Storage

Objectives

- After completing this lesson, you should be able to manage:
  - Permanent tablespaces in CDB and PDBs
  - Temporary tablespaces in CDB and PDBs
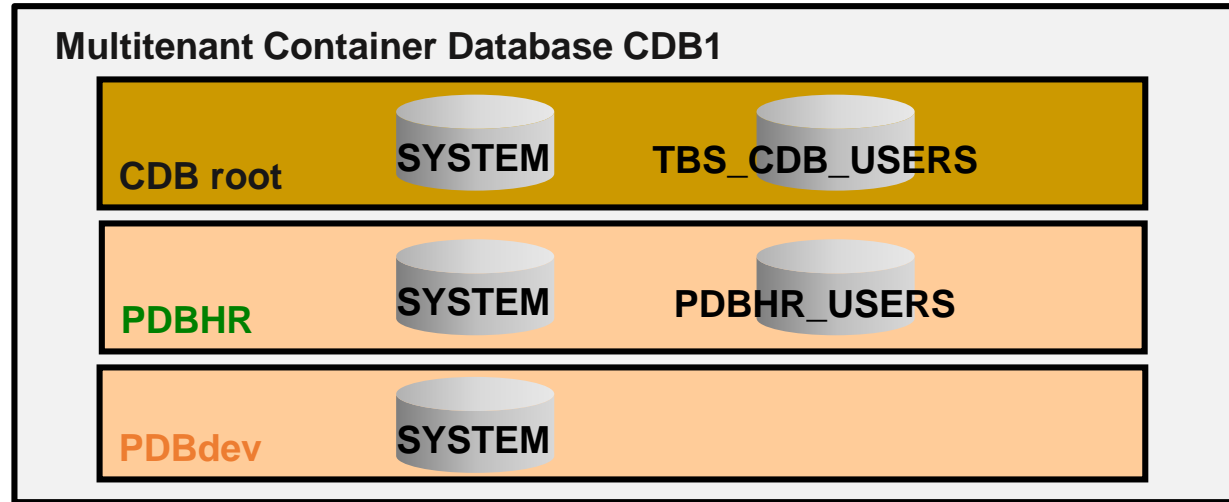 - UNDO tablespaces in CDB root and PDB

Objects in Tablespaces

- A tablespace in a PDB can contain objects associated with exactly one PDB.
- An object can be common to multiple PDBs.
  - Regular PDBs:
    - Common objects exist in the CDB root only.
    - Data is stored in the CDB root only.
    - Or each PDB has a private data copy.
    - CANNOT be created by users
    - Can be created by Oracle-supplied users
  - Application PDBs: Common objects exist in the application root
    - The object definition exists in the application root only.
    - Data is stored in the application root only.
    - Or data is stored in both the application root and the application PDB.
    - Or data is stored in the application PDB.
    - Can be created by users

Tablespaces Created During PDB Creation

- Define the default tablespace of a new PDB:
  - Created from the CDB seed
  - During PDB cloning
  - Cloning with `USER_TABLESPACES` and `COMPATIBLE=12.2`

Defining Default PermanentTablespaces

Multitenant Container Database CDB1

CDB root SYSTEM   TBS_CDB_USERS

PDBHR SYSTEM   PDBHR_USERS
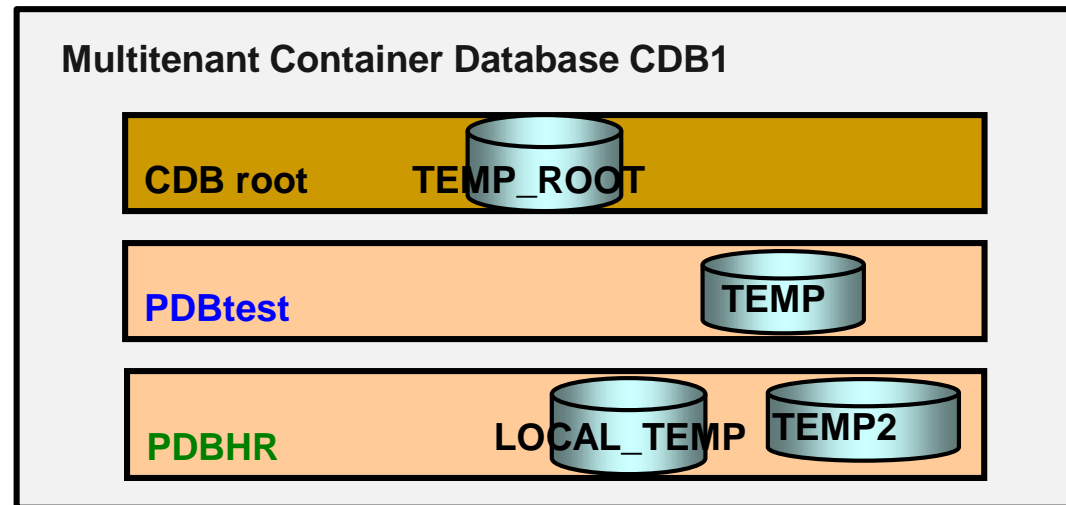
PDBdev SYSTEM

- In the CDB:

```
SQL> CONNECT system@cdb1
SQL> ALTER DATABASE DEFAULT TABLESPACE tbs_CDB_users;
```

```
SQL> CONNECT pdb1_admin@pdbhr
SQL> ALTER PLUGGABLE DATABASE DEFAULT TABLESPACE pdbhr_users;
```

Temporary Tablespaces

- Only one default temporary tablespace or tablespace group is allowed per CDB or PDB.
- Each PDB can have temporary tablespaces or tablespace groups.

Multitenant Container Database CDB1

CDB root   TEMP_ROOT

PDBtest   TEMP
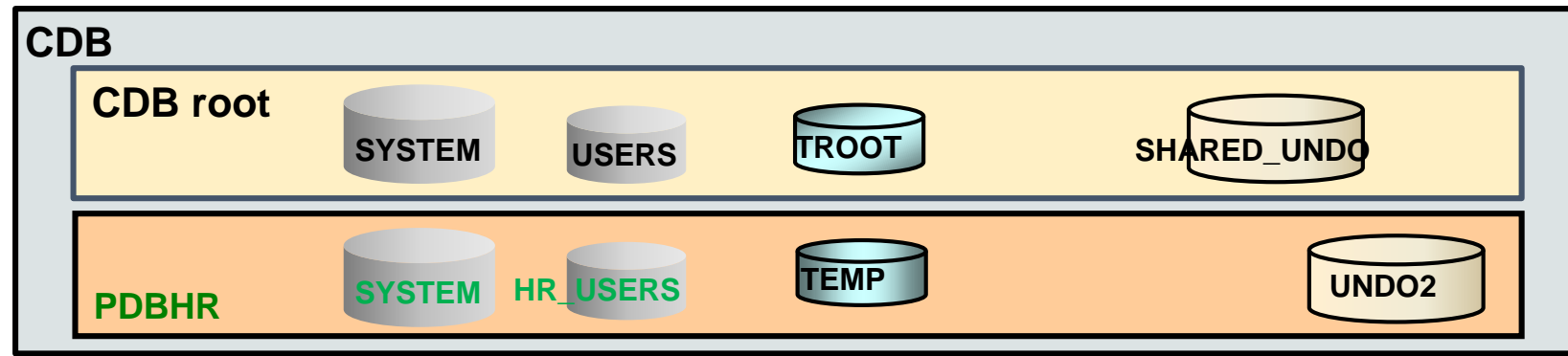
PDBHR   LOCAL_TEMP TEMP2

- Define the default temporary tablespace in a PDB:

```
SQL> CONNECT pdb1_admin@pdbhr
SQL> ALTER DATABASE DEFAULT TEMPORARY TABLESPACE local_temp;
```

UNDO Tablespaces

- Two UNDO modes: SHARED versus LOCAL
    - There is only one shared UNDO tablespace (in CDB root).
    - There can be a local UNDO tablespace in each PDB.

- When is local UNDO mode required?
    - Hot cloning
    - Near-zero downtime PDB relocation

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

Summary

- In this lesson, you should have learned how to manage:
    - Permanent tablespaces in CDB and PDBs
    - Temporary tablespaces in CDB and PDBs
    - UNDO tablespaces in CDB root and PDB

Practice 6: Overview

- 6-1: Managing permanent and temporary tablespaces
- 6-2: Managing UNDO tablespaces