

# **DATABASE ADMINISTRATION**

## **Lab 5 – Blockades, monitoring**

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## Part 1 - Locks

1. Connect to the base as an administrator.

```
SQL> conn
Enter user-name: sys as sysdba
Enter password:
Connected.
SQL>
```

2. Verify that a role named hremployee exists in the system. If so, remove it.

```
SQL> SELECT * FROM dba_roles WHERE role IN ('hremployee');

no rows selected

SQL>
```

3. Verify that there are users named smavis and NGREENBERG in the system. If so, delete them.

```
SQL> SELECT username FROM dba_users WHERE username IN ('smavis', 'NGREENBERG');

no rows selected

SQL>
```

4. Create the hremployee role and give it the privilege of connecting to the base.

```
SQL> CREATE ROLE hremployee;

Role created.

SQL> GRANT connect TO hremployee;

Grant succeeded.

SQL>
```

5. Give the role select and update privileges on the employees table in the hr user schema.

```
SQL> GRANT select, update ON hr.employees to hremployee;

Grant succeeded.

SQL>
```

6. Give the hremployee role identified by the password oracle\_4U to SMARVIS and NGREENBERG users. Note that the grant command will create a new user (!).

```
SQL> GRANT hremployee TO SMARVIS, NGREENBERG IDENTIFIED BY oracle_4U, oracle_4U;

Grant succeeded.

SQL> █
```

7. Connect to the base as the NGREENBERG user and update the telephone number of employee 110 (John Chen) in the hr.employees table. Leave the session open in this state.

```
[oracle@localhost ~]$ sqlplus

SQL*Plus: Release 11.2.0.2.0 Production on Fri Nov 12 05:16:20 2021

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Enter user-name: NGREENBERG
Enter password:

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> SELECT employee_id, first_name, last_name, phone_number FROM hr.employees WHERE employee_id IN ('110');

EMPLOYEE_ID FIRST_NAME          LAST_NAME          PHONE_NUMBER
-----
110 John          Chen              515.124.4269

SQL> UPDATE hr.employees SET phone_number='123.456.7890' WHERE employee_id IN ('110');

1 row updated.

SQL> SELECT employee_id, first_name, last_name, phone_number FROM hr.employees WHERE employee_id IN ('110');

EMPLOYEE_ID FIRST_NAME          LAST_NAME          PHONE_NUMBER
-----
110 John          Chen              123.456.7890

SQL>
```

8. Open a new SQL \* Plus terminal window. As administrator, execute the sleep command (this way you will be sure that the NGREENBERG session is the first to get a lock. Code:

```
begin
sys.dbms_lock.sleep (20);
end;
/
```

```
[oracle@localhost ~]$ sqlplus

SQL*Plus: Release 11.2.0.2.0 Production on Fri Nov 12 05:20:37 2021

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Enter user-name: sys as sysdba
Enter password:

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> begin
  2  sys.dbms_lock.sleep(20);
  3  end;
  4  /

PL/SQL procedure successfully completed.

SQL> █
```

9. Wait for the end of sleep and log into the SMARVIS user. Perform the same update on the Users table (employee\_id = 110) from his session. What have you noticed?

```
[oracle@localhost ~]$ sqlplus

SQL*Plus: Release 11.2.0.2.0 Production on Fri Nov 12 05:22:30 2021

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Enter user-name: SMARVIS
Enter password:

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> SELECT employee_id, first_name, last_name, phone_number FROM hr.employees where emp
loyee_id IN ('110');

EMPLOYEE_ID FIRST_NAME          LAST_NAME          PHONE_NUMBER
-----
110 John                      Chen                515.124.4269

SQL> UPDATE hr.employees SET phone_number='098.765.4321' WHERE employee_id IN ('110');
```

The operation for this session is blocked, so it is waiting.

10. Using the Blocking Sessions Enterprise Manager option, determine which session is causing the block conflict (Performance | Additional Monitoring Links | Blocking Sessions option).

Database Instance: orcl > Logged in As SYS

### Blocking Sessions

Page Refreshed Nov 12, 2021 6:13:43 AM PST Refresh

View Session Kill Session

[Expand All](#) | [Collapse All](#)

Select	Username	Sessions Blocked	Session ID	Serial Number	SQL ID	Wait Class	Wait Event	P1 Value	P2 Value	P3 Value	Seconds in Wait
<input type="radio"/>	Blocking Sessions										
<input checked="" type="radio"/>	NGREENBERG	1	<a href="#">29</a>	139	<a href="#">3ap9wbfs9sc0</a>	Idle	SQL*Net message from client	1650815232	1	0	3297
<input type="radio"/>	SMARVIS	0	<a href="#">151</a>	289		Application	enq: TX - row lock contention	1415053318	327690	9482	2928

11. Check which command caused the lock conflict. To do this, select the NGREENBERG session and choose the View Session option. Then click the hash link for Previous SQL.

#### Application

Current SQL [3ap9wbfs9sc0](#)  
 Current SQL Command **SELECT**  
 Last Call Duration **1:6:30 (hh:mm:ss)**  
 SQL Trace **DISABLED**  
 Current SQL Trace Level **1**  
 Trace With Wait Information **DISABLED**  
 Trace With Bind Information **DISABLED**  
 Open Cursors **31**  
 Program **sqlplus@localhost.localdomain (TNS V1-V3)**  
 Service **SYS\$USERS**  
 Current Module **SQL\*Plus**  
 Current Action **Unavailable**

## SQL Details: 3ap9wbsfs9sc0

Switch to SQL ID   View Data

[Text](#) 

```
SELECT employee_id, first_name, last_name, phone_number
FROM hr.employees
WHERE employee_id IN ('110')
```

12. Go back to the previous view and kill NGREENBERG's session.



## Confirmation

Are you sure you want to kill this session?

SID 29

DB User **NGREENBERG**

Program **sqlplus@localhost.localdomain (TNS V1-V3)**

Options ☒ Kill Immediate

☐ Post Transactional

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)



## Information

Session 29 has been killed successfully.

## Blocking Sessions

Page Refreshed Nov 12, 2021 6:27:39 AM PST

Select	Username	Sessions Blocked	Session ID	Serial Number	SQL Wait ID Class	Wait Event	P1 Value	P2 Value	P3 Value	Seconds in Wait
	No sessions found to be currently blocking other sessions.									

13. Return to the SQL \* Plus session for the SMARVIS user and observe what has changed.

```
SQL> UPDATE hr.employees SET phone_number='098.765.4321' WHERE employee_id IN ('110')
```

```
1 row updated.
```

```
SQL> █
```

14. Try to execute any SQL command in the NGREENBERG user session window. What you see?

```
SQL> SELECT * FROM hr.employees WHERE employee_id IN ('110');
SELECT * FROM hr.employees WHERE employee_id IN ('110')
*
ERROR at line 1:
ORA-12571: TNS:packet writer failure
```

```
SQL> select * from hr.employees;
ERROR:
ORA-03114: not connected to ORACLE
```

```
SQL>
```

Not connected to Oracle.

15. Close all sessions.

## Part 2 - User activity monitoring

16. Start Enterprise Manager and log in as an administrator with the SYSDBA role. On the Server tab, select Audit Settings from the Security section.

Database Instance: orcl >

Logged in As SYS

### Audit Settings

Audit information can be located in the database or in an OS file. Some information is always written to the OS audit file. Other information can optionally be written to either the OS audit file or to the database.

#### Configuration

#### Audit Trails

Audit Trail [DB](#)  
 Audit SYS User Operations [FALSE](#)  
 Audit File Directory [/home/oracle/app/oracle/admin/orcl/adump](#)  
Audit File Directory value is effective only when Audit Trail is set to "OS" or "XML".

Database

Default Options For Future Audited Objects [0](#)

Operating System

[Audited Privileges \(23\)](#)

[Audited Objects \(1\)](#)

[Audited Statements \(6\)](#)

Privilege  User  Proxy

Select	Privilege	User	Proxy	Success	Failure
	No object found.				

[Audited Privileges \(23\)](#)

[Audited Objects \(1\)](#)

[Audited Statements \(6\)](#)

17. Click the DB link from the Audit Trail option, then the SPFile tab.

Database Instance: orcl >

Logged in As SYS

Show SQL

Revert

Apply

## Initialization Parameters

Current

SPFile

The parameter values listed here are from the SPFILE `/home/oracle/app/oracle/product/11.2.0/dbhome_2/d`

Name

Basic

Dynamic

Category

All

All

All

Go

Filter on a name or partial name

☐ Apply changes in SPFile mode to the current running instance(s). For static parameters, you must restart the c

Reset

Select	Name	Help	Revisions	Value	Comments
<input checked="" type="radio"/>	db_recovery_file_dest_size	<a href="#">i</a>		3852M	
<input type="radio"/>	memory_target			436M	
<input type="radio"/>	pga_aggregate_target	<a href="#">i</a>			
<input type="radio"/>	sga_target	<a href="#">i</a>			
<input type="radio"/>	client_result_cache_lag			3000	
<input type="radio"/>	client_result_cache_size			64M	

18. Enter audit in the Name field and click Go.

Database Instance: orcl >

Logged in As SYS

Show SQL

Revert

Apply

## Initialization Parameters

Current

SPFile

The parameter values listed here are from the SPFILE `/home/oracle/app/oracle/product/11.2.0/dbhome_2/dbs`

Name

Basic

Dynamic

Category

All

All

All

Go

Filter on a name or partial name

☐ Apply changes in SPFile mode to the current running instance(s). For static parameters, you must restart the dat

Reset

Select	Name	Help	Revisions	Value	Comments
<input checked="" type="radio"/>	audit_file_dest	<a href="#">i</a>		/home/oracle/app/oracle/admin/orcl	
<input type="radio"/>	audit_sys_operations	<a href="#">i</a>		Unspecified	
<input type="radio"/>	audit_syslog_level				
<input type="radio"/>	audit_trail	<a href="#">i</a>		DB	

Current

SPFile

Show SQL

Revert

Apply

19. From the list of parameters displayed as search results, select audit\_trail and change its value to XML. View the SQL code corresponding to the command by selecting Show SQL - return using the Return button. On the parameters page, select Apply.

### Update Message

The changes have been made successfully. It may take a while before the changes take effect.

## Initialization Parameters

Current




SPFile

The parameter values listed here are from the SPFILE `/home/oracle/app/oracle/product/11.2.0/dbhome_2/dbs/s`

Name  Basic  Dynamic  Category

[Filter on a name or partial name](#)

☐ Apply changes in SPFile mode to the current running instance(s). For static parameters, you must restart the data

<input type="button" value="Reset"/>					
Select	Name ▲	Help	Revisions	Value	Comments
<input checked="" type="radio"/>	audit_file_dest			/home/oracle/app/oracle/admin/or	
<input type="radio"/>	audit_sys_operations			Unspecified ▾	
<input type="radio"/>	audit_syslog_level				
<input type="radio"/>	audit_trail			XML	

Current

SPFile

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

[Database Instance: orcl](#) > [Initialization Parameters](#) >

Logged in As SYS

## Show SQL

**ALTER SYSTEM SET** audit\_trail = "XML" **SCOPE=SPFILE**

20. Restart the database - necessary, because the static database parameter has changed. Wait until all processes are running and log in to Enterprise Manager again.

```
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup
ORACLE instance started.

Total System Global Area  456146944 bytes
Fixed Size                  1344840 bytes
Variable Size             352324280 bytes
Database Buffers          96468992 bytes
Redo Buffers               6008832 bytes
Database mounted.
Database opened.
SQL> █
```



21. In the Audit Settings of the Server tab, select Audite Objects, then Add.

Database Instance: orcl > Audit Settings >

Logged in As SYS

### Add Audited Object

Show SQL

Cancel

OK

Select the object type to audit, then specify the audit attributes for that object type.

Object Type Table

#### Attributes for Object Type: Table

Table

ALTER

AUDIT

COMMENT

DELETE

FLASHBACK

GRANT

INDEX

INSERT

LOCK

RENAME

SELECT

UPDATE

>

>>

<

<<

Move

Move All

Remove

Remove All

Selected Statements

#### Statement Execution Condition

☒ Success or Failure

☐ Success

☐ Failure

#### DML Audit Granularity

Specify the granularity to use for auditing DML statements. DDL statements are always audited by access.

☒ Session  
Summarize by writing a single record per session for the same statement type on the same object.

☐ Access  
Write a record each time the audited statement type is executed.

Show SQL

Cancel

OK

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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22. Make sure that the selected object type is Table, then enter HR.JOBS in the Table field (or use a "flashlight").

### Search And Select: Table

Cancel

Select

#### Search

To filter the list or to search for a specific item in the list, enter text in the text field and click Go. To see all items, clear the search box and click Go.

Schema

Name

By default, the search returns all uppercase matches beginning with the string you entered. To run an exact or case-sensitive match, double quote the search string. You can use the wildcard symbol (% , \*) in a double-quoted string.

Select	Schema	Name
<input type="radio"/>	HR1	JOBS
<input checked="" type="radio"/>	HR	JOBS

Cancel

Select

23. Move the DELETE, INSERT and UPDATE actions by double clicking from the left to the right pane.

Check the corresponding SQL code using the Show SQL option. Click OK to activate the audit.

[Database Instance: orcl](#) > [Audit Settings](#) >

Logged in As SYS

## Add Audited Object

[Show SQL](#) [Cancel](#) [OK](#)

Select the object type to audit, then specify the audit attributes for that object type.

Object Type

### Attributes for Object Type: Table

Table

#### Available Statements

ALTER  
AUDIT  
COMMENT  
FLASHBACK  
GRANT  
INDEX  
LOCK  
RENAME  
SELECT



Move



Move All



Remove



Remove All

#### Selected Statements

DELETE  
INSERT  
UPDATE

### Statement Execution Condition

☒ Success or Failure

☐ Success

☐ Failure

### DML Audit Granularity

Specify the granularity to use for auditing DML statements. DDL statements are always audited by access.

☒ Session

Summarize by writing a single record per session for the same statement type on the same object.

☐ Access

Write a record each time the audited statement type is executed.

[Show SQL](#) [Cancel](#) [OK](#)

[Database Instance: orcl](#) > [Audit Settings](#) >

Logged in As SYS

## Show SQL

[Return](#)

**AUDIT DELETE, INSERT, UPDATE ON HR.JOBS BY SESSION**

[Return](#)

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[Database Instance: orcl](#) >

Logged in As SYS

## Confirmation

Audited objects have been added successfully.

## Audit Settings



Audit information can be located in the database or in an OS file. Some information is always written to the OS audit file. Other information can optionally be written to either the OS audit file or to the database.

## Configuration

## Audit Trails

24. Follow the next steps to check if the audit worked later.

25. Check if the audit\_user user exists, if so, remove it cascade (at the end you should give the cascade option)

```
SQL> SELECT username FROM dba_users WHERE username IN ('audit_user');
```

```
no rows selected
```

```
SQL> █
```

26. Create a new audit\_user identified by the password oracle\_4U

```
SQL> CREATE USER audit_user IDENTIFIED BY oracle_4U;
```

User created.

```
SQL> █
```

27. Give the user the role connect and all privileges (GRANT ALL) on the hr.jobs table

```
SQL> GRANT connect TO audit_user;
```

Grant succeeded.

```
SQL> GRANT ALL ON hr.jobs TO audit_user;
```

Grant succeeded.

```
SQL> █
```

28. Connect from the SQL \* Plus session as audit\_user and execute the following commands: select from the hr.jobs table, update the max\_salary column by multiplying it by 10 (confirm the transaction) and re-select.

```
[oracle@localhost ~]$ sqlplus
```

SQL\*Plus: Release 11.2.0.2.0 Production on Sun Nov 14 19:18:15 2021

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Enter user-name: audit\_user

Enter password:

Connected to:

Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - Production

With the Partitioning, OLAP, Data Mining and Real Application Testing options

```
SQL> SELECT * FROM hr.jobs;
```

JOB_ID	JOB_TITLE	MIN_SALARY	MAX_SALARY
--------	-----------	------------	------------

AD_PRES	President	20000	40000
AD_VP	Administration Vice President	15000	30000
AD_ASST	Administration Assistant	3000	6000
FI_MGR	Finance Manager	8200	16000
FI_ACCOUNT	Accountant	4200	9000
AC_MGR	Accounting Manager	8200	16000
AC_ACCOUNT	Public Accountant	4200	9000
SA_MAN	Sales Manager	10000	20000
SA_REP	Sales Representative	6000	12000
PU_MAN	Purchasing Manager	8000	15000
PU_CLERK	Purchasing Clerk	2500	5500

JOB_ID	JOB_TITLE	MIN_SALARY	MAX_SALARY
--------	-----------	------------	------------

ST_MAN	Stock Manager	5500	8500
ST_CLERK	Stock Clerk	2000	5000
SH_CLERK	Shipping Clerk	2500	5500
IT_PROG	Programmer	4000	10000
MK_MAN	Marketing Manager	9000	15000
MK_REP	Marketing Representative	4000	9000
HR_REP	Human Resources Representative	4000	9000
PR_REP	Public Relations Representative	4500	10500

19 rows selected.

```
SQL> UPDATE hr.jobs SET max_salary=10*max_salary;
```

19 rows updated.

```
SQL> SELECT * FROM hr.jobs;
```

JOB_ID	JOB_TITLE	MIN_SALARY	MAX_SALARY
--------	-----------	------------	------------

```

AD_PRES  President                20000  400000
AD_VP    Administration Vice President  15000  300000
AD_ASST  Administration Assistant      3000   60000
FI_MGR   Finance Manager              8200   160000
FI_ACCOUNT Accountant                 4200   90000
AC_MGR   Accounting Manager           8200   160000
AC_ACCOUNT Public Accountant          4200   90000
SA_MAN   Sales Manager               10000  200000
SA_REP   Sales Representative          6000   120000
PU_MAN   Purchasing Manager           8000   150000
PU_CLERK Purchasing Clerk             2500   55000

```

```

JOB_ID  JOB_TITLE                MIN_SALARY MAX_SALARY
-----
ST_MAN  Stock Manager             5500   85000
ST_CLERK Stock Clerk              2000   50000
SH_CLERK Shipping Clerk           2500   55000
IT_PROG Programmer                4000  100000
MK_MAN  Marketing Manager          9000  150000
MK_REP  Marketing Representative    4000   90000
HR_REP  Human Resources Representative 4000   90000
PR_REP  Public Relations Representative 4500  105000

```

19 rows selected.

SQL> COMMIT;

Commit complete.

SQL>

## 29. Switch to user hr and make another change - divide max\_salary by 10. Confirm and check the result of the change.

```
[oracle@localhost ~]$ sqlplus
```

SQL\*Plus: Release 11.2.0.2.0 Production on Sun Nov 14 19:20:45 2021

Copyright (c) 1982, 2010, Oracle. All rights reserved.

Enter user-name: hr

Enter password:

Connected to:

Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - Production

With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> UPDATE hr.jobs SET max\_salary=max\_salary/10;

19 rows updated.

SQL> SELECT \* FROM hr.jobs;

```

JOB_ID  JOB_TITLE                MIN_SALARY MAX_SALARY
-----
AD_PRES  President                20000  40000
AD_VP    Administration Vice President  15000  30000
AD_ASST  Administration Assistant      3000   6000
FI_MGR   Finance Manager              8200   16000
FI_ACCOUNT Accountant                 4200   9000
AC_MGR   Accounting Manager           8200   16000
AC_ACCOUNT Public Accountant          4200   9000
SA_MAN   Sales Manager               10000  20000
SA_REP   Sales Representative          6000   12000
PU_MAN   Purchasing Manager           8000   15000
PU_CLERK Purchasing Clerk             2500   5500

```

```

JOB_ID  JOB_TITLE                MIN_SALARY MAX_SALARY
-----
ST_MAN  Stock Manager             5500   8500
ST_CLERK Stock Clerk              2000   5000
SH_CLERK Shipping Clerk           2500   5500
IT_PROG Programmer                4000  10000
MK_MAN  Marketing Manager          9000  15000
MK_REP  Marketing Representative    4000   9000
HR_REP  Human Resources Representative 4000   9000
PR_REP  Public Relations Representative 4500  10500

```

19 rows selected.

SQL> COMMIT;

Commit complete.

SQL>

30. Switch to administrator and delete the audit\_user cascade


SQL> DROP USER audit\_user CASCADE;

User dropped.

SQL> █

31. Using Enterprise Manager, check information about audited objects - Server | tab Audit Settings | Audited Objects. Additional note: Can it be deduced from the information displayed which user has lowered the salary?

### Audit Settings

 Audit information can be located in the database or in an OS file. Some information is always written to the OS audit file. Other information can optionally be written to either the OS audit file or to the database.

#### Configuration

Audit Trail [XML](#)  
Audit SYS User Operations [FALSE](#)  
Audit File Directory [/home/oracle/app/oracle/admin/orcl/adump](#)  
Audit File Directory value is effective only when Audit Trail is set to "OS" or "XML".

#### Audit Trails

Database Audit

Operating System Audit

Default Options For Future Audited Objects [0](#)

[Audited Privileges \(23\)](#)

[Audited Objects \(2\)](#)

[Audited Statements \(6\)](#)

Schema

HR

Object Name

JOBS

Object Type

Search

Add

Remove

[Select All](#) | [Select None](#)

Select	Schema	Object Name	Audited Statement	Success	Failure	Object Type
<input type="checkbox"/>	HR	JOBS	DELETE	BY SESSION	BY SESSION	TABLE
<input type="checkbox"/>	HR	JOBS	INSERT	BY SESSION	BY SESSION	TABLE
<input type="checkbox"/>	HR	JOBS	UPDATE	BY SESSION	BY SESSION	TABLE

[Audited Privileges \(23\)](#)

[Audited Objects \(2\)](#)

[Audited Statements \(6\)](#)

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

No.

32. Revert all changes related to the previously set audit: in Audited Objects go to the HR diagram and click Search, select all three lines and click Remove. On the confirmation page, click Show SQL. Confirm YES.

## Confirmation

Are you sure you want to remove the 3 selected audited objects?

The audited statements you remove will no longer be audited on the objects.

[Hide SQL](#)

```
NOAUDIT DELETE ON HR.JOBS
NOAUDIT INSERT ON HR.JOBS
NOAUDIT UPDATE ON HR.JOBS
```

[No](#) [Yes](#)

Database Instance: orcl >

Logged in As SYS

### Update Message

Audited objects have been removed successfully.

33. On the Audit Settings page, select XML. On the SPFile tab of the Initialization Parameters page, enter the audit search name in the field and click Go. Rename the audit\_trail parameter to DB (as it was at the beginning), check the SQL code and approve the changes.

ORACLE Enterprise Manager 11g Database Control

[Setup](#) [Preferences](#) [Help](#) [Logout](#)

Database

Database Instance: orcl >

Logged in As SYS

[Show SQL](#) [Revert](#) [Apply](#)

### Update Message

The changes have been made successfully. It may take a while before the changes take effect.

## Initialization Parameters

[Current](#)

SPFile

The parameter values listed here are from the SPFILE /home/oracle/app/oracle/product/11.2.0/dbhome\_2/dbs/sp

Name

Basic

Dynamic

Category

audit

All

All

All

Go

Filter on a name or partial name

☐ Apply changes in SPFile mode to the current running instance(s). For static parameters, you must restart the datab

[Reset](#)

Select	Name	Help	Revisions	Value	Comments
<input checked="" type="radio"/>	audit_file_dest	<a href="#">i</a>		/home/oracle/app/oracle/admin/or	
<input type="radio"/>	audit_sys_operations	<a href="#">i</a>		Unspecified	
<input type="radio"/>	audit_syslog_level				
<input type="radio"/>	audit_trail	<a href="#">i</a>		DB	

[Current](#)

SPFile

[Show SQL](#) [Revert](#) [Apply](#)

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[Show SQL](#)[Return](#)

```
ALTER SYSTEM SET audit_trail = "DB" SCOPE=SPFILE
```

[Return](#)

34. The static initialization parameter has changed, ie ... restart the database.

```
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup
ORACLE instance started.
```

```
Total System Global Area  456146944 bytes
Fixed Size                  1344840 bytes
Variable Size               356518584 bytes
Database Buffers            92274688 bytes
Redo Buffers                 6008832 bytes
Database mounted.
Database opened.
SQL> █
```