Using RMAN Recovery Catalog Database

By Ahmed Baraka

Objectives

In this lecture, you will learn how to perform the following:

- Compare between using control file and Recovery Catalog as RMAN repository
- Create and manage recovery catalogs
- Manually resynchronize recovery catalogs
- Catalog files into RMAN repository
- Create and manage stored scripts

Ahmed Baraka
Oracle Database Administrator

Comparison of RMAN Repository Options

Control File	**Recovery Catalog Database**
Stores the history for maximum one year	Stores longer history
RMAN repository of local database only	RMAN repository of multiple target databases
Stored scripts cannot be stored in it	Stored scripts can be stored in it
Easier management	More complicated management
Using KEEP FOREVER clause of the BACKUP command is **not** possible	Using KEEP FOREVER clause of the BACKUP command is possible
History of database physical structure **cannot** be retrieved	History of database physical structure **can** be retrieved
Recommended for simple backup management requirements	Recommended for complicated backup management requirements

Creating the Recovery Catalog: Three Steps

1. Configure the recovery catalog database
2. Create the recovery catalog owner
3. Create the recovery catalog

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Configuring the Recovery Catalog Database

- Create a tablespace for the recovery catalog, which becomes the default tablespace for the recovery catalog owner

```
CREATE TABLESPACE rcat_tbs DATAFILE <data file name> SIZE 15M;
```

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Creating the Recovery Catalog Owner

- Create the recovery catalog owner.
- Grant the **RECOVERY_CATALOG_OWNER** role.

```
SQL> CREATE USER rcowner IDENTIFIED BY ***
 TEMPORARY TABLESPACE temp
 DEFAULT TABLESPACE rcat_tbs
 QUOTA UNLIMITED ON rcat_tbs;

SQL> GRANT RECOVERY_CATALOG_OWNER TO rcowner;
```

Creating the Recovery Catalog

- Connect to the recovery catalog database as the catalog owner
- Execute the **`CREATE CATALOG`** command to create the catalog objects:

```
$ rman
RMAN> CONNECT CATALOG rcowner/***@catdb
RMAN> CREATE CATALOG;
```

Managing Target Database Records in the Recovery Catalog

- Registering a target database in the recovery catalog
- Cataloging additional backup files
- Unregistering a target database from the recovery catalog

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Oracle Database Administrator

Registering a Database in the Recovery Catalog

- Using the RMAN command line to register a database:

```
$ rman TARGET / CATALOG rcowner/****@catdb
RMAN> REGISTER DATABASE;
```

- RMAN does the following when a database is registered:
  - Creates rows in the recovery catalog tables for the target database
  - Synchronizes the recovery catalog with the control file

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Unregistering a Target Database from the Recovery Catalog

- This removes information about the target database from the recovery catalog.
- Use this when you no longer want the target database to be defined in the recovery catalog.

```
$ rman TARGET / CATALOG username/password@catdb
RMAN> UNREGISTER DATABASE;
```

About Recovery Catalog Resynchronization

- Is the process of updating the Recovery Catalog with the changes made on control file
- Two types:
  - **Partial**
    - Updates the recovery catalog with any metadata on the recovery files
    - Changes to the control file are those records that are governed by **`CONTROL_FILE_RECORD_KEEP_TIME`**,
  - **Full**
    - Updates the recovery catalog by comparing recovery catalog contents with a control file snapshot
    - Database physical structure changes are included in the update
    - Is executed when you issue the **`RESYNC CATALOG`** command

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Manually Resynchronizing the Recovery Catalog

- Manually resynchronize the recovery catalog in the following situations:
  - After the recovery catalog is unavailable for RMAN to automatically resynchronize it
  - When you perform infrequent backups of your target database
  - After making changes to the physical structure of the target database

```
RMAN> RESYNC CATALOG;
```

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About Cataloging Operations

- Process of adding backup records to the RMAN repository
- To the following file types can be added:
  - **`CONTROLFILECOPY`**
  - **`DATAFILECOPY`**
  - **`BACKUPPIECE`**
  - **`ARCHIVELOG`**
- Example scenarios:
  - You used an operating system utility to make copies of the files
  - You changed the archiving destination
  - Backup file are aged out

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Oracle Database Administrator

Cataloging Examples

- Cataloging backup pieces:

```
CATALOG BACKUPPIECE '/disk2/09dsq44d_1_2',
'/disk2/0bdtad7u_1_1';
```

- Cataloging all files in a disk location:

```
CATALOG START WITH '+disk';
CATALOG START WITH '/fs1/datafiles/';
CATALOG RECOVERY AREA;
```

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- Cataloging data file copies:

```
CATALOG DATAFILECOPY '/tmp/users01.dbf';
```

Cataloging Examples (cont)

- Cataloging backup pieces:

```
CATALOG ARCHIVELOG '/disk1/arch_logs/archive1_731.log',
'/disk1/arch_logs/archive1_732.log';
```

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About RMAN Stored Scripts

- An alternative to command files
- Available to any RMAN client that can connect to the target database and recovery catalog
- Of two types:
  - **Local**: associated with the target database to which RMAN is connected when the script is created
  - **Global**: can be executed against any database registered in the recovery catalog
- Same commands available in `RUN` block can be used

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Creating Stored Scripts

- Create script format when script commands are provided inline:

```
CREATE [GLOBAL] SCRIPT script_name [COMMENT 'comment']
{ <RMAN commands> }
```

- Create script format when script commands are provided in a file:

```
CREATE [GLOBAL] SCRIPT script_name FROM FILE 'file_name';
```

Creating Stored Scripts: Examples

- Local stored script:

```
CREATE SCRIPT full_backup
{ BACKUP DATABASE PLUS ARCHIVELOG;
  DELETE OBSOLETE;
}
```

- Global stored script:

```
CREATE GLOBAL SCRIPT global_full_backup
COMMENT 'full database backup and delete obsolete'
{ BACKUP DATABASE PLUS ARCHIVELOG;
  DELETE OBSOLETE;
}
```

Creating Stored Scripts: Examples (cont)

- Stored script from external file:

```
CREATE SCRIPT full_backup
 FROM FILE '/home/oracle/scripts/full_backup.txt';
```

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Replacing Stored Scripts

- To update stored scripts:

```
REPLACE SCRIPT full_backup
COMMENT 'updated script'
{
  BACKUP AS BACKUPSET DATABASE PLUS ARCHIVELOG;
}
```

Executing RMAN Stored Scripts

- Executing a script:

```
RUN
{
 EXECUTE SCRIPT <script_name>;
}
```

- Executing a global script:

```
RUN
{
 EXECUTE GLOBAL SCRIPT <script_name>;
}
```

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Using Substitution Variables RMAN Stored Scripts

- Create and use a dynamic stored script:

```
CREATE SCRIPT tbs_backup
{
 BACKUP TABLESPACE &1 TAG &2;
}
```

- Passing values to the variables:
  - In a run block:

```
RUN { EXECUTE SCRIPT tbs_backup USING 'USERS','USERS102018';}
```

  - When you invoke RMAN:

```
rman target "'/ as SYSBACKUP'" catalog rc_owner@rcdb
script=tbs_backup using 'USERS','USERS102018'
```

Maintaining RMAN Stored Scripts

- Displaying a script:

```
PRINT [GLOBAL] SCRIPT script_name;
```

- Sending the contents of a script to a file:

```
PRINT [GLOBAL] SCRIPT script_name TO FILE 'file_name';
```

- Displaying the names of defined scripts:

```
LIST [GLOBAL] SCRIPT NAMES;
```

- Deleting a script:

```
DELETE [GLOBAL] script_name;
```

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About Backing Up Recovery Catalog

- You should backup recovery catalog database
- Recommendations:
  - Use RMAN for making backups
  - No production data should be saved in the recovery catalog database
  - Recovery database files should be saved in separate disk storage
  - Enable control file autobackup in RMAN
  - Take backup of the recovery catalog database after every target database backup
  - Backup recovery catalog database in more than one disk storage
  - Use the control file as the RMAN repository destination

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Oracle Database Administrator

Summary

In this lecture, you should have learnt how to perform the following:

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Ahmed Baraka
Oracle Database Administrator