

Demos - Workshop

-- Configure the RMAN

```
configure device type disk backup type to compressed backupset;
configure channel 1 device type disk format '/home/oracle/app/oracle/backup/bck_orcl_%U';
configure channel 1 device type disk maxpiecesize 200m maxopenfiles 8 rate 150m;
configure backup optimization on;
configure controlfile autobackup on;
configure controlfile autobackup format for device type disk to
'/home/oracle/app/oracle/backup/ctl_orcl_%F';
configure retention policy to recovery window of 1 days;
configure archivelog deletion policy to backed up 1 times to disk;
configure encryption for database off;
set encryption on identified by backuppwd only; (valid only for the rman session)
set decryption on identified by backuppwd; (valid only for the rman session)
```

-- Backup Database

```
select algorithm_name from v$rman_encryption_algorithms;
configure encryption algorithm 'AES128';
backup database plus archivelog;
```

-- Obsolete

```
report obsolete;
delete obsolete;
```

-- Monitoring the backup (mon_backup)

```
select sid, serial#, context, sofar, totalwork, round(sofar/totalwork*100,2) "%_COMPLETE"
from v$session_longops
where opname like 'RMAN%'
and opname not like '%aggregate%'
and totalwork !=0
and sofar <> totalwork
/
```

-- FRA

-- Check times of Redo switches

```
alter session set nls_date_format='dd/mm/yyyy hh24:mi:ss';
```

```
select sequence#, first_time log_started,
lead(first_time, 1,null) over (order by first_time) log_ended
from (select distinct sequence#, first_time
from dba_hist_log
```

```
where archived='YES'  
and sequence#!=0  
order by first_time)  
order by sequence#;
```

```
-- Check for FRA alerts
```

```
select reason from dba_outstanding_alerts;
```

```
-- Check FRA Usage (fra_usage)
```

```
set pagesize 300  
set linesize 300  
column name format a35  
alter system switch logfile;  
select * from v$recovery_file_dest;  
select * from v$flash_recovery_area_usage;
```

```
-- Check for FRA alerts
```

```
select reason from dba_outstanding_alerts;
```

```
-- Creating RMAN Catalog
```

```
-- Creating Catalog User
```

```
create tablespace catalog_tbs datafile '/home/oracle/app/oracle/oradata/ts_catalog_bck_01.dbf'  
size 100M autoextend on maxsize 200M extent management local uniform size 512K;
```

```
create user catalog_bck identified by rmancatalog default tablespace catalog_tbs;  
grant connect, resource, recovery_catalog_owner to catalog_bck;
```

```
-- Creating Recovery Catalog
```

```
rman catalog=catalog_bck/rmancatalog@orcl  
create catalog tablespace catalog_tbs;
```

```
-- Register your DB in the Recovery Catalog
```

```
rman target=backup_admin/bckpwd catalog=catalog_bck/rmancatalog  
register database;  
report schema;
```

```
-- Create a Virtual Private Catalog
```

```
-- SQL*Plus
```

```
create user fmunoz identified by alvarez default tablespace catalog_tbs;  
grant recovery_catalog_owner to fmunoz;
```

```
rman catalog=catalog_bck/rmancatalog
```

```
grant catalog for database orcl to fmunoz;  
grant register database to fmunoz;
```

```
rman catalog=fmunoz/alvarez  
create virtual catalog;
```

```
--if 10g
```

```
sqlplus fmunoz/alvarez  
EXEC catalog_bck.DBMS_RCVCAT.CREATE_VIRTUAL_CATALOG;
```

```
-- If do you want to remove privileges
```

```
revoke catalog for database orcl from fmunoz;  
revoke register database from fmunoz;
```

```
-- if 11g
```

```
rman catalog=fmunoz/alvarez  
drop catalog;
```

```
-- if 10g
```

```
sqlplus fmunoz/alvarez  
EXEC catalog_bck.DBMS_RCVCAT.DROP_VIRTUAL_CATALOG;
```

```
-- 11g have now IMPORT CATALOG
```

```
rman catalog=catalog_bck2/rmancatalog  
import catalog catalog_bck2@orcl;
```

```
-- Catalog Views
```

```
-- See Archived Log generated by the DB target
```

```
set pagesize 200  
set linesize 200  
column name format a50  
column completion_time format a25  
alter session set nls_date_format= 'DD-MON-YYYY:HH24:MI:SS';  
select name, sequence#, status, completion_time  
from CATALOG_BCK.rc_archived_log;
```

```
-- See the control file backups
```

```
alter session set nls_date_format= 'DD-MON-YYYY:HH24:MI:SS';
```

```
select file#, creation_time, resetlogs_time  
blocks, block_size, controlfile_type  
from v$backup_datafile where file#=0;
```

```

column completion_time format a25
column autobackup_date format a25
alter session set nls_date_format= 'DD-MON-YYYY:HH24:MI:SS';
select db_name, status, completion_time, controlfile_type,
autobackup_date from CATALOG_BCK.rc_backup_controlfile;

set pagesize 200
set linesize 200
select creation_time, block_size, status, completion_time, autobackup_date, autobackup_sequence
from CATALOG_BCK.rc_backup_controlfile;

-- See list of corruption that exists in datafile backups

select db_name, piece#, file#, block#, blocks, corruption_type
from CATALOG_BCK.rc_backup_corruption where db_name='ORCL';

-- See Block Corruption in the Db, populated when a backup or backup validate

select file#, block#, corruption_type
from v$database_block_corruption;

-- See all RMAN configuration (equivalent to show all)

column value format a60
select db_key, name, value from CATALOG_BCK.rc_rman_configuration;

-- Monitore backups

select output from v$rman_output order by stamp;

-- Offline backups

rman target / catalog=catalog_bck/rmancatalog
shutdown immediate
startup mount
backup as compressed backupset database;
alter database open;

-- offline backup without using configured defaults

shutdown
startup mount
run
{
allocate channel c1 device type disk format '/DB/u02/backups/other/bck1/orcl_%U';
allocate channel c2 device type disk format '/DB/u02/backups/other/bck2/orcl_%U';

```

```
backup as compressed backupset database;
backup current controlfile;
}
```

--Block change tracking file

```
alter database enable block change tracking using file '/home/oracle/app/oracle/ bctf01.btr';
select status from v$block_change_tracking;
```

-- Incremental backup

```
backup incremental level=0 database plus archivelog delete input;
backup incremental level=1 database plus archivelog delete input;
backup incremental level=1 cumulative database;
```

-- Multisection Backups (New 11G)

```
backup section size 10M tablespace users;
```

-- Compression at 11G

```
configure compression algorithm 'DEFAULT';
configure compression algorithm 'HIGH';
configure compression algorithm 'MEDIUM';
configure compression algorithm clear;
```

LOW – corresponds to LZO (11gR2) – smallest compression ratio, fastest

MEDIUM – corresponds to ZLIB (11gR1) – good compression ratio, slower than LOW

HIGH – corresponds to unmodified BZIP2 (11gR2) – highest compression ratio, slowest

BASIC (which is free) – corresponds to BZIP2 (10g style compression) – compression ratio in the range of MEDIUM, but slower

-- Limiting Backup Impacts

```
backup duration 00:30 database;
backup duration 00:30 partial minimize time database;
backup duration 00:30 partial minimize load_database;
```

-- Modifying Retention Policy for a Backup Set

-- In 11g the keep command override the default criteria, this cannot use the FRA

```
backup database keep forever;
backup database format '/DB/u02/backups/other/bck1/orcl_%U' keep untiltime='sysdate+180' tag
keep_backup;
```

-- Archivelog Deletion Policy

configure archivelog deletion policy to backed up 2 times to device type disk;

-- Use RMAN to scan DB for physical and logical error without do the backup

backup validate check logical database;

-- Configuring Tablespaces for Exclusion from Whole Database Backups

CONFIGURE EXCLUDE FOR TABLESPACE example;

BACKUP DATABASE;

backs up the whole database, including cwm1ite and example

BACKUP DATABASE NOEXCLUDE;

BACKUP TABLESPACE example; # backs up only example

CONFIGURE EXCLUDE FOR TABLESPACE example CLEAR;

-- Skipping offline, inaccessible or read only datafiles

backup database skip readonly;

backup database skip offline;

backup database skip inaccessible;

backup database skip readonly skip offline skip inaccessible;

-- Forcing backups of Read only Datafiles

backup database force;

-- Backup of newly added datafiles

backup database not backed up;

-- Backup files not backed up in a specific period

backup database not backed up since time='sysdate-2';

backup archivelog all not backed up 1 times;

backup as compressed backupset database plus archivelog not backed up 1 times delete input;

-- General backups

backup tablespace users include current controlfile plus archivelog;

backup datafile 2;

backup archivelog all;

backup archivelog from time 'sysdate-1';

backup archivelog from sequence xxx;

backup archivelog all delete input;

```
backup archivelog from sequence xxx delete input;
backup archivelog not backed up 3 times;
backup archivelog until time 'sysdate - 2' delete all input;
```

-- Backup Copies, RMAN will use FRA if it is configured

```
backup as copy database;
backup as copy tablespace users;
backup as copy datafile 1;
backup as copy archivelog all;
```

Session 5 - Advanced RMAN

-- Information about full completed backups

```
select /*+ RULE */ session_key, session_recid,
start_time, end_time, output_bytes, elapsed_seconds
from v$rman_backup_job_details
where start_time >= sysdate-180
and status='COMPLETED'
And input_type='DB FULL';
```

-- A summary of the active session history might help (make sure you are licensed!)

```
select sid, serial#, program
from v$session
where lower(program) like '%rman%';
```

Set lines 132

Set pagesize 300

Set linesize 300

Column session_id format 999 heading "SESS|ID"

Column session_serial# format 9999 heading "SESS|SER|#"

Column event format a40

Column total_waits format 9,999,999,999 heading "TOTAL|TIME|WAITED|MICRO"

Select session_id, session_serial#, Event, sum(time_waited) total_waits

From v\$active_session_history

Where session_id|session_serial# in (1885, 452777, 476759,583459,661183,733783,766073)

And sample_time > sysdate -1

And program like '%rman%'

And session_state='WAITING' And time_waited > 0

Group by session_id, session_serial#, Event

Order by session_id, session_serial#, total_waits desc;

-- How Long will it takes?

```
select sid, serial#, program
from v$session
where lower(program) like '%rman%';
```

```
Select sid, serial#, opname, time_remaining
From v$session_longops
Where sid | serial# in (1885, 452777, 476759,583459,661183,733783,766073)
And time_remaining > 0;
```

-- V\$BACKUP_ASYNC_IO

```
column filename format a60
select sid, serial, effective_bytes_per_second, filename
from V$BACKUP_ASYNC_IO
Where sid | serial# in (128138,134178,138267);
```

```
SELECT LONG_WAITS/IO_COUNT, FILENAME
FROM V$BACKUP_ASYNC_IO
WHERE LONG_WAITS/IO_COUNT > 0
Where sid | serial# in (128138,134178,138267)
ORDER BY LONG_WAITS/IO_COUNT DESC;
```

-- Tablespace Point in Time Recovery
-- Check if tablespace is fully self-contained

```
SELECT ts1_name, ts2_name, reason
FROM SYS.TS_PITR_CHECK
WHERE ( TS1_NAME IN ('EXAMPLE' ) AND TS2_NAME NOT IN ('EXAMPLE' ) )
OR ( TS1_NAME NOT IN ('EXAMPLE') AND TS2_NAME IN ('EXAMPLE' ) );
```

-- Looking for object that will be lost during the recovery

```
SELECT OWNER, NAME, TABLESPACE_NAME,
TO_CHAR(CREATION_TIME, 'YYYY-MM-DD:HH24:MI:SS')
FROM TS_PITR_OBJECTS_TO_BE_DROPPED
WHERE TABLESPACE_NAME IN ('USERS')
AND CREATION_TIME >
TO_DATE('07-OCT-08:22:35:30','YY-MON-DD:HH24:MI:SS')
ORDER BY TABLESPACE_NAME, CREATION_TIME;
```

-- Here is a script that displays databases that are registered in the catalog and the last date they were backed up (full backup or level 0)

```
Select a.db_key, a.dbid, a.name db_name,
b.backup_type, b.incremental_level,
```



```
b.completion_time, max(b.completion_time)
over (partition by a.name, a.dbid) max_completion_time
from catalog_bck.rc_database a, catalog_bck.rc_backup_set b
where b.status = 'A'
and b.backup_type = 'D'
and b.db_key = a.db_key;
```

```
-- Example of rmanRestoreDatafiles.sql
```

```
cd $ORACLE_BASE/cfgtoollogs/dbca/orcl
vi rmanRestoreDatafiles.sql
```

```
-- Example of recover.bsq
```

```
cd $ORACLE_HOME/rdbms/admin
vi recover.bsq
```

```
-- Duplex Backup
```

```
configure datafile backup copies for device type disk to 2;
configure archivelog backup copies for device type disk to 2;
backup datafile 1 format '/DB/u02/backups/bck_orcl_%U', '/Data/backup/bck_orcl_%U' plus archivelog;
```

```
-- Check if Backup are recoverable
-- Restore Preview
```

```
restore database preview;
```

```
-- Recover advisors
```

```
create tablespace test datafile '/home/oracle/app/oracle/oradata/ts_test_01.dbf'
size 50M autoextend on maxsize 200M extent management local uniform size 512K;
```

```
create user test identified by test default tablespace test;
grant connect, resource to test;
ALTER USER test QUOTA UNLIMITED ON test;
```

```
CREATE TABLE TEST.EMPLOYEE2
( EMP_ID    NUMBER(10) NOT NULL,
  EMP_NAME  VARCHAR2(30),
  EMP_SSN   VARCHAR2(9),
  EMP_DOB   DATE
)
/
```

```
mv ts_test_01.dbf /home/oracle/app/oracle/ts_test_01.dbf
echo > ts_test_01.dbf
```

```
ls -lrt
```

```
insert into test.employee2 values (2, 'test', '12345 ', '20-JUN-73');
```

```
RMAN> LIST FAILURE;  
RMAN> ADVISE FAILURE;  
RMAN> REPAIR FAILURE PREVIEW;  
RMAN> REPAIR FAILURE;
```

```
-TTIPR
```

```
alter system switch logfile;
```

```
CREATE TABLE hr.EMPLOYEE5
```

```
( EMP_ID    NUMBER(10) NOT NULL,
```

```
  EMP_NAME VARCHAR2(30),
```

```
  EMP_SSN   VARCHAR2(9),
```

```
  EMP_DOB   DATE
```

```
)
```

```
/
```

```
alter system switch logfile;
```

```
backup database plus archivelog;
```

```
recover tablespace users until logseq 2400 thread 1
```

```
auxiliary destination '/Data/data';
```

```
backup tablespace users;
```

```
alter tablespace users online;
```