



# What full and partial backups are SnapManager Oracle

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# What full and partial backups are

You can choose to back up the entire database or just a portion of it. If you choose to back up a portion of the database, you can choose to back up a group of tablespaces or data files. You can choose to take a separate backup of both tablespaces and data files.

The following table lists the benefits and consequences of each type of backup:

| Backup type | Advantages   | Disadvantages  |
|-------------|--|--|
| Full        | Minimizes the number of Snapshot copies. For online backups, each tablespace is in backup mode for the entire time of the backup operation. SnapManager takes one Snapshot copy for each volume that the database uses, plus one Snapshot copy for each volume that the log files occupy.  | For online backups, each tablespace is in backup mode for the entire time of the backup operation.   |
| Partial     | Minimizes the amount of time each tablespace spends in backup mode. SnapManager groups the Snapshot copies it takes by tablespace. Each tablespace is in backup mode only long enough to create the Snapshot copies. This method of grouping the Snapshot copies minimizes the physical block writes in the log files during an online backup. | The backup can require creating Snapshot copies of multiple tablespaces in the same volume. This method can cause SnapManager to create multiple Snapshot copies of a single volume during the backup operation. |

**Note:** Although you can perform a partial backup, you must always perform a full backup of the entire database.

## Backup types and the number of Snapshot copies

The backup type (full or partial) affects the number of Snapshot copies that SnapManager creates. For a full backup, SnapManager creates a Snapshot copy of each volume, while for a partial backup, SnapManager creates a Snapshot copy of each tablespace file.



Data ONTAP limits the maximum number of Snapshot copies to 255 per volume. You might reach this maximum only if you configure SnapManager to retain a large number of backups where each backup consists of numerous Snapshot copies.

To keep an adequate pool of backups available while ensuring that the maximum limit of Snapshot copies per volume is not reached, you must remove backups when they are no longer needed. You can configure the SnapManager retention policy to remove successful backups after reaching a specific threshold for a specific backup frequency. For example, after SnapManager creates four successful daily backups, SnapManager removes the daily backups created on the previous day.

The following tables show how SnapManager creates Snapshot copies based on the backup type. The example in the tables assumes that database Z includes two volumes, each volume includes two tablespaces (TS1 and TS2), and each tablespace includes two database files (ts1\_1.dbf, ts1\_2.dbf, ts2\_1.dbf, and ts2\_2.dbf).

These tables show how the two types of backups produce different numbers of Snapshot copies.

SnapManager creates Snapshot copies at the volume level instead of the tablespace level, which usually reduces the number of Snapshot copies it must create.



Both backups also create Snapshot copies of the log files.

| Volumes in database | Tablespace TS1<br>(includes 2 database files) | Tablespace TS2<br>(includes 2 database files) | Snapshot copies created | Total number of Snapshot copies |
|---------------------|---|---|-------------------------|---------------------------------|
| E:\data             | TS1_1.dbf                                     | TS2_1.dbf                                     | 1 per volume            | 2                               |

| Volumes in database | Tablespace TS1<br>(includes 2 database files) | Tablespace TS2<br>(includes 2 database files) | Snapshot copies created | Total number of Snapshot copies |
|---------------------|---|---|-------------------------|---------------------------------|
| E:\data             | TS1_1.dbf                                     | TS2_1.dbf                                     | 2 per file              | 4                               |

## Full online backups

During a full online backup, SnapManager backs up the entire database and creates Snapshot copies at the volume level (not at the tablespace level).

SnapManager creates two Snapshot copies for each backup. If all the files needed by the database are in a single volume, then both Snapshot copies appear in that volume.

When you specify a full backup, SnapManager performs the following actions:

1. Places the entire database in the online backup mode
2. Creates Snapshot copies of all the volumes containing database files
3. Takes the database out of the online backup mode
4. Forces a log switch and then archives the log files

This also flushes the redo information to disk.

5. Generates backup control files
6. Creates a Snapshot copy of the log files and the backup control files

When performing a full backup, SnapManager places the entire database in the online backup mode. An individual tablespace (for example, E:\data\ts1\_1.dbf) is in the online backup mode longer than certain tablespaces or data files that were specified.

When a database goes into backup mode, Oracle writes entire blocks to the logs and does not merely write the delta between backups. Because databases do more work in online backup mode, choosing a full backup

places a greater load on the host.

Although performing full backups places a greater load on the host, full backups require fewer Snapshot copies, resulting in fewer storage requirements.

## Partial online backups

Instead of a full backup, you can choose to perform a partial backup of the tablespaces in a database. While SnapManager takes a Snapshot copy of volumes for *full* backups, SnapManager takes a Snapshot copy of each specified tablespace for *partial* backups.

Because the tablespace level is the lowest level that Oracle allows into backup mode, SnapManager processes backups at the tablespace level, even if you specify a data file in a tablespace.

With a partial backup, each tablespace exists in backup mode for a shorter amount of time compared to a full backup. During an online backup, the database is always available to users; however, the database must perform more work and the host must perform more physical I/O. In addition, because it is taking Snapshot copies of each tablespace specified or each tablespace containing a specified data file instead of the entire volume, SnapManager takes more Snapshot copies.

SnapManager takes Snapshot copies of specific tablespaces or data files. The partial backup algorithm is a loop that SnapManager repeats until it has taken a Snapshot copy of each specified tablespace or data file.



Although you can perform a partial backup, it is recommended that you always perform a full backup of the entire database.

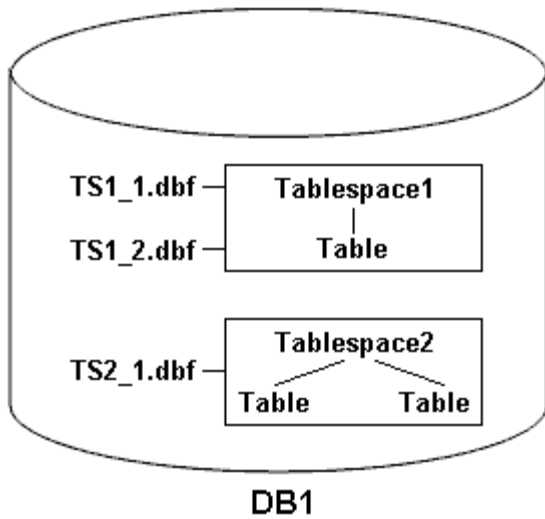
During a partial backup, SnapManager performs these actions:

1. Places the tablespace containing the data files into backup mode.
2. Takes a Snapshot copy of all the volumes used by the tablespace.
3. Takes the tablespace out of backup mode.
4. Continues this process, until it has taken a Snapshot copy of all the tablespaces or files.
5. Forces a log switch and then archives the log files.
6. Generates backup control files.
7. Takes a Snapshot copy of the log files and the backup control files.

## Examples of backup, restore, and recover operations

You can find information about some of the backup, restore, and recover scenarios that you can use to accomplish your data protection goals.

The following illustration shows the contents of the tablespace:



In the illustration, Tablespace1 has one table and two database files associated with it. Tablespace2 has two tables and one database file associated with it.

The following tables describe some full and partial backup, restore, and recover scenarios:

### Examples of full backup, restore, and recover operations

| Full backup  | Restore   | Recover  |
|--|---|--|
| SnapManager makes a backup of everything in database DB1, including the data files, archive logs, and control files.   | Complete restore with control files SnapManager restores all data files, tablespaces, and control files in the backup.  | You can specify one of the following: <ul style="list-style-type: none"> <li>• SCN - Enter an SCN, such as 384641.</li> <li>• Date/Time - Enter a date and time of the backup, such as 2005-11-25:19:06:22.</li> <li>• The last transaction made to the database.</li> </ul> |
| Complete restore without control files SnapManager restores all tablespaces and data files, without the control files. | Restore either data files or tablespaces with control files Specify one of the following: <ul style="list-style-type: none"> <li>• Tablespaces</li> <li>• Data files</li> </ul> | SnapManager recovers the data to the last transaction made to the database.  |

### Examples of partial backup, restore, and recover operations

| Partial backup | Restore | Recover |
|----------------|---------|---------|
|----------------|---------|---------|

|   |  |   |
|---|--|---|
| <p>You can choose one of the following options:</p> <ul style="list-style-type: none"> <li>• Tablespaces</li> </ul> <p>You can specify Tablespace1 and Tablespace2 or only one of them.</p> <ul style="list-style-type: none"> <li>• Data files</li> </ul> <p>You can specify all three database files (TS1_1.dbf, TS1_2.dbf, and TS2_1.dbf), two files, or one file.</p> <p>Regardless of which option you select, the backup includes all the control files. Archive log files are included in the partial backup if the profile is not enabled to create the archive log backups separately.</p> | <p>Complete restore SnapManager restores all data files, tablespaces, and control files specified in the partial backup.</p>   | <p>SnapManager recovers the data to the last transaction made to the database instance.</p> |
| <p>Restore either data files or tablespaces with control files SnapManager restores one of the following:</p> <ul style="list-style-type: none"> <li>• All the data files specified</li> <li>• All the tablespaces specified</li> </ul>   | <p>Restore either data files or tablespaces without control files SnapManager restores one of the following:</p> <ul style="list-style-type: none"> <li>• Tablespaces</li> </ul> <p>Specify any of the tablespaces. SnapManager restores only the tablespaces specified. If the backup contains Tablespace1, SnapManager restores only that tablespace.</p> <ul style="list-style-type: none"> <li>• Data files</li> </ul> <p>Specify any of the database files. SnapManager restores only the data files specified. If the backup contains database files (TS1_1.dbf and TS1_2.dbf), SnapManager restores only those files.</p> | <p>Restore control files only</p>   |

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