

# Oracle RAC Backup, ASM Disk Failure, and Recovery Scenario

## 1. Overview

This document outlines a **detailed scenario** for handling, **ASM disk failure using full image backup, file restoration, and large data insertion** in an Oracle RAC environment.

## 2. Scenario Objectives

1. **Take a full image backup** of the RAC database.
2. **Simulate ASM disk failure** by removing an ASM disk.
3. **Identify missing files.**
4. **Switch these file to backup copy files.**
5. **Validate the recovery process** by ensuring the database is fully operational.
6. **Add new disk group to the database.**
7. **Take the files 8 and 9 backup copy to the new disk**
8. **Switch again to DATA2**
9. **Validate the recovery process** by ensuring the database is fully operational.

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## 3. Full Image Backup Using RMAN

### Prerequisites:

- The **Oracle RAC database** is running on ASM.
- **RMAN (Recovery Manager)** is configured for backup.
- There is **sufficient storage** for backup.

## Backup Steps:

1. Connect to RMAN from the primary node:

`rman target /`

2. Check database status:

`SELECT name, open_mode FROM v$database;`

3. Take a full image copy backup of the database:

`RMAN> BACKUP AS COPY DATABASE FORMAT  
'+BACKUP/ORCL/%u_%p_%c';`

```
RMAN> BACKUP AS COPY DATABASE FORMAT '+BACKUP/ORCL/%u_%p_%c';  
BACKUP AS COPY DATABASE FORMAT '+BACKUP/ORCL/%u_%p_%c';  
Starting backup at 07-FEB-25  
using channel ORA_DISK_1  
channel ORA_DISK_1: starting datafile copy  
input datafile file number=00002 name=+DATA/ORCL/DATAFILE/users.270.1185503869
```

Make sure it's done successfully.

4. Back up the control file and SPFILE separately:

`BACKUP AS COPY CURRENT CONTROLFILE FORMAT  
'+FRA/backup/controlfile.bkp';`

5. Validate backup integrity:

`CROSSCHECK BACKUP;`

`VALIDATE DATABASE;`

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## 4. Simulating ASM Disk Failure

### Steps to Simulate Disk Loss:

1. Identify current ASM disks:

```
SELECT group_number, disk_number, name, path FROM  
v$asm_disk;
```

2. **Check ASM disk group status:**

```
SELECT name, state FROM v$asm_diskgroup;
```

```
SQL> SELECT name, state FROM v$asm_diskgroup;  
  
NAME                                STATE  
-----  
BACKUP                             CONNECTED  
DATA                                CONNECTED  
FRA                                 CONNECTED  
OCR                                 MOUNTED  
DATA2                              CONNECTED
```

3. **Simulate disk failure by deleting the disk group :**

```
[root@node1 ~]# /usr/sbin/oracleasm deletedisk DATA2  
Clearing disk header: done  
Dropping disk: done
```

4. **SELECT name, state FROM v\$asm\_diskgroup WHERE name = 'DATA2';**

**It will be unknown**

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The database has been stopped up normally

Due to

```
Errors in file /u01/app/oracle/diag/rdbms/orcl/orcl1/trace/orcl1_dbw0_50620.trc:
ORA-01157: cannot identify/lock data file 9 - see DBWR trace file
ORA-01110: data file 9: '+DATA2/ORCL/DATAFILE/users.257.1192469457'
ORA-17503: ksfedpnn:2 Failed to open file +DATA2/ORCL/DATAFILE/users.257.1192469457
ORA-15001: diskgroup "DATA2" does not exist or is not mounted
ORA-59069: Oracle ASM file operation failed.
2025-02-07T18:16:19.468245+02:00
Smart fusion block transfer is disabled:
  not an Exadata system.
2025-02-07T18:16:19.542450+02:00
WARNING: group 5 (DATA2) has missing disks
ORA-15040: diskgroup is incomplete
WARNING: group 5 is being dismounted.
WARNING: ASMB force dismounting group 5 (DATA2) due to missing disks
SUCCESS: diskgroup DATA2 dismounted
```

We started the database in mount mode

```
srvctl start database -d orcl -o mount
```

## 5. Identifying Lost Files

To determine which files were lost due to the disk failure:

### 1. Check missing datafiles:

```
select file#, name from v$datafile where name like '%+DATA2%';
```

### 2. List missing ASM files:

```
SELECT name FROM v$asm_file WHERE group_number NOT IN
(SELECT group_number FROM v$asm_disk);
```

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### Solution 1: Switch the Missing Files to Copy

Since only **file 8 and file 9** were missing, they were switched to their image copy to reduce downtime:

### 1. Start RMAN and mount the database if needed:

```
rman target /
```

### 2. Switch only files 8 and 9 to the backup copy:

SWITCH DATAFILE 8 TO COPY;

SWITCH DATAFILE 9 TO COPY;

3. **Recover the switched files:**

RECOVER DATABASE;

note: you can recover the missed files only

4. **Open the database:**

ALTER DATABASE OPEN;

**Post-Recovery Plan to Reduce Downtime**

- Once the system was online, preparation began to **add back the disk with the same name (DATA2)**.
- After re-adding the disk, a new backup as a copy was taken.

```
RMAN> backup as copy datafile 8,9 format '+DATA2';
backup as copy datafile 8,9 format '+DATA2';
Starting backup at 07-FEB-25
using channel ORA_DISK_1
channel ORA_DISK_1: starting datafile copy
input datafile file number=00008 name=+BACKUP/ORCL/3l3h7aim_1_1
output file name=+DATA2/ORCL/DATAFILE/users.256.1192485457 tag=TAG20250207T215737 RECID=41 STAMP=1192485460
channel ORA_DISK_1: datafile copy complete, elapsed time: 00:00:07
channel ORA_DISK_1: starting datafile copy
input datafile file number=00009 name=+BACKUP/ORCL/3n3h7aj4_1_1
output file name=+DATA2/ORCL/DATAFILE/users.257.1192485465 tag=TAG20250207T215737 RECID=42 STAMP=1192485466
channel ORA_DISK_1: datafile copy complete, elapsed time: 00:00:03
Finished backup at 07-FEB-25

Starting Control File and SPFILE Autobackup at 07-FEB-25
piece handle=+FRA/ORCL/AUTOBACKUP/2025_02_07/s_1192485468.438.1192485469 comment=NONE
Finished Control File and SPFILE Autobackup at 07-FEB-25
```

- A final switch back to the original storage was planned for **2 AM**, minimizing downtime.

```
RMAN> switch datafile 8 to copy;
switch datafile 8 to copy;
using target database control file instead of recovery catalog
datafile 8 switched to datafile copy "+DATA2/ORCL/DATAFILE/users.256.1192485457"

RMAN> switch datafile 9 to copy;
switch datafile 9 to copy;
datafile 9 switched to datafile copy "+DATA2/ORCL/DATAFILE/users.257.1192485465"

RMAN> recover datafile 8;
recover datafile 8;
Starting recover at 07-FEB-25
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=38 instance=orcl1 device type=DISK

starting media recovery
media recovery complete, elapsed time: 00:00:01

Finished recover at 07-FEB-25
```

Open the database

```
RMAN> recover datafile 8;
recover datafile 8;
Starting recover at 07-FEB-25
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=38 instance=orcl1 device type=DISK

starting media recovery
media recovery complete, elapsed time: 00:00:01

Finished recover at 07-FEB-25

RMAN> recover datafile 9;
recover datafile 9;
Starting recover at 07-FEB-25
using channel ORA_DISK_1

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

Finished recover at 07-FEB-25

RMAN> alter database open;
alter database open;
Statement processed
```