More Concepts About Oracle Database Multitenant

By Ahmed Baraka

Objectives

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

- Understand the licenses needed to use the Multitenant option
- Describe the pros and cons of using the Multitenant option
- Learn more about the changes in the Multitenant architecture
- Describe the PDB identifiers

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Multitenant License

- Multitenant Architecture is available for all Oracle Database Editions
- Standard Edition allows only one user PDB
- Available at no additional cost for the Enterprise Edition and the Standard Edition, providing only one PDB is created (single-tenant configuration)
- Multitenant option license required for more than one PDB
- 12.2: number of PDBs can be enforced by the parameter MAX_PDBS

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Should I move to the Multitenant?

- Pros:
  - Study the consolidation benefits
  - Non-CDB is deprecated
  - Agility in data movement (even for a single-tenant)
- Cons:
  - Some features (like Oracle Streams) are not supported by the Multitenant Architecture

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When more than one CDB is needed?

- Upgrade the CDB but not some PDBs
- Different environment (production, development, test)

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Naming the PDBs in Multiple CDBs in the same Host

- Keep the PDB names unique even among the different CDBs in the same machine

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Data Dictionary Views within a PDB

View Category within a PDB	Description
USER_***	Objects owned by the current user
ALL_***	Objects accessible by the current user
DBA_***	All the objects in within the PDB

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Data Dictionary Views in CDB level

View Category within a PDB	Description
USER_*	Objects owned by the current user
ALL_*	Objects accessible by the current user
DBA_*	All the objects in within the current container (root or pdb)
CDB_*	All objects in the CDB (container identified by CON_ID) Examples: CDB_PDBS, CDB_TABLESPACES, CDB_USERS
V$*	SGA accessed by all the containers (container identified by CON_ID)

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New Flag in the Dictionary Views

- ORACLE_MAINTAINED flag in DBA_OBJECTS, DBA_USERS, and DBA_ROLES views to identify the objects created at by Oracle at the database creation

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Container Identifications

- A container a name and a **CON_ID** within the CDB

CON_ID	Corresponding Container
0	CDB level (no container)
1	CDB$ROOT
2	PDB$SEED
Anything else	User Created PDB

- **CON_UID** : does not change when PDB is moved
- **DBID**: same as CON_UID for a PDB (1 for the CDB root)
- **GUID**: 16-byte RAW value that never changes

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Showing the Tables Owned by Specific Schemas in Multiple PDBs

```
SELECT p.PDB_ID, p.PDB_NAME, t.OWNER, t.TABLE_NAME
FROM DBA_PDBS p, CDB_TABLES t
WHERE p.PDB_ID > 2
  AND t.OWNER ='HR'
  AND p.PDB_ID = t.CON_ID
ORDER BY p.PDB_ID;
```

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Common Files in a CDB

- SPFILE
  - Some params are PDB modifiable (ISPDB_MODIFIABLE=TRUE)
  - Saved in the CDB dictionary PDB_SPFILE$
- Control Files
  - Exist in the CDB level only
  - Hold records of all the PDBs
- Temporary Tablespaces
  - A PDB can have its own, or use the shared one at the root
  - MAX_SHARED_TEMP_SIZE sets the maximum size allowed

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Summary

In this lecture, you should have learnt the following:

- Understand the licenses needed to use the Multitenant option
- Describe the pros and cons of using the Multitenant option
- Learn more about the changes in the Multitenant architecture
- Describe the PDB identifiers

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