

Oracle 19c – Table Recovery Using RMAN Backup

-

Table Creation:

- You created a table `sai` with an `id` column of type `NUMBER`.
- You inserted 100,000 rows into this table using a PL/SQL block.

```
SQL> create table sai(id number);
```

```
begin
for i in 1 .. 100000 loop
insert into sai values(i);
end loop;
end;
/
Table created.
```

```
SQL> SQL>      2      3      4      5      6
```

PL/SQL procedure successfully completed.

```
SQL>
```

```
SQL>
```

```
SQL> select count(*) from sai;
```

```
      COUNT(*)
-----
      100000
```

```
SQL> SELECT TO_CHAR (SYSDATE, 'MM-DD-YYYY HH24:MI:SS') "NOW"
FROM DUAL;
```

```
NOW
```

```
-----
12-12-2024 05:04:07
```

• RMAN Backup:

- Performed a backup of the database using RMAN (backup database plus archivelog).
- Archived log files and datafiles were backed up, and the control file and SPFILE were also included in the backup.

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

```
Recovery Manager: Release 19.0.0.0.0 - Production on Thu Dec
12 05:04:48 2024
Version 19.3.0.0.0
```

Oracle DBA : - Sainath

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connected to target database: SAINATH (DBID=156218003)

RMAN> backup database plus archivelog;

Starting backup at 12-DEC-24
current log archived
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=1 device type=DISK
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=6 RECID=1
STAMP=1187490667
input archived log thread=1 sequence=7 RECID=2
STAMP=1187490684
input archived log thread=1 sequence=8 RECID=3
STAMP=1187499891
channel ORA_DISK_1: starting piece 1 at 12-DEC-24
channel ORA_DISK_1: finished piece 1 at 12-DEC-24
piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/backupset/20
24_12_12/o1_mf_annnn_TAG20241212T050452_moofb4hc_.bkp
tag=TAG20241212T050452 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time:
00:00:01
Finished backup at 12-DEC-24

Starting backup at 12-DEC-24
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=00001
name=/u01/app/oracle/oradata/SAINATH/datafile/o1_mf_system_mom
382bj_.dbf
input datafile file number=00003
name=/u01/app/oracle/oradata/SAINATH/datafile/o1_mf_sysaux_mom
395q6_.dbf
input datafile file number=00004
name=/u01/app/oracle/oradata/SAINATH/datafile/o1_mf_undotbs1_m
om39yx4_.dbf
input datafile file number=00007
name=/u01/app/oracle/oradata/SAINATH/datafile/o1_mf_users_mom3
9zy3_.dbf
channel ORA_DISK_1: starting piece 1 at 12-DEC-24
channel ORA_DISK_1: finished piece 1 at 12-DEC-24

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```
piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/backupset/20
24_12_12/o1_mf_nnndf_TAG20241212T050453_moofb5th_.bkp
tag=TAG20241212T050453 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time:
00:00:07
Finished backup at 12-DEC-24
```

```
Starting backup at 12-DEC-24
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=9 RECID=4
STAMP=1187499900
channel ORA_DISK_1: starting piece 1 at 12-DEC-24
channel ORA_DISK_1: finished piece 1 at 12-DEC-24
```

```
piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/backupset/20
24_12_12/o1_mf_annnn_TAG20241212T050500_moofbf14_.bkp
tag=TAG20241212T050500 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time:
00:00:01
Finished backup at 12-DEC-24
```

```
Starting Control File and SPFILE Autobackup at 12-DEC-24
piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/autobackup/2
024_12_12/o1_mf_s_1187499902_moofbg78_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 12-DEC-24
```

RMAN>

• Dropping a table :

```
SQL> drop table sai.sai;
```

Table dropped.

```
SQL> select count(*) from sai.sai;
select count(*) from sai.sai
*
```

```
ERROR at line 1:
ORA-00942: table or view does not exist
```

```
SQL> SELECT TO_CHAR (SYSDATE, 'MM-DD-YYYY HH24:MI:SS') "NOW"
FROM DUAL;
```

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NOW

12-12-2024 05:15:46

The following command executes the required Point-in-Time Recovery (PITR) and Data Pump Export activities:

```
RECOVER TABLE sai.sai UNTIL TIME "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')" AUXILIARY DESTINATION '/u01/app/oracle/restore';
```

- Creating automatic instance, with SID='dtag'
- sql statement: alter database open read only
- Performing export of tables...
- Automatic instance removed
- Performing import of tables...

.

```
RMAN> RECOVER TABLE sai.sai UNTIL TIME "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')" AUXILIARY DESTINATION '/u01/app/oracle/restore';
```

```
Starting recover at 12-DEC-24
current log archived
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=58 device type=DISK
RMAN-05026: warning: presuming following set of tablespaces applies to specified point-in-time
```

```
List of tablespaces expected to have UNDO segments
Tablespace SYSTEM
Tablespace UNDOTBS1
```

Creating automatic instance, with SID='dtag'

```
initialization parameters used for automatic instance:
db_name=SAINATH
db_unique_name=dtag_pitr_SAINATH
compatible=19.0.0
db_block_size=8192
db_files=200
diagnostic_dest=/u01/app/oracle
_ system_trig_enabled=FALSE
sga_target=1088M
processes=200
db_create_file_dest=/u01/app/oracle/restore
log_archive_dest_1='location=/u01/app/oracle/restore'
#No auxiliary parameter file used
```

starting up automatic instance SAINATH

Oracle instance started

Total System Global Area 1140849904 bytes

Fixed Size 8895728 bytes

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Variable Size 301989888 bytes
Database Buffers 822083584 bytes
Redo Buffers 7880704 bytes
Automatic instance created

contents of Memory Script:

```
{  
# set requested point in time  
set until time "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')";  
# restore the controlfile  
restore clone controlfile;
```

```
# mount the controlfile  
sql clone 'alter database mount clone database';
```

```
# archive current online log  
sql 'alter system archive log current';  
}
```

executing Memory Script

executing command: SET until clause

Starting restore at 12-DEC-24
allocated channel: ORA_AUX_DISK_1
channel ORA_AUX_DISK_1: SID=34 device type=DISK

channel ORA_AUX_DISK_1: starting datafile backup set restore
channel ORA_AUX_DISK_1: restoring control file
channel ORA_AUX_DISK_1: reading from backup piece
/u01/app/oracle/fast_recovery_area/SAINATH/autobackup/2024_12_12/ol_mf_s_1187500515_moofxmcd.bkp
channel ORA_AUX_DISK_1: piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/autobackup/2024_12_12/ol_mf_s_1187500515_moofxmcd.bkp tag=TAG20241212T051515
channel ORA_AUX_DISK_1: restored backup piece 1
channel ORA_AUX_DISK_1: restore complete, elapsed time: 00:00:01
output file name=/u01/app/oracle/restore/SAINATH/controlfile/ol_mf_moog4s2t_.ctl
Finished restore at 12-DEC-24

sql statement: alter database mount clone database

sql statement: alter system archive log current

contents of Memory Script:

```
{  
# set requested point in time  
set until time "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')";  
# set destinations for recovery set and auxiliary set datafiles  
set newname for clone datafile 1 to new;  
set newname for clone datafile 4 to new;  
set newname for clone datafile 3 to new;  
set newname for clone tempfile 1 to new;  
# switch all tempfiles  
switch clone tempfile all;  
# restore the tablespaces in the recovery set and the auxiliary set  
restore clone datafile 1, 4, 3;
```

```
switch clone datafile all;  
}
```

executing Memory Script

executing command: SET until clause

executing command: SET NEWNAME

executing command: SET NEWNAME

executing command: SET NEWNAME

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executing command: SET NEWNAME

renamed tempfile 1 to /u01/app/oracle/restore/SAINATH/datafile/ol_mf_temp_%u_.tmp
in control file

Starting restore at 12-DEC-24
using channel ORA_AUX_DISK_1

channel ORA_AUX_DISK_1: starting datafile backup set restore
channel ORA_AUX_DISK_1: specifying datafile(s) to restore from backup set
channel ORA_AUX_DISK_1: restoring datafile 00001 to
/u01/app/oracle/restore/SAINATH/datafile/ol_mf_system_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00004 to
/u01/app/oracle/restore/SAINATH/datafile/ol_mf_undotbs1_%u_.dbf
channel ORA_AUX_DISK_1: restoring datafile 00003 to
/u01/app/oracle/restore/SAINATH/datafile/ol_mf_sysaux_%u_.dbf
channel ORA_AUX_DISK_1: reading from backup piece
/u01/app/oracle/fast_recovery_area/SAINATH/backupset/2024_12_12/ol_mf_nnndf_TAG2024
1212T051458_moofx2yj_.bkp
channel ORA_AUX_DISK_1: piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/backupset/2024_12_12/ol_mf_nnndf_
TAG20241212T051458_moofx2yj_.bkp tag=TAG20241212T051458
channel ORA_AUX_DISK_1: restored backup piece 1
channel ORA_AUX_DISK_1: restore complete, elapsed time: 00:00:07
Finished restore at 12-DEC-24

datafile 1 switched to datafile copy
input datafile copy RECID=4 STAMP=1187500760 file
name=/u01/app/oracle/restore/SAINATH/datafile/ol_mf_system_moog5173_.dbf
datafile 4 switched to datafile copy
input datafile copy RECID=5 STAMP=1187500760 file
name=/u01/app/oracle/restore/SAINATH/datafile/ol_mf_undotbs1_moog517b_.dbf
datafile 3 switched to datafile copy
input datafile copy RECID=6 STAMP=1187500760 file
name=/u01/app/oracle/restore/SAINATH/datafile/ol_mf_sysaux_moog5178_.dbf

contents of Memory Script:

```
{  
# set requested point in time  
set until time "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')";  
# online the datafiles restored or switched  
sql clone "alter database datafile 1 online";  
sql clone "alter database datafile 4 online";  
sql clone "alter database datafile 3 online";  
# recover and open database read only  
recover clone database tablespace "SYSTEM", "UNDOTBS1", "SYSAUX";  
sql clone 'alter database open read only';  
}
```

executing Memory Script

executing command: SET until clause

sql statement: alter database datafile 1 online

sql statement: alter database datafile 4 online

sql statement: alter database datafile 3 online

Starting recover at 12-DEC-24
using channel ORA_AUX_DISK_1

starting media recovery

archived log for thread 1 with sequence 11 is already on disk as file
/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/ol_mf_1_11_moofx10
1_.arc

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```
archived log for thread 1 with sequence 12 is already on disk as file
/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_12_moog4ch
g_.arc
archived log file
name=/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_11_mo
ofxl0l_.arc thread=1 sequence=11
archived log file
name=/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_12_mo
og4chg_.arc thread=1 sequence=12
media recovery complete, elapsed time: 00:00:00
Finished recover at 12-DEC-24
```

sql statement: alter database open read only

contents of Memory Script:

```
{
  sql clone "create spfile from memory";
  shutdown clone immediate;
  startup clone nomount;
  sql clone "alter system set control_files =
  '/u01/app/oracle/restore/SAINATH/controlfile/o1_mf_moog4s2t_.ctl' comment=
  'RMAN set' scope=spfile";
  shutdown clone immediate;
  startup clone nomount;
# mount database
sql clone 'alter database mount clone database';
}
executing Memory Script
```

sql statement: create spfile from memory

database closed
database dismounted
Oracle instance shut down

connected to auxiliary database (not started)
Oracle instance started

Total System Global Area 1140849904 bytes

Fixed Size	8895728 bytes
Variable Size	301989888 bytes
Database Buffers	822083584 bytes
Redo Buffers	7880704 bytes

```
sql statement: alter system set control_files =
  '/u01/app/oracle/restore/SAINATH/controlfile/o1_mf_moog4s2t_.ctl' comment= 'RMAN
set' scope=spfile
```

Oracle instance shut down

connected to auxiliary database (not started)
Oracle instance started

Total System Global Area 1140849904 bytes

Fixed Size	8895728 bytes
Variable Size	301989888 bytes
Database Buffers	822083584 bytes
Redo Buffers	7880704 bytes

sql statement: alter database mount clone database

contents of Memory Script:

```
{
# set requested point in time
set until time "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')";
# set destinations for recovery set and auxiliary set datafiles
```

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```
set newname for datafile 7 to new;
# restore the tablespaces in the recovery set and the auxiliary set
restore clone datafile 7;
```

```
switch clone datafile all;
}
```

executing Memory Script

executing command: SET until clause

executing command: SET NEWNAME

```
Starting restore at 12-DEC-24
allocated channel: ORA_AUX_DISK_1
channel ORA_AUX_DISK_1: SID=34 device type=DISK
```

```
channel ORA_AUX_DISK_1: starting datafile backup set restore
channel ORA_AUX_DISK_1: specifying datafile(s) to restore from backup set
channel ORA_AUX_DISK_1: restoring datafile 00007 to
/u01/app/oracle/restore/DTAG_PITR_SAINATH/datafile/o1_mf_users_%u_.dbf
channel ORA_AUX_DISK_1: reading from backup piece
/u01/app/oracle/fast_recovery_area/SAINATH/backupset/2024_12_12/o1_mf_nnndf_TAG2024
1212T051458_moofx2yj_.bkp
channel ORA_AUX_DISK_1: piece
handle=/u01/app/oracle/fast_recovery_area/SAINATH/backupset/2024_12_12/o1_mf_nnndf_
TAG20241212T051458_moofx2yj_.bkp tag=TAG20241212T051458
channel ORA_AUX_DISK_1: restored backup piece 1
channel ORA_AUX_DISK_1: restore complete, elapsed time: 00:00:01
Finished restore at 12-DEC-24
```

```
datafile 7 switched to datafile copy
input datafile copy RECID=8 STAMP=1187500832 file
name=/u01/app/oracle/restore/DTAG_PITR_SAINATH/datafile/o1_mf_users_moog7h52_.dbf
```

```
contents of Memory Script:
{
# set requested point in time
set until time "TO_DATE('2024-12-12 05:15:46','YYYY-MM-DD HH24:MI:SS')";
# online the datafiles restored or switched
sql clone "alter database datafile 7 online";
# recover and open resetlogs
recover clone database tablespace "USERS", "SYSTEM", "UNDOTBS1", "SYSAUX" delete
archivelog;
alter clone database open resetlogs;
}
executing Memory Script
```

executing command: SET until clause

sql statement: alter database datafile 7 online

```
Starting recover at 12-DEC-24
using channel ORA_AUX_DISK_1
```

starting media recovery

```
archived log for thread 1 with sequence 11 is already on disk as file
/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_11_moofx10
1_.arc
archived log for thread 1 with sequence 12 is already on disk as file
/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_12_moog4ch
g_.arc
archived log file
name=/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_11_mo
ofx101_.arc thread=1 sequence=11
archived log file
name=/u01/app/oracle/fast_recovery_area/SAINATH/archivelog/2024_12_12/o1_mf_1_12_mo
og4chg_.arc thread=1 sequence=12
```


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media recovery complete, elapsed time: 00:00:01
Finished recover at 12-DEC-24

database opened

contents of Memory Script:

```
{
# create directory for datapump import
sql "create or replace directory TSPITR_DIROBJ_DPDIR as '"
/u01/app/oracle/restore'";
# create directory for datapump export
sql clone "create or replace directory TSPITR_DIROBJ_DPDIR as '"
/u01/app/oracle/restore'";
}
executing Memory Script
```

sql statement: create or replace directory TSPITR_DIROBJ_DPDIR as
'/u01/app/oracle/restore'

sql statement: create or replace directory TSPITR_DIROBJ_DPDIR as
'/u01/app/oracle/restore'

Performing export of tables...

```
EXPDP> Starting "SYS"."TSPITR_EXP_dtag_srqn":
EXPDP> Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
EXPDP> Processing object type TABLE_EXPORT/TABLE/STATISTICS/TABLE_STATISTICS
EXPDP> Processing object type TABLE_EXPORT/TABLE/TABLE
EXPDP> . . exported "SAI"."SAI"                                873.1 KB  100000
rows
EXPDP> Master table "SYS"."TSPITR_EXP_dtag_srqn" successfully loaded/unloaded
EXPDP>
*****
EXPDP> Dump file set for SYS.TSPITR_EXP_dtag_srqn is:
EXPDP>    /u01/app/oracle/restore/tspitr_dtag_90198.dmp
EXPDP> Job "SYS"."TSPITR_EXP_dtag_srqn" successfully completed at Thu Dec 12
05:21:13 2024 elapsed 0 00:00:24
Export completed
```

contents of Memory Script:

```
{
# shutdown clone before import
shutdown clone abort
}
executing Memory Script
```

Oracle instance shut down

Performing import of tables...

```
IMPDP> Master table "SYS"."TSPITR_IMP_dtag_jpDC" successfully loaded/unloaded
IMPDP> Starting "SYS"."TSPITR_IMP_dtag_jpDC":
IMPDP> Processing object type TABLE_EXPORT/TABLE/TABLE
IMPDP> Processing object type TABLE_EXPORT/TABLE/TABLE_DATA
IMPDP> . . imported "SAI"."SAI"                                873.1 KB  100000
rows
IMPDP> Processing object type TABLE_EXPORT/TABLE/STATISTICS/TABLE_STATISTICS
IMPDP> Job "SYS"."TSPITR_IMP_dtag_jpDC" successfully completed at Thu Dec 12
05:21:30 2024 elapsed 0 00:00:06
Import completed
```

Removing automatic instance

Automatic instance removed

auxiliary instance file

/u01/app/oracle/restore/SAINATH/datafile/o1_mf_temp_moog5bm1_.tmp deleted

auxiliary instance file

/u01/app/oracle/restore/DTAG_PITR_SAINATH/onlineelog/o1_mf_3_moog7mfd_.log deleted

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```
auxiliary instance file
/u01/app/oracle/restore/DTAG_PITR_SAINATH/onlinelog/o1_mf_2_moog7klb_.log deleted
auxiliary instance file
/u01/app/oracle/restore/DTAG_PITR_SAINATH/onlinelog/o1_mf_1_moog7k61_.log deleted
auxiliary instance file
/u01/app/oracle/restore/DTAG_PITR_SAINATH/datafile/o1_mf_users_moog7h52_.dbf
deleted
auxiliary instance file
/u01/app/oracle/restore/SAINATH/datafile/o1_mf_sysaux_moog5178_.dbf deleted
auxiliary instance file
/u01/app/oracle/restore/SAINATH/datafile/o1_mf_undotbs1_moog517b_.dbf deleted
auxiliary instance file
/u01/app/oracle/restore/SAINATH/datafile/o1_mf_system_moog5173_.dbf deleted
auxiliary instance file
/u01/app/oracle/restore/SAINATH/controlfile/o1_mf_moog4s2t_.ctl deleted
auxiliary instance file tspitr_dtag_90198.dmp deleted
Finished recover at 12-DEC-24
```

RMAN>