***SESSION 14 PERFORMING BACKUPS with RMAN (NOARCHIVELOG)***

*This exercise is Optional, but read and try to understand it, it will help you with further practices for sure.*

Last login: Fri Mar 25 10:05:02 2022 from 10.31.12.209

[student@oracledb19c ~]$ **su - oracle**

Password:

Last login: Fri Mar 25 10:05:17 EDT 2022 on pts/0

The Oracle base remains unchanged with value /opt/oracle/app/oracle

[oracle@oracledb19c ~]$ **pwd**

/home/oracle

[oracle@oracledb19c ~]$ **mkdir BACKUP ARCHIVE**

[oracle@oracledb19c ~]$ **chmod 777 BACKUP ARCHIVE**

** This will add TWO new Directories for Backup and Archiving needs, also all permissions**

[oracle@oracledb19c ~]$ **cd BACKUP**

[oracle@oracledb19c BACKUP]$ **pwd**

/home/oracle/BACKUP

[oracle@oracledb19c BACKUP]$ **rman target /**

Recovery Manager: Release 19.0.0.0.0 - Production on Wed Mar 30 12:14:56 2022

Version 19.3.0.0.0

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connected to target database: STUDENT (DBID=107505563)

RMAN> **report schema;  This will list all Datafiles and Tempfiles by their file#**

using target database control file instead of recovery catalog

Report of database schema for database with db\_unique\_name STUDENT

List of Permanent Datafiles

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File Size(MB) Tablespace RB segs Datafile Name

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1 940 SYSTEM YES /opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

2 15 JOKE NO /opt/oracle/app/oracle/oradata/STUDENT/joke01.dbf

3 1300 SYSAUX NO /opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

4 120 UNDOTBS1 YES /opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

5 10 MINE NO /opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

7 6 USERS NO /opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

8 3 JOKE NO /opt/oracle/app/oracle/oradata/DISK4/joke02.dbf

9 10 INDX NO /opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

List of Temporary Files

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File Size(MB) Tablespace Maxsize(MB) Tempfile Name

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1 131 TEMP 32767 /opt/oracle/app/oracle/oradata/STUDENT/temp01.dbf

RMAN> **show all;  This will list all RMAN parameters, #default points to unchanged ones**

RMAN configuration parameters for database with db\_unique\_name STUDENT are:

CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default

CONFIGURE BACKUP OPTIMIZATION OFF; # default

CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default

CONFIGURE CONTROLFILE AUTOBACKUP ON; # default

CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F'; # default

CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; # default

CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default

CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default

CONFIGURE MAXSETSIZE TO UNLIMITED; # default

CONFIGURE ENCRYPTION FOR DATABASE OFF; # default

CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default

CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR LOAD TRUE ; # default

CONFIGURE RMAN OUTPUT TO KEEP FOR 7 DAYS; # default

CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default

CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/opt/oracle/app/oracle/product/19.3.0/dbhome\_1/dbs/snapcf\_student.f'; # default

RMAN> **show controlfile autobackup;**

RMAN configuration parameters for database with db\_unique\_name STUDENT are:

CONFIGURE CONTROLFILE AUTOBACKUP ON; # default

** in version 19c default value is ON, meaning that ANY backup procedure will also produce backup of the Controlfile as well**

RMAN> **show maxsetsize;**

RMAN configuration parameters for database with db\_unique\_name STUDENT are:

CONFIGURE MAXSETSIZE TO UNLIMITED; # default

RMAN> **CONFIGURE RETENTION POLICY TO REDUNDANCY 2;**

** This means that RMAN will consider third, fourth … backup of anything as obsolete**

new RMAN configuration parameters:

CONFIGURE RETENTION POLICY TO REDUNDANCY 2;

new RMAN configuration parameters are successfully stored

RMAN> **CONFIGURE CHANNEL DEVICE TYPE DISK FORMAT**

**'/home/oracle/BACKUP/full\_%u\_%s\_%p';**

** this is the right setting for Location and Name of our Backup Sets**

new RMAN configuration parameters:

CONFIGURE CHANNEL DEVICE TYPE DISK FORMAT '/home/oracle/BACKUP/full\_%u\_%s\_%p';

new RMAN configuration parameters are successfully stored

**\* We can perform only Whole Database, Full and Off-Line (Cold) Backup ; that is the ONLY option in NOARCHIVELOG mode \***

RMAN> **shutdown immediate;**

database closed

database dismounted

Oracle instance shut down

RMAN> **startup mount;**

connected to target database (not started)

Oracle instance started

database mounted

Total System Global Area 2147481656 bytes

Fixed Size 8898616 bytes

Variable Size 1476395008 bytes

Database Buffers 637534208 bytes

Redo Buffers 24653824 bytes

RMAN> **backup database filesperset=4;**

** the only option for backup syntax in NOARCHIVELOG mode is BACKUP DATABASE, we may add filesperset option to limit # of files per each set**

Starting backup at 30-MAR-22

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=388 device type=DISK

channel ORA\_DISK\_1: starting full datafile backup set

channel ORA\_DISK\_1: specifying datafile(s) in backup set

input datafile file number=00003 name=/opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

input datafile file number=00009 name=/opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

input datafile file number=00007 name=/opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

input datafile file number=00008 name=/opt/oracle/app/oracle/oradata/DISK4/joke02.dbf

channel ORA\_DISK\_1: starting piece 1 at 30-MAR-22

channel ORA\_DISK\_1: finished piece 1 at 30-MAR-22

piece handle=/home/oracle/BACKUP/full\_010pmgho\_1\_1 tag=TAG20220330T122112 comment=NONE

channel ORA\_DISK\_1: backup set complete, elapsed time: 00:00:15

channel ORA\_DISK\_1: starting full datafile backup set

channel ORA\_DISK\_1: specifying datafile(s) in backup set

input datafile file number=00001 name=/opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

input datafile file number=00004 name=/opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

input datafile file number=00002 name=/opt/oracle/app/oracle/oradata/STUDENT/joke01.dbf

input datafile file number=00005 name=/opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

channel ORA\_DISK\_1: starting piece 1 at 30-MAR-22

channel ORA\_DISK\_1: finished piece 1 at 30-MAR-22

piece handle=/home/oracle/BACKUP/full\_020pmgi7\_2\_1 tag=TAG20220330T122112 comment=NONE

channel ORA\_DISK\_1: backup set complete, elapsed time: 00:00:15

Finished backup at 30-MAR-22

Starting Control File and SPFILE Autobackup at 30-MAR-22

piece handle=/opt/oracle/app/oracle/recovery\_area/STUDENT/autobackup/2022\_03\_30/o1\_mf\_s\_1100694021\_k490wq12\_.bkp comment=NONE

Finished Control File and SPFILE Autobackup at 30-MAR-22

RMAN> **list backup of database;**

** this will give us the Listing of Whole Database backups only**

List of Backup Sets

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BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------

**1 Full** **1.08G** DISK 00:00:07 30-MAR-22

BP Key: 1 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122112

**Piece Name: /home/oracle/BACKUP/full\_010pmgho\_1\_1**

List of Datafiles in backup set 1

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

**3 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

**7 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

**8 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK4/joke02.dbf

**9 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------

**2 Full 821.93M** DISK 00:00:06 30-MAR-22

BP Key: 2 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122112

Piece Name: /home/oracle/BACKUP/full\_020pmgi7\_2\_1

List of Datafiles in backup set 2

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

**1 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

**2 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/joke01.dbf

**4 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

**5 Full** 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

RMAN> **alter database open;**

Statement processed

RMAN> **list backup;**

** this will give us the Listing of ALL backups incl. the Controlfile AutoBackup as well**

List of Backup Sets

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BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------

1 Full 1.08G DISK 00:00:07 30-MAR-22

BP Key: 1 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122112

Piece Name: /home/oracle/BACKUP/full\_010pmgho\_1\_1

List of Datafiles in backup set 1

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

3 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

7 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

8 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK4/joke02.dbf

9 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------

2 Full 821.93M DISK 00:00:06 30-MAR-22

BP Key: 2 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122112

Piece Name: /home/oracle/BACKUP/full\_020pmgi7\_2\_1

List of Datafiles in backup set 2

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

1 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

2 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/joke01.dbf

4 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

5 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

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**3 Full 10.20M** DISK 00:00:01 30-MAR-22

BP Key: 3 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122142

**Piece Name: /opt/oracle/app/oracle/recovery\_area/STUDENT/autobackup/2022\_03\_30/o1\_mf\_s\_11**00694021\_k490wq12\_.bkp

SPFILE Included: Modification time: 30-MAR-22

SPFILE db\_unique\_name: STUDENT

Control File Included: Ckp SCN: 8461257 Ckp time: 30-MAR-22

RMAN> **configure exclude for tablespace JOKE;**

**\* We may want to EXCLUDE some tablespaces from our Backups (that are read-only, used for teaching or testing etc). Our backup will then perform faster and use less space \***

Tablespace JOKE will be excluded from future whole database backups

new RMAN configuration parameters are successfully stored

RMAN> **shutdown immediate;**

database closed

database dismounted

Oracle instance shut down

RMAN> **startup mount;**

connected to target database (not started)

Oracle instance started

database mounted

Total System Global Area 2147481656 bytes

Fixed Size 8898616 bytes

Variable Size 1476395008 bytes

Database Buffers 637534208 bytes

Redo Buffers 24653824 bytes

RMAN> **backup database filesperset=3;**

Starting backup at 30-MAR-22

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=388 device type=DISK

file 2 is excluded from whole database backup

file 8 is excluded from whole database backup

channel ORA\_DISK\_1: starting full datafile backup set

channel ORA\_DISK\_1: specifying datafile(s) in backup set

input datafile file number=00003 name=/opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

input datafile file number=00009 name=/opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

input datafile file number=00007 name=/opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

channel ORA\_DISK\_1: starting piece 1 at 30-MAR-22

channel ORA\_DISK\_1: finished piece 1 at 30-MAR-22

piece handle=/home/oracle/BACKUP/full\_040pmgtl\_4\_1 tag=TAG20220330T122733 comment=NONE

channel ORA\_DISK\_1: backup set complete, elapsed time: 00:00:15

channel ORA\_DISK\_1: starting full datafile backup set

channel ORA\_DISK\_1: specifying datafile(s) in backup set

input datafile file number=00001 name=/opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

input datafile file number=00004 name=/opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

input datafile file number=00005 name=/opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

channel ORA\_DISK\_1: starting piece 1 at 30-MAR-22

channel ORA\_DISK\_1: finished piece 1 at 30-MAR-22

piece handle=/home/oracle/BACKUP/full\_050pmgu4\_5\_1 tag=TAG20220330T122733 comment=NONE

channel ORA\_DISK\_1: backup set complete, elapsed time: 00:00:07

Finished backup at 30-MAR-22

Starting Control File and SPFILE Autobackup at 30-MAR-22

piece handle=/opt/oracle/app/oracle/recovery\_area/STUDENT/autobackup/2022\_03\_30/o1\_mf\_s\_1100694391\_k4918cto\_.bkp comment=NONE

Finished Control File and SPFILE Autobackup at 30-MAR-22

RMAN> **alter database open;**

Statement processed

RMAN> **list backup of database;**

List of Backup Sets

===================

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------

1 Full 1.08G DISK 00:00:07 30-MAR-22

BP Key: 1 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122112

Piece Name: /home/oracle/BACKUP/full\_010pmgho\_1\_1

List of Datafiles in backup set 1

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

3 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

7 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

8 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK4/joke02.dbf

9 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------

2 Full 821.93M DISK 00:00:06 30-MAR-22

BP Key: 2 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122112

Piece Name: /home/oracle/BACKUP/full\_020pmgi7\_2\_1

List of Datafiles in backup set 2

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

1 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

2 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/joke01.dbf

4 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

5 Full 8461257 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

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**4 Full 1.07G** DISK 00:00:09 30-MAR-22

BP Key: 4 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122733

**Piece Name: /home/oracle/BACKUP/full\_040pmgtl\_4\_1**

List of Datafiles in backup set 4

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

**3 Full 8462745** 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/sysaux01.dbf

**7 Full 8462745** 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/users01.dbf

**9 Full 8462745** 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK2/indx01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

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**5 Full 829.58M** DISK 00:00:05 30-MAR-22

BP Key: 5 Status: AVAILABLE Compressed: NO Tag: TAG20220330T122733

**Piece Name: /home/oracle/BACKUP/full\_050pmgu4\_5\_1**

List of Datafiles in backup set 5

File LV Type Ckp SCN Ckp Time Abs Fuz SCN Sparse Name

---- -- ---- ---------- --------- ----------- ------ ----

**1 Full 8462745** 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/system01.dbf

**4 Full 8462745** 30-MAR-22 NO /opt/oracle/app/oracle/oradata/DISK3/undotbs01.dbf

**5 Full 8462745** 30-MAR-22 NO /opt/oracle/app/oracle/oradata/STUDENT/mine01.dbf

**\* Notice that in all sets created together like (1,2) and (4,5)  Checkpoint System Change Number is the SAME number. This means that ALL Datafiles and Controlfile have the same last transaction number  that is why Cold or Off-Line backup is also called CONSISTENT \***

RMAN> **backup as copy datafile 5;**

Starting backup at 30-MAR-22

using channel ORA\_DISK\_1

channel ORA\_DISK\_1: starting datafile copy

RMAN-00571: ===========================================================

RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============

RMAN-00571: ===========================================================

RMAN-03009: failure of backup command on ORA\_DISK\_1 channel at 03/30/2022 12:29:54

ORA-19602: **cannot backup or copy active file in NOARCHIVELOG mode**

** the only option for backup syntax in NOARCHIVELOG mode is BACKUP DATABASE, we can NOT backup or copy individual Tablespaces or Datafiles**

RMAN> **report obsolete;**

** This will list all sets (or copies) beyond Retention Policy (here all 3rd or 4th backups of DB)**

RMAN retention policy will be applied to the command

RMAN retention policy is set to redundancy 2

**no obsolete backups found**

RMAN> **exit**

Recovery Manager complete.

[oracle@oracledb19c BACKUP]$ **pwd**

/home/oracle/BACKUP

[oracle@oracledb19c BACKUP]$ **ls -l**

total 3945568

-rw-r----- 1 oracle dba 1157963776 Mar 30 12:21 **full\_010pmgho\_1\_1**

-rw-r----- 1 oracle dba 861863936 Mar 30 12:21 **full\_020pmgi7\_2\_1**

-rw-r----- 1 oracle dba 1150550016 Mar 30 12:27 **full\_040pmgtl\_4\_1**

-rw-r----- 1 oracle dba 869883904 Mar 30 12:27 **full\_050pmgu4\_5\_1**

** File names in our BACKUP folder are same as the PIECE names in the Backup Listing**

[oracle@oracledb19c BACKUP]$ **exit**

logout

[student@oracledb19c ~]$ **exit**

logout