ORACLE

Oracle Recovery Manager day 2

Sessão exclusiva – Accenture

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Exadata Cloud Specialist
Oracle, Alliances and Channels LAD
March, 2024

SQL> select * from person where name = ‘Marcel Lamarca’

SCAN ME

MARCEL LAMARCA

Exadata Cloud Specialist

Upgrade, Utilities, Patching, Performance & Migrations

marcel-lamarca

marcel.lamarca@oracle.com

About My Career

- 22 Years dedicated to study and support Oracle Databases.
- 12 Years working with Exadata (On-prem, C@C and Cloud Services) .
- 5 Year working for Oracle do Brasil
- 2 Year on Alliances LAD knowledge Team

Certifications

Oracle Cloud Specialist (OCS)

- Exadata Database Machine X9M Certified Specialist
- OCI Foundation 2020 / 2023
- Oracle Autonomous Database Administrator Professional 2019 / 2023
- Oracle Cloud Database Migration and Integration 2021
- OCI Cloud Certified Architect Associate 2022
- OCI Cloud Certified Architect Professional 2022
- OCI Multi-Cloud Architect Professional 2023
- Oracle Database Services Certified Professional 2023

Oracle Certified Professional (OCP)

- Oracle Database certified professional 10g, 11g, 12c and 19c.
- Mysql 8.0 Database Administrator Certified Professional

Oracle Certified Specialist (OCE)

- Grid/RAC Database Administrator 11g
- Oracle Golden Gate 12c Certified Implementation Specialist

Agenda

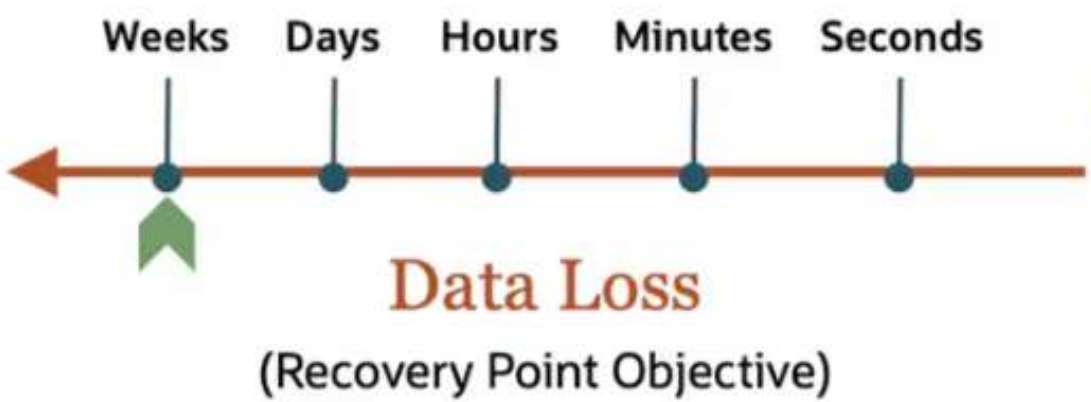
1. ORP VS RTO
2. Multitenant databases on Recover Manager
3. RMAN Cross Platform
4. Flashback Logical and Physical
5. Demos

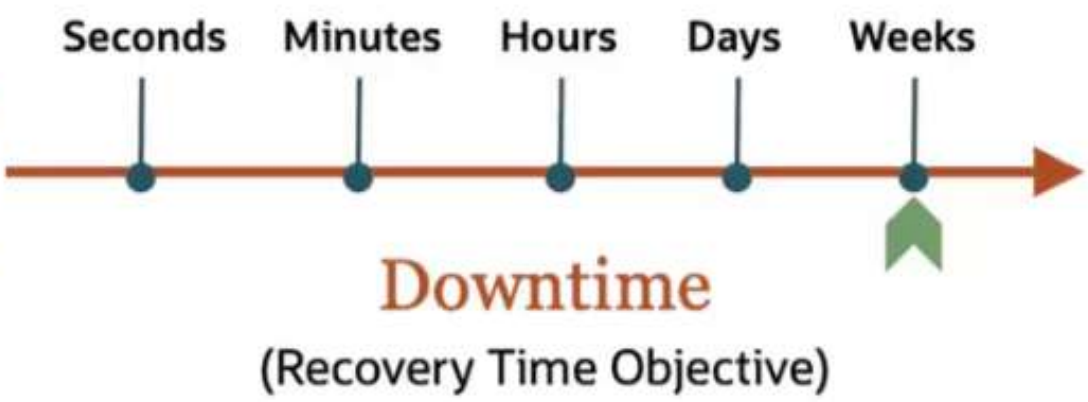
Remembering RMAN day 1 topics

- Oracle Database Structure
  - Instance and memory components
  - Network connections
  - Datafiles and Tablespaces characteristics
- RMAN backup concepts
  - Rman Image copies
  - Rman Backup set
  - Rman configuring parameters
- Troubleshooting Rman
  - Troubleshooting logs
  - Trace File analysis
- Recovery Manager features
  - Recover Manager compression
  - Rman Incremental updated backups
  - Rman Block Change Tracking
- Tuning Recover Manager
  - Recover Manager Views
- Recover Manager Catalog
  - Rman Catalog Concepts
  - Creating and Managing Catalog Scripts

RPO VS RTO concepts

Recovery Point Objective Vs Recovery Time Objective





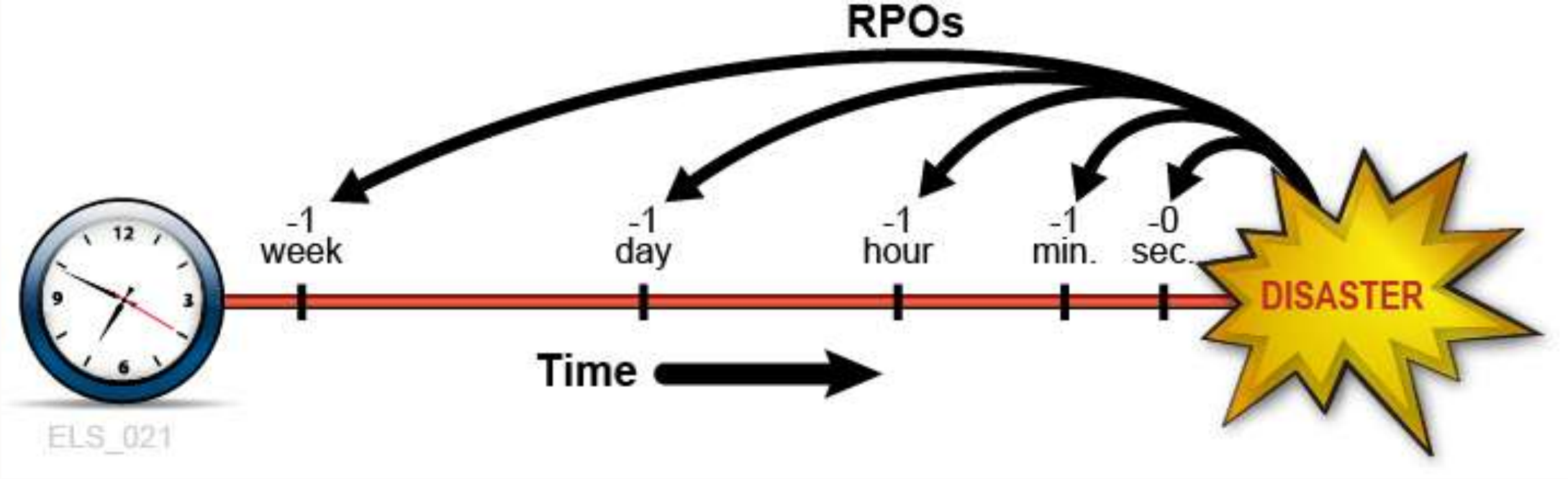
Recovery Point Objective (RPO)

Tolerance for data loss (seconds, hours, days); determines frequency of backups and replication approaches

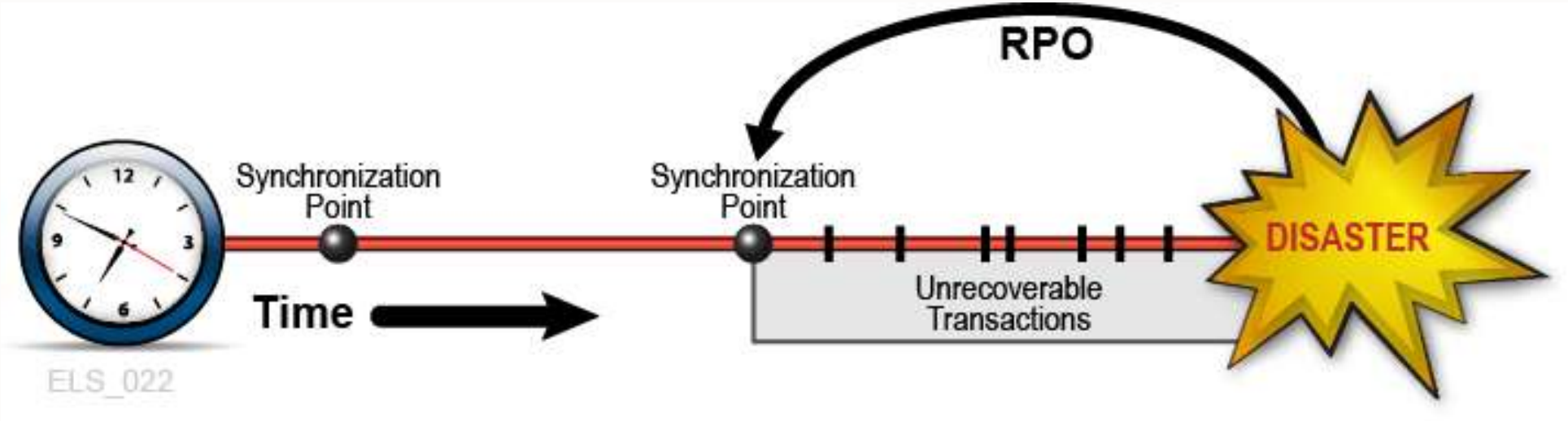
Recovery Time Objective (RTO)

The shorter the Recovery Time Objective (RTO) the quicker you get back to business

Recovery Point Objective Vs Recovery Time Objective



Recovery Point Objective Vs Recovery Time Objective



Oracle Database Flashback

Oracle Database flashback types

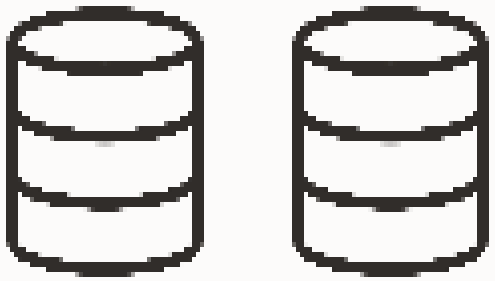
Logical Flashback

- Use undo Tablespace data
- Allow to flashback table
- Allow to flashback query

Physical Flashbacks

- Manages Flashback logs
- Used to flashback entire database
- Generates Physical file on flash Recover area

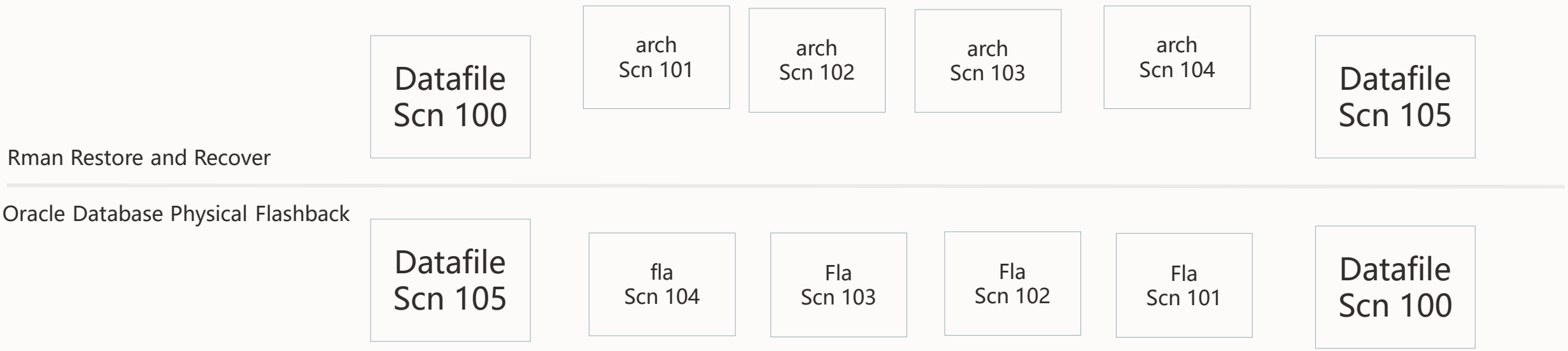
Oracle Database Physical Flashbacks



"**Flashback Database (a component of Physical Flashback)** uses its own logging mechanism to create flashback logs in the fast recovery area (FRA).

Flashback Database can only be used if flashback logs are available!"

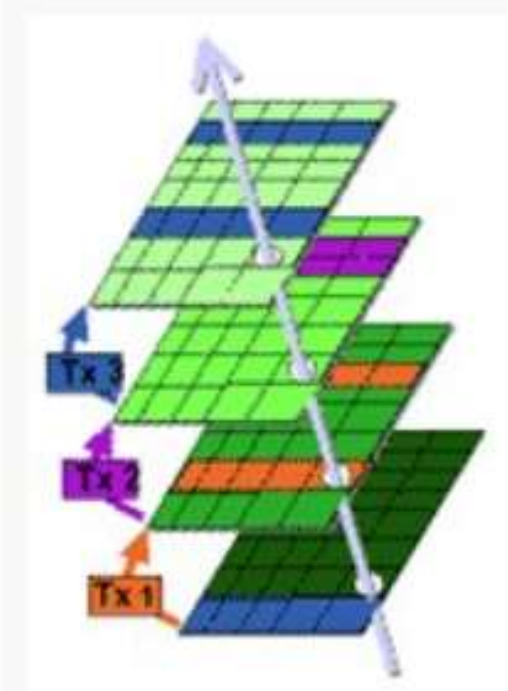
Oracle Database Physical Flashbacks



Oracle Database Physical Flashback Configuration steps

```
1. SHUTDOWN IMMEDIATE;

2. STARTUP MOUNT;

3. ARCHIVE LOG LIST;

4. ALTER DATABASE ARCHIVELOG;

5. ALTER SYSTEM SET DB_RECOVERY_FILE_DEST_SIZE=60G;

6. ALTER SYSTEM SET DB_RECOVERY_FILE_DEST='+FRA';

7. ALTER DATABASE FLASHBACK ON;

8. ALTER DATABASE OPEN;
```

Oracle Logical and human errors solved with Flashback Query



"**When thinking about high availability (HA) for their database**, people routinely think about protection from instance failures, node failures, and even more disastrous events such as data center failures.

However, one category of "failures" that is equally disastrous but commonly overlooked is "logical corruptions," a.k.a. application or **human errors**."

Oracle Database logical Flashback Configuration steps

```
1. ALTER SYSTEM SET UNDO_RETENTION = 604800;


2. ALTER TABLESPACE UNDOTBS1 RETENTION GUARANTEE;


3. SQL> select TABLESPACE_NAME, RETENTION, STATUS, CONTENTS from dba_tablespaces;

TABLESPACE_NAME                RETENTION   STATUS    CONTENTS
------------------------------ ----------- --------- --------------------
SYSTEM                         NOT APPLY   ONLINE    PERMANENT
SYSAUX                         NOT APPLY   ONLINE    PERMANENT
UNDOTBS1                       NOGUARANTEE ONLINE    UNDO
TEMP                           NOT APPLY   ONLINE    TEMPORARY
USERS                          NOT APPLY   ONLINE    PERMANENT
TBS1                           NOT APPLY   ONLINE    PERMANENT

6 rows selected.
```

Oracle Flashback Query samples

```
SQL> SELECT salary FROM employees   WHERE last_name = 'Chung';

    SALARY
----------
      3800

SQL> UPDATE employees SET salary = 4000   WHERE last_name = 'Chung';

1 row updated.

SQL> SELECT salary FROM employees    WHERE last_name = 'Chung';

    SALARY
----------
      4000
```

Oracle Flashback Query samples

To revert to the earlier value, use the Flashback Query as the To revert to the earlier value

```
SQL> UPDATE employees SET salary =
   (SELECT salary FROM employees
   AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '2' MINUTE)
   WHERE last_name = 'Chung')
   WHERE last_name = 'Chung';

1 row updated.

SQL> SELECT salary FROM employees  WHERE last_name = 'Chung';

  SALARY
  --------
      3800
```


Oracle Flashback Query samples

```
## To learn what the value was before the update the following Flashback Query  ####

SQL> SELECT salary FROM employees
     AS OF TIMESTAMP (SYSTIMESTAMP - INTERVAL '1' MINUTE)
     WHERE last_name = 'Chung';

    SALARY
----------
      3800

##  Values were during a particular time period, you can use a version Flashback Query ##


SQL> SELECT salary FROM employees
  VERSIONS BETWEEN TIMESTAMP
    SYSTIMESTAMP - INTERVAL '10' MINUTE AND
    SYSTIMESTAMP - INTERVAL '1' MINUTE
  WHERE last_name = 'Chung';
```

Oracle Flashback table samples

```
###### Create table employees_test, with row movement enabled #######

SQL> CREATE TABLE employees_test  AS SELECT * FROM employees;

#### As a benchmark, list those salaries less than 2500 #######

SQL> SELECT salary   FROM employees_test   WHERE salary < 2500;

   SALARY
----------
      2400
      2200
      2100
      2400

### Enable row movement for the table ####

SQL> ALTER TABLE employees_test    ENABLE ROW MOVEMENT;
```

Oracle Flashback table samples

```
## Issue a 10% salary increase to those employees earning less than 2500 ##

SQL> UPDATE employees_test   SET salary = salary * 1.1   WHERE salary < 2500;

5 rows updated.

commit.

#### list those salaries that remain less than 2500 following the 10% increase #####

SQL> SELECT salary   FROM employees_test  WHERE salary < 2500;

    SALARY
    -------
    2420
    2310
    2420
```


Oracle Flashback table samples

```
##### Flashback table to timestamp ########

SQL> FLASHBACK TABLE employees_test   TO TIMESTAMP (SYSTIMESTAMP - INTERVAL '1'
minute);

##### Check after Flashback ########

SELECT salary  FROM employees_test   WHERE salary < 2500;

    SALARY
----------
      2400
      2200
      2100
      2400
      2200
```

Oracle Flashback table samples

```
##### Flashback table BEFORE drop ########

SQL> FLASHBACK TABLE print_media TO BEFORE DROP;

##### Flashback table BEFORE drop rename table  ########

SQL> FLASHBACK TABLE print_media TO BEFORE DROP RENAME TO print_media_old;

##### Flashback Check recyclebin  ########

SQL> SELECT object_name, droptime FROM user_recyclebin
   WHERE original_name = 'PRINT_MEDIA';

OBJECT_NAME                    DROPTIME
------------------------------ -------------------
RB$$45703$TABLE$0              2003-06-03:15:26:39
RB$$45704$TABLE$0              2003-06-12:12:27:27
RB$$45705$TABLE$0              2003-07-08:09:28:01
```

Undo Advisor and how to Use it through the DBMS_UNDO_ADV package (Doc ID 1580225.1)

PURPOSE

Explain Undo Advisor and the options available

Automatic tuning of undo retention typically achieves better results with a fixed-size undo tablespace. If you decide to use a fixed-size undo tablespace, the Undo Advisor can help you estimate needed capacity.

You can access the Undo Advisor through Oracle Enterprise Manager (EM) or through the DBMS_ADVISOR PL/SQL package or through the DBMS_UNDO_ADV PL/SQL package.

In This Document we will explain how to use the DBMS_UNDO_ADV PL/SQL package.

The package DBMS_UNDO_ADV is undocumented , and it is used internally by the Undo Advisor .

[No Title]

The Undo Advisor assists in correctly sizing the undo tablespace and to set the low threshold value of the undo retention period for any Oracle Flashback requirements.

The Undo Advisor can also be used to estimate the Undo Tablespace needed for migration from Manual To Automatic Undo management, before actually creating the new undo tablespace which will use automatic undo management.

The Undo Advisor relies for its analysis on data collected in the Automatic Workload Repository (AWR). It is therefore important that the AWR have adequate workload statistics available so that the Undo Advisor can make accurate recommendations. For newly created databases, adequate statistics may not be available immediately. In such cases, continue to use the default auto-extending undo tablespace until at least one workload cycle completes.

Note: To make the undo tablespace fixed-size, Oracle suggests that you first allow enough time after database creation to run a full workload, thus allowing the undo tablespace to grow to its minimum required size to handle the workload. Then, you can use the Undo Advisor to determine, if desired, how much larger to set the size of the undo tablespace to allow for long-running queries and Oracle Flashback operations.

Oracle Multitenant Databases

Rman report SYSTEM & SYSAUX Tablespace CDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    950      SYSTEM               YES     /u01/database/catalog/datafiles/HOMOLOGA/system01.dbf
3    860      SYSAUX               NO      /u01/database/catalog/datafiles/HOMOLOGA/sysaux01.dbf
4    340      UNDOTBS1             YES     /u01/database/catalog/datafiles/HOMOLOGA/undotbs01.dbf
5    270      PDB$SEED:SYSTEM      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/system01.dbf
6    330      PDB$SEED:SYSAUX      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/sysaux01.dbf
7    5        USERS                NO      /u01/database/catalog/datafiles/HOMOLOGA/users01.dbf
8    100      PDB$SEED:UNDOTBS1    NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/undotbs01.dbf
9    280      HOM1:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/system01.dbf
10   350      HOM1:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/sysaux01.dbf
11   100      HOM1:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/undotbs01.dbf
12   5        HOM1:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/users01.dbf
13   280      HOM2:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/system01.dbf
14   360      HOM2:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/sysaux01.dbf
15   100      HOM2:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/undotbs01.dbf
16   5        HOM2:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/users01.dbf
```

Rman report UNDO Tablespace CDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    950      SYSTEM               YES     /u01/database/catalog/datafiles/HOMOLOGA/system01.dbf
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4    340      UNDOTBS1             YES     /u01/database/catalog/datafiles/HOMOLOGA/undotbs01.dbf
5    270      PDB$SEED:SYSTEM      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/system01.dbf
6    330      PDB$SEED:SYSAUX      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/sysaux01.dbf
7    5        USERS                NO      /u01/database/catalog/datafiles/HOMOLOGA/users01.dbf
8    100      PDB$SEED:UNDOTBS1    NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/undotbs01.dbf
9    280      HOM1:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/system01.dbf
10   350      HOM1:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/sysaux01.dbf
11   100      HOM1:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/undotbs01.dbf
12   5        HOM1:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/users01.dbf
13   280      HOM2:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/system01.dbf
14   360      HOM2:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/sysaux01.dbf
15   100      HOM2:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/undotbs01.dbf
16   5        HOM2:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/users01.dbf
```

Rman report USER Tablespace CDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    950      SYSTEM               YES     /u01/database/catalog/datafiles/HOMOLOGA/system01.dbf
3    860      SYSAUX               NO      /u01/database/catalog/datafiles/HOMOLOGA/sysaux01.dbf
4    340      UNDOTBS1             YES     /u01/database/catalog/datafiles/HOMOLOGA/undotbs01.dbf
5    270      PDB$SEED:SYSTEM      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/system01.dbf
6    330      PDB$SEED:SYSAUX      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/sysaux01.dbf
7    5        USERS                NO      /u01/database/catalog/datafiles/HOMOLOGA/users01.dbf
8    100      PDB$SEED:UNDOTBS1    NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/undotbs01.dbf
9    280      HOM1:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/system01.dbf
10   350      HOM1:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/sysaux01.dbf
11   100      HOM1:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/undotbs01.dbf
12   5        HOM1:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/users01.dbf
13   280      HOM2:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/system01.dbf
14   360      HOM2:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/sysaux01.dbf
15   100      HOM2:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/undotbs01.dbf
16   5        HOM2:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/users01.dbf
```

Rman report SYSTEM & SYSAUX Tablespace PDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    950      SYSTEM               YES     /u01/database/catalog/datafiles/HOMOLOGA/system01.dbf
3    860      SYSAUX               NO      /u01/database/catalog/datafiles/HOMOLOGA/sysaux01.dbf
4    340      UNDOTBS1             YES     /u01/database/catalog/datafiles/HOMOLOGA/undotbs01.dbf
5    270      PDB$SEED:SYSTEM      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/system01.dbf
6    330      PDB$SEED:SYSAUX      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/sysaux01.dbf
7    5        USERS                NO      /u01/database/catalog/datafiles/HOMOLOGA/users01.dbf
8    100      PDB$SEED:UNDOTBS1    NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/undotbs01.dbf
9    280      HOM1:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/system01.dbf
10   350      HOM1:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/sysaux01.dbf
11   100      HOM1:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/undotbs01.dbf
12   5        HOM1:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/users01.dbf
13   280      HOM2:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/system01.dbf
14   360      HOM2:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/sysaux01.dbf
15   100      HOM2:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/undotbs01.dbf
16   5        HOM2:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/users01.dbf
```

Rman Report UNDO Tablespace PDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    950      SYSTEM               YES     /u01/database/catalog/datafiles/HOMOLOGA/system01.dbf
3    860      SYSAUX               NO      /u01/database/catalog/datafiles/HOMOLOGA/sysaux01.dbf
4    340      UNDOTBS1             YES     /u01/database/catalog/datafiles/HOMOLOGA/undotbs01.dbf
5    270      PDB$SEED:SYSTEM      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/system01.dbf
6    330      PDB$SEED:SYSAUX      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/sysaux01.dbf
7    5        USERS                NO      /u01/database/catalog/datafiles/HOMOLOGA/users01.dbf
8    100      PDB$SEED:UNDOTBS1    NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/undotbs01.dbf
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11   100      HOM1:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/undotbs01.dbf
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13   280      HOM2:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/system01.dbf
14   360      HOM2:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/sysaux01.dbf
15   100      HOM2:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/undotbs01.dbf
16   5        HOM2:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/users01.dbf
```

Rman Report User Tablespace PDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Permanent Datafiles
===========================
File Size(MB) Tablespace           RB segs Datafile Name
---- -------- -------------------- ------- ------------------------
1    950      SYSTEM               YES     /u01/database/catalog/datafiles/HOMOLOGA/system01.dbf
3    860      SYSAUX               NO      /u01/database/catalog/datafiles/HOMOLOGA/sysaux01.dbf
4    340      UNDOTBS1             YES     /u01/database/catalog/datafiles/HOMOLOGA/undotbs01.dbf
5    270      PDB$SEED:SYSTEM      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/system01.dbf
6    330      PDB$SEED:SYSAUX      NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/sysaux01.dbf
7    5        USERS                NO      /u01/database/catalog/datafiles/HOMOLOGA/users01.dbf
8    100      PDB$SEED:UNDOTBS1    NO      /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/undotbs01.dbf
9    280      HOM1:SYSTEM          YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/system01.dbf
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11   100      HOM1:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM1/undotbs01.dbf
12   5        HOM1:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM1/users01.dbf
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14   360      HOM2:SYSAUX          NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/sysaux01.dbf
15   100      HOM2:UNDOTBS1        YES     /u01/database/catalog/datafiles/HOMOLOGA/HOM2/undotbs01.dbf
16   5        HOM2:USERS           NO      /u01/database/catalog/datafiles/HOMOLOGA/HOM2/users01.dbf
```

Rman Report USER Temporary Tablespace CDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Temporary Files
=======================
File Size(MB) Tablespace           Maxsize(MB) Tempfile Name
---- -------- -------------------- ----------- --------------------
1    131      TEMP                 32767       /u01/database/catalog/datafiles/HOMOLOGA/temp01.dbf
2    36       PDB$SEED:TEMP        32767       /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/temp01.dbf
3    36       HOM1:TEMP            32767       /u01/database/catalog/datafiles/HOMOLOGA/HOM1/temp02.dbf
4    36       HOM2:TEMP            32767       /u01/database/catalog/datafiles/HOMOLOGA/HOM2/temp01.dbf
```


Rman Report USER Temporary Tablespace PDB

```
RMAN> report schema;

using target database control file instead of recovery catalog

List of Temporary Files
=======================
File Size(MB) Tablespace           Maxsize(MB) Tempfile Name
---- -------- -------------------- ----------- --------------------
1    131      TEMP                 32767       /u01/database/catalog/datafiles/HOMOLOGA/temp01.dbf
2    36       PDB$SEED:TEMP        32767       /u01/database/catalog/datafiles/HOMOLOGA/pdbseed/temp01.dbf
3    36       HOM1:TEMP            32767       /u01/database/catalog/datafiles/HOMOLOGA/HOM1/temp02.dbf
4    36       HOM2:TEMP            32767       /u01/database/catalog/datafiles/HOMOLOGA/HOM2/temp01.dbf
```


Oracle Database Startup Process

Oracle Database Startup & Shutdown process

1
startup nomount

- Read Initfile (Spfile)
- Stage Memory (SGA/PGA)
- Create background Process

2
startup mount

- Read Control file
- Open control file
- Locate Datafiles (not open)

3
alter database open

- Acess all datafiles
- Check datafile consistency

Oracle Database Startup and shutdown process

4

alter database open (Resetlogs)

- Creates new DB incarnation
- Reset SCN
- Requires Standby atention

- Prevent any new loggins
- Save Chanches on files
- No instance recover required

5

shutdown immediate

- Abort all sessions
- Close DB inconsistancy
- Requires instance recover

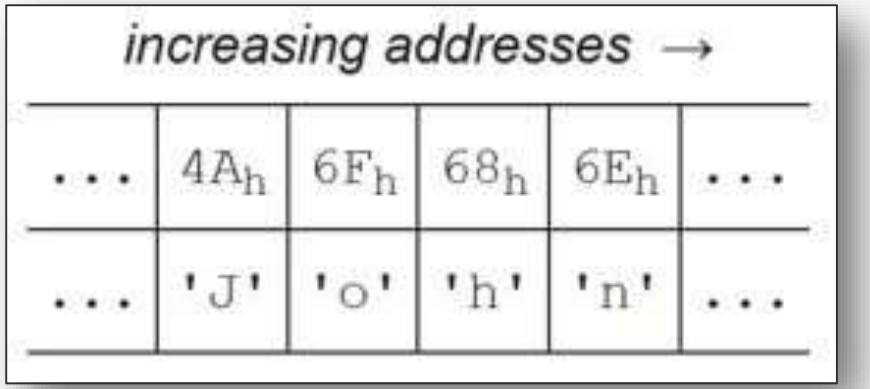
6

shutdown abort

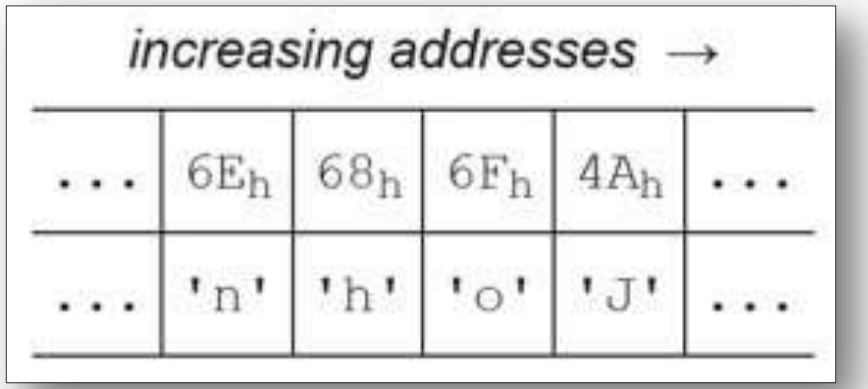
Recovery Manager Cross Plaform

Endianness | The Basis

Big-endian



Little-endian



Source: https://en.wikipedia.org/wiki/Endianness

S.O Plataforms using Little Endian Engine

```
SQL> SELECT platform_name, endian_format
     FROM v$transportable_platform
     WHERE endian_format='Little';

PLATFORM_NAME                                  ENDIAN_FORMAT
_____________________________________________ ______________
Apple Mac OS (x86-64)                          Little
HP IA Open VMS                                 Little
HP Open VMS                                    Little
HP Tru64 UNIX                                  Little
Linux IA (32-bit)                              Little
Linux IA (64-bit)                              Little
Linux x86 64-bit                               Little
Microsoft Windows IA (32-bit)                  Little
Microsoft Windows IA (64-bit)                  Little
Microsoft Windows x86 64-bit                   Little
Solaris Operating System (x86)                 Little
Solaris Operating System (x86-64)              Little
```

S.O Plataforms using Big Endian Engine


```
SQL> SELECT platform_name, endian_format
     FROM v$transportable_platform
     WHERE endian_format!='Big';

PLATFORM_NAME                                  ENDIAN_FORMAT
---------------------------------------------- --------------
AIX-Based Systems (64-bit)                     Big
Apple Mac OS                                   Big
HP-UX (64-bit)                                 Big
HP-UX IA (64-bit)                              Big
IBM Power Based Linux                          Big
IBM zSeries Based Linux                        Big
Linux OS (S64)                                 Big
Solaris[tm] OE (32-bit)                        Big
Solaris[tm] OE (64-bit)                        Big
```

RMAN Convert Cross platform process

Big-endian

```
users01.dbf
users02.dbf
data01.dbf
data02.dbf
...
```

RMAN Convert Cross platform process

Big-endian

Little-endian

```
users01.dbf
users02.dbf
data01.dbf
data02.dbf
...
```

```
users01.dbf
users02.dbf
data01.dbf
data02.dbf
...
```

RMAN Convert Datafiles to Little Endian

```
C:\>RMAN TARGET /

Recovery Manager: Release 12.1.0.1.0 - Production

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connected to target database: ORAWIN (DBID=3462152886)

RMAN> CONVERT DATAFILE
2>'C:\Temp\sales_101.dbf',
3>'C:\Temp\sales_201.dbf'
4>TO PLATFORM="Microsoft Windows IA (32-bit)"
5>FROM PLATFORM="Solaris[tm] OE (32-bit)"
6>DB_FILE_NAME_CONVERT=
7>'C:\Temp\', 'C:\app\orauser\oradata\orawin\'
8> PARALLELISM=4;
```

RMAN Convert Tablespaces to Little Endian

```
$ RMAN TARGET /

connected to target database: salesdb (DBID=3295731590)


RMAN> CONVERT TABLESPACE sales_1,sales_2
2> TO PLATFORM 'Microsoft Windows IA (32-bit)'
3> FORMAT '/tmp/%U';

Starting conversion at source at 30-SEP-08
using channel ORA_DISK_1
channel ORA_DISK_1: starting datafile conversion
input datafile file number=00007 name=/u01/app/oracle/oradata/salesdb/sales_101.dbf
converted datafile=/tmp/data_D-SALESDB_I-1192614013_TS-SALES_1_FNO-7_03jru08s
channel ORA_DISK_1: datafile conversion complete, elapsed time: 00:00:45
channel ORA_DISK_1: starting datafile conversion
input datafile file number=00008 name=/u01/app/oracle/oradata/salesdb/sales_201.dbf
converted datafile=/tmp/data_D-SALESDB_I-1192614013_TS-SALES_2_FNO-8_04jru0aa
channel ORA_DISK_1: datafile conversion complete, elapsed time: 00:00:25
Finished conversion at source at 30-SEP-08
```

M5 Cross Endian Platform Migration using Full Transportable Export/Import and RMAN Inc Backups (Doc ID 2999157.1)

PURPOSE

Cross platform database migration is the process of moving databases to a new platform, including Exadata Database Machine, Exadata Cloud@Customer, Exadata Database Service, etc. This note provides a simple, reliable, and fast migration solution with minimal downtime.
The information below will guide you in performing a cross platform (Big Endian to small Endian, vice versa, or same platform when Data Guard option is not available) database migration.

DETAILS

Cross platform database migration is the process of moving databases to a new platform, including Exadata Database Machine, Exadata Cloud@Customer, Exadata Database Service, etc. This note provides a simple, reliable, and fast migration solution with minimal downtime.

The information below will guide you in performing a cross platform (Big Endian to small Endian, vice versa, or same platform when Data Guard option is not available) database migration.

Note:
1. This procedure only supports Oracle Database 19.18 or higher on source and destination.

Oracle Crash Manager

Crash Manager Simulator

Choose one of the following crash scenario:

Loss of a control file:	[1]
Loss of all control files:	[2]
Loss of a redo log file group member:	[3]
Loss of a redo log file group:	[4]
Loss of a non-system datafile:	[5]
Loss of a temporary datafile:	[6]
Loss of a SYSTEM datafile:	[7]
Loss of an UNDO datafile:	[8]
Loss of a Read-Only tablespace:	[9]
Loss of an Index tablespace:	[10]
Loss of all indexes in USERS tablespace:	[11]
Loss of a non-system tablespace:	[12]
Loss of a temporary tablespace:	[13]
Loss of a SYSTEM tablespace:	[14]
Loss of an UNDO tablespace:	[15]
Loss of the password file:	[16]
Loss of all datafiles:	[17]
Loss of redo log member of a multiplexed group:	[18]
Loss of all redo log members of an INACTIVE group:	[19]
Loss of all redo log members of an ACTIVE group:	[20]
Loss of all redo log members of CURRENT group:	[21]
Perform a random crash scenario:	[99]

Resources

- **Oracle Database Flackback feature**

  https://www.oracle.com/database/technologies/flashback/

- **Oracle Flashback Tecnology**

  https://docs.oracle.com/en/database/oracle/oracle-database/19/bradv/introduction-backup-recovery.html#GUID-993ACA58-F6BA-4FBF-85D0-ED63D522551E

- **RMAN: RAC Backup, Restore and Recovery using RMAN (Doc ID 243760.1)**

  https://support.oracle.com/epmos/faces/DocumentDisplay?id=243760.1

- **RMAN Myths Dispelled: Common RMAN Performance Misconceptions [ID 134214.1]**

  https://support.oracle.com/epmos/faces/DocumentDisplay?id=134214.1

- **Advise On How To Improve Rman Performance [ID 579158.1]**

  https://support.oracle.com/epmos/faces/DocumentDisplay?id=579158.1

- **RMAN Performance Tuning Diagnostics [ID 311068.1]**

  https://support.oracle.com/epmos/faces/DocumentDisplay?id=311068.1

- **RMAN Performance Tuning Using Buffer Memory Parameters [ID 1072545.1]**

  https://support.oracle.com/epmos/faces/DocumentDisplay?id=1072545.1

- **Migration and Integration workshop (Oracle University)**

  https://mylearn.oracle.com/ou/course/oracle-db-cloud-migration-and-integration-workshop/122248/168832

- **Oracle Lift Services site**

  https://www.oracle.com/br/cloud/cloud-lift/

- **Frequently Asked Questions (FAQs) for Oracle Cloud Lift Services**

https://www.oracle.com/br/a/ocom/docs/cloud/faq-oracle-cloud-lift.pdf

- **Mike Dietrich – Upgrade your Database now**

https://mikedietrichde.com/

- **Real Application Test Product Page**

https://www.oracle.com/manageability/enterprise-manager/technologies/real-application-testing.html

- **Real Application Test (RAT) Technician Overview**

https://www.oracle.com/a/otn/docs/enterprise-manager/wp-19c-rat-em.pdf

OCI Database Migration (DMS) – Link's

- **OCI Database Migration Product page**

  https://www.oracle.com/cloud/database-migration/

- **OCI Database Migration Documentation**

  https://docs.oracle.com/en/cloud/paas/database-migration/dmsus/getting-started-oracle-cloud-infrastructure-database-migration.html#GUID-30481DFD-08D7-4D38-A952-3D81138AB71C

Oracle Recover Manager (Rman) – Links

- **Getting Started with Recovery Manager (RMAN) (Doc ID 360416.1)**
  https://support.oracle.com/epmos/faces/DocumentDisplay?id=360416.1
- **Oracle Database 19c Backup and Recovery user guide**
  https://docs.oracle.com/en/database/oracle/oracle-database/19/bradv/index.html#Oracle%C2%AE-Database
- **Oracle Database 19c Multitenant Administrator guide**
  https://docs.oracle.com/en/database/oracle/oracle-database/19/multi/index.html#Oracle%C2%AE-Multitenant
- **M5 Cross Endian Platform Migration using Full Transportable Data Export/Import and RMAN Inc Backups (Doc ID 2999157.1)**
  https://support.oracle.com/epmos/faces/DocumentDisplay?id=2999157.1
- **Golden Gate Veridata Get started**
  https://docs.oracle.com/en/middleware/goldengate/veridata/12.2.1.4/index.html

Zero Downtime Migration (ZDM) - Links

- **Zero Downtime migration product page**

  https://www.oracle.com/database/zero-downtime-migration/

- **Zero Downtime Migration 21.4 documentation**

  https://docs.oracle.com/en/database/oracle/zero-downtime-migration/21.4/

- **Migrating and Upgrading Oracle Databases to OCI with Oracle Zero Downtime Migration (ZDM) demo**

  https://www.youtube.com/watch?v=WPkqwnXGSjo

- **Zero Downtime Migration Release Notes**

  https://docs.oracle.com/en/database/oracle/zero-downtime-migration/21.4/zdmrn/index.html#GUID-A1A467DC-FC06-4409-AF7F-BF0186CD8C54

- **Zero Downtime Migration Licensing Information User Manual**

  https://docs.oracle.com/en/database/oracle/zero-downtime-migration/21.4/zdmli/index.html#GUID-0E273386-149E-4A98-823A-388C60752632

- **livelabs - Zero Downtime Migration: Logical Online Migration to Oracle Autonomous Database**

  https://apexapps.oracle.com/pls/apex/dbpm/r/livelabs/view-workshop?wid=937

- **Livelabs - Zero Downtime Migration - Logical Offline Migration to ADB**
  https://apexapps.oracle.com/pls/apex/dbpm/r/livelabs/view-workshop?wid=850

- **livelabs - Zero Downtime Migration : Physical Offline Migration to Co-Managed Databases in OCI**
  https://apexapps.oracle.com/pls/apex/r/dbpm/livelabs/view-workshop?wid=3568

- **Oracle Zero Downtime Migration (ZDM) & Oracle Advanced Cluster File System**
  https://www.oracle.com/a/tech/docs/oracle-zdm-logical-migration-acfs.pdf

- **Oracle Zero Downtime Migration – Logical Migration Performance Guidelines**
  https://www.oracle.com/a/tech/docs/zdm-gg-performance.pdf

- **Oracle Zero Downtime Migration (ZDM)– Logical Online Migration from On-Premises to Oracle Autonomous(ADB)**
  https://www.oracle.com/a/tech/docs/oracle-zdm-logical-migration-to-autonomous-guide.pdf

- **Oracle Zero Downtime Migration (ZDM) - Logical Migration Upgrade from On-Premises to DBCS and ExaCS**
  https://blogs.oracle.com/maa/post/oracle-zero-downtime-migration-214

- **Oracle Zero Downtime Migration (ZDM) Physical Migration Step by Step Guide**
  https://www.oracle.com/a/tech/docs/oracle-zdm-step-by-step-guide.pdf

Thank you

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