Creating Database Backups

Objectives

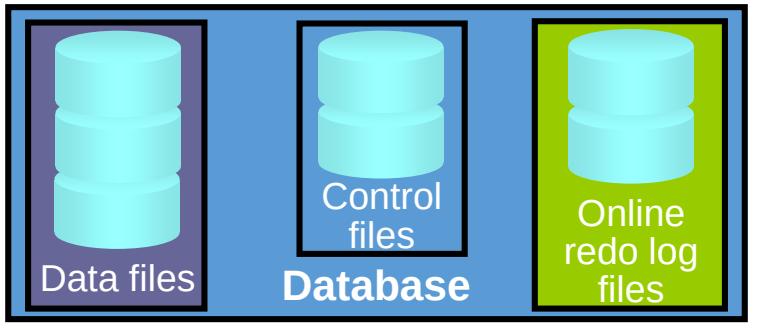
- After completing this lesson, you should be able to:
  - Create consistent database backups
  - Back up your database without shutting it down
  - Create incremental backups
  - Modify the DBCS default backup configuration
  - Create DBCS backups

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:
  - The entire database (whole)
  - A 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

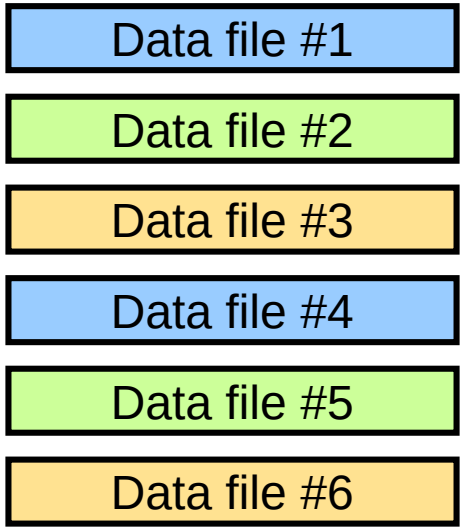
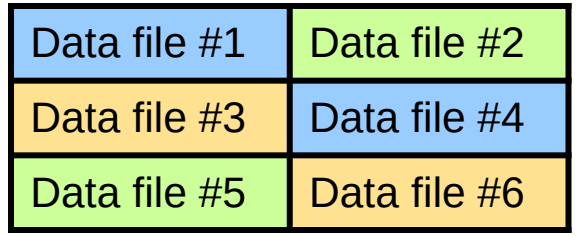


Image copies

(Duplicate data and log files in OS format)

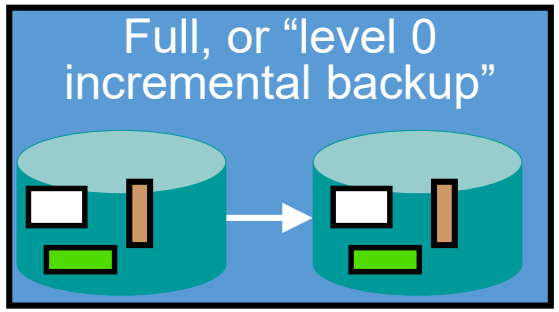


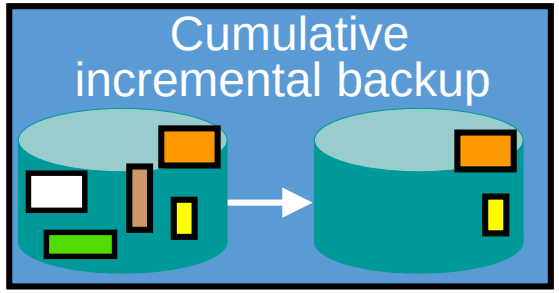
Backup set

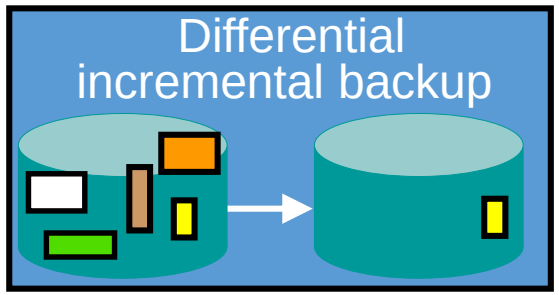
(Binary, compressed files in Oracle proprietary format)

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.







Using Recovery Manager (RMAN)

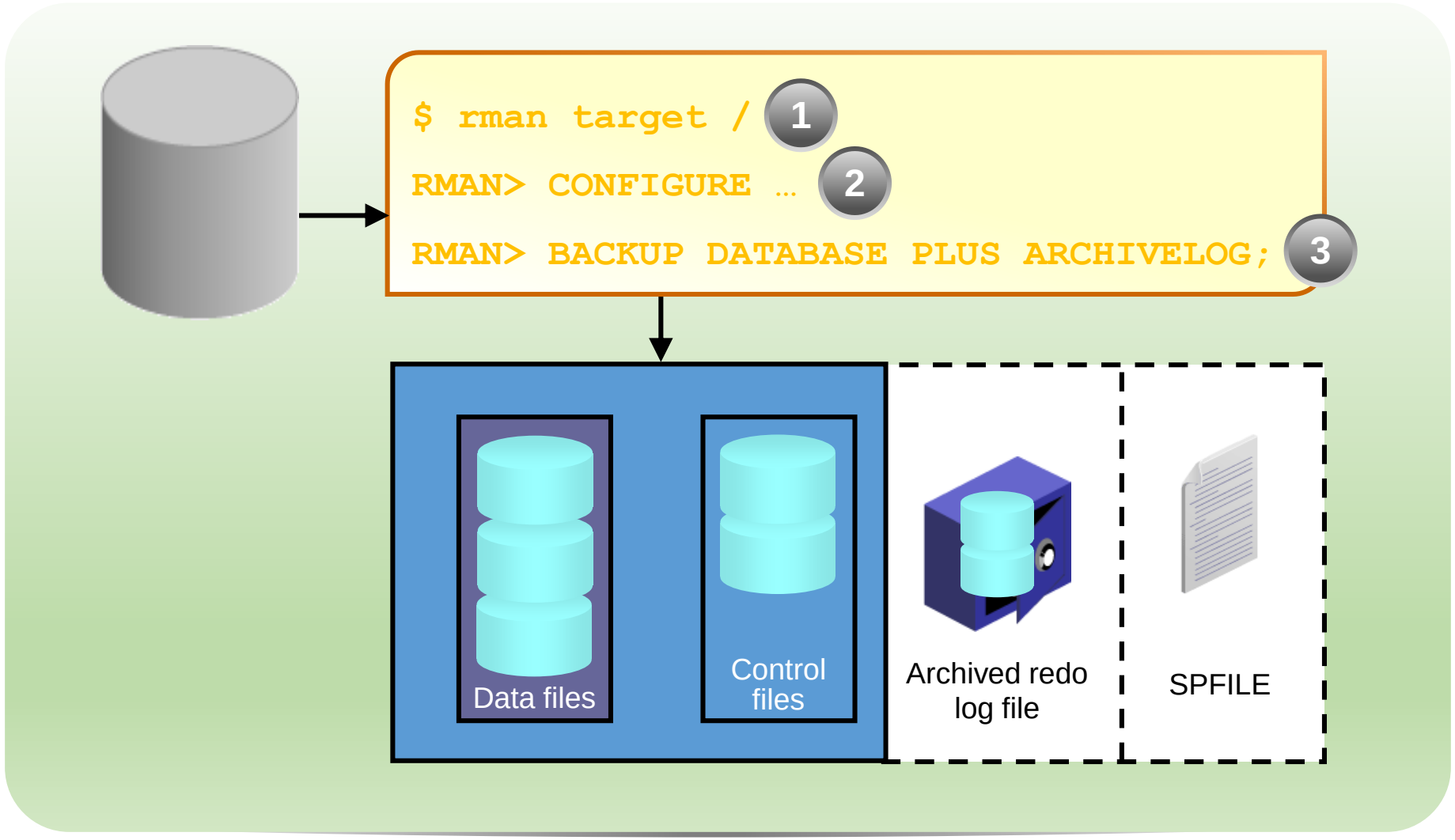
- Provides a powerful control and scripting language
- Includes a published API that enables the interface with the most popular backup software
- Backs up data, control, the archived redo log, and server parameter files
- Backs up files to disk or tape
- Is integrated with Enterprise Manager Cloud Control
- Is used by Oracle Database Cloud Service, Oracle Database Backup Service, and other Oracle Cloud services for automated backups
- Can be used with Oracle Database Cloud Service if no backup configuration was selected when the database deployment was created

Backing Up the Control File to a Trace File

- Control files can be backed up to a trace file, generating a SQL command to re-create the control file.
- Control file trace backups may be used to recover from the loss of all control files.

```
ALTER DATABASE BACKUP CONTROLFILE TO TRACE
```

Using RMAN Commands to Create Backups



Backing Up Databases on DBCS

- Database Cloud Service provides a backup feature that backs up:
  - The database
  - Database configuration files
  - Grid Infrastructure configuration files (on deployments hosting an Oracle RAC database)
  - System and cloud tooling files
- The backup feature relies on the following, which are installed in the database deployment:
  - System utilities
  - Oracle Database utilities
  - Oracle Database Backup Cloud Service

Backup Destination Choices

Backup Destination	Description	Retention
Both Cloud Storage and Local Storage	Backups are created automatically and stored both on local compute node storage and on an Oracle Storage Cloud Service container.	30 days 7 most recent days' backups available on local storage
Cloud Storage Only	Backups are created automatically and stored only on an Oracle Storage Cloud Service container.	30 days
None	No backups are created.	

Backup Configuration

- Full (level 0) backup of the database followed by rolling incremental (level 1) backups on a seven-day cycle
- Full backup of selected database configuration files
- Full backup of selected system files
- Automatic backups daily at a time between 11 PM (23:00) and 3 AM (03:00), with the specific time set during database deployment creation
- Encryption:
  - Both Cloud Storage and Local Storage: All backups to cloud storage are encrypted; backups of Enterprise Edition databases to local storage are encrypted; backups of Standard Edition databases to local storage are not encrypted.
  - Cloud Storage Only: All backups to cloud storage are encrypted.

Creating an On-Demand Backup

- Click “Backup Now” on the Oracle Database Cloud Service Instance Administration page.
- Command-line interfaces for backups:
  - For single-instance databases, use the `bkup_api` utility.
  - For RAC databases, use the `raccli` utility.

Customizing the Backup Configuration

Customization	Description	Utility to Use or File to Edit
Backup Configuration Settings	Persistent configuration settings	Recovery Manager (RMAN)
System Files	System files and directories	`/home/oracle/bkup/oscfg.spec` file
Database Configuration Files	Wallet, initialization parameter, network configuration files	`/home/oracle/bkup/dbcfg.spec` file
Retention Period	Backup retention period (days)	`bkup_api` utility
Cycle Period	Backup cycle period (days)	`bkup_api` utility
Frequency	Time that `bkup_api` is run	`/etc/crontab` file

Summary

- In this lesson, you should have learned how to:
  - Create consistent database backups
  - Back up your database without shutting it down
  - Create incremental backups
  - Modify the DBCS default backup configuration
  - Create DBCS backups

Practice 18: Overview

- 18-1: Backing Up the Control File
- 18-2: Verifying Automatic Backups of the Control File and SPFILE
- 18-3: Checking Storage Availability
- 18-4: Creating a Whole Database Backup
- 18-5: Creating a Partial Database Backup