# 6

Using Optional Backup Features

Objectives

After completing this lesson, you should be able to:

- Compress backups
- Create multisection backups of very large files
- Create proxy copies
- Create duplexed backup sets
- Create archival backups

Saving Backup Space with Unused Block Compression

The following blocks can be skipped during certain types of backup operations:

- **Unallocated blocks:** These are above the data file's high-water mark (HWM).
- **Unused blocks:** These are blocks that have been allocated but no longer belong to a segment.

Data file
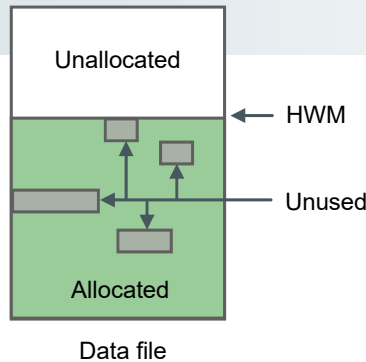
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Compressing Backups

RMAN can perform binary compression on any backup set that is generated.

- It can be performed in addition to unused block compression.
- Available compression algorithms are HIGH, MEDIUM, LOW, and BASIC.
- No extra steps are required by the DBA to restore a compressed backup.

```
CONFIGURE COMPRESSION ALGORITHM 'HIGH/MEDIUM/LOW/BASIC'
```

```
run {
SET COMPRESSION ALGORITHM 'HIGH/MEDIUM/LOW/BASIC';
.. }
```

```
BACKUP AS COMPRESSED BACKUPSET DATABASE PLUS ARCHIVELOG;
```

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Using RMAN Backup Compression

Compression Ratio or Level	Considerations	Requires Advanced Compression Option
`LOW`	Fastest. Best suited to address backup: CPU resources.	✓
`MEDIUM`	Fast. Good balance of CPU usage and compression ratio.	✓
`HIGH`	Best compression ratio at the expense of high CPU consumption. Best suited to address backup constraint: network.	✓
`BASIC`	Fair. Compression ratio similar to `MEDIUM` at expense of additional CPU usage. Compression ratio between `MEDIUM` and `HIGH`.	✓

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Using a Media Manager

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3
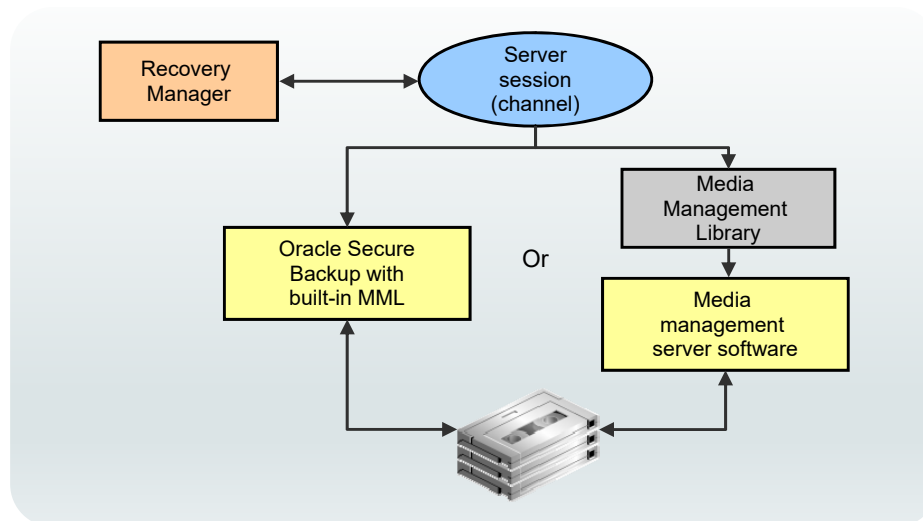
Configuring Backup and Restore for Very Large Files

Multisection backups of a single file:

- Are created by RMAN, with your specified size value
- Are processed independently (serially or in parallel)
- Produce multipiece backup sets and image copies
- Improve performance of the backup

Section 1	Channel 1	
Section 2	Channel 2	
Section 3	Channel 3	
Section 4	Channel 4	
One large data file		Multipiece backup set
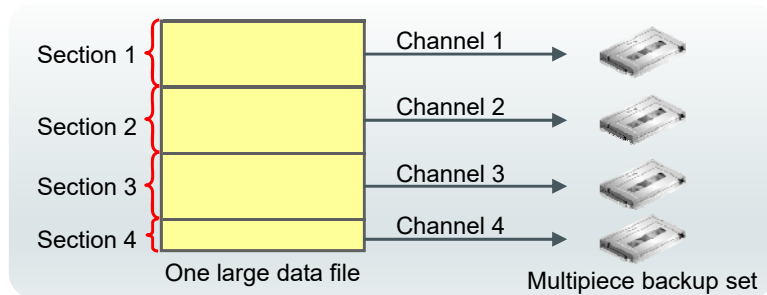
Creating RMAN Multisection Backups

RMAN command syntax:

```
BACKUP <options> SECTION SIZE <integer> [K | M | G]
```

```
VALIDATE DATAFILE <options> SECTION SIZE <integer> [K | M | G]
```

Example:

```
RMAN> BACKUP DATAFILE 5 SECTION SIZE = 25M TAG 'section25mb';
backing up blocks 1 through 3200
piece handle=/u01/.../o1_mf_nnndf_SECTION25MB_382dryt4_.bkp
    tag=SECTION25MB comment=NONE
...
backing up blocks 9601 through 12800
piece handle=/u01/.../o1_mf_nnndf_SECTION25MB_382dsto8_.bkp
    tag=SECTION25MB comment=NONE
```
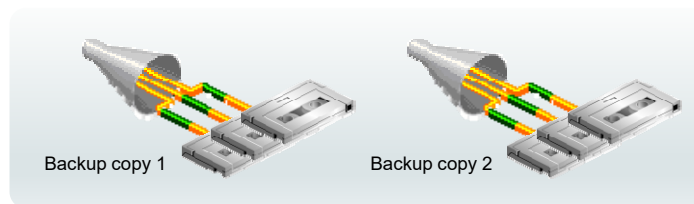
Creating Duplexed Backup Sets by Using BACKUP COPIES

Example of creating two copies of the backup set on tape:

```
RMAN> BACKUP AS BACKUPSET DEVICE TYPE sbt
    2> COPIES 2
    3> INCREMENTAL LEVEL 0
    4> DATABASE;
```
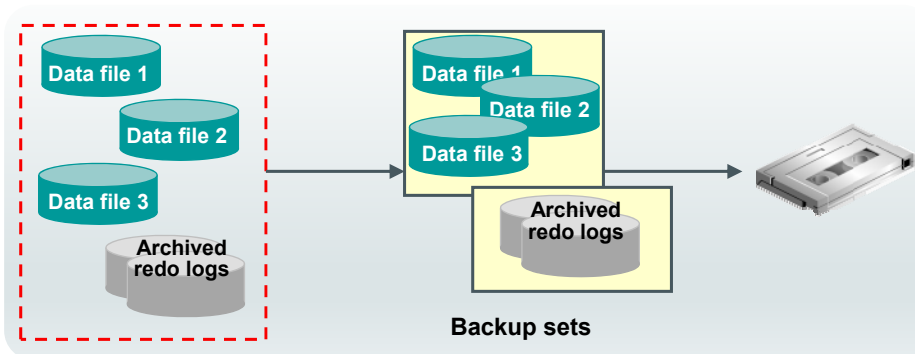
Backup copy 1   Backup copy 2

Creating Backups of Backup Sets

```
RMAN> BACKUP DEVICE TYPE DISK AS BACKUPSET
    2> DATABASE PLUS ARCHIVELOG;
RMAN> BACKUP DEVICE TYPE sbt BACKUPSET ALL;
```
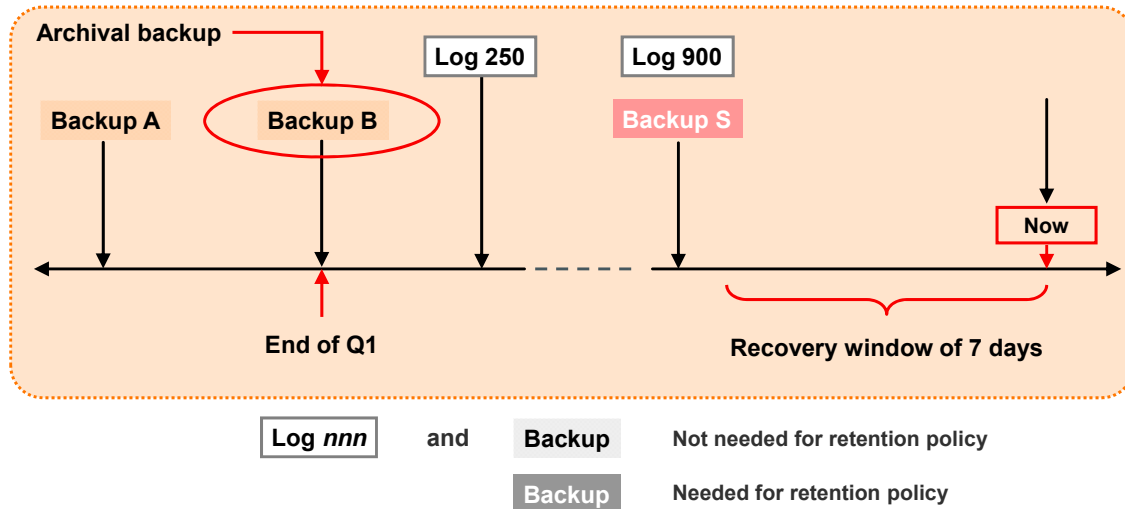
Data file 1

Data file 2

Data file 3

Archived redo logs

Data file 1

Data file 2

Data file 3

Archived redo logs

Backup sets

Archival Backups: Concepts

Archival backup

Backup A	Backup B	Log 250	Log 900
		Backup S	

Now

End of Q1

Recovery window of 7 days

Log *nnn* and Backup — Not needed for retention policy

Backup — Needed for retention policy

Creating Archival Backups with RMAN

- Specifying the `KEEP` clause when the database is online includes both data file and archive log backup sets:

```
KEEP {FOREVER | UNTIL TIME [=] ' date_string '}
NOKEEP
[RESTORE POINT rsname]
```

- List all restore points known to the RMAN repository:

```
LIST RESTORE POINT ALL;
```

- Display a specific restore point:

```
LIST RESTORE POINT 'rsname';
```

Managing Archival Database Backups

1   Archiving a database backup:

```
RMAN> CONNECT TARGET /
RMAN> CONNECT CATALOG rman/rman@catdb
RMAN> CHANGE BACKUP TAG 'consistent_db_bkup'
   2> KEEP FOREVER;
```

2   Changing the status of a database copy:

```
RMAN> CHANGE COPY OF DATABASE CONTROLFILE NOKEEP;
```

Backing Up Recovery Files

- Back up only the files in the fast recovery area:

```
RMAN> BACKUP RECOVERY AREA
```

- Back up all recovery files:

```
RMAN> BACKUP RECOVERY FILES
```

Fast recovery area

Summary

In this lesson, you should have learned how to:

- Compress backups
- Create multisection backups of very large files
- Create proxy copies
- Create duplexed backup sets
- Create archival backups

Practice Overview

- Creating an Archival Backup