

# 19

## Database Backups

# Objectives

**After completing this lesson you should be able to do the following:**

- **Create consistent database backups**
- **Back up your database without shutting it down**
- **Create incremental backups**
- **Automate database backups**
- **Monitor the flash recovery area**

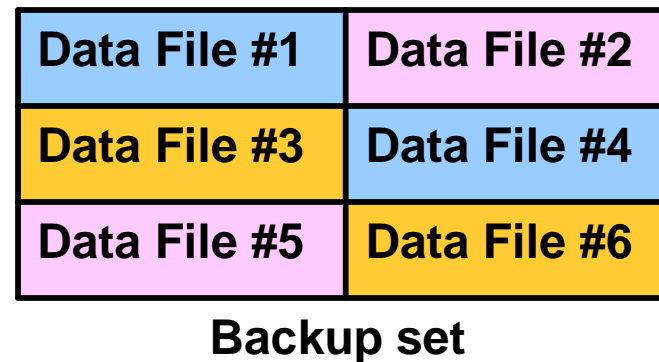
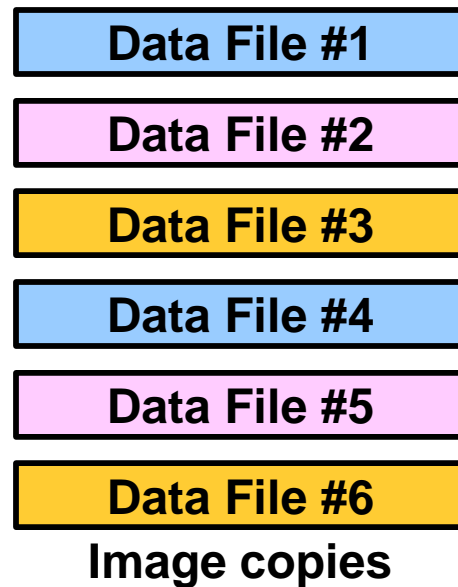
# Terminology

- **Backup strategy may include:**
  - The entire database (whole)
  - A portion of the database (partial)
- **Backup type may be:**
  - All information from all data files (full)
  - Only information that has changed since some previous backup (incremental)
- **Backups mode may be:**
  - Offline (consistent, cold)
  - Online (inconsistent, hot)



# Terminology

- Backups may be stored as:
  - Image copies
  - Backup sets



# Recovery Manager (RMAN)

**Enterprise Manager uses Recovery Manager (RMAN) to perform backup and recovery operations.**

- **Command-line client for advanced functions**
- **Powerful control and scripting language**
- **Published API that allows interface with most popular backup software**
- **Backs up data, control, archived log, and server parameter files**
- **Backs up files to disk or tape**

# Configuring Backup Settings

## Configure Backup Settings

**Device** [Backup Set](#) [Policy](#)

### Disk Settings

Parallelism  [Test Disk Backup](#)

Concurrent streams to disk drives

Disk Backup Location

An existing directory or diskgroup name where database files will be backed up. If you do not specify a location, database files will be backed up to the flash recovery area location.

Disk Backup Type ☒ Backup Set

An Oracle proprietary format which has to be restored before use.

☐ Compressed Backup Set

An Oracle proprietary format in compressed format which has to be restored before use.

☐ Image Copy

A bit-by-bit copy of database files that can be used as-is to perform recovery.

### Host Credentials

To save the backup settings, supply operating system login credentials.

\* Username

\* Password

☒ Save as Preferred Credential

# Configuring Backup Settings

## Backup Policy

☐ Automatically backup the control file and server parameter file (SPFILE) with every backup and database structural change

Autobackup Disk Location

An existing directory or diskgroup name where the control file and server parameter file will be backed up. If you do not specify a location, the files will be backed up to the flash recovery area location.

☐ Optimize the whole database backup by skipping unchanged files such as read-only and offline datafiles that have been backed up

☐ Enable block change tracking for faster incremental backups

Block Change Tracking File

Specify a location and file, otherwise an Oracle managed file will be created in the database area.

## Tablespaces Excluded From Whole Database Backup

Populate this table with the tablespaces you want to exclude from a whole database backup. Use the Add button to add tablespaces to this table.

Add

Select	Tablespace Name	Tablespace Number	Status	Contents
<input type="checkbox"/>	No Items Selected			

☒ **TIP** These tablespaces can be backed up separately using tablespace backup.

## Retention Policy

☐ Retain All Backups

You must manually delete any backups

☐ Retain backups that are necessary for a recovery to any time within the specified number of days (point-in-time recovery)

Days

Recovery Window

☒ Retain at least the specified number of full backups for each datafile

Backups

Redundancy

ORACLE

# Scheduling Backups: Strategy

**Choose whole or partial database backup.**

## Schedule Backup: Strategy

Based on your disk and/or tape configuration, Oracle provides an automated backup strategy, or you can develop your own backup strategy with customized options.

Backup Strategy Customized

Object Type

☒ Whole Database

☐ Tablespaces

☐ Datafiles

☐ Archivelogs

☐ All Recovery Files on Disk

These files include all archivelogs and disk backups that are not already backed up to tape

### Host Credentials

To perform a backup, supply operating system login credentials.

\* Username

\* Password

☒ Save as Preferred Credential

Cancel Continue

### Backup Strategies

Oracle-suggested:

- Provides an out-of-the-box backup strategy based on the backup destination. Options may vary based on the database version.
- Sets up recovery window for backup management
- Automates backup management
- Schedules recurring backups

Customized:

- Specify the objects to be backed up
- Choose a disk or tape backup destination
- Override the default backup settings
- Schedule the backup

ORACLE



# Scheduling Backups: Options

Backup Strategy	Customized
Object Type	Whole Database

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## Backup Type

☒ Full Backup

☐ Use as the base of an incremental backup strategy

☐ Incremental Backup (Level 1)

Level 1 incremental backup includes all the changed blocks since the most recent level 0 backup (cumulative).

☐ Refresh the latest datafile copy on disk to the current time using the incremental backup

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## Backup Mode

☒ Online Backup

The backup can be performed when the database is OPEN.

☐ Offline Backup

If the database is OPEN at the time of backup, the database will be shut down and mounted before the backup. The database will be opened after the backup.

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## Advanced

☒ Back up all archived logs on disk

☐ Delete all archived logs from disk after they are successfully backed up

☐ Use proxy copy supported by media management software to perform a backup

If proxy copy of the selected files is not supported, Recovery Manager will perform a conventional backup.

☐ Delete obsolete backups

Delete backups that are no longer needed to satisfy the retention policy.

Maximum Files per Backup Set

The maximum number of input files in each backup set.

# Scheduling Backups: Settings

The screenshot shows the 'Schedule Backup: Settings' dialog box. At the top, there is a progress bar with four steps: 'Options' (yellow circle), 'Settings' (blue circle), 'Schedule' (white circle), and 'Review' (white circle). Below the progress bar, the title 'Schedule Backup: Settings' is displayed. To the right of the title are four buttons: 'Cancel', 'Back', 'Step 2 of 4' (highlighted), and 'Next'. The main content area shows the following settings: Database: orcl, Backup Strategy: Customized, and Object Type: Whole Database. Below these settings is a paragraph: 'Here are the settings for your current backup job. You can select your backup destination directly from this page. You can also view the default settings or override the settings by clicking the buttons below.' There are two radio buttons: 'Disk' (selected) and 'Tape'. Below the 'Disk' radio button is the text 'Flash Recovery Area /oracle/flash\_recovery\_area/'. Below the 'Tape' radio button is the text 'Media Management Vendor(MMV) Library Parameters not specified'. At the bottom, there are two buttons: 'View Default Settings' and 'Override Current Settings'. Below these buttons is a note: 'Changed settings will only apply to the current backup.'

Options Settings Schedule Review

### Schedule Backup: Settings

Cancel Back Step 2 of 4 Next

Database **orcl**  
Backup Strategy **Customized**  
Object Type **Whole Database**

Here are the settings for your current backup job. You can select your backup destination directly from this page. You can also view the default settings or override the settings by clicking the buttons below.

☒ Disk  
Flash Recovery Area /oracle/flash\_recovery\_area/

☐ Tape  
Media Management Vendor(MMV) Library Parameters **not specified**

View Default Settings Override Current Settings

Changed settings will only apply to the current backup.

**Persistent backup configuration settings can be overridden for this backup by clicking Override Current Settings.**

# Scheduling Backups: Schedule

## Schedule Backup: Schedule

CancelBackStep 3 of 4Next

Database orcl.oracle.com  
Backup Strategy Customized  
Object Type Whole Database

### Job

\* Job Name BACKUP\_ORCL.Oracle.COM\_000  
Job Description Whole Database Backup

### Schedule

Time Zone GMT -7:00

#### Start

☒ Immediately  
☐ Later  
Date Feb 16, 2004  
(example: Feb 16, 2004)  
Time 2 00 ☒ AM ☐ PM

#### Repeat

☒ One Time Only  
☐ Interval  
Frequency 1 Minutes  
☐ Monthly  
☐ Yearly

#### Repeat Until

☒ Indefinite  
☐ Custom  
Date Feb 16, 2004  
(example: Feb 16, 2004)  
Time 8 15 ☐ AM ☒ PM  
(Ignored except when repeating by minutes or hours.)

# Scheduling Backups: Review

**Schedule Backup: Review**

Cancel Edit RMAN Script Back Step 4 of 4 Submit Job

Database	orcl
Backup Strategy	Customized
Object Type	Whole Database
Backup Type	Full Backup
Backup Mode	Online Backup

[Settings](#)

Flash Recovery Area /oracle/flash\_recovery\_area/

**Review: Edit RMAN Script**

Cancel Submit Job

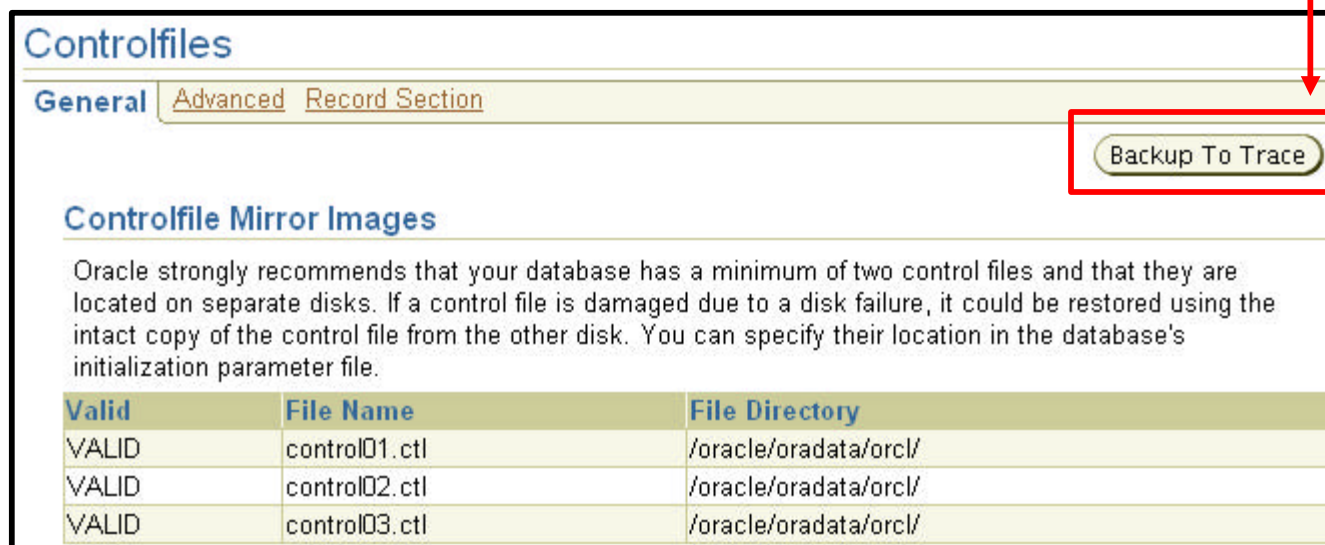
You can modify the RMAN script before submitting it. However, you will not be able to go back to previous wizard pages if you modify the script.

```
backup device type disk tag '%TAG' database include current controlfile;
backup device type disk tag '%TAG' archivelog all;
```

**Click Edit RMAN Script to review RMAN commands.**

# Backup Control File to Trace

Control files have an additional backup option.



**Controlfiles**

[General](#) [Advanced](#) [Record Section](#)

**Backup To Trace**

**Controlfile Mirror Images**

Oracle strongly recommends that your database has a minimum of two control files and that they are located on separate disks. If a control file is damaged due to a disk failure, it could be restored using the intact copy of the control file from the other disk. You can specify their location in the database's initialization parameter file.

Valid	File Name	File Directory
VALID	control01.ctl	/oracle/oradata/orcl/
VALID	control02.ctl	/oracle/oradata/orcl/
VALID	control03.ctl	/oracle/oradata/orcl/

Control file trace backups may be used to recover from loss of all control files.

# Manage Backups

## Manage Current Backups

Catalog Additional FilesCrosscheck AllDelete All ObsoleteDelete All Expired

This backup data was retrieved from the database control file.

**Backup Sets** [Image Copies](#)

**Search**

Status Available

Contents ☒ Datafile ☒ Archived Redo Log ☒ SPFILE ☒ Control File

Completion Time Within a month GO

**Results**

CrosscheckChange to UnavailableDelete

[Select All](#) | [Select None](#)

Select	Key	Tag	Completion Time	Contents	Device Type	Status	Obsolete	Keep	Pieces
<input type="checkbox"/>	3	BACKUP_ORCL_000006_120303103223	Dec 3, 2003 10:48:48 AM	<a href="#">ARCHIVED LOG</a>	DISK	AVAILABLE	NO	NO	1
<input type="checkbox"/>	2	BACKUP_ORCL_000006_120303103223	Dec 3, 2003 10:41:41 AM	<a href="#">DATAFILE, SPFILE, CONTROLFILE</a>	DISK	AVAILABLE	NO	NO	1

**Click Edit RMAN Script to review RMAN commands.**

# Flash Recovery Area

## Monitor the Flash Recovery Area

- **Configure flashback logging**
- **Size the recovery area**
- **Monitor current space consumption**

### Flash Recovery Area

It is highly recommended that you use flash recovery area to automate your disk backup management.

Flash Recovery Area Location

Flash Recovery Area Size

Flash Recovery Area Size must be set when the location is set

Used Flash Recovery Area Size (GB) **1.75**

☐ Enable flashback logging for fast database point-in-time recovery\*

The flash recovery area must be set to enable flashback logging. When using flashback logs, you may recover your entire database to a prior point-in-time without restoring files. Flashback is the preferred point-in-time recovery method in the recovery wizard when appropriate.

Specify how far back you wish to flash the database in the future

Flashback Retention Time

# 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**
- **Automate database backups**
- **Monitor the flash recovery area**



# **Practice 19:**

## **Database Backups**

**This practice covers the following:**

- **Configuring your database for backups**
- **Backing up your database while the database is open for user activity**
- **Scheduling automatic nightly incremental backups for your database**