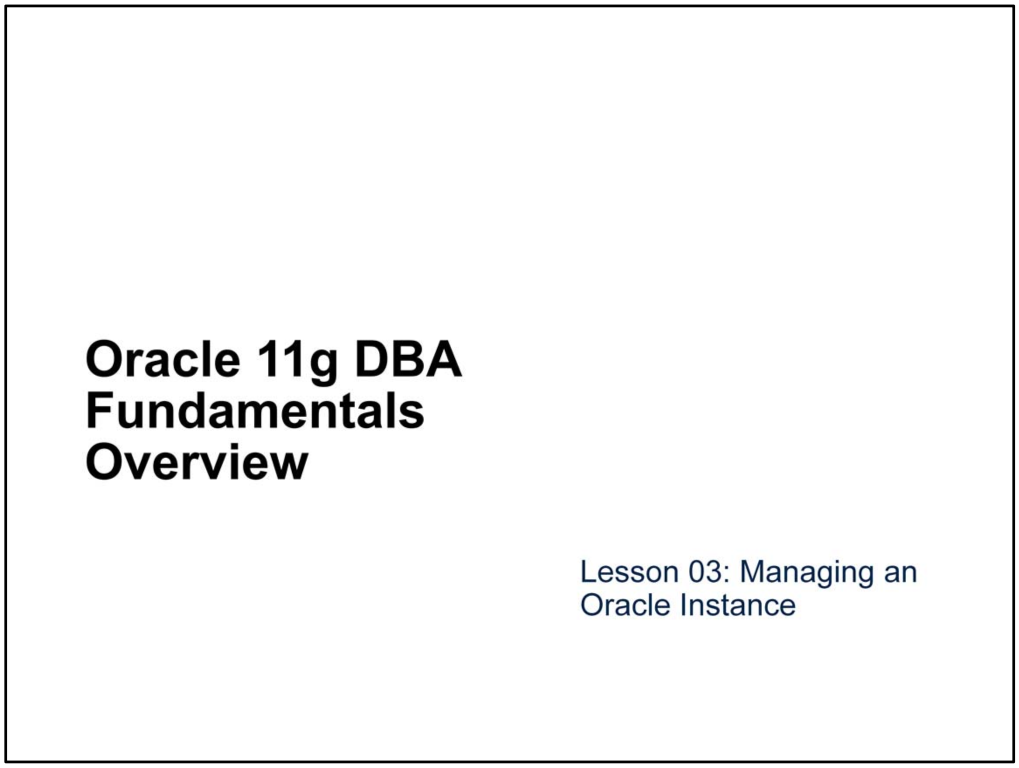
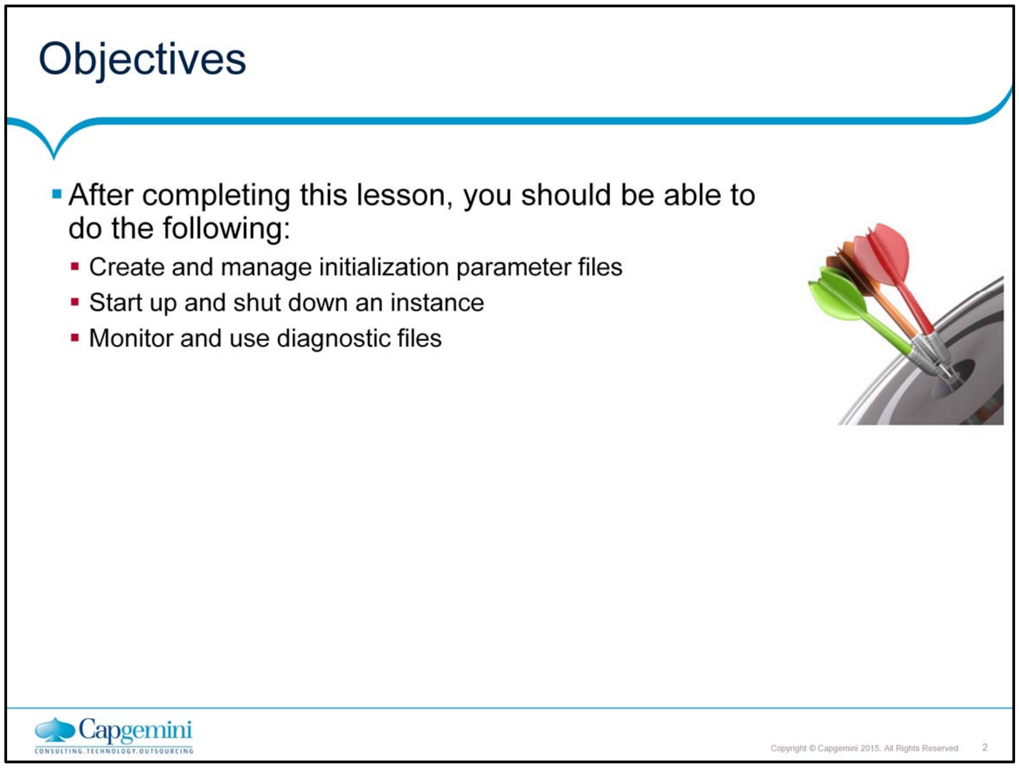


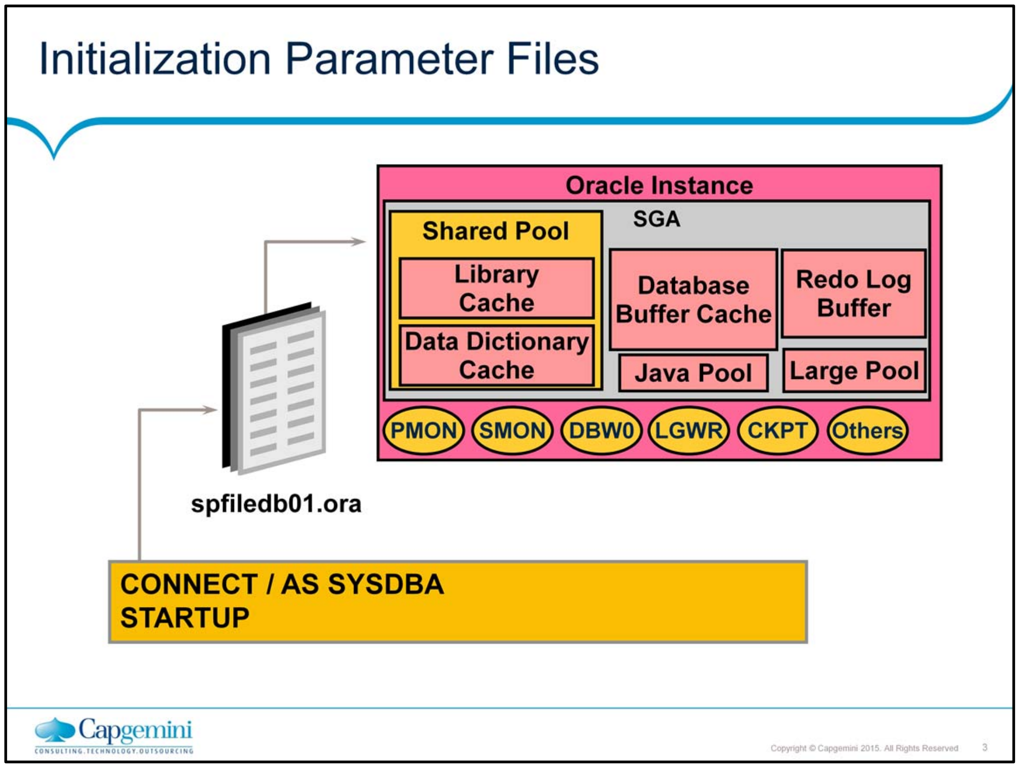
Oracle 11g DBA Fundamentals Overview

Lesson 03: 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

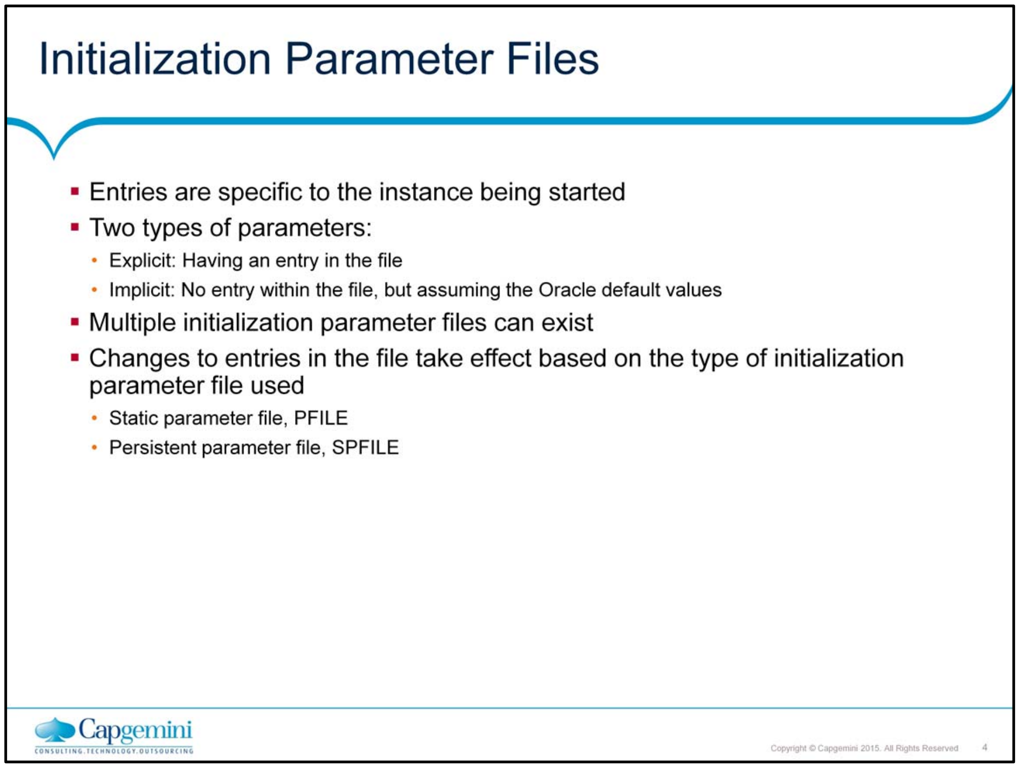


Initialization Parameter Files

```
CONNECT / AS SYSDBA
STARTUP
```

Initialization Parameter Files

To start an instance, the Oracle server must read the initialization parameter file.

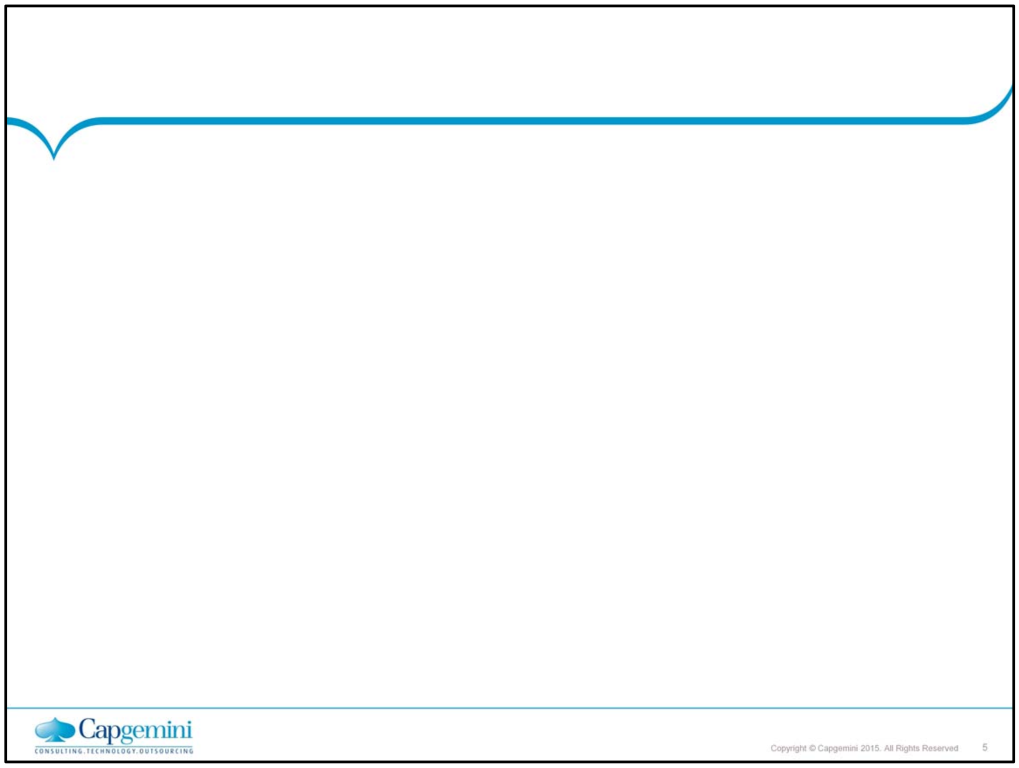


Initialization Parameter Files

- 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 parameter file, SPFILE

Initialization Parameter Files

- To start an instance, the Oracle server reads the initialization parameter file.
- Two types of initialization parameter files exist:
  - Static parameter file, PFILE, commonly referred to as initSID.ora.
  - Persistent parameter file, SPFILE, commonly referred to as spfileSID.ora.
- Initialization parameter file contents:
  - A list of instance parameters
  - The name of the database the instance is associated with
  - Allocations for memory structures of the System Global Area (SGA)
  - What to do with filled online redo log files
  - The names and locations of control files
  - Information about undo segments
- Multiple initialization parameter files can exist for an instance in order to optimize performance in different situations.



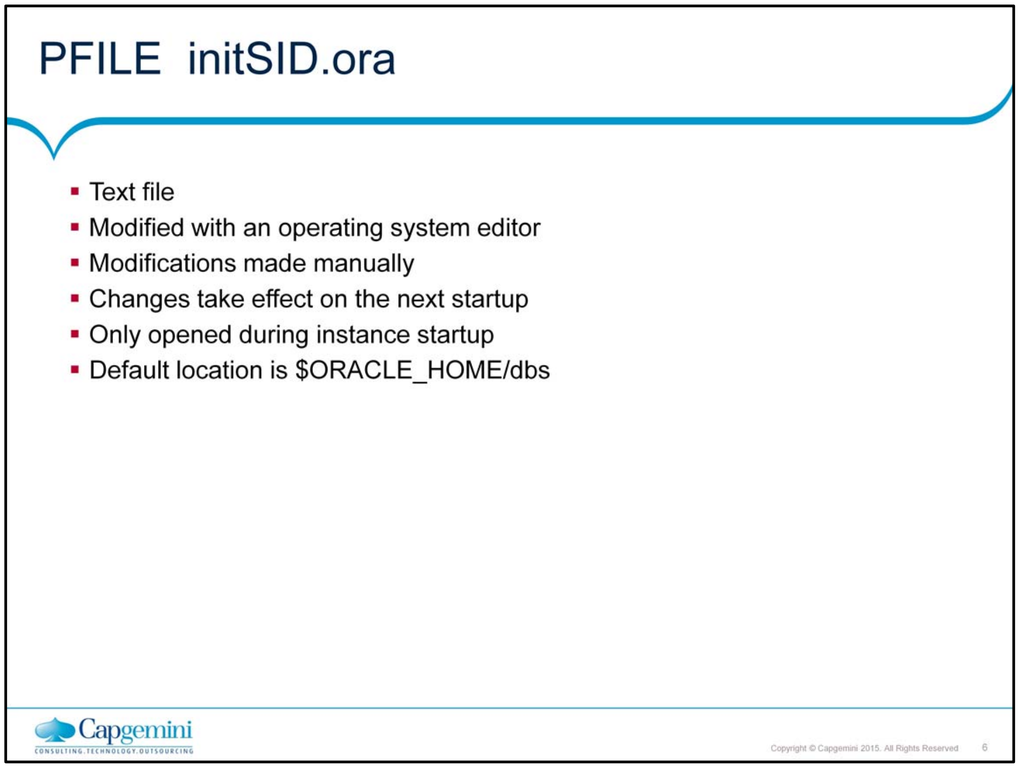
Initialization Parameter Files

Using Oracle Enterprise Manager to View Initialization Parameters

From the OEM Console:

1. Navigate to Databases > Instance > Configuration.

Select All Initialization Parameters from the General page.

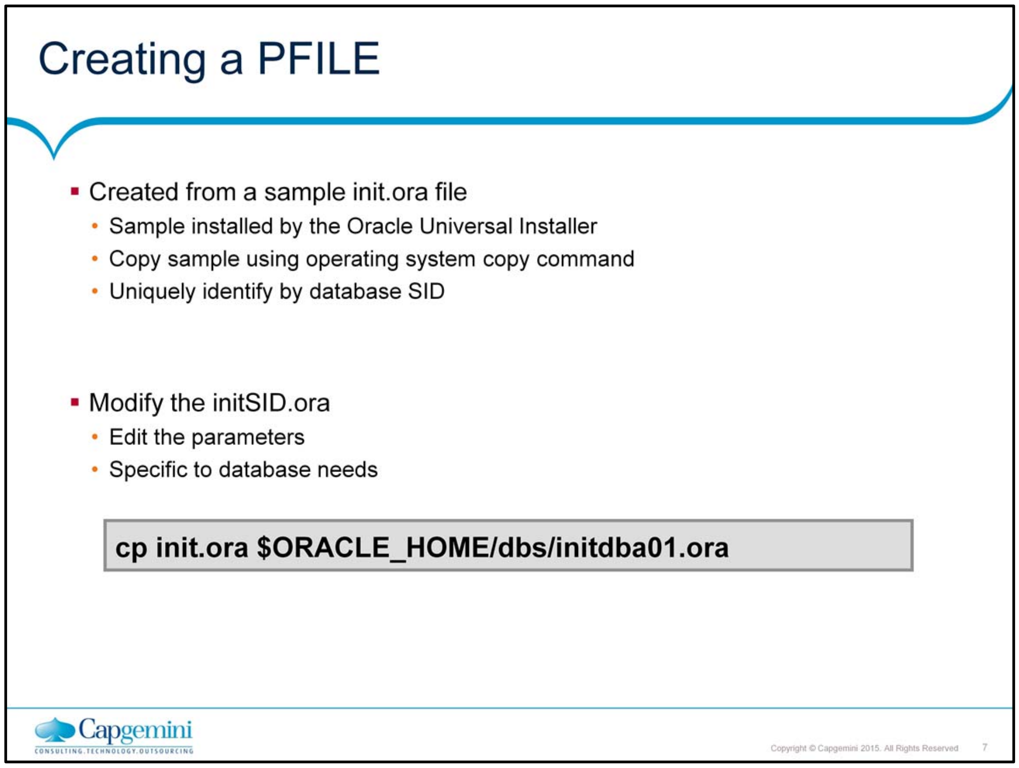


PFILE initSID.ora

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

PFILE

The PFILE is a text file that can be maintained using a standard operating system editor. The PFILE is read only during instance startup. If the file is modified, the instance must be shut down and restarted in order to make the new parameter values effective.
By default, located in the $ORACLE_HOME/dbs directory and named initSID.ora.



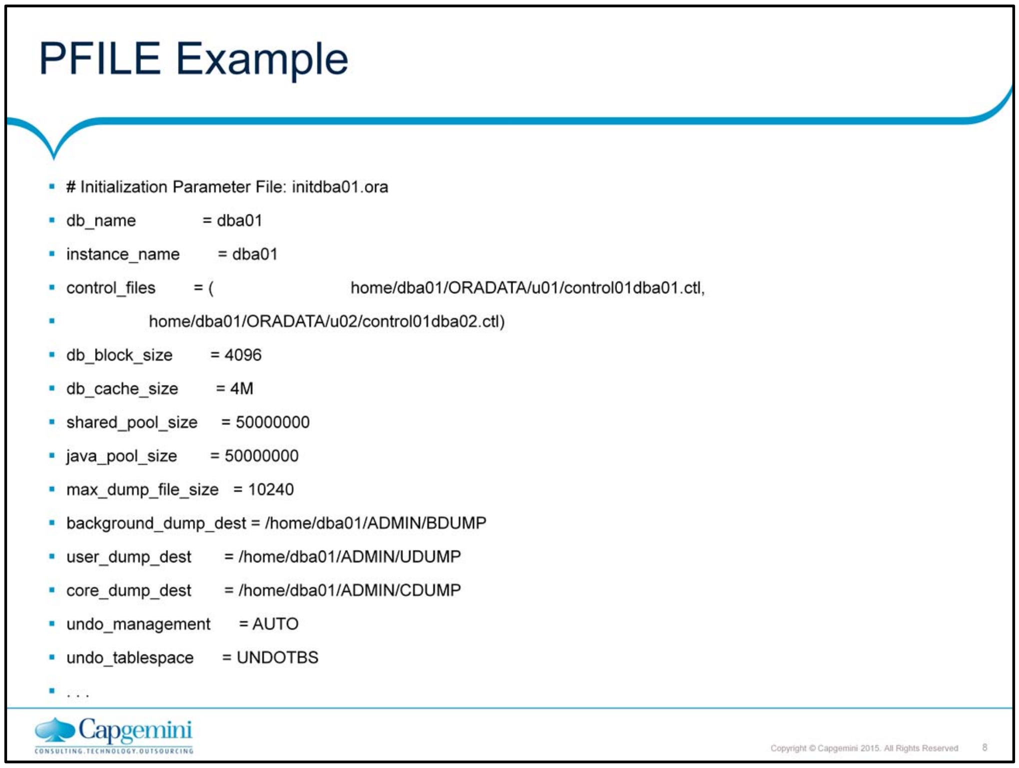
Creating a PFILE

- Created from a sample init.ora file
  - Sample installed by the Oracle Universal Installer
  - Copy sample using operating system copy command
  - Uniquely identify by database SID
- Modify the initSID.ora
  - Edit the parameters
  - Specific to database needs

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

Creating a PFILE

A sample init.ora file is created by the Universal Installer during installation. This sample init.ora file can be used to create an instance-specific initSID.ora. A text editor can be used to modify the parameters within the initSID.ora file.



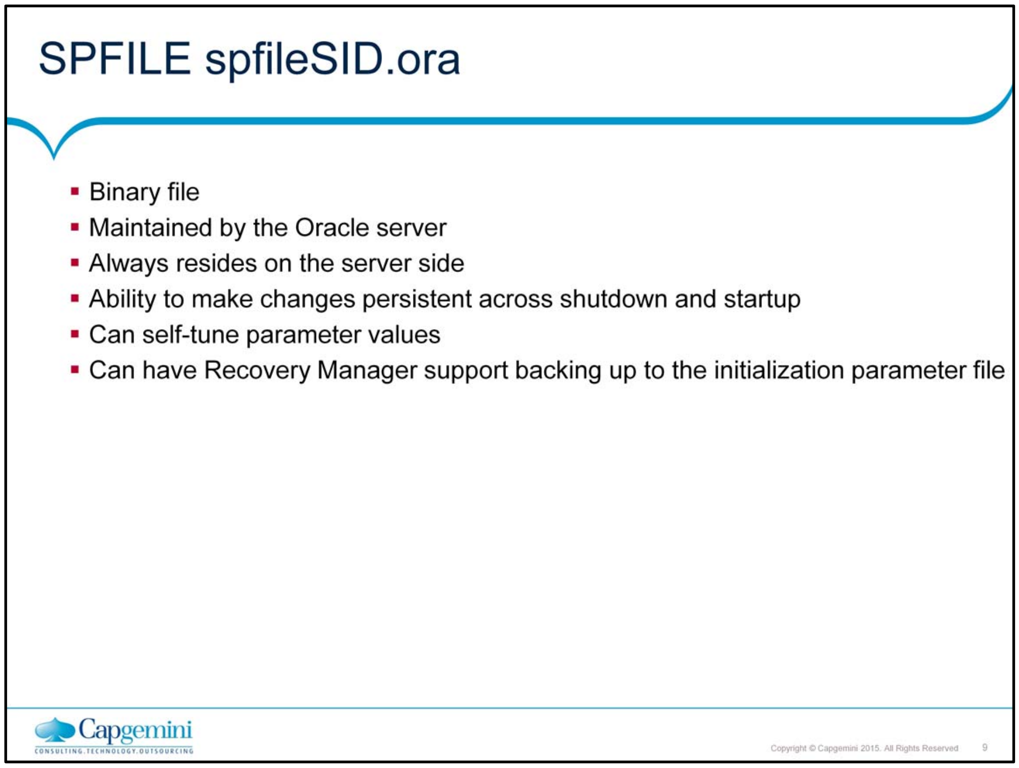
PFILE Example

```
# 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
. . .
```

PFILE Example

Specify the values in the following format: keyword=value.
The server has a default value for each parameter. This value may be operating system dependent, depending on the parameter.
Parameters can be specified in any order, although there are some exceptions.
Comment lines begin with the # symbol.
Enclose parameters in double quotation marks to include character literals.
Additional files can be included with the keyword IFILE.
If case is significant for the operating system, then it is also significant in filenames.
Multiple values are enclosed in parentheses and separated by commas.

Note: Develop a standard for listing parameters; either list them alphabetically or
group them by functionality. The PFILE varies from instance to instance and does not
necessarily look like the preceding example.

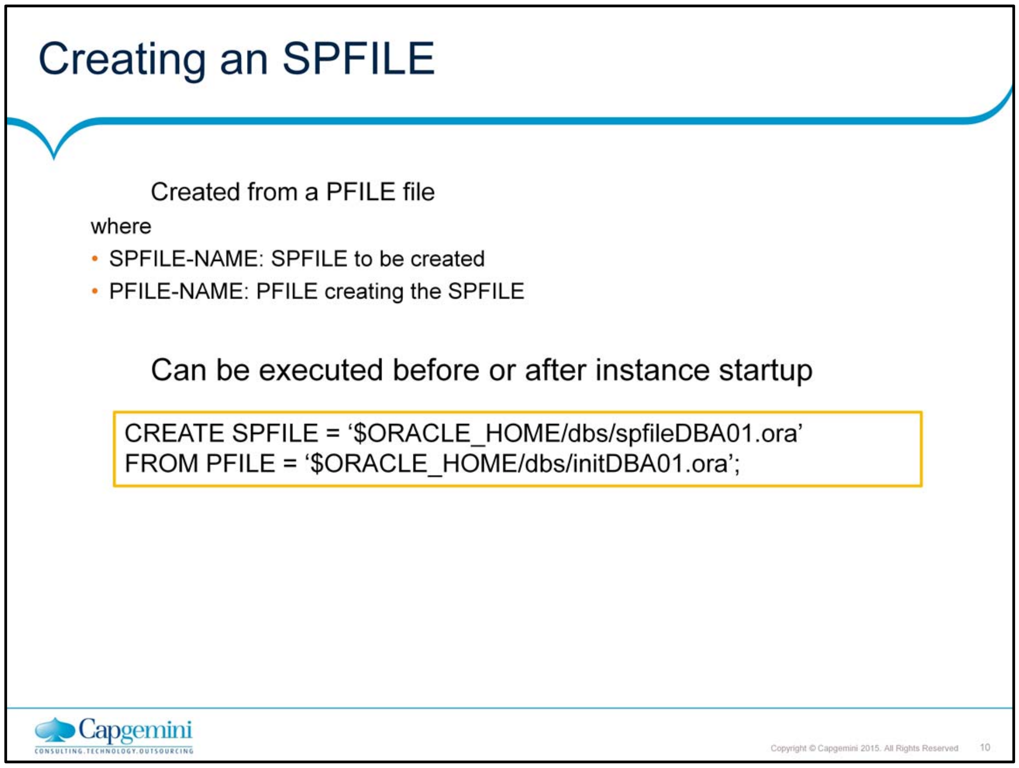


SPFILE spfileSID.ora

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

SPFILE

An SPFILE, new to Oracle9i, is a binary file. The file is not meant to be modified manually and must always reside on the server side. Once the file is created it is maintained by the Oracle server. If modified manually, the SPFILE is rendered useless. The SPFILE provides the ability to make changes to the database persistent across shutdown and startup. It also provides the ability to self-tune parameter values, which are recorded in the file. RMAN support for backing up the initialization parameter file is possible because the SPFILE resides on the server side. By default, the file is located in $ORACLE_HOME/dbs and has a default name in the format of spfileSID.ora.



Creating an SPFILE

Created from a PFILE file

where
- SPFILE-NAME: SPFILE to be created
- PFILE-NAME: PFILE creating the SPFILE

Can be executed before or after instance startup

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

Creating an SPFILE

An SPFILE is created from a PFILE file using the CREATE SPFILE command. This command requires the SYSDBA privilege to execute. This command can be executed before or after instance startup.

```
SQL> CREATE SPFILE [='SPFILE-NAME']
  2 FROM PFILE[='PFILE-NAME']
```

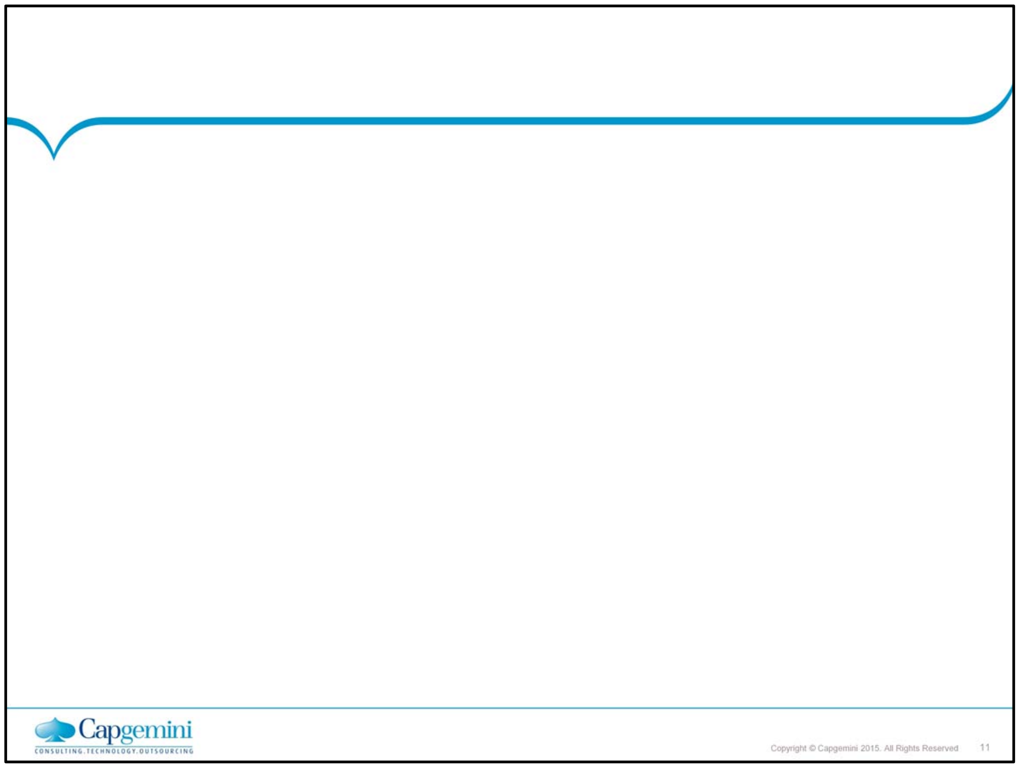
where:

SPFILE-NAME: Name of the SPFILE to be created

PFILE-NAME: Name of the PFILE being used to create the SPFILE. The PFILE must be available on the server side

If the SPFILE-NAME and PFILE-NAME are not included in the syntax, Oracle will use the default PFILE to generate an SPFILE with a system generated name.

```
SQL> CREATE SPFILE FROM PFILE;
```



Creating an SPFILE (continued)

Exporting an SPFILE:

The contents of an SPFILE can be exported into a PFILE.

```
  SQL> CREATE PFILE FROM SPFILE;
```

The PFILE is created as a text file on the server side. This command can be executed either before or after instance startup. This provides an easy way to view the SPFILE and make modifications by:

- Exporting the SPFILE to a PFILE
- Editing the PFILE
- Recreating the SPFILE from the edited PFILE

Exporting an SPFILE to a PFILE can also serve as another alternative to creating a backup of the persistent parameter file.

V$SPPARAMETER

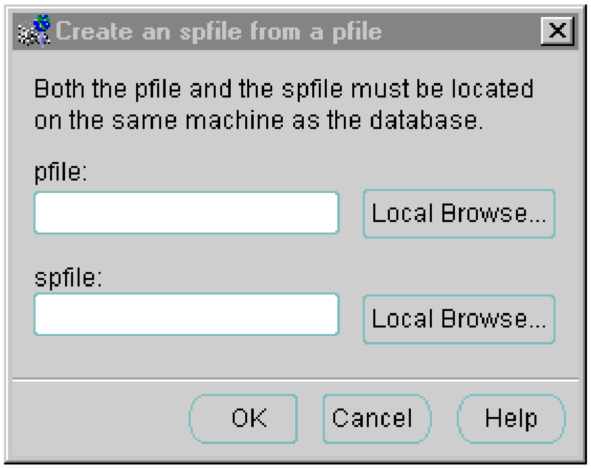
As shown above, there are several options for viewing the parameter settings within the SPFILE. V$SPPARAMETER is another source for presenting and viewing contents of the SPFILE.

Creating an SPFILE

Using Oracle Enterprise Manager to Create an SPFILE

From the OEM Console:

1. Select Object > Create spfile from the main menu.


Create an spfile from a pfile

Both the pfile and the spfile must be located on the same machine as the database.

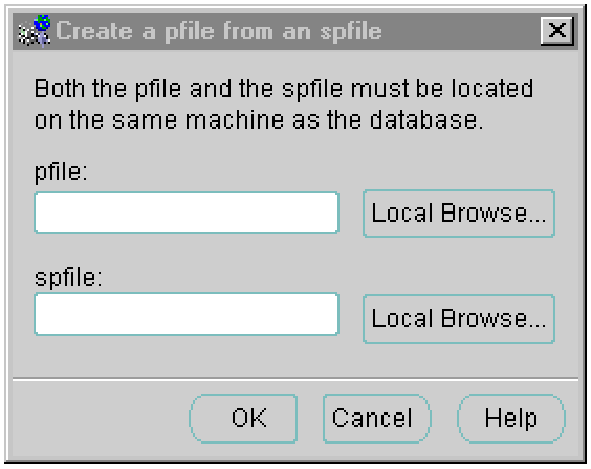
pfile:

spfile:

Using Oracle Enterprise Manager to Export an SPFILE

From the OEM Console:

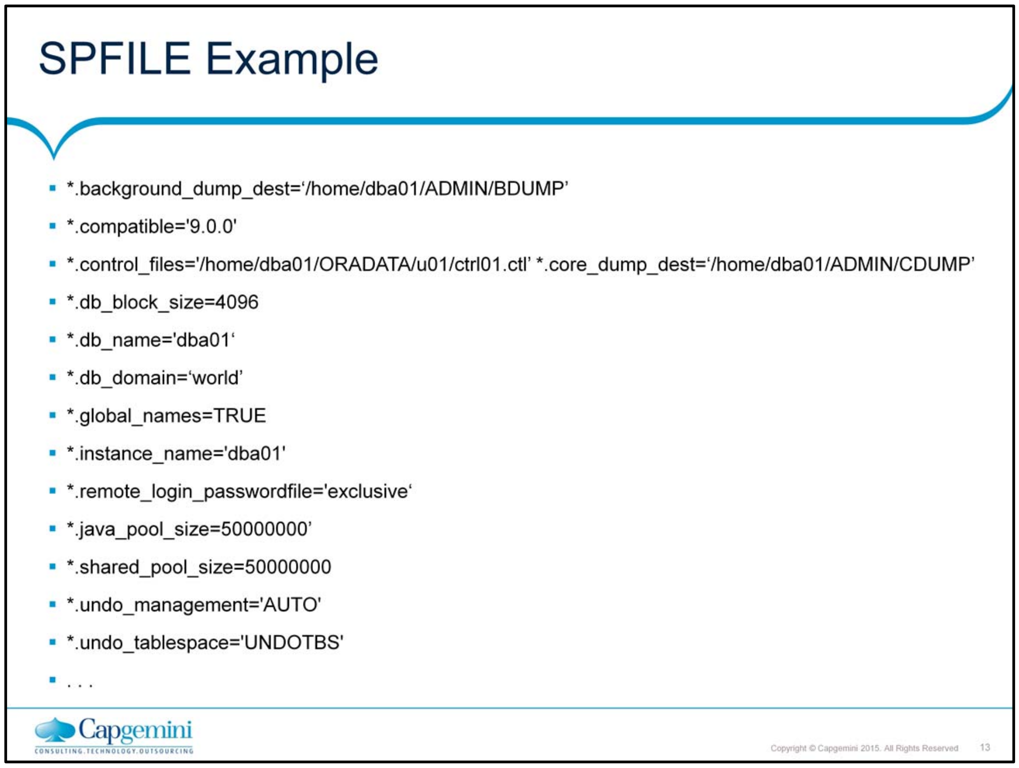
Select Object > Create pfile from the main menu.


Create a pfile from an spfile

Both the pfile and the spfile must be located on the same machine as the database.

pfile:

spfile:

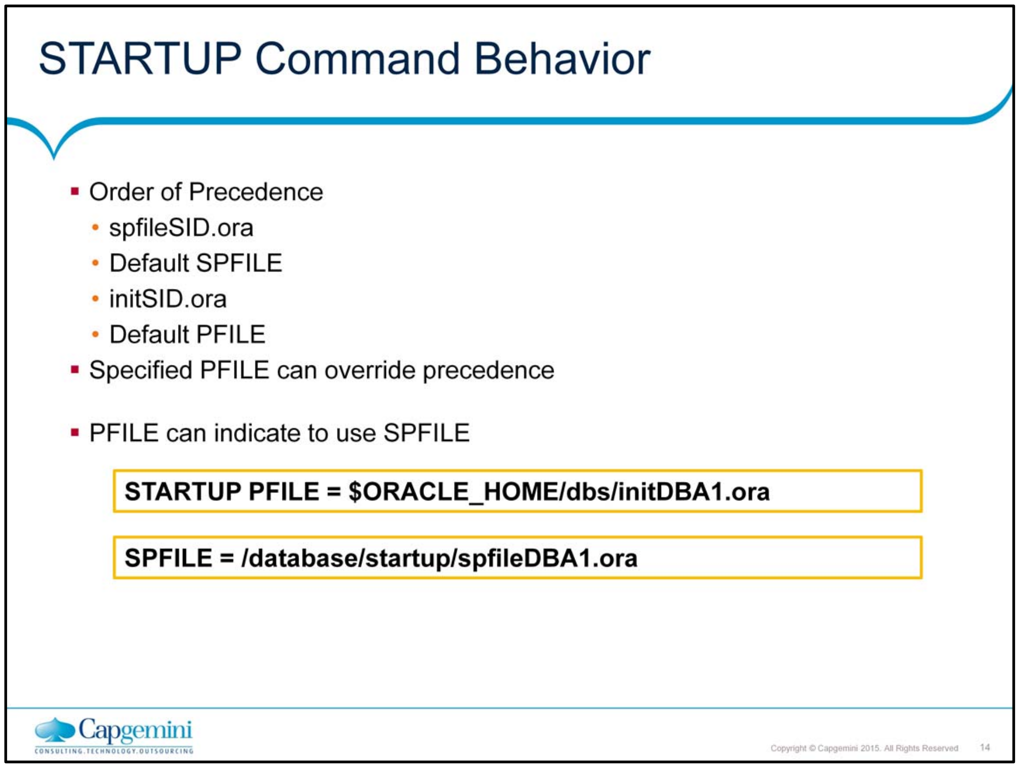


SPFILE Example

- *.background_dump_dest='/home/dba01/ADMIN/BDUMP'
- *.compatible='9.0.0'
- *.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'
- . . .

SPFILE Example

The comments specified on the same lines as a parameter setting in the PFILE are maintained in the SPFILE. All other comments are ignored. Although the text of an SPFILE is easily viewed in UNIX, the SPFILE is binary, and manual modification of the SPFILE will render it unusable. If you need to view the specific contents of an SPFILE or make some modification, export the SPFILE to a PFILE.



STARTUP Command Behavior

- Order of Precedence
  - spfileSID.ora
  - Default SPFILE
  - initSID.ora
  - Default PFILE
- Specified PFILE can override precedence
- PFILE can indicate to use SPFILE

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

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

STARTUP Command Behavior

Order of precedence:

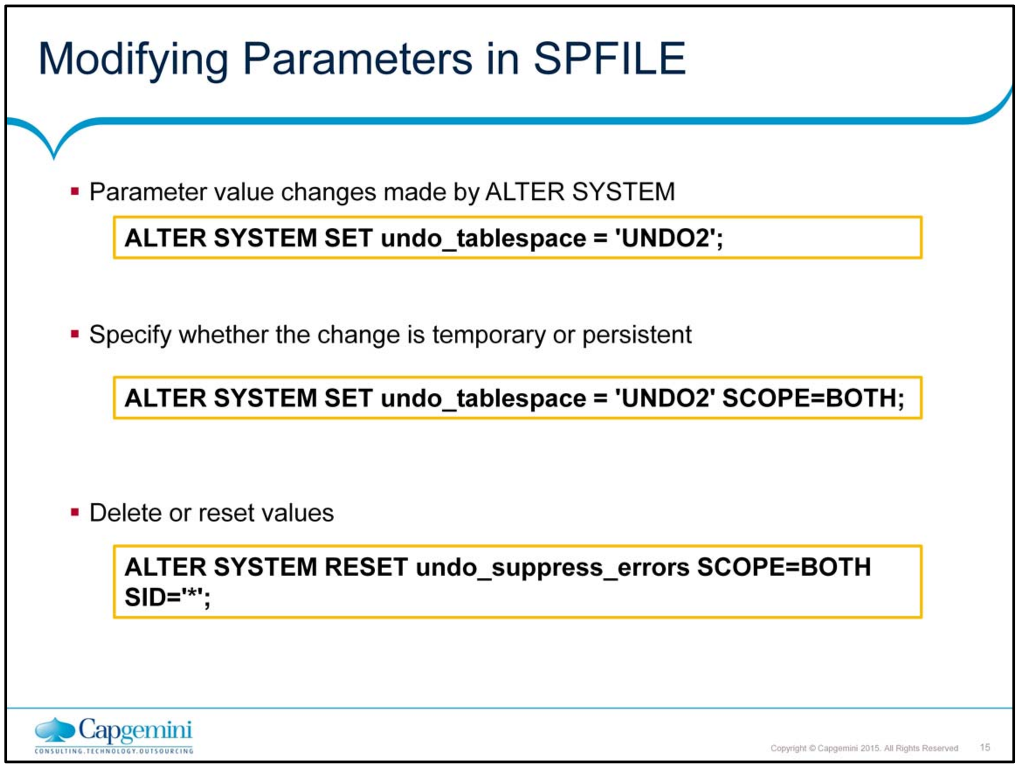
When the command STARTUP is used, the spfileSID.ora on the server side is used to start up the instance.

If the spfileSID.ora is not found, the default SPFILE on the server side is used to start the instance.

If the default SPFILE is not found, the initSID.ora on the server side will be used to start the instance.

A specified PFILE can override the use of the default SPFILE to start the instance.

A PFILE can optionally contain a definition to indicate use of an SPFILE. This is the only way to start the instance with an SPFILE in a non-default location. To start the database with an SPFILE not in the default location, SPFILE=<full path and filename> must be placed in the PFILE. Example: SPFILE=$HOME/ADMIN/PFILE/$ORACLE_SID.ora.



Modifying Parameters in SPFILE

- Parameter value changes made by ALTER SYSTEM

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

- Specify whether the change is temporary or persistent

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

- Delete or reset values

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

Modifying Parameters in SPFILE

The ALTER SYSTEM SET command is used to change the value of instance parameters.

```
ALTER SYSTEM SET parameter_name = parameter_value
[COMMENT 'text'] [SCOPE = MEMORY|SPFILE|BOTH]
[SID= 'sid'|'*']
```

where

parameter_name: Name of the parameter to be changed
parameter_value: Value the parameter is being changed to
COMMENT: A comment to be added into the SPFILE next to the parameter being altered
SCOPE: Determines if change should be made in memory, SPFILE, or in both areas
MEMORY: Changes the parameter value only in the currently running instance
SPFILE: Changes the parameter value in the SPFILE only
BOTH: Changes the parameter value in the currently running instance and the SPFILE
SID: Identifies the ORACLE_SID for the SPFILE being used
'sid': Specific SID to be used in altering the SPFILE
'*': Uses the default SPFILE

Modifying Parameters in SPFILE (continued)

Example:

```
SQL>  SHOW PARAMETERS undo_suppress_errors
   NAME                  TYPE       VALUE
   --------------------- ----------- -------
   undo_suppress_errors   boolean     FALSE

SQL> ALTER SYSTEM SET undo_suppress_errors = TRUE
  2  COMMENT = ‘temporary testing’ SCOPE=BOTH
  3  SID=‘DBA01’;
SQL> SHOW PARAMETERS undo_suppress_errors
   NAME                  TYPE       VALUE
   --------------------- ----------- -------
   undo_suppress_errors   boolean     TRUE
```

The ALTER SYSTEM RESET command is used to delete or revert to the default value.

SQL> ALTER SYSTEM RESET parameter_name [SCOPE = MEMORY|SPFILE|BOTH] [SID= ‘sid’|’*’]

Example:

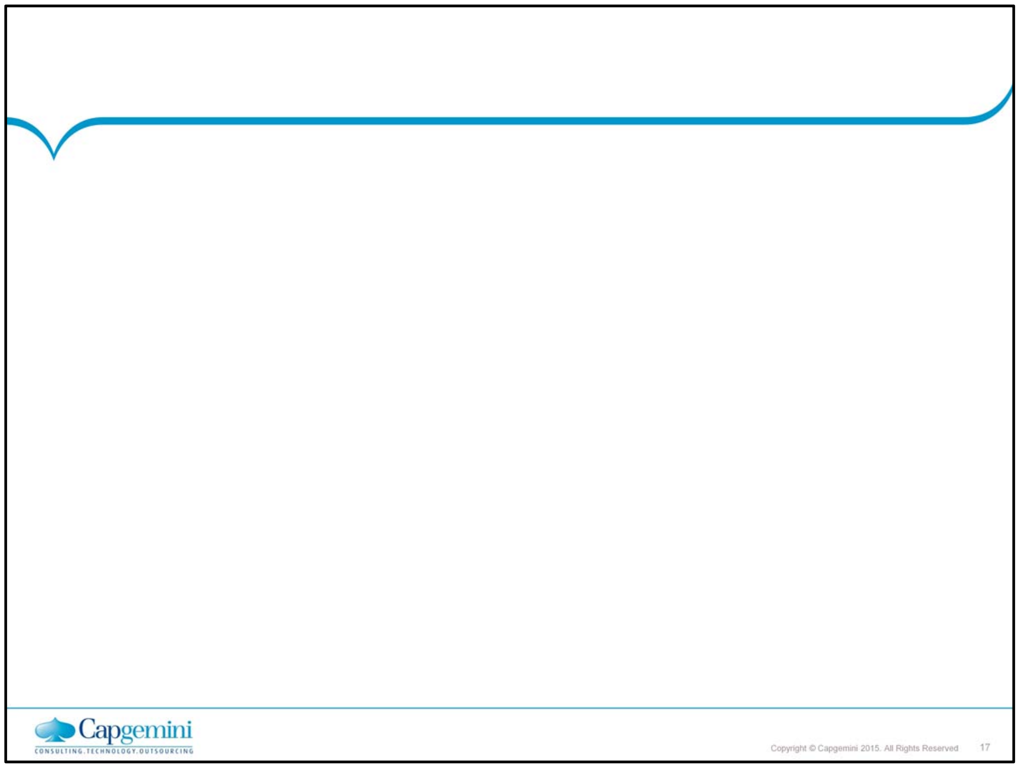
```
SQL> ALTER SYSTEM RESET undo_suppress_errors
  2  SCOPE=BOTH SID=‘dba01’;
```

Several ways exist to remove a parameter from the SPFILE:

Set the parameter back to its default value to simulate deleting using ALTER SYSTEM SET.

Recreate the SPFILE using CREATE SPFILE FROM PFILE.

Use ALTER SYSTEM RESET to delete the parameter from the SPFILE.



Modifying Parameters in SPFILE (continued)

Using Oracle Enterprise Manager to Modify the SPFILE Configuration

From the OEM Console:

Navigate to Databases > Instance

Click Configuration.

3. In the General page, click All Initialization Parameters.

4. Modify a parameter in the value column.

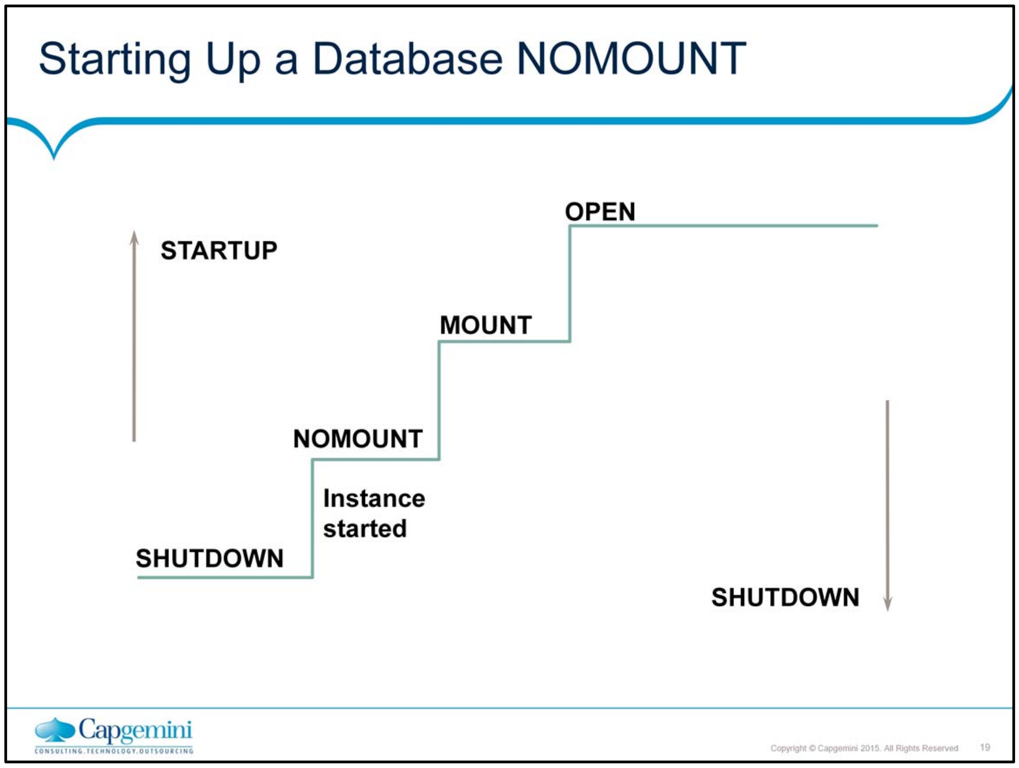
5. Click OK.

Parameters That Should Be Specified in the Initialization Parameter File

Parameter	**Description**
BACKGROUND_DUMP_DEST	Location where background process trace files are written (LGWR, DBWn, and so on). Also the location for the alert log file
COMPATIBLE	Version of the server with which this instance should be compatible
CONTROL_FILES	Names of the control files
DB_CACHE_SIZE	Specifies the size of the cache for standard block size buffers
DB_NAME	Database identifier of eight characters or fewer. This is the only parameter that is required when a new database is created
SHARED_POOL_SIZE	Size in bytes of the shared pool
USER_DUMP_DEST	Location where user debugging trace files are created on behalf of a user process

Note: The default values depend on the version of the Oracle server.
Commonly Modified Parameters

Parameter	**Description**
IFILE	Name of another parameter file to be embedded within the current parameter file. Up to three levels of nesting is possible
LOG_BUFFER	Number of bytes allocated to the redo log buffer in the SGA
MAX_DUMP_FILE_SIZE	Maximum size of the trace files, specified as number of operating system blocks
PROCESSES	Maximum number of operating system processes that can connect simultaneously to this instance
SQL_TRACE	Enables or disables the SQL trace facility for every user session
TIMED_STATISTICS	Enables or disables timing in trace files and in monitor screens



Starting Up a Database NOMOUNT

Starting Up a Database

When starting the database, you select the state in which it starts. The following scenarios describe different stages of starting up an instance.

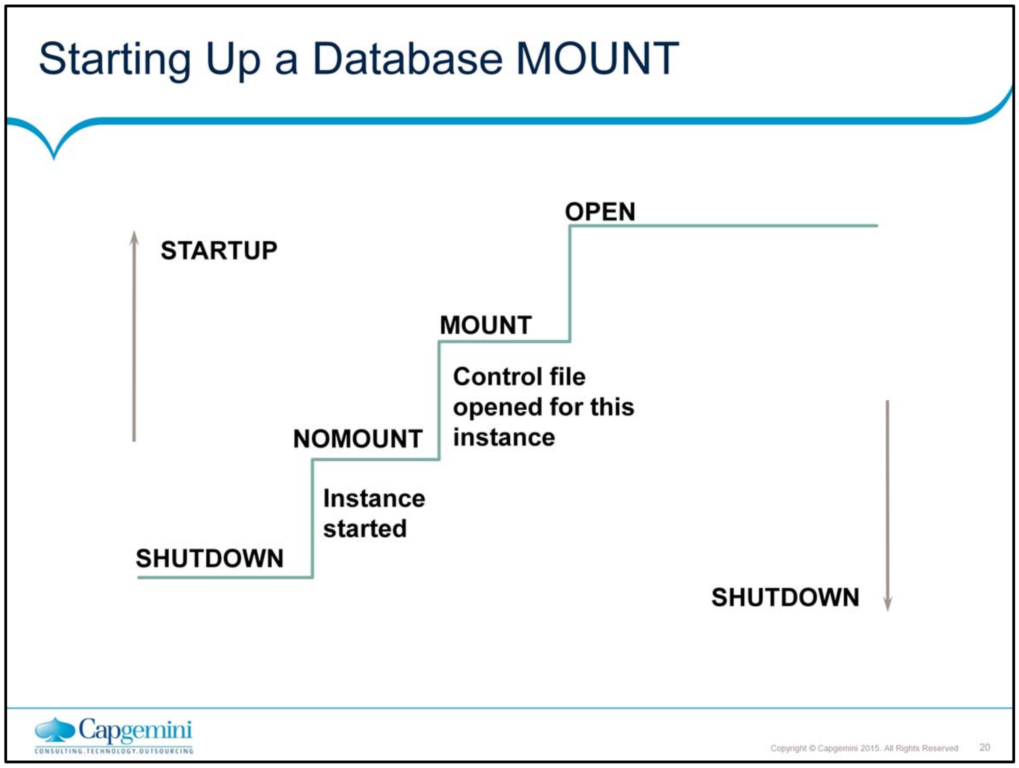
Starting the instance (NOMOUNT):

An instance would be started in the NOMOUNT stage only during database creation or the re-creation of control files.

Starting an instance includes the following tasks:

- Reading the initialization file from $ORACLE_HOME/dbs in the following order:
  - First spfileSID.ora
  - If not found then, spfile.ora
  - If not found then, initSID.ora
  - Specifying the PFILE parameter with STARTUP overrides the default behavior.
- Allocating the SGA
- Starting the background processes
- Opening the alertSID.log file and the trace files

The database must be named with the DB_NAME parameter either in the initialization parameter file or in the STARTUP command.



Starting Up a Database MOUNT

Starting Up a Database

Mounting the database (MOUNT):

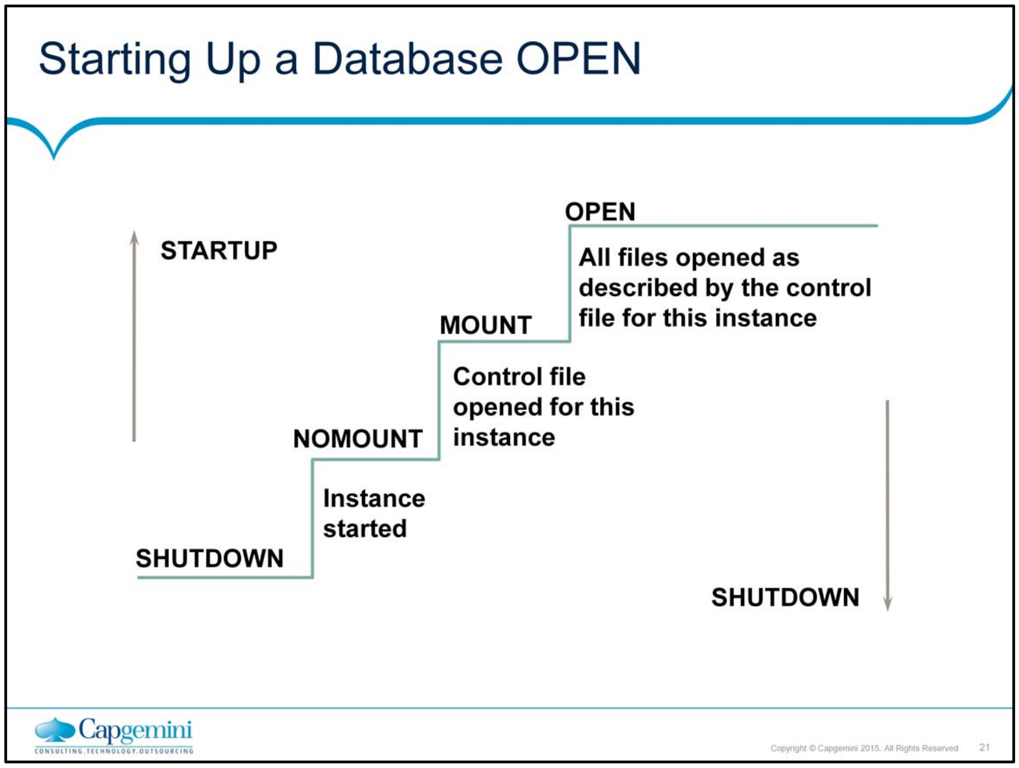
To perform specific maintenance operations, you start an instance and mount a database but do not open the database.

For example, the database must be mounted but not open during the following tasks:

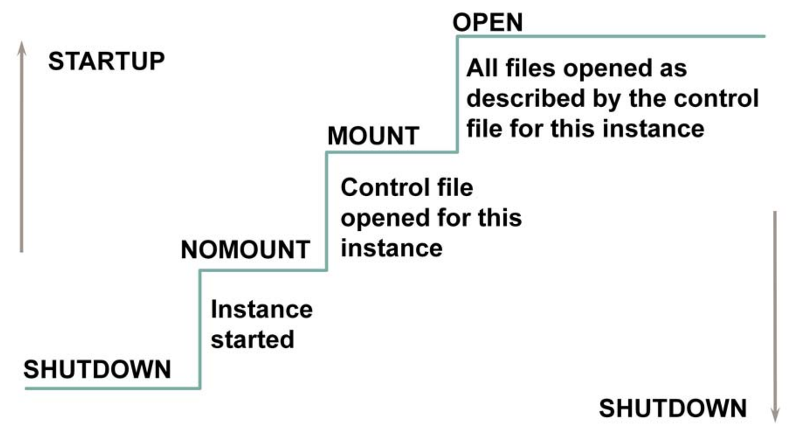
- Renaming datafiles
- Enabling and disabling redo log archiving options
- Performing full database recovery

Mounting a database includes the following tasks:

- Associating a database with a previously started instance
- Locating and opening the control files specified in the parameter file
- Reading the control files to obtain the names and status of the datafiles and redo log files. However, no checks are performed to verify the existence of the datafiles and online redo log files at this time.



Starting Up a Database OPEN


OPEN
STARTUP
All files opened as described by the control file for this instance
MOUNT
Control file opened for this instance
NOMOUNT
Instance started
SHUTDOWN
SHUTDOWN

Starting Up a Database

Opening the database (OPEN):

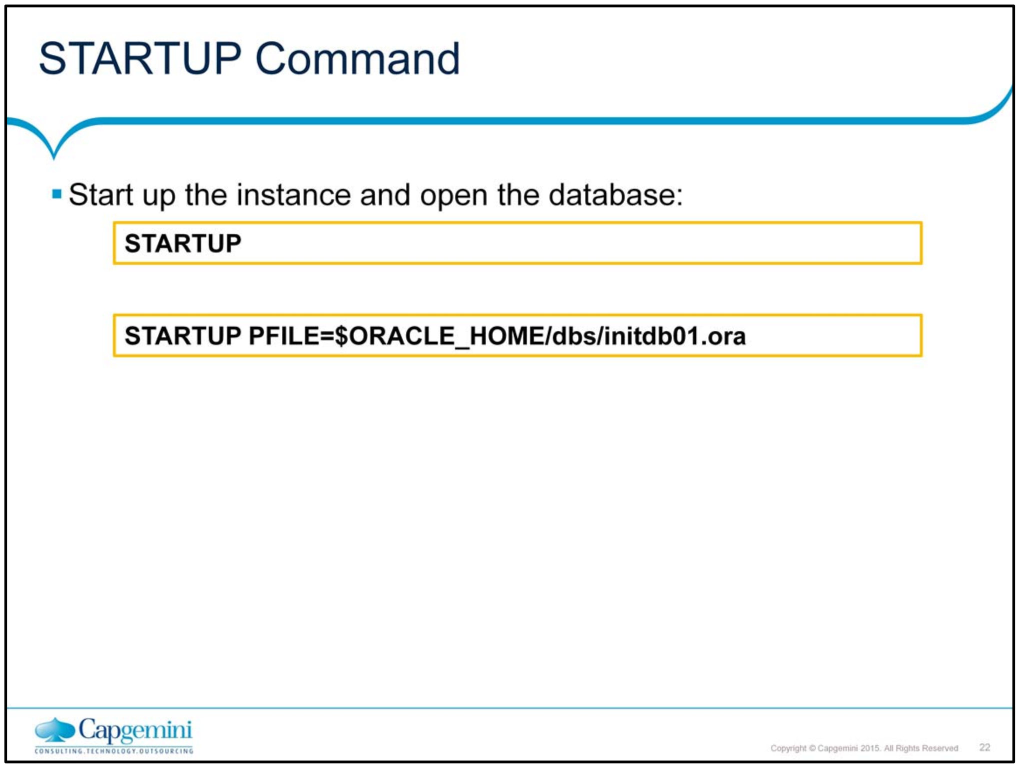
Normal database operation means that an instance is started and the database is mounted and open. With normal database operation, any valid user can connect to the database and perform typical data access operations.

Opening the database includes the following tasks:

- Opening the online datafiles
- Opening the online redo log files

If any of the datafiles or online redo log files are not present when you attempt to open the database, the Oracle server returns an error.

During this final stage, the Oracle server verifies that all the datafiles and online redo log files can be opened and checks the consistency of the database. If necessary, the System Monitor (SMON) background process initiates instance recovery.



STARTUP Command

- Start up the instance and open the database:

```
STARTUP
```

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

STARTUP Command

To start up an instance, use the following command:

```
STARTUP [FORCE] [RESTRICT] [PFILE=filename]
          [OPEN [RECOVER][database]
          |MOUNT
          |NOMOUNT]
```

(Note: This is not the complete syntax.)

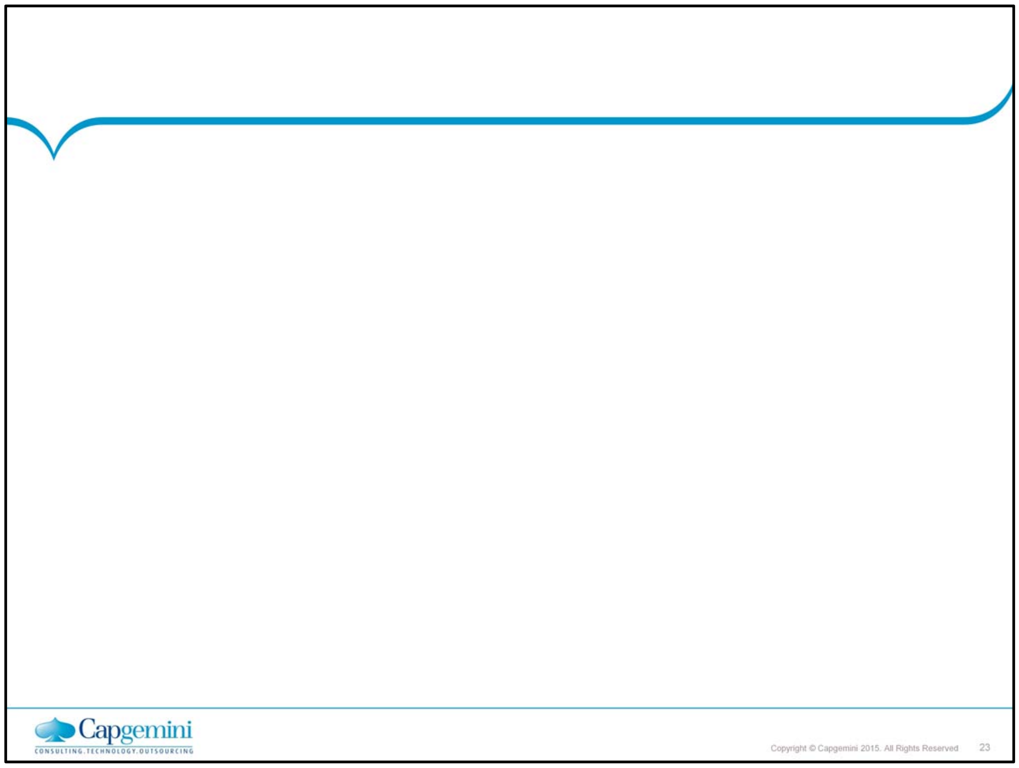
where:

OPEN: Enables users to access the database

MOUNT: Mounts the database for certain DBA activities but does not provide user access to the database

NOMOUNT: Creates the SGA and starts up the background processes but does not provide access to the database

PFILE=parfile: Enables a nondefault parameter file to be used to configure the instance



Starting Up (continued)

FORCE: Aborts the running instance before performing a normal startup.

RESTRICT: Enables only users with RESTRICTED SESSION privilege to access the database.

RECOVER: Begins media recovery when the database starts.

Automating database startup:

On UNIX:

Automating database startup and shutdown can be controlled by the entries in a special operating system file; for example, oratab in the /var/opt/oracle directory.

Note: Refer to the installation guide of your operating system for more information.

Troubleshooting:

If any errors are encountered while issuing the STARTUP command the SHUTDOWN command must be issued before another STARTUP.

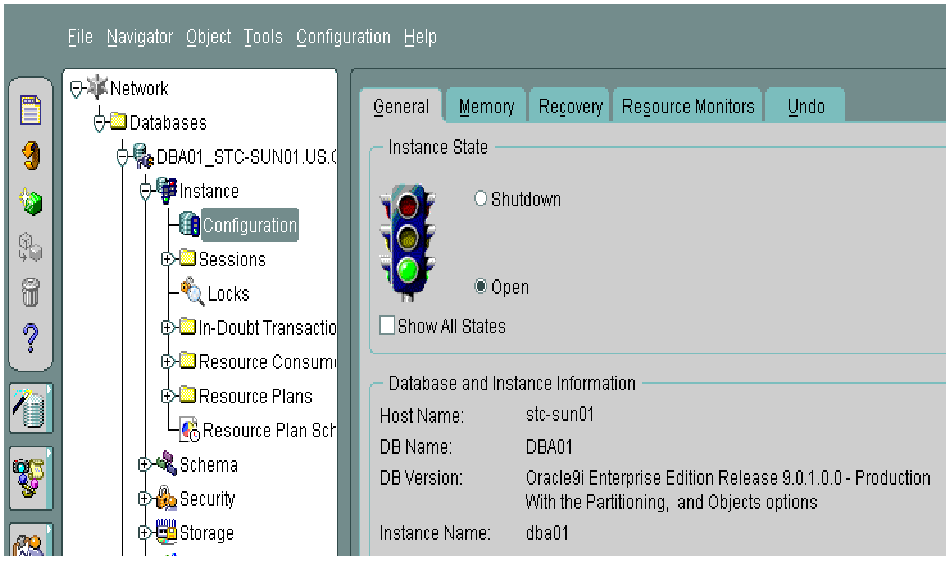
Note: STARTUP and SHUTDOWN commands are SQL*Plus commands, not SQL commands.

Shutdown Options (continued)

Using Oracle Enterprise Manager to Start Up a Database

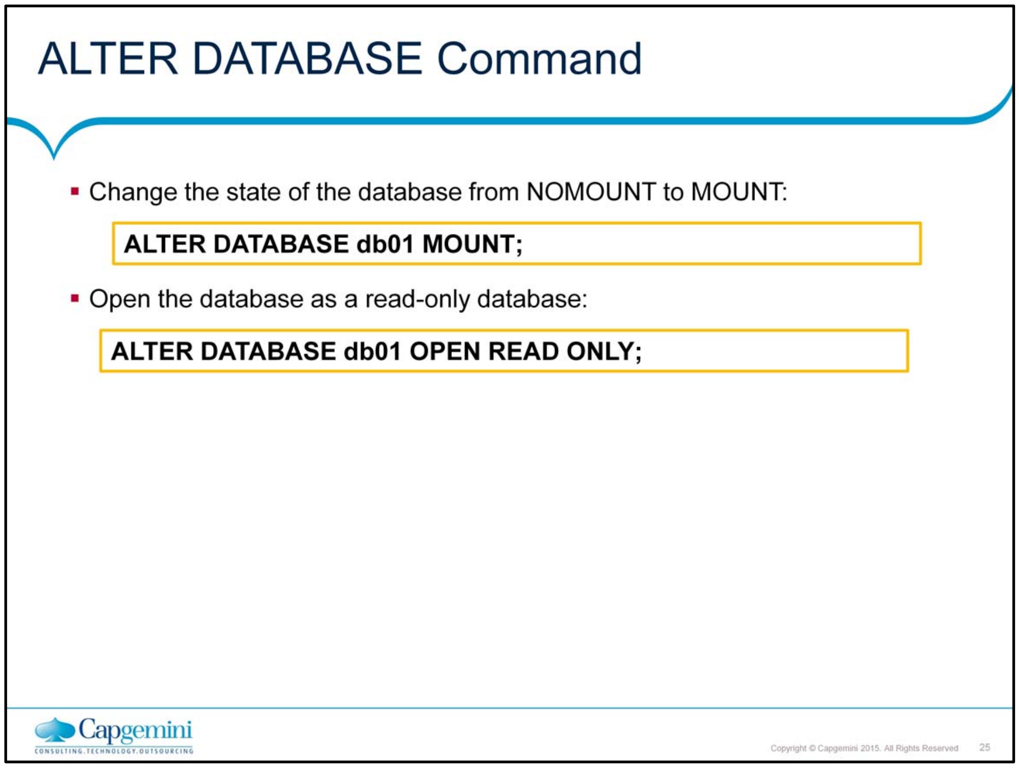
From the OEM Console:
Navigate to Databases > Instance
Click Configuration
From the General tab, select the Open option.
Click Apply.

Note: You must be connected to the database with SYSDBA privileges to perform startup.



Instance State: Shutdown [✓ Open]

Host Name:	stc-sun01
DB Name:	DBA01
DB Version:	Oracle9i Enterprise Edition Release 9.0.1.0.0 - Production With the Partitioning, and Objects options
Instance Name:	dba01



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;
```

ALTER DATABASE Command

To move the database from the NOMOUNT to a MOUNT stage or from the MOUNT to an OPEN stage, use the ALTER DATABASE command:

ALTER DATABASE { MOUNT | OPEN }

To prevent data from being modified by user transactions, the database can be opened in read-only mode.

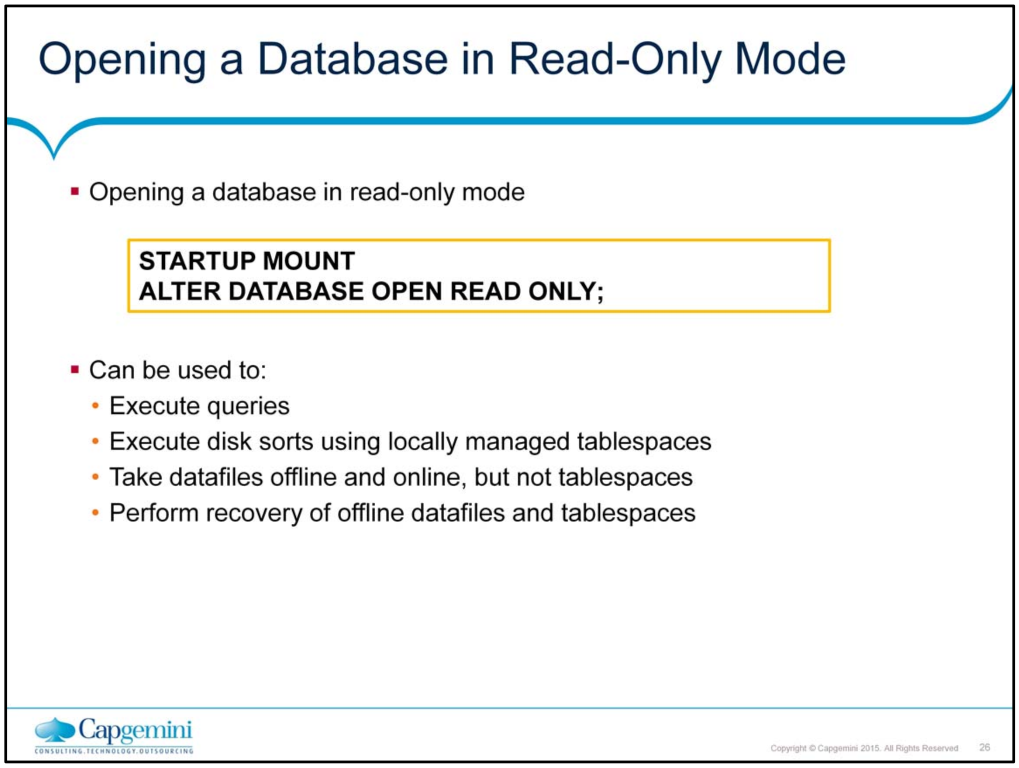
To start up an instance, use the following command:

ALTER DATABASE OPEN [READ WRITE| READ ONLY]

where:

READ WRITE: Opens the database in read-write mode, so that users can generate redo logs.

READ ONLY: Restricts users to read-only transactions, preventing them from generating redo log information.



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 datafiles offline and online, but not tablespaces
  - Perform recovery of offline datafiles and tablespaces

Opening a Database in Read-Only Mode

A database can be opened as read-only, as long as it is not already open in read-write mode. The feature is especially useful for a standby database to offload query processing from the production database.

If a query needs to use a temporary tablespace, for example, to do disk sorts, the current user must have a locally managed tablespace assigned as the default temporary tablespace; otherwise, the query fails. For user SYS, a locally managed tablespace is required.

Note: Locally managed tablespaces are discussed in a later lesson.

Read-only mode does not restrict database recovery or operations that change the database state without generating redo data. For example, in read-only mode:

- Datafiles can be taken offline and online.
- Recovery of offline datafiles and tablespaces can be performed.

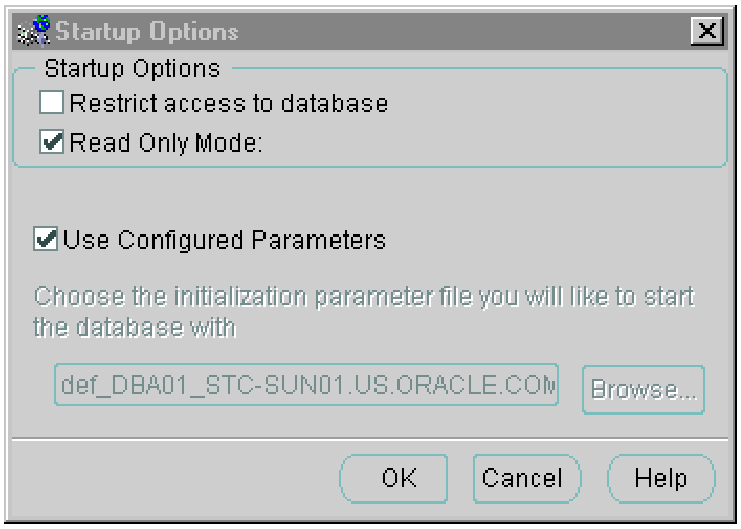
Disk writes to other files, such as control files, operating system audit trails, trace files, and alert log files, can continue in read-only mode.

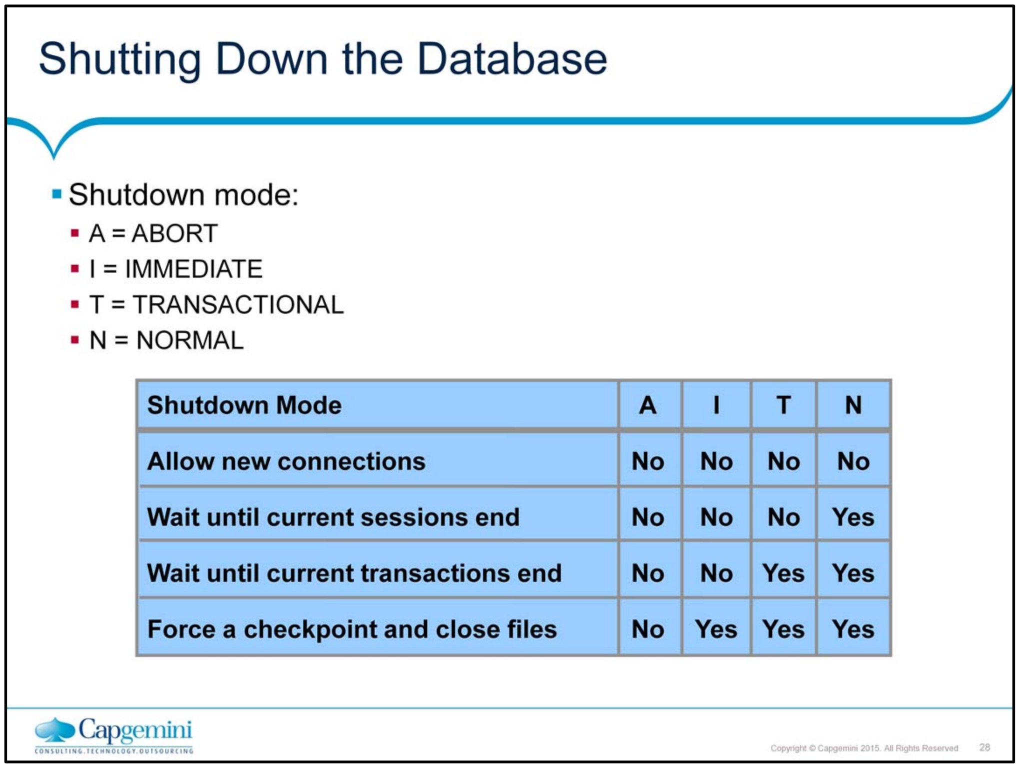
Shutdown Options (continued)

Using Oracle Enterprise Manager to Start a Database in Read Only Mode

From the OEM Console:
Navigate to Instance > Configuration.
Select the General page.
Under Instance State, select the Shutdown option.
Select Apply.
The Shutdown Options dialog box will appear. Select the Immediate option.
Select OK.
Select Close when processing is complete.
Under Instance State, select the Open option.
Select OK.
The Startup Options dialog box will appear. Select Read Only Mode option.
Select OK.
Click Close when processing complete.

Note: You must be connected to the database with SYSDBA privileges.


Startup Options
Startup Options
☐ Restrict access to database
☑ Read Only Mode:
☑ Use Configured Parameters
Choose the initialization parameter file you will like to start the database with
def_DBA01_STC-SUN01.US.ORACLE.COM



Shutting Down the Database

- Shutdown mode:
  - A = ABORT
  - I = IMMEDIATE
  - T = TRANSACTIONAL
  - N = NORMAL

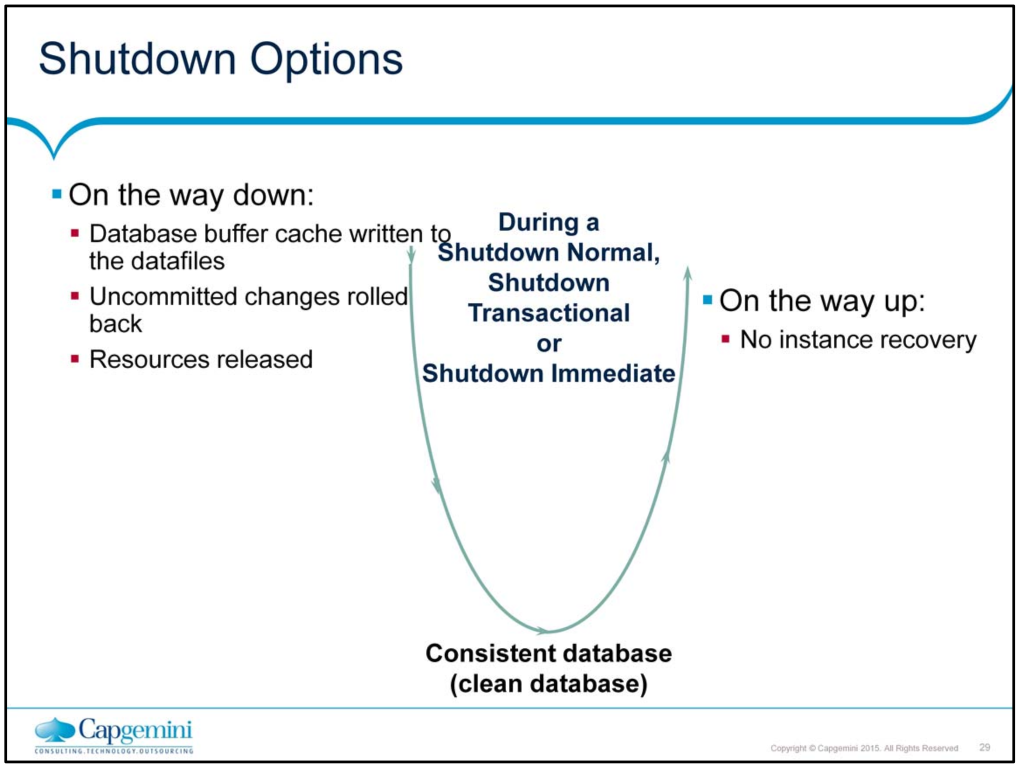
Shutdown Mode	A	I	T	N
Allow new connections	No	No	No	No
Wait until current sessions end	No	No	No	Yes
Wait until current transactions end	No	No	Yes	Yes
Force a checkpoint and close files	No	Yes	Yes	Yes

Shutting Down the Database

Shut down the database to make operating system offline backups of all physical structures and to have modified static initialization parameters take effect when restarted.

To shut down an instance you must connect as SYSOPER or SYSDBA and use the following command:

SHUTDOWN [NORMAL | TRANSACTIONAL | IMMEDIATE | ABORT]



Shutdown Options

- On the way down:
  - Database buffer cache written to the datafiles
  - Uncommitted changes rolled back
  - Resources released
- On the way up:
  - No instance recovery

During a
Shutdown Normal,
Shutdown
Transactional
or
Shutdown Immediate
Consistent database
(clean database)
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Shutdown Options

Shutdown normal:

Normal is the default shutdown mode. Normal database shutdown proceeds with the following conditions:

No new connections can be made.

The Oracle server waits for all users to disconnect before completing the shutdown.

Database and redo buffers are written to disk.

Background processes are terminated, and the SGA is removed from memory.

Oracle closes and dismounts the database before shutting down the instance.

The next startup does not require an instance recovery.

Shutdown transactional:

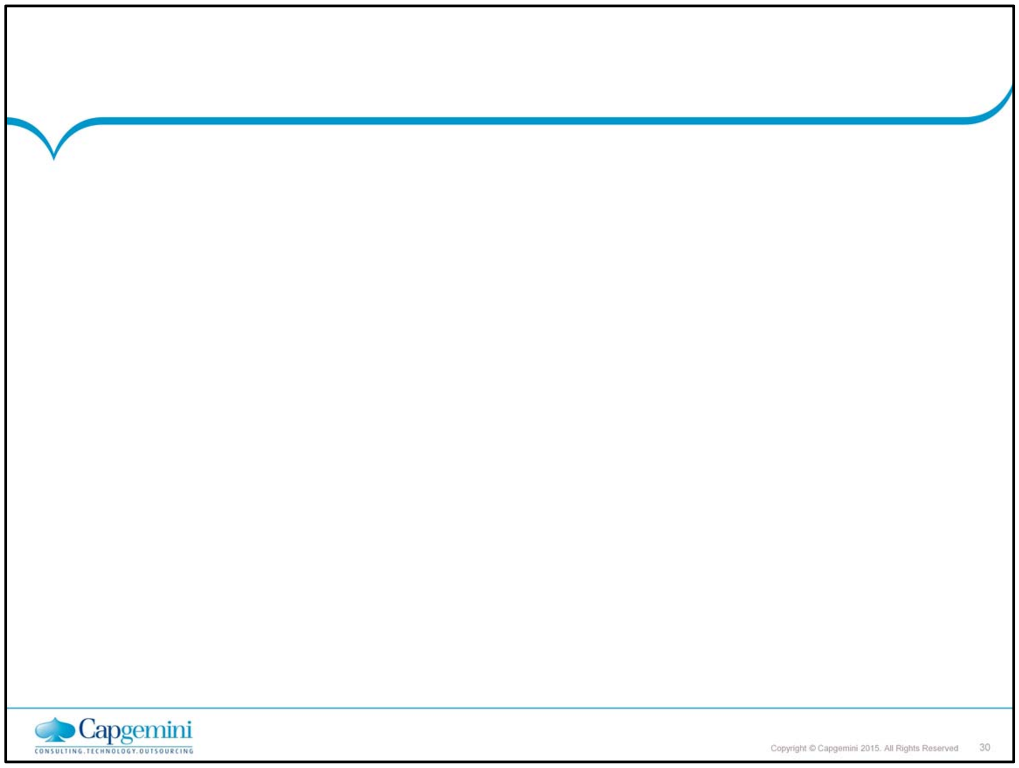
A transactional shutdown prevents clients from losing work. A transactional database shutdown proceeds with the following conditions:

No client can start a new transaction on this particular instance.

A client is disconnected when the client ends the transaction that is in progress.

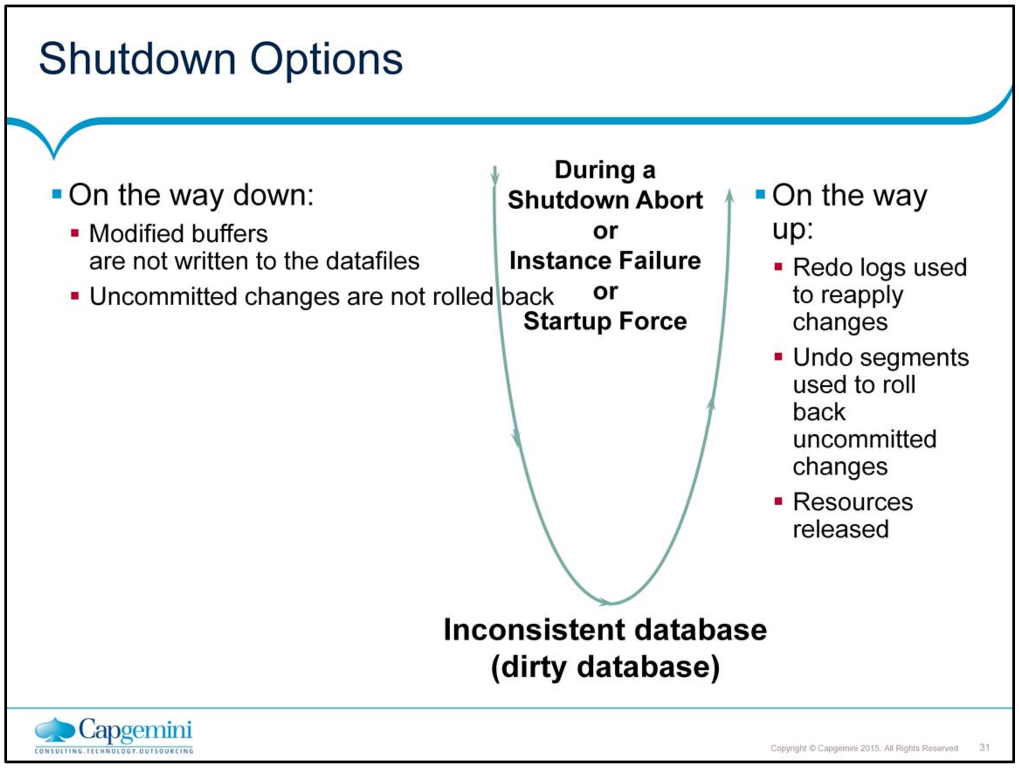
When all transactions have finished, a shutdown immediately occurs.

The next startup does not require an instance recovery.



Shutdown Options (continued)

- Shutdown immediate:
- Immediate database shutdown proceeds with the following conditions:
  - Current SQL statements being processed by Oracle are not completed.
  - The Oracle server does not wait for the users, who are currently connected to the database, to disconnect.
  - Oracle rolls back active transactions and disconnects all connected users.
  - Oracle closes and dismounts the database before shutting down the instance.
  - The next startup does not require an instance recovery.



Shutdown Options

- On the way down:
  - Modified buffers are not written to the datafiles
  - Uncommitted changes are not rolled back

During a
Shutdown Abort
or
Instance Failure
or
Startup Force
Inconsistent database
(dirty database)

- On the way up:
  - Redo logs used to reapply changes
  - Undo segments used to roll back uncommitted changes
  - Resources released

Shutdown Options

Shutdown abort:

If the normal and immediate shutdown options do not work, you can abort the current database instance. Aborting an instance proceeds with the following conditions:

Current SQL statements being processed by the Oracle server are immediately terminated.

Oracle does not wait for users currently connected to the database to disconnect.

Database and redo buffers are not written to disk.

Uncommitted transactions are not rolled back.

The instance is terminated without closing the files.

The database is not closed or dismounted.

The next startup requires instance recovery, which occurs automatically.

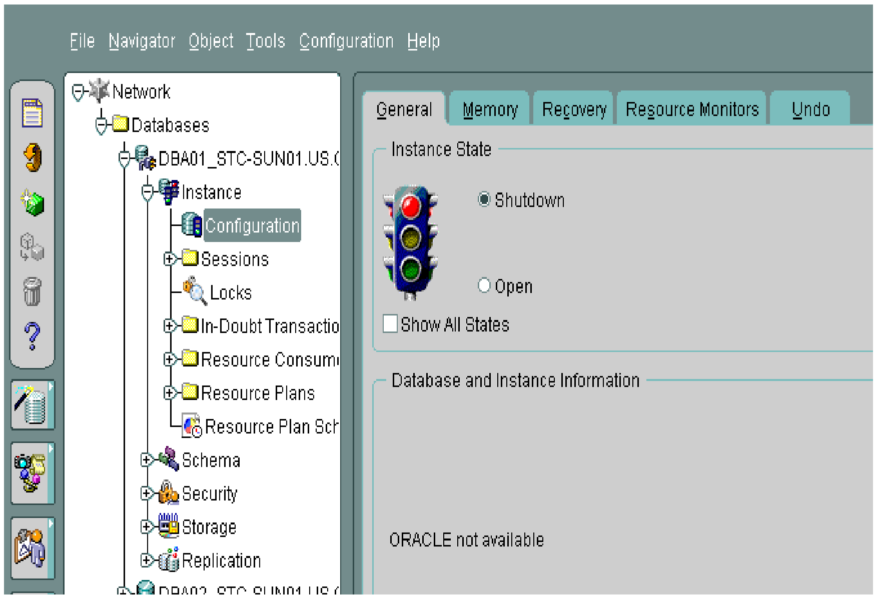
Note: It is not advisable to backup a database that is in an inconsistent state.

Shutdown Options (continued)

Using Oracle Enterprise Manager to Shut Down a Database

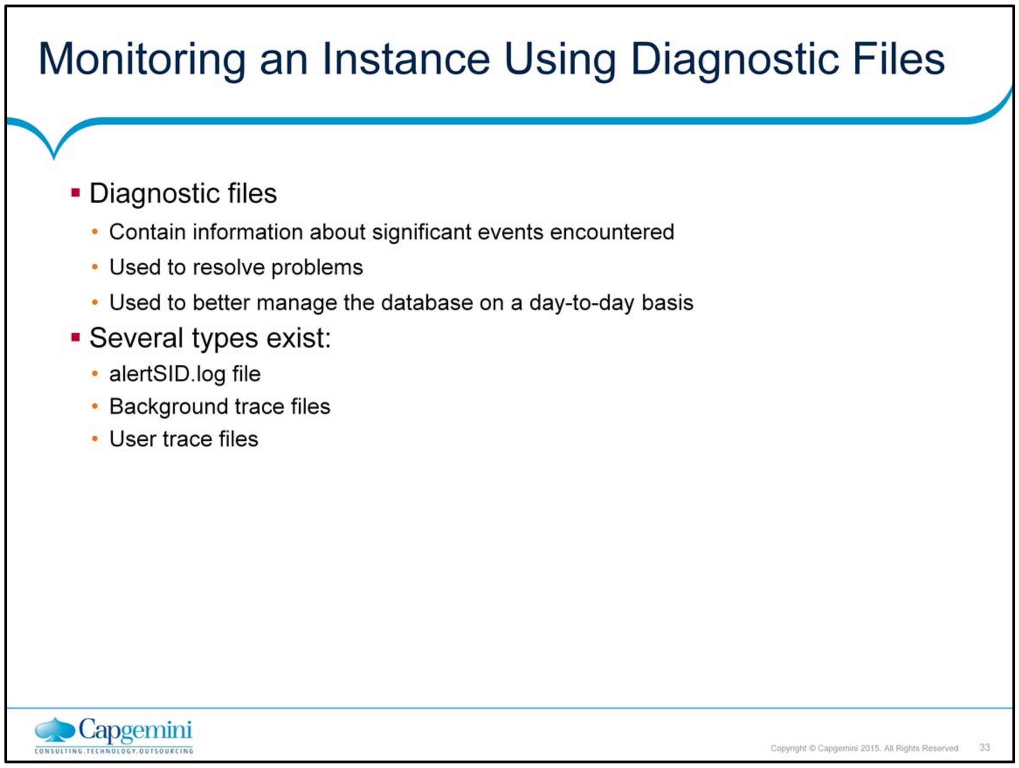
From the OEM Console:
Navigate to Databases > Instance
Click Configuration
From the General tab, select the Open option.
Click Apply.

Note: You must be connected to the database with SYSDBA privileges to perform shutdown.



[✓ Shutdown] Open

ORACLE not available



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

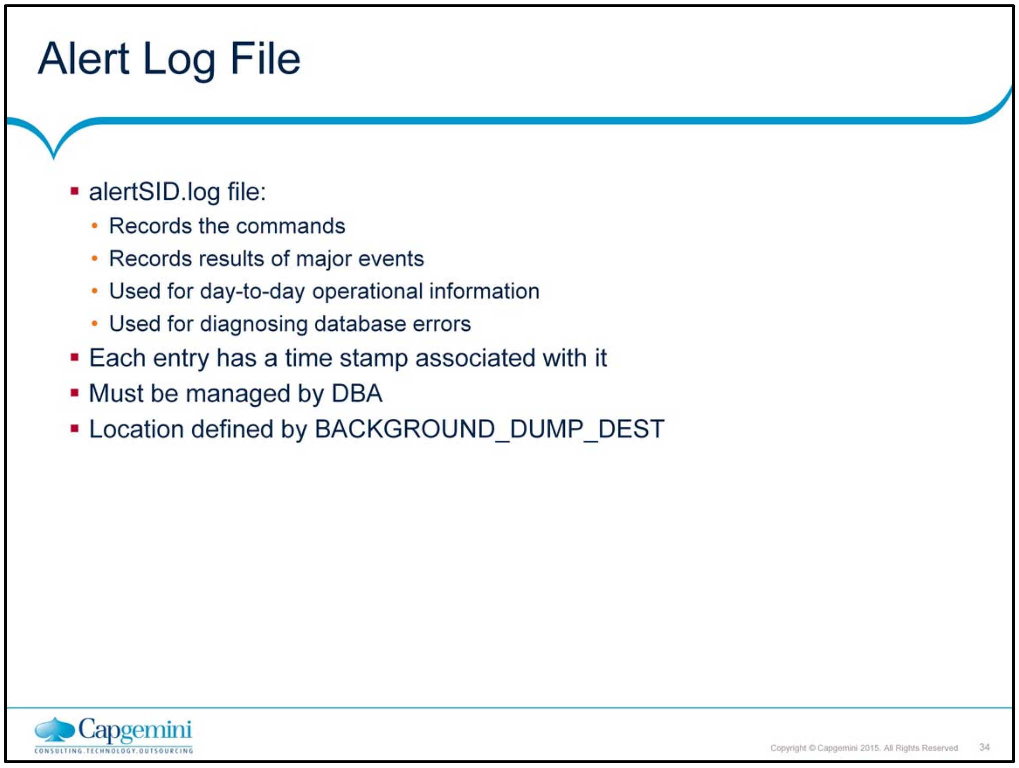
Monitoring an Instance Using Diagnostic Files

Diagnostic files are a means to capture information about the database's activities. They are also useful tools for you when you are managing an instance. Several types exist. The type of diagnostic file created depends on the problem that occurred or the information that is needed to be disseminated.

alertSID.log file: Information for day-to-day operation of the database

Background trace files: Vital information when background processes, such as SMON, PMON, DBWn, and others fail

User trace files: Vital information for fatal user errors or user forced traced 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

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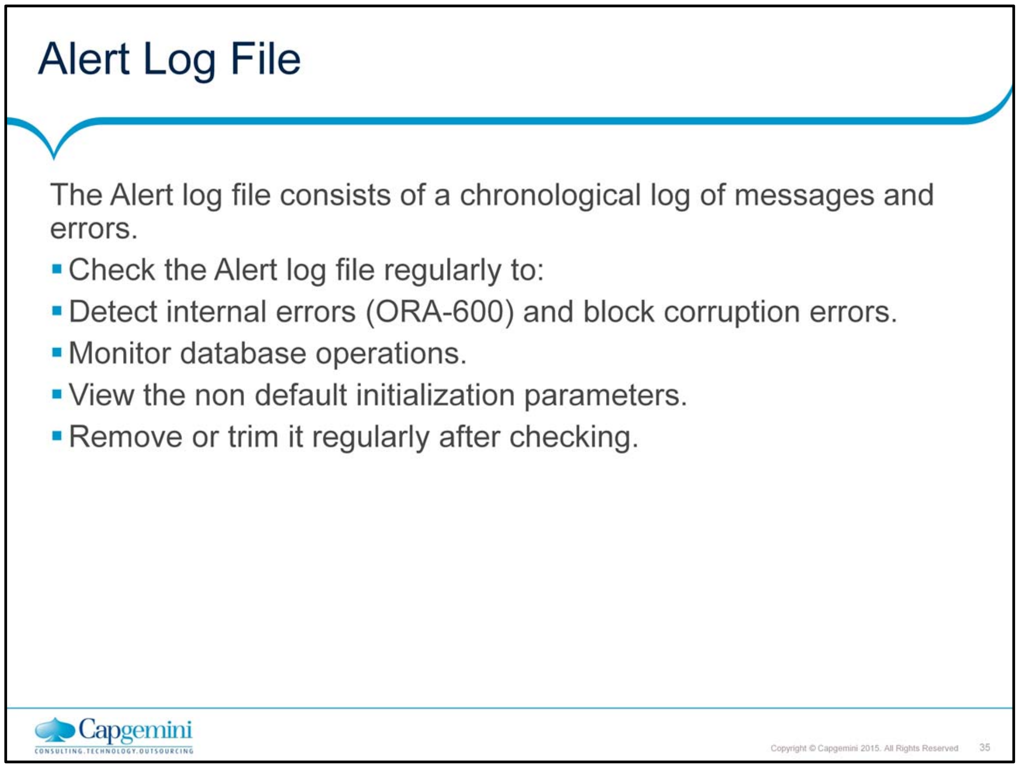
Alert Log File

Each Oracle Instance has an alert log file. If not already created, it is created during instance startup. The alert log file is managed by you, as it continues to grow while the database continues to work. The alert log file should be the first place you look when diagnosing day-to-day operations or errors. The alert log file also contains pointers to trace files for more detailed information.

The alert log file keeps a record of the following information:

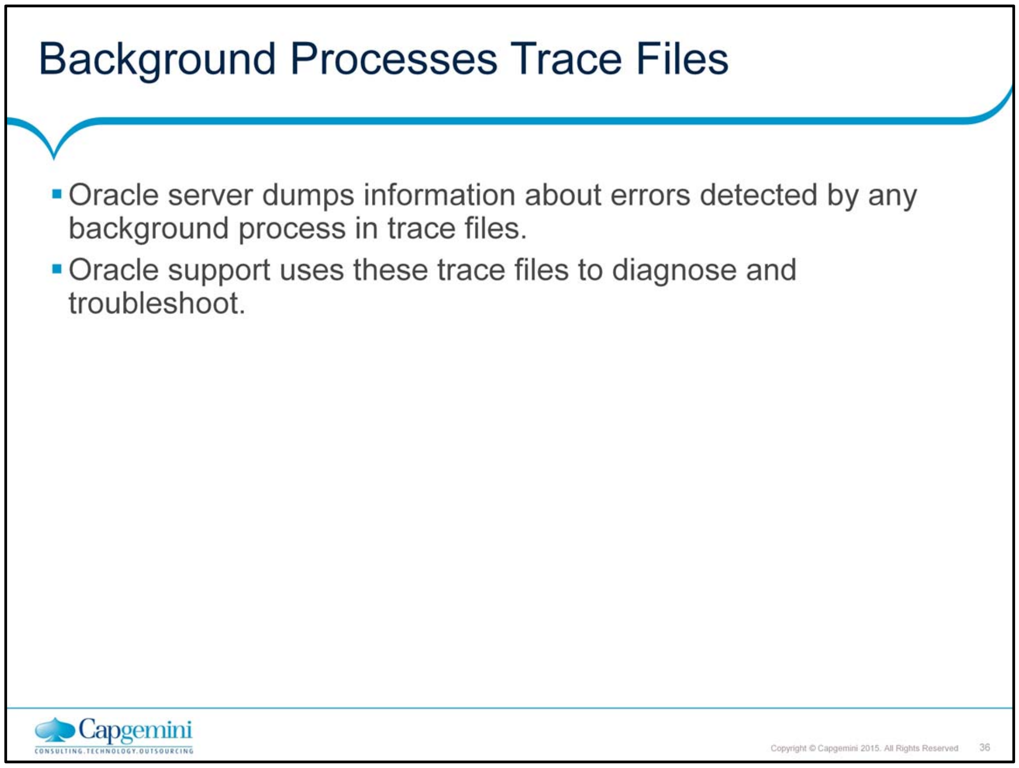
When the database was started or shut down
A list of all non-default initialization parameters
The startup of background processes
The thread being used by the instance
The log sequence number LGWR is writing to
Information regarding a log switch
Creation of tablespaces and undo segments
Alter statements that have been issued
Information regarding error messages such as ORA-600 and extent errors



Alert Log File

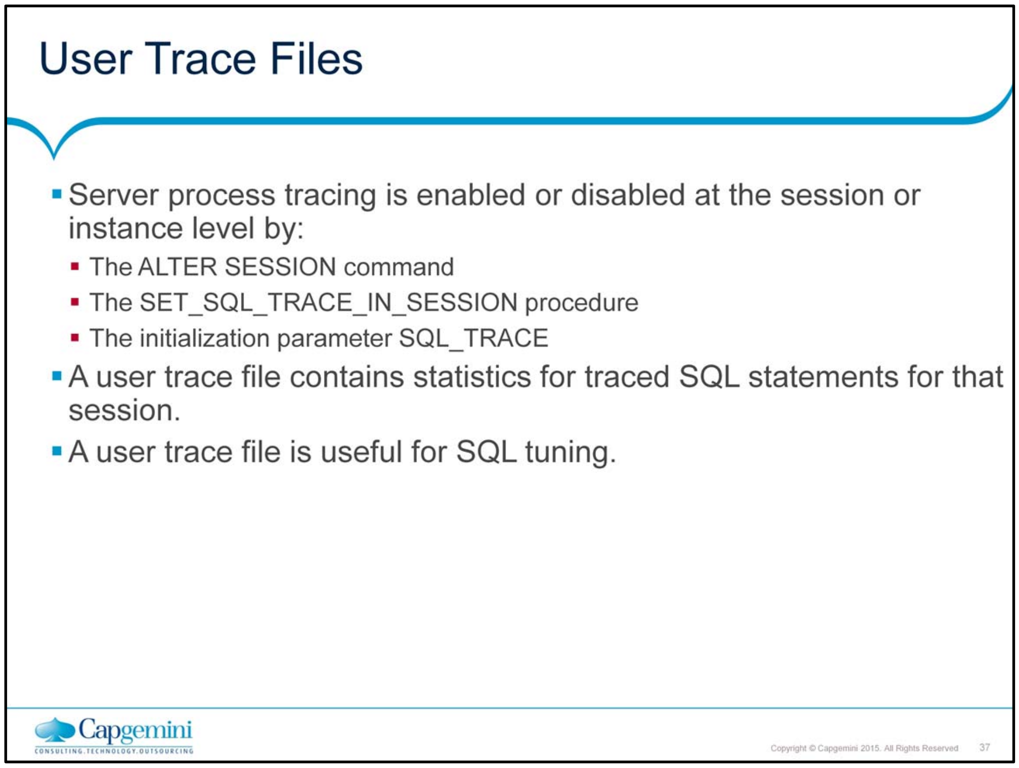
The Alert log file consists of a chronological log of messages and errors.

- Check the Alert log file regularly to:
- Detect internal errors (ORA-600) and block corruption errors.
- Monitor database operations.
- View the non default initialization parameters.
- Remove or trim it regularly after checking.



Background Processes Trace Files

- Oracle server dumps information about errors detected by any background process in trace files.
- Oracle support uses these trace files to diagnose and troubleshoot.



User Trace Files

- Server process tracing is enabled or disabled at the session or instance level by:
  - The ALTER SESSION command
  - The SET_SQL_TRACE_IN_SESSION procedure
  - The initialization parameter SQL_TRACE
- A user trace file contains statistics for traced SQL statements for that session.
- A user trace file is useful for SQL tuning.

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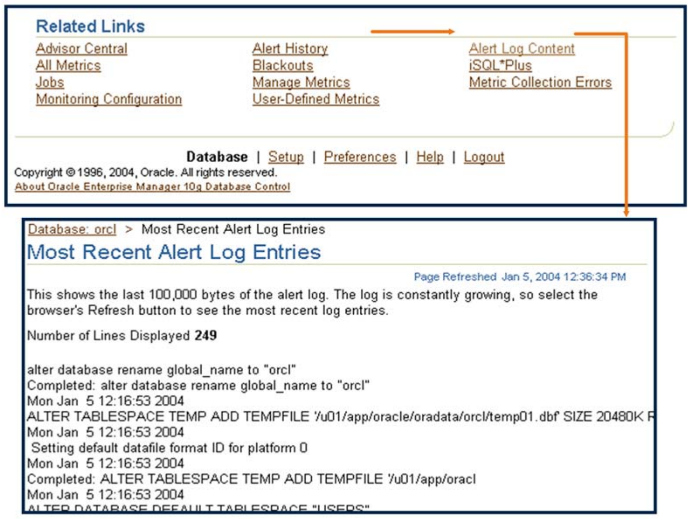
Viewing the Alert Log



Related Links

Advisor Central	Alert History	Alert Log Content
All Metrics	Blackouts	iSQL*Plus
Jobs	Manage Metrics	Metric Collection Errors
Monitoring Configuration	User-Defined Metrics	

Database | Setup | Preferences | Help | Logout

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About Oracle Enterprise Manager 10g Database Control

Database: orcl > Most Recent Alert Log Entries

Most Recent Alert Log Entries

Page Refreshed Jan 5, 2004 12:36:34 PM

This shows the last 100,000 bytes of the alert log. The log is constantly growing, so select the browser's Refresh button to see the most recent log entries.

Number of Lines Displayed **249**

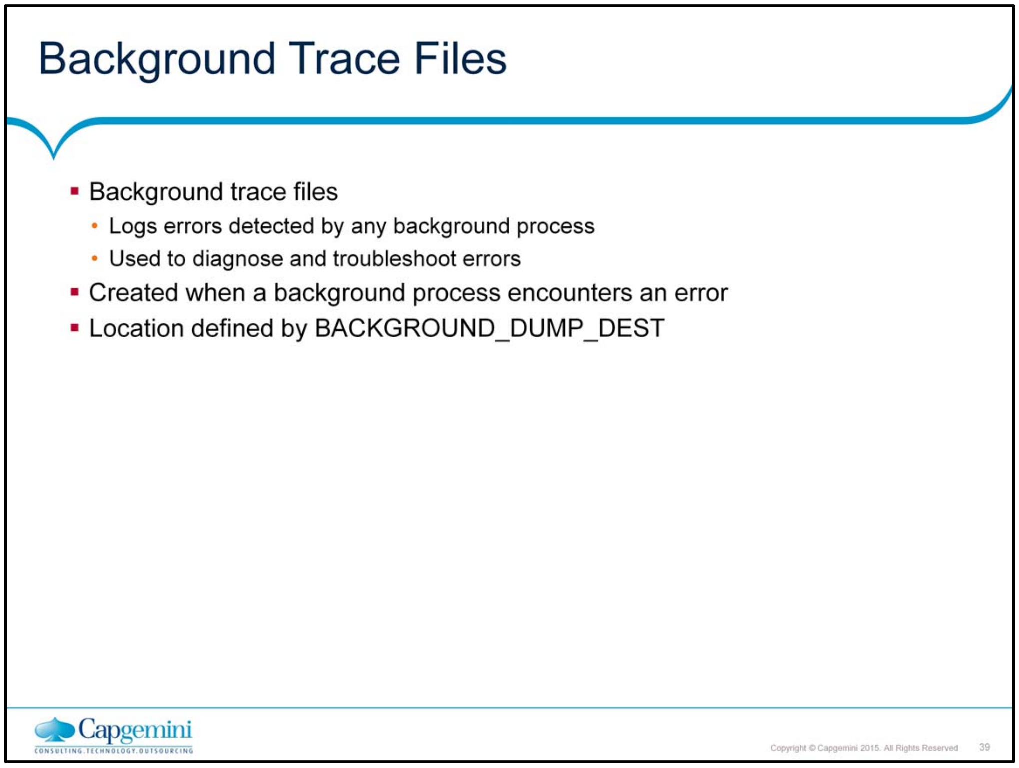
```
alter database rename global_name to "orcl"
Completed: alter database rename global_name to "orcl"
Mon Jan  5 12:16:53 2004
ALTER TABLESPACE TEMP ADD TEMPFILE '/u01/app/oracle/oradata/orcl/temp01.dbf' SIZE 20480K R
Mon Jan  5 12:16:53 2004
 Setting default datafile format ID for platform 0
Mon Jan  5 12:16:53 2004
Completed: ALTER TABLESPACE TEMP ADD TEMPFILE '/u01/app/oracl
Mon Jan  5 12:16:53 2004
ALTER DATABASE DEFAULT TABLESPACE "USERS"
```

Viewing the Alert Log

Each database also has an alert_sid.log. The file is on the server with the database and is stored in the directory specified with the initialization parameter background_dump_dest. The alert file of a database is a chronological log of messages and errors, including the following:

- All internal errors (ORA-600), block corruption errors (ORA-1578), and deadlock errors (ORA-60) that occur
- Administrative operations, such as the SQL statements CREATE, ALTER, DROP DATABASE, TABLESPACE, ROLLBACK SEGMENT and the Enterprise Manager or SQL*Plus statements STARTUP, SHUTDOWN, ARCHIVE LOG, and RECOVER
- Several messages and errors relating to the functions of shared server and dispatcher processes
- Errors during the automatic refresh of a materialized view

EM monitors the alert log file and notifies you of critical errors. You can also view the log to see noncritical error and informative messages. Also the file can grow to an unmanageable size if left alone. You should make a back up of the alert file occasionally and delete the current alert file. When the database attempts to write to the alert file again, the database will then re-create a new alert file.



Background Trace Files

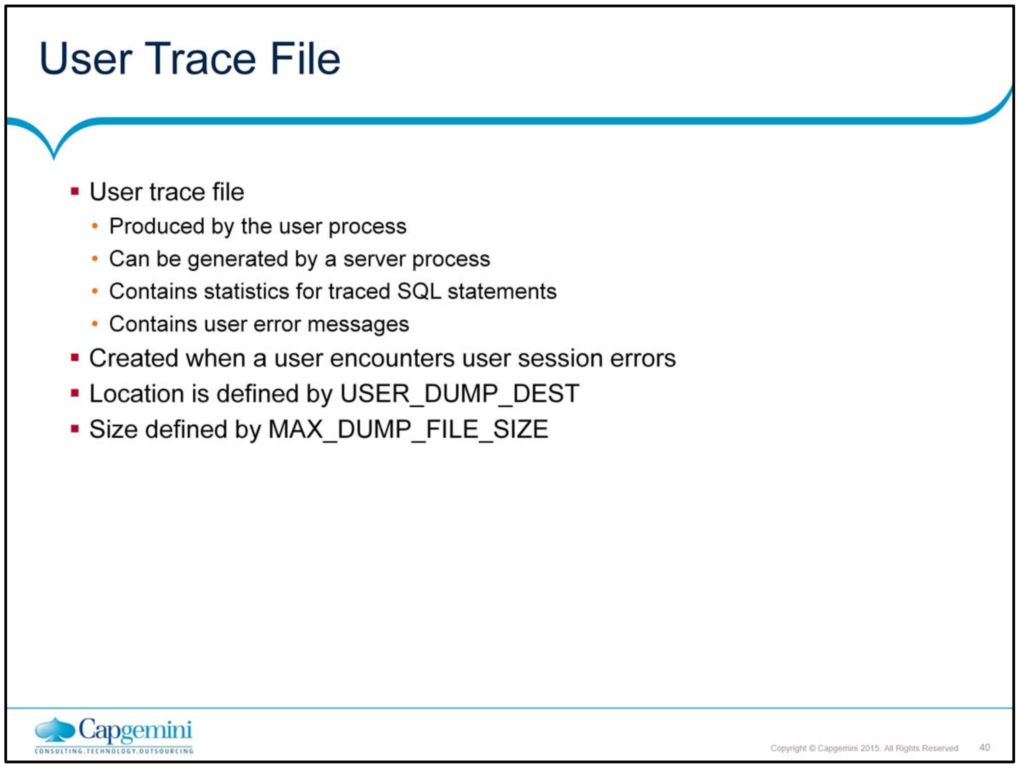
- Background trace files
  - Logs errors detected by any background process
  - Used to diagnose and troubleshoot errors
- Created when a background process encounters an error
- Location defined by BACKGROUND_DUMP_DEST

Background Trace Files

Background trace files are used to log errors that have been encountered by a background process, such are SMON, PMON, DBWn, and other background processes. These files exist only when an error requires writing to the trace files.You use these files to diagnose and troubleshoot problems. Initially when a background trace file is created it contains header information indicating the version number of the data server and the operating system.

Naming convention for user trace file: sid_processname_PID.trc (db01_lgwr_23845.trc).

Its location is defined by the BACKGROUND_DUMP_DEST initialization parameter.

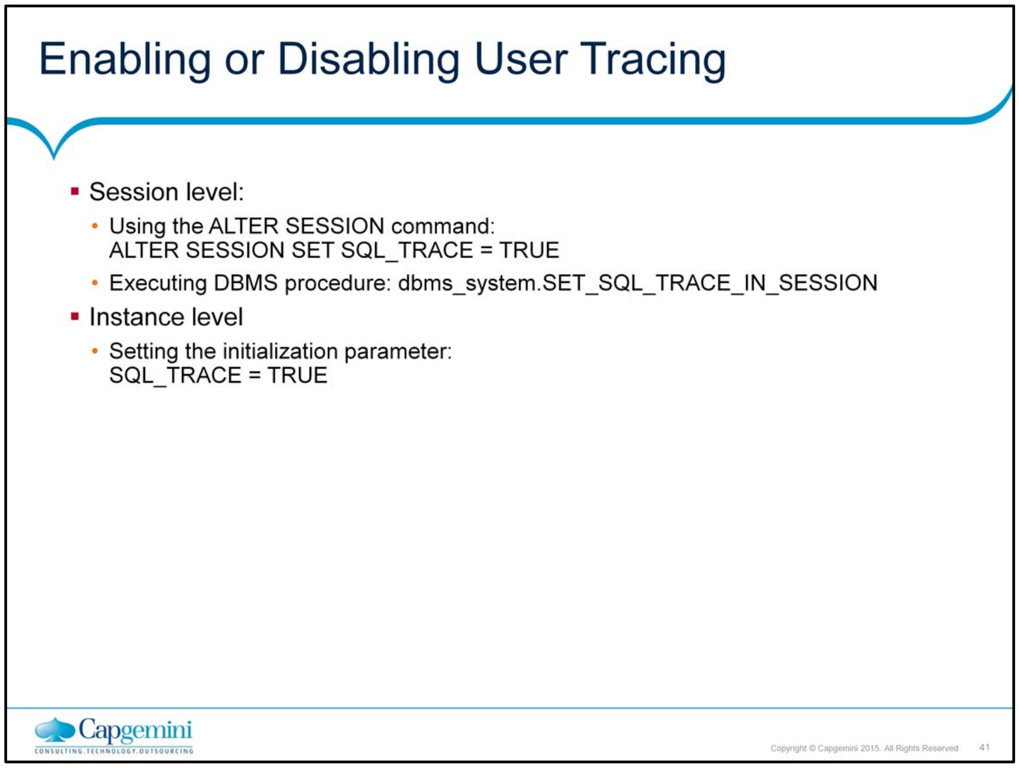


User Trace File

- User trace file
  - Produced by the user process
  - Can be generated by a server process
  - Contains statistics for traced SQL statements
  - Contains 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

User Trace Files

User trace files contain statistics for traced SQL statements, which are useful for SQL tuning. In addition, user trace files contain user error messages.
Naming convention for user trace file:
sid_ora_PID.trc(db01_ora_23845.trc).
Its location is defined by the USER_DUMP_DEST initialization parameter.

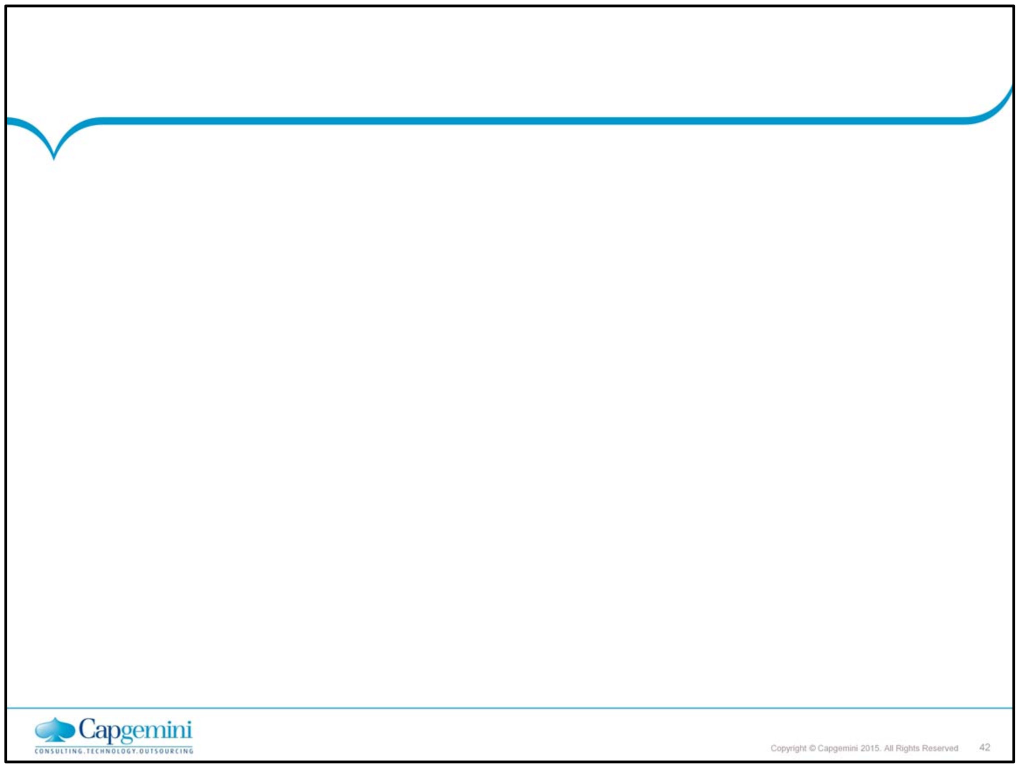


Enabling or Disabling User Tracing

- 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

Enabling or Disabling User Tracing

Note: Setting SQL_TRACE=TRUE at the instance level will produce a significant volume of trace data. This option should be used with care.



Enabling or Disabling User Tracing

Using Oracle Enterprise Manager to Enable or Disable User Tracing

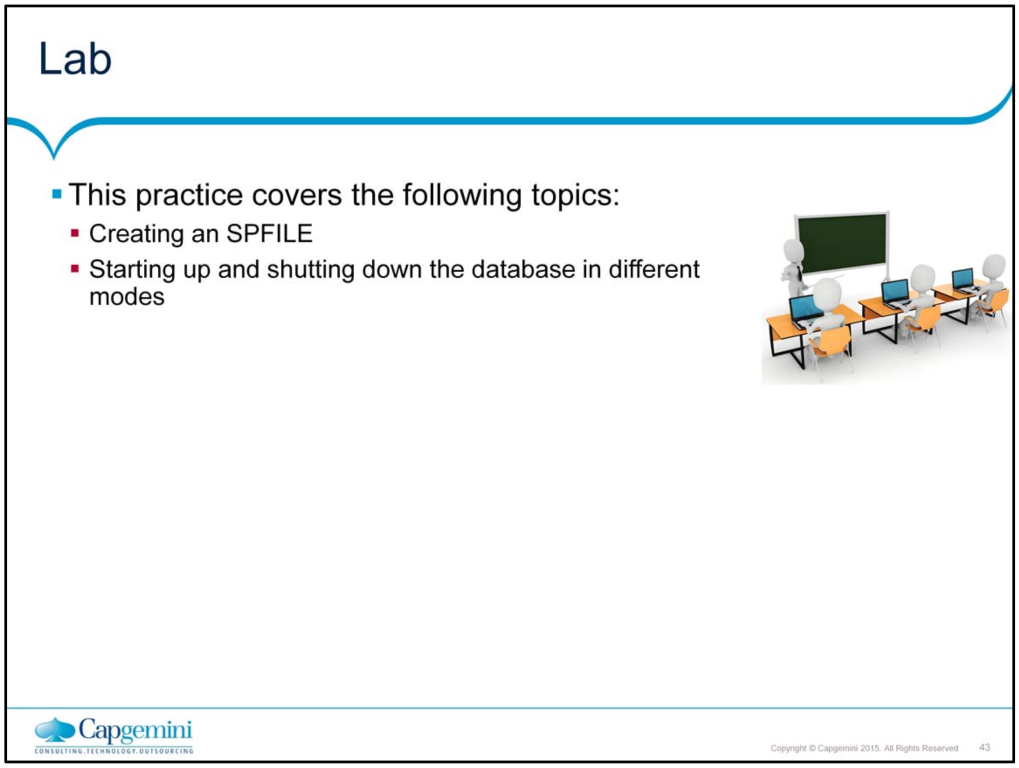
From the OEM Console:

1. Navigate to Databases > Instance > Configuration.

Select All Initialization Parameters from the General page.

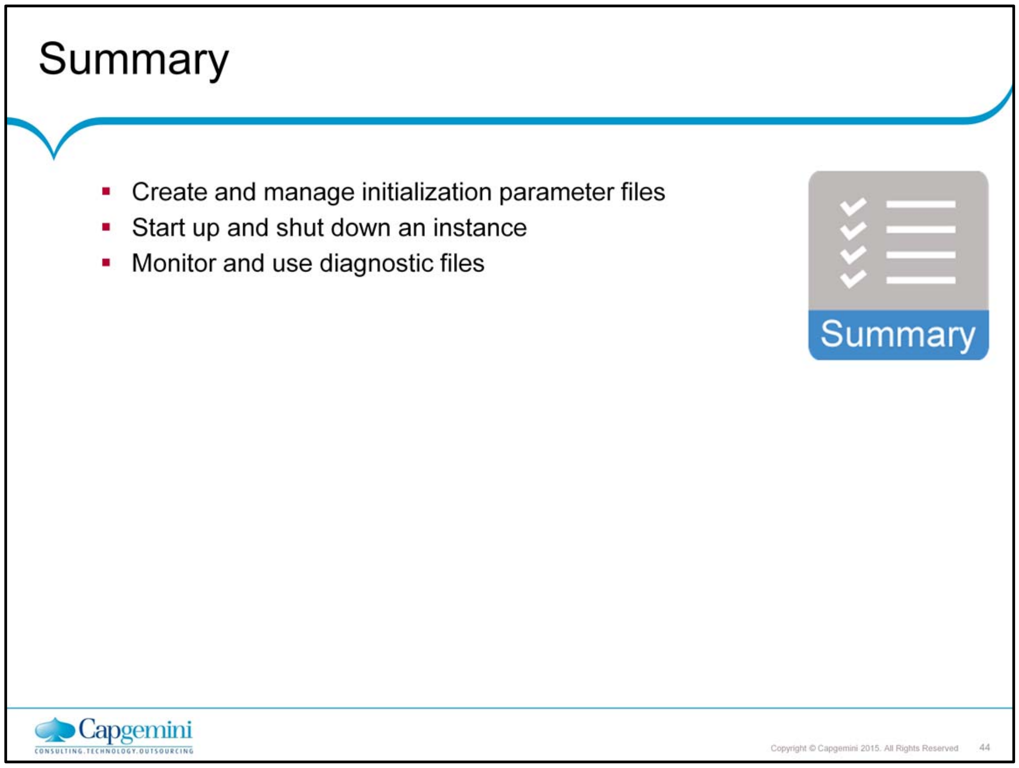
Set the parameter SQL_TRACE = TRUE.

Select OK.



Lab

- This practice covers the following topics:
  - Creating an SPFILE
  - Starting up and shutting down the database in different modes



Summary

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

Add the notes here.