Oracle 11g DBA Fundamentals Overview

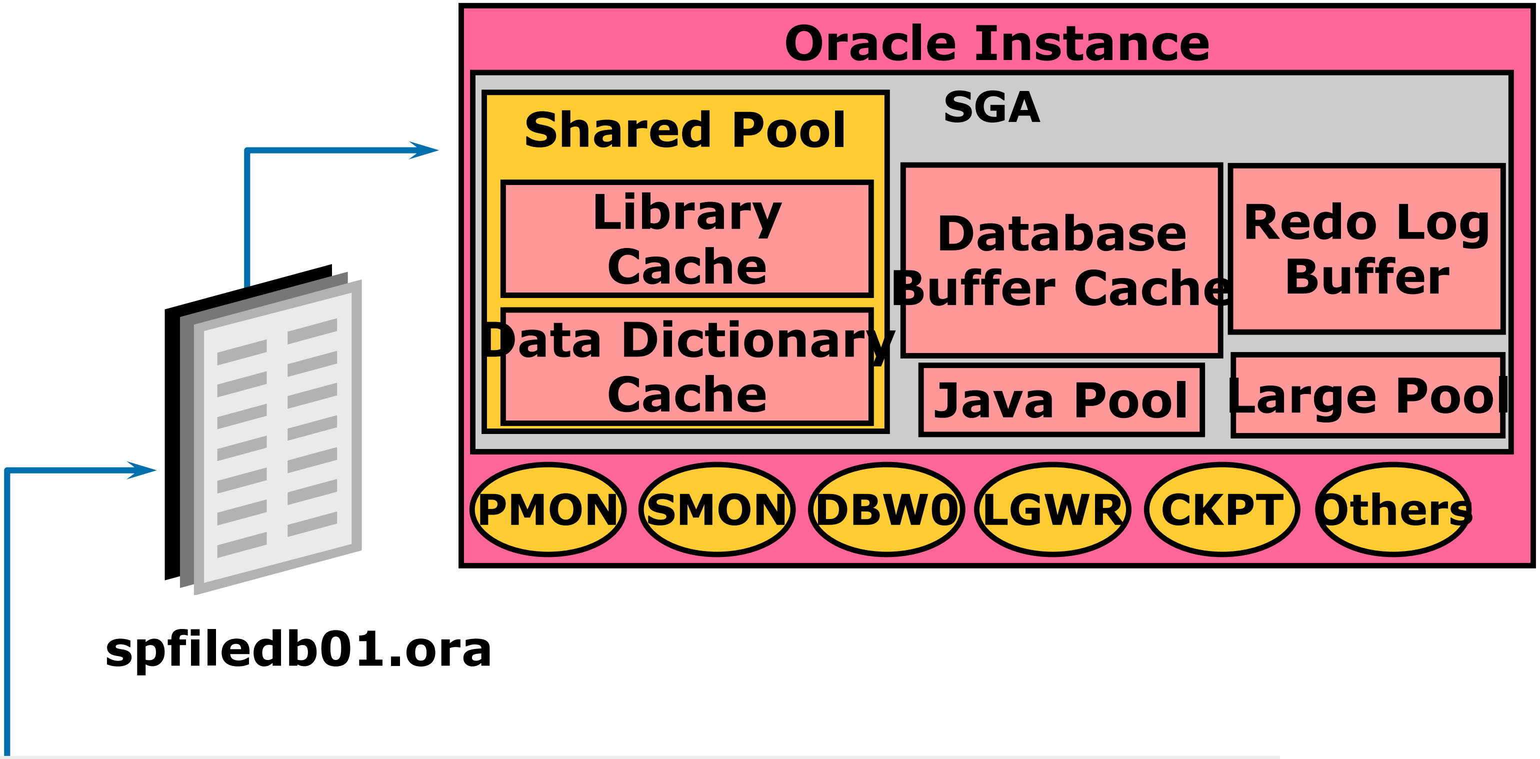
Lesson 03: Managing an Oracle Instance

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

- 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

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

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
```

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 shutdown and startup
- 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

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’;
```

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'

. . .
```

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
```

Modifying Parameters in SPFILE

- Parameter value changes made by ALTER SYSTEM

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

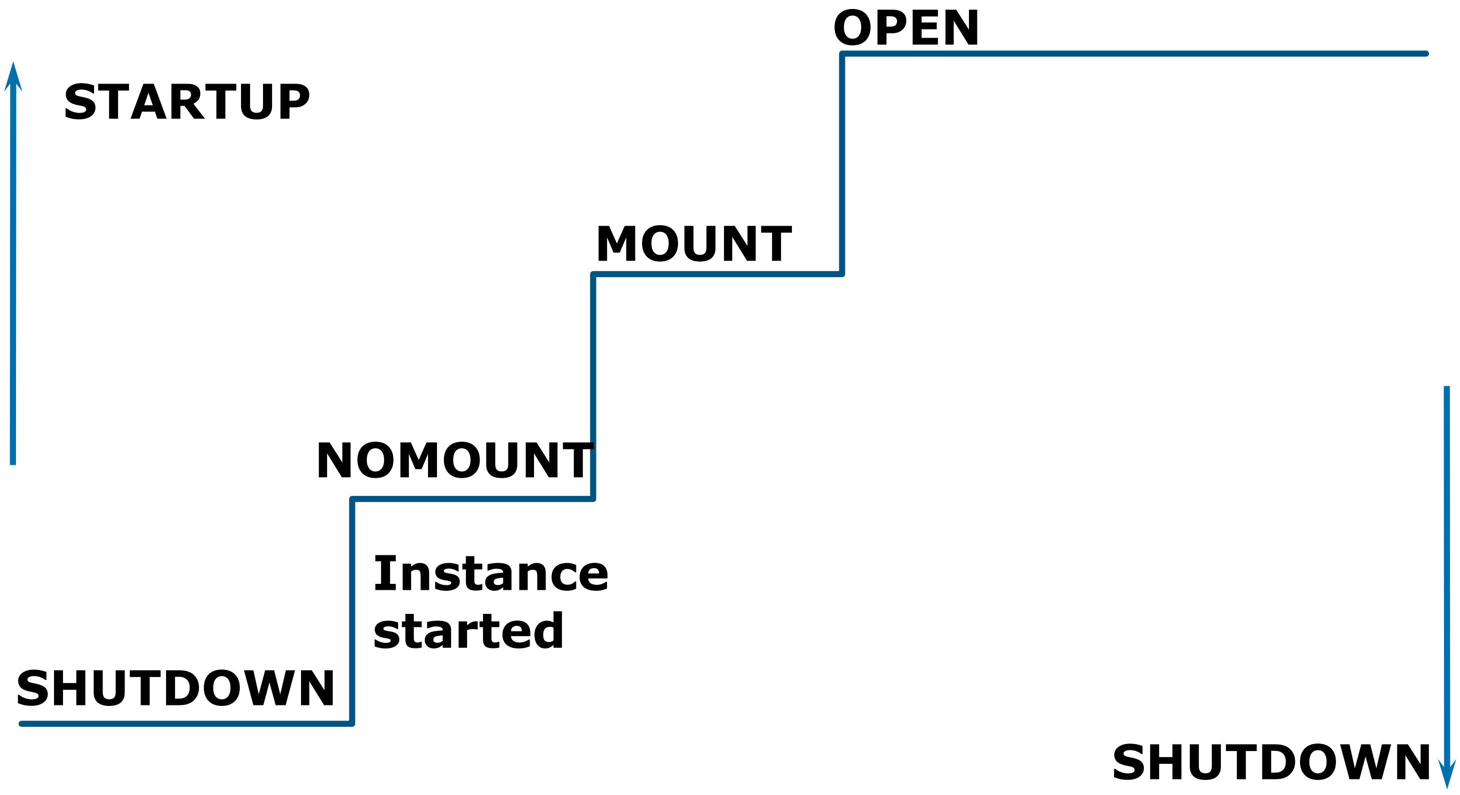
- Specify whether the change is temporary or persistent

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

- Delete or reset values

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

Starting Up a Database NOMOUNT



STARTUP

OPEN

MOUNT

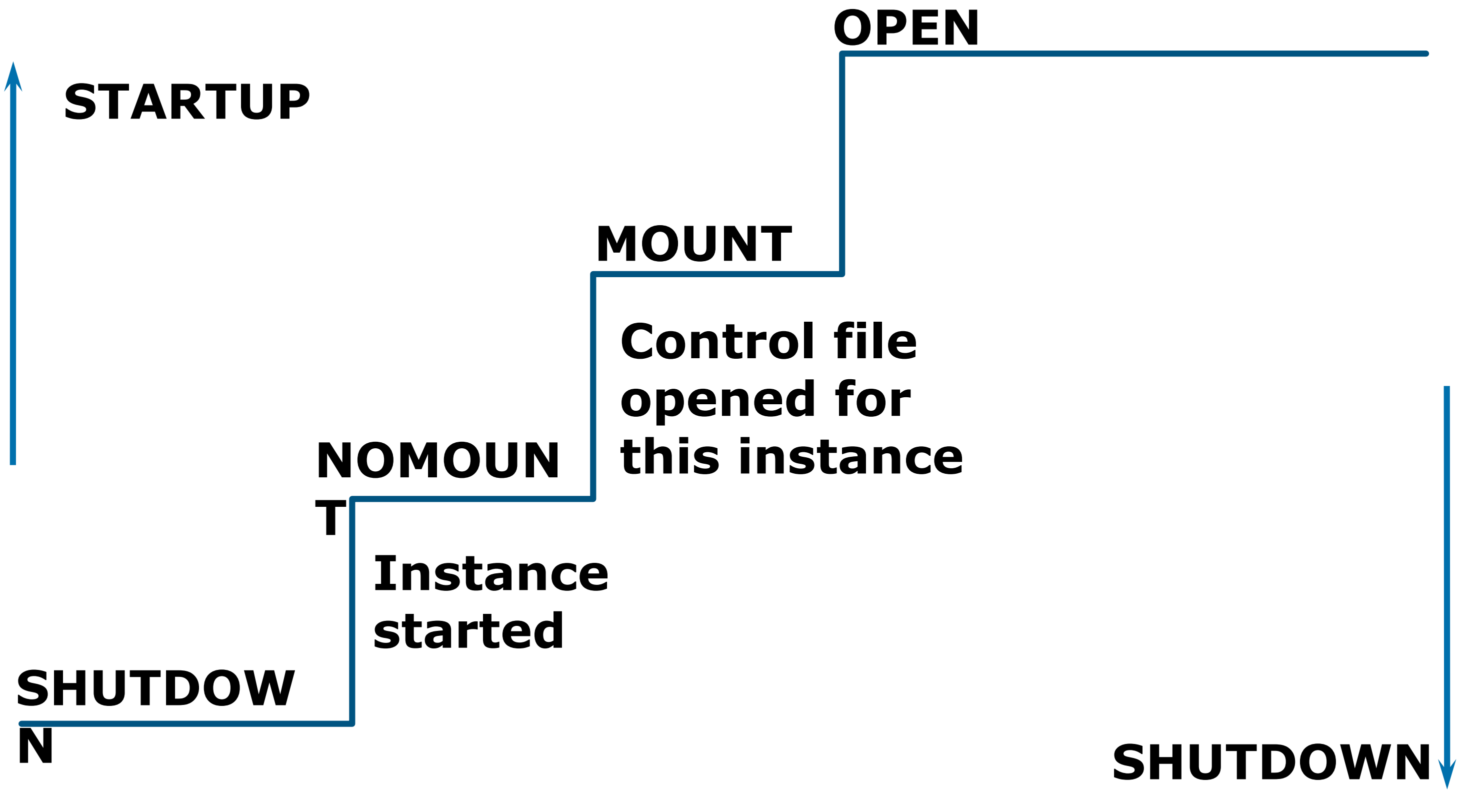
NOMOUNT

Instance started

SHUTDOWN

SHUTDOWN

Starting Up a Database MOUNT



STARTUP

OPEN

MOUNT

Control file opened for this instance

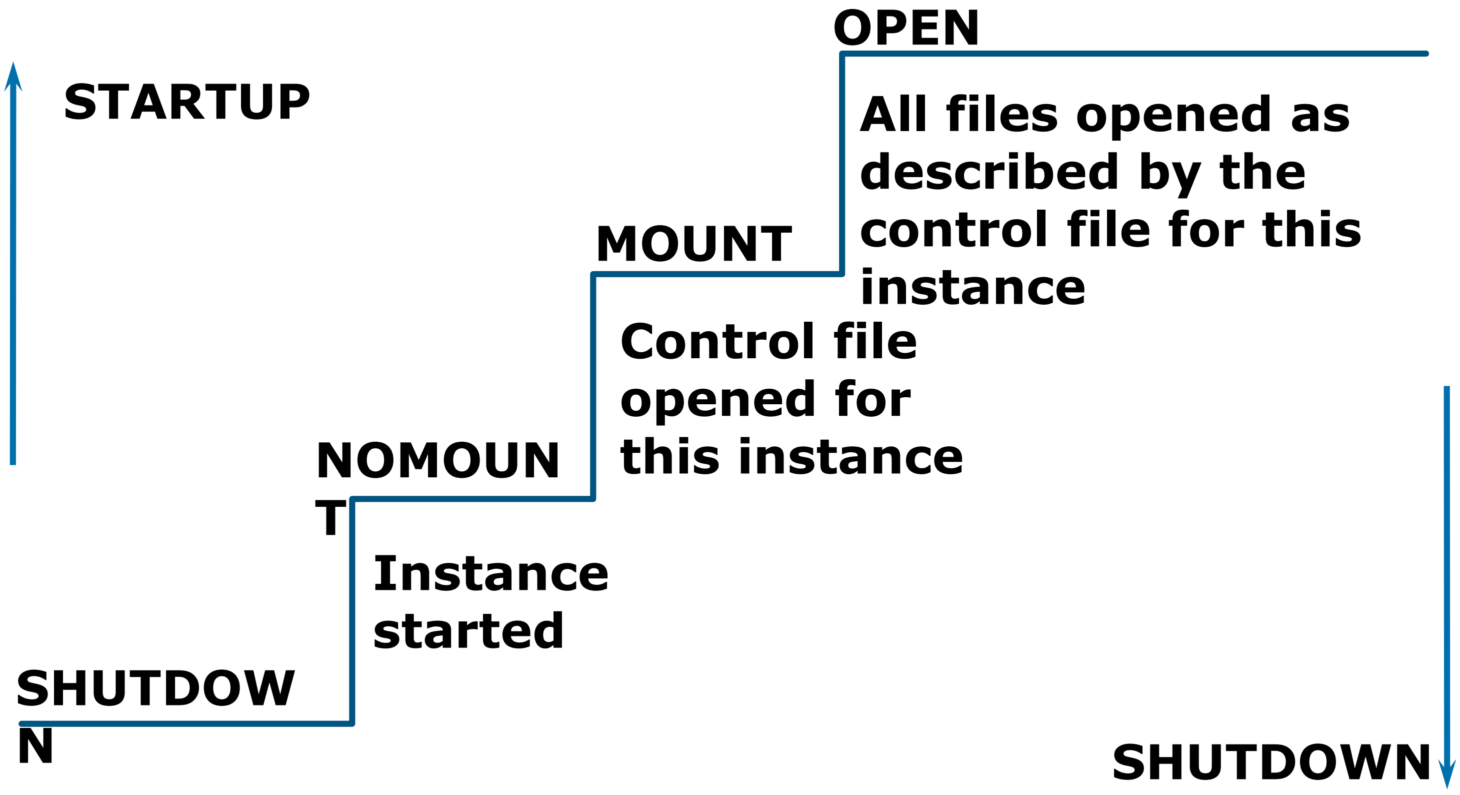
NOMOUNT

Instance started

SHUTDOWN

SHUTDOWN

Starting Up a Database OPEN



STARTUP

SHUTDOW
N

NOMOUN
T

Instance started

MOUNT

Control file opened for this instance

OPEN

All files opened as described by the control file for this instance

SHUTDOWN

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 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

Shutting Down the Database

Shutdown mode:

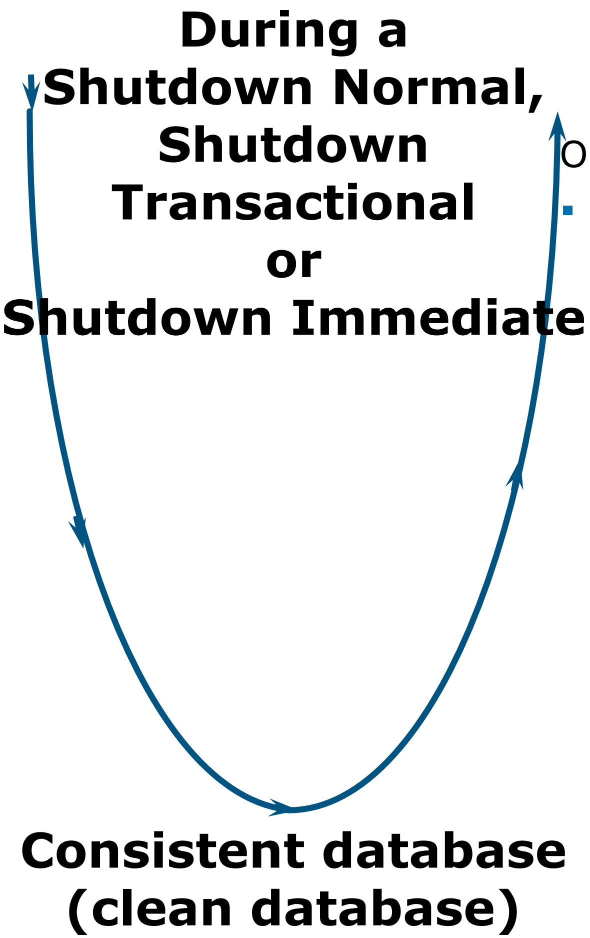
- A = ABORT
- I = IMMEDIATE
- T = TRANSACTIONAL
- N = NORMAL

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

Shutdown Options

On the way down:

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



During a Shutdown Normal, Shutdown Transactional or Shutdown Immediate

On the way up:

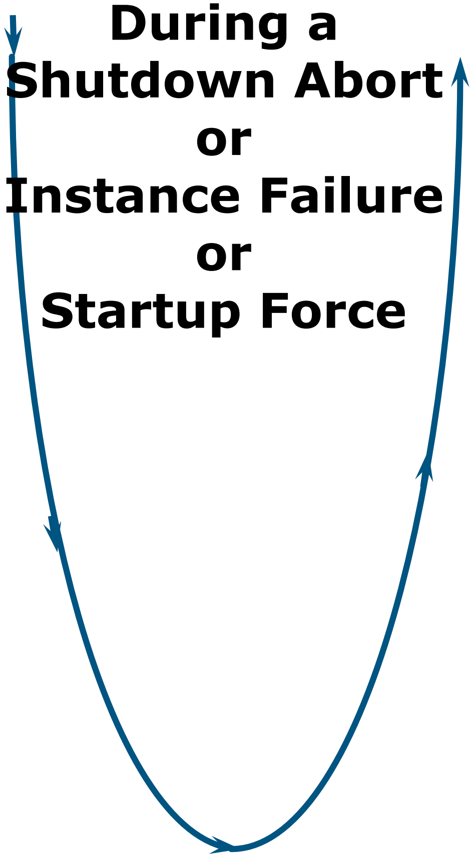
- No instance recovery

Consistent database (clean database)

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

On the way up:

- Redo logs 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

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

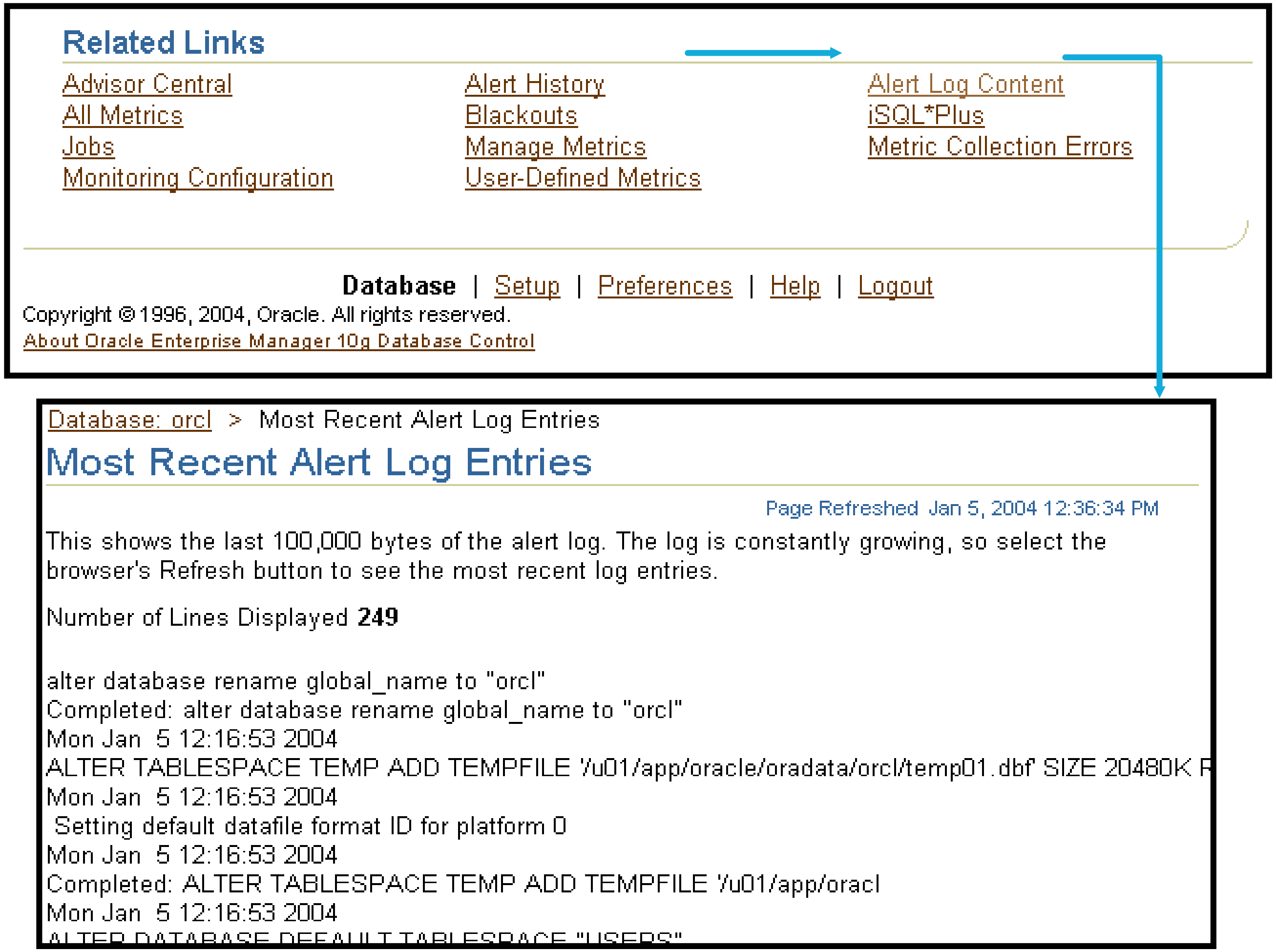
Server process tracing is enabled or disabled at the session or instance level by:

- 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.

Viewing the Alert Log



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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"
```

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

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

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

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