

About a Multitenant Environment

The multitenant architecture enables an Oracle database to function as a multitenant container database (CDB) that includes zero, one, or many customer-created pluggable databases (PDBs). A PDB is a portable collection of schemas, schema objects, and nonschema objects that appears to an Oracle Net client as a non-CDB. All Oracle databases before Oracle Database 12c were non-CDBs.

This section contains the following topics:

- Components of a CDB
- Common Users and Local Users
- Separation of Duties in CDB and PDB Administration

Components of a CDB

A CDB includes the following components:

- Root

The root, named **CDB\$ROOT**, stores Oracle-supplied metadata and common users. An example of metadata is the source code for Oracle-supplied PL/SQL packages. A common user is a database user known in every container. A CDB has exactly one root.

- Seed

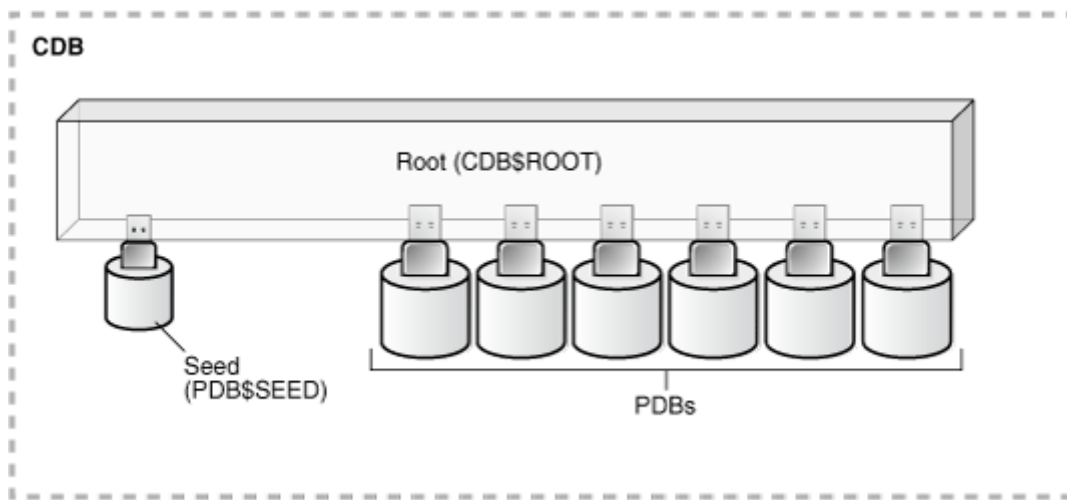
The seed, named **PDB\$SEED**, is a template that you can use to create new PDBs. You cannot add objects to or modify objects in the seed. A CDB has exactly one seed.

- PDBs

A PDB appears to users and applications as if it were a non-CDB. For example, a PDB can contain the data and code required to support a specific application. A PDB is fully backward compatible with Oracle Database releases before Oracle Database 12c.

Each of these components is called a container. Therefore, the root is a container, the seed is a container, and each PDB is a container. Each container has a unique container ID and name within a CDB.

Figure 1 shows a CDB with several PDBs.



You can easily plug a PDB into a CDB and unplug a PDB from a CDB. When you plug in a PDB, you associate the PDB with a CDB. When you unplug a PDB, you disassociate the PDB from a CDB. An unplugged PDB consists of an XML file that describes the PDB and the PDB's files (such as the data files and wallet file).

You can unplug a PDB from one CDB and plug it into a different CDB without altering your schemas or applications. A PDB can be plugged into only one CDB at a time.

Each PDB has a globally unique identifier (GUID). The PDB GUID is primarily used to generate names for directories that store the PDB's files, including both Oracle Managed Files directories and non-Oracle Managed Files directories.

Common Users and Local Users

A CDB supports common users. A common user is a user that has the same identity in the root and in every existing and future PDB. A common user can log in to the root and any PDB in which it has privileges. The operations that a common user can perform depend on the privileges granted to the common user. Some administrative tasks, such as creating a PDB or unplugging a PDB, must be performed by a common user. A CDB also supports local users. A local user is a user that exists in exactly one PDB.

Separation of Duties in CDB and PDB Administration

Some database administrators manage the entire CDB. These database administrators connect to the CDB as common users, and they manage attributes of the entire CDB and the root, as well as some attributes of PDBs. For example, these database administrators can create, unplug, plug in, and drop PDBs. They can also specify the temporary tablespace for the entire CDB and the default tablespace for the root, and they can change the open mode of one or more PDBs.

Database administrators can also connect to a specific PDB as a local user and then perform a subset of management tasks on the PDB that a database administrator performs on a non-CDB. The subset of tasks are those required for the PDB to support an application. For example, these can include management of tablespaces and schemas in a PDB, specification of storage parameters for that PDB, and changing the open mode of the current PDB.