# Configuring RMAN Persistent Settings

By Ahmed Baraka

# Objectives

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

- Configure RMAN backup retention policy
- Specifying RMAN backup destinations in all levels
- Configure archived redo log deletion policy

# Managing RMAN Persistent Settings

- RMAN persistent settings can be shown using the command:

```
SHOW ALL;
SHOW CONTROLFILE AUTOBACKUP FORMAT;
```

- To modify a persistent setting:

```
CONFIGURE DEVICE TYPE sbt PARALLELISM 3;
```

- To reset a persistent setting to its default value:

```
CONFIGURE BACKUP OPTIMIZATION CLEAR;
```

# Configuring Backup Retention Policy

- Two retention policies are available:
  - **Redundancy-based**:
    - How many copies of each backed-up file to keep
    - Example: keep the last 3 database backups
  - **Window-based**:
    - Up to how long on the past you can recover
    - Example: keep the backups required to recover for the last 7 days
- You cannot have both of them enabled in the same time
- RMAN can operate without any retention policy in place (not recommended)

# Configuring Redundancy-based Retention Policy

- How many full or level 0 backups of each data file and control file should be kept
- The default is 1
- Extra backups are marked as obsolete
- To configure it:

```
CONFIGURE RETENTION POLICY TO REDUNDANCY 3;
```

# Configuring Window-based Retention Policy

- The number of days between the current time and a specific point in the past.
- Any backup and archive log that fall outside this recovery window is considered obsolete.
- To configure it:

```
CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 7 DAYS;
```

# Retention Policy and Incrementally Updated Backups

- Incrementally updated backups assumes a retention policy of redundancy 1, otherwise FRA will eventually run out of disk space
- If you want to set the retention policy to a recovery window, use the **`UNTIL TIME`** clause:

```
run {
RECOVER COPY OF DATABASE WITH TAG 'ORCL_LEVEL_0' UNTIL TIME
'SYSDATE-8';
BACKUP INCREMENTAL LEVEL 1 CUMULATIVE COPIES=1 FOR RECOVER OF
COPY WITH TAG 'ORCL_LEVEL_0' DATABASE;
}
```

# Disabling the Retention Policy

- To disable the retention policy:

```
CONFIGURE RETENTION POLICY TO NONE;
```

- Not recommended (specially if FRA is configured)
- This is not the same as clearing the policy.

# About Channel Configuration

- All backup and recovery operations create channels
- Can be automatic (default) or manual
- Automatic channel settings: use **`CONFIGURE CHANNEL`** command
- Manual channel settings: use **`ALLOCATE CHANNEL`** command

# Specifying a FORMAT for RMAN Backups

- The precedence of defining RMAN output files:
  - **FORMAT** being used in **BACKUP** command
  - **FORMAT** configured for the channel
  - **FORMAT** configured for device type
  - Automatic generated names in FRA
  - Default platform-specific location
- Specifying **FORMAT** in **BACKUP** command:

```
BACKUP DATABASE FORMAT "/u02/orcl_%U";
```

```
BACKUP DATABASE FORMAT '+BACKUP1';
```

# Configuring Backup Locations in Default Channels

- Configuring a non-default backup location for disk devices:

```
CONFIGURE CHANNEL DEVICE TYPE DISK FORMAT
'/disk1/orcl_df%t_s%s_p%p';
```

- List of the substitution variables are in the documentation "*Oracle Database Backup and Recovery Reference"*. Lookup the semantics "*formatSpec*".

# Configuring Backup Locations in Manually Allocated Channels

- About **`ALLOCATE CHANNEL`** command:
  - must be issued within a **`RUN`** block
  - allocates a channel only in the block where the command is issued.
  - channels are automatically released by end of executing the block

```
RUN
{
  ALLOCATE CHANNEL c1 DEVICE TYPE disk FORMAT '/disk1/%U';
  BACKUP DATABASE PLUS ARCHIVELOG;
}
```

# Configuring AUTOBACKUP Destination

- To enable the **AUTOBACKUP** feature (by default enabled in 12.2):

```
CONFIGURE CONTROLFILE AUTOBACKUP ON;
```

- The default name is **%F** (equivalent to c-<DBID>-YYYYMMDD-QQ)
- To change the default format:

```
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT
FOR DEVICE TYPE DISK TO 'u01/backupdata/cf_%F';
```

- To clear control file **AUTOBACKUP** formats for a device:

```
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE
TYPE DISK CLEAR;
```

# Configuring AUTOBACKUP Destination (cont)

- At RMAN prompt:

```
SET CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO
'control_%F';
```

- Within a **RUN** block

```
RUN
{
 SET CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO
  '/tmp/%F.bck';
 BACKUP AS BACKUPSET DEVICE TYPE DISK DATABASE;
}
```

# Archived Redo Logs Automatic Deletion

- By default, if the archived redo log files are in FRA, the database considers deleting from them if the FRA requires free disk space.
- By default, archived redo log files in FRA are eligible for deletion if **either** of the following cases is true:
  - The archive logs have been backed up at least once to disk or tape
  - The archive logs are not needed by a guaranteed restore point and are not needed by Flashback Database retention period (obsolete)

**Note**: this default deletion mechanism does not apply, if the archive logs are saved outside the FRA

# About Archived Redo Log Deletion Policy

- Used to specify when archived redo logs are eligible for deletion.

```
CONFIGURE ARCHIVELOG DELETION POLICY
  BACKED UP < n > TIMES TO DEVICE TYPE [ DISK | SBT ]
```

- Applies to all archive redo log destinations
- Effect:
  - Enforced on the automatic archived redo log deletion
  - Obeyed by **`BACKUP ... DELETE INPUT`**, **`DELETE ARCHIVELOG`**, and **`DELETE OBSOLETE`** commands
  - If <*n*> backups of the logs exist, then the **`BACKUP ARCHIVELOG`** command skips the logs (can be overridden using the **`FORCE`** option)

# Summary

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

- Configure RMAN backup retention policy
- Specifying RMAN backup destinations in all levels
- Configure archived redo log deletion policy