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Flashback demystified

About me

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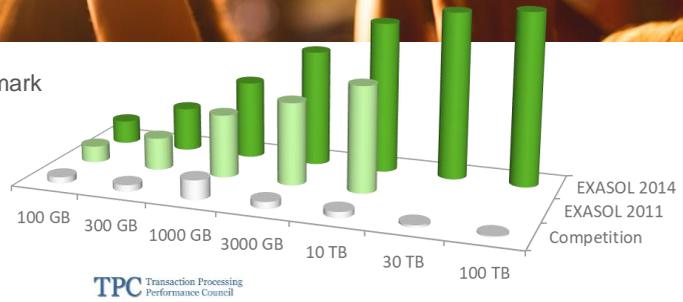
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About Exasol

**Our in-memory database
is the fastest and most scalable
analytic RDBMS platform on the market**

- TPC-H is the industry standard benchmark for analytic databases
- #1 - dwarfing our followers
- Best price-performance ratio

EXASOL 2014
EXASOL 2011
Competition

100 GB   300 GB   1000 GB   3000 GB   10 TB   30 TB   100 TB

TPC Transaction Processing
Performance Council

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Agenda

1. Flashback Query
2. Flashback table to before drop
3. Flashback table to timestamp
4. Flashback (pluggable) database

This will be no slide-show: All topics are being explained with live demonstrations, while the number of slides has been kept to a minimum.

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Flashback query

Introduced in 9i – together with automatic undo – flashback query is the first appearance of the term „Flashback" in the history of Oracle databases. Using automatic undo is a requirement for this technique. The before images that are created upon every DML statement to provide read consistency and the option of rollback are here used to display the content of tables as they were in the past. These before images are not kept eternally and are overwritten at some point in order not to let the undo tablespace grow out of proportion. Therefore, flashback query can only display the recent past, typically. The parameter UNDO_RETENTION can be used to configure a prolonged period of time to preserve before images that belong to already commited transactions. Unless the undo tablespace is configured with RETENTION GUARANTEE, this is just a wish that may not be granted if space in the undo tablespace gets scarce.

Flashback Archives can be used to preserve the before images of selected tables in order to be able to do flashback query on these tables very much longer, e.g. several years. With this technique, before images of these tables that have been created first in the undo tablespace are preserved in another tablespace so that they do not get overwritten.

Live demo

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Flashback query

Introduced in 10g
DROP TABLE internally renames that table
Data stays at the same location as before
Can still be queried
Space will be reused if needed
Behavior is controlled by parameter RECYCLEBIN (default on)
  No Redo
  No Archived Logs
  No Flashback Logs

```
SQL> drop table t;
     flashback table t to before drop;
```

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Flashback to before drop
This form of flashback has been introduced in 10g. Using the default configuration, a dropped table is internally just marked as dropped but stays under another name where it is. Unless the space consumed by that dropped table is needed by other segments, it can be flashed back. The parameter RECYCLEBIN configures that feature. It doesn't need before images from the undo tablespace nor redo information nor archived logs or flashback logs.

Live demo

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Introduced in 10g
Uses *Before Images* from UNDO
  No Redo
  No Archived Logs
  No Flashback Logs
Multiple tables can be flashed back together
Optionally configurable:
  UNDO_RETENTION
  RETENTION GUARANTEE

```
SQL> flashback table t1,t2 to restore point mypoint;
```

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Flashback table to timestamp

Also introduced in 10g, this feature uses the same foundation as flashback query: before images from the undo tablespace. The same two parameters as for flashback query can be used to configure the period of time this feature may reach into the past.

Flashback table to timestamp

Live demo

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Introduced in 10g
Uses Flashback Logs and Archived Logs
Optionally uses guaranteed restore points
Flashback *pluggable* database requires *Local UNDO*

```
SQL> flashback database to restore point mypoint;
```

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Flashback (pluggable) database

Flashback database has been introduced in 10g. It requires the usage of flashback logs as the only of the discussed features. Flashback logs can only be created when the database is in archive log mode. Ordinary flashback logs may be overwritten if space in the recovery area gets scarce regardles of the setting of the parameter DB_FLASHBACK_RETENTION_TARGET. This is not the case for flashback logs that belong to a guarenteed restore point, though.
When 12c introduced pluggable databases, flashback database was initially only possible for the whole container database, affecting all pluggable databases. That has changed with 12c R2 when local undo tablespaces are configured.

Flashback (pluggable) database

Live demo

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Thank you for your attention!

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