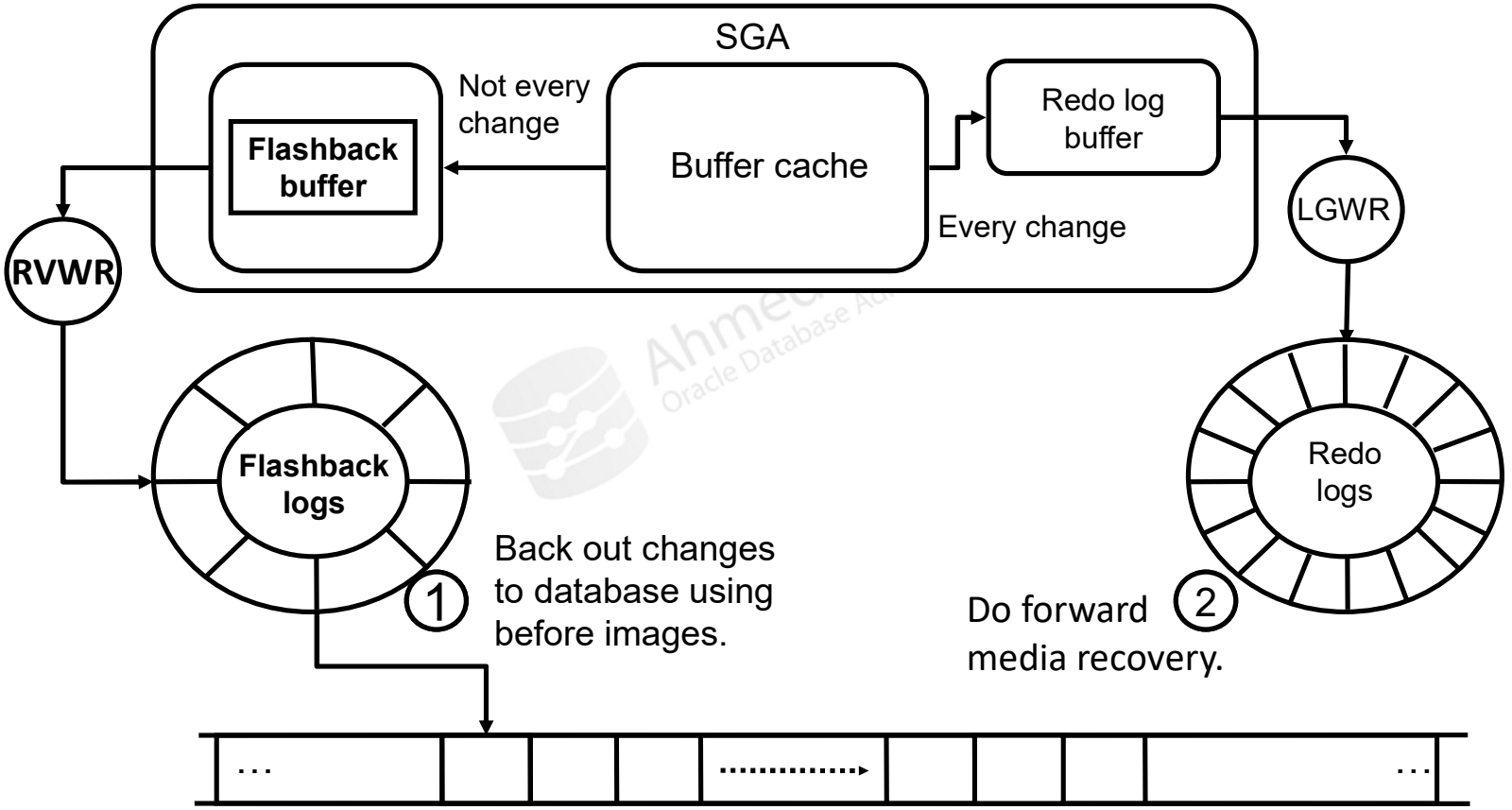
Incorrect data changes/apply changes

Invalid/changed data

Press the rewind button (`FLASHBACK DATABASE`).

The database is rewound and data recovered

Flashback Database Architecture



About Flashback Database

- Is used to rewind the database to some point in time in the past
- Can be used in the following scenarios:
  - Correct logical data failures like invalid data entered by users
  - Rollback changes made on the database (like applying application upgrade patches)
  - Testing environments
- When enabled, the following components are started: flashback buffer, RVWR process or Flashback Writer, and flashback logs
- Flashback logs are saved in the FRA in a circular fashion
- The overhead of enabling flashback database depends on the read/write mix of the database workload
- Oracle database supports other flashback options

Configuring Flashback Database

1. Configure the FRA and **ARCHIVELOG**.

2. Set the retention target

3. Enable Flashback Database.

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```
ALTER SYSTEM SET DB_FLASHBACK_RETENTION_TARGET=2880 SCOPE=BOTH;
ALTER DATABASE FLASHBACK ON;
SELECT FLASHBACK_ON FROM V$DATABASE;
```

Flashing Back a Database (the Whole CDB)

- Flashback command options (db must be in MOUNT state):

```
RMAN> FLASHBACK DATABASE TO TIME "TO_DATE('2022-06-20 15:00:00',
   3> 'YYYY-MM-DD HH24:MI:SS')";
RMAN> FLASHBACK DATABASE TO BEFORE TIME(SYSTIMESTAMP - INTERVAL '30'
MINUTE);
RMAN> FLASHBACK DATABASE TO SCN 23565;
RMAN> FLASHBACK DATABASE TO BEFORE SCN 23565;
RMAN> FLASHBACK DATABASE TO SEQUENCE=223 THREAD 1;
RMAN> FLASHBACK DATABASE TO BEFORE SEQUENCE=223 THREAD 1;
RMAN> FLASHBACK DATABASE TO RESTORE POINT 'BEFORE_UPDATE';
```

- To review the recovered data, open the database in read-only mode
- To finalize: open the database in read/write mode with **RESETLOGS**
- Monitor the flashback progress with the `V$SESSION_LONGOPS` view

Flashing Back a PDB

- When flashing back a PDB, the other PDBs can be opened

1. Connect to the root CDB as **SYSDBA** or **SYSBACKUP**
2. Close the PDB
3. Flashback the PDB:

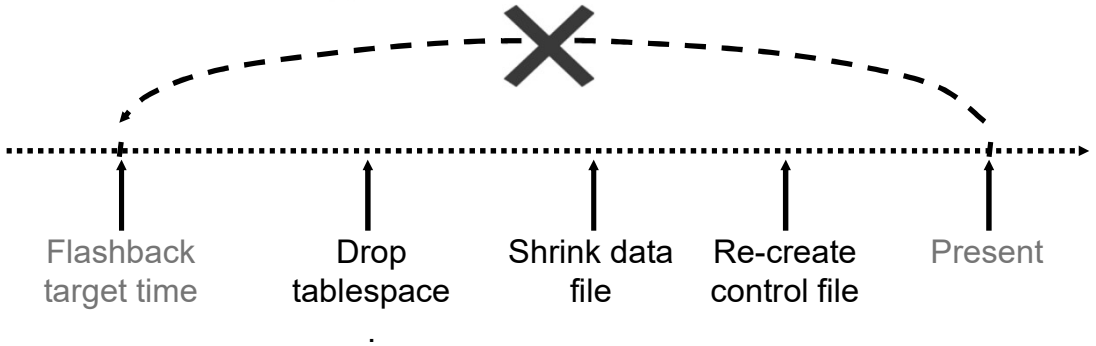
```
FLASHBACK PLUGGABLE DATABASE my_pdb TO TIME TO_DATE('2022-06-20
15:00:00','YYYY-MM-DD HH24:MI:SS');
FLASHBACK PLUGGABLE DATABASE my_pdb TO SCN 24368;
FLASHBACK PLUGGABLE DATABASE my_pdb TO RESTORE POINT guar_rp;
FLASHBACK PLUGGABLE DATABASE my_pdb TO CLEAN RESTORE POINT clean_rp;
```

4. Open the PDB with **RESETLOGS**

```
ALTER PLUGGABLE DATABASE my_pdb OPEN RESETLOGS;
```

Flashback Database Considerations

- You cannot use Flashback Database for physical recovery, such as:
  - The control file has been restored or re-created
  - A tablespace has been dropped or datafiles have been deleted
  - A data file has been reduced in size (shrunk)
- Use the **`TO BEFORE RESETLOGS`** clause to flash back to before the last **`RESETLOGS`** operation.



Monitoring the Ability to Meet Retention Target

- View the Fast Recovery Area disk quota:

```
SELECT ESTIMATED_FLASHBACK_SIZE,
       FLASHBACK_SIZE
FROM   V$FLASHBACK_DATABASE_LOG;
```

- Determine the current flashback window:

```
SELECT OLDEST_FLASHBACK_SCN,
       OLDEST_FLASHBACK_TIME
FROM   V$FLASHBACK_DATABASE_LOG;
```

- Monitor logging in the Flashback Database logs:

```
SELECT BEGIN_TIME, END_TIME, FLASHBACK_DATA, DB_DATA, REDO_DATA,
       ESTIMATED_FLASHBACK_SIZE
FROM V$FLASHBACK_DATABASE_STAT;
```

Flashback Database Best Practices

- Consider enable it in production databases
- Use the flashback for short-term recovery. Use RMAN PITR for long-term recovery.
- Keep eye on the size consumed by the flashback logs with the flashback window (retention period)
- Make sure to delete the guaranteed restore points after finishing for their purposes

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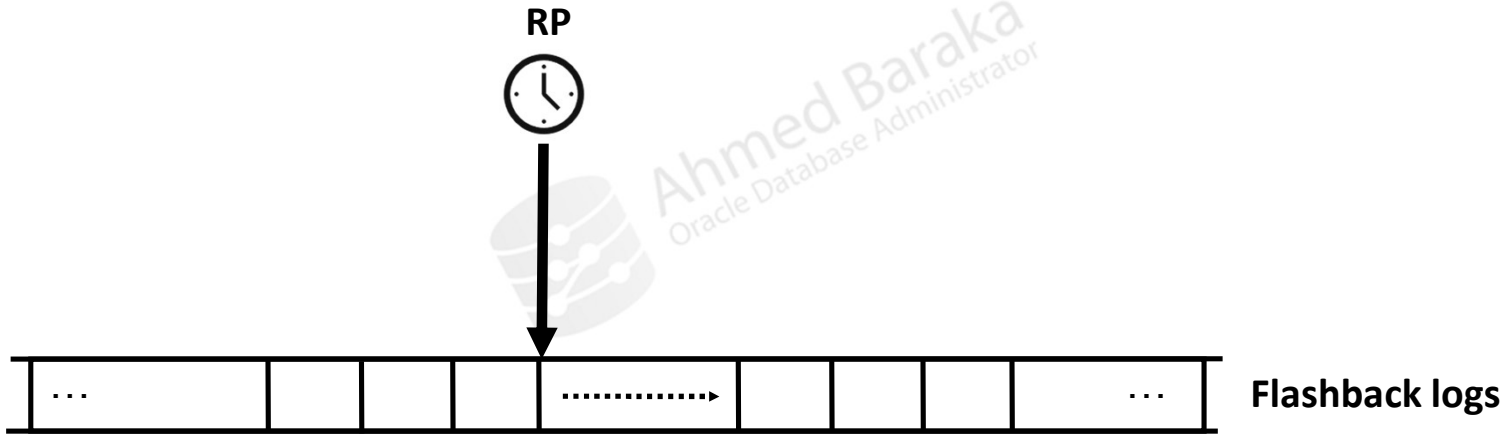
Normal Restore Points

- A guaranteed restore point ensures that you can perform a **`FLASHBACK DATABASE`** command to that SCN at any time.




```
CREATE RESTORE POINT b4_batch;
```

Creating Normal Restore Points

- Create a restore point for the current SCN:

```
CREATE RESTORE POINT b4_update;
```

- Create a restore point for a specific SCN or timestamp:

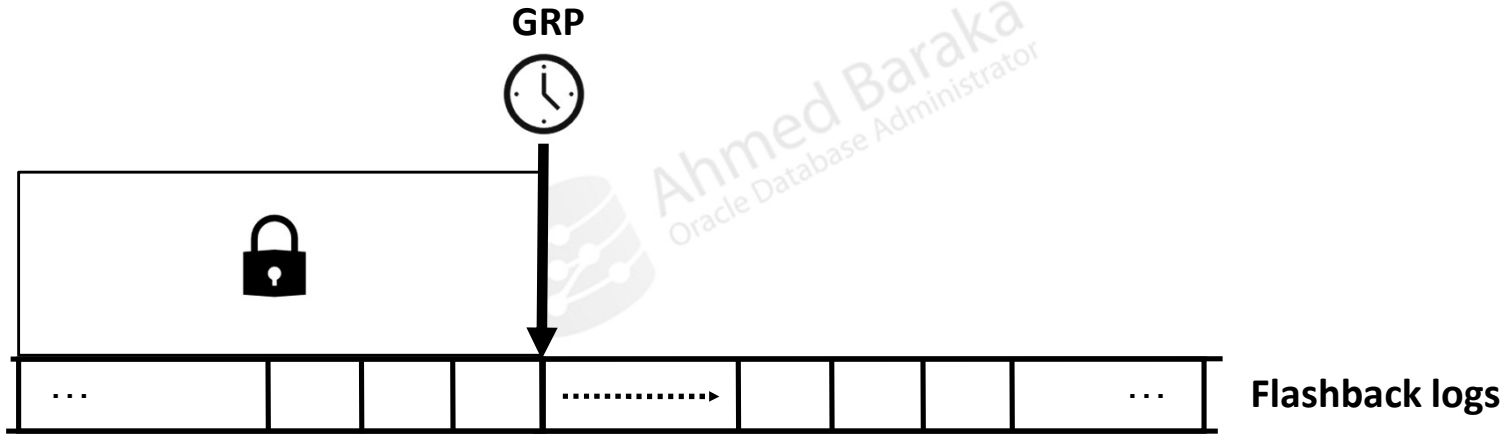
```
CREATE RESTORE POINT b4_update AS OF TIMESTAMP '...';
CREATE RESTORE POINT b4_update AS OF SCN ...;
```

- Create a restore point for a specific PDB:

```
CREATE RESTORE POINT b4_update FOR PLUGGABLE DATABASE pdb1;
```

Guaranteed Restore Points

- A guaranteed restore point ensures that you can perform a **`FLASHBACK DATABASE`** command to that SCN at any time.




```
CREATE RESTORE POINT b4_upgrade GUARANTEE FLASHBACK DATABASE;
```

Removing Restore Points

- Removing restore point of the current container:

```
DROP RESTORE POINT b4_update;
```

- Removing a restore point for a specific PDB (connected to root):

```
DROP RESTORE POINT b4_update FOR PLUGGABLE DATABASE pdb1;
```

Summary

By the end of this lecture, you should have learnt how to perform the following:

- Describe and configure Flashback Database
- Perform Flashback Database operations
- Describe and manage the restore points

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