Oracle STARTUP - How to Start an Oracle Database Instance

Summary: In this lab, you will learn how to use the Oracle `STARTUP` command to start an Oracle Database instance.

Connect with sqlplus CLI:

```
sqlplus / as sysdba
```

To start up a database instance, you use the `STARTUP` command:

```
STARTUP
```

```
[oracle@0f0c8fc405b1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Fri Apr 26 17:16:13 2024
Version 19.3.0.0.0

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Connected to an idle instance.

SQL> SQL>
SQL> STARTUP
ORACLE instance started.

Total System Global Area  788526632 bytes
Fixed Size                  9139752 bytes
Variable Size             226492416 bytes
Database Buffers          545259520 bytes
Redo Buffers                7634944 bytes
Database mounted.
Database opened.
SQL>
```
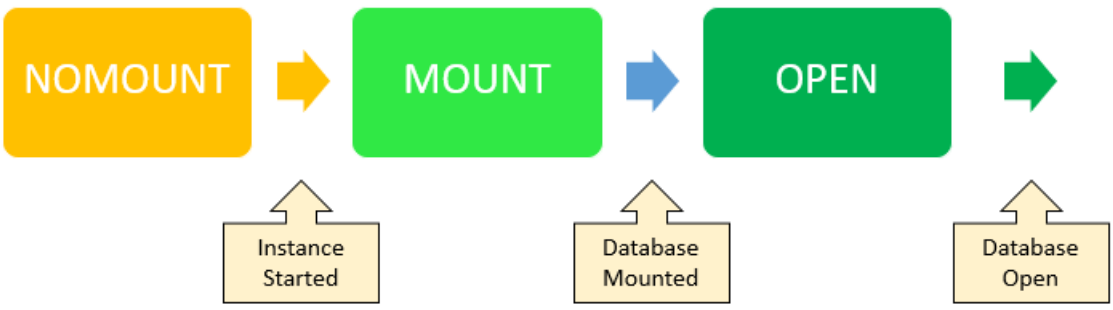

When the Oracle Database starts an instance, it goes through the following stages: `NOMOUNT`, `MOUNT`, and `OPEN`.



The `STARTUP` command allows you to control the stage of the database instance.

1) `NOMOUNT` stage

In the `NOMOUNT` stage, Oracle carries the following steps:

- First, search for a server parameter file in the default location. You can override the default behavior by using the `SPFILE` or `PFILE` parameters in the `STARTUP` command.
- Next, read the parameter file to get the values of the initialization parameters.
- Then, allocate the system global area (SGA) based on the initialization parameter settings.
- After that, start the Oracle background processes such as `SMON`, `PMON`, and `LGWR`.
- Finally, open the alert log and trace files and record all explicit parameters to the alert log in the valid parameter syntax.

At the `NOMOUNT` stage, Oracle does not associate the database with the instance.

2) `MOUNT` stage

In the `MOUNT` stage, Oracle associates a database with an instance. In other words, the instance mounts the database.

The instance carries the following steps to mount a database:

- First, get the name of the database control files specified in the `CONTROL_FILE` initialization parameter.
- Second, open the control files.
- Third, find the name of the data files and the online redo log files.

When a database is mounted, the database is only available to database administrators, not all users.

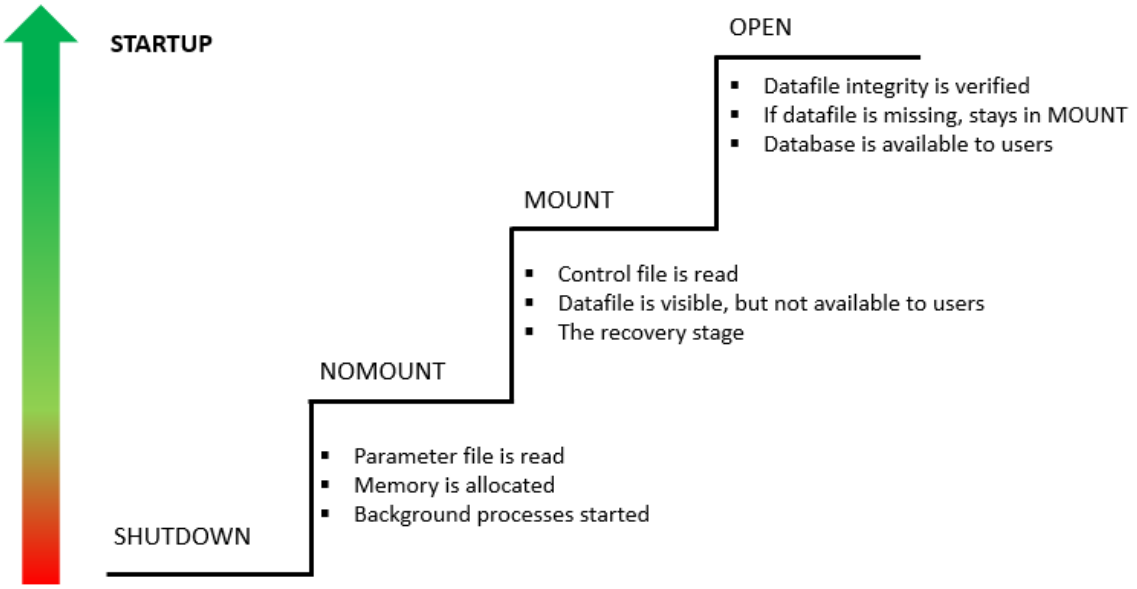
3) `OPEN` stage

In the `OPEN` stage, Oracle performs the following actions:

- First, open the online data files in tablespaces other than the undo tablespaces.
- Then, select an undo tablespace. The instance uses the default undo tablespace if an undo tablespace is specified in the `UNDO_TABLESPACE` initialization parameter. Otherwise, it will select the first available undo tablespace.
- Finally, open the online redo log files.

When Oracle opens a mounted database, the database is available for normal operations.

The following picture illustrates the Oracle database startup process:



Oracle `STARTUP` command

Note: Run `SHUTDOWN` command before running each command below first. Otherwise, you will get cannot start already running Oracle error.

The basic syntax of the `STARTUP` command is as follows:

```
STARTUP;
```

It is equivalent to starting the database instance in the `OPEN` stage:

```
STARTUP OPEN;
```

To start up a database instance in the `NOMOUNT` stage, you use the following command:

```
STARTUP NOMOUNT;
```

To bring the database to the next stage, you use the `ALTER DATABASE` statement. For example, this statement brings the database from the `NOMOUNT` to the `MOUNT` stage:

```
ALTER DATABASE MOUNT;
```

Oracle STARTUP command example

First, launch the SQL*Plus program and log in to the Oracle Database as the `SYS` user.

Second, issue the `SHUTDOWN IMMEDIATE` command to shut down the database:

```
shutdown immediate;
```

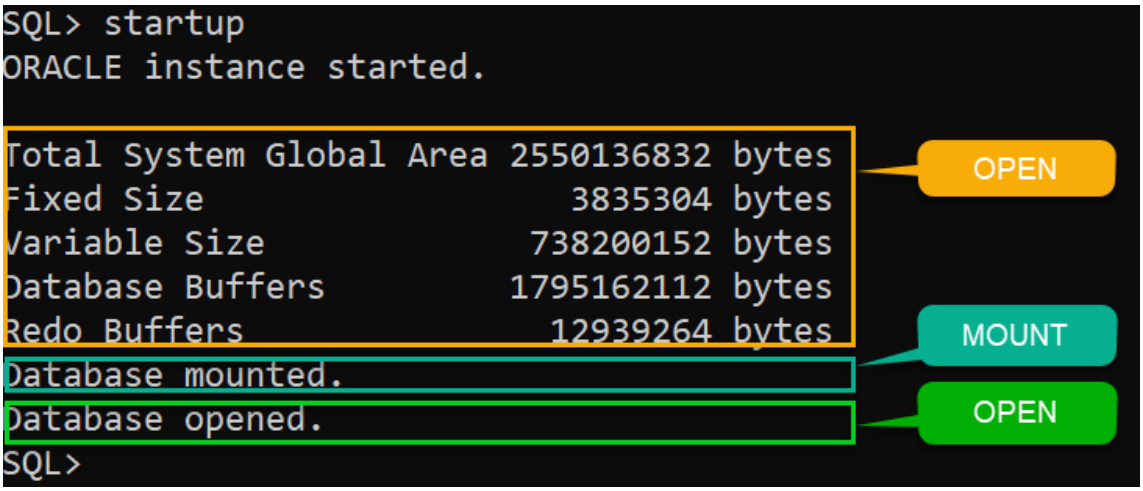
Here is the output:

```
Database dismounted.
ORACLE instance shut down.
```

Third, start the database instance at the `OPEN` stage:

```
startup
```

Here is the output:



Fourth, shut down the instance again:

```
shutdown immediate;
```

Fifth, start the database instance at the `MOUNT` state:

```
startup mount;
```

The output is:

```
ORACLE instance started.

Total System Global Area 2550136832 bytes
Fixed Size                  3835304 bytes
Variable Size             738200152 bytes
Database Buffers         1795162112 bytes
Redo Buffers               12939264 bytes
```

Sixth, check the current status of the database instance by querying the `v$instance` view:

```
SELECT
    instance_name,
    status
FROM
    v$instance;
```

Output:

```
INSTANCE_NAME    STATUS

fenagodb             MOUNTED
```

Seventh, bring the database to the `OPEN` stage by using the `ALTER DATABASE` command:

```
ALTER DATABASE OPEN;
```

Output:

```
Database altered.
```

Finally, check the status of the database by executing the following statement:

```
SELECT
    instance_name,
    status
FROM
    v$instance;
```

Now, the database is open and available for normal operations.

```
INSTANCE_NAME    STATUS

fenagodb             OPEN
```

In this lab, you have learned how to start a database instance using the Oracle `STARTUP` command.

note: to determine if this is a CDB or PDB, execute this:

```
SELECT CDB FROM V$DATABASE;
SELECT instance_name, status FROM V$INSTANCE;
```

PDB: To start a Pluggable Database (PDB) within a CDB, you would use the ALTER PLUGGABLE DATABASE command after the CDB is started (Don't run this!):

```
ALTER PLUGGABLE DATABASE pdb_name OPEN;
```

Oracle Database Instance Information Queries

Sure, you can use the following queries to get detailed information about the database instance, including whether it is a CDB or PDB, and its name and status:

Check if the database is a CDB:

```
SELECT CDB FROM V$DATABASE;
```

Get the instance name and status:

```
SELECT instance_name, status FROM V$INSTANCE;
```

Get detailed information about the database:

```
SELECT name, open_mode, database_role, platform_name FROM V$DATABASE;
```

If it is a CDB, list all PDBs and their statuses:

```
SELECT pdb_name, open_mode FROM CDB_PDBS;
```

Get information about the current container:

```
SELECT name, con_id, open_mode FROM V$CONTAINERS;
```

Here's how you can combine these queries to get a comprehensive overview:

```
-- Check if the database is a CDB
SELECT CDB FROM V$DATABASE;

-- Get the instance name and status
SELECT instance_name, status FROM V$INSTANCE;

-- Get detailed information about the database
SELECT name, open_mode, database_role, platform_name FROM V$DATABASE;

-- If the database is a CDB, list all PDBs and their statuses
SELECT pdb_name, open_mode FROM CDB_PDBS;

-- Get information about the current container
SELECT name, con_id, open_mode FROM V$CONTAINERS;
```

Run these queries in SQL*Plus or any other SQL client connected to your Oracle database to get the details you need.