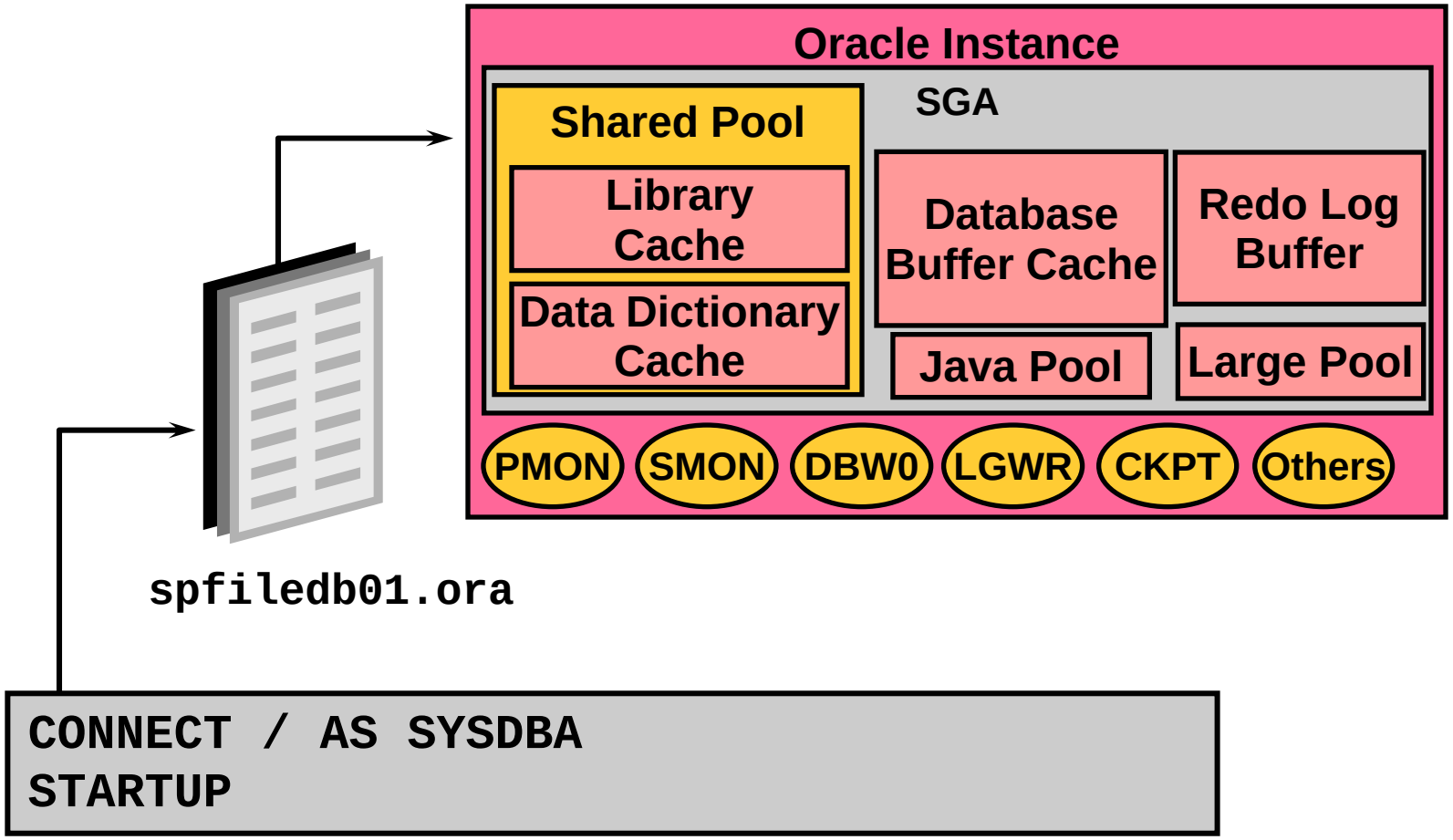
Managing an Oracle Instance

Objectives

After completing this lesson, you should be able to do the following:

- **Create and manage initialization parameter files**
- **Start up and shut down an instance**
- **Monitor and use diagnostic files**

Initialization Parameter Files



Initialization Parameter Files

- Entries are specific to the instance being started
- Two types of parameters:
  - Explicit: Having an entry in the file
  - Implicit: No entry within the file, but assuming the Oracle default values
- Multiple initialization parameter files can exist
- Changes to entries in the file take effect based on the type of initialization parameter file used:
  - Static parameter file, PFILE
  - Persistent server parameter file, SPFILE

PFILE
initSID.ora

- Text file
- Modified with an operating system editor
- Modifications made manually
- Changes take effect on the next start up
- Only opened during instance start up
- Default location is `$ORACLE_HOME/dbs`

Creating a PFILE

- Created from a sample `init.ora` file
  - Sample installed by the Oracle Universal Installer
  - Copy sample using operating system copy command
  - Uniquely identified by database SID

```
cp init.ora $ORACLE_HOME/dbs/initdba01.ora
```

- Modify the `initSID.ora`
  - Edit the parameters
  - Specific to database needs

PFILE Example

```
# Initialization Parameter File: initdba01.ora
db_name                 = dba01
instance_name           = dba01
control_files           = (
    /home/dba01/ORADATA/u01/control01dba01.ctl,
    /home/dba01/ORADATA/u02/control01dba02.ctl)
db_block_size           = 4096
db_cache_size           = 4M
shared_pool_size        = 50000000
java_pool_size          = 50000000
max_dump_file_size      = 10240
background_dump_dest    = /home/dba01/ADMIN/BDUMP
user_dump_dest          = /home/dba01/ADMIN/UDUMP
core_dump_dest          = /home/dba01/ADMIN/CDUMP
undo_management         = AUTO
undo_tablespace         = UNDOTBS
. . .
```

SPFILE
spfileSID.ora

- Binary file
- Maintained by the Oracle server
- Always resides on the server side
- Ability to make changes persistent across shut down and start up
- Can self-tune parameter values
- Can have Recovery Manager support backing up to the initialization parameter file

Creating an SPFILE

- Created from a PFILE file

```
CREATE SPFILE = '$ORACLE_HOME/dbs/spfileDBA01.ora'
FROM PFILE = '$ORACLE_HOME/dbs/initDBA01.ora';
```

  where
  - SPFILE-NAME: SPFILE to be created
  - PFILE-NAME: PFILE creating the SPFILE
- Can be executed before or after instance start up

SPFILE Example

```
*.background_dump_dest= '/home/dba01/ADMIN/BDUMP'
*.compatible='9.2.0'
*.control_files='/home/dba01/ORADATA/u01/ctrl01.ctl'
*.core_dump_dest= '/home/dba01/ADMIN/CDUMP'
*.db_block_size=4096
*.db_name='dba01'
*.db_domain= 'world'
*.global_names=TRUE
*.instance_name='dba01'
*.remote_login_passwordfile='exclusive'
*.java_pool_size=50000000
*.shared_pool_size=50000000
*.undo_management='AUTO'
*.undo_tablespace='UNDOTBS'
. . .
```

Modifying Parameters in SPFILE

- Changing parameter values

```
ALTER SYSTEM SET undo_tablespace = UNDO2;
```

- Specifying temporary or persistent changes

```
ALTER SYSTEM SET undo_tablespace = UNDO2
SCOPE=BOTH;
```

- Deleting or resetting values

```
ALTER SYSTEM RESET undo_suppress_errors
SCOPE=BOTH SID='*';
```

STARTUP Command Behavior

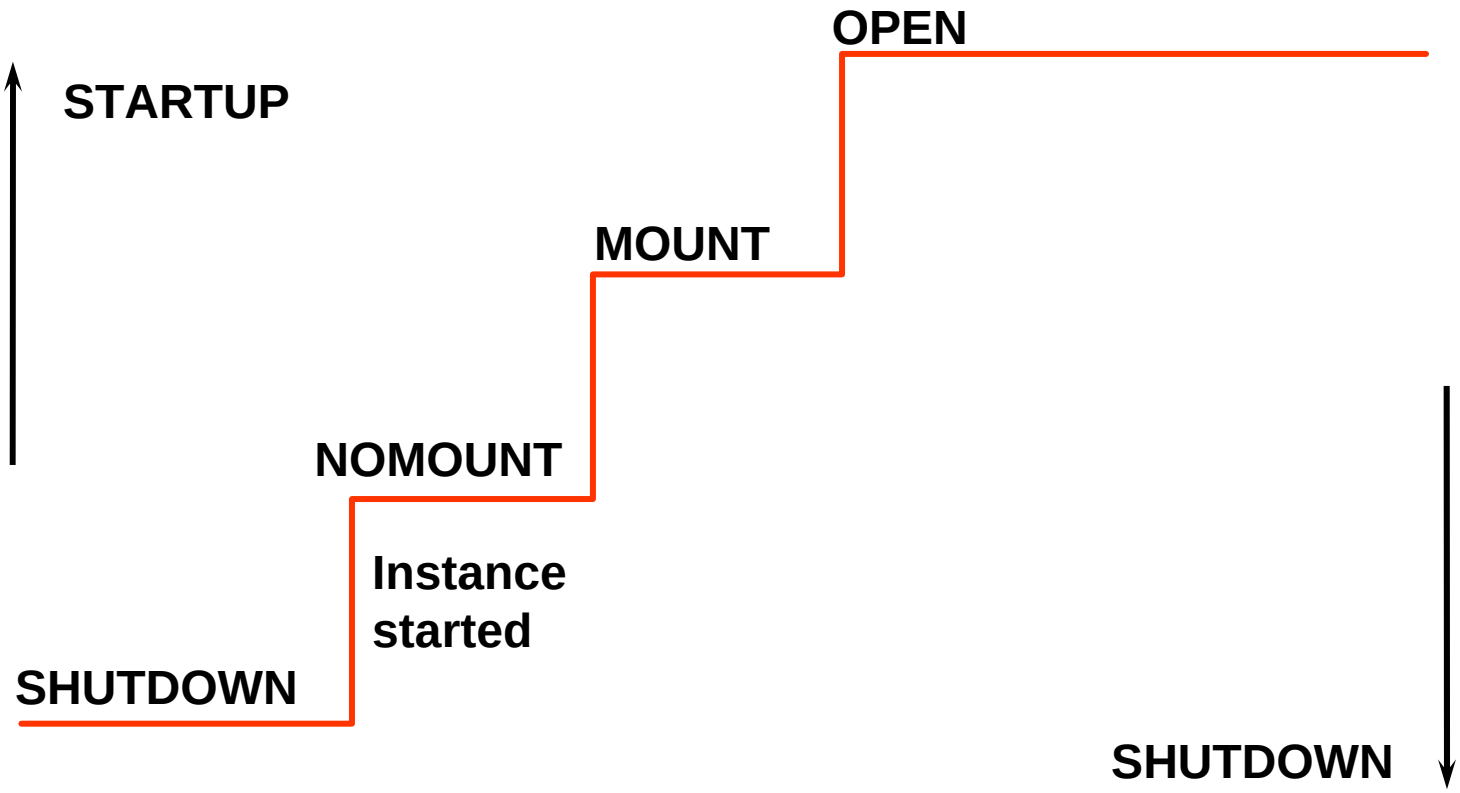
- Order of precedence:
  - `spfileSID.ora`
  - Default SPFILE
  - `initSID.ora`
  - Default PFILE
- Specified PFILE can override precedence.

```
STARTUP PFILE = $ORACLE_HOME/dbs/initDBA1.ora
```

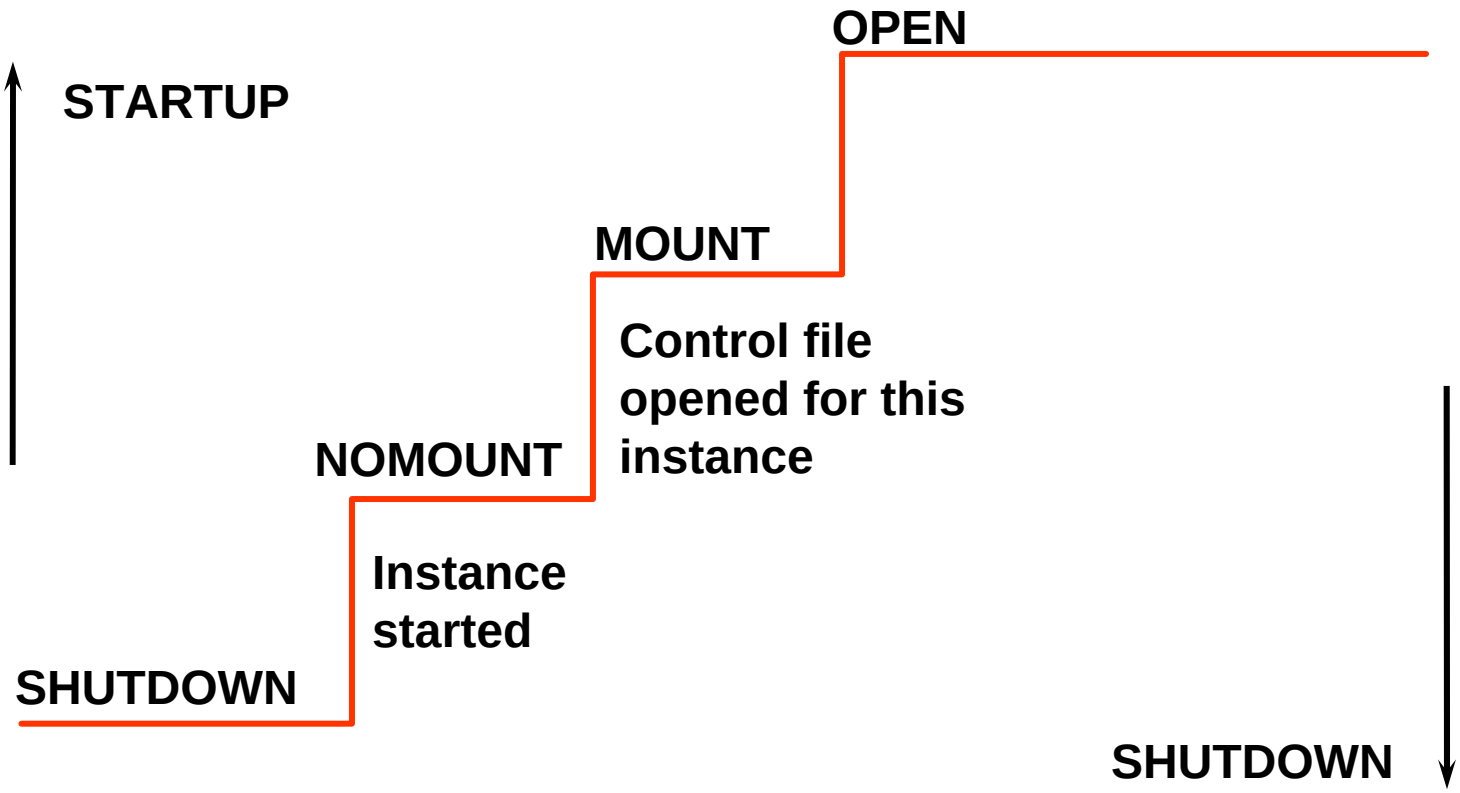
- PFILE can indicate to use SPFILE.

```
SPFILE = /database/startup/spfileDBA1.ora
```

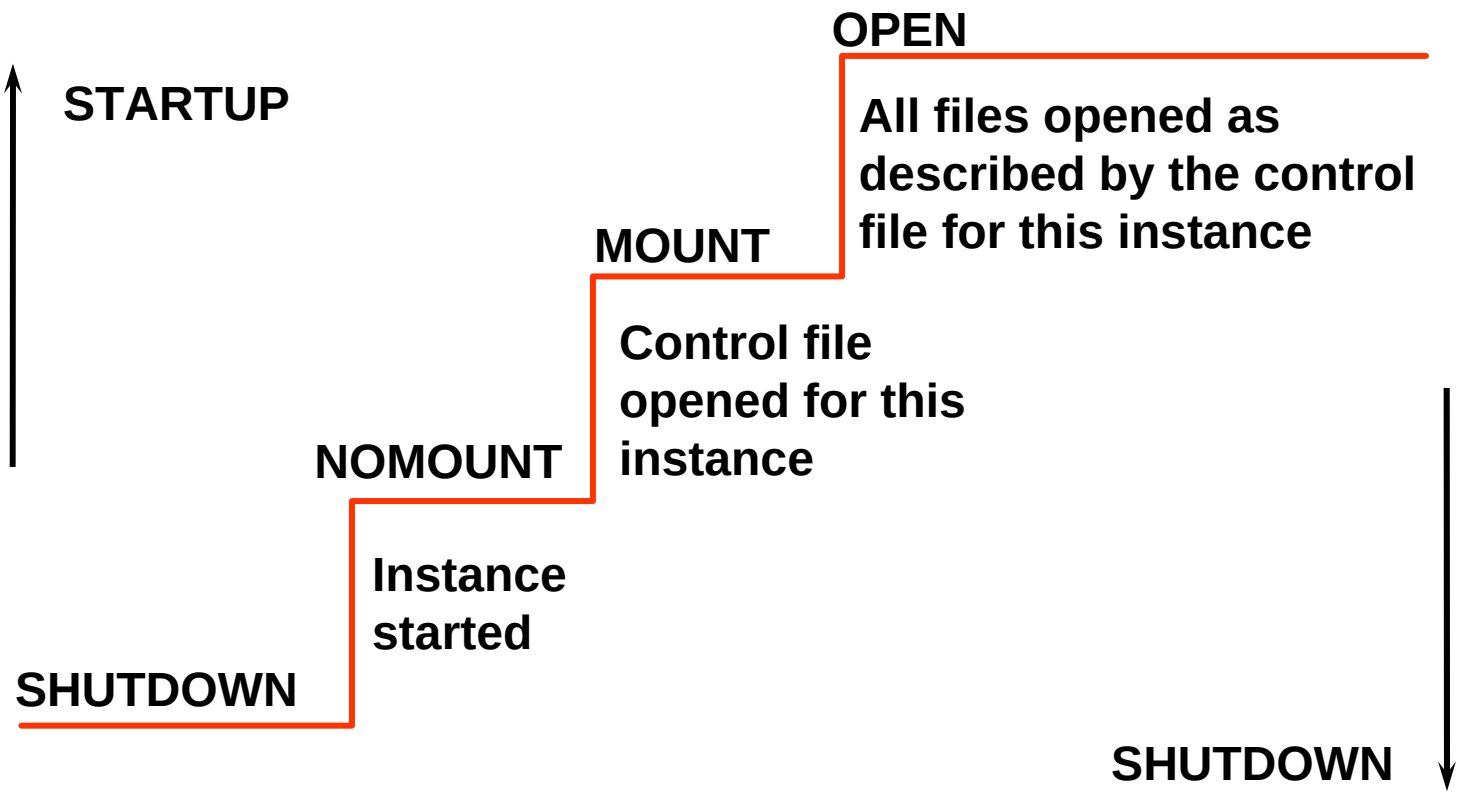
Starting Up a Database
NOMOUNT



Starting Up a Database
MOUNT



Starting Up a Database
OPEN



STARTUP Command

Start up the instance and open the database:

```
STARTUP
```

```
STARTUP PFILE=$ORACLE_HOME/dbs/initdb01.ora
```

ALTER DATABASE Command

- Change the state of the database from **NOMOUNT** to **MOUNT**:

```
ALTER DATABASE db01 MOUNT;
```

- Open the database as a read-only database:

```
ALTER DATABASE db01 OPEN READ ONLY;
```

Opening a Database in Restricted Mode

- Use the `STARTUP` command to restrict access to a database:

```
STARTUP RESTRICT
```

- Use the `ALTER SYSTEM` command to place an instance in restricted mode:

```
ALTER SYSTEM ENABLE RESTRICTED SESSION;
```

Opening a Database in Read-Only Mode

- Opening a database in read-only mode:

```
STARTUP MOUNT
ALTER DATABASE OPEN READ ONLY;
```

- Can be used to:
  - Execute queries
  - Execute disk sorts using locally managed tablespaces
  - Take data files offline and online, but not tablespaces
  - Perform recovery of offline data files and tablespaces

Shutting Down the Database

Shutdown Mode	A	I	T	N
Allow new connections	No	No	No	No
Wait until current sessions end	No	No	No	Yes
Wait until current transactions end	No	No	Yes	Yes
Force a checkpoint and close files	No	Yes	Yes	Yes

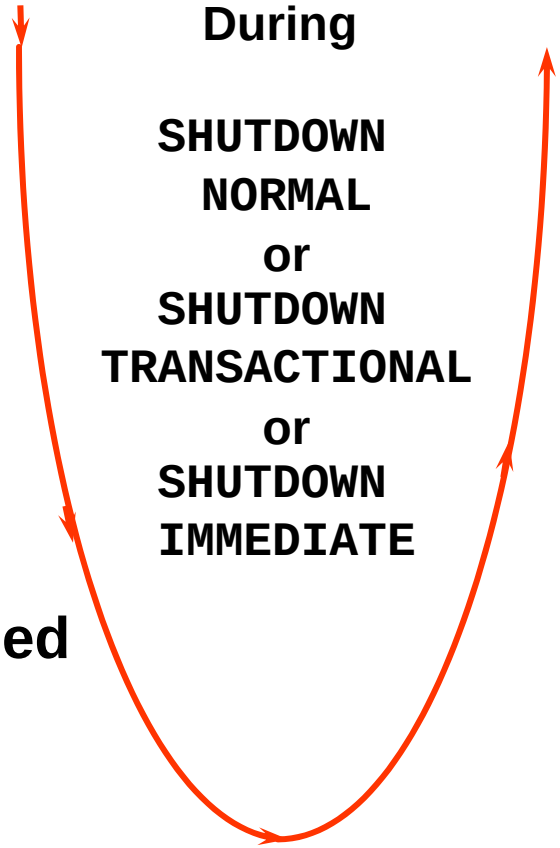
Shutdown mode:

- **A = ABORT**
- **I = IMMEDIATE**
- **T = TRANSACTIONAL**
- **N = NORMAL**

SHUTDOWN Options

On the way down:

- Database buffer cache written to the data files
- Uncommitted changes rolled back
- Resources released



On the way up:

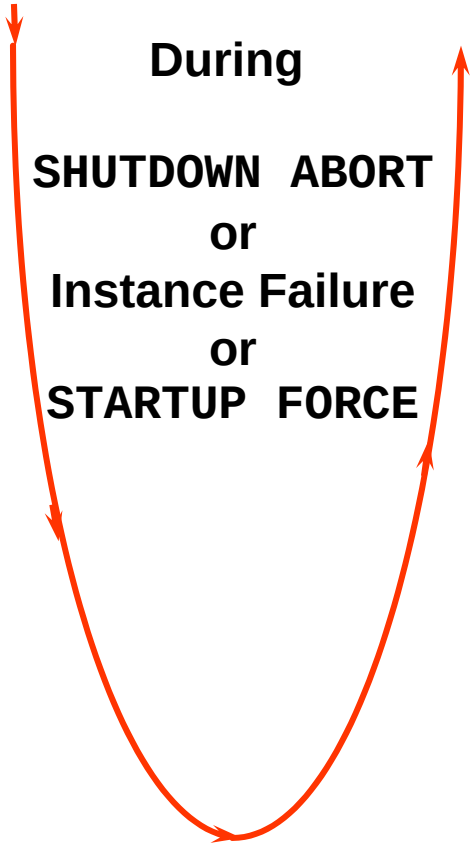
- No instance recovery

Consistent database (clean database)

SHUTDOWN Options

On the way down:

- Modified buffers are not written to the data files
- Uncommitted changes are not rolled back



On the way up:

- Online redo log files used to reapply changes
- Undo segments used to roll back uncommitted changes
- Resources released

Inconsistent database (dirty database)

Monitoring an Instance Using Diagnostic Files

- **Diagnostic files**
  - **Contain information about significant events encountered**
  - **Used to resolve problems**
  - **Used to better manage the database on a day-to-day basis**
- **Several types exist:**
  - **`alertSID.log` file**
  - **Background trace files**
  - **User trace files**

Alert Log File

- **`alertSID.log` file:**
  - **Records the commands**
  - **Records results of major events**
  - **Used for day-to-day operational information**
  - **Used for diagnosing database errors**
- **Each entry has a time stamp associated with it**
- **Must be managed by DBA**
- **Location defined by `BACKGROUND_DUMP_DEST`**

Background Trace Files

- **Background trace files**
  - **Log errors detected by any background process**
  - **Are used to diagnose and troubleshoot errors**
- **Created when a background process encounters an error**
- **Location defined by `BACKGROUND_DUMP_DEST`**

User Trace Files

- User trace files
  - Produced by the user process
  - Can be generated by a server process
  - Contain statistics for traced SQL statements
  - Contain user error messages
- Created when a user encounters user session errors
- Location is defined by `USER_DUMP_DEST`
- Size defined by `MAX_DUMP_FILE_SIZE`

Enabling or Disabling User Tracing

- **Session level:**
  - **Using the `ALTER SESSION` command:**
    `ALTER SESSION SET SQL_TRACE = TRUE`
  - **Executing DBMS procedure:**
    `dbms_system.SET_SQL_TRACE_IN_SESSION`
- **Instance level**
  - **Setting the initialization parameter:**
    `SQL_TRACE = TRUE`

Summary

In this lesson, you should have learned how to:

- **Create and manage initialization parameter files**
- **Start up and shut down an instance**
- **Monitor and use diagnostic files**

Practice 3 Overview

This practice covers the following topics:

- **Creating an SPFILE**
- **Starting up and shutting down the database in different modes**