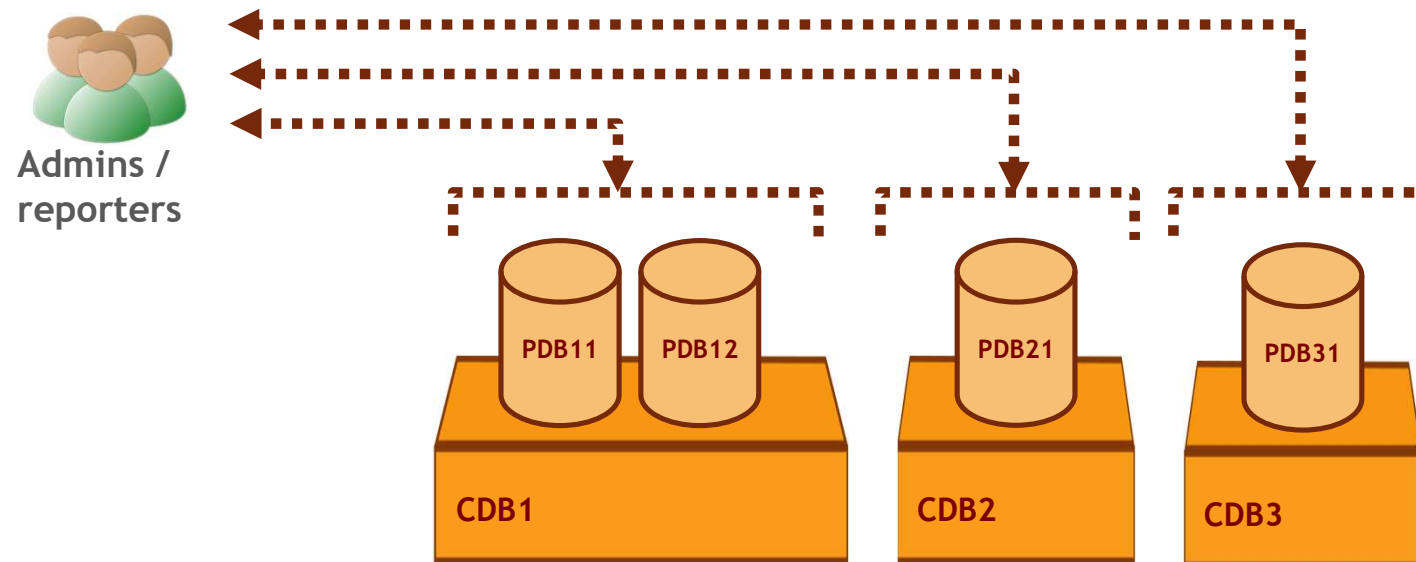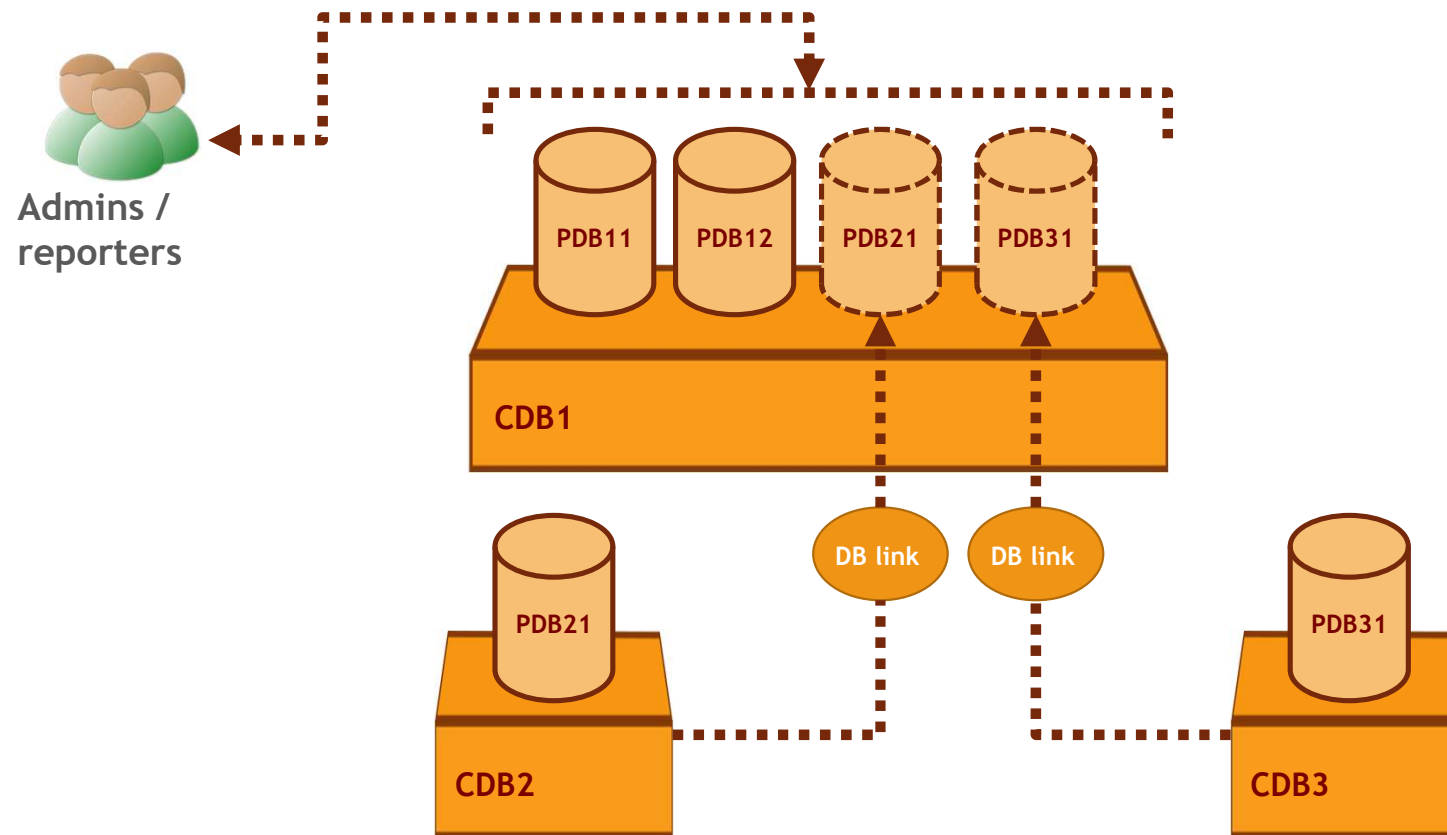# Managing CDB Fleet

By Ahmed Baraka

Objectives

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

- Describe CDB Fleet architecture and its benefits

- Set up CD Fleet

- Retrieve information about Fleet containers

- Deactivate CDB Fleet

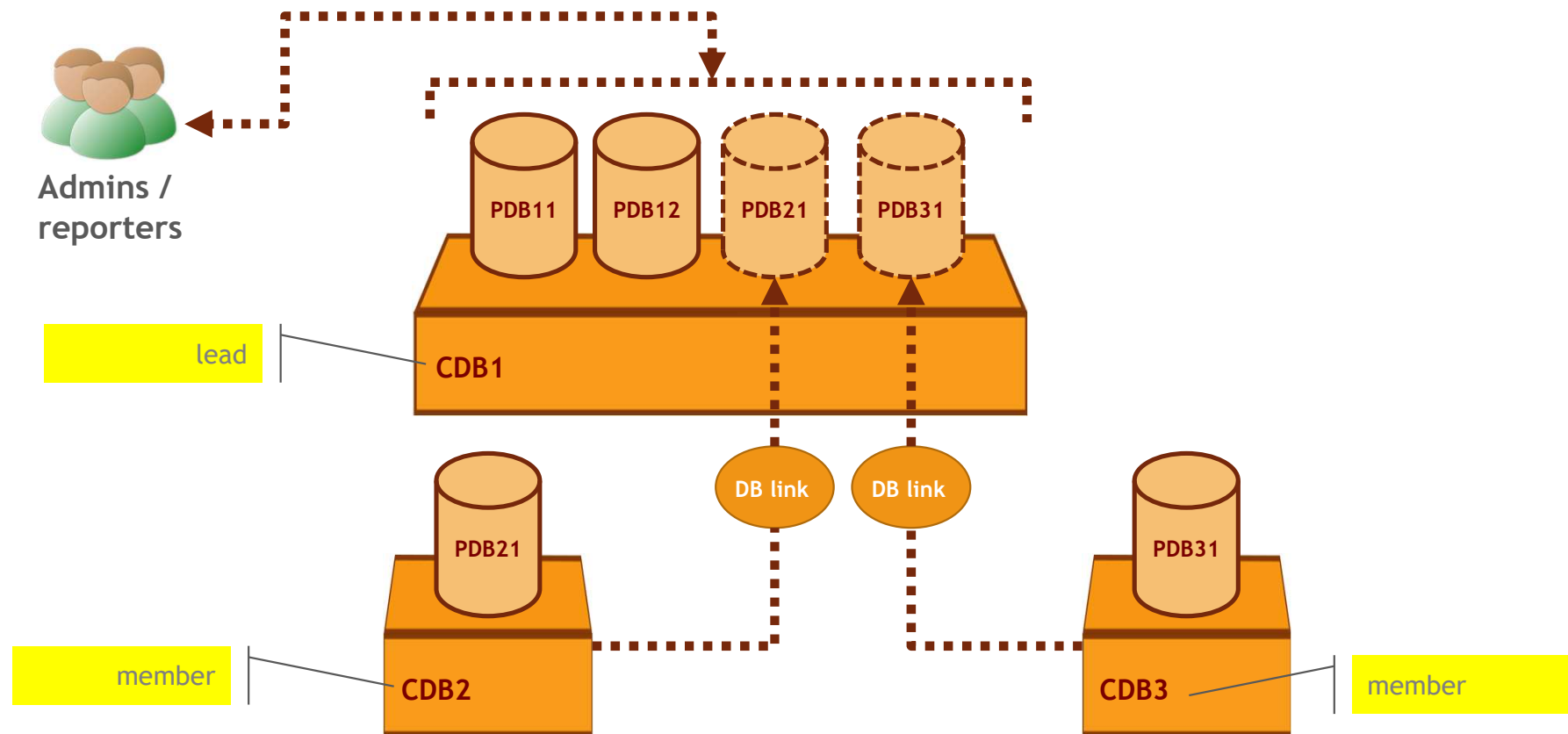- Compare between CDB Fleet Member PDBs and Proxy PDBs

Without CDB Fleet

CDB Fleet

CDB Fleet

About CDB Fleet

- A collection of CDBs that can be seen as a logical one CDB (used in Oracle Exadata and OCI DB systems)

- The hosting CDB is called the **Lead CDB**

- The other CDBs are called Fleet **members**

- Common users can:
  - Cross-container V$, GV$, CDB, and DBA_*_HIST views
    - In my testing cases, works with V$PDBS, DBA_PDBS, V$CONTAINERS
  - Query common data across fleet PDBs owned by common users

- It is not clear how the lead CDB connects to the members

CDB Fleet Use Cases

- DBAs can obtain information about the fleet containers from a central container

- Obtain information about application PDBs distributed in different CDBs

- Query common data in the Fleet PDBs owned by common users

Setting Up CD Fleet: in the Lead CDB

1. In lead CDB, enable the `LEAD_CDB` database property:

```
ALTER SESSION SET CONTAINER = CDB$ROOT;
ALTER DATABASE SET LEAD_CDB = TRUE;
```

2. Verify:

```
SELECT PROPERTY_VALUE
FROM DATABASE_PROPERTIES WHERE PROPERTY_NAME='LEAD_CDB';
```

3. (optional) Create a common user:

```
CREATE USER c##fleet_user IDENTIFIED BY ***;
GRANT CREATE SESSION TO c##fleet_user;
```

Setting Up CD Fleet: in every Member CDB

4. In the root container, create a database link to the fleet CDB lead:

```
CREATE PUBLIC DATABASE LINK lead_cdb_link CONNECT TO
c##fleet_user IDENTIFIED BY oracle USING 'ORADB';
```

5. Designate the fleet member:

```
ALTER DATABASE SET LEAD_CDB_URI = 'dblink:LEAD_CDB_LINK';
```

Retrieve Info about Fleet Containers

```
SQL> show pdbs

    CON_ID CON_NAME                    OPEN MODE  RESTRICTED
---------- ---------------------- ----------- -----------
         2 PDB$SEED                    READ ONLY  NO
         3 PDB11                       READ WRITE NO
         5 PDB21                       MOUNTED
```

- For member PDBs, the OPEN_MODE is MOUNTED as seen by the lead CDB

- The CON_ID of the fleet member PDBs in the lead are not necessarily the same as the CON_ID of the same PDBs in their hosting CDBs

- CDB containers are not retrieved

Retrieve Info about Fleet Containers   (cont..)

```
SELECT PDB_ID, PDB_NAME, STATUS, IS_PROXY_PDB FROM DBA_PDBS;


PDB_ID PDB_NAME          STATUS        IS_PROXY
------ ---------------- ----------- ---------
     3 PDB11            NORMAL        NO
     2 PDB$SEED         NORMAL        NO
     4 CDB2             STUB          YES
     5 PDB21            STUB          YES
```

- Member CDB container is retrieved

- For member PDBs, the STATUS is STUB

- Although PROXY flag is set, fleet member PDBs are not *totally* proxy PDBs

Retrieve Info about Fleet Containers   (cont..)

```
SELECT NAME, OPEN_MODE, MEMBER_CDB FROM V$CONTAINERS;


NAME                   OPEN_MODE   MEMBER_CDB
---------------------- ----------- -----------
CDB$ROOT               READ WRITE  NO
PDB$SEED               READ ONLY   NO
PDB11                  READ WRITE  NO
CDB2                   MOUNTED     YES
PDB21                  MOUNTED     NO
```

- MEMBER_CDB tells which container is a CDB

Deactivating CD Fleet

1. In all member CDBs, disable LEAD_CDB_URI:

```
ALTER DATABASE SET LEAD_CDB_URI = '';
```

2. Verify all member CDBs are un-registered:

```
SELECT NAME, OPEN_MODE, MEMBER_CDB FROM V$CONTAINERS;
```

3. In the Lead CDB:

```
ALTER DATABASE SET LEAD_CDB = FALSE;
```

Note: maintain the procedure order

Comparison between CDB Fleet Member PDBs and Proxy PDBs

	CDB Fleet Member PDBs	Proxy PDBs
SYSTEM and SYSAUX location	Source CDB	Destination CDB
Can we switch to it?	No	Yes
Can we open/close it from destination CDB?	No	Yes
Can we retrieve details about the PDBs from the destination CDB?	No[*]	Yes
Can common users query common objects from the linked PDBs?	Yes	Yes

Summary

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

- Describe CDB Fleet architecture and its benefits

- Set up CD Fleet

- Retrieve information about fleet containers

- Deactivate CDB Fleet

- Compare between CDB Fleet member PDBs and Proxy PDBs