SESSION 14   PERFORMING BACKUPS with RMAN (NOARCHIVELOG)

```
The Oracle base remains unchanged with value /opt/oracle
[oracle@oracloud12c ~]$ pwd
/home/oracle
[oracle@oracloud12c ~]$ mkdir BACKUP

[oracle@oracloud12c ~]$ chmod 777 BACKUP
[oracle@oracloud12c ~]$ ls -l
total 20
-rw-r--r--. 1 oracle dba   52 Mar  9 09:42 afiedt.buf
drwxrwxrwx. 2 oracle dba 4096 Mar 27 19:32 BACKUP
drwxr-xr-x. 2 oracle dba 4096 Jul 24  2017 bea
drwxr-----. 3 oracle dba 4096 Jul 25  2017 oradiag_oracle
-rw-r--r--. 1 oracle dba   46 Jan 18 10:22 setport.sql

[oracle@oracloud12c ~]$ cd BACKUP

[oracle@oracloud12c BACKUP]$ rman target /

Recovery Manager: Release 12.1.0.2.0 - Production on Tue Mar 27
19:24:01 2018

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reserved.
connected to target database: STUDENT (DBID=4285838094)

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
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- -------------------------
1    1050     SYSTEM               YES
/opt/oracle/oradata/student/system01.dbf
2    5150     MGMT_TABLESPACE      NO
/opt/oracle/oradata/student/mgmt.dbf
3    2110     SYSAUX               NO
/opt/oracle/oradata/student/sysaux01.dbf
4    500      UNDOTBS1             YES
/opt/oracle/oradata/student/undotbs01.dbf
5    60       MGMT_ECM_DEPOT_TS    NO
/opt/oracle/oradata/student/mgmt_depot.dbf
6    5        USERS                NO
/opt/oracle/oradata/student/users01.dbf
7    200      MGMT_AD4J_TS         NO
/opt/oracle/oradata/student/mgmt_ad4j.dbf
8    10       MINE                 NO
```

```
/opt/oracle/oradata/student/mine01.dbf
9    5        JOKE                NO
/opt/oracle/oradata/student/joke01.dbf
10   50       MYUNDO              YES
/opt/oracle/product/12.1.0/dbhome_1/dbs/myundo01.dbf
11   3        JOKE                NO
/opt/oracle/oradata/student/joke02.dbf
12   5        INDX                NO
/opt/oracle/oradata/student/indx01.dbf

List of Temporary Files
=======================
File Size(MB) Tablespace          Maxsize(MB) Tempfile Name
---- -------- ------------------- ----------- --------------------
1    60       TEMP                32767
/opt/oracle/oradata/student/temp01.dbf
2    20       MYTEMP              20
```

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

```
using target database control file instead of recovery catalog
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 OFF; # 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/product/12.1.0/dbhome_1/dbs/snapcf_st
udent.f'; # 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 CONTROLFILE AUTOBACKUP ON;**
     ← **This means that EVERY backup is followed by backup of Controlfile and SPFILE**

```
new RMAN configuration parameters:
CONFIGURE CONTROLFILE AUTOBACKUP ON;
new RMAN configuration parameters are successfully stored
```

RMAN> **CONFIGURE CHANNEL 1 DEVICE TYPE DISK CONNECT '*' FORMAT '/home/oracle/BACKUP/cold%U' ;**
     ← **this was first syntax option on Google to set channel for disk in NOARCHIVELOG mode**

```
new RMAN configuration parameters:
CONFIGURE CHANNEL 1 DEVICE TYPE DISK CONNECT '*' FORMAT
'/home/oracle/BACKUP/cold%U';
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    1694498816 bytes
Fixed Size                     2925168 bytes
Variable Size                771755408 bytes
Database Buffers             889192448 bytes
Redo Buffers                  30625792 bytes
```

     ← **the only option for backup syntax in NOARCHIVELOG mode is BACKUP DATABASE**

RMAN> **backup database filesperset=4;**   ← **to limit # of files per set (peace)**

```
Starting backup at 27-MAR-18
RMAN-00571:
===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS
===============
RMAN-00571:
===========================================================
RMAN-03002: failure of backup command at 03/27/2018 19:52:58
```
RMAN-12001: could not open channel ORA_DISK_1

```
RMAN-10008: could not create channel context
RMAN-10003: unable to connect to target database
ORA-01005: null password given; logon denied
```
* No surprise, that channel opening failed. As I say – do NOT trust Google too much. After consulting ORACLE online RMAN notes, I have used the right syntax for disk channel *

RMAN> **CONFIGURE CHANNEL 1 DEVICE TYPE DISK clear;**
    ← this is how you remove certain setting, before you set it again

```
old RMAN configuration parameters:
CONFIGURE CHANNEL 1 DEVICE TYPE DISK CONNECT '*' FORMAT
'/home/oracle/BACKUP/cold%U';
old RMAN configuration parameters are successfully deleted
```

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
```

RMAN> **show all;**

```
RMAN configuration parameters for database with db_unique_name STUDENT
are:
```
CONFIGURE RETENTION POLICY TO REDUNDANCY 2;
```
CONFIGURE BACKUP OPTIMIZATION OFF; # default
CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default
```
CONFIGURE CONTROLFILE AUTOBACKUP ON;
```
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 CHANNEL DEVICE TYPE DISK FORMAT
'/home/oracle/BACKUP/full_%u_%s_%p';
```
CONFIGURE MAXSETSIZE TO UNLIMITED;
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/product/12.1.0/dbhome_1/dbs/snapcf_student.f'; # default
```

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

```
Starting backup at 27-MAR-18
using channel ORA_DISK_1
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00002
name=/opt/oracle/oradata/student/mgmt.dbf
input datafile file number=00009
name=/opt/oracle/oradata/student/joke01.dbf
input datafile file number=00011
name=/opt/oracle/oradata/student/joke02.dbf
channel ORA_DISK_1: starting piece 1 at 27-MAR-18
channel ORA_DISK_1: finished piece 1 at 27-MAR-18
piece handle=/home/oracle/BACKUP/full_01sus1gh_1_1
tag=TAG20180327T202033 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:02:56
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/oradata/student/sysaux01.dbf
input datafile file number=00010
name=/opt/oracle/product/12.1.0/dbhome_1/dbs/myundo01.dbf
input datafile file number=00008
name=/opt/oracle/oradata/student/mine01.dbf
input datafile file number=00006
name=/opt/oracle/oradata/student/users01.dbf
channel ORA_DISK_1: starting piece 1 at 27-MAR-18
channel ORA_DISK_1: finished piece 1 at 27-MAR-18
piece handle=/home/oracle/BACKUP/full_02sus1m1_2_1
tag=TAG20180327T202033 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:02:05
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/oradata/student/system01.dbf
input datafile file number=00004
name=/opt/oracle/oradata/student/undotbs01.dbf
input datafile file number=00007
name=/opt/oracle/oradata/student/mgmt_ad4j.dbf
input datafile file number=00005
name=/opt/oracle/oradata/student/mgmt_depot.dbf
channel ORA_DISK_1: starting piece 1 at 27-MAR-18
channel ORA_DISK_1: finished piece 1 at 27-MAR-18
piece handle=/home/oracle/BACKUP/full_03sus1pv_3_1
tag=TAG20180327T202033 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:45
Finished backup at 27-MAR-18

Starting Control File and SPFILE Autobackup at 27-MAR-18
piece
handle=/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_03_27/o1
_mf_s_971898661_fcor9fhq_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 27-MAR-18
```

```
RMAN> list backup of database;

List of Backup Sets
===================

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
1       Full    1.36G      DISK        00:02:53     27-MAR-18
        BP Key: 1   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180327T202033
        Piece Name: /home/oracle/BACKUP/full_01sus1gh_1_1
  List of Datafiles in backup set 1
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- --------------------------------
  2   Full 25169175   27-MAR-18 /opt/oracle/oradata/student/mgmt.dbf
  9   Full 25169175   27-MAR-18 /opt/oracle/oradata/student/joke01.dbf
  11  Full 25169175   27-MAR-18 /opt/oracle/oradata/student/joke02.dbf

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
2       Full    1.68G      DISK        00:01:57     27-MAR-18
        BP Key: 2   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180327T202033
        Piece Name: /home/oracle/BACKUP/full_02sus1m1_2_1
  List of Datafiles in backup set 2
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  3  Full 25169175   27-MAR-18 /opt/oracle/oradata/student/sysaux01.dbf
  6  Full 25169175   27-MAR-18 /opt/oracle/oradata/student/users01.dbf
  8  Full 25169175   27-MAR-18 /opt/oracle/oradata/student/mine01.dbf
  10 Full 25169175   27-MAR-18
              /opt/oracle/product/12.1.0/dbhome_1/dbs/myundo01.dbf

BS Key   Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
3       Full    962.24M    DISK        00:00:44     27-MAR-18
        BP Key: 3   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180327T202033
        Piece Name: /home/oracle/BACKUP/full_03sus1pv_3_1
  List of Datafiles in backup set 3
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  1 Full 25169175   27-MAR-18 /opt/oracle/oradata/student/system01.dbf
  4 Full 25169175   27-MAR-18 /opt/oracle/oradata/student/undotbs01.dbf
  5 Full 25169175   27-MAR-18
                    /opt/oracle/oradata/student/mgmt_depot.dbf
  7 Full 25169175   27-MAR-18 /opt/oracle/oradata/student/mgmt_ad4j.dbf

RMAN> alter database open;

Database altered.
```

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

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

Tablespace MGMT_TABLESPACE will be excluded from future whole database backups
new RMAN configuration parameters are successfully stored

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

Tablespace MGMT_ECM_DEPOT_TS will be excluded from future whole database backups
new RMAN configuration parameters are successfully stored

RMAN> **configure exclude for tablespace MGMT_AD4J_TS;**

Tablespace MGMT_AD4J_TS will be excluded from future whole database backups
new RMAN configuration parameters are successfully stored

RMAN> **show all;**

RMAN configuration parameters for database with db_unique_name STUDENT are:
CONFIGURE RETENTION POLICY TO REDUNDANCY 2;
CONFIGURE BACKUP OPTIMIZATION OFF; # default
CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default
CONFIGURE CONTROLFILE AUTOBACKUP ON;
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 CHANNEL DEVICE TYPE DISK FORMAT
'/home/oracle/BACKUP/full_%u_%s_%p';
CONFIGURE MAXSETSIZE TO UNLIMITED;
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 EXCLUDE FOR TABLESPACE 'MGMT_TABLESPACE';
CONFIGURE EXCLUDE FOR TABLESPACE 'MGMT_ECM_DEPOT_TS';
CONFIGURE EXCLUDE FOR TABLESPACE 'MGMT_AD4J_TS';
CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default
CONFIGURE SNAPSHOT CONTROLFILE NAME TO
'/opt/oracle/product/12.1.0/dbhome_1/dbs/snapcf_student.f'; # default

```
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     1694498816 bytes

Fixed Size                      2925168 bytes
Variable Size                 788532624 bytes
Database Buffers              872415232 bytes
Redo Buffers                   30625792 bytes

RMAN> backup database filesperset=3;

Starting backup at 04-APR-18
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=250 device type=DISK
file 2 is excluded from whole database backup
file 5 is excluded from whole database backup
file 7 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/oradata/student/sysaux01.dbf
input datafile file number=00012
name=/opt/oracle/oradata/student/indx01.dbf
input datafile file number=00011
name=/opt/oracle/oradata/student/joke02.dbf
channel ORA_DISK_1: starting piece 1 at 04-APR-18
channel ORA_DISK_1: finished piece 1 at 04-APR-18
piece handle=/home/oracle/BACKUP/full_05svgfpg_5_1
tag=TAG20180404T142656 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:35
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/oradata/student/system01.dbf
input datafile file number=00006
name=/opt/oracle/oradata/student/users01.dbf
input datafile file number=00009
name=/opt/oracle/oradata/student/joke01.dbf
channel ORA_DISK_1: starting piece 1 at 04-APR-18
channel ORA_DISK_1: finished piece 1 at 04-APR-18
piece handle=/home/oracle/BACKUP/full_06svgfqk_6_1
tag=TAG20180404T142656 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=00004
name=/opt/oracle/oradata/student/undotbs01.dbf
input datafile file number=00010
name=/opt/oracle/product/12.1.0/dbhome_1/dbs/myundo01.dbf
input datafile file number=00008
name=/opt/oracle/oradata/student/mine01.dbf
channel ORA_DISK_1: starting piece 1 at 04-APR-18
channel ORA_DISK_1: finished piece 1 at 04-APR-18
piece handle=/home/oracle/BACKUP/full_07svgfr3_7_1
tag=TAG20180404T142656 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:03
Finished backup at 04-APR-18

Starting Control File and SPFILE Autobackup at 04-APR-18
piece
handle=/opt/oracle/fast_recovery_area/STUDENT/autobackup/2018_04_04/o1
_mf_s_972570367_fdb696wo_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 04-APR-18
```

RMAN> **alter database open;**

```
Database altered.
```

RMAN> **list backup of database;**

```
List of Backup Sets
===================

BS Key  Type LV Size        Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
1       Full   1.36G        DISK        00:02:53     27-MAR-18
        BP Key: 1   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180327T202033
        Piece Name: /home/oracle/BACKUP/full_01sus1gh_1_1
  List of Datafiles in backup set 1
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  2       Full 25169175   27-MAR-18
/opt/oracle/oradata/student/mgmt.dbf
  9       Full 25169175   27-MAR-18
/opt/oracle/oradata/student/joke01.dbf
  11      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/joke02.dbf

BS Key  Type LV Size        Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
2       Full   1.68G        DISK        00:01:57     27-MAR-18
        BP Key: 2   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180327T202033
```

```
          Piece Name: /home/oracle/BACKUP/full_02sus1m1_2_1
  List of Datafiles in backup set 2
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
   3      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/sysaux01.dbf
   6      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/users01.dbf
   8      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/mine01.dbf
  10      Full 25169175   27-MAR-18
/opt/oracle/product/12.1.0/dbhome_1/dbs/myundo01.dbf

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
3       Full    962.24M    DISK        00:00:44     27-MAR-18
        BP Key: 3   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180327T202033
          Piece Name: /home/oracle/BACKUP/full_03sus1pv_3_1
  List of Datafiles in backup set 3
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
   1      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/system01.dbf
   4      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/undotbs01.dbf
   5      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/mgmt_depot.dbf
   7      Full 25169175   27-MAR-18
/opt/oracle/oradata/student/mgmt_ad4j.dbf

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
5       Full    1.70G      DISK        00:00:25     04-APR-18
        BP Key: 5   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180404T142656
          Piece Name: /home/oracle/BACKUP/full_05svgfpg_5_1
  List of Datafiles in backup set 5
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
   3  Full 28459530 04-APR-18 /opt/oracle/oradata/student/sysaux01.dbf
  11  Full 28459530 04-APR-18 /opt/oracle/oradata/student/joke02.dbf
  12  Full 28459530 04-APR-18 /opt/oracle/oradata/student/indx01.dbf

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
6       Full    937.49M    DISK        00:00:11     04-APR-18
        BP Key: 6   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180404T142656
          Piece Name: /home/oracle/BACKUP/full_06svgfqk_6_1
  List of Datafiles in backup set 6
  File LV Type Ckp SCN    Ckp Time  Name
```

```
---- -- ---- ---------- --------- ----
   1   Full 28459530 04-APR-18 /opt/oracle/oradata/student/system01.dbf
   6   Full 28459530 04-APR-18 /opt/oracle/oradata/student/users01.dbf
   9   Full 28459530 04-APR-18 /opt/oracle/oradata/student/joke01.dbf

BS Key   Type LV Size        Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
7       Full    16.96M     DISK        00:00:01     04-APR-18
        BP Key: 7   Status: AVAILABLE  Compressed: NO  Tag:
TAG20180404T142656
        Piece Name: /home/oracle/BACKUP/full_07svgfr3_7_1
  List of Datafiles in backup set 7
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
   4   Full 28459530 04-APR-18 /opt/oracle/oradata/student/undotbs01.dbf
   8   Full 28459530 04-APR-18 /opt/oracle/oradata/student/mine01.dbf
  10   Full 28459530 04-APR-18
                 /opt/oracle/product/12.1.0/dbhome_1/dbs/myundo01.dbf
```

* Notice that in all sets created together like (1,2,3) and (5,6,7) → Checkpoint System Change Number is the SAME number. This means that ALL Datafiles and Controlfiles have same last transaction number → that is why Off-Line backup is also called CONSISTENT *

```
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@oracloud12c BACKUP]$ ls -l
total 6929860
-rw-r-----. 1 oracle dba 1458790400 Mar 27 20:23 full_01sus1gh_1_1
-rw-r-----. 1 oracle dba 1807187968 Mar 27 20:25 full_02sus1m1_2_1
-rw-r-----. 1 oracle dba 1008992256 Mar 27 20:26 full_03sus1pv_3_1
-rw-r-----. 1 oracle dba 1820352512 Apr  4 14:27 full_05svgfpg_5_1
-rw-r-----. 1 oracle dba  983040000 Apr  4 14:27 full_06svgfqk_6_1
-rw-r-----. 1 oracle dba   17793024 Apr  4 14:27 full_07svgfr3_7_1

[oracle@oracloud12c BACKUP]$ exit
logout
```