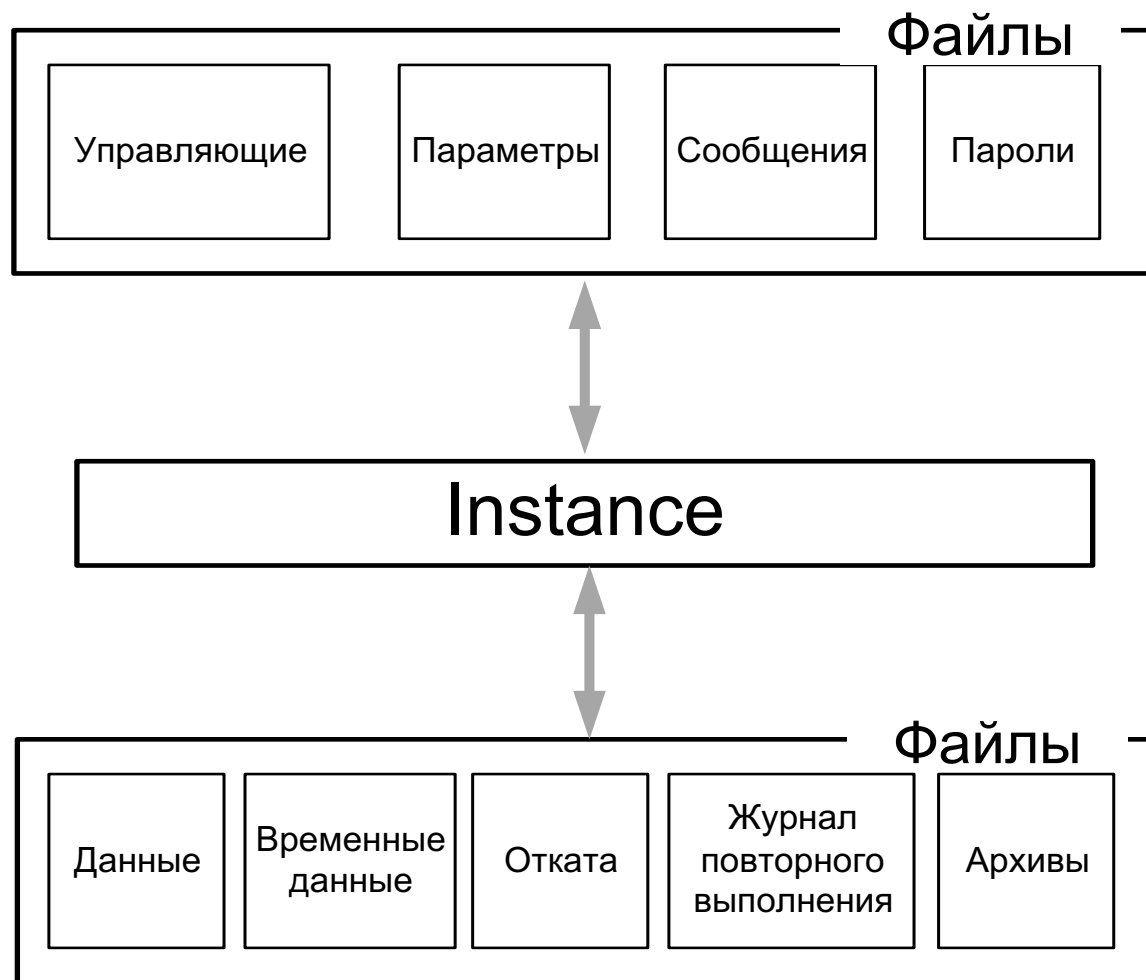


# Администрирование баз данных и приложений

**Архитектура ORACLE: Файлы БД и сервера**

Лекция 4

# Архитектура внешней памяти



# Файл параметров

- ▶ Файл параметров предназначен для хранения параметров экземпляра

connect system

```
SELECT name, DESCRIPTION FROM V$PARAMETER;
```

Script Output x Query Result x

SQL | Fetched 50 rows in 0,031 seconds

NAME	DESCRIPTION
lock_name_space	lock name space used for generating lock names for standby/clone database
processes	user processes
sessions	user and system sessions
timed_statistics	maintain internal timing statistics
timed_os_statistics	internal os statistic gathering interval in seconds
resource_limit	master switch for resource limit
license_max_sessions	maximum number of non-system user sessions allowed
license_sessions_warning	warning level for number of non-system user sessions
cpu_count	number of CPUs for this instance
instance_groups	list of instance group names
event	debug event control - default null string
sga_max_size	max total SGA size
use_large_pages	Use large pages if available (TRUE/FALSE/ONLY)
pre_page_sga	pre-page sga for process
shared_memory_address	SGA starting address (low order 32-bits on 64-bit platforms)
hi shared memory address	SGA starting address (high order 32-bits on 64-bit platforms)

# Файл параметров

## Наименование параметра – значение параметра

connect system

```
SELECT name, VALUE, DESCRIPTION FROM V$PARAMETER;
```

	NAME	VALUE	DESCRIPTION
1	lock_name_space	(null)	lock name space used for generating lock names for standby/clon
2	processes	300	user processes
3	sessions	472	user and system sessions
4	timed_statistics	TRUE	maintain internal timing statistics
5	timed_os_statistics	0	internal os statistic gathering interval in seconds
6	resource_limit	FALSE	master switch for resource limit
7	license_max_sessions	0	maximum number of non-system user sessions allowed
8	license_sessions_warning	0	warning level for number of non-system user sessions
9	cpu_count	1	number of CPUs for this instance
10	instance_groups	(null)	list of instance group names
11	event	(null)	debug event control - default null string
12	sga_max_size	1677721600	max total SGA size
13	use_large_pages	TRUE	Use large pages if available (TRUE/FALSE/ONLY)
14	pre_page_sga	TRUE	pre-page sga for process
15	shared_memory_address	0	SGA starting address (low order 32-bits on 64-bit platforms)
16	hi_shared_memory_address	0	SGA starting address (high order 32-bits on 64-bit platforms)
17	use_indirect_data_buffers	FALSE	Enable indirect data buffers (very large SGA on 32-bit platform

# Файл параметров

---

- ▶ Месторасположение файла параметров по умолчанию

Platform	Default Location
UNIX and Linux	<code>ORACLE_HOME/dbs</code>
Windows	<code>ORACLE_HOME\database</code>



# Файл параметров

File	Edit	View	Favorites	Help
Computer				
HKEY_CLASSES_ROOT				
HKEY_CURRENT_USER				
HKEY_LOCAL_MACHINE				
BCD00000000				
HARDWARE				
SAM				
SECURITY				
SOFTWARE				
Classes				
Clients				
Microsoft				
ODBC				
ORACLE				
KEY_OraDB12Home1				
ODE				
OLED				
ODP.NET				
OracleMTSRecoveryServices				
Policies				
RegisteredApplications				
Wow6432Node				
SYSTEM				
HKEY_USERS				
Name	Type	Data		
(Default)	REG_SZ	(value not set)		
MSHELP_TOOLS	REG_SZ	C:\app\ora_install_user\product\12.1.0\dbhome_1\MSHELP		
NLS_LANG	REG_SZ	AMERICAN_AMERICA.WE8MSWIN1252		
OLED	REG_SZ	C:\app\ora_install_user\product\12.1.0\dbhome_1\oledb\mesg		
OMTSRECO_PORT	REG_EXPAND_SZ	2030		
ORA_ORCL_AUTOSTART	REG_EXPAND_SZ	TRUE		
ORA_ORCL_SHUTDOWN	REG_EXPAND_SZ	TRUE		
ORA_ORCL_SHUTDOWN_TIMEOUT	REG_EXPAND_SZ	90		
ORA_ORCL_SHUTDOWNNTYPE	REG_EXPAND_SZ	immediate		
ORACLE_BASE	REG_SZ	C:\app\ora_install_user		
ORACLE_BUNDLE_NAME	REG_SZ	Enterprise		
ORACLE_GROUP_NAME	REG_SZ	Oracle - OraDB12Home1		
ORACLE_HOME	REG_SZ	C:\app\ora_install_user\product\12.1.0\dbhome_1		
ORACLE_HOME_KEY	REG_SZ	SOFTWARE\ORACLE\KEY_OraDB12Home1		
ORACLE_HOME_NAME	REG_SZ	OraDB12Home1		
ORACLE_HOME_TYPE	REG_SZ	1		
ORACLE_SID	REG_SZ	orcl		
ORACLE_SVCUSER	REG_SZ	ora_install_user		
ORACLE_SVCUSER_PWDREQ	REG_SZ	1		
RDBMS_ARCHIVE	REG_SZ	C:\app\ora_install_user\product\12.1.0\dbhome_1\DATABASE\AR..		
RDBMS_CONTROL	REG_SZ	C:\app\ora_install_user\product\12.1.0\dbhome_1\DATABASE		
SOLPATH	REG_SZ	C:\app\ora_install_user\product\12.1.0\dbhome_1\dfs		

# Файл параметров

<< product > 12.1.0 > dbhome_1 > database	
Name	Date modified
archive	29.08.2016 5:27
hc_orcl.dat	29.08.2016 5:30
oradba	22.12.2005 4:07
oradim	26.09.2016 4:47
PWDorcl	29.08.2016 5:57
SPFILEORCL	26.09.2016 22:00

Name	Date modified	Type	Size	Folder path
init.ora.729201654015	29.08.2016 5:30	729201654015 ...	2 KB	C:\app\ora_install_user\admin\orcl\pfile
initdg4odbc	28.06.2013 1:09	ORA File	1 KB	C:\app\ora_install_user\product\12.1.0\dbhome_1\hs\admin
init	03.02.2012 10:24	ORA File	3 KB	C:\app\ora_install_user\product\12.1.0\dbhome_1\dfs
init	25.07.2001 20:04	ORA File	8 KB	C:\app\ora_install_user\product\12.1.0\dbhome_1\svrm\admin

# Файл параметров

```
init.ora.729201654015 - Notepad
File Edit Format View Help
#####
# Copyright (c) 1991, 2013 by Oracle Corporation
#####

#####
# Cache and I/O
#####
db_block_size=8192

#####
# Cursors and Library Cache
#####
open_cursors=300

#####
# Database Identification
#####
db_domain=be.by
db_name="orcl"

#####
# File Configuration
#####
control_files=("C:\app\ora_install_user\oradata\orcl\control01.ctl", "C:\app\ora_install_use
db_recovery_file_dest="C:\app\ora_install_user\fast_recovery_area"
db_recovery_file_dest_size=6930m

#####
# Miscellaneous
#####
compatible=12.1.0.0.0
diagnostic_dest=C:\app\ora_install_user
enable_pluggable_database=true
memory_target=1600m

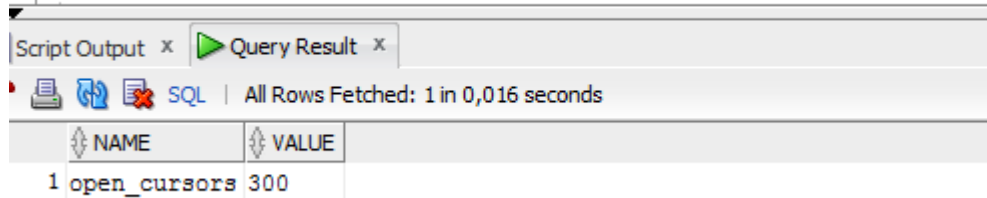
#####
# Processes and Sessions
```



# Файл параметров

- ▶ SPFILE - файл параметров сервера в двоичном виде
- ▶ Может изменяться командой ALTER SYSTEM ...  
SCOPE=SPFILE
- ▶ Изменение параметров сохраняется в SPFILE и будет применяться при следующем старте Oracle

```
SELECT name, value FROM V$PARAMETER where name = 'open_cursors';
```

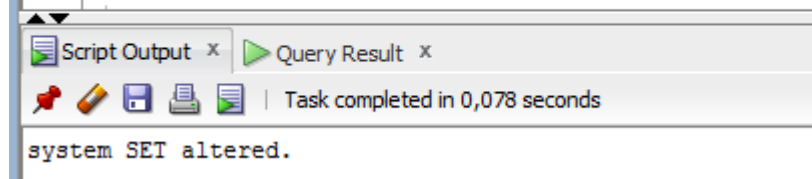


Script Output x Query Result x

SQL | All Rows Fetched: 1 in 0,016 seconds

	NAME	VALUE
1	open_cursors	300

```
ALTER SYSTEM SET OPEN_CURSORS=350 SCOPE=SPFILE;
```



Script Output x Query Result x

Task completed in 0,078 seconds

system SET altered.

# Файл параметров

```
SELECT name, value FROM V$PARAMETER where name = 'open_cursors';
```

```
ALTER SYSTEM SET OPEN_CURSORS=350 SCOPE=SPFILE;
```

Script Output x Query Result x	
SQL   All Rows Fetched: 1 in 0,015 seconds	
NAME	VALUE
1 open_cursors	300

```
SQL> connect /as sysdba;
Connected.
SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup open;
ORACLE instance started.

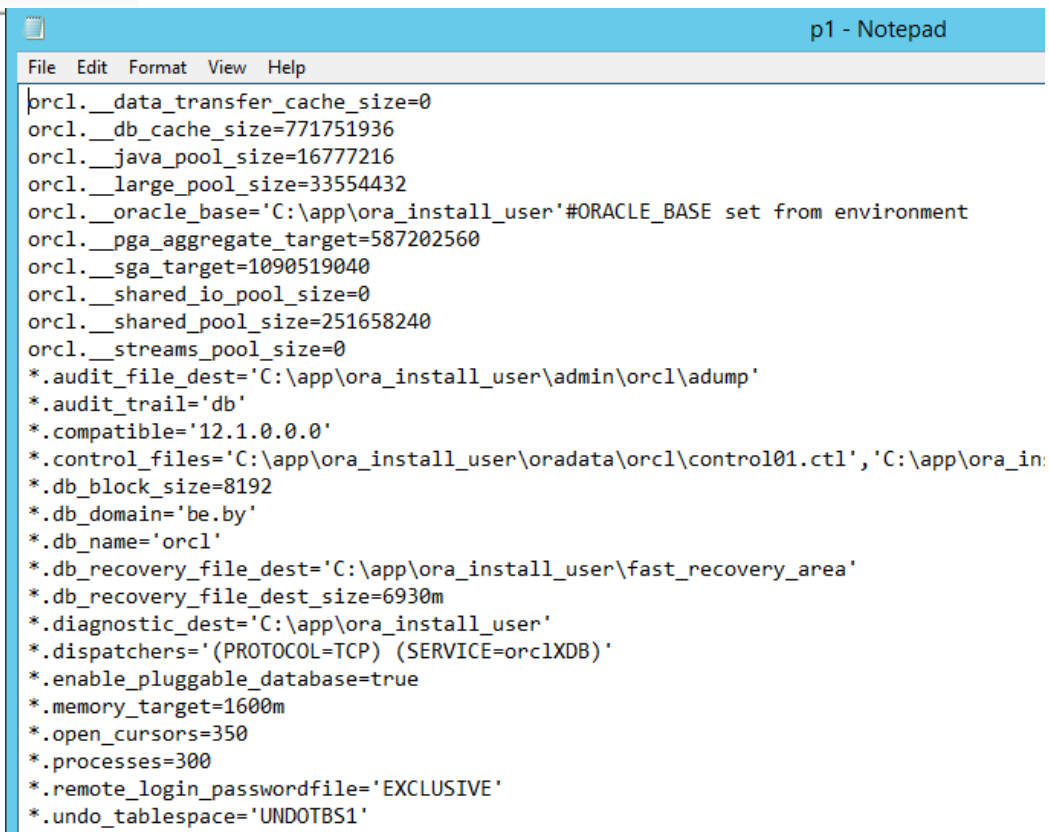
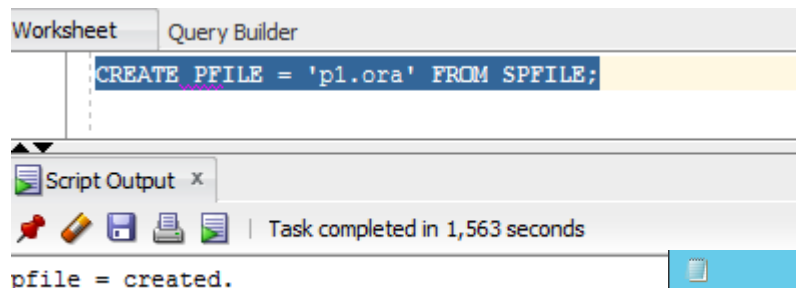
Total System Global Area 1670221824 bytes
Fixed Size                  2403352 bytes
Variable Size             1006633960 bytes
Database Buffers           654311424 bytes
Redo Buffers                6873088 bytes
Database mounted.
Database opened.
SQL> _
```

```
SELECT name, value FROM V$PARAMETER where name = 'open_cursors';
```

Query Result x	
SQL   All Rows Fetched: 1 in 0,031 seconds	
NAME	VALUE
1 open_cursors	350








# Файл параметров

Создание текстового файла параметров PFILE из бинарного файла SPFILE.



# Файл параметров

This PC ► Local Disk (C:) ► app ► ora\_install\_user ► product ► 12.1.0 ► dbhome\_1 ► database

Name	Date modified	Type	Size
 archive	29.08.2016 5:27	File folder	
 hc_orcl.dat	29.08.2016 5:30	DAT File	2 KB
 oradba	22.12.2005 4:07	Application	31 KB
 oradim	26.09.2016 4:47	Text Document	1 KB
 p1	27.09.2016 6:00	ORA File	2 KB
 PWDorcl	29.08.2016 5:57	ORA File	8 KB
 SPFILEORCL	27.09.2016 6:02	ORA File	4 KB

# Файл параметров

- ▶ Сформировать бинарный файл SPFILE параметров из текстового файла PFILE

```
*.db_block_size=8192
*.db_domain='be.by'
*.db_name='orcl'
*.db_recovery_file_dest='C:\app\ora_install_user\fast_recovery_
*.db_recovery_file_dest_size=6930m
*.diagnostic_dest='C:\app\ora_install_user'
*.dispatchers='(PROTOCOL=TCP) (SERVICE=orclXDB)'
*.enable_pluggable_database=true
*.memory_target=1600m
*.open_cursors=300
*.processes=300
*.remote_login_passwordfile='EXCLUSIVE'
*.undo_tablespace='UNDOTBS1'
```

```
CREATE SPFILE = 'SPFILEORCL1.ora' FROM PFILE='p1.ora';
```

Script Output x

Task completed in 0,25 seconds

spfile = created.

```
SELECT name, value FROM V$PARAMETER where name = 'open_cursors';
```

Query Result x

SQL | All Rows Fetched: 1 in 0,032 seconds

	NAME	VALUE
1	open_cursors	300

# Файл параметров

- Необходимы специальные привилегии

```
SQL> connect system/Pa$$w0rd;  
Connected.  
SQL> CREATE SPFILE = 'SPFILEORCL1.ora' FROM PFILE='p1.ora';  
CREATE SPFILE = 'SPFILEORCL1.ora' FROM PFILE='p1.ora'  
*  
ERROR at line 1:  
ORA-01031: insufficient privileges
```

```
SQL> connect /as sysdba;  
Connected.  
SQL> CREATE SPFILE = 'SPFILEORCL1.ora' FROM PFILE='p1.ora';  
File created.
```

## Свойства файла параметров

```
SQL> show parameter spfile;
```

NAME	TYPE	VALUE
spfile	string	C:\APP\ORA_INSTALL_USER\PRODUCT\12.1.0\DBHOME_1\DATABASE\SPFILEORCL.ORA

# Файл параметров

## Порядок поиска имен

1. spfileORACLE\_SID.ora

2. spfile.ora

3. initORACLE\_SID.ora

## Переименован spfileorcl.ora

```
SQL> startup open;  
ORA-01078: failure in processing system parameters  
LRM-00109: could not open parameter file 'C:\APP\ORA_INSTALL_USER\PRODUCT\12.1.0  
\DBHOME_1\DATABASE\INITORCL.ORA'
```

## Переименован p1.ora в initorcl.ora

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

```
Total System Global Area 1670221824 bytes  
Fixed Size 2403352 bytes  
Variable Size 1006633960 bytes  
Database Buffers 654311424 bytes  
Redo Buffers 6873088 bytes
```

```
Database mounted.
```

```
Database opened.
```

```
SQL> show parameter spfile;
```

NAME	TYPE	VALUE
------	------	-------

spfile	string	
--------	--------	--

```
SQL> _
```

# Файл параметров

Переименован spfileorcl\_0.ora

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

Total System Global Area 1670221824 bytes
Fixed Size                  2403352 bytes
Variable Size             1006633960 bytes
Database Buffers           654311424 bytes
Redo Buffers                6873088 bytes
Database mounted.
Database opened.
SQL> show parameter spfile;

NAME                           TYPE        VALUE
-----
spfile                          string      C:\APP\ORA_INSTALL_USER\PRODUC
T\12.1.0\DBHOME_1\DATABASE\SPF
ILEORCL.ORA
SQL>
```



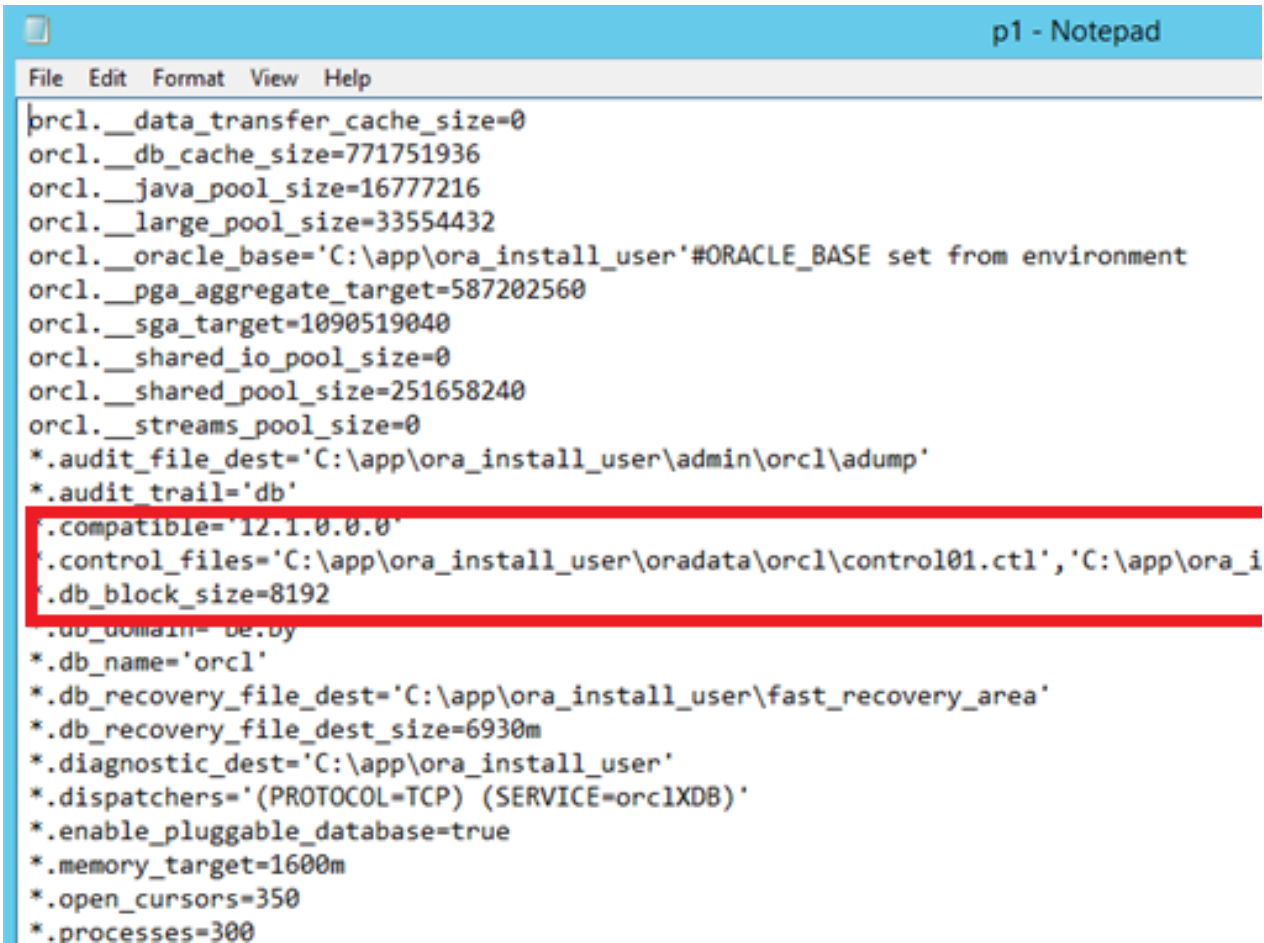
# Управляющие файлы

---

- ▶ **Control files** — файлы, содержащие имена (местоположение) основных физических файлов базы данных и некоторых параметров
- ▶ Используются для поиска других файлов операционной системы;
- ▶ Местоположение управляющих файлов экземпляра получает из файла параметров.
- ▶ По умолчанию для надежности создается 2 управляющих файла. Можно создать больше. Обычно их размещают на разных дисковых носителях (для надежности).



# Управляющие файлы



```
p1 - Notepad
File Edit Format View Help
orcl.__data_transfer_cache_size=0
orcl.__db_cache_size=771751936
orcl.__java_pool_size=16777216
orcl.__large_pool_size=33554432
orcl.__oracle_base='C:\app\ora_install_user'#ORACLE_BASE set from environment
orcl.__pga_aggregate_target=587202560
orcl.__sga_target=1090519040
orcl.__shared_io_pool_size=0
orcl.__shared_pool_size=251658240
orcl.__streams_pool_size=0
*.audit_file_dest='C:\app\ora_install_user\admin\orcl\adump'
*.audit_trail='db'
*.compatible='12.1.0.0.0'
*.control_files='C:\app\ora_install_user\oradata\orcl\control01.ctl','C:\app\ora_i
*.db_block_size=8192
*.db_domain= de.by
*.db_name='orcl'
*.db_recovery_file_dest='C:\app\ora_install_user\fast_recovery_area'
*.db_recovery_file_dest_size=6930m
*.diagnostic_dest='C:\app\ora_install_user'
*.dispatchers='(PROTOCOL=TCP) (SERVICE=orclXDB)'
*.enable_pluggable_database=true
*.memory_target=1600m
*.open_cursors=350
*.processes=300
```

# Управляющие файлы

SHOW <u>PARAMETER</u> CONTROL;		
Script Output x		
Task completed in 0,265 seconds		
NAME	TYPE	VALUE
control_file_record_keep_time	integer	7
control_files	string	C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\CONTROL01.CTL, C:
control_management_pack_access	string	DIAGNOSTIC+TUNING

SELECT NAME FROM V\$CONTROLFILE;	
Script Output x Query Result x	
All Rows Fetched: 2 in 0,078 seconds	
NAME	
1 C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\CONTROL01.CTL	
2 C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\CONTROL02.CTL	

# Управляющие файлы

```
SELECT TYPE, RECORD_SIZE, RECORDS_TOTAL FROM V$CONTROLFILE_RECORD_SECTION;
```

TYPE	RECORD_SIZE	RECORDS_TOTAL
1 DATABASE	316	1
2 CKPT PROGRESS	8180	11
3 REDO THREAD	256	8
4 REDO LOG	72	16
5 DATAFILE	520	1024
6 FILENAME	524	4146
7 TABLESPACE	68	1024
8 TEMPORARY FILENAME	56	1024
9 RMAN CONFIGURATION	1108	50
10 LOG HISTORY	56	292
11 OFFLINE RANGE	200	1063
12 ARCHIVED LOG	584	28
13 BACKUP SET	96	1022
14 BACKUP PIECE	780	1006
15 BACKUP DATAFILE	200	1063
16 BACKUP REDOLOG	76	215
17 DATAFILE COPY	736	1000
18 BACKUP CORRUPTION	44	1115
19 COPY CORRUPTION	40	1227
20 DELETED OBJECT	20	818

# Управляющие файлы – изменение

---

- ▶ Остановить Oracle (shutdown transactional или immediate);
- ▶ Скопировать один из управляющих файлов;
- ▶ Изменить параметр CONTROL\_FILES в файле параметров;
- ▶ Стартовать Oracle (startup open).



# Управляющие файлы – изменение

```
SQL> startup open;
ORACLE instance started.

Total System Global Area 1670221824 bytes
Fixed Size                 2403352 bytes
Variable Size             1006633960 bytes
Database Buffers          654311424 bytes
Redo Buffers               6873088 bytes
ORA-00214: control file 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\CONTROL01.CTL'
version 20509 inconsistent with file
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\CONTROL03.CTL' version 20491
```

```
SQL> select name from v$controlfile;
```

```
no rows selected
```

```
SQL> show parameter control;
```

NAME	TYPE	VALUE
control_file_record_keep_time	integer	7
control_files	string	C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\CONTROL01.CTL, C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\CONTROL02.CTL, C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\CONTROL03.CTL
control_management_pack_access	string	DIAGNOSTIC+TUNING

```
SQL> _
```

# Управляющие файлы – изменение

- ▶ Старт Oracle без одного из управляющих файлов;

```
SQL> startup open;  
ORACLE instance started.  
  
Total System Global Area 1670221824 bytes  
Fixed Size                2403352 bytes  
Variable Size             1006633960 bytes  
Database Buffers          654311424 bytes  
Redo Buffers               6873088 bytes  
ORA-00205: error in identifying control file, check alert log for more info
```

# Управляющие файлы – изменение

- ▶ Если надо изменить управляющий файл, то следует создать сценарий, откорректировать его и

```
ALTER DATABASE BACKUP CONTROLFILE TO TRACE;
```

```
database backup CONTROLFILE altered.
```

```
File Edit Format View Help
```

```
CREATE CONTROLFILE REUSE DATABASE "ORCL" NORESETLOGS NOARCHIVELOG
```

```
MAXLOGFILES 16
```

```
MAXLOGMEMBERS 3
```

```
MAXDATAFILES 1024
```

```
MAXINSTANCES 8
```

```
MAXLOGHISTORY 292
```

```
LOGFILE
```

```
GROUP 1 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO01.LOG' SIZE 50M BLOCKSIZE 512,
```

```
GROUP 2 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO02.LOG' SIZE 50M BLOCKSIZE 512,
```

```
GROUP 3 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO03.LOG' SIZE 50M BLOCKSIZE 512,
```

```
GROUP 4 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO04.LOG' SIZE 50M BLOCKSIZE 512
```

```
-- STANDBY LOGFILE
```

```
DATAFILE
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\SYSTEM01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBSEED\SYSTEM01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\SYS_AUX01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBSEED\SYS_AUX01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\UNDOTBS01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\USERS01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBORCL\SYSTEM01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBORCL\SYS_AUX01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBORCL\SAMPLE_SCHEMA_USERS01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBORCL\EXAMPLE01.DBF',
```

```
'C:\APP\TABLESPACES\TS_LEC.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDB_A\SYSTEM01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDB_A\SYS_AUX01.DBF',
```

```
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDB_A\USERS01.DBF',
```



# Файл паролей

- ▶ Предназначен для аутентификации администраторов базы данных

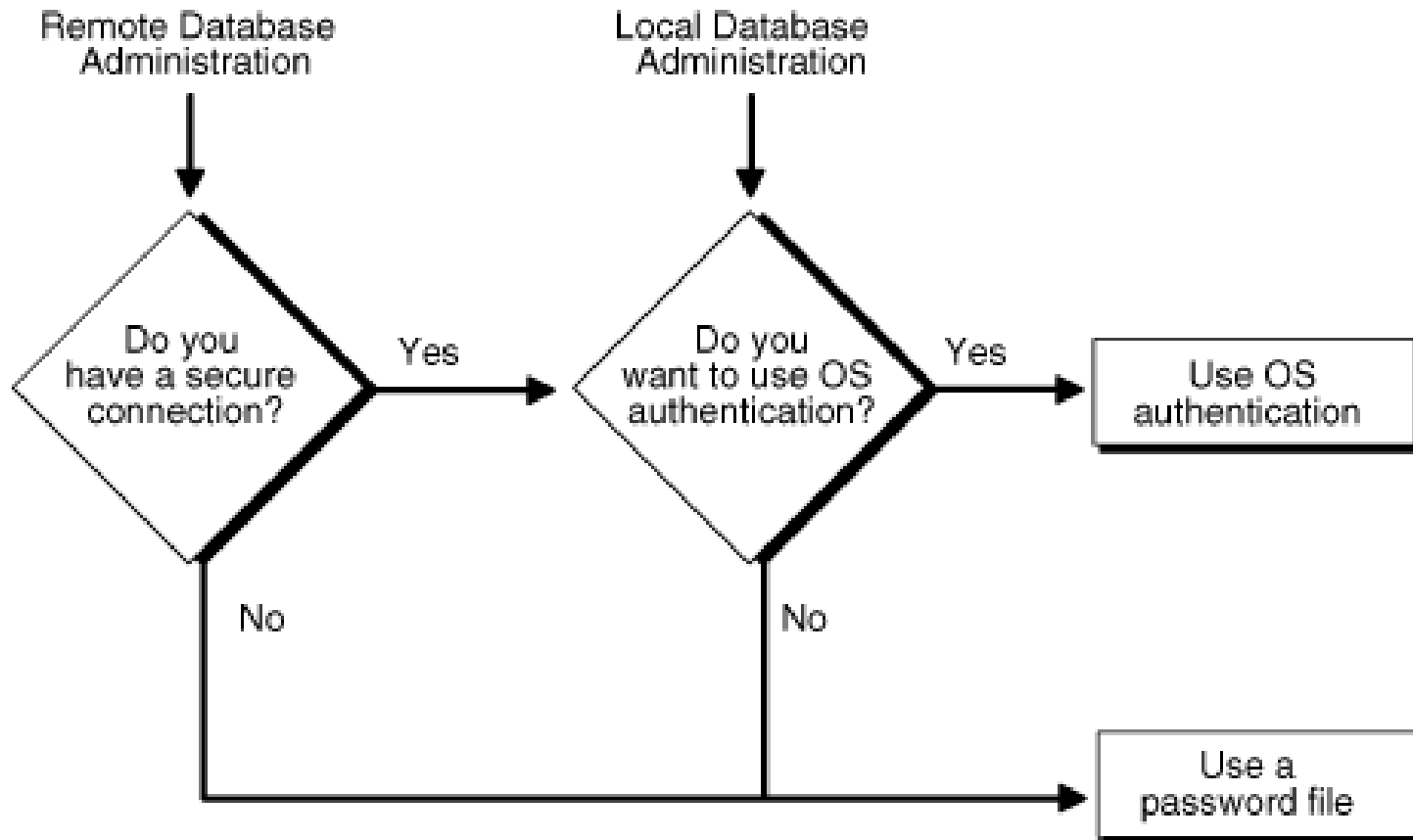
```
Warning: You are no longer connected.  
SQL> connect /as sysdba;  
Connected to an idle instance.
```

- ▶ Можно создавать, пересоздавать и изменять

Platform	Required Name	Required Location
UNIX and Linux	orapwORACLE_SID	ORACLE_HOME/dbs
Windows	PWDORACLE_SID.ora	ORACLE_HOME\database

# Аутентификация администраторов

---



# Файл паролей

## ► Просмотр пользователей в файле паролей

```
SELECT * FROM V$PWFILE_USERS;
```

	USERNAME	SYSDBA	SYSOPER	SYSASM	SYSBACKUP	SYSDG	SYSKM	CON_ID
1	SYS	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	0
2	SYSDG	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	1
3	SYSBACKUP	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	1
4	SYSKM	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	1

# Файл паролей

---

Параметр использования файла пароля:

EXCLUSIVE

SHARED

NONE

```
show parameter remote_login_passwordfile;
```

NAME	TYPE	VALUE
remote_login_passwordfile	string	EXCLUSIVE

# Файлы сообщений

- ▶ Протоколы работы
- ▶ Трассировки
- ▶ Дампы

```
SELECT * FROM V$DIAG_INFO;
```

Query Result x

SQL | All Rows Fetched: 11 in 0,094 seconds

INST_ID	NAME	VALUE	CON_ID
1	1 Diag Enabled	TRUE	0
2	1 ADR Base	C:\APP\ORA_INSTALL_USER	0
3	1 ADR Home	C:\APP\ORA_INSTALL_USER\diag\rdbms\orcl\orcl	0
4	1 Diag Trace	C:\APP\ORA_INSTALL_USER\diag\rdbms\orcl\orcl\trace	0
5	1 Diag Alert	C:\APP\ORA_INSTALL_USER\diag\rdbms\orcl\orcl\alert	0
6	1 Diag Incident	C:\APP\ORA_INSTALL_USER\diag\rdbms\orcl\orcl\incident	0
7	1 Diag Cdump	C:\app\ora_install_user\diag\rdbms\orcl\orcl\cdump	0
8	1 Health Monitor	C:\APP\ORA_INSTALL_USER\diag\rdbms\orcl\orcl\hm	0
9	1 Default Trace File	C:\APP\ORA_INSTALL_USER\diag\rdbms\orcl\orcl\trace\orcl_ora_144.trc	0
10	1 Active Problem Count	0	0
11	1 Active Incident Count	0	0

# Файлы сообщений

## ► Журнал ... \ALERT\LOG.XML

```
<msg time='2016-09-27T05:30:04.193-07:00' org_id='oracle'
comp_id='rdbms'
msg_id='opiexe:3293:2802784106' type='NOTIFICATION'
group='admin_ddl'
level='16' host_id='BOR' host_addr='fe80::cbf:3c5a:ab5a:dcfb%
12'
module='SQL Developer' pid='1596'>
<txt>Completed: alter database add logfile group 4 &apos;C:\APP
\ORA_INSTALL_USER\ORADATA\ORCL\REDO04.LOG&apos;
size 50m blocksize 512
</txt>
</msg>
<msg time='2016-09-27T05:30:04.193-07:00' org_id='oracle'
comp_id='rdbms'
type='UNKNOWN' level='16' host_id='BOR'
host_addr='fe80::cbf:3c5a:ab5a:dcfb%12' module='SQL Developer'
pid='1596'>
<txt>ALTER SYSTEM SET open_cursors=350 SCOPE=SPFILE;
</txt>
</msg>
<msg time='2016-09-27T05:30:25.244-07:00' org_id='oracle'
comp_id='rdbms'
type='UNKNOWN' level='16' host_id='BOR'
host_addr='fe80::cbf:3c5a:ab5a:dcfb%12' module='SQL Developer'
pid='1596'>
<txt>ALTER SYSTEM SET open_cursors=350 SCOPE=SPFILE;
</txt>
</msg>
<msg time='2016-09-27T05:34:15.265-07:00' org_id='oracle'
comp_id='rdbms'
msg_id='opistp_real:1927:1141351617' type='NOTIFICATION'
group='shutdown'
```

# Журналы повтора

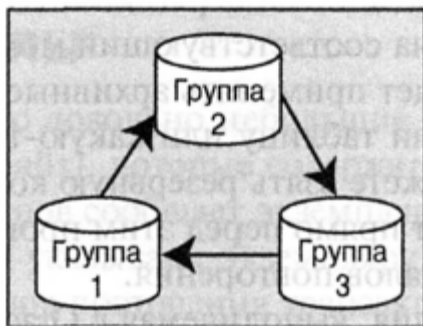
---

- ▶ **Журналы повторного выполнения** - дисковые ресурсы, в которых фиксируются изменения вносимых пользователями в базу данных;
- ▶ журнал представляет собой файл операционной системы;
- ▶ как минимум должно быть два файла;
- ▶ журналы применяются при восстановлении базы данных.



# Журналы повтора

- ▶ файлы журналов используются циклически (сначала запись идет в 1й файл, после заполнения во 2й, 3й..., затем снова в 1й)



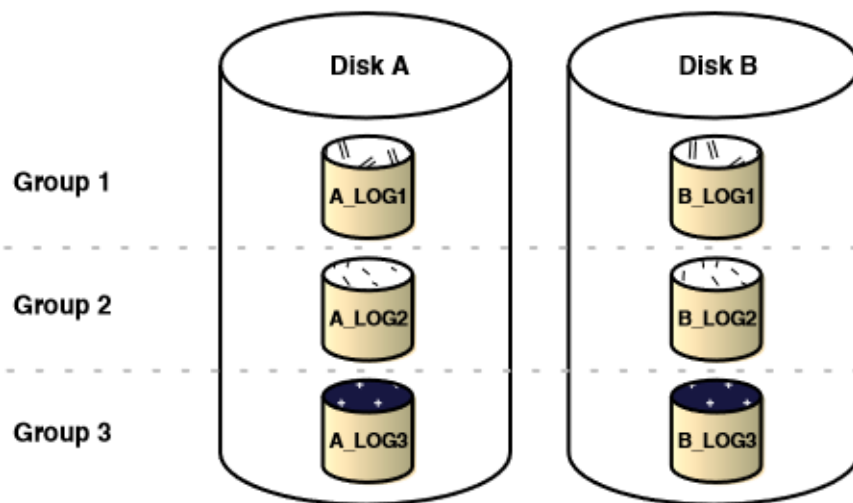
```
SELECT * FROM V$LOGFILE;
```

	GROUP#	STATUS	TYPE	MEMBER	IS_RECOVERY_I
1	3	(null)	ONLINE	C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO03.LOG	NO
2	2	(null)	ONLINE	C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO02.LOG	NO
3	1	(null)	ONLINE	C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO01.LOG	NO



# Журналы повтора

- ▶ **Мультиплексирование журналов повтора – поддержка несколько копий каждого журнала**



```
SELECT GROUP#, STATUS, MEMBERS FROM V$LOG;
```

	GROUP#	STATUS	MEMBERS
1	1	CURRENT	1
2	2	INACTIVE	1
3	3	INACTIVE	1

# Журналы повтора

- ▶ SCN – System change number – системный номер изменений в базе данных

```
SELECT * FROM V$LOG;
```

Query Result x

SQL | All Rows Fetched: 4 in 0,062 seconds

GROUP#	THREAD#	SEQUENCE#	BYTES	BLOCKSIZE	MEMBERS	ARCHIVED	STATUS	FIRST_CHANGE#	FIRST_TIME
1	1	121	52428800	512	1	NO	CURRENT	3832638	25.09.16
2	2	119	52428800	512	1	NO	INACTIVE	3797754	25.09.16
3	3	120	52428800	512	1	NO	INACTIVE	3818813	25.09.16

# Журналы повтора - добавление новой группы

```
ALTER DATABASE ADD LOGFILE GROUP 4 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO04.LOG'  
SIZE 50m BLOCKSIZE 512;
```

```
select group#,  
       sequence#,  
       bytes,  
       members,  
       status,  
       FIRST_CHANGE#  
from v$log;
```

Query Result x						
SQL   All Rows Fetched: 4 in 0,046 seconds						
	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	121	52428800	1	CURRENT	3832638
2	2	119	52428800	1	INACTIVE	3797754
3	3	120	52428800	1	INACTIVE	3818813
4	4	0	52428800	1	UNUSED	0

# Журналы повтора - добавление файла в группу

```
ALTER DATABASE ADD LOGFILE MEMBER'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO041.LOG' TO GROUP 4 ;
```

```
select group#,  
       sequence#,  
       bytes,  
       members,  
       status,  
       FIRST_CHANGE#  
from v$log;
```

Script Output x Query Result x

SQL | All Rows Fetched: 4 in 0,046 seconds

	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	121	52428800	1	CURRENT	3832638
2	2	119	52428800	1	INACTIVE	3797754
3	3	120	52428800	1	INACTIVE	3818813
4	4	0	52428800	2	UNUSED	0

# Журналы повтора - переключение журналов

```
ALTER SYSTEM SWITCH LOGFILE;
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

Script Output x Query Result x						
SQL   All Rows Fetched: 4 in 0,062 seconds						
	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	121	52428800		1 ACTIVE	3832638
2	2	119	52428800		1 INACTIVE	3797754
3	3	120	52428800		1 INACTIVE	3818813
4	4	122	52428800		2 CURRENT	3864321

```
ALTER SYSTEM SWITCH LOGFILE;
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

Script Output x Query Result x						
SQL   All Rows Fetched: 4 in 0,078 seconds						
	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	121	52428800		1 ACTIVE	3832638
2	2	123	52428800		1 CURRENT	3864363
3	3	120	52428800		1 INACTIVE	3818813
4	4	122	52428800		2 ACTIVE	3864321

# Журналы повтора - переключение журналов

```
ALTER SYSTEM SWITCH LOGFILE;
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

Script Output x Query Result x

SQL | All Rows Fetched: 4 in 0,047 seconds

GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	121	52428800	1 ACTIVE	3832638
2	2	123	52428800	1 ACTIVE	3864363
3	3	124	52428800	1 CURRENT	3864438
4	4	122	52428800	2 ACTIVE	3864321

```
ALTER SYSTEM SWITCH LOGFILE;
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

Script Output x Query Result x

SQL | All Rows Fetched: 4 in 0,047 seconds

GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	125	52428800	1 CURRENT	3864455
2	2	123	52428800	1 ACTIVE	3864363
3	3	124	52428800	1 ACTIVE	3864438
4	4	122	52428800	2 ACTIVE	3864321

# Журналы повтора – удаление файла

- ▶ Группа должна быть не CURRENT
- ▶ Файл ОС не удаляется)

```
ALTER DATABASE DROP LOGFILE MEMBER 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO041.LOG';
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	125	52428800		1 CURRENT	3864455
2	2	123	52428800		1 ACTIVE	3864363
3	3	124	52428800		1 ACTIVE	3864438
4	4	122	52428800		1 INACTIVE	3864321

# Журналы повтора – удаление группы

```
ALTER DATABASE DROP LOGFILE GROUP 4;
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

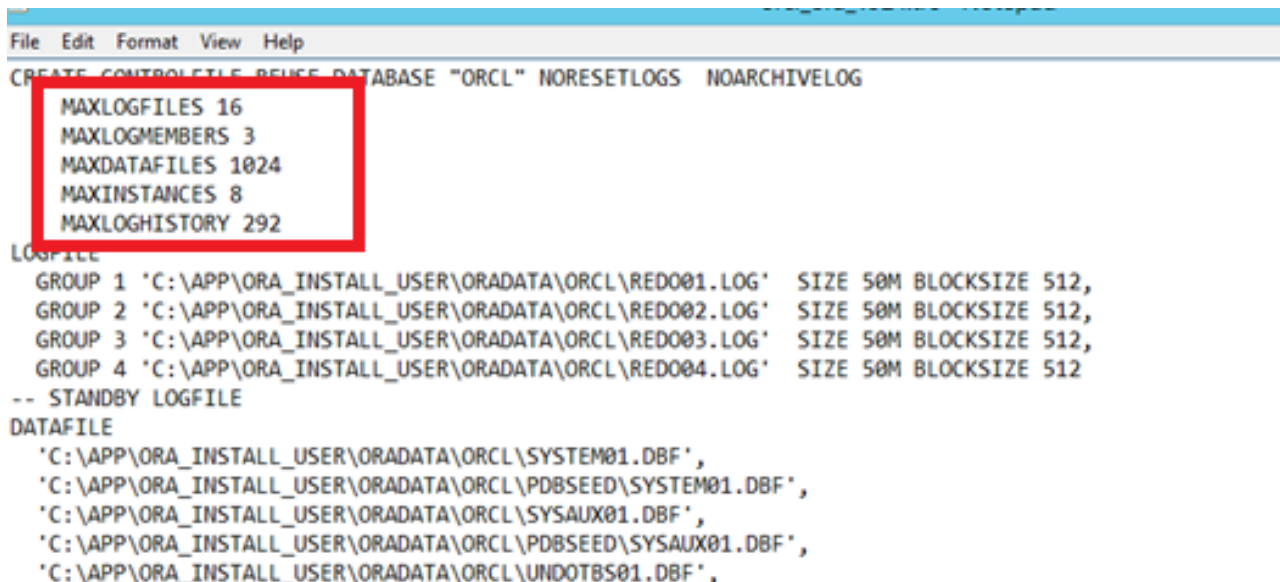
Script Output x Query Result x						
SQL   All Rows Fetched: 3 in 0,047 seconds						
	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	125	52428800		1 CURRENT	3864455
2	2	123	52428800		1 INACTIVE	3864363
3	3	124	52428800		1 INACTIVE	3864438



# Журналы повтора - параметры

Указывается в управляющих файлах:

- ▶ MAXLOGFILES - максимальное количество групп журналов повтора
- ▶ MAXLOGMEMBERS - максимальное количество файлов в группе



```
File Edit Format View Help
CREATE CONTROLFILE REUSE DATABASE "ORCL" NORESETLOGS NOARCHIVELOG
MAXLOGFILES 16
MAXLOGMEMBERS 3
MAXDATAFILES 1024
MAXINSTANCES 8
MAXLOGHISTORY 292

LOGFILE
GROUP 1 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO001.LOG' SIZE 50M BLOCKSIZE 512,
GROUP 2 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO002.LOG' SIZE 50M BLOCKSIZE 512,
GROUP 3 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO003.LOG' SIZE 50M BLOCKSIZE 512,
GROUP 4 'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\REDO004.LOG' SIZE 50M BLOCKSIZE 512
-- STANDBY LOGFILE

DATAFILE
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\SYSTEM01.DBF',
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBSEED\SYSTEM01.DBF',
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\SYS_AUX01.DBF',
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\PDBSEED\SYS_AUX01.DBF',
'C:\APP\ORA_INSTALL_USER\ORADATA\ORCL\UNDOTBS01.DBF',
```

# Архивы журналов повтора

- ▶ Режимы работы экземпляра:
  - ▶ ARCHIVELOG
  - ▶ NOARCHIVELOG

```
SELECT NAME, LOG_MODE FROM V$DATABASE;
```

Script Output x Query Result x	
SQL   All Rows Fetched: 1 in 0,032 seconds	
NAME	LOG_MODE
1 ORCL	NOARCHIVELOG

```
SELECT INSTANCE_NAME, ARCHIVER, ACTIVE_STATE FROM V$INSTANCE;
```

Script Output x Query Result x		
SQL   All Rows Fetched: 1 in 0,016 seconds		
INSTANCE_NAME	ARCHIVER	ACTIVE_STATE
1 orcl	STOPPED	NORMAL

# Архивы

---

- ▶ Включить процесс архивирования
- ▶ Архивный файл появляется после переключения оперативного журнала.

```
SQL> shutdown immediate;  
Database closed.  
Database dismounted.  
ORACLE instance shut down.  
SQL> startup mount;  
ORACLE instance started.  
  
Total System Global Area 1670221824 bytes  
Fixed Size                2403352 bytes  
Variable Size             1006633960 bytes  
Database Buffers          654311424 bytes  
Redo Buffers              6873088 bytes  
Database mounted.  
SQL> alter database archivelog;  
  
Database altered.  
  
SQL> alter database open;  
  
Database altered.  
  
SQL> _
```

# Архивы

```
SELECT NAME, LOG_MODE FROM V$DATABASE;
```

	NAME	LOG_MODE
1	ORCL	ARCHIVELOG

```
SELECT INSTANCE_NAME, ARCHIVER, ACTIVE_STATE FROM V$INSTANCE;
```

	INSTANCE_NAME	ARCHIVER	ACTIVE_STATE
1	orcl	STARTED	NORMAL

# Архивы

```
SELECT * FROM V$LOG;
```

Script Output x Query Result x Query Result 1 x												
SQL   All Rows Fetched: 3 in 0,063 seconds												
	GROUP #	THREAD #	SEQUENCE #	BYTES	BLOCKSIZE	MEMBERS	ARCHIVED	STATUS	FIRST_CHANGE #	FIRST_TIME	NEXT	
1	1	1	125	52428800	512	1	NO	CURRENT	3864455	27.09.16	28147	
2	2	1	123	52428800	512	1	YES	INACTIVE	3864363	27.09.16		
3	3	1	124	52428800	512	1	YES	INACTIVE	3864438	27.09.16		

# Архивы журналов повтора

## ► После переключения журнала

```
ALTER SYSTEM SWITCH LOGFILE;  
SELECT * FROM V$ARCHIVED_LOG;
```

Script Output x Query Result x Query Result 1 x

SQL | All Rows Fetched: 1 in 0,063 seconds

RECID	STAMP	NAME
1	1 923650337	C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\ARCHIVELOG\2016_09_27\01_MF_1_125_CYO7RKCR_.ARC

```
ALTER SYSTEM SWITCH LOGFILE;  
SELECT * FROM V$ARCHIVED_LOG;
```

Script Output x Query Result x Query Result 1 x

SQL | All Rows Fetched: 2 in 0 seconds

RECID	STAMP	NAME
1	1 923650337	C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\ARCHIVELOG\2016_09_27\01_MF_1_125_CYO7RKCR_.ARC
2	2 923650483	C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\ARCHIVELOG\2016_09_27\01_MF_1_126_CYO7X3M6_.ARC

# Архивы

```
ALTER SYSTEM SWITCH LOGFILE;
```

```
SELECT GROUP#, SEQUENCE#,BYTES, MEMBERS, STATUS, FIRST_CHANGE# FROM V$LOG;
```

```
SELECT Name, FIRST_CHANGE#, NEXT_CHANGE# FROM V$ARCHIVED_LOG;
```

	GROUP#	SEQUENCE#	BYTES	MEMBERS	STATUS	FIRST_CHANGE#
1	1	128	52428800	1	CURRENT	3866172
2	2	126	52428800	1	INACTIVE	3866094
3	3	127	52428800	1	ACTIVE	3866147

	NAME	FIRST_CHANGE#	NEXT_CHANGE#
1	C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\ARCHIVELOG\2016_09_27\01_MF_1_125_CYO7RKCR_.ARC	3864455	3866094
2	C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\ARCHIVELOG\2016_09_27\01_MF_1_126_CYO7X3M6_.ARC	3866094	3866147
3	C:\APP\ORA_INSTALL_USER\FAST_RECOVERY_AREA\ORCL\ARCHIVELOG\2016_09_27\01_MF_1_127_CYO7YBDJ_.ARC	3866147	3866172

# Архивы

Worksheet Query Builder

```
ARCHIVE LOG LIST;
```




Script Output x  
Task completed in 0,109 seconds

Database log mode	Archive log Mode
Automatic archival	Enabled
Archive destination	USE_DB_RECOVERY_FILE_DEST
Oldest online log sequence	126
Next log sequence to archive	128
Current log sequence	128

```
SHOW PARAMETER DB_RECOVERY;
```

NAME	TYPE	VALUE
db_recovery_file_dest	string	C:\app\ora_install_user\fast_recovery_area
db_recovery_file_dest_size	big integer	6930M

PC ► Local Disk (C:) ► app ► ora\_install\_user ► fast\_recovery\_area ► orcl ► ARCHIVELOG ► 2016\_09\_27

Name	Date modified	Type	Size
 O1_MF_1_125_CYO7RKCR_.ARC	27.09.2016 9:32	ARC File	849 KB
 O1_MF_1_126_CYO7X3M6_.ARC	27.09.2016 9:34	ARC File	7 KB
 O1_MF_1_127_CYO7YBDJ_.ARC	27.09.2016 9:35	ARC File	13 KB



# Архивы


## Отключение процесса архивирования

```
SQL> startup mount;  
ORACLE instance started.  
  
Total System Global Area 1670221824 bytes  
Fixed Size                2403352 bytes  
Variable Size             1006633960 bytes  
Database Buffers          654311424 bytes  
Redo Buffers               6873088 bytes  
Database mounted.  
SQL> alter database noarchivelog;  
  
Database altered.
```

```
SQL> select name, log_mode from v$database;  
  
NAME      LOG_MODE  
-----  
ORCL      NOARCHIVELOG
```

```
SELECT INSTANCE_NAME, ARCHIVER, ACTIVE_STATE FROM V$INSTANCE;
```

Script Output x Query Result x

 SQL | All Rows Fetched: 1 in 0,016 seconds

INSTANCE_NAME	ARCHIVER	ACTIVE_STATE
1 orcl	STOPPED	NORMAL

# Вопросы?

---

