4

Backup Strategies

Objectives

After completing this lesson, you should be able to:

- Describe RMAN backup types
- Describe Oracle backup solutions
- Describe, compare, and determine your backup strategy

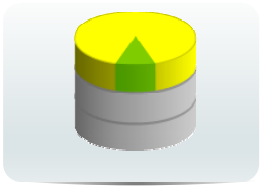
Understanding Types of Backups

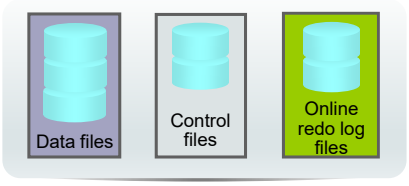
You can understand different types of backups by becoming familiar with these concepts:

- Backup terminology
- Types of backups
- RMAN backup types

Backup Terminology

- *Backup strategy* may include:
  - Entire database (whole)
  - Portion of the database (partial)
- *Backup type* may indicate inclusion of:
  - All data blocks within your chosen files (full)
  - Only information that has changed since a previous backup (incremental)
    - Cumulative (changes since last level 0)
    - Differential (changes since last incremental)
- *Backup mode* may be:
  - Offline (consistent, cold)
  - Online (inconsistent, hot)





Understanding Types of Backups

Backups may be stored as:

- Image copies
- Backup sets

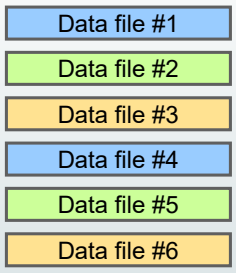
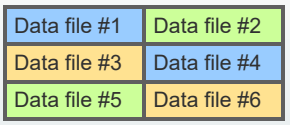


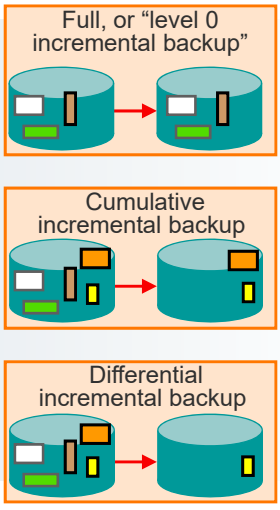
Image copies
(Duplicate data and log files in OS format)



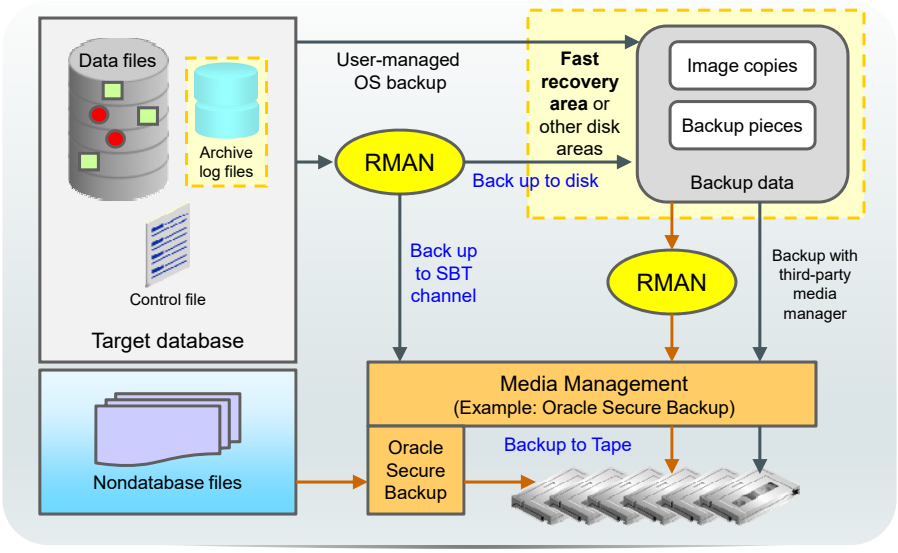
Backup set
(Binary, compressed files in Oracle proprietary format)

RMAN Backup Types

- A *full backup* contains all used data file blocks.
- A *level 0 incremental backup* is equivalent to a full backup that has been marked as level 0.
- A *cumulative level 1 incremental backup* contains only blocks modified since the last level 0 incremental backup.
- A *differential level 1 incremental backup* contains only blocks modified since the last incremental backup.



Backup Solutions: Overview

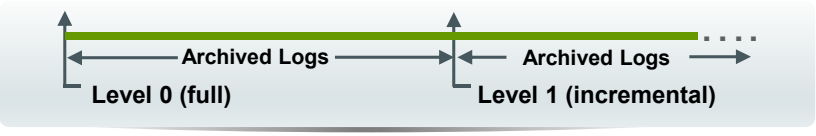


Comparing Backup Strategies

Strategy	Backup Factors	Recovery Factors
Option 1: Full and Incremental Backups	Fast incremental backups Save space with backup compression. Cost-effective tape storage	Full backup restored first and then incremental backups and archived logs Tape backups read sequentially
Option 2: Incrementally Updated Disk Backups	Incremental + roll forward to create up-to-date copy Requires 1x production storage for copy	Backups read via random access Restore-free recovery with `SWITCH` command
Option 3: Offload Backups to Physical Standby Database	Above benefits + primary database free to handle more workloads Requires 1X production hardware and storage for standby database	Fast failover to standby database in the event of any failure Backups are last resort, in the event of double site failure

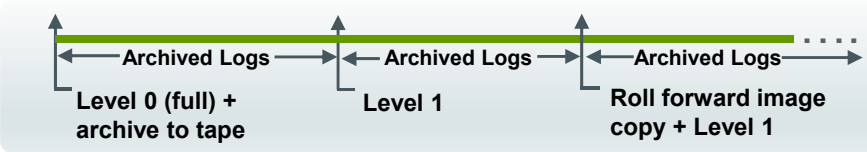
Option 1: Full and Incremental Backups

- Well suited for:
  - Databases that can tolerate hours/days RTO
  - Environments where disk is premium
- Backup strategy:
  - Weekly level 0 and daily differential incremental backup sets to tape, with optional backup compression
  - Enable block change tracking so that only changed block chunks are read and written during incremental backup.
  - Back up archived logs and retain on-disk, as needed.



Option 2: Incrementally Updated Disk Backups

- Well suited for:
  - Databases that can tolerate no more than a few hours RTO
  - Environments where disk can be allocated for 1x size of database or most critical tablespaces
- Backup strategy:
  - Initial image copy to FRA, daily incremental backups
  - New on-disk copy by using incrementals to roll forward copy
  - Full backup archived to tape as needed
  - Archived logs backed up and retained on-disk as needed
  - Fast recovery from disk or `SWITCH` to use image copies



Option 3: Offloading Backups to Physical Standby Database in Data Guard Environment

- Well suited for:
  - Databases that require no more than several minutes of recovery time in the event of any failure
  - Environments that can preferably allocate symmetric hardware and storage for physical standby database
  - Environments with tape infrastructure that can be shared between primary and standby database sites
- Backup strategy:
  - Full and incremental backups offloaded to physical standby database
  - Fast incremental backup on standby with Active Data Guard
  - Backups restored to primary or standby database
  - Backups taken at each database for optimal local protection

Summary

In this lesson, you should have learned how to:

- Describe RMAN backup types
- Describe Oracle backup solutions
- Describe, compare, and determine your backup strategy