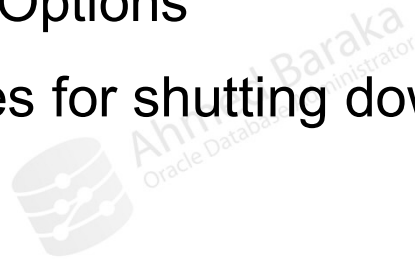# Starting up and Shutting Down Database Instances
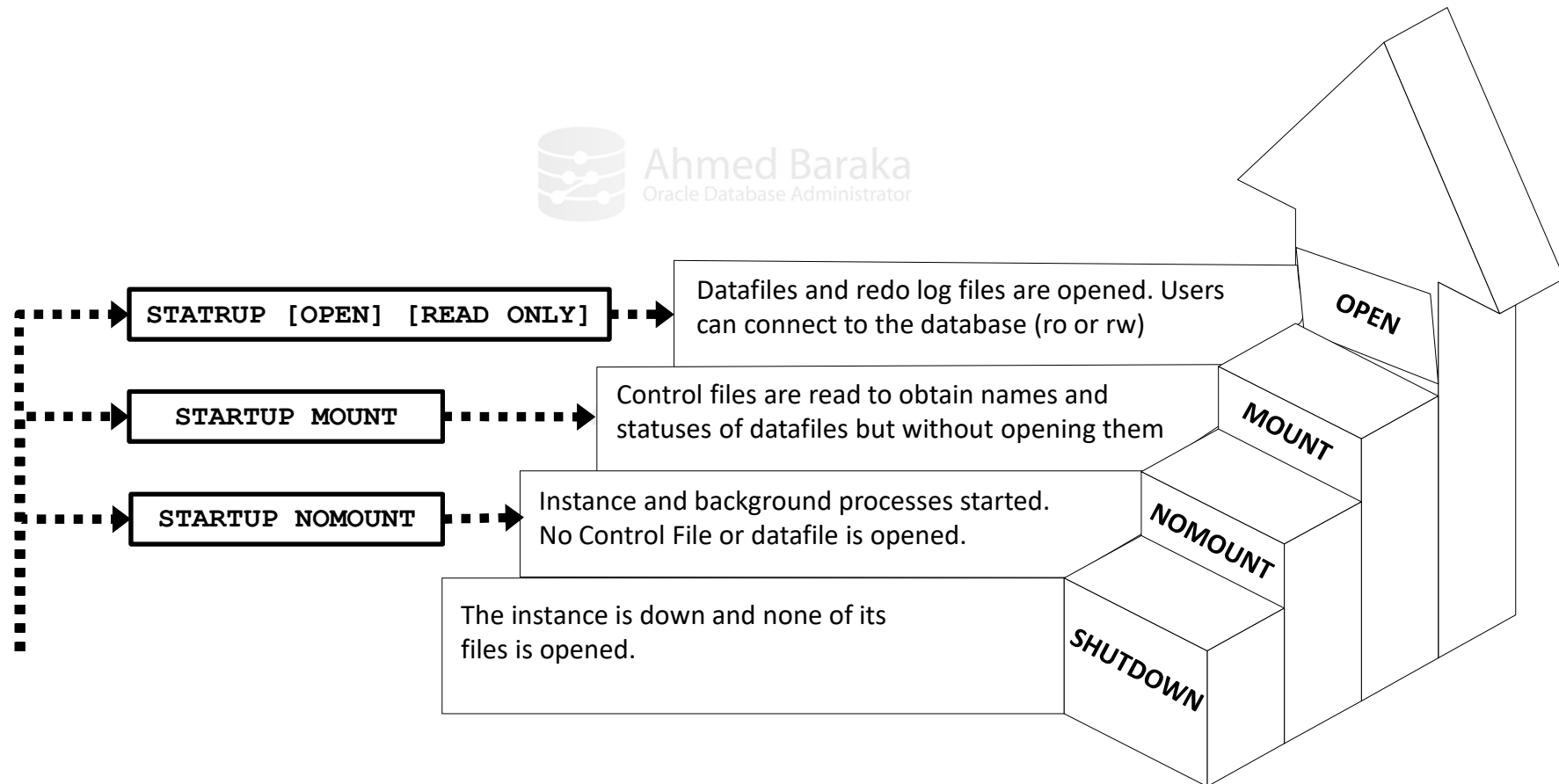
By Ahmed Baraka

Objectives

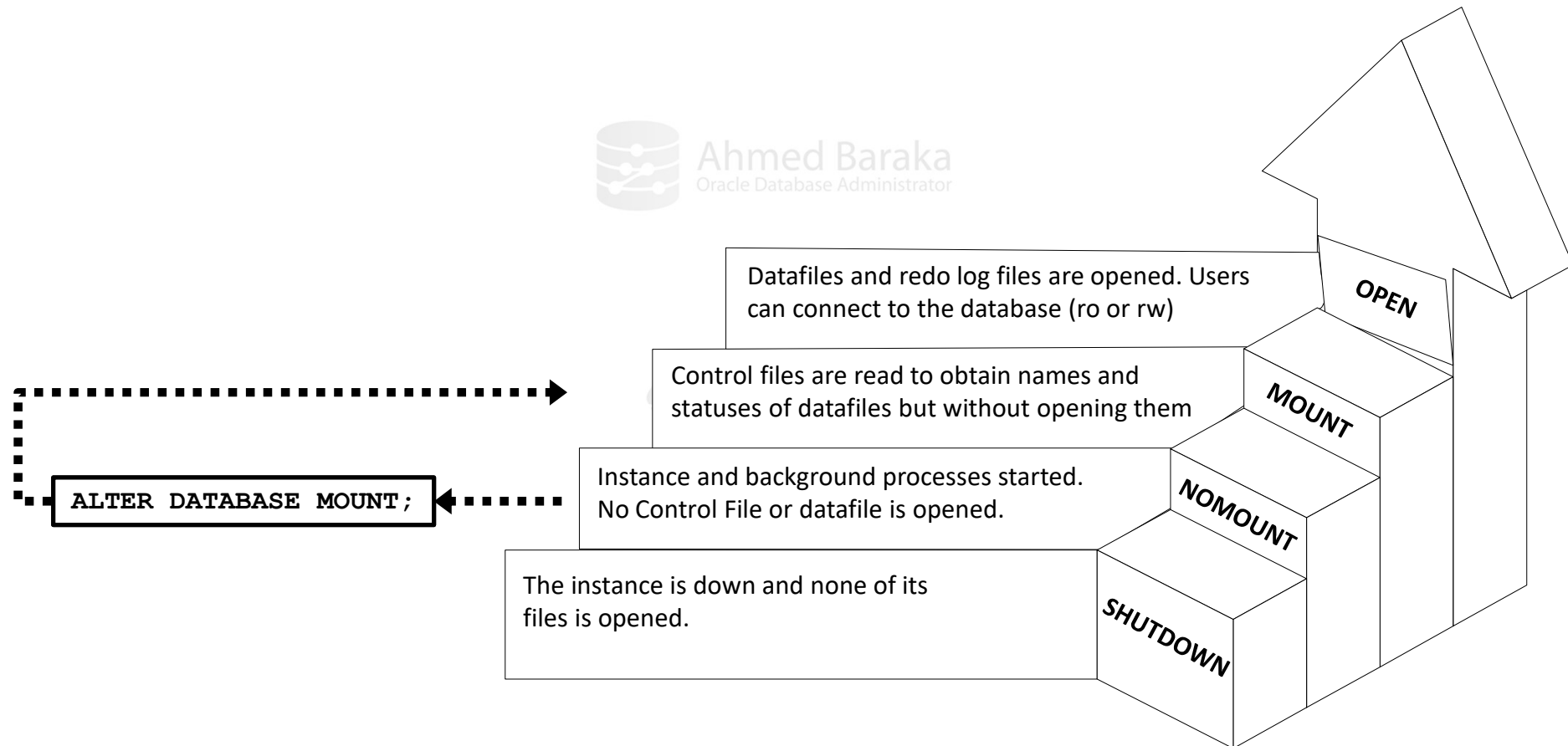In this lecture, you will learn how to perform the following:

- Use Database Startup Options

- Use Database Shutdown Options

- Describe the best practices for shutting down a production system in work environment

Oracle Database Instance Open Modes

STATRUP [OPEN] [READ ONLY]
— Datafiles and redo log files are opened. Users can connect to the database (ro or rw)

STARTUP MOUNT
— Control files are read to obtain names and statuses of datafiles but without opening them

STARTUP NOMOUNT
— Instance and background processes started. No Control File or datafile is opened.

The instance is down and none of its files is opened.

OPEN

MOUNT

NOMOUNT

SHUTDOWN

Switching from NOMOUNT to MOUNT

Datafiles and redo log files are opened. Users can connect to the database (ro or rw)

OPEN

Control files are read to obtain names and statuses of datafiles but without opening them

MOUNT

Instance and background processes started. No Control File or datafile is opened.

NOMOUNT

`ALTER DATABASE MOUNT;`

The instance is down and none of its files is opened.

SHUTDOWN

Switching from NOMOUNT or MOUNT to OPEN state

Datafiles and redo log files are opened. Users can connect to the database (ro or rw)

OPEN

```
ALTER DATABASE OPEN
    [READ ONLY]
```

Control files are read to obtain names and statuses of datafiles but without opening them

MOUNT

Instance and background processes started. No Control File or datafile is opened.

NOMOUNT

The instance is down and none of its files is opened.

SHUTDOWN
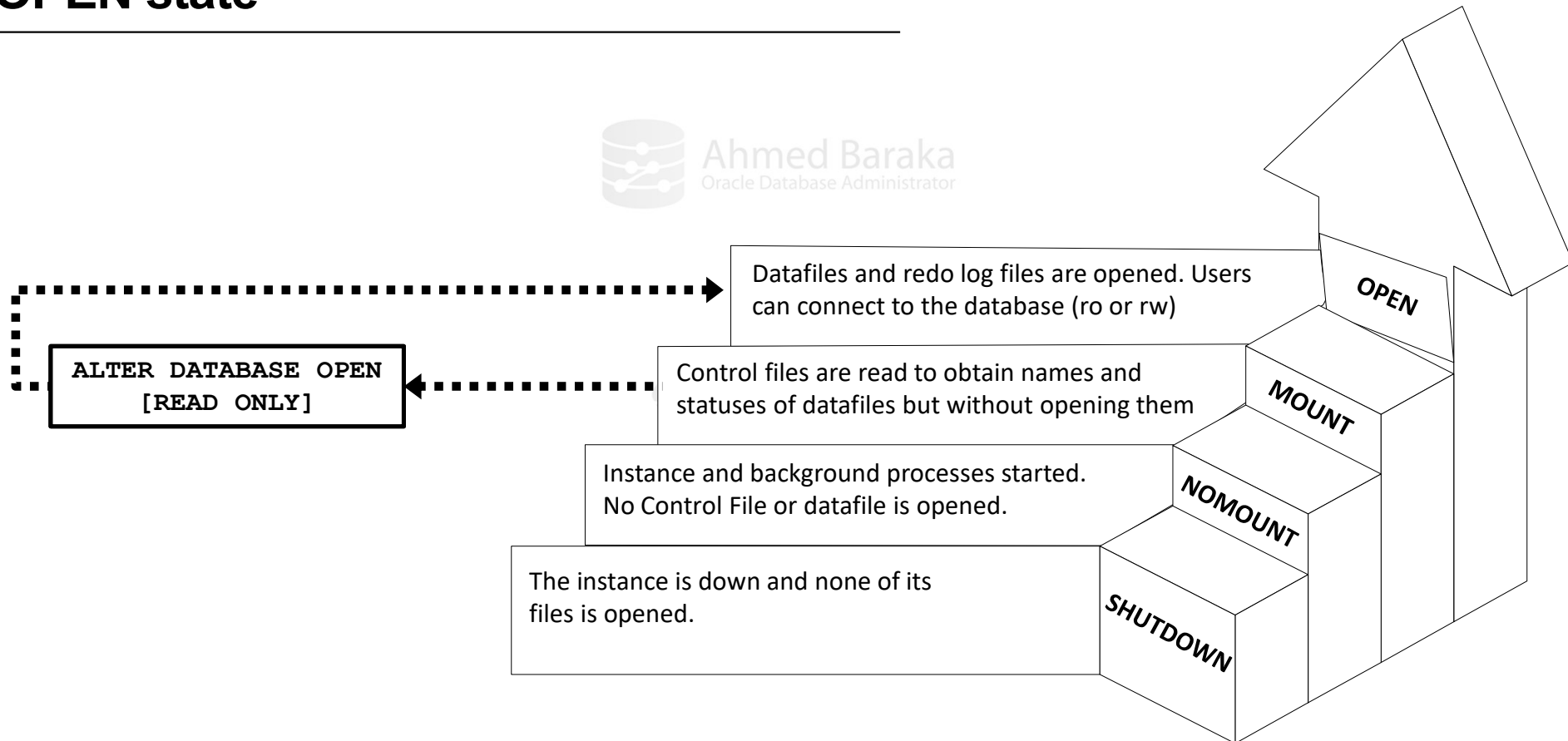
Startup Common Scenarios

Open Mode	Common Scenarios
`NOMOUNT`	Re-creation of control files Certain backup and recovery scenarios
`MOUNT`	Enabling and disabling online redo log file archiving options Performing full database recovery
`OPEN READ ONLY`	Allow the users to perform read only operations
`OPEN`	Normal application user transactions

Note: Other options are available.

Restricting Access to an Instance at Startup

- To startup the database normally but without allowing general database users from logging to the database:

  ```
  STARTUP RESTRICT
  ```

- Only DBAs can connect to the database

- The connection must be locally (remote connection is not allowed)

- Is used in troubleshooting situations

- To allow the normal users to connect:

  ```
  ALTER SYSTEM DISABLE RESTRICTED SESSION;
  ```

Shutdown Modes

```
SHUTDOWN [<shutdown mode>]
```

Shutdown modes:

- N = **NORMAL**
- T = **TRANSACTIONAL**
- I = **IMMEDIATE**
- A = **ABORT** (inconsistent or unclean state)

Shutdown Mode	N	T	I	A
Allows new connections	No	No	No	No
Waits until current sessions end	Yes	No	No	No
Waits until current transactions end	Yes	Yes	No	No
Forces a checkpoint and closes files	Yes	Yes	Yes	No

About SHUTDOWN Options

- **`NORMAL`**, **`TRANSACTIONAL`**, **`IMMEDIATE`** are clean methods for shutting down the database

  - The database files are consistent after the shutdown

  - They are different in the waiting mechanism

- **`ABORT`** option is an abnormal or unclean shutdown

  - The database files are inconsistent after the shutdown

  - The database must perform instance recovery after the next startup

  - Should be used only when needed

Further Notes About Starting Up and Shutting Down Database Instance

- The state of a database instance can be changed with SQL*Plus by connecting as **SYSOPER**, **SYSDBA**, **SYSBACKUP**, or **SYSDG**.

- When the database instance is registered in Clusterware (Grid Infrastructure), we should use the **srvctl** utility to startup and shutdown the database instance is different. However, **STARTUP** and **SHUTDOWN** commands still work.

- A way to restart the database in one command:

  ```
  STARTUP FORCE
  ```

  - This is equivalent to: **SHUTDOWN ABORT + STARTUP**
  - Should be used only when the clean shutdown is not possible.

Shutting Down Databases: Best Practices

- Any system should eventually shutdown (planned or unplanned)

- Adhere to any documented approved procedure implemented in the work environment

- If you need to shutdown a database for a scheduled maintenance, all users (may include third-party) should be notified in advance

- If a user or more are still connected, consult the manager

Summary

In this lecture, you should have learnt how to perform the following:

- Use Database Startup Options

- Use Database Shutdown Options

- Describe the best practices for shutting down a production system in work environment