



A Discussion and Demonstration of 10G Flashback Technology



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Target Audience

- ◆ DBAs and Developers who require near instantaneous recovery scenarios due to possibly injudicious use of the database by unnamed users.

Flashback Database

What can it be used for?

Restore a database to a prior point in time faster than traditional recovery methods.

What are its limitations?

Space, and lots of it, are required.

Database must be in archivelogmode.

Cannot recover a datafile that has been shrunk.

Cannot recover a tablespace that has been dropped.

Cannot be used for media recovery.

Flashback Database

OK, it's set up. Now how do I get information about it?

```
SELECT * FROM V$FLASHBACK_DATABASE_LOG;
```

```
SQL> DESC V$FLASHBACK_DATABASE_LOG;
```

Name	Type
-----	-----
OLDEST_FLASHBACK_SCN	NUMBER
OLDEST_FLASHBACK_TIME	DATE
RETENTION_TARGET	NUMBER
FLASHBACK_SIZE	NUMBER
ESTIMATED_FLASHBACK_SIZE	NUMBER

Flashback Database

Ok, how much overhead am I causing?

```
SELECT * FROM V$FLASHBACK_DATABASE_STAT;
```

```
SQL> DESC V$FLASHBACK_DATABASE_STAT;
```

Name	Type
BEGIN_TIME	DATE
END_TIME	DATE
FLASHBACK_DATA	NUMBER
DB_DATA	NUMBER
REDO_DATA	NUMBER
ESTIMATED_FLASHBACK_SIZE	NUMBER

Flashback Database

How do I actually “flashback” the database?

- Enterprise Manager: Recovery Wizard (not discussed, too long)
- RMAN
- SQL command

Flashback Database

RMAN examples:

```
RMAN> FLASHBACK DATABASE TO TIME =
```

```
2> TO_DATE('20051-10-01 12:00:00','YYYY-MM-DD H24:MI:SS');
```

```
RMAN> FLASHBACK DATABASE TO SCN = 11786;
```

```
RMAN> FLASHBACK DATABASE TO SEQUENCE = 451 THREAD = 1;
```

NOTE: To perform a flashback of the database, the database must be in a mounted exclusive state.

Flashback Database

How do I Disable Flashback?

```
ALTER TABLESPACE TS1 FLASHBACK OFF;
```

Using RMAN

```
RMAN> SQL "ALTER DATABASE FLASHBACK OFF";
```

Using SQL Commands

```
SQL> ALTER DATABASE FLASHBACK OFF;
```

Note: When you disable Flashback Database, all existing flashback logs are deleted.

Flashback Drop

Problem:

```
SQL> DROP TABLE VERY_CRITICAL_TAB;  
Table Dropped.
```

USER: OMG I can't believe I just did that! I'm so fired!

(Old Technology Problem: Pre 10g)

Flashback Drop

10g Solution to the Problem:

We now have a RECYCLE BIN, where objects are stored when DROP commands are executed. Constraints and Triggers are preserved there. To see what's in there:

```
SHOW RECYCLEBIN (Sqlplus only)
```

```
SELECT * FROM RECYCLEBIN;
```

```
SELECT * FROM USER_RECYCLEBIN;
```

To blow away what's in there:

```
PURGE RECYCLEBIN; (user)
```

```
PURGE DBA_RECYCLEBIN; (dba)
```

Flashback Drop

10g Solution to the Problem:

```
SQL> create table a (c1 number);
```

Table created.

```
ALTER TABLE BONUS_DROP ENABLE ROW MOVEMENT;
```

```
SQL> drop table a;
```

Table dropped.

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

Flashback complete.

Flashback Drop

More about the RECYCLEBIN:

```
SQL> insert into a values(1); 1 row created.
```

```
SQL> commit; Commit complete.
```

```
SQL> drop table a; Table dropped.
```

```
SQL> SELECT object_name,original_name,type FROM user_recyclebin;
```

OBJECT_NAME	ORIGINAL_NAME	TYPE
-----	-----	-----
BIN\$7hnovo6cTW+xk3pJLcv+VA==\$0 A		TABLE

```
SQL> select * from "BIN$7hnovo6cTW+xk3pJLcv+VA==$0";
```

```
  C1
```

```
-----  
  1
```


Flashback Table

```
CREATE TABLE A (C1 NUMBER);
```

```
ALTER TABLE A ADD (CONSTRAINT A_PK PRIMARY KEY (C1));
```

```
DROP TABLE A;
```

OBJECT_NAME	ORIG_NM	TYPE	TS_NAME
BIN\$gMoJ4PgrQdar7Y89+2IPTQ==\$0	A	TABLE	USERS
BIN\$eU4uKKSRR52P23VHnODrIA==\$0	A_PK	INDEX	USERS

Flashback Table

```
FLASHBACK TABLE A TO BEFORE DROP  
RENAME TO A_RESTORE;
```

OBJECT_NAME	OBJECT_TYPE
-----	-----
BIN\$eU4uKKSRR52P23VHnODrIA==\$0	INDEX
A_RESTORE	TABLE

Flashback Versions Query

Introduced in Oracle9i

View historical data.

VERSIONS BETWEEN clause (new in 10g)

AS OF [SCN/TIMESTAMP] clause (9i)

Obtain transaction id from either LogMiner or
Flashback Transaction Query

Flashback Versions Query

UNDO_RETENTION initialization parameter

ALTER TABLESPACE UNDOTBS RETENTION GUARANTEE;

With Oracle 10G version we have an option to guarantee undo retention. When this option is enabled the database never overwrites unexpired undo data that is, undo data whose age is less than the undo retention period.

```
SQL> select TABLESPACE_NAME,RETENTION from dba_tablespaces;
```

TABLESPACE_NAME	RETENTION
-----	-----
UNDOTBS1	NOGUARANTEE

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-
-

Flashback Transaction Query

Allows you to view changes made to the database at the transaction level

Undo SQL generated via this feature can be used to roll back the changes made by a transaction.

Enable supplemental logging

ALTER DATABASE ADD SUPPLEMENTAL LOG DATA;

SELECT SUPPLEMENTAL_LOG_DATA_MIN FROM V\$DATABASE;

Uses undo data stored in the undo tablespace.

References

- ◆ <http://technet.oracle.com>
- ◆ <http://metalink.oracle.com>
- ◆ <http://partner.oracle.com>

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Questions?



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- “Only when the last tree has died and the last river has been poisoned and the last fish has been caught will we realize that we can’t eat money” --- Cree proverb
-
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- “Love is all you need”
- -- J. Lennon and P. McCartney
-

The End

