

Infrastructure at your Service.

Incrementally Updating Backups Tips and Tricks

Oracle 12.1.0.2 - Linux x86 64bit



Infrastructure at your Service.

About me

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Architecture



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Incrementally Updating Backup – A Quick Reminder



Incrementally Updating Backup – A Quick Reminder

Oracle Recommended Backup Strategy

Why are the Incrementally Updating Backups the Oracle recommended Backup Strategy?

- > It offers a very fast way to recover your data
- > Easy to implement
 - > Every day, the same backup scripts are running
 - > No need to distinguish between a full backup today, a cumulative tomorrow, an incremental the day after tomorrow
 - > After the third day, quite quick backups
 - > With block change tracking even faster

Incrementally Updating Backup – A Quick Reminder

Oracle Recommended Backup Strategy

When creating a backup with OEM 12c, the incrementally updating backups are the default

Oracle-Suggested Backup

Schedule a disk or tape backup using Oracle's automated backup strategy.

[Schedule Oracle-Suggested Backup](#)

This option will back up the entire database. The database will be backed up on daily and weekly intervals.

Daily Script created by Cloud Control 12c:

```
run {
allocate channel oem_disk_backup1 type disk ;
allocate channel oem_disk_backup2 type disk ;
recover copy of database with tag 'incr_update';
backup incremental level 1 copies=1 for recover of copy
with tag 'incr_update' database;
}
```


Incrementally Updating Backup – A Quick Reminder

Oracle Recommended Backup Strategy

What does the script do?

Cmd	Monday	Tuesday	Wednesday	Thursday Onward
RECOVER	Because no incremental backup or data file copy exists, the command generates a message (but not an error). That is, the command has no effect.	A database copy now exists, but no incremental level 1 backup exists with which to recover it. Thus, the RECOVER command has no effect.	The level 1 incremental backup made on Tuesday is applied to the database copy, bringing the copy up to the checkpoint SCN of the level 1 incremental backup.	The level 1 incremental backup made yesterday is applied to the database copy, bringing the copy up to the checkpoint SCN of the level 1 incremental backup.
BACKUP	No level 0 image copy exists, so the command creates an image copy of the database and applies the tag incr_update. This copy is needed to begin the cycle of incremental updates.	The command makes an incremental level 1 backup and assigns it the tag incr_update. This backup contains blocks that changed between Monday and Tuesday.	The command makes an incremental level 1 backup and assigns it the tag incr_update. This backup contains blocks that changed between Tuesday and Wednesday.	The command makes an incremental level 1 backup and assigns it the tag incr_update. This backup contains blocks that changed between now and the most recent backup with the tag incr_update.

Incrementally Updating Backup – A Quick Reminder

12c New Features

Section size with datafile copies

The following example creates a multisection backup of the entire database using image copies with 512MB sections

```
RMAN> CONFIGURE DEVICE TYPE DISK PARALLELISM 32;  
RMAN> BACKUP AS COPY SECTION SIZE 512M DATABASE;
```

Section size with incremental backups

```
RMAN> BACKUP INCREMENTAL LEVEL 1 SECTION SIZE 512M COPIES=1  
FOR RECOVER OF COPY WITH TAG 'INCR_UPDATE' DATABASE;
```

Automatic creation of missing datafiles

No need for alter database create datafile anymore

```
SQL> ALTER DATABASE CREATE DATAFILE '/u01/oracle/dbs/tbs01.dbf';  
Statement processed.
```

Incrementally Updating Backup – A Quick Reminder

12c New Features

Tips with Section size

In case you want to use the 12c new features, you need compatible to be set to 12.0 or higher

If a section size selected is larger than the file, then rman will not use multisectional backup for that file

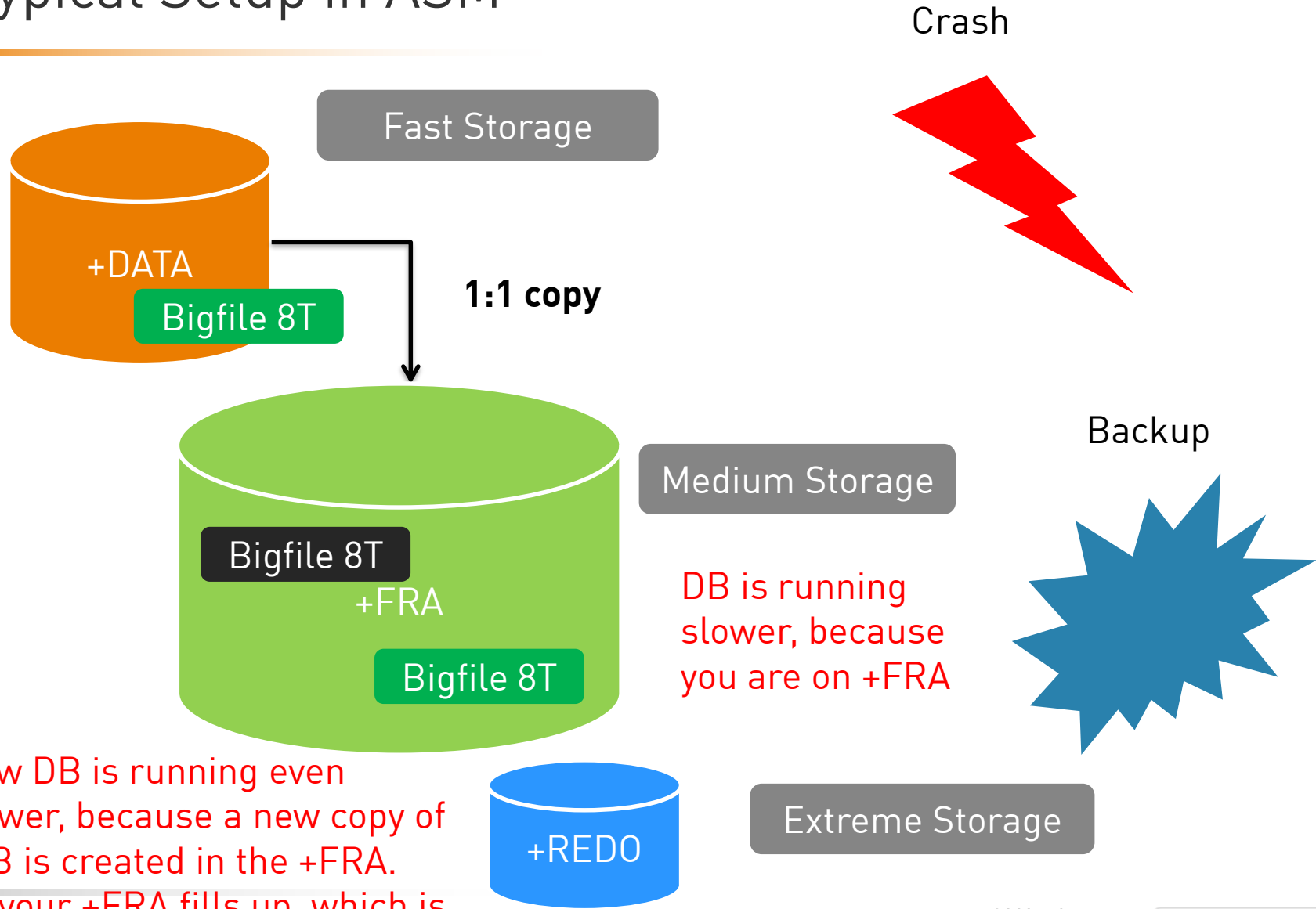
If the section size chosen is so small that more than 256 sections will be produced, RMAN will increase the section size to a value which will result in 256 sections

You can specify different section sizes for different files in the same backup job

```
run {  
  backup section size 32M as copy datafile 8 format ='+FRA' ;  
  backup section size 64M as copy datafile 9 format ='+FRA' ;  
}
```

Architecture Overview

Typical Setup in ASM



Now DB is running even slower, because a new copy of 8TB is created in the +FRA. Or your +FRA fills up, which is even worse

Backup/Recovery Recommendations



Backup/Recovery Recommendations

Backup Recommendations

My recommendations

- > Turn on Block Change Tracking
 - > And more important. Make sure that it is really used. 😊
 - > Search MOS for `_bct_bitmaps_per_file`
- > Don't compress the Backup Sets
 - > Have to be uncompressed before applying to the Datafile copies
- > Don't delete the Archivelogs too quickly
 - > Keep them for 3 days if possible in the +FRA
 - > In case of a recovery, archivelogs don't need to be extracted from the backupsets
- > Build into your monitoring a list of Bigfile and Smallfile tablespaces
 - > The RMAN `report schema` does not show you that information

Backup/Recovery Recommendations

Backup Recommendations

My recommendations

- > Apply July 2016 PSU
- > Apply the following Patch to fix the issue with wrong PREVIEW information
- > Patch 20315311: RMAN-5119: RECOVERY CAN NOT BE DONE TO A CONSISTENT STATE
- > Check MOS
 - > Master Note For Oracle Recovery Manager (RMAN) (Doc ID 1116484.1)
 - > Known RMAN Performance Problems (Doc ID 247611.1)

Recovery

What to do if you loose a datafile?

My recommendations

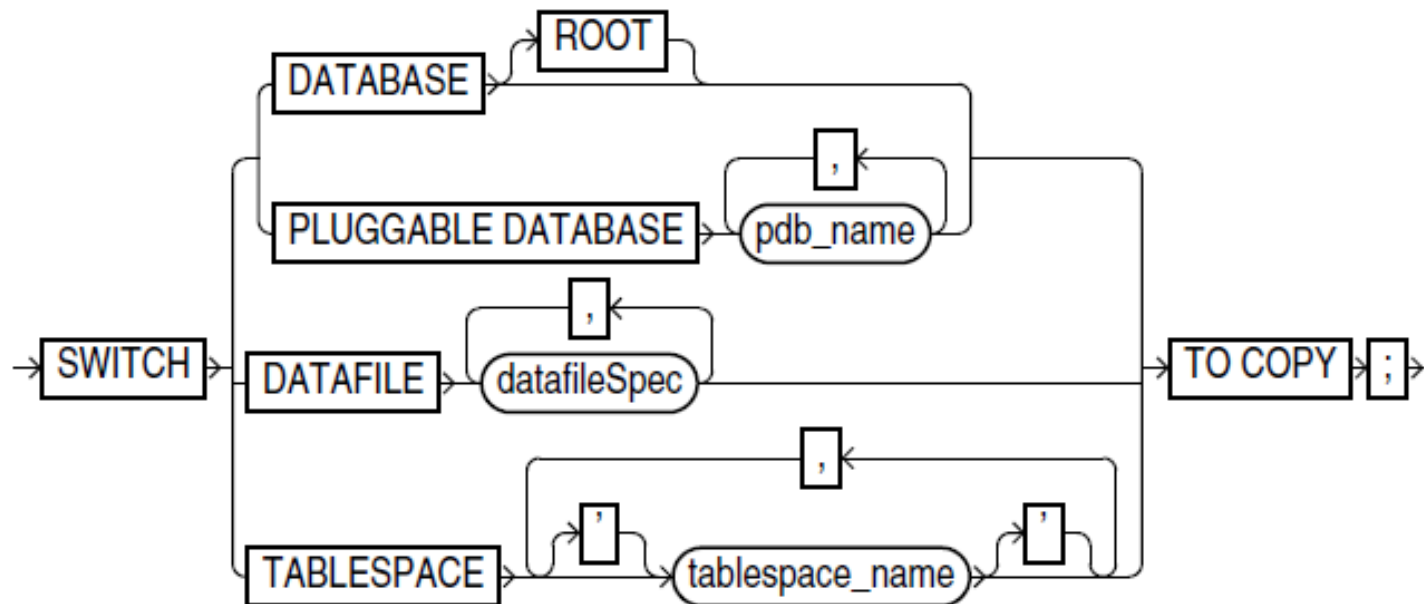
- > Test the switch to datafile copies
 - > Build up your own environment
- > Turn off the backup schedule during the recovery
 - > It might make things even more complicated
- > Be careful with the Oracle Data Recovery Advisor
 - > Sometimes not the best decision ;-)
- > Move the datafile as soon as possible to the +DATA diskgroup again
 - > For performance reasons

Recovery

Some more Tips

The SWITCH command switches per default always to the latest copy

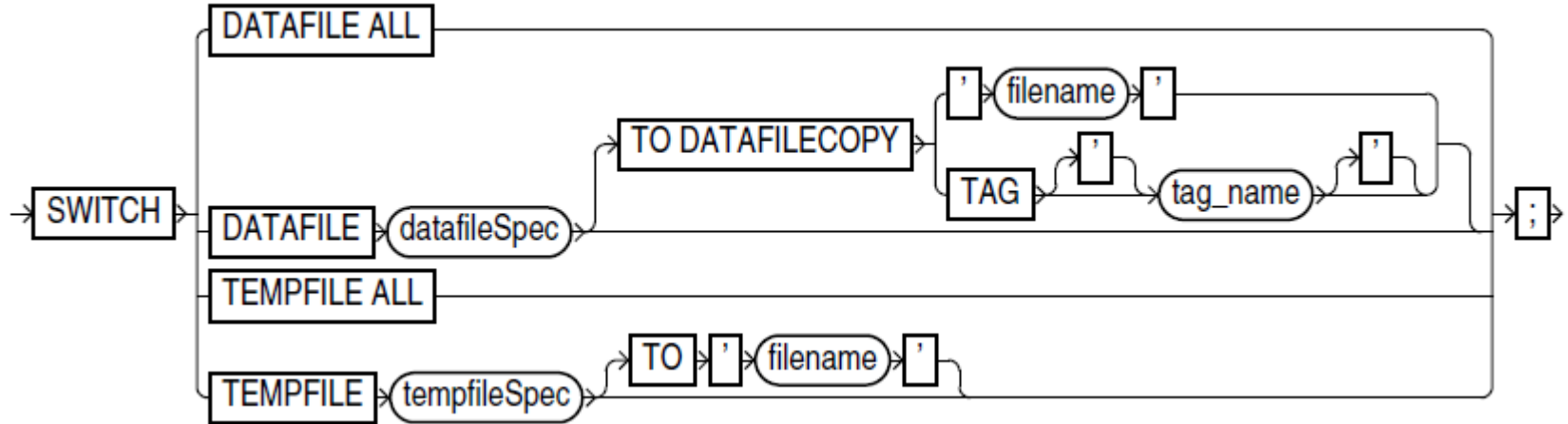
In case of Multitenant, you can switch a PDB only. You don't need always to switch the whole CDB



Recovery

Some more Tips

In case you want to switch to a different datafile copy, you can specify either the name or a tag



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Demo



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Cores messages



Cores messages

Strengths and weaknesses



- > Easy and well documented setup
- > When you do click, click, click in OEM you have it already
- > Very fast recovery, in case it is done correctly



- > Needs a lot of space in the +FRA

See blog for more infos:

<https://blog.dbi-services.com/oracle-12c-and-rman-switch-datafile-to-copy-is-it-really-so-easy/>

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Any questions? Please do ask

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