

Oracle Database ~~12c~~ 12c és 18c
Data Guard újdonságok,
Application Continuity
tapasztalatok és demó

Papp Balázs - Webváltó

Introduction

- Webváltó Kft. 2010 -

ORACLE®

Certified Master

Oracle Database 12c
Maximum Availability
Architecture

ORACLE®

Certified Master

Oracle Database 12c
Administrator

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Database Cloud
Administrator

ORACLE®

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Oracle Database 11g
Administrator

ORACLE®

Certified Expert

Oracle Exadata X5
Administrator

ORACLE®

Certified Expert

Oracle Database 12c
Performance Management
and Tuning



12.1 – Transaction Guard and Application Continuity

12.1 – Transaction Guard and Application Continuity

- Transaction Guard and Application Continuity
 - **D77758 - Oracle Database 12c: New Features for Administrators** – marketing slide
 - **D79232 - Oracle Database 12c: Data Guard Administration** – marketing slide
 - ***D81250 - Oracle Database 12c: RAC Administration***
 - *9 – High Availability for Connections and Applications*
 - ***D79794 – Oracle Database 12c: High Availability New Features***
 - *9 – Application Continuity*

Without TAF

```
SQL> select * from myschema.mytable where column1 = :B1;
```

```
. . .
```

```
57623 rows selected.
```

```
*** RAC instance shutdown/crash, DG switchover/failover ***
```

```
SQL> select * from myschema.mytable where column1 = :B1;
```

```
ERROR at line 1:
```

```
ORA-03113: end-of-file on communication channe
```

```
ERROR at line 1:
```

```
ORA-03114: not connected to ORACLE
```

```
ERROR at line 1:
```

```
ORA-03135: connection lost contact
```

TAF - SESSION failover

```
SQL> select * from myschema.mytable where column1 = :B1;
```

```
. . .
```

```
57623 rows selected.
```

```
*** RAC instance shutdown/crash, DG switchover/failover ***
```

```
SQL> select * from myschema.mytable where column1 = :B1;
```

```
. . .
```

```
57623 rows selected.
```

TAF - SESSION failover

```
SQL> select * from myschema.mytable where column1 = :B1;
```

```
. . .
```

```
*** RAC instance shutdown/crash, DG switchover/failover ***
```

```
57623 rows selected.
```

```
ERROR at line 1:
```

```
ORA-03113: end-of-file on communication channe
```

```
ERROR at line 1:
```

```
ORA-03114: not connected to ORACLE
```

```
ERROR at line 1:
```

```
ORA-03135: connection lost contact
```

TAF SELECT failover

```
SQL> select * from myschema.mytable where column1 = :B1;
```

```
. . .
```

```
*** RAC instance shutdown/crash, DG switchover/failover ***
```

```
57623 rows selected.
```


Problem

```
SQL> update balance set amount = amount + 100
      where user_id = 3;
```

```
1 row updated.
```

```
*** RAC instance shutdown/crash, DG switchover/failover ***
```

```
SQL> commit;
```

```
ORA-25402: transaction must roll back
```

Problem

```
SQL> update balance set amount = amount + 100  
      where user_id = 3;
```

```
1 row updated.
```

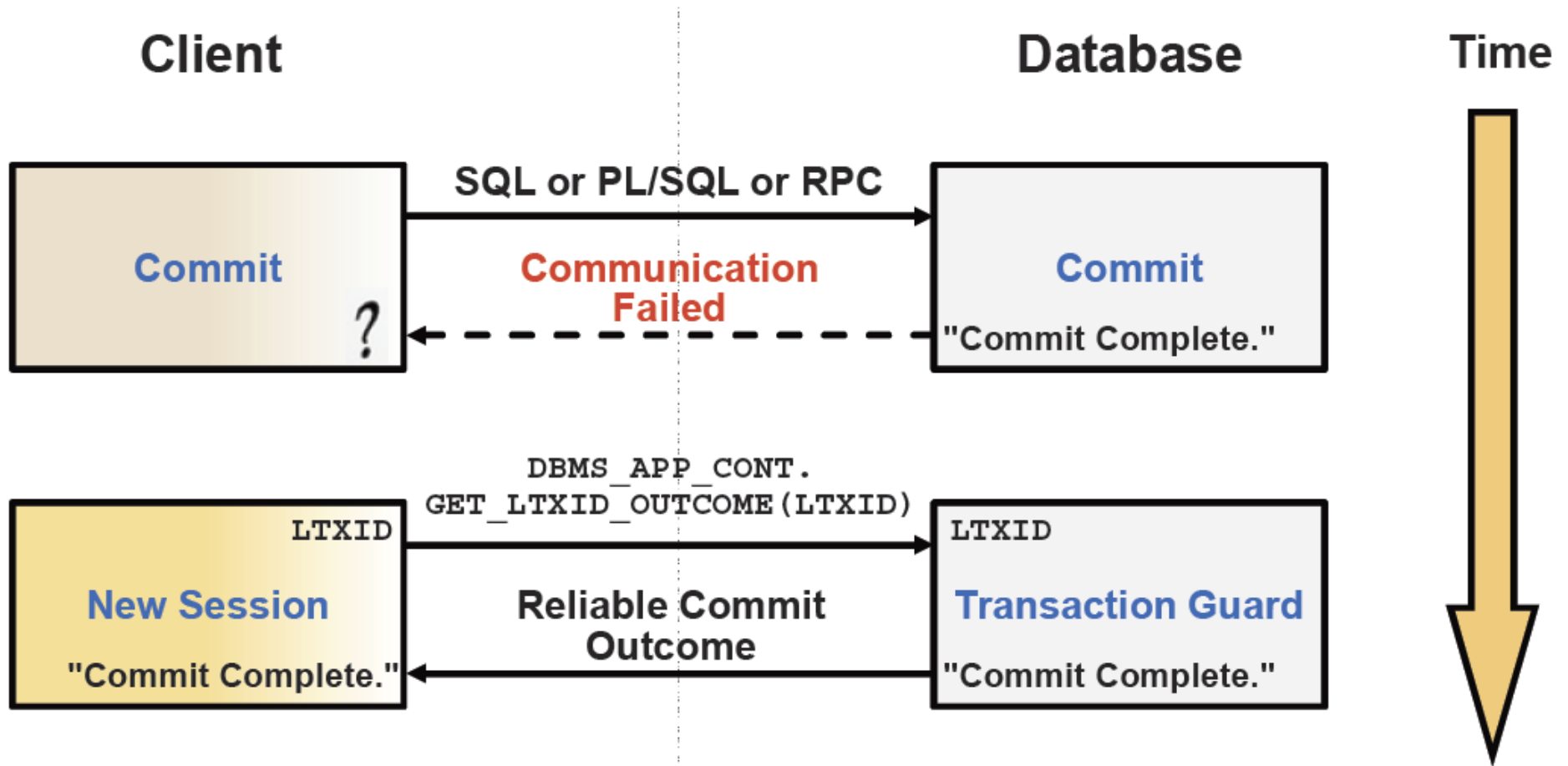
```
SQL> commit;
```

```
. . .
```

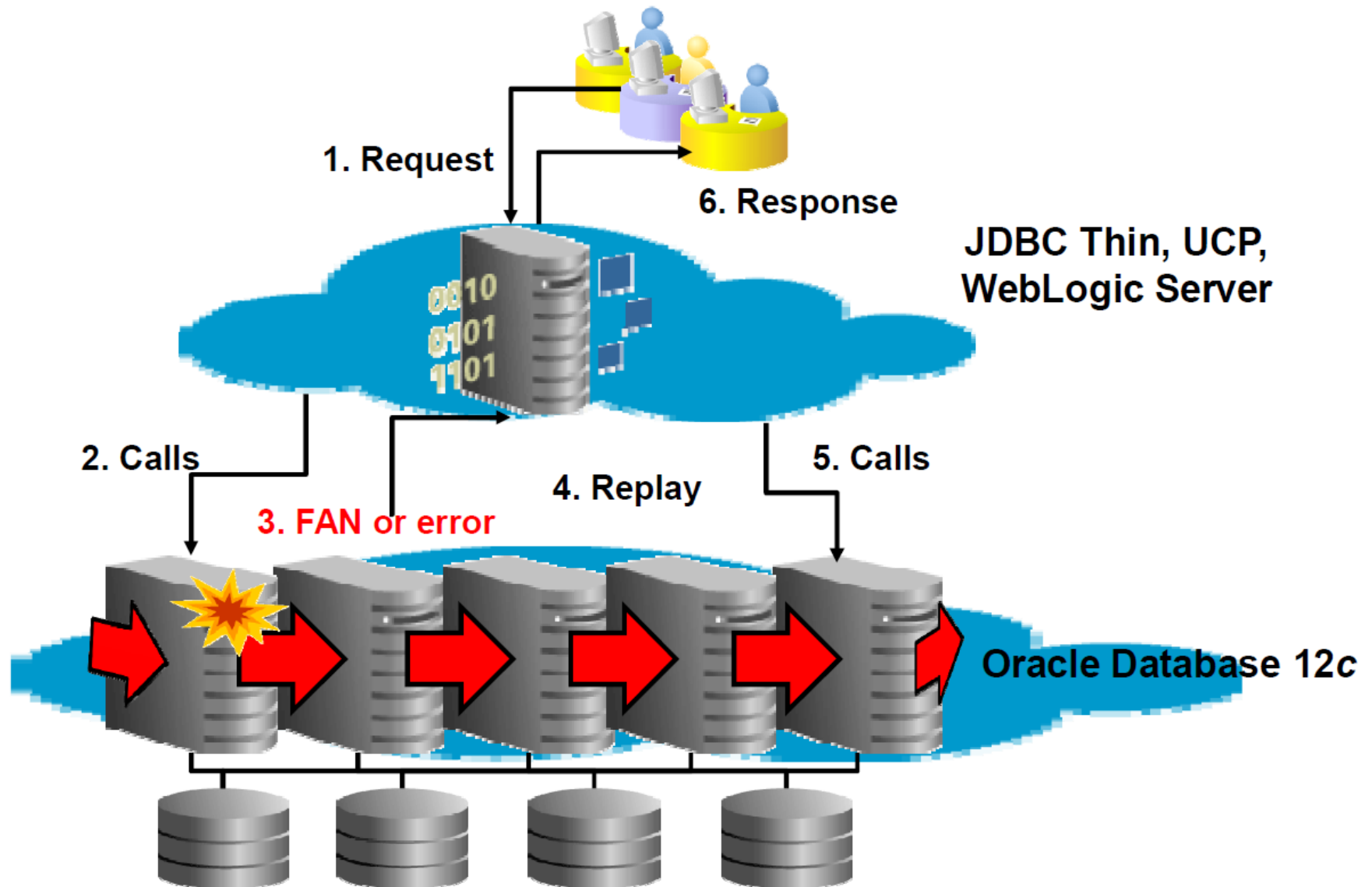
```
*** RAC instance shutdown/crash, DG switchover/failover ***
```

```
Commit complete. ???
```

Transaction Guard



Application Continuity



DBA tasks

```
srvctl add service -db orcl_o7ca -service orcl
  -preferred ORCL1,ORCL2 -policy automatic
  -failovertype TRANSACTION -commit_outcome TRUE
  -notification TRUE -role primary -failoverdelay 5
  -failoverretry 60 -clbgoal SHORT
```

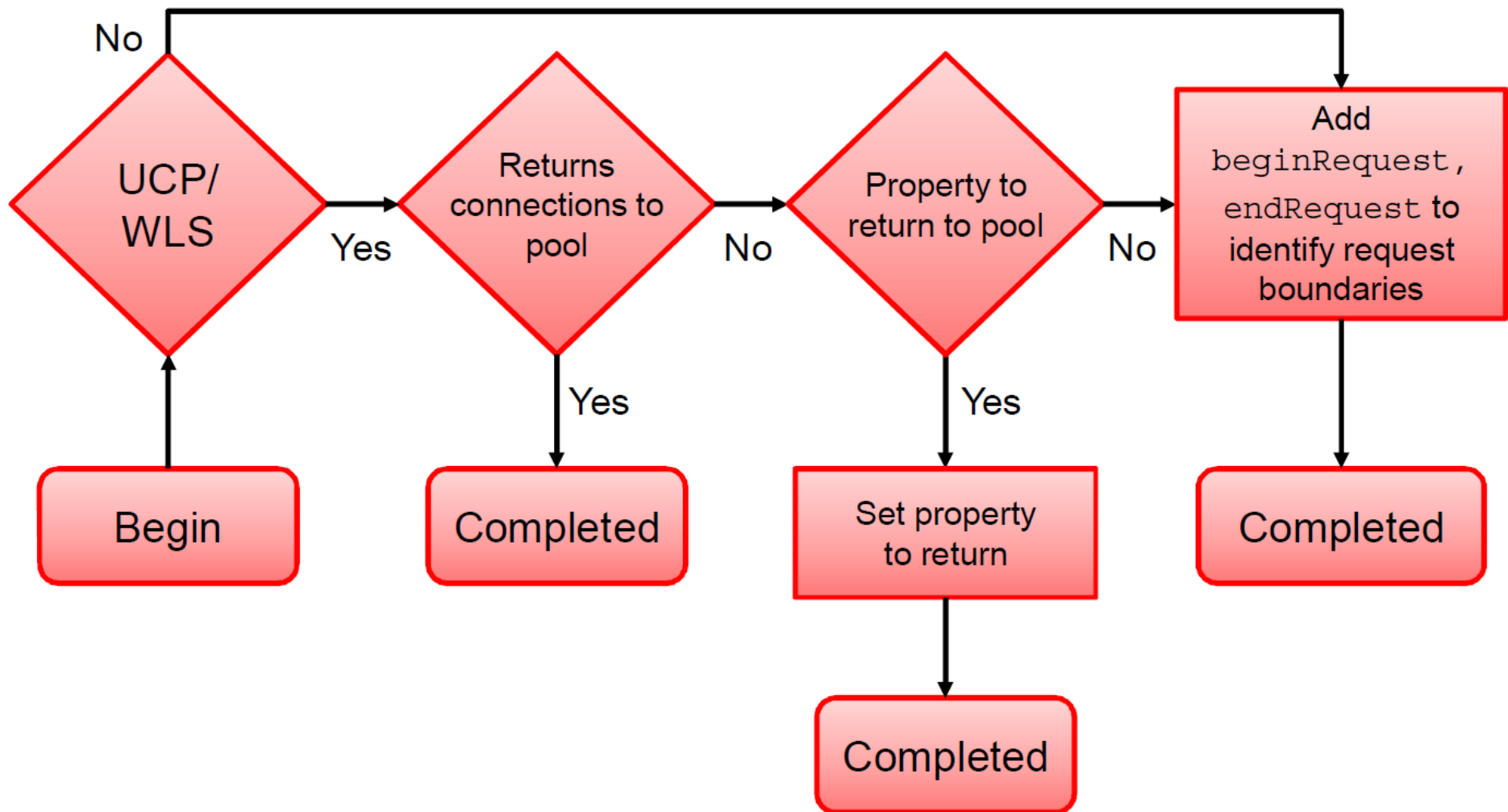
```
-----
declare
  params dbms_service.svc_parameter_array;
begin
  params('FAILOVER_TYPE') := 'TRANSACTION';
  params('REPLAY_INITIATION_TIMEOUT') := 300;
  params('FAILOVER_DELAY') := 3;
  params('FAILOVER_RETRIES') := 30;
  params('FAILOVER_RESTORE') := 'LEVEL1';
  params('commit_outcome') := 'true';
  params('drain_timeout') := 60;
  params('stop_option') := 'immediate';
  dbms_service.CREATE_SERVICE(SERVICE_NAME=>'ORCL_AC',
NETWORK_NAME=>'ORCL_AC');
  dbms_service.modify_service('ORCL_AC',params);
end;
/
```



DEMO - RAC

- Demo0
- Demo1
- Demo2

Handling Request Boundaries





DEMO - RAC

- Demo3

Pitfalls

- disableReplay API
- mutable values:
 - SYSDATE, SYSTIMESTAMP, SYS_GUID, SEQUENCE.NEXTVAL

```
GRANT KEEP DATE TIME TO <user>;  
GRANT KEEP SYS_GUID TO <user>;  
REVOKE...  
GRANT KEEP SEQUENCE ON <sequence_name> TO <user>;  
REVOKE...
```

```
CREATE SEQUENCE <sequence_name> KEEP | NOKEEP;  
ALTER SEQUENCE <sequence_name> KEEP | NOKEEP;
```



DEMO – Data Guard

- 18c, Fast-Start Failover

Application Continuity Licensing

- Application Continuity is supported for Oracle Data Guard switchovers to physical standby databases. It is also supported for fast-start failover to physical standbys in maximum availability data protection mode. Note that primary and standby databases must be licensed for **Oracle RAC or Oracle Active Data Guard** in order to use Application Continuity.



Not today.

- Far Sync
- Logical standby
- Upgrades with DBMS_ROLLING
- Pluggable databases
- In-Memory Column Store

12.1 – static listener registration

- Static listener registration for broker:

```
SID_LIST_LISTENER =  
  (SID_LIST =  
    (SID_DESC =  
      (GLOBAL_DBNAME = ORCL_DGMGRL)  
      (ORACLE_HOME = /u01/app/oracle/product/11.2.0/dbhome_1)  
      (SID_NAME = ORCL)  
    )  
  )  
)
```

- https://docs.oracle.com/database/121/DGBKR/release_changes.htm

“You now need to define and register a static service only if Oracle Clusterware or Oracle Restart is not being used.”

12.1 - FASTSYNC

- LOG_ARCHIVE_DEST_N:

MAXIMUM PERFORMANCE	MAXIMUM AVAILABILITY	MAXIMUM PROTECTION
NOAFFIRM	AFFIRM	AFFIRM
ASYNC	SYNC	SYNC

- https://docs.oracle.com/database/121/SBYDB/release_changes.htm

“Maximum Availability mode now allows the LOG_ARCHIVE_DEST_n attributes SYNC and NOAFFIRM to be used together. This enables a synchronous standby database to be deployed at a further distance from the primary site without increasing the impact on primary database performance. (In an Oracle Data Guard broker configuration, this is referred to as FASTSYNC mode.)”

12.1 – online datafile move

- online datafile move

```
SQL> ALTER DATABASE MOVE DATAFILE  
      '/u01/app/oracle/oradata/ORCL/system01.dbf'  
      TO '/oradata/ORCL/system01.dbf';
```

*“You can move the location of an online data file from one physical file to another physical file while the database is actively accessing the file. **Moves on a primary database do not affect the standby, and vice versa.**”*

12.1 – Temporary undo

- Temporary undo

```
SQL> show parameter temp_undo_enabled
```

NAME	TYPE	VALUE
temp_undo_enabled	boolean	TRUE

- DML operations are allowed on global temporary tables on Oracle Active Data Guard standbys.

12.1 – Global sequences

- Primary:

```
SQL> create sequence s1 cache 10;  
SQL> select s1.nextval from dual;
```

```
      NEXTVAL  
-----  
              1
```

- Active Data Guard standby

```
SQL> select s1.nextval from dual;
```

```
      NEXTVAL  
-----  
             11
```

12.1 – Session sequences

- Primary:

```
SQL> create sequence s1 cache 10 session;  
SQL> select s1.nextval from dual;
```

```
NEXTVAL  
-----  
1
```

- Active Data Guard standby (or new session)

```
SQL> select s1.nextval from dual;
```

```
NEXTVAL  
-----  
1
```

12.2 – Password file changes

- Password file changes done on the primary database are now automatically propagated to standby databases. ... The password file is updated on the standby when the redo is applied.

```
SQL> alter user sys identified by oracle;
```

```
User altered.
```

- orapwd:

```
ORA-46952: standby database format mismatch for password file
```

18c – standby buffer cache

- As of Oracle Database 18c, the database buffer cache state is maintained on an Active Data Guard standby during a role transition so that application performance is not affected by physical blocks read from disk to populate the buffer cache. This results in improved application performance on the new primary after a role transition.

18c – Private temporary tables

- Metadata for private temporary tables (also known as local temporary tables) can be stored in memory.

```
SQL> show parameter private_temp_table_prefix
```

NAME	TYPE	VALUE
private_temp_table_prefix	string	ORA\$PTT_

```
SQL> CREATE PRIVATE TEMPORARY TABLE ora$ptt_t1 (c1 number)
ON COMMIT DROP DEFINITION | ON COMMIT RESERVE DEFINITION;
```

```
Table created.
```

```
Primary: ORA-14451: unsupported feature with temporary table
```

18c – FORCE LOGGING?

```
SQL> alter database force logging;  
SQL> alter database no force logging;
```

```
SQL> alter database set standby nologging for  
data availability;
```

- Causes the load operation to send the loaded data to each standby through its own connection to the standby. The commit is delayed until all the standbys have applied the data as part of running managed recovery in an Active Data Guard environment.

```
SQL> alter database set standby nologging for  
load performance;
```

18c – RMAN RECOVER FROM SERVICE

- 12c: RECOVER DATABASE FROM SERVICE

```
SQL> recover managed standby database cancel;  
SQL> shutdown immediate;  
SQL> startup mount;  
RMAN> recover database from service orcl_primary ...;  
RMAN> shutdown immediate;  
RMAN> startup nomount;  
RMAN> restore standby controlfile from service orcl_primary;  
RMAN> alter database mount
```

- 18c: RECOVER STANDBY DATABASE FROM SERVICE

```
RMAN> recover standby database from service orcl_primary;
```