

Session 18 CLOSED (COLD) COMPLETE RECOVERY by RMAN

→ One of the ESSENTIAL files is missing (corrupted)

The Oracle base remains unchanged with value /opt/oracle
[oracle@oracloud12c ~]\$ **sqlplus / as sysdba**

SQL*Plus: Release 12.1.0.2.0 Production on Wed Apr 11 11:31:44 2018

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Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit
Production

With the Partitioning, OLAP, Advanced Analytics and Real Application
Testing options

SQL> set pagesize 200

SQL> **SELECT * FROM V\$LOG;**

GROUP#	THREAD#	SEQUENCE#	BYTES	BLOCKSIZE	MEMBERS	ARC

STATUS		FIRST_CHANGE#	FIRST_TIM	NEXT_CHANGE#	NEXT_TIME	

1	1	1573	52428800	512		1 YES
INACTIVE		31255458	11-APR-18	31273676	11-APR-18	
2	1	1574	52428800	512		1 YES
INACTIVE		31273676	11-APR-18	31278551	11-APR-18	
3	1	1575	52428800	512		1 NO
CURRENT		31278551	11-APR-18	2.8147E+14		

SQL> **conn tom/cat;**

Connected.

SQL> **INSERT INTO play VALUES (sysdate);**

1 row created.

SQL> **select * from play;**

A

11-APR-18

04-APR-18

08-APR-18

SQL> **rollback;**

Rollback complete.

```
SQL> INSERT INTO play VALUES (sysdate+1);
```

```
1 row created.
```

```
SQL> select * from play;
```

```
A
```

```
-----  
12-APR-18  
04-APR-18  
08-APR-18
```

```
SQL> CONN / AS SYSDBA
```

```
Connected.
```

```
SQL> HOST
```

```
[oracle@oracloud12c ~]$ rman target /
```

```
Recovery Manager: Release 12.1.0.2.0 - Production on Wed Apr 11  
11:36:19 2018
```

```
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reserved.
```

```
connected to target database: STUDENT (DBID=4285838094)
```

```
RMAN> list backup of tablespace undotbs1;
```

```
using target database control file instead of recovery catalog
```

```
List of Backup Sets
```

```
=====
```

BS Key	Type	LV	Size	Device	Type	Elapsed Time	Completion Time
--------	------	----	------	--------	------	--------------	-----------------

11	Full		32.35M	DISK		00:00:04	04-APR-18
----	------	--	--------	------	--	----------	-----------

```
BP Key: 11 Status: AVAILABLE Compressed: NO Tag:  
TAG20180404T180827
```

```
Piece Name: /home/oracle/BACKUP/full_0bsvgssu_11_1  
List of Datafiles in backup set 11
```

File	LV	Type	Ckp	SCN	Ckp Time	Name
------	----	------	-----	-----	----------	------

4		Full		28472490	04-APR-18	
---	--	------	--	----------	-----------	--

```
/opt/oracle/oradata/student/undotbs01.dbf
```

BS Key	Type	LV	Size	Device	Type	Elapsed Time	Completion Time
--------	------	----	------	--------	------	--------------	-----------------

30	Incr 0		2.62G	DISK		00:00:55	06-APR-18
----	--------	--	-------	------	--	----------	-----------

```
BP Key: 30 Status: AVAILABLE Compressed: NO Tag:  
TAG20180406T090625
```

```
Piece Name: /home/oracle/BACKUP/full_0vsvl5oh_31_1  
List of Datafiles in backup set 30
```

File	LV	Type	Ckp	SCN	Ckp Time	Name
------	----	------	-----	-----	----------	------

```

-----
4      0  Incr 29153195    06-APR-18
/opt/oracle/oradata/student/undotbs01.dbf

BS Key   Type LV Size          Device Type Elapsed Time Completion Time
-----
35        Incr 0   8.11M        DISK          00:00:01      06-APR-18
      BP Key: 35   Status: AVAILABLE Compressed: NO   Tag:
TAG20180406T091147
      Piece Name: /home/oracle/BACKUP/full_14svl62j_36_1
List of Datafiles in backup set 35
File LV Type Ckp SCN      Ckp Time  Name
-----
4      0  Incr 29154531    06-APR-18
/opt/oracle/oradata/student/undotbs01.dbf

```

```

BS Key   Type LV Size          Device Type Elapsed Time Completion Time
-----
39        Incr 1   272.00K        DISK          00:00:00      06-APR-18
      BP Key: 39   Status: AVAILABLE Compressed: NO   Tag:
TAG20180406T091251
      Piece Name: /home/oracle/BACKUP/full_18svl64j_40_1
List of Datafiles in backup set 39
File LV Type Ckp SCN      Ckp Time  Name
-----
4      1  Incr 29154793    06-APR-18
/opt/oracle/oradata/student/undotbs01.dbf

```

RMAN> **BACKUP INCREMENTAL LEVEL 0 TABLESPACE UNDOTBS1;**

```

Starting backup at 11-APR-18
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=288 device type=DISK
channel ORA_DISK_1: starting incremental level 0 datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00004
name=/opt/oracle/oradata/student/undotbs01.dbf
channel ORA_DISK_1: starting piece 1 at 11-APR-18
channel ORA_DISK_1: finished piece 1 at 11-APR-18
piece handle=/home/oracle/BACKUP/full_1bt02kf8_43_1
tag=TAG20180411T113712 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 11-APR-18

```

```

Starting Control File and SPFILE Autobackup at 11-APR-18
piece
handle=/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_11/o1
_mf_s_973165033_fdwbx9nk_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 11-APR-18

```

RMAN> **report obsolete;**

RMAN retention policy will be applied to the command

RMAN retention policy is set to redundancy 2

Report of obsolete backups and copies

Type	Key	Completion Time	Filename/Handle
Backup Set	11	04-APR-18	
Backup Piece	11	04-APR-18	
			/home/oracle/BACKUP/full_0bsvgssu_11_1
Backup Set	38	06-APR-18	
Backup Piece	38	06-APR-18	
			/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_06/o1_mf_s_9
			72724341_fdgwko94_.bkp
Backup Set	40	06-APR-18	
Backup Piece	40	06-APR-18	
			/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_06/o1_mf_s_9
			72724372_fdgwlnjs_.bkp

RMAN> **delete obsolete;**

RMAN retention policy will be applied to the command

RMAN retention policy is set to redundancy 2

using channel ORA_DISK_1

Deleting the following obsolete backups and copies:

Type	Key	Completion Time	Filename/Handle
Backup Set	11	04-APR-18	
Backup Piece	11	04-APR-18	
			/home/oracle/BACKUP/full_0bsvgssu_11_1
Backup Set	38	06-APR-18	
Backup Piece	38	06-APR-18	
			/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_06/o1_mf_s_9
			72724341_fdgwko94_.bkp
Backup Set	40	06-APR-18	
Backup Piece	40	06-APR-18	
			/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_06/o1_mf_s_9
			72724372_fdgwlnjs_.bkp

Do you really want to delete the above objects (enter YES or NO)? **yes**

deleted backup piece

backup piece handle=/home/oracle/BACKUP/full_0bsvgssu_11_1 RECID=11

STAMP=972583838

deleted backup piece

backup piece

handle=/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_06/o1

_mf_s_972724341_fdgwko94_.bkp RECID=38 STAMP=972724341

deleted backup piece

backup piece

handle=/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_06/o1

_mf_s_972724372_fdgwlnjs_.bkp RECID=40 STAMP=972724372

Deleted 3 objects

RMAN> **list backup of datafile 4;**

List of Backup Sets

=====

BS Key	Type	LV	Size	Device	Type	Elapsed Time	Completion Time
30	Incr	0	2.62G	DISK		00:00:55	06-APR-18
BP Key: 30 Status: AVAILABLE Compressed: NO Tag:							
TAG20180406T090625							
Piece Name: /home/oracle/BACKUP/full_0vsvl5oh_31_1							
List of Datafiles in backup set 30							
File	LV	Type	Ckp	SCN	Ckp Time	Name	
4	0	Incr	29153195	06-APR-18		/opt/oracle/oradata/student/undotbs01.dbf	

BS Key	Type	LV	Size	Device	Type	Elapsed Time	Completion Time
35	Incr	0	8.11M	DISK		00:00:01	06-APR-18
BP Key: 35 Status: AVAILABLE Compressed: NO Tag:							
TAG20180406T091147							
Piece Name: /home/oracle/BACKUP/full_14svl62j_36_1							
List of Datafiles in backup set 35							
File	LV	Type	Ckp	SCN	Ckp Time	Name	
4	0	Incr	29154531	06-APR-18		/opt/oracle/oradata/student/undotbs01.dbf	

BS Key	Type	LV	Size	Device	Type	Elapsed Time	Completion Time
39	Incr	1	272.00K	DISK		00:00:00	06-APR-18
BP Key: 39 Status: AVAILABLE Compressed: NO Tag:							
TAG20180406T091251							
Piece Name: /home/oracle/BACKUP/full_18svl64j_40_1							
List of Datafiles in backup set 39							
File	LV	Type	Ckp	SCN	Ckp Time	Name	
4	1	Incr	29154793	06-APR-18		/opt/oracle/oradata/student/undotbs01.dbf	

BS Key	Type	LV	Size	Device	Type	Elapsed Time	Completion Time
42	Incr	0	8.79M	DISK		00:00:01	11-APR-18
BP Key: 42 Status: AVAILABLE Compressed: NO Tag:							
TAG20180411T113712							
Piece Name: /home/oracle/BACKUP/full_1bt02kf8_43_1							
List of Datafiles in backup set 42							
File	LV	Type	Ckp	SCN	Ckp Time	Name	
4	0	Incr	31285420	11-APR-18		/opt/oracle/oradata/student/undotbs01.dbf	

* Let's mimic Disk Controller error, where Datafile 4 from the UNDOTBS1 tablespace becomes unusable. This is one of TWO ESSENTIAL Datafiles (the other one is from SYSTEM Tablespace) and they can NOT be taken offline. In that case Database will most likely shut down itself and you will need to perform CLOSED COMPLETE RECOVERY. This type Recovery happens while in MOUNT state and NO data loss will occur, because ALL Archive Log files since the LAST FULL Backup of Datafile 4 are available.

In the case that just one of these Archive Log files (needed for recovery) is lost or corrupted, you can perform only INCOMPLETE RECOVERY till Point in Time in the Past, when the Redo Log file (of that lost Archive Log file) became current OR till SCN that was saved with the previous Redo Log file (the LAST_CHANGE#) *

Mimicking Disk Controller error involves aborting the database and deleting the essential file, but later we are NOT going to switch to other (good) disk, like the real life situation would require *

```
RMAN> SHUTDOWN ABORT;
```

Oracle instance shut down

```
RMAN> host;
```

```
[oracle@oracloud12c ~]$ cd /opt/oracle/oradata/student
[oracle@oracloud12c student]$ ls -l
total 9689040
-rw-r-----. 1 oracle dba      10305536 Apr 11 11:38 control01.ctl
-rw-r-----. 1 oracle dba       5251072 Apr 11 11:16 indx01.dbf
-rw-r-----. 1 oracle dba       5251072 Apr 11 11:16 joke01.dbf
-rw-r-----. 1 oracle dba       3153920 Apr 11 11:16 joke02.dbf
-rw-r-----. 1 oracle dba    209723392 Apr 11 11:16 mgmt_ad4j.dbf
-rw-r-----. 1 oracle dba    5557460992 Apr 11 11:38 mgmt.dbf
-rw-r-----. 1 oracle dba     62922752 Apr 11 11:38 mgmt_depot.dbf
-rw-r-----. 1 oracle dba     10493952 Apr 11 11:25 mine01.dbf
-rw-r-----. 1 oracle dba     52429312 Apr 11 11:01 redo01.log
-rw-r-----. 1 oracle dba     52429312 Apr 11 11:16 redo02.log
-rw-r-----. 1 oracle dba     52429312 Apr 11 11:38 redo03.log
-rw-r-----. 1 oracle dba    2212503552 Apr 11 11:38 sysaux01.dbf
-rw-r-----. 1 oracle dba    1101012992 Apr 11 11:38 system01.dbf
-rw-r-----. 1 oracle dba     62922752 Apr 11 11:21 temp01.dbf
-rw-r-----. 1 oracle dba    524296192 Apr 11 11:37 undotbs01.dbf
-rw-r-----. 1 oracle dba       5251072 Apr 11 11:16 users01.dbf
[oracle@oracloud12c student]$ rm undotbs01.dbf
```

```
[oracle@oracloud12c ~]$ ls -l un*
ls: cannot access un*: No such file or directory
```

```
[oracle@oracloud12c ~]$ exit
exit
host command complete
RMAN-00571:
```

```

=====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS
=====
RMAN-00571:
=====
RMAN-06135: error executing host command: Additional information: 512

```

Step One – Mount Database and Inspect file for RECOVERY

→ you may try to go for OPEN, but it will stop at MOUNT with the famous errors 1157 and 1110

```

RMAN> STARTUP;

connected to target database (not started)
Oracle instance started
database mounted
RMAN-00571:
=====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS
=====
RMAN-00571:
=====
RMAN-03002: failure of startup command at 04/11/2018 11:40:32
ORA-01157: cannot identify/lock data file 4 - see DBWR trace file
ORA-01110: data file 4: '/opt/oracle/oradata/student/undotbs01.dbf'

RMAN> SELECT FILE#, ONLINE_STATUS, ERROR, CHANGE#
FROM V$RECOVER_FILE;

2>

```

FILE#	ONLINE_	ERROR	CHANGE#
4	ONLINE	FILE NOT FOUND	0

Step Two – Restore missing Datafile (or whole Tablespace)

```

RMAN> RESTORE DATAFILE 4;

Starting restore at 11-APR-18
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=248 device type=DISK

channel ORA_DISK_1: starting datafile backup set restore
channel ORA_DISK_1: specifying datafile(s) to restore from backup set
channel ORA_DISK_1: restoring datafile 00004 to
/opt/oracle/oradata/student/undotbs01.dbf
channel ORA_DISK_1: reading from backup piece
/home/oracle/BACKUP/full_1bt02kf8_43_1
channel ORA_DISK_1: piece
handle=/home/oracle/BACKUP/full_1bt02kf8_43_1 tag=TAG20180411T113712
channel ORA_DISK_1: restored backup piece 1

```

```
channel ORA_DISK_1: restore complete, elapsed time: 00:00:03
Finished restore at 11-APR-18
```

→ Notice that RMAN used piece# 43. This is Last Full=Level 0 Backup of Datafile 4, taken just today.

Step Three – Recover missing Datafile (or whole Tablespace)

```
RMAN> RECOVER DATAFILE 4;
```

```
Starting recover at 11-APR-18
using channel ORA_DISK_1
```

```
starting media recovery
media recovery complete, elapsed time: 00:00:00
```

```
Finished recover at 11-APR-18
```

* We see that this recovery needed NO Archived logs, because the Most Recent Full Backup of Datafile 4 was taken just recently today *

Step Four – Open Database

```
RMAN> ALTER DATABASE OPEN;
```

```
Statement processed
```

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

GROUP#	THREAD#	SEQUENCE#	BYTES	BLOCKSIZE	MEMBERS	ARC
-----	-----	-----	-----	-----	-----	----
STATUS		FIRST_CHANGE#	FIRST_TIM	NEXT_CHANGE#	NEXT_TIME	
-----	-----	-----	-----	-----	-----	----
1	1	1576	52428800	512		1 NO
CURRENT		31485988	11-APR-18	281474976710		
2	1	1574	52428800	512		1 YES
INACTIVE		31273676	11-APR-18	31278551	11-APR-18	
3	1	1575	52428800	512		1 YES
INACTIVE		31278551	11-APR-18	31485988	11-APR-18	

Step Five – Verify Recovery File and that there is NO DATA LOSS

```
RMAN> SELECT FILE#, ONLINE_STATUS, ERROR, CHANGE#
        FROM V$RECOVER_FILE;
```

```
no rows selected
```

```
RMAN> SELECT * FROM tom.play;
```


A

12-APR-18

04-APR-18

08-APR-18

→ Notice that our Table and its rows are back (No Data Loss)

RMAN> **exit**

Recovery Manager complete.

[oracle@oracloud12c ~]\$ **exit**

exit

SQL> **exit**

Disconnected from Oracle Database 12c Enterprise Edition Release

12.1.0.2.0 - 64bit Production

With the Partitioning, OLAP, Advanced Analytics and Real Application

Testing options

[oracle@oracloud12c ~]\$ **exit**

logout