

## HOW TO

Author: Martin Decker

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# Implementierung Oracle 10gR2 DataGuard Physical Standby

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## 1 Einleitung

Dieses Dokument gibt einen Überblick über die Schritte, die notwendig sind, eine DataGuard Physical Standby Database zu erstellen und zu administrieren.

Zwischen der Datenbank PRDDB1 auf dem Host dbhost1.intra und der STBDB1 auf dem Host dbhost2.intra soll eine synchrone Standby-Kommunikation erfolgen.

Die ORACLE\_BASE Filesysteme auf dbhost1 und dbhost2 sind unterschiedlich (/oracle/PRDDB1 vs. /oracle/STBDB1), deshalb muss über DB\_FILE\_NAME\_CONVERT and LOG\_FILE\_NAME\_CONVERT konvertiert werden.

## 2 Hardware-Konfiguration

Für die DataGuard Kommunikation steht ein eigenes Gigabit Ethernet Interface zur Verfügung.

Die Netzwerk-Interfaces sind folgenderweise konfiguriert:

### 2.1 Netzwerk-Konfiguration dbhost1

Public VIP Interface:

```
lan900:1: flags=1843<UP,BROADCAST,RUNNING,MULTICAST,CKO>  
    inet 10.0.0.1 netmask ffffffff broadcast 10.0.0.255
```

Private Interconnect Interface:

```
lan901:1: flags=1843<UP,BROADCAST,RUNNING,MULTICAST,CKO>  
    inet 192.168.0.1 netmask ffffffff broadcast 192.168.0.255
```

### 2.2 Netzwerk-Konfiguration dbhost2

Private Interconnect Interface

```
lan901:1: flags=1843<UP,BROADCAST,RUNNING,MULTICAST,CKO>  
    inet 192.168.0.2 netmask ffffffff broadcast 192.168.0.255
```

## 3 Oracle Net Konfiguration

### 3.1 Oracle-Net Konfiguration dbhost1

#### 3.1.1 listener.ora

```
LISTENER_PRDDB1 =  
  (DESCRIPTION_LIST =  
    (DESCRIPTION =  
      (ADDRESS = (PROTOCOL = IPC) (KEY = PRDDB1))  
      (ADDRESS = (PROTOCOL = TCP) (HOST = 10.0.0.1) (PORT = 1521) (IP=FIRST))  
      (ADDRESS = (PROTOCOL = IPC) (KEY = EXTPROC_PRDDB1))  
    )  
  )
```

```
SID_LIST_LISTENER_PRDDb1 =
(SID_LIST =
(SID_DESC =
(SID_NAME = PLSExtProc)
(ORACLE_HOME = /oracle/PRDDb1/10.2.0)
(PROGRAM = extproc)
)
(SID_DESC =
(ORACLE_HOME = /oracle/PRDDb1/10.2.0)
(SID_NAME = PRDDb1)
)
)

SUBSCRIBE_FOR_NODE_DOWN_EVENT_LISTENER_PRDDb1=OFF

LISTENER_DATAGUARD_PRDDb1 =
(DESCRIPTION_LIST =
(DESCRIPTION =
(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1)(PORT = 1521)(IP=FIRST))
)
)

SID_LIST_LISTENER_DATAGUARD_PRDDb1 =
(SID_LIST =
(SID_DESC =
(SID_NAME = PRDDb1)
#(GLOBAL_DBNAME=PRDDb1_DGMGRL) # NUR NOTWENDIG FÜR BROKER
(ORACLE_HOME = /oracle/PRDDb1/10.2.0)
)
)

SUBSCRIBE_FOR_NODE_DOWN_EVENT_LISTENER_DATAGUARD_PRDDb1=OFF
INBOUND_CONNECT_TIMEOUT_LISTENER_PRDDb1=0
```

Der Parameter "IP=FIRST" ist notwendig, um zu verhindern, dass der erste gestartete Listener auf \*:1521 hört. Alternativ könnte man auch beiden Listenern einen anderen Port geben.

Die Parameter „SUBSCRIBE\_FOR\_NODE\_DOWN\_EVENT“ sind notwendig aufgrund Oracle Bug # 3881276.

### 3.1.2 tnsnames.ora

```
EXTPROC_CONNECTION_DATA =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC0))
)
(CONNECT_DATA =
(SID = PLSExtProc)
(PRESENTATION = RO)
)
)

PRDDb1 =
(DESCRIPTION =
(ADDRESS = (PROTOCOL = TCP)(HOST = PRDDb1.intra)(PORT = 1521))
(CONNECT_DATA = (SERVICE_NAME = PRDDb1))
)

STBDB1 =
(DESCRIPTION =
```

```
(ADDRESS_LIST =
  (ADDRESS = (PROTOCOL = TCP)(HOST = dbhost2.intra)(PORT = 1521))
)
(CONNECT_DATA =
  (SERVICE_NAME = STBDB1)
)
)

PRDDB1_DATAGUARD =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1)(PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = PRDDB1)
    )
  )
)

STBDB1_DATAGUARD =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2)(PORT = 1521))
    (CONNECT_DATA =
      (SERVICE_NAME = STBDB1)
    )
  )
)

LISTENER_DATAGUARD_PRDDB1 =
  (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1)(PORT = 1521))
```

### 3.1.3 sqlnet.ora

```
NAMES.DIRECTORY_PATH= (TNSNAMES)
SQLNET.EXPIRE_TIME = 10

DEFAULT_SDU_SIZE=32767
RECV_BUF_SIZE=327670
SEND_BUF_SIZE=327670

SQLNET.INBOUND_CONNECT_TIMEOUT=0
```

Der ideale Wert für die Send/Receive Buffers kann berechnet werden mittels:

**Formel:**  $3 * \text{BDP}$  (Bandwith Delay Product)

- $3 * (1 \text{ GBit/sec} * 0.8 \text{ ms Round Trip Time})$
- $3 * (125,000,000 \text{ Bytes / sec} * 0,0008 \text{ sec}) = 300,000 \text{ Bytes}$
- Die Buffer sollten ein vielfaches der SDU sein, also 327670 Bytes.

## 3.2 Oracle-Net Konfiguration dbhost2

### 3.2.1 listener.ora

```
LISTENER_STBDB1 =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = IPC)(KEY = STBDB1))
      (ADDRESS = (PROTOCOL = TCP)(HOST = dbhost2.intra)(PORT = 1521)(IP=FIRST))
      (ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC_STBDB1))
    )
  )
```

```
)
)

SID_LIST_LISTENER_STBDB1 =
(SID_LIST =
(SID_DESC =
(SID_NAME = STBDB1)
(ORACLE_HOME = /oracle/STBDB1/10.2.0)

)
(SID_DESC =
(SID_NAME = PLSExtProc)
(ORACLE_HOME = /oracle/STBDB1/10.2.0)
(PROGRAM = extproc)
)
)

SUBSCRIBE_FOR_NODE_DOWN_EVENT_LISTENER_STBDB1=OFF

LISTENER_DATAGUARD_STBDB1 =
(DESCRIPTION_LIST =
(DESCRIPTION =
(AADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2)(PORT = 1521)(IP=FIRST))
)
)

SID_LIST_LISTENER_DATAGUARD_STBDB1 =
(SID_LIST =
(SID_DESC =
(SID_NAME = STBDB1)
(GLOBAL_DBNAME = STBDB1_DGMGRL)
(ORACLE_HOME = /oracle/STBDB1/10.2.0)
)
)

SUBSCRIBE_FOR_NODE_DOWN_EVENT_LISTENER_DATAGUARD_STBDB1=OFF
```

## 3.2.2 tnsnames.ora

```
EXTPROC_CONNECTION_DATA =
(DESCRIPTION =
(AADDRESS_LIST =
(AADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC0))
)
(CONNECT_DATA =
(SID = PLSExtProc)
(PRESENTATION = RO)
)
)

STBDB1 =
(DESCRIPTION =
(AADDRESS = (PROTOCOL = TCP)(HOST = dbhost2.intra)(PORT = 1521))
(CONNECT_DATA = (SERVICE_NAME = STBDB1))
)

PRDDB1 =
(DESCRIPTION =
(AADDRESS_LIST =
(AADDRESS = (PROTOCOL = TCP)(HOST = PRDDB1.intra )(PORT = 1521))
)
(CONNECT_DATA =
(SERVICE_NAME = PRDDB1)
)
)

PRDDB1_DATAGUARD =
```

```
(DESCRIPTION =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1 )(PORT = 1521))
  )
  (CONNECT_DATA =
    (SERVICE_NAME = PRDDB1)
  )
)

STBDB1_DATAGUARD =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2 )(PORT = 1521))
    (CONNECT_DATA =
      (SERVICE_NAME = STBDB1)
    )
  )
)

LISTENER_DATAGUARD_STBDB1 =
  (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2)(PORT = 1521))
```

### 3.2.3 sqlnet.ora

```
NAMES.DIRECTORY_PATH= (TNSNAMES)
SQLNET.EXPIRE_TIME = 10
DEFAULT_SDU_SIZE=32767
RECV_BUF_SIZE=327670
SEND_BUF_SIZE=327670
```

## 3.3 Tests der Verbindungen

```
/oracle/PRDDB1/10.2.0/network/admin:[ORACLE_DB] tnsping PRDDB1_DATAGUARD
```

TNS Ping Utility for HPUX: Version 10.2.0.2.0 - Production on 18-OCT-2006 11:18:52

Copyright (c) 1997, 2005, Oracle. All rights reserved.

Used parameter files:

```
/oracle/PRDDB1/10.2.0/network/admin/sqlnet.ora
```

Used TNSNAMES adapter to resolve the alias

```
Attempting to contact (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL =
TCP)(HOST = 192.168.0.1)(PORT = 1521))) (CONNECT_DATA = (SERVICE_NAME =
PRDDB1_DGMGRL)))
```

OK (0 msec)

```
/oracle/PRDDB1/10.2.0/network/admin:[ORACLE_DB] tnsping STBDB1_DATAGUARD
```

TNS Ping Utility for HPUX: Version 10.2.0.2.0 - Production on 18-OCT-2006 11:19:10

Copyright (c) 1997, 2005, Oracle. All rights reserved.

Used parameter files:

```
/oracle/PRDDB1/10.2.0/network/admin/sqlnet.ora
```

Used TNSNAMES adapter to resolve the alias

```
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST =
192.168.0.2)(PORT = 1521)) (CONNECT_DATA = (SERVICE_NAME = STBDB1)))
```

OK (0 msec)

```
/oracle/STBDB1/10.2.0/network/admin:[ORACLE_DB] tnsping PRDDB1_DATAGUARD
```

TNS Ping Utility for HPUX: Version 10.2.0.2.0 - Production on 14-FEB-2007 09:56:02

Copyright (c) 1997, 2005, Oracle. All rights reserved.

Used parameter files:  
/oracle/STBDB1/10.2.0/network/admin/sqlnet.ora

Used TNSNAMES adapter to resolve the alias  
Attempting to contact (DESCRIPTION = (ADDRESS\_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1)(PORT = 1521))) (CONNECT\_DATA = (SERVICE\_NAME = PRDDB1)))  
OK (0 msec)  
/oracle/STBDB1/10.2.0/network/admin:[ORACLE\_DB] **tnsping STBDB1\_DATAGUARD**

TNS Ping Utility for HP-UX: Version 10.2.0.2.0 - Production on 14-FEB-2007 09:56:09

Copyright (c) 1997, 2005, Oracle. All rights reserved.

Used parameter files:  
/oracle/STBDB1/10.2.0/network/admin/sqlnet.ora

Used TNSNAMES adapter to resolve the alias  
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2)(PORT = 1521)) (CONNECT\_DATA = (SERVICE\_NAME = STBDB1)))  
OK (0 msec)

## 4 Installation der Standby-Datenbank

### 4.1 Initialisierungsparameter für Primary PRDDB1

initPRDDB1.ora-clean:

```
*.archive_lag_target=0
*.background_dump_dest='/oracle/PRDDB1/oratrace/bdump'
*.compatible='10.2.0.2'
*.control_files='/oracle/PRDDB1/origlogA/control01.ctl','/oracle/PRDDB1/origlogB/control02.ctl'
*.core_dump_dest='/oracle/PRDDB1/oratrace/cdump'
*.db_block_size=8192
*.db_domain=''
*.db_file_multiblock_read_count=16
*.db_file_name_convert='/oracle/PRDDB1/oradata/', '/oracle/STBDB1/oradata/'
*.db_name='PRDDB1'
*.DB_UNIQUE_NAME='PRDDB1'
*.db_writer_processes=8
*.dg_broker_start=TRUE
*.dispatchers='(PROTOCOL=TCP) (SERVICE=PRDDB1XDB)'
*.fal_client='PRDDB1_DATAGUARD'
*.fal_server='STBDB1_DATAGUARD'
*.fast_start_mttr_target=600
*.fast_start_parallel_rollback='HIGH'
*.hpux_sched_noage=178
*.job_queue_processes=10
*.local_listener='LISTENER_DATAGUARD_PRDDB1'
*.log_archive_config='dg_config=(PRDDB1, STBDB1)'
*.LOG_ARCHIVE_DEST_1='LOCATION=/oracle/PRDDB1/oraarch/
VALID_FOR=(ALL_LOGFILES,ALL_ROLES) DB_UNIQUE_NAME=PRDDB1'
*.log_archive_dest_2='SERVICE=STBDB1_DATAGUARD LGWR SYNC AFFIRM NET_TIMEOUT=10
VALID_FOR=(ONLINE_LOGFILES,PRIMARY_ROLE) DB_UNIQUE_NAME=STBDB1'
*.LOG_ARCHIVE_DEST_STATE_1='ENABLE'
*.log_archive_dest_state_2='ENABLE'
*.log_archive_format='PRDDB1arch_%s_%t_%r.dbf'
*.log_archive_max_processes=6
*.log_archive_min_succeed_dest=1
*.log_checkpoints_to_alert=TRUE
*.log_file_name_convert='/oracle/PRDDB1/', '/oracle/STBDB1/'
*.open_cursors=1000
```



```
*.optimizer_index_cost_adj=1
*.os_authent_prefix=''
*.parallel_execution_message_size=4096
*.parallel_max_servers=100
*.pga_aggregate_target=6442450944
*.processes=1000
*.query_rewrite_enabled='FALSE'
*.remote_password_file='EXCLUSIVE'
*.recovery_parallelism=16
*.sessions=1105
*.sga_target=19327352832
*.standby_archive_dest='/oracle/PRDDb1/oraarch/'
*.standby_file_management='auto'
*.undo_management='AUTO'
*.undo_retention=10800
*.undo_tablespace='UNDOTBS1'
*.user_dump_dest='/oracle/PRDDb1/oratrace/udump'
```

Dieses Parameter File wird dann in ein spfile umgewandelt:

```
create spfile from pfile='/oracle/PRDDb1/10.2.0/dbs/initPRDDb1.ora-clean';
```

## 4.2 Initialisierungsparameter für Standby STBDB1

initSTBDB1.ora-clean:

```
*.archive_lag_target=0
*.background_dump_dest='/oracle/STBDB1/oratrace/bdump'
*.compatible='10.2.0.2'
*.control_files='/oracle/STBDB1/origlogA/control01.ctl','/oracle/STBDB1/origlogB/control02.ctl'
*.core_dump_dest='/oracle/STBDB1/oratrace/cdump'
*.DB_BLOCK_CHECKING='FALSE'
*.db_block_size=8192
*.db_domain=''
*.db_file_multiblock_read_count=16
*.db_file_name_convert='/oracle/PRDDb1/oradata/', '/oracle/STBDB1/oradata/'
*.db_name='PRDDb1'
*.DB_UNIQUE_NAME='STBDB1'
*.db_writer_processes=8
*.dg_broker_start=TRUE
*.dispatchers='(PROTOCOL=TCP) (SERVICE=STBDB1XDB)'
*.fal_client='STBDB1_DATAGUARD'
*.fal_server='PRDDb1_DATAGUARD'
*.fast_start_mtr_target=600
*.fast_start_parallel_rollback='HIGH'
*.job_queue_processes=10
*.local_listener='LISTENER_DATAGUARD_STBDB1'
*.LOG_ARCHIVE_CONFIG='DG_CONFIG=(PRDDb1, STBDB1)'
*.log_archive_dest_1='LOCATION=/oracle/STBDB1/oraarch/
valid_for=(ALL_LOGFILES, ALL_ROLES) DB_UNIQUE_NAME=STBDB1'
*.log_archive_dest_2='SERVICE=PRDDb1_DATAGUARD LGWR SYNC AFFIRM NET_TIMEOUT=10
VALID_FOR=(ONLINE_LOGFILES, PRIMARY_ROLE) DB_UNIQUE_NAME=PRDDb1'
*.LOG_ARCHIVE_DEST_STATE_1='ENABLE'
*.LOG_ARCHIVE_DEST_STATE_2='DEFER'
*.log_archive_format='STBDB1arch_%s_%t_%r.dbf'
*.log_archive_max_processes=6
*.log_archive_min_succeed_dest=1
*.log_checkpoints_to_alert=TRUE
*.log_file_name_convert='/oracle/PRDDb1/', '/oracle/STBDB1/'
*.open_cursors=1000
*.optimizer_index_cost_adj=1
*.os_authent_prefix=''
*.parallel_execution_message_size=4096
*.parallel_max_servers=100
```

```
*.pga_aggregate_target=500M
*.processes=1000
*.recovery_parallelism=16
*.remote_login_passwordfile='EXCLUSIVE'
*.sessions=1105
*.sga_target=1G
*.standby_archive_dest='/oracle/STBDB1/oraarch/'
*.standby_file_management='AUTO'
*.undo_management='AUTO'
*.undo_retention=10800
*.undo_tablespace='UNDOTBS1'
*.user_dump_dest='/oracle/STBDB1/oratrace/udump'
*.DB_RECOVERY_FILE_DEST_SIZE=30G
*.DB_RECOVERY_FILE_DEST='/oracle/STBDB1/flash_recovery_area'
```

Der Parameter db\_block\_checking kann auf Standby-Seite aus Performance-Gründen auf false gestellt werden.

Dieses Parameter File wird dann auf der Standby-Seite in ein spfile umgewandelt:

```
create spfile from pfile=' /oracle/STBDB1/10.2.0/dbs/initSTBDB1.ora-clean';
```

## 4.3 Backup der Primary und Transfer zur Standby

Anschließend wird die Primary gestoppt und die Datafiles per scp auf die Standby kopiert:

```
SQL> alter database begin backup;
!scp /oracle/PRDDB1/oradata/*.dbf 192.168.0.2:/oracle/STBDB1/oradata/
SQL> alter database end backup;
```

Danach wird die Primary gestartet und ein Standby Controlfile erzeugt:

```
SQL> alter database create standby controlfile as '/tmp/control_PRDDB1.ctl';
```

Dieses wird nun zur Standby kopiert:

```
scp /tmp/control_PRDDB1.ctl 192.168.0.2:/oracle/STBDB1/origlogA/control01.ctl
scp /tmp/control_PRDDB1.ctl 192.168.0.2:/oracle/STBDB1/origlogB/control02.ctl
```

## 4.4 Start der Standby-Datenbank

Zuerst wird der Listener gestartet:

```
oraclep@dbhost2: lsnrctl start LISTENER_DATAGUARD_STBDB1
```

Danach wird die Standby-Datenbank in den Mount-Status gestartet:

```
sqlplus „/as sysdba“
startup mount;
alter database force logging;
alter database flashback on;
```

Nun können die Standby Redo Logs erzeugt werden. Aus Performance-Gründen empfiehlt es sich, auf die zweiten Members zu verzichten. Dies gilt aber nur für die Standby-Redo Logs. Die Anzahl der Redo Logs beträgt:

# Online Redo Log Groups + 1, z.B. 5 Online Redo Log Groups +1 = 6 Standby Redo Log Groups.

```
ALTER DATABASE ADD STANDBY LOGFILE GROUP 6 ('/oracle/STBDB1/origlogB/standby_g6_m1.log') size
750M;
ALTER DATABASE ADD STANDBY LOGFILE GROUP 7 ('/oracle/STBDB1/origlogB/standby_g7_m1.log') size
750M;
ALTER DATABASE ADD STANDBY LOGFILE GROUP 8 ('/oracle/STBDB1/origlogB/standby_g8_m1.log') size
750M;
```

```
ALTER DATABASE ADD STANDBY LOGFILE GROUP 9 ('/oracle/STBDB1/origlogB/standby_g9_m1.log') size 750M;  
ALTER DATABASE ADD STANDBY LOGFILE GROUP 10 ('/oracle/STBDB1/origlogB/standby_g10_m1.log') size 750M;  
ALTER DATABASE ADD STANDBY LOGFILE GROUP 11 ('/oracle/STBDB1/origlogB/standby_g11_m1.log') size 750M;
```

Es empfiehlt sich, die Standby Redo Logs im Filenamens anders zu benennen wie die Online Redo Logs.

Beim nächsten Schritt wird der Managed Recovery Process (MRP) gestartet:

Mit „using current logfile“ wird der Realtime Apply aktiviert. Falls die Recovery Geschwindigkeit erhöht werden soll, kann auch mit „parallel 4“ gearbeitet werden.

```
ALTER DATABASE RECOVER MANAGED  
STANDBY DATABASE USING CURRENT LOGFILE PARALLEL 4 disconnect from session ;
```

## 4.5 Start der Primary-Datenbank

Zuerst wird der Listener gestartet:

```
oraclep@dbhost1: lsnrctl start LISTENER_DATAGUARD_PRDDB1
```

Nun kann die Datenbank gestartet werden.

```
sqlplus „/as sysdba“  
startup mount;  
alter database force logging;  
alter database open;
```

## 4.6 Verbindungstests mit SQL\*Plus

Es empfiehlt sich, vor dem Aktivieren des Redo Transport Verbindungstests durchzuführen:

### 4.6.1 PRDDB1->STBDB1

```
/oracle/PRDDB1/10.2.0/dbs:[ORACLE_DB] sqlplus "sys@STBDB1_DATAGUARD as sysdba"
```

```
SQL*Plus: Release 10.2.0.2.0 - Production on Wed Oct 18 11:27:06 2008
```

```
Copyright (c) 1982, 2005, Oracle. All Rights Reserved.
```

```
Enter password:
```

```
Connected to:
```

```
Oracle Database 10g Enterprise Edition Release 10.2.0.2.0 - 64bit Production  
With the Partitioning and Data Mining options
```

```
SQL>
```

### 4.6.2 STBDB1->PRDDB1

```
/oracle/STBDB1/oratrace/bdump:[ORACLE_DB] sqlplus "sys@PRDDB1_DATAGUARD as sysdba"
```

```
SQL*Plus: Release 10.2.0.2.0 - Production on Wed Oct 18 11:27:43 2008
```

```
Copyright (c) 1982, 2005, Oracle. All Rights Reserved.
```

```
Enter password:
```

```
Connected to:
```

```
Oracle Database 10g Enterprise Edition Release 10.2.0.2.0 - 64bit Production
```

With the Partitioning and Data Mining options

SQL>

## 4.7 Aktivieren des Redo Transports

Nun kann der Redo Transport auf der Primary aktiviert werden:

```
alter system set log_archive_dest_state_2 = enable;  
alter system switch logfile;
```

Die Alert logs zeigen folgende Meldungen:

Primary:

```
Destination LOG_ARCHIVE_DEST_2 is UNSYNCHRONIZED  
*****  
LGWR: Setting 'active' archival for destination LOG_ARCHIVE_DEST_2  
*****  
LNSb started with pid=22, OS id=10728  
Fri Sep 15 15:12:45 2008  
Destination LOG_ARCHIVE_DEST_2 is SYNCHRONIZED  
LGWR: Standby redo logfile selected to archive thread 1 sequence 765  
LGWR: Standby redo logfile selected for thread 1 sequence 765 for destination  
LOG_ARCHIVE_DEST_2  
Beginning log switch checkpoint up to RBA [0x2fd.2.10], SCN: 3266674  
Thread 1 advanced to log sequence 765  
Current log# 4 seq# 765 mem# 0: /oracle/PRDDb1/origlogA/log_g4_01.log  
Fri Sep 15 15:12:45 2008  
ARC1: LGWR is actively archiving destination LOG_ARCHIVE_DEST_2  
ARC1: Standby redo logfile selected for thread 1 sequence 764 for destination  
LOG_ARCHIVE_DEST_2  
Fri Sep 15 15:16:10 2008  
Completed checkpoint up to RBA [0x2fd.2.10], SCN: 3266674
```

Standby:

```
Primary database is in MAXIMUM AVAILABILITY mode  
Changing standby controlfile to RESYNCHRONIZATION level  
Primary database is in MAXIMUM AVAILABILITY mode  
Changing standby controlfile to MAXIMUM AVAILABILITY level  
RFS[3]: Successfully opened standby log 5:  
'/oracle/PRDDb1/origlogA/standby_01_01.log'  
Fri Sep 15 15:12:45 2008  
Redo Shipping Client Connected as PUBLIC  
-- Connected User is Valid  
RFS[4]: Assigned to RFS process 17384  
RFS[4]: Identified database type as 'physical standby'  
RFS[4]: Successfully opened standby log 6:  
'/oracle/PRDDb1/origlogA/standby_02_01.log'  
Fri Sep 15 15:12:47 2008  
Media Recovery Log /oracle/PRDDb1/oraarch/1_764_598006431.dbf  
Media Recovery Waiting for thread 1 sequence 765 (in transit)  
Fri Sep 15 15:12:48 2008  
Recovery of Online Redo Log: Thread 1 Group 5 Seq 765 Reading mem 0  
Mem# 0 errs 0: /oracle/PRDDb1/origlogA/standby_01_01.log  
Fri Sep 15 15:13:04 2008  
Redo Shipping Client Connected as PUBLIC  
-- Connected User is Valid  
RFS[5]: Assigned to RFS process 17854  
RFS[5]: Identified database type as 'physical standby'
```

## 5 DataGuard Broker

Es empfiehlt sich, die init.ora Initialisierungsparameter-Dateien mit der non-Broker Konfiguration aufzuheben. (/oracle/PRDDB1/10.2.0/dbs/initPRDDB1.ora-clean, /oracle/STBDB1/10.2.0/dbs/initSTBDB1.ora-clean)

Für die Aktivierung des Broker Prozesses sind folgende Schritte notwendig:

### 5.1 Erstellen der Konfiguration

Für die Broker Konfiguration ist es notwendig, den init.ora Parameter dg\_broker\_start auf true zu setzen:

Primary:

```
SQL> alter system set DG_BROKER_START=TRUE;
System altered.
```

Standby:

```
SQL> alter system set DG_BROKER_START=TRUE;
System altered.
```

Anschließend wird die Configuration erstellt.

```
oraclep@dbhost1:PRDDB1~ > dgmgrrl
DGMGRL for Linux: Version 10.2.0.2.0 - 64bit Production

Copyright (c) 2000, 2005, Oracle. All rights reserved.

Welcome to DGMGRL, type "help" for information.
DGMGRL> connect sys
Connected.
CREATE CONFIGURATION 'mdecker_dataguard' AS
  PRIMARY DATABASE IS 'PRDDB1'
  CONNECT IDENTIFIER IS PRDDB1_DATAGUARD;
Configuration "MDECKER_DATAGUARD" created with primary database "PRDDB1"

DGMGRL> show configuration;

Configuration
  Name:                MDECKER_DATAGUARD
  Enabled:              NO
  Protection Mode:     MaxPerformance
  Fast-Start Failover: DISABLED
  Databases:
    PRDDB1 - Primary database

Current status for "mdecker_dataguard":
DISABLED

DGMGRL> ADD DATABASE 'STBDB1' AS
  CONNECT IDENTIFIER IS STBDB1_DATAGUARD
  MAINTAINED AS PHYSICAL;
Database "STBDB1" added

DGMGRL> show configuration;
```

## Configuration

```
Name:                mdecker_dataguard
Enabled:             NO
Protection Mode:    MaxPerformance
Fast-Start Failover: DISABLED
Databases:
  PRDDb1 - Primary database
  STBDB1 - Physical standby database
```

Current status for "MDECKER\_DATAGUARD":  
DISABLED

DGMGRL> **show database verbose 'PRDDb1';**

## Database

```
Name:                PRDDb1
Role:                PRIMARY
Enabled:             NO
Intended State:     ONLINE
Instance(s):
  PRDDb1
```

## Properties:

```
InitialConnectIdentifier = 'PRDDb1_dataguard'
LogXptMode              = 'ASYNc'
Dependency               = ''
DelayMins                 = '0'
Binding                   = 'OPTIONAL'
MaxFailure                = '0'
MaxConnections            = '1'
ReopenSecs                = '300'
NetTimeout             = '180'
LogShipping               = 'ON'
PreferredApplyInstance   = ''
ApplyInstanceTimeout     = '0'
ApplyParallel             = 'AUTO'
StandbyFileManagement    = 'auto'
ArchiveLagTarget         = '0'
LogArchiveMaxProcesses   = '6'
LogArchiveMinSucceedDest = '1'
DbFileNameConvert        = '/oracle/PRDDb1/oradata/,
/oracle/STBDB1/oradata/'
LogFileNameConvert       = '/oracle/PRDDb1/, /oracle/STBDB1/'
FastStartFailoverTarget  = ''
StatusReport              = '(monitor)'
InconsistentProperties    = '(monitor)'
InconsistentLogXptProps  = '(monitor)'
SendQEntries              = '(monitor)'
LogXptStatus              = '(monitor)'
RecvQEntries              = '(monitor)'
HostName                  = 'dbhost1'
SidName                   = 'PRDDb1'
LocalListenerAddress     =
'(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.1) (PORT=1521))'
StandbyArchiveLocation   = '/oracle/PRDDb1/oraarch'
AlternateLocation        = ''
LogArchiveTrace           = '0'
LogArchiveFormat          = 'PRDDb1arch_%s_%t_%r.dbf'
LatestLog                 = '(monitor)'
TopWaitEvents             = '(monitor)'
```

Current status for "PRDDb1":  
DISABLED

Nun wird der Log Transport Mode auf Sync gestellt, was für Maximum Availability zwingend notwendig ist:

```
DGMGRL> EDIT DATABASE 'PRDD1' SET PROPERTY 'LogXptMode'='SYNC';
Property "LogXptMode" updated
DGMGRL> EDIT DATABASE 'STBDB1' SET PROPERTY 'LogXptMode'='SYNC';
Property "LogXptMode" updated
```

```
dgmgrl> EDIT DATABASE 'PRDD1' SET PROPERTY 'NetTimeout'='10';
dgmgrl> EDIT DATABASE 'STBDB1' SET PROPERTY 'NetTimeout'='10';
```

```
DGMGRL> enable configuration;
```

```
DGMGRL> show configuration;
```

Configuration

```
Name: MDECKER_DATAGUARD
Enabled: YES
Protection Mode: MaxPerformance
Fast-Start Failover: DISABLED
Databases:
  PRDD1 - Primary database
  STBDB1 - Physical standby database
```

```
Current status for "MDECKER_DATAGUARD":
SUCCESS
```

## 5.2 Temporäres Deaktivieren des Log Transports

Stoppen des Log Transport von Primary auf Standby:

```
DGMGRL
connect sys
DISABLE CONFIGURATION
```

```
sqlplus //as sysdba"
alter system set log_archive_dest_state_2 = DEFER;
```

```
Reaktivieren:
alter system set log_archive_dest_state_2 = ENABLE;
```

oder

```
dgmgrl
dgmgrl> EDIT DATABASE 'PRDD1' SET STATE="LOG-TRANSPORT-OFF";
```

oder

```
dgmgrl> EDIT DATABASE 'STBDB1' SET PROPERTY 'LogShipping'='OFF';
```

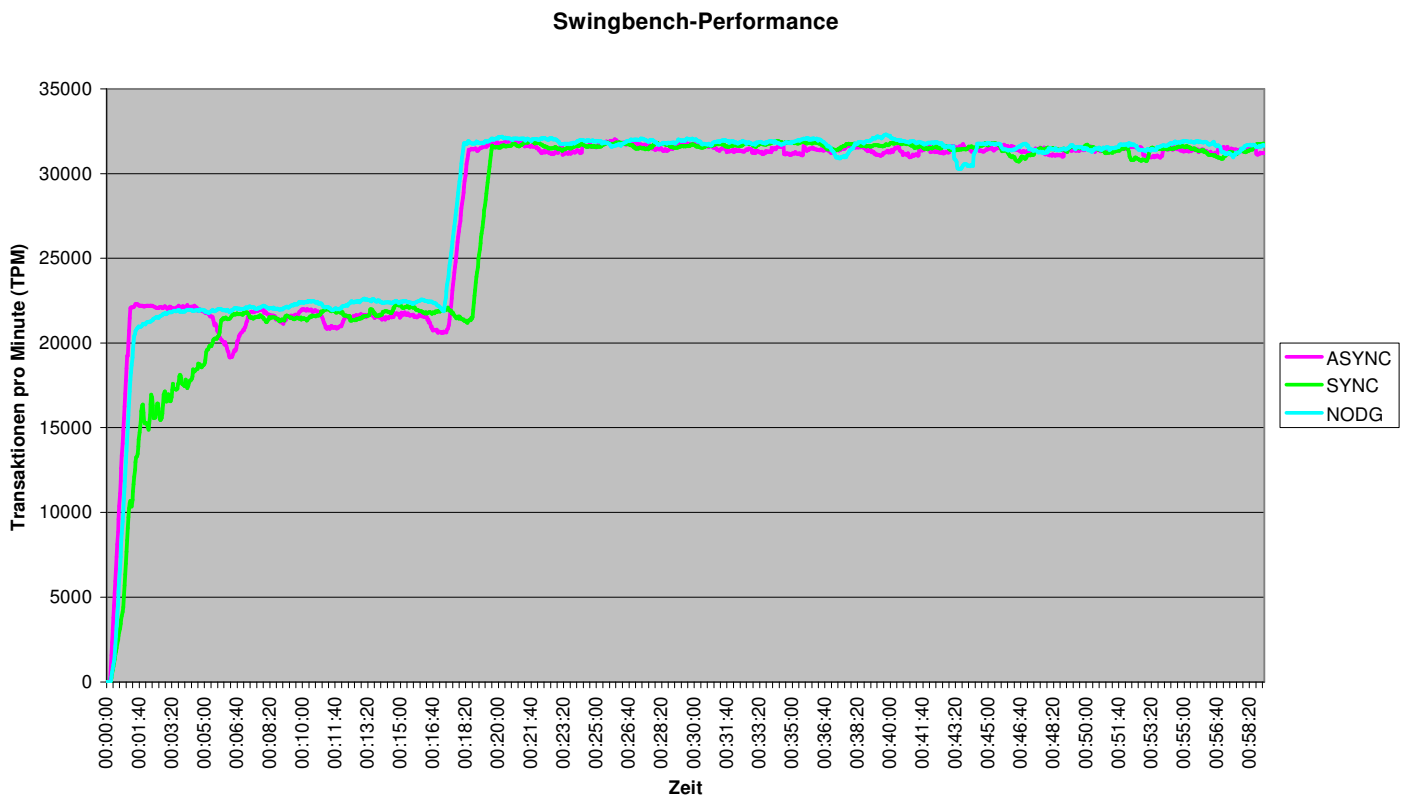
Reaktivieren:

```
dgmgrl> EDIT DATABASE 'PRDD1' SET STATE="ONLINE";
```

## 6 Tests

### 6.1 Performance Tests mit SYNC/ASYNC/NODG

Es wird mittels Swingbench ([www.dominicgiles.com/swingbench.php](http://www.dominicgiles.com/swingbench.php)) die Performance von DataGuard sync/async und ohne DataGuard ermittelt. Die Testläufe sollen ca. 60 Minuten betragen und es sollen 10 minütliche AWR Snapshots konfiguriert werden.



Der Performance-Einfluss von DataGuard Sync/Async war in diesem Benchmark nicht messbar.

#### 6.1.1 SYNC AWR Report

	Snap Id	Snap Time	Sessions	Curs/Sess
Begin Snap:	739	20-Oct-06 12:00:51	237	25.6
End Snap:	740	20-Oct-06 12:15:52	243	25.0
Elapsed:		15.02 (mins)		
DB Time:		132.18 (mins)		

Load Profile	Per Second	Per Transaction
~~~~~		



	-----	-----
Redo size:	628,203.31	683.21
Logical reads:	183,046.42	199.07
Block changes:	4,407.10	4.79
Physical reads:	37.18	0.04
Physical writes:	278.65	0.30
User calls:	1,056.32	1.15
Parses:	645.38	0.70
Hard parses:	0.21	0.00
Sorts:	739.19	0.80
Logons:	0.07	0.00
Executes:	4,133.16	4.50
Transactions:	919.49	

Top 5 Timed Events

Event	Waits	Time (s)	Avg wait (ms)	%Total Call Time	Wait Class
CPU time		4,022		50.7	
log file sync	206,879	3,296	16	41.6	Commit
LGWR wait on LNS	183,141	486	3	6.1	Network
LGWR-LNS wait on channel	296,274	481	2	6.1	Other
LNS wait on SENDREQ	183,137	238	1	3.0	Network

Event	Waits	%Time -outs	Total Wait Time (s)	Avg wait (ms)	Waits /txn
log file sync	206,879	.0	3,296	16	0.2
LGWR wait on LNS	183,141	.0	486	3	0.2
LGWR-LNS wait on channel	296,274	3.0	481	2	0.4
LNS wait on SENDREQ	183,137	.0	238	1	0.2
buffer busy waits	24,514	.0	226	9	0.0
db file sequential read	20,463	.0	204	10	0.0
log file parallel write	183,130	.0	160	1	0.2
rdbms ipc reply	38,237	.0	101	3	0.0

Statistic	Total	per Second	per Trans
user calls	951,748	1,056.3	1.2
user commits	635,836	705.7	0.8

## 6.1.2 ASYNC AWR Report

	Snap Id	SnapTime	Sessions	Curs/Sess
Begin Snap:	753	20-Oct-06 15:30:37	236	25.6
End Snap:	754	20-Oct-06 15:45:44	236	25.6
Elapsed:		15.11 (mins)		
DB Time:		116.79 (mins)		

Load Profile

	Per Second	Per Transaction
Redo size:	689,444.40	756.37
Logical reads:	177,367.59	194.59
Block changes:	4,001.77	4.39
Physical reads:	83.54	0.09
Physical writes:	289.53	0.32
User calls:	1,037.27	1.14
Parses:	522.66	0.57
Hard parses:	0.02	0.00
Sorts:	733.75	0.80
Logons:	0.01	0.00

Executes: 3,977.18 4.36  
Transactions: 911.51

Top 5 Timed Events

Event	Waits	Time (s)	Avg wait (ms)	%Total Call Time	Wait Class
CPU time		3,872		55.3	
log file sync	189,739	2,644	14	37.7	Commit
db file sequential read	31,004	422	14	6.0	User I/O
log file parallel write	305,156	295	1	4.2	System I/O
enq: FB - contention	397	81	203	1.1	Other

Event	Waits	%Time -outs	Total Wait Time (s)	Avg wait (ms)	Waits /txn
log file sync	189,739	.0	2,644	14	0.2
db file sequential read	31,004	.0	422	14	0.0
log file parallel write	305,156	.0	295	1	0.4
enq: FB - contention	397	.0	81	203	0.0
db file scattered read	6,416	.0	48	7	0.0
buffer busy waits	763	.1	34	44	0.0
LNS wait on SENDREQ	80	.0	19	238	0.0
enq: TX - row lock contentio	596	.0	14	23	0.0
log file sequential read	485	.0	13	27	0.0
reliable message	34	2.9	10	284	0.0

Statistic	Total	per Second	per Trans
user calls	940,689	1,037.3	1.1
user commits	634,041	699.1	0.8

### 6.1.3 NO-DATAGUARD AWR Report

	Snap Id	Snap Time	Sessions	Curs/Sess
Begin Snap:	754	20-Oct-06 17:00:48	235	25.7
End Snap:	755	20-Oct-06 17:15:49	235	25.7
Elapsed:		15.01 (mins)		
DB Time:		92.49 (mins)		

Load Profile

	Per Second	Per Transaction
Redo size:	721,776.52	780.84
Logical reads:	179,752.00	194.46
Block changes:	4,119.37	4.46
Physical reads:	1.93	0.00
Physical writes:	878.87	0.95
User calls:	1,052.07	1.14
Parses:	530.43	0.57
Hard parses:	0.01	0.00
Sorts:	741.86	0.80
Logons:	0.01	0.00
Executes:	4,032.11	4.36
Transactions:	924.36	

Top 5 Timed Events

Event	Waits	Time (s)	Avg wait (ms)	%Total Call Time	Wait Class
CPU time		3,942		71.0	

log file sync	190,322	1,698	9	30.6	Commit
log file parallel write	307,833	274	1	4.9	System I/O
ARCH wait on SENDREQ	2,494	116	47	2.1	Network
Log archive I/O	3,250	101	31	1.8	System I/O

Event	Waits	%Time -outs	Total Wait Time (s)	Avg wait (ms)	Waits /txn
log file sync	190,322	.1	1,698	9	0.2
log file parallel write	307,833	.0	274	1	0.4
ARCH wait on SENDREQ	2,494	.0	116	47	0.0
Log archive I/O	3,250	.0	101	31	0.0
reliable message	56	8.9	14	251	0.0
log file sequential read	587	.0	13	22	0.0
control file sequential read	2,507	.0	11	4	0.0
db file scattered read	304	.0	8	26	0.0
latch: cache buffers chains	2,383	.0	7	3	0.0
log file switch completion	150	.0	6	37	0.0

Statistic	Total	per Second	per Trans
user calls	947,798	1,052.1	1.1
user commits	638,781	709.1	0.8

## 6.2 Fetch Archive Log (FAL)

Der Fetch Archive Log (FAL) Mechanismus ist dafür zuständig, auf Standby Datenbank fehlende Archivelogs von der Primary Datenbank anzufordern und zu empfangen.

- ➔ Stop der Standby Database
- ➔ Mehrere Log Switches auf der Primary manuell oder durch Last
- ➔ Start der Standby Database und start des Managed Recovery Process

Ziel: die fehlenden Archivelogs sollen automatisch übertragen und von MRP applied werden.

Während der letzten No-DataGuard Tests war der Log Transport deaktiviert. In der Zwischenzeit wurden über Nacht die Archivelogs der Primary auf Tape gesichert und vom Filesystem gelöscht. Sie standen daher am nächsten Tag nicht mehr zur Verfügung, als der Log Transport wieder aktiviert wurde. Durch einen RMAN Restore konnten die Logs auf die Primary restored werden. Anschließend wurden sie automatisch zur Standby Database übertragen.

Primary:

```
Thu Oct 19 09:12:21 2008
FAL[server]: Fail to queue the whole FAL gap
GAP - thread 1 sequence 267-280
DBID 4111674537 branch 601822185
Thu Oct 19 09:15:25 2008
Completed checkpoint up to RBA [0x11b.2.10], SCN: 21232195
Thu Oct 19 09:26:35 2008
Incremental checkpoint up to RBA [0x11b.3dd.0], current log tail at RBA
[0x11b.4ae.0]
```

```
Thu Oct 19 09:34:11 2008
Thread 1 cannot allocate new log, sequence 284
Private strand flush not complete
Current log# 1 seq# 283 mem# 0: /oracle/PRDDb1/origlogA/log_g1m1.log
Beginning log switch checkpoint up to RBA [0x11c.2.10], SCN: 21233243
Thread 1 advanced to log sequence 284
Current log# 2 seq# 284 mem# 0: /oracle/PRDDb1/origlogA/log_g2m1.log
Thu Oct 19 09:34:12 2008
LNS: Standby redo logfile selected for thread 1 sequence 284 for destination
LOG_ARCHIVE_DEST_2
Thu Oct 19 09:35:35 2008
Completed checkpoint up to RBA [0x11c.2.10], SCN: 21233243
Thu Oct 19 09:56:36 2008
Incremental checkpoint up to RBA [0x11c.327.0], current log tail at RBA
[0x11c.33b.0]
Thu Oct 19 10:10:55 2008
Archivelog restore complete. Elapsed time: 0:00:00
Archivelog restore complete. Elapsed time: 0:00:00
Thu Oct 19 10:11:11 2008
Archivelog restore complete. Elapsed time: 0:00:16
Thu Oct 19 10:12:37 2008
Archivelog restore complete. Elapsed time: 0:00:29
Archivelog restore complete. Elapsed time: 0:00:29
Thu Oct 19 10:15:44 2008
Archivelog restore complete. Elapsed time: 0:00:25
Thu Oct 19 10:15:56 2008
Archivelog restore complete. Elapsed time: 0:00:38
Archivelog restore complete. Elapsed time: 0:00:38
Thu Oct 19 10:17:03 2008
Archivelog restore complete. Elapsed time: 0:00:00
Archivelog restore complete. Elapsed time: 0:00:03
Archivelog restore complete. Elapsed time: 0:00:09
Thu Oct 19 10:17:57 2008
Archivelog restore complete. Elapsed time: 0:00:00
Thu Oct 19 10:19:36 2008
Archivelog restore complete. Elapsed time: 0:00:29
Archivelog restore complete. Elapsed time: 0:00:29
Thu Oct 19 10:26:37 2008
Incremental checkpoint up to RBA [0x11c.a99.0], current log tail at RBA
[0x11c.abf.0]
```

## Standby:

```
Thu Oct 19 09:11:47 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[13]: Assigned to RFS process 17118
RFS[13]: Identified database type as 'physical standby'
Primary database is in MAXIMUM PERFORMANCE mode
Primary database is in MAXIMUM PERFORMANCE mode
RFS[13]: Successfully opened standby log 4: '/oracle/STBDB1/origlogA/log_g4m1.log'
Thu Oct 19 09:11:50 2008
Fetching gap sequence in thread 1, gap sequence 267-281
Thu Oct 19 09:11:51 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[14]: Assigned to RFS process 17729
RFS[14]: Identified database type as 'physical standby'
RFS[14]: Successfully opened standby log 5: '/oracle/STBDB1/origlogA/log_g5m1.log'
Thu Oct 19 09:11:51 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[15]: Assigned to RFS process 17735
RFS[15]: Identified database type as 'physical standby'
RFS[15]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_281_1_601822185.dbf'
Thu Oct 19 09:12:08 2008
Redo Shipping Client Connected as PUBLIC
```

```
-- Connected User is Valid
RFS[16]: Assigned to RFS process 18487
RFS[16]: Identified database type as 'physical standby'
Thu Oct 19 09:12:20 2008
Fetching gap sequence in thread 1, gap sequence 267-280
Thu Oct 19 09:12:51 2008
FAL[client]: Failed to request gap sequence
  GAP - thread 1 sequence 267-280
  DBID 4111674537 branch 601822185
FAL[client]: All defined FAL servers have been attempted.
-----
Check that the CONTROL_FILE_RECORD_KEEP_TIME initialization
parameter is defined to a value that is sufficiently large
enough to maintain adequate log switch information to resolve
archivelog gaps.
-----
Thu Oct 19 09:34:12 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[13]: Successfully opened standby log 5: '/oracle/STBDB1/origlogA/log_g5m1.log'
Thu Oct 19 10:11:12 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[17]: Assigned to RFS process 28356
RFS[17]: Identified database type as 'physical standby'
RFS[17]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_267_1_601822185.dbf'
Thu Oct 19 10:11:13 2008
RFS[15]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_269_1_601822185.dbf'
Thu Oct 19 10:11:22 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_267_1_601822185.dbf
Media Recovery Waiting for thread 1 sequence 268 (in transit)
Thu Oct 19 10:11:29 2008
RFS[14]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_268_1_601822185.dbf'
Thu Oct 19 10:11:32 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_268_1_601822185.dbf
Thu Oct 19 10:13:13 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[18]: Assigned to RFS process 795
RFS[18]: Identified database type as 'physical standby'
Thu Oct 19 10:13:39 2008
RFS[17]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_276_1_601822185.dbf'
Thu Oct 19 10:13:39 2008
RFS[18]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_275_1_601822185.dbf'
Thu Oct 19 10:16:35 2008
RFS[14]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_270_1_601822185.dbf'
Thu Oct 19 10:16:52 2008
RFS[15]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_271_1_601822185.dbf'
Thu Oct 19 10:16:54 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_269_1_601822185.dbf
Thu Oct 19 10:16:55 2008
RFS[18]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_272_1_601822185.dbf'
Thu Oct 19 10:17:02 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_270_1_601822185.dbf
Thu Oct 19 10:20:06 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_271_1_601822185.dbf
Thu Oct 19 10:20:40 2008
RFS[14]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_273_1_601822185.dbf'
Thu Oct 19 10:20:40 2008
RFS[15]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_274_1_601822185.dbf'
Thu Oct 19 10:21:15 2008
RFS[14]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_280_1_601822185.dbf'
Thu Oct 19 10:21:15 2008
RFS[18]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_278_1_601822185.dbf'
Thu Oct 19 10:21:18 2008
RFS[15]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_279_1_601822185.dbf'
Thu Oct 19 10:21:26 2008
RFS[17]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_277_1_601822185.dbf'
Thu Oct 19 10:25:06 2008
```

```
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_272_1_601822185.dbf
Thu Oct 19 10:29:51 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_273_1_601822185.dbf
Thu Oct 19 10:34:20 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_274_1_601822185.dbf
Thu Oct 19 10:38:52 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_275_1_601822185.dbf
Thu Oct 19 10:43:30 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_276_1_601822185.dbf
```

## 6.3 Datafile Management

Wir verwenden den init.ora Parameter „standby\_file\_management=auto“. Hier soll getestet werden, dass „add datafile“ und „add tablespace“ automatisch auf die Standby-Seite propagiert werden.

### Primary:

```
Tue Oct 17 16:24:28 2008
create tablespace soe datafile '/oracle/PRDDB1/oradata/soe.dbf'
size 100M reuse
autoextend on next 50m maxsize unlimited
extent management local uniform size 100k
segment space management auto
nologging
Tue Oct 17 16:24:29 2008
Completed: create tablespace soe datafile '/oracle/PRDDB1/oradata/soe.dbf'
size 100M reuse
autoextend on next 50m maxsize unlimited
extent management local uniform size 100k
segment space management auto
nologging
Tue Oct 17 16:24:29 2008
create tablespace soeindex datafile '/oracle/PRDDB1/oradata/soeindex.dbf'
size 100M reuse
autoextend on next 50m maxsize unlimited
extent management local uniform size 100k
segment space management auto
nologging
Completed: create tablespace soeindex datafile
'/oracle/PRDDB1/oradata/soeindex.dbf'
size 100M reuse
autoextend on next 50m maxsize unlimited
extent management local uniform size 100k
segment space management auto
nologging
Tue Oct 17 16:29:06 2008
```

### Standby:

```
Recovery created file /oracle/STBDB1/oradata/soe.dbf
Successfully added datafile 12 to media recovery
Datafile #12: '/oracle/STBDB1/oradata/soe.dbf'
Recovery created file /oracle/STBDB1/oradata/soeindex.dbf
Successfully added datafile 13 to media recovery
Datafile #13: '/oracle/STBDB1/oradata/soeindex.dbf'
```

### Löschen:

#### Primary:

```
Tue Oct 17 17:25:27 2008
drop tablespace SOEINDEX including contents and datafiles
Tue Oct 17 17:25:28 2008
Deleted file /oracle/PRDDB1/oradata/soeindex.dbf
```

```
Completed: drop tablespace SOEINDEX including contents and Datafiles
drop tablespace SOE including contents and datafiles
Tue Oct 17 17:24:58 2008
Deleted file /oracle/PRDDDB1/oradata/soe.dbf
Completed: drop tablespace SOE including contents and datafiles
```

## Standby:

```
Recovery deleting file #12:'/oracle/STBDB1/oradata/soe.dbf' from controlfile.
Recovery dropped tablespace 'SOE'
Recovery deleting file #13:'/oracle/STBDB1/oradata/soeindex.dbf' from controlfile.
Recovery dropped tablespace 'SOEINDEX'
```

## 6.4 Netzwerk-Kabel kurzzeitig entfernen

Wenn das Netzwerk-Kabel des DataGuard Interfaces der Standby Database gezogen wird, wartet der LogWriter der Primary Database. Das folgende Test-Script inserted in einer Schleife Datum-Werte in eine Tabelle und committed sofort.

### Test-Script:

```
set echo on
set feedback on
set timing on

spool commit.log

ALTER SESSION SET EVENTS '10046 trace name context forever, level 12';

drop table soe.dg_commit_test
/

create table soe.dg_commit_test(a date)
/
commit
/

insert into soe.dg_commit_test values (sysdate)
/

commit
/

insert into soe.dg_commit_test values (sysdate)
/

commit
/

insert into soe.dg_commit_test values (sysdate)
/

commit
/

. . . . .
/

insert into soe.dg_commit_test values (sysdate)
/

commit
/

ALTER SESSION SET EVENTS '10046 trace name context off'
```

/

spool off

Um 13:43:50 wurde das Netzwerk-Kabel gezogen und um 13:44:20 wieder eingesteckt.

Der LogWriter wartet NET\_TIMEOUT Sekunden (hier 10) bevor er aufgibt und die Remote Destination nicht mehr versorgt.

Werte in Tabelle:

```
06.10.2006 13:43:50
06.10.2006 13:43:50
06.10.2006 13:43:50
06.10.2006 13:43:50
06.10.2006 13:43:50
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
06.10.2006 13:44:00
```

Logfiles:

```
Fri Oct 6 13:43:26 2008
LGWR: Standby redo logfile selected for thread 1 sequence 827 for destination
LOG_ARCHIVE_DEST_2
Beginning log switch checkpoint up to RBA [0x33b.2.10], SCN: 4329458
Thread 1 advanced to log sequence 827
Current log# 2 seq# 827 mem# 0: /oracle/PRDDb1/origlogA/redo02_01.log
Fri Oct 6 13:44:00 2008
ORA-16198: LGWR received timedout error from KSR
LGWR: Attempting destination LOG_ARCHIVE_DEST_2 network reconnect (16198)
LGWR: Destination LOG_ARCHIVE_DEST_2 network reconnect abandoned
Fri Oct 6 13:44:00 2008
Errors in file /oracle/PRDDb1/oratrace/bdump/PRDDb1_lgwr_20228.trc:
ORA-16198: Timeout incurred on internal channel during remote archival
LGWR: Network asynch I/O wait error 16198 log 2 service 'STBDB1_DATAGUARD'
Fri Oct 6 13:44:00 2008
Destination LOG_ARCHIVE_DEST_2 is UNSYNCHRONIZED
Thread 1 cannot allocate new log, sequence 828
Checkpoint not complete
Current log# 2 seq# 827 mem# 0: /oracle/PRDDb1/origlogA/redo02_01.log
Fri Oct 6 13:44:02 2008
Completed checkpoint up to RBA [0x339.2.10], SCN: 4295635
Fri Oct 6 13:44:03 2008
LGWR: Failed to archive log 2 thread 1 sequence 827 (16198)
Fri Oct 6 13:44:03 2008
LGWR: Closing remote archive destination LOG_ARCHIVE_DEST_2: 'STBDB1_DATAGUARD'
(error 16198)
(PRDDb1)
Fri Oct 6 13:44:03 2008
Errors in file /oracle/PRDDb1/oratrace/bdump/PRDDb1_lgwr_20228.trc:
ORA-16198: Timeout incurred on internal channel during remote archival
LGWR: Error 16198 closing archivelog file 'STBDB1_DATAGUARD'
LGWR: Error 16198 disconnecting from destination LOG_ARCHIVE_DEST_2 standby host
'STBDB1_DATAGUARD'
Beginning log switch checkpoint up to RBA [0x33c.2.10], SCN: 4342508
Thread 1 advanced to log sequence 828
Current log# 3 seq# 828 mem# 0: /oracle/PRDDb1/origlogA/redo03_01.log
```



```
Fri Oct 6 13:46:29 2008
Completed checkpoint up to RBA [0x33a.2.10], SCN: 4301306
Fri Oct 6 13:47:20 2008
Completed checkpoint up to RBA [0x33b.2.10], SCN: 4329458
Fri Oct 6 13:49:05 2008
Completed checkpoint up to RBA [0x33c.2.10], SCN: 4342508
Fri Oct 6 13:49:44 2008
FAL[server, ARC1]: Begin FAL archive (dbid 0 branch 598006431 thread 1 sequence 827
dest STBDB1_DATAGUARD)
Fri Oct 6 13:49:44 2008
FAL_TIMING: Archival of thread 1 sequence 827 completed in 0 second(s) using 1
connection(s).
FAL[server, ARC1]: Complete FAL archive (dbid 0 branch 598006431 thread 1 sequence
827 destination STBDB1_DATAGUARD)
LNSb started with pid=21, OS id=7157
Fri Oct 6 13:49:47 2008
Destination LOG_ARCHIVE_DEST_2 is SYNCHRONIZED
LGWR: Standby redo logfile selected for thread 1 sequence 829 for destination
LOG_ARCHIVE_DEST_2
Beginning log switch checkpoint up to RBA [0x33d.2.10], SCN: 4452168
Thread 1 advanced to log sequence 829
Current log# 4 seq# 829 mem# 0: /oracle/PRDDB1/origlogA/redo04_01.log
Fri Oct 6 13:49:47 2008
ARC0: LGWR is actively archiving destination LOG_ARCHIVE_DEST_2
ARC0: Standby redo logfile selected for thread 1 sequence 828 for destination
LOG_ARCHIVE_DEST_2
Fri Oct 6 13:52:59 2008
Completed checkpoint up to RBA [0x33d.2.10], SCN: 4452168
```

## 6.5 Flashback Database

Die Standby-Datenbank soll im Flashback Database Modus betrieben werden.

### 6.5.1 Flashback mit open read-only:

Auf der Primary Datenbank wird ein Schema angelegt (create user flashback\_test), eine Tabelle angelegt, 2 MIO Datensätze inserted und geprüft, ob es auf der Standby Datenbank vorhanden ist.

```
SQL> create user flashback_test identified by flashback_test ;

User created.

SQL> grant resource,create session to flashback_test;

Grant succeeded.

SQL> create table test (a number);

Table created.

SQL> insert into test values (1);

1 row created.

SQL> insert into test select * from test;

1 row created.
```

```
SQL> /

4 rows created.

SQL> /

8 rows created.

SQL> /

524288 rows created.

SQL> /

1048576 rows created.

SQL> commit;

SQL> select current_scn from v$database;

CURRENT_SCN
-----
      22180303

SQL> !date
Thu Oct 19 14:32:09 MESZ 2008

SQL> drop user flashback_test cascade;

User dropped.
```

**Dieser Zeitpunkt (SCN und timestamp) wird notiert. Danach wird es auf Primary gelöscht.**

**Dann wird die Standby-Datenbank mittels Flashback Database zum notierten Timestamp (oder SCN) zurückgesetzt und read-only geöffnet. Nun muss das Schema vorhanden sein.**

```
dgmgrl> EDIT DATABASE 'PRDDB1' SET STATE="LOG-TRANSPORT-OFF";

dgmgrl> disable configuration;

SQL> alter database recover managed standby database cancel;

SQL> flashback database to scn 22180303;
```

### alert\_STBDB1.log:

```
Thu Oct 19 14:38:01 2008
flashback database to scn 22180303
Thu Oct 19 14:38:01 2008
Flashback Restore Start
Flashback Restore Complete
Flashback Media Recovery Start
  parallel recovery started with 7 processes
Flashback Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_323_1_601822185.dbf
Thu Oct 19 14:38:04 2008
Incomplete Recovery applied until change 22180305
Flashback Media Recovery Complete

SQL> alter database open read only;

SQL> select count(*) from flashback_test.test;
```

```
COUNT (*)  
-----  
2097152
```

Anschließend muss die Datenbank wieder in den Mount-Status gesetzt werden, die DataGuard Broker Configuration enabled werden. Die Datenbank soll sich dann wieder synchronisieren.

```
SQL> shutdown immediate;  
SQL> startup mount;  
  
dgmgrl> enable configuration;  
  
dgmgrl> enable configuration;  
dgmgrl> EDIT DATABASE 'PRDD1' SET STATE="OLINE";
```

## 6.5.2 Flashback nach open read-write:

```
dgmgrl> EDIT DATABASE 'PRDD1' SET STATE="LOG-TRANSPORT-OFF";  
  
dgmgrl> disable configuration;  
  
SQL> alter database recover managed standby database cancel;  
  
SQL> create restore point t1 guarantee flashback database;  
  
SQL> alter database activate standby database;  
  
SQL> alter database open;
```

### alert\_STBDB1.log:

```
alter database recover managed standby database cancel  
Thu Oct 19 15:11:58 2008  
MRP0: Background Media Recovery cancelled with status 16037  
Thu Oct 19 15:11:58 2008  
Errors in file /oracle/STBDB1/oratrace/bdump/STBDB1_mrp0_27986.trc:  
ORA-16037: user requested cancel of managed recovery operation  
Managed Standby Recovery not using Real Time Apply  
Recovery interrupted!  
Thu Oct 19 15:12:01 2008  
Errors in file /oracle/STBDB1/oratrace/bdump/STBDB1_mrp0_27986.trc:  
ORA-16037: user requested cancel of managed recovery operation  
Thu Oct 19 15:12:01 2008  
MRP0: Background Media Recovery process shutdown (STBDB1)  
Thu Oct 19 15:12:01 2008  
Managed Standby Recovery Canceled (STBDB1)  
Thu Oct 19 15:12:01 2008  
Completed: alter database recover managed standby database cancel  
Created guaranteed restore point T1  
Thu Oct 19 15:12:25 2008  
alter database activate standby database  
Thu Oct 19 15:12:25 2008  
ALTER DATABASE ACTIVATE [PHYSICAL] STANDBY DATABASE (STBDB1)  
Thu Oct 19 15:12:27 2008  
RESETLOGS after incomplete recovery UNTIL CHANGE 22182378  
Resetting resetlogs activation ID 4114138455 (0xf538c557)  
Online log /oracle/STBDB1/origlogA/log_g1m1.log: Thread 1 Group 1 was previously  
cleared  
Online log /oracle/STBDB1/origlogA/log_g2m1.log: Thread 1 Group 2 was previously  
cleared
```

```
Online log /oracle/STBDB1/origlogA/log_g3m1.log: Thread 1 Group 3 was previously
cleared
Standby became primary SCN: 22182376
Thu Oct 19 15:12:27 2008
Setting recovery target incarnation to 2
Thu Oct 19 15:12:27 2008
Converting standby mount to primary mount.
Thu Oct 19 15:12:27 2008
ACTIVATE STANDBY: Complete - Database mounted as primary (STBDB1)
Completed: alter database activate standby database
Thu Oct 19 15:12:58 2008
ARC1: STARTING ARCH PROCESSES
ARC6: Archival started
ARC1: STARTING ARCH PROCESSES COMPLETE
ARC6 started with pid=33, OS id=4348
Thu Oct 19 15:13:20 2008
alter database open
```

**Zu diesem Zeitpunkt existieren zwei unabhängige Datenbanken. Die Primary Datenbank läuft unbeeinflusst weiter. Die Standby-Datenbank steht nun in read/write Modus zur Verfügung.**

```
SQL> create user flashback_test2 identified by test2;

User created.

SQL> shutdown immediate;
SQL> startup mount;
SQL> flashback database to restore point t1
SQL> alter database convert to physical standby;
```

## alert\_STBDB1.log:

```
Thu Oct 19 15:21:13 2008
flashback database to restore point t1
Thu Oct 19 15:21:14 2008
Flashback Restore Start
Flashback Restore Complete
Completed: flashback database to restore point t1
Thu Oct 19 15:21:32 2008
alter database convert to physical standby
Thu Oct 19 15:21:32 2008
ALTER DATABASE CONVERT TO PHYSICAL STANDBY (STBDB1)
Thu Oct 19 15:21:33 2008
The primary database controlfile was created using the
'MAXLOGFILES 16' clause.
There is space for up to 13 standby redo logfiles
Use the following SQL commands on the standby database to create
standby redo logfiles that match the primary database:
ALTER DATABASE ADD STANDBY LOGFILE 'sr11.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr12.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr13.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr14.f' SIZE 524288000;
Setting recovery target incarnation to 1
Completed: alter database convert to physical standby

SQL> shutdown immediate;
SQL> startup mount;

dgmgrl> enable configuration;
dgmgrl> EDIT DATABASE 'PRDDB1' SET STATE="OLINE";
```

## 7 Monitoring

### 7.1 Monitoring via SQL

```
select DATABASE_ROLE from v$database
select error,db_unique_name from v$archive_dest where target='STANDBY'
```

Wenn error = "", dann ok.

```
select count(*), severity from v$dataguard_status group by severity
```

```
SELECT PROCESS, CLIENT_PROCESS, SEQUENCE#, STATUS FROM V$MANAGED_STANDBY;
```

```
SELECT *
```

```
FROM V$ARCHIVE_DEST_STATUS where type = 'PHYSICAL'
```

```
SELECT SUM(DECODE(name, 'apply finish time', value, 0)) FOT,
SUM(DECODE(name, 'apply lag', value, 0)) LAG,
SUM(DECODE(name, 'transport lag', value, 0)) PDL
from (SELECT name,
extract(day from p.val) * 86400 +
extract(hour from p.val) * 3600 +
extract(minute from p.val) * 60 + extract(second from p.val) value
from (SELECT name, to_dsinterval(value) val from v$dataguard_stats) p)
```

```
SQL> SELECT PROTECTION_MODE, PROTECTION_LEVEL FROM V$DATABASE;
PROTECTION_MODE PROTECTION_LEVEL
```

### 7.2 Monitoring via DataGuard Broker

```
DGMGRL> show configuration;
```

Configuration

```
Name: MDECKER_DATAGUARD
Enabled: YES
Protection Mode: MaxPerformance
Fast-Start Failover: DISABLED
Databases:
PRDDB1 - Primary database
STBDB1 - Physical standby database
```

```
Current status for "MDECKER_DATAGUARD":
```

**SUCCESS**

```
DGMGRL> show database verbose 'PRDDB1'
```

Database

```
Name: PRDDB1
Role: PRIMARY
Enabled: YES
Intended State: ONLINE
Instance(s):
PRDDB1
```

Properties:

```
InitialConnectIdentifier = 'PRDDB1_dataguard'
LogXptMode = 'SYNC'
Dependency = ''
DelayMins = '0'
Binding = 'OPTIONAL'
```

```

MaxFailure                = '0'
MaxConnections            = '1'
ReopenSecs                = '300'
NetTimeout                = '10'
LogShipping               = 'ON'
PreferredApplyInstance    = ''
ApplyInstanceTimeout      = '0'
ApplyParallel             = 'AUTO'
StandbyFileManagement     = 'auto'
ArchiveLagTarget          = '0'
LogArchiveMaxProcesses    = '6'
LogArchiveMinSucceedDest  = '1'
DbFileNameConvert         = '/oracle/PRDDb1/oradata/,
/oracle/STBDB1/oradata/'
LogFileNamesConvert       = '/oracle/PRDDb1/, /oracle/STBDB1/'
FastStartFailoverTarget   = ''
StatusReport              = '(monitor)'
InconsistentProperties     = '(monitor)'
InconsistentLogXptProps   = '(monitor)'
SendQEntries              = '(monitor)'
LogXptStatus              = '(monitor)'
RecvQEntries              = '(monitor)'
HostName                  = 'dbhost1'
SidName                   = 'PRDDb1'
LocalListenerAddress       = ''
'(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.1) (PORT=1521))'
StandbyArchiveLocation    = '/oracle/PRDDb1/oraarch'
AlternateLocation          = ''
LogArchiveTrace           = '0'
LogArchiveFormat          = 'PRDDb1arch_%s_%t_%r.dbf'
LatestLog                 = '(monitor)'
TopWaitEvents             = '(monitor)'

```

Current status for "PRDDb1":  
**SUCCESS**

## Check der Standby:

```
DGMGRL> show database verbose 'STBDB1';
```

```

Database
Name:          STBDB1
Role:          PHYSICAL STANDBY
Enabled:       YES
Intended State: ONLINE
Instance(s):
  STBDB1

Properties:
InitialConnectIdentifier = 'STBDB1_dataguard'
LogXptMode              = 'SYNC'
Dependency              = ''
DelayMins               = '0'
Binding                 = 'OPTIONAL'
MaxFailure              = '0'
MaxConnections          = '1'
ReopenSecs              = '300'
NetTimeout              = '10'
LogShipping             = 'ON'
PreferredApplyInstance  = ''
ApplyInstanceTimeout    = '0'
ApplyParallel           = 'AUTO'
StandbyFileManagement   = 'AUTO'
ArchiveLagTarget        = '0'
LogArchiveMaxProcesses  = '6'
LogArchiveMinSucceedDest = '1'
DbFileNameConvert       = ''
'/oracle/PRDDb1/oradata/,/oracle/STBDB1/oradata/'
LogFileNamesConvert     = '/oracle/PRDDb1/, /oracle/STBDB1/'
FastStartFailoverTarget = ''
StatusReport            = '(monitor)'
InconsistentProperties   = '(monitor)'
InconsistentLogXptProps = '(monitor)'
SendQEntries            = '(monitor)'
LogXptStatus            = '(monitor)'

```

```

RecvQEntries           = '(monitor)'
HostName               = 'dbhost2'
SidName                = 'STBDB1'
LocalListenerAddress  =
'(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.2) (PORT=1521))'
StandbyArchiveLocation = '/oracle/STBDB1/oraarch/'
AlternateLocation     = ''
LogArchiveTrace       = '0'
LogArchiveFormat      = 'STBDB1arch_%s_%t_%r.dbf'
LatestLog             = '(monitor)'
TopWaitEvents         = '(monitor)'

```

Current status for "STBDB1":

**SUCCESS**

```
DGMGRL> show database 'PRDDDB1' 'StatusReport';
```

```

STATUS REPORT
  INSTANCE_NAME  SEVERITY ERROR_TEXT

```

```
DGMGRL> show database 'PRDDDB1' 'StatusReport';
```

```

STATUS REPORT
  INSTANCE_NAME  SEVERITY ERROR_TEXT

```

```
DGMGRL> show database 'STBDB1' 'StatusReport';
```

```

STATUS REPORT
  INSTANCE_NAME  SEVERITY ERROR_TEXT

```

```
DGMGRL> show database 'PRDDDB1' 'LogXptStatus';
```

```

LOG TRANSPORT STATUS
PRIMARY_INSTANCE_NAME  STANDBY_DATABASE_NAME  STATUS
      PRDDDB1                STBDB1

```

```
DGMGRL> show database 'PRDDDB1' 'InconsistentProperties';
```

```

INCONSISTENT PROPERTIES
  INSTANCE_NAME  PROPERTY_NAME  MEMORY_VALUE  SPFILE_VALUE
BROKER_VALUE

```

```
DGMGRL> show database 'STBDB1' 'InconsistentProperties';
```

```

INCONSISTENT PROPERTIES
  INSTANCE_NAME  PROPERTY_NAME  MEMORY_VALUE  SPFILE_VALUE
BROKER_VALUE

```

```
DGMGRL> show database 'PRDDDB1' 'InconsistentLogXptProps';
```

```

INCONSISTENT LOG TRANSPORT PROPERTIES
  INSTANCE_NAME  STANDBY_NAME  PROPERTY_NAME  MEMORY_VALUE
BROKER_VALUE

```

## 7.3 Monitoring via Enterprise Manager

Primary:

Auf Primary-Seite kann die Metric "DataGuard Status" ermittelt werden.

Standby:

Neben DataGuard Status stehen auf Standby-Seite noch folgende Metriken zur Verfügung:

- Apply Lag (Warning: 60 Seconds, Critical 120 Seconds)
- Transport Lag (Warning: 60 Seconds, Critical 120 Seconds)
- Prozessüberwachung auf MRP Prozess

## 8 Switchover Konzept

Um den Switchover für die Application-Server und andere Clients so transparent wie möglich zu machen, ist folgende Methode empfohlen:

- beide Hosts (primary: dbhost1.intra, standby: dbhost2.intra) verfügen über Application Listener, die jeweils auf die VIP horchen (primary: PRDDB1.intra, standby: STBDB1.intra)
- init.ora: remote\_listener wird auf Primary konfiguriert, damit auch der standby listener weiss, dass die Primary auf PRDDB1 läuft.
- der TNS Eintrag der Clients soll so aussehen:

```
PRDDB1 =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS =(PROTOCOL = TCP) (Host = PRDDB1.intra) (Port = 1521))
      (ADDRESS =(PROTOCOL = TCP) (Host = STBDB1.intra) (Port = 1521))
      (LOAD_BALANCE = NO)
      (FAILOVER = YES)
    )
    (CONNECT_DATA =
      (SERVICE_NAME = PRDDB1)
    )
  )
```

- in client sqlnet.ora soll eingetragen werden:

```
SQLNET.OUTBOUND_CONNECT_TIMEOUT=5
```

- Achtung: Bug 5549203 (fixed in 10.2.0.4)

[http://www.trivadis.com/uploads/tx\\_cabagdownloadarea/TimoutsDataGuard\\_070826.pdf](http://www.trivadis.com/uploads/tx_cabagdownloadarea/TimoutsDataGuard_070826.pdf)

## 9 Switchover ohne Broker

Primary:

**Step 1 Verify it is possible to perform a switchover.**

```
SQL> SELECT SWITCHOVER_STATUS FROM V$DATABASE;
```

```
SWITCHOVER_STATUS
-----
SESSIONS ACTIVE
```

```
alter system set job_queue_processes = 0;
```

```
SQL> SELECT SWITCHOVER_STATUS FROM V$DATABASE;
```

```
SWITCHOVER_STATUS
-----
TO STANDBY
```

**Step 2 Initiate the switchover on the primary database.**

```
SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY;
```

```
Database altered.
```

**Step 3 Shut down and restart the former primary instance.**



```
SQL> SHUTDOWN IMMEDIATE;
ORA-01507: database not mounted
```

```
ORACLE instance shut down.
SQL> STARTUP MOUNT;
ORACLE instance started.
```

```
Total System Global Area 1073741824 bytes
Fixed Size                  2076688 bytes
Variable Size               293605360 bytes
Database Buffers            771751936 bytes
Redo Buffers                 6307840 bytes
Database mounted.
SQL>
```

#### Step 4 Verify the switchover status in the V\$DATABASE view on former standby.

```
SQL> SELECT SWITCHOVER_STATUS FROM V$DATABASE;

SWITCHOVER_STATUS
-----
TO PRIMARY
```

#### Step 5 Switch the target physical standby database role to the primary role.

```
SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY;

Database altered.
```

#### Step 6 Finish the transition of the standby database to the primary role.

```
SQL> ALTER DATABASE OPEN;

Database altered.
```

#### Step 7 If necessary, restart log apply services on the standby databases.

```
SQL> alter database recover managed standby database using current logfile
disconnect from session parallel 4
```

#### Step 8 Begin sending redo data to the standby databases.

```
SQL> ALTER SYSTEM SWITCH LOGFILE;
```

## 10 Switchover via Broker

### 10.1 PRDDB1 -> STBDB1

Es gab einige Probleme beim ersten Switchover-Versuch

```
DGMGRL> switchover to 'STBDB1';
Performing switchover NOW, please wait...
Operation requires shutdown of instance "PRDDB1" on database "PRDDB1"
Shutting down instance "PRDDB1"...
ORA-01017: invalid username/password; logon denied
```

**You are no longer connected to ORACLE**

```
Please connect again.
Unable to shut down instance "PRDDB1"
You must shut down instance "PRDDB1" manually
Operation requires shutdown of instance "STBDB1" on database "STBDB1"
You must shut down instance "STBDB1" manually
Operation requires startup of instance "PRDDB1" on database "PRDDB1"
You must start instance "PRDDB1" manually
Operation requires startup of instance "STBDB1" on database "STBDB1"
```

```
You must start instance "STBDB1" manually
Switchover succeeded, new primary is "STBDB1"
DGMGRL>
```

Der init.ora Parameter „REMOTE\_LOGIN\_PASSWORDFILE=EXCLUSIVE“ war auf der Primary Datenbank nicht gesetzt. Zusätzlich sollte der dgmgrl Connect immer zur Primary gemacht werden mit dem korrekten Passwort, allerdings ohne den String „as sysdba“

```
dgmgrl> connect sys;
Password:
```

Das zweite Problem bezog sich auf den init.ora Parameter standby\_archive\_dest. Auf der Primary Database war dieser Parameter nicht gesetzt. Das hat zur Folge, dass die PRDDB1 als Standby Role die Archivelogs ins \$ORACLE\_HOME/dbs abgelegt werden.

```
Media Recovery Log
/oracle/PRDDB1/10.2.0/dbs/dgsby_PRDDB1PRDDB1arch_290_1_601822185.dbf
Media Recovery Log
/oracle/PRDDB1/10.2.0/dbs/dgsby_PRDDB1PRDDB1arch_292_1_601822185.dbf
```

Der init.ora Parameter „standby\_archive\_dest‘ sollte auf /oracle/PRDDB1/oraarch gesetzt sein bevor die Broker Configuration erstellt wird.

Hier ist ein erfolgreicher Switchover dokumentiert:

```
dgmgrl> connect sys # connect zur Primary
Password:
```

```
DGMGRL> show configuration;
```

```
Configuration
Name:          mdecker_dataguard
Enabled:       YES
Protection Mode: MaxPerformance
Fast-Start Failover: DISABLED
Databases:
  PRDDB1 - Physical standby database
  STBDB1 - Primary database
```

```
Current status for "mdecker_dataguard":
SUCCESS
```

## Check der Primary

```
DGMGRL> show database verbose 'PRDDB1';
```

```
Database
Name:          PRDDB1
Role:          PRIMARY
Enabled:       YES
Intended State: ONLINE
Instance(s):
  PRDDB1

Properties:
  InitialConnectIdentifier      = 'PRDDB1_dataguard'
  LogXptMode                   = 'SYNC'
  Dependency                   = ''
  DelayMins                    = '0'
  Binding                      = 'OPTIONAL'
  MaxFailure                   = '0'
  MaxConnections               = '1'
  ReopenSecs                   = '300'
  NetTimeout                   = '10'
  LogShipping                   = 'ON'
  PreferredApplyInstance       = ''
  ApplyInstanceTimeout         = '0'
  ApplyParallel                = 'AUTO'
  StandbyFileManagement        = 'auto'
  ArchiveLagTarget             = '0'
  LogArchiveMaxProcesses       = '6'
```

```

LogArchiveMinSucceedDest      = '1'
DbFileNameConvert            = '/oracle/PRDDB1/oradata/,
/oracle/STBDB1/oradata/'
LogFileNamesConvert          = '/oracle/PRDDB1/, /oracle/STBDB1/'
FastStartFailoverTarget      = ''
StatusReport                 = '(monitor)'
InconsistentProperties        = '(monitor)'
InconsistentLogXptProps      = '(monitor)'
SendQEntries                 = '(monitor)'
LogXptStatus                 = '(monitor)'
RecvQEntries                 = '(monitor)'
HostName                     = 'dbhost1'
SidName                      = 'PRDDB1'
LocalListenerAddress         =
'(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.1) (PORT=1521))'
StandbyArchiveLocation       = '/oracle/PRDDB1/oraarch/'
AlternateLocation            = ''
LogArchiveTrace              = '0'
LogArchiveFormat             = 'PRDDB1arch_%s_%t_%r.dbf'
LatestLog                   = '(monitor)'
TopWaitEvents                = '(monitor)'

```

```

Current status for "PRDDB1":
show database verbose 'PRDDB1';
SUCCESS

```

## Check der Standby:

```
DGMGRL> show database verbose 'STBDB1';
```

### Database

```

Name:          STBDB1
Role:          PHYSICAL STANDBY
Enabled:       YES
Intended State: ONLINE
Instance(s):
  STBDB1

```

### Properties:

```

InitialConnectIdentifier      = 'STBDB1_dataguard'
LogXptMode                    = 'SYNC'
Dependency                    = ''
DelayMins                     = '0'
Binding                       = 'OPTIONAL'
MaxFailure                    = '0'
MaxConnections                = '1'
ReopenSecs                    = '300'
NetTimeout                    = '10'
LogShipping                   = 'ON'
PreferredApplyInstance        = ''
ApplyInstanceTimeout          = '0'
ApplyParallel                 = 'AUTO'
StandbyFileManagement         = 'AUTO'
ArchiveLagTarget              = '0'
LogArchiveMaxProcesses        = '6'
LogArchiveMinSucceedDest      = '1'
DbFileNameConvert            = '/oracle/STBDB1/oradata/,
/oracle/PRDDB1/oradata/'
LogFileNamesConvert          = '/oracle/PRDDB1/, /oracle/STBDB1/'
FastStartFailoverTarget      = ''
StatusReport                 = '(monitor)'
InconsistentProperties        = '(monitor)'
InconsistentLogXptProps      = '(monitor)'
SendQEntries                 = '(monitor)'
LogXptStatus                 = '(monitor)'
RecvQEntries                 = '(monitor)'
HostName                     = 'dbhost2'
SidName                      = 'STBDB1'
LocalListenerAddress         =
'(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.2) (PORT=1521))'
StandbyArchiveLocation       = '/oracle/STBDB1/oraarch/'
AlternateLocation            = ''
LogArchiveTrace              = '0'
LogArchiveFormat             = 'STBDB1arch_%s_%t_%r.dbf'
LatestLog                   = '(monitor)'

```

```
TopWaitEvents = '(monitor)'
```

```
Current status for "STBDB1":  
SUCCESS
```

## auf neuer Primary:

```
alter system set db_block_checking = TRUE;
```

## auf neuer Standby:

```
alter system set db_block_checking = FALSE;
```

```
DGMGRL> switchover to 'STBDB1'  
Performing switchover NOW, please wait...  
Operation requires shutdown of instance "PRDDB1" on database "PRDDB1"  
Shutting down instance "PRDDB1"...  
ORA-01109: database not open
```

```
Database dismounted.  
ORACLE instance shut down.  
Operation requires shutdown of instance "STBDB1" on database "STBDB1"  
Shutting down instance "STBDB1"...  
ORA-01109: database not open
```

```
Database dismounted.  
ORACLE instance shut down.  
Operation requires startup of instance "PRDDB1" on database "PRDDB1"  
Starting instance "PRDDB1"...  
ORACLE instance started.  
Database mounted.  
Operation requires startup of instance "STBDB1" on database "STBDB1"  
Starting instance "STBDB1"...  
ORACLE instance started.  
Database mounted.  
Switchover succeeded, new primary is "STBDB1"
```

```
alert_PRDDB1.log:
```

```
ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY WITH SESSION SHUTDOWN  
Thu Oct 19 13:54:05 2008  
ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY (PRDDB1)  
*****  
LGWR: Resetting 'active' archival for destination LOG_ARCHIVE_DEST_2  
*****  
Thu Oct 19 13:54:09 2008  
Destination LOG_ARCHIVE_DEST_2 no longer supports SYNCHRONIZATION  
Beginning log switch checkpoint up to RBA [0x137.2.10], SCN: 22174421  
Thread 1 advanced to log sequence 311  
Current log# 3 seq# 311 mem# 0: /oracle/PRDDB1/origlogA/log_g3m1.log  
Thu Oct 19 13:54:09 2008  
Stopping background process CJQ0  
Thu Oct 19 13:54:09 2008  
SMON: disabling tx recovery  
Thu Oct 19 13:54:09 2008  
Stopping background process QMNC  
Thu Oct 19 13:54:11 2008  
Stopping Job queue slave processes  
Thu Oct 19 13:54:11 2008  
Job queue slave processes stopped  
Thu Oct 19 13:54:11 2008  
Completed checkpoint up to RBA [0x137.2.10], SCN: 22174421  
Completed checkpoint up to RBA [0x136.2.10], SCN: 22174418  
Thu Oct 19 13:54:13 2008  
All dispatchers and shared servers shutdown  
Active process 13033 user 'oraclep' program 'oracle@dbhost1 (TNS V1-V3)'
```

```
Active process 10714 user 'oraclep' program 'oraclePRDDB1@dbhost1'
CLOSE: waiting for server sessions to complete.
Thu Oct 19 13:54:28 2008
CLOSE: all sessions shutdown successfully.
Thu Oct 19 13:54:28 2008
SMON: disabling cache recovery
Thu Oct 19 13:54:28 2008
Shutting down archive processes
Archiving is disabled
Thu Oct 19 13:54:33 2008
ARCH shutting down
ARC5: Archival stopped
Thu Oct 19 13:54:38 2008
ARCH shutting down
ARC4: Archival stopped
Thu Oct 19 13:54:43 2008
ARCH shutting down
ARC3: Archival stopped
Thu Oct 19 13:54:48 2008
ARCH shutting down
ARC2: Archival stopped
Thu Oct 19 13:54:53 2008
RCH shutting down
ARC1: Archival stopped
Thu Oct 19 13:54:58 2008
ARCH shutting down
ARC0: Archival stopped
Thu Oct 19 13:54:59 2008
Thread 1 closed at log sequence 311
Successful close of redo thread 1
Thu Oct 19 13:54:59 2008
ARCH: Noswitch archival of thread 1, sequence 311
ARCH: End-Of-Redo Branch archival of thread 1 sequence 311
ARCH: Archiving is disabled due to current logfile archival
Clearing standby activation ID 4114114464 (0xf53867a0)
The primary database controlfile was created using the
'MAXLOGFILES 16' clause.
There is space for up to 13 standby redo logfiles
Use the following SQL commands on the standby database to create
standby redo logfiles that match the primary database:
ALTER DATABASE ADD STANDBY LOGFILE 'sr11.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr12.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr13.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr14.f' SIZE 524288000;
Archivelog for thread 1 sequence 311 required for standby recovery
MRP0 started with pid=17, OS id=16056
Thu Oct 19 13:55:00 2008
MRP0: Background Managed Standby Recovery process started (PRDDB1)
Managed Standby Recovery not using Real Time Apply
parallel recovery started with 7 processes
Online logfile pre-clearing operation disabled by switchover
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_311_1_601822185.dbf
Identified End-Of-Redo for thread 1 sequence 311
Thu Oct 19 13:55:07 2008
Media Recovery End-Of-Redo indicator encountered
Thu Oct 19 13:55:07 2008
Media Recovery Applied until change 22174440
Thu Oct 19 13:55:07 2008
MRP0: Media Recovery Complete: End-Of-REDO (PRDDB1)
Resetting standby activation ID 4114114464 (0xf53867a0)
Thu Oct 19 13:55:10 2008
MRP0: Background Media Recovery process shutdown (PRDDB1)
Thu Oct 19 13:55:11 2008
Switchover: Complete - Database shutdown required (PRDDB1)
Thu Oct 19 13:55:11 2008
Completed: ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY WITH SESSION
SHUTDOWN
Using STANDBY_ARCHIVE_DEST parameter default value as ?/dbs/arch
```

```

Thu Oct 19 13:55:11 2008
ALTER SYSTEM SET log_archive_dest_2='' SCOPE=BOTH;
Thu Oct 19 13:55:11 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH;
Thu Oct 19 13:55:58 2008
idle dispatcher 'D000' terminated, pid = (20, 1)
Thu Oct 19 14:00:05 2008
WARNING: inbound connection timed out (ORA-3136)
Thu Oct 19 14:03:43 2008
Shutting down instance: further logons disabled
Thu Oct 19 14:03:43 2008
Shutting down instance: further logons disabled
Thu Oct 19 14:03:43 2008
Stopping background process MMNL
Thu Oct 19 14:03:44 2008
Stopping background process MMON
Thu Oct 19 14:03:45 2008
Shutting down instance (immediate)
License high water mark = 8
Waiting for dispatcher 'D000' to shutdown
All dispatchers and shared servers shutdown
Thu Oct 19 14:03:52 2008
ALTER DATABASE CLOSE NORMAL
ORA-1109 signalled during: ALTER DATABASE CLOSE NORMAL...
Thu Oct 19 14:03:52 2008
ALTER DATABASE DISMOUNT
Completed: ALTER DATABASE DISMOUNT
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Shutting down Data Guard Broker processes
Thu Oct 19 14:03:56 2008
Completed: Data Guard Broker shutdown
Thu Oct 19 14:03:57 2008
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Thu Oct 19 14:05:39 2008
Starting ORACLE instance (normal)
LICENSE_MAX_SESSION = 0
LICENSE_SESSIONS_WARNING = 0
Picked latch-free SCN scheme 3
Autotune of undo retention is turned on.
IMODE=BR
ILAT =121
LICENSE_MAX_USERS = 0
SYS auditing is disabled
My pid is 22272, priority is -179, running with SCHED_NOAGE policy 8.
ksdpec: called for event 13740 prior to event group initialization
Starting up ORACLE RDBMS Version: 10.2.0.2.0.
System parameters with non-default values:
  processes                = 1000
  sessions                  = 1105
  __shared_pool_size        = 2231369728
  __large_pool_size         = 16777216
  __java_pool_size          = 16777216
  __streams_pool_size       = 0
  sga_target                 = 19327352832
  control_files              = /oracle/PRDDB1/origlogA/control01.ctl,
/oracle/PRDDB1/origlogB/control02.ctl
  db_file_name_convert       = /oracle/PRDDB1/oradata/, /oracle/STBDB1/oradata/
  log_file_name_convert     = /oracle/PRDDB1/, /oracle/STBDB1/
  db_block_size              = 8192
  __db_cache_size           = 17045651456
  db_writer_processes        = 8
  compatible                 = 10.2.0.2

```

```

log_archive_config          = dg_config=(PRDDB1,STBDB1)
log_archive_dest_1         = location="/oracle/PRDDB1/oraarch/",
valid_for=(ONLINE_LOGFILE,ALL_ROLES)
log_archive_dest_2         =
log_archive_dest_state_1   = ENABLE
log_archive_dest_state_2   = ENABLE
log_archive_max_processes  = 6
log_archive_min_succeed_dest= 1
standby_archive_dest       =
log_archive_trace          = 0
log_archive_format         = PRDDB1arch_%s_%t_%r.dbf
fal_client                 = PRDDB1_DATAGUARD
fal_server                 = STBDB1_DATAGUARD
archive_lag_target         = 0
db_file_multiblock_read_count= 16
standby_file_management    = auto
fast_start_mttr_target     = 600
log_checkpoints_to_alert   = TRUE
recovery_parallelism       = 16
undo_management            = AUTO
undo_tablespace            = UNDOTBS1
undo_retention              = 10800
fast_start_parallel_rollback= HIGH
remote_login_passwordfile= EXCLUSIVE
db_domain                  =
dispatchers                = (PROTOCOL=TCP) (SERVICE=PRDDB1XDB)
local_listener             = LISTENER_DATAGUARD_PRDDB1
job_queue_processes        = 10
parallel_max_servers       = 100
parallel_execution_message_size= 4096
background_dump_dest       = /oracle/PRDDB1/oratrace/bdump
user_dump_dest             = /oracle/PRDDB1/oratrace/udump
core_dump_dest             = /oracle/PRDDB1/oratrace/cdump
hpux_sched_noage          = 178
db_name                    = PRDDB1
db_unique_name             = PRDDB1
open_cursors               = 1000
os_authent_prefix          =
optimizer_index_cost_adj   = 1
query_rewrite_enabled      = FALSE
pga_aggregate_target       = 6442450944
dg_broker_start            = TRUE
PMON started with pid=2, OS id=22274
PSP0 started with pid=3, OS id=22298
MMAN started with pid=4, OS id=22300
DBW0 started with pid=5, OS id=22302
DBW1 started with pid=6, OS id=22304
DBW2 started with pid=7, OS id=22306
DBW3 started with pid=8, OS id=22317
DBW4 started with pid=9, OS id=22373
DBW5 started with pid=10, OS id=22453
DBW6 started with pid=11, OS id=22485
DBW7 started with pid=12, OS id=22487
LGWR started with pid=13, OS id=22489
CKPT started with pid=14, OS id=22491
SMON started with pid=15, OS id=22493
RECO started with pid=16, OS id=22495
CJQ0 started with pid=17, OS id=22497
MMON started with pid=18, OS id=22499
Thu Oct 19 14:05:48 2008
starting up 1 dispatcher(s) for network address
'(ADDRESS=(PARTIAL=YES)(PROTOCOL=TCP))'...
MMNL started with pid=19, OS id=22501
Thu Oct 19 14:05:48 2008
starting up 1 shared server(s) ...
DMON started with pid=22, OS id=22530
Thu Oct 19 14:05:49 2008
ALTER DATABASE MOUNT

```

```
Thu Oct 19 14:05:53 2008
Setting recovery target incarnation to 1
ARCH: STARTING ARCH PROCESSES
ARC0 started with pid=24, OS id=22539
ARC1 started with pid=25, OS id=22541
ARC2 started with pid=26, OS id=22543
ARC3 started with pid=27, OS id=22545
ARC4 started with pid=28, OS id=22548
Thu Oct 19 14:05:55 2008
ARC0: Archival started
ARC1: Archival started
ARC2: Archival started
ARC3: Archival started
ARC4: Archival started
ARC5: Archival started
ARCH: STARTING ARCH PROCESSES COMPLETE
Thu Oct 19 14:05:55 2008
ARC4: Becoming the 'no FAL' ARCH
ARC4: Becoming the 'no SRL' ARCH
ARC4: Thread not mounted
ARC5 started with pid=29, OS id=22550
Thu Oct 19 14:05:55 2008
ARC1: Becoming the heartbeat ARCH
Thu Oct 19 14:05:55 2008
ARC1: Thread not mounted
Thu Oct 19 14:05:55 2008
ARC5: Thread not mounted
Thu Oct 19 14:05:55 2008
ARC2: Thread not mounted
Thu Oct 19 14:05:55 2008
ARC3: Thread not mounted
Thu Oct 19 14:05:55 2008
ARC0: Thread not mounted
Thu Oct 19 14:05:55 2008
Successful mount of redo thread 1, with mount id 4114133629
Thu Oct 19 14:05:55 2008
Physical Standby Database mounted.
Completed: ALTER DATABASE MOUNT
Thu Oct 19 14:05:57 2008
Starting Data Guard Broker (DMON)
NSV1 started with pid=30, OS id=22557
INSV started with pid=33, OS id=22662
RSM0 started with pid=31, OS id=22816
Using STANDBY_ARCHIVE_DEST parameter default value as ?/dbs/arch
Thu Oct 19 14:07:15 2008
ALTER SYSTEM SET
log_archive_dest_1='location="/oracle/PRDDb1/oraarch/"',valid_for=(ALL_LOGFILES,AL
L_ROLES)' SCOPE=BOTH SID='PRDDb1';
Thu Oct 19 14:07:15 2008
ALTER SYSTEM SET log_archive_dest_state_1='ENABLE' SCOPE=BOTH SID='PRDDb1';
Thu Oct 19 14:07:15 2008
ALTER SYSTEM SET standby_archive_dest='/oracle/PRDDb1/oraarch/' SCOPE=BOTH
SID='PRDDb1';
Thu Oct 19 14:07:15 2008
ALTER SYSTEM SET log_archive_trace=0 SCOPE=BOTH SID='PRDDb1';
Thu Oct 19 14:07:15 2008
ALTER SYSTEM SET log_archive_format='PRDDb1arch_%s_%t_%r.dbf' SCOPE=SPFILE
SID='PRDDb1';
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET standby_file_management='auto' SCOPE=BOTH SID='*';
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET archive_lag_target=0 SCOPE=BOTH SID='*';
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET log_archive_max_processes=6 SCOPE=BOTH SID='*';
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET log_archive_min_succeed_dest=1 SCOPE=BOTH SID='*';
Thu Oct 19 14:07:16 2008
```



```
ALTER SYSTEM SET
db_file_name_convert='/oracle/PRDDB1/oradata/', '/oracle/STBDB1/oradata/'
SCOPE=SPFILE;
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET log_file_name_convert='/oracle/PRDDB1/', '/oracle/STBDB1/'
SCOPE=SPFILE;
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET
fal_server='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.2)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=STBDB1_XPT)(SERVER=dedicated)))' SCOPE=BOTH;
Thu Oct 19 14:07:16 2008
ALTER SYSTEM SET
fal_client='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.1)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=PRDDB1_XPT)(INSTANCE_NAME=PRDDB1)(SERVER=dedicated)))' SCOPE=BOTH;
Thu Oct 19 14:07:16 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE THROUGH ALL SWITCHOVER DISCONNECT
USING CURRENT LOGFILE
Thu Oct 19 14:07:16 2008
Attempt to start background Managed Standby Recovery process (PRDDB1)
MRP0 started with pid=34, OS id=22820
Thu Oct 19 14:07:16 2008
MRP0: Background Managed Standby Recovery process started (PRDDB1)
Managed Standby Recovery starting Real Time Apply
  parallel recovery started with 7 processes
Clearing online redo logfile 1 /oracle/PRDDB1/origlogA/log_g1m1.log
Clearing online log 1 of thread 1 sequence number 309
Thu Oct 19 14:07:24 2008
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE THROUGH ALL SWITCHOVER
DISCONNECT USING CURRENT LOGFILE
Thu Oct 19 14:07:27 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[1]: Assigned to RFS process 22858
RFS[1]: Identified database type as 'physical standby'
Thu Oct 19 14:07:27 2008
RFS LogMiner: Client disabled from further notification
Thu Oct 19 14:07:28 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[2]: Assigned to RFS process 22860
RFS[2]: Identified database type as 'physical standby'
Thu Oct 19 14:07:28 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[3]: Assigned to RFS process 22862
RFS[3]: Identified database type as 'physical standby'
Thu Oct 19 14:07:28 2008
RFS[2]: Archived Log: '/oracle/PRDDB1/oraarch/PRDDB1arch_312_1_601822185.dbf'
Thu Oct 19 14:07:28 2008
RFS[3]: Archived Log: '/oracle/PRDDB1/oraarch/PRDDB1arch_313_1_601822185.dbf'
Thu Oct 19 14:07:30 2008
Clearing online redo logfile 1 complete
Clearing online redo logfile 2 /oracle/PRDDB1/origlogA/log_g2m1.log
Clearing online log 2 of thread 1 sequence number 314
Thu Oct 19 14:07:31 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[4]: Assigned to RFS process 22889
RFS[4]: Identified database type as 'physical standby'
Primary database is in MAXIMUM PERFORMANCE mode
Primary database is in MAXIMUM PERFORMANCE mode
RFS[4]: Successfully opened standby log 4: '/oracle/PRDDB1/origlogA/log_g4m1.log'
Thu Oct 19 14:07:32 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[5]: Assigned to RFS process 22894
RFS[5]: Identified database type as 'physical standby'
```

```
RFS[5]: Successfully opened standby log 5: '/oracle/PRDDB1/origlogA/log_g5m1.log'
Thu Oct 19 14:07:36 2008
Clearing online redo logfile 2 complete
Clearing online redo logfile 3 /oracle/PRDDB1/origlogA/log_g3m1.log
Clearing online log 3 of thread 1 sequence number 315
Clearing online redo logfile 3 complete
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_312_1_601822185.dbf
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_313_1_601822185.dbf
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_314_1_601822185.dbf
Media Recovery Waiting for thread 1 sequence 315 (in transit)
Thu Oct 19 14:07:42 2008
Recovery of Online Redo Log: Thread 1 Group 4 Seq 315 Reading mem 0
  Mem# 0 errs 0: /oracle/PRDDB1/origlogA/log_g4m1.log
```

#### alert\_STBDB1.log:

```
Thu Oct 19 13:54:04 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[7]: Successfully opened standby log 4: '/oracle/STBDB1/origlogA/log_g4m1.log'
Thu Oct 19 13:54:04 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_309_1_601822185.dbf
Media Recovery Waiting for thread 1 sequence 310 (in transit)
Thu Oct 19 13:54:05 2008
Recovery of Online Redo Log: Thread 1 Group 4 Seq 310 Reading mem 0
  Mem# 0 errs 0: /oracle/STBDB1/origlogA/log_g4m1.log
Media Recovery Waiting for thread 1 sequence 311
Thu Oct 19 13:54:20 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[9]: Assigned to RFS process 6305
RFS[9]: Identified database type as 'physical standby'
Thu Oct 19 13:54:59 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[10]: Assigned to RFS process 6380
RFS[10]: Identified database type as 'physical standby'
RFS[10]: Archived Log: '/oracle/STBDB1/oraarch/STBDB1arch_311_1_601822185.dbf'
Thu Oct 19 13:55:01 2008
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_311_1_601822185.dbf
Identified End-Of-Redo for thread 1 sequence 311
Thu Oct 19 13:55:01 2008
Media Recovery End-Of-Redo indicator encountered
Thu Oct 19 13:55:01 2008
Media Recovery Continuing
Media Recovery Waiting for thread 1 sequence 312
Thu Oct 19 13:55:11 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL
Thu Oct 19 13:55:16 2008
MRP0: Background Media Recovery cancelled with status 16037
Thu Oct 19 13:55:16 2008
Errors in file /oracle/STBDB1/oratrace/bdump/STBDB1_mrp0_2454.trc:
ORA-16037: user requested cancel of managed recovery operation
Managed Standby Recovery not using Real Time Apply
Recovery interrupted!
Thu Oct 19 13:55:18 2008
Errors in file /oracle/STBDB1/oratrace/bdump/STBDB1_mrp0_2454.trc:
ORA-16037: user requested cancel of managed recovery operation
Thu Oct 19 13:55:18 2008
MRP0: Background Media Recovery process shutdown (STBDB1)
Thu Oct 19 13:55:18 2008
Managed Standby Recovery Canceled (STBDB1)
Thu Oct 19 13:55:18 2008
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL
Thu Oct 19 13:55:18 2008
ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WAIT WITH SESSION SHUTDOWN
Thu Oct 19 13:55:18 2008
ALTER DATABASE SWITCHOVER TO PRIMARY (STBDB1)
```

```
If media recovery active, switchover will wait 900 seconds
SwitchOver after complete recovery through change 22174440
Online log /oracle/STBDB1/origlogA/log_g1m1.log: Thread 1 Group 1 was previously
cleared
Online log /oracle/STBDB1/origlogA/log_g2m1.log: Thread 1 Group 2 was previously
cleared
Online log /oracle/STBDB1/origlogA/log_g3m1.log: Thread 1 Group 3 was previously
cleared
Standby became primary SCN: 22174438
Converting standby mount to primary mount.
Thu Oct 19 13:55:18 2008
Switchover: Complete - Database mounted as primary (STBDB1)
Completed: ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WAIT WITH SESSION
SHUTDOWN
Thu Oct 19 13:55:18 2008
ARC2: STARTING ARCH PROCESSES
ARC6: Archival started
ARC2: STARTING ARCH PROCESSES COMPLETE
ARC2: Becoming the 'no SRL' ARCH
ARC6 started with pid=31, OS id=6454
Thu Oct 19 13:59:40 2008
db_recovery_file_dest_size of 30720 MB is 58.38% used. This is a
user-specified limit on the amount of space that will be used by this
database for recovery-related files, and does not reflect the amount of
space available in the underlying filesystem or ASM diskgroup.
Thu Oct 19 14:03:58 2008
Shutting down instance: further logons disabled
Thu Oct 19 14:03:58 2008
Stopping background process CJQ0
Thu Oct 19 14:03:58 2008
Stopping background process MMNL
Thu Oct 19 14:03:59 2008
Stopping background process MMON
Thu Oct 19 14:04:00 2008
Shutting down instance (immediate)
License high water mark = 13
Thu Oct 19 14:04:00 2008
Stopping Job queue slave processes
Thu Oct 19 14:04:00 2008
Job queue slave processes stopped
Waiting for dispatcher 'D000' to shutdown
All dispatchers and shared servers shutdown
Thu Oct 19 14:04:03 2008
ARC6: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Thu Oct 19 14:04:07 2008
ALTER DATABASE CLOSE NORMAL
Thu Oct 19 14:04:07 2008
ORA-1109 signalled during: ALTER DATABASE CLOSE NORMAL...
Thu Oct 19 14:04:07 2008
ALTER DATABASE DISMOUNT
Thu Oct 19 14:04:14 2008
ARCH shutting down
ARC5: Archival stopped
Thu Oct 19 14:04:19 2008
ARCH shutting down
ARC4: Archival stopped
Thu Oct 19 14:04:24 2008
ARCH shutting down
ARC3: Archival stopped
Thu Oct 19 14:04:29 2008
ARCH shutting down
ARC2: Archival stopped
Thu Oct 19 14:04:34 2008
ARCH shutting down
ARC1: Archival stopped
Thu Oct 19 14:04:39 2008
```

```

ARCH shutting down
ARC0: Archival stopped
Thu Oct 19 14:04:44 2008
ARCH shutting down
ARC6: Archival stopped
Thu Oct 19 14:04:44 2008
Completed: ALTER DATABASE DISMOUNT
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Shutting down Data Guard Broker processes
Thu Oct 19 14:04:47 2008
Completed: Data Guard Broker shutdown
Thu Oct 19 14:04:48 2008
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Thu Oct 19 14:06:14 2008
Starting ORACLE instance (normal)
LICENSE_MAX_SESSION = 0
LICENSE_SESSIONS_WARNING = 0
Picked latch-free SCN scheme 3
Autotune of undo retention is turned on.
IMODE=BR
ILAT =121
LICENSE_MAX_USERS = 0
SYS auditing is disabled
ksdpec: called for event 13740 prior to event group initialization
Starting up ORACLE RDBMS Version: 10.2.0.2.0.
System parameters with non-default values:
  processes                = 1000
  sessions                  = 1105
  __shared_pool_size        = 255852544
  __large_pool_size         = 4194304
  __java_pool_size          = 4194304
  __streams_pool_size       = 0
  sga_target                 = 1073741824
  control_files              = /oracle/STBDB1/origlogA/control01.ctl,
/oracle/STBDB1/origlogB/control02.ctl
  db_file_name_convert       = /oracle/STBDB1/oradata/, /oracle/PRDDB1/oradata/
  log_file_name_convert      = /oracle/PRDDB1/, /oracle/STBDB1/
  db_block_size              = 8192
  __db_cache_size           = 801112064
  db_writer_processes        = 8
  compatible                 = 10.2.0.2
  log_archive_config         = DG_CONFIG=(PRDDB1,STBDB1)
  log_archive_dest_1         = location="/oracle/STBDB1/oraarch/",
valid_for=(ALL_LOGFILES,ALL_ROLES)
  log_archive_dest_2         = SERVICE=PRDDB1_DATAGUARD LGWR SYNC AFFIRM
NET_TIMEOUT=10 VALID_FOR=(ONLINE_LOGFILES,PRIMARY_ROLE) DB_UNIQUE_NAME=PRDDB1
  log_archive_dest_state_1   = ENABLE
  log_archive_dest_state_2   = DEFER
  log_archive_max_processes  = 6
  log_archive_min_succeed_dest = 1
  standby_archive_dest       = /oracle/STBDB1/oraarch/
  log_archive_trace          = 0
  log_archive_format         = STBDB1arch_%s_%t_%r.dbf
  fal_client                 =
  (DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.2) (PORT=1521))) (C
ONNECT_DATA=(SERVICE_NAME=STBDB1_XPT) (INSTANCE_NAME=STBDB1) (SERVER=dedicated)))
  fal_server                 =
  (DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.1) (PORT=1521))) (C
ONNECT_DATA=(SERVICE_NAME=PRDDB1_XPT) (SERVER=dedicated)))
  archive_lag_target         = 0
  db_file_multiblock_read_count = 16
  db_recovery_file_dest      = /oracle/STBDB1/flash_recovery_area

```

```

db_recovery_file_dest_size= 32212254720
standby_file_management = AUTO
fast_start_mttr_target = 600
log_checkpoints_to_alert = TRUE
recovery_parallelism = 16
undo_management = AUTO
undo_tablespace = UNDOTBS1
undo_retention = 10800
fast_start_parallel_rollback= HIGH
db_block_checking = FALSE
remote_login_passwordfile= EXCLUSIVE
db_domain =
dispatchers = (PROTOCOL=TCP) (SERVICE=STBDB1XDB)
local_listener = LISTENER_DATAGUARD_STBDB1
job_queue_processes = 10
parallel_max_servers = 100
parallel_execution_message_size= 4096
background_dump_dest = /oracle/STBDB1/oratrace/bdump
user_dump_dest = /oracle/STBDB1/oratrace/udump
core_dump_dest = /oracle/STBDB1/oratrace/cdump
db_name = PRDDB1
db_unique_name = STBDB1
open_cursors = 1000
os_authent_prefix =
optimizer_index_cost_adj = 1
pga_aggregate_target = 524288000
dg_broker_start = TRUE
PMON started with pid=2, OS id=14025
PSP0 started with pid=3, OS id=14035
MMAN started with pid=4, OS id=14037
DBW0 started with pid=5, OS id=14039
DBW1 started with pid=6, OS id=14041
DBW2 started with pid=7, OS id=14043
DBW3 started with pid=8, OS id=14045
DBW4 started with pid=9, OS id=14047
DBW5 started with pid=10, OS id=14049
DBW6 started with pid=11, OS id=14051
DBW7 started with pid=12, OS id=14053
LGWR started with pid=13, OS id=14056
CKPT started with pid=14, OS id=14066
SMON started with pid=15, OS id=14074
RECO started with pid=16, OS id=14076
CJQ0 started with pid=17, OS id=14078
MMON started with pid=18, OS id=14080
Thu Oct 19 14:06:16 2008
starting up 1 dispatcher(s) for network address
'(ADDRESS=(PARTIAL=YES) (PROTOCOL=TCP))'...
MMNL started with pid=19, OS id=14082
Thu Oct 19 14:06:17 2008
starting up 1 shared server(s) ...
DMON started with pid=22, OS id=14089
Thu Oct 19 14:06:17 2008
ALTER DATABASE MOUNT
Thu Oct 19 14:06:21 2008
Setting recovery target incarnation to 1
Thu Oct 19 14:06:21 2008
Successful mount of redo thread 1, with mount id 4114129561
Thu Oct 19 14:06:21 2008
Allocated 3981120 bytes in shared pool for flashback generation buffer
Starting background process RVWR
RVWR started with pid=24, OS id=14091
Thu Oct 19 14:06:21 2008
Database mounted in Exclusive Mode
Completed: ALTER DATABASE MOUNT
Thu Oct 19 14:06:22 2008
ALTER DATABASE OPEN
Thu Oct 19 14:06:25 2008
Starting Data Guard Broker (DMON)

```

```
INSV started with pid=25, OS id=14120
Thu Oct 19 14:06:26 2008
Assigning activation ID 4114129561 (0xf538a299)
LGWR: STARTING ARCH PROCESSES
ARC0 started with pid=26, OS id=14122
ARC1 started with pid=27, OS id=14124
ARC2 started with pid=28, OS id=14126
ARC3 started with pid=29, OS id=14128
ARC4 started with pid=30, OS id=14130
Thu Oct 19 14:06:27 2008
ARC0: Archival started
ARC1: Archival started
ARC2: Archival started
ARC3: Archival started
ARC4: Archival started
ARC5: Archival started
LGWR: STARTING ARCH PROCESSES COMPLETE
ARC5 started with pid=31, OS id=14132
Thu Oct 19 14:06:27 2008
Thread 1 opened at log sequence 312
  Current log# 3 seq# 312 mem# 0: /oracle/STBDB1/origlogA/log_g3m1.log
Successful open of redo thread 1
Thu Oct 19 14:06:27 2008
ARC2: STARTING ARCH PROCESSES
Thu Oct 19 14:06:27 2008
ARC0: Becoming the 'no FAL' ARCH
ARC0: Becoming the 'no SRL' ARCH
Thu Oct 19 14:06:27 2008
ARC5: Becoming the heartbeat ARCH
Thu Oct 19 14:06:27 2008
SMON: enabling cache recovery
Thu Oct 19 14:06:27 2008
ARC6: Archival started
ARC2: STARTING ARCH PROCESSES COMPLETE
ARC6 started with pid=32, OS id=14134
Thu Oct 19 14:06:28 2008
Successfully onlined Undo Tablespace 1.
Dictionary check beginning
Dictionary check complete
Thu Oct 19 14:06:28 2008
SMON: enabling tx recovery
Thu Oct 19 14:06:28 2008
Database Characterset is AL32UTF8
Thu Oct 19 14:06:28 2008
Incremental checkpoint up to RBA [0x138.3.0], current log tail at RBA [0x138.13f.0]
Thu Oct 19 14:06:28 2008
replication_dependency_tracking turned off (no async multimaster replication found)
Starting background process QMNC
QMNC started with pid=33, OS id=14137
NSV0 started with pid=34, OS id=14139
Thu Oct 19 14:06:30 2008
LOGSTDBY: Validating controlfile with logical metadata
Thu Oct 19 14:06:30 2008
LOGSTDBY: Validation complete
Completed: ALTER DATABASE OPEN
Thu Oct 19 14:06:31 2008
db_recovery_file_dest_size of 30720 MB is 58.38% used. This is a
user-specified limit on the amount of space that will be used by this
database for recovery-related files, and does not reflect the amount of
space available in the underlying filesystem or ASM diskgroup.
Thu Oct 19 14:06:45 2008
Beginning log switch checkpoint up to RBA [0x139.2.10], SCN: 22175964
Thread 1 advanced to log sequence 313
Thu Oct 19 14:06:45 2008
  Current log# 1 seq# 313 mem# 0: /oracle/STBDB1/origlogA/log_g1m1.log
Thu Oct 19 14:06:45 2008
Shutting down archive processes
Thu Oct 19 14:06:50 2008
```

```
ARCH shutting down
ARC6: Archival stopped
Thu Oct 19 14:07:11 2008
Beginning log switch checkpoint up to RBA [0x13a.2.10], SCN: 22175974
Thread 1 advanced to log sequence 314
Current log# 2 seq# 314 mem# 0: /oracle/STBDB1/origlogA/log_g2m1.log
```

## 10.2STBDB1 -> PRDDB1

```
dgmgrl> connect sys/<password> # auf neue primary STBDB1
DGMGR1> switchover to 'PRDDB1';
Performing switchover NOW, please wait...
Operation requires shutdown of instance "STBDB1" on database "STBDB1"
Shutting down instance "STBDB1"...
ORA-01109: database not open

Database dismounted.
ORACLE instance shut down.
Operation requires shutdown of instance "PRDDB1" on database "PRDDB1"
Shutting down instance "PRDDB1"...
ORA-01109: database not open

Database dismounted.
ORACLE instance shut down.
Operation requires startup of instance "STBDB1" on database "STBDB1"
Starting instance "STBDB1"...
ORACLE instance started.
Database mounted.
Operation requires startup of instance "PRDDB1" on database "PRDDB1"
Starting instance "PRDDB1"...
ORACLE instance started.
Database mounted.
Switchover succeeded, new primary is "PRDDB1"
```

alert\_STBDB1.log:

```
ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY WITH SESSION SHUTDOWN
Thu Oct 19 14:15:17 2008
ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY (STBDB1)
Thu Oct 19 14:15:21 2008
*****
LGWR: Resetting 'active' archival for destination LOG_ARCHIVE_DEST_2
*****
Thu Oct 19 14:15:22 2008
Destination LOG_ARCHIVE_DEST_2 no longer supports SYNCHRONIZATION
Beginning log switch checkpoint up to RBA [0x140.2.10], SCN: 22176175
Thread 1 advanced to log sequence 320
Current log# 2 seq# 320 mem# 0: /oracle/STBDB1/origlogA/log_g2m1.log
Thu Oct 19 14:15:22 2008
Stopping background process CJQ0
Thu Oct 19 14:15:22 2008
SMON: disabling tx recovery
Thu Oct 19 14:15:22 2008
Stopping background process QMNC
Thu Oct 19 14:15:23 2008
Stopping Job queue slave processes
Thu Oct 19 14:15:23 2008
Job queue slave processes stopped
Thu Oct 19 14:15:23 2008
Completed checkpoint up to RBA [0x140.2.10], SCN: 22176175
Thu Oct 19 14:15:25 2008
All dispatchers and shared servers shutdown
Active process 14092 user 'oraclep' program 'oracle@dbhost2 (TNS V1-V3)'
CLOSE: waiting for server sessions to complete.
Thu Oct 19 14:15:35 2008
CLOSE: all sessions shutdown successfully.
Thu Oct 19 14:15:35 2008
SMON: disabling cache recovery
Thu Oct 19 14:15:35 2008
Shutting down archive processes
```

```
Archiving is disabled
Thu Oct 19 14:15:40 2008
ARCH shutting down
ARC5: Archival stopped
Thu Oct 19 14:15:45 2008
ARCH shutting down
ARC4: Archival stopped
Thu Oct 19 14:15:50 2008
ARCH shutting down
ARC3: Archival stopped
Thu Oct 19 14:15:55 2008
ARCH shutting down
ARC2: Archival stopped
Thu Oct 19 14:16:00 2008
ARCH shutting down
ARC1: Archival stopped
Thu Oct 19 14:16:05 2008
ARCH shutting down
ARC0: Archival stopped
Thu Oct 19 14:16:06 2008
Thread 1 closed at log sequence 320
Successful close of redo thread 1
Thu Oct 19 14:16:06 2008
ARCH: Noswitch archival of thread 1, sequence 320
ARCH: End-Of-Redo Branch archival of thread 1 sequence 320
ARCH: Archiving is disabled due to current logfile archival
Clearing standby activation ID 4114129561 (0xf538a299)
The primary database controlfile was created using the
'MAXLOGFILES 16' clause.
There is space for up to 13 standby redo logfiles
Use the following SQL commands on the standby database to create
standby redo logfiles that match the primary database:
ALTER DATABASE ADD STANDBY LOGFILE 'sr11.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr12.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr13.f' SIZE 524288000;
ALTER DATABASE ADD STANDBY LOGFILE 'sr14.f' SIZE 524288000;
Archivelog for thread 1 sequence 320 required for standby recovery
MRP0 started with pid=17, OS id=20728
Thu Oct 19 14:16:07 2008
MRP0: Background Managed Standby Recovery process started (STBDB1)
Managed Standby Recovery not using Real Time Apply
parallel recovery started with 7 processes
Online logfile pre-clearing operation disabled by switchover
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_320_1_601822185.dbf
Identified End-Of-Redo for thread 1 sequence 320
Thu Oct 19 14:16:13 2008
Media Recovery End-Of-Redo indicator encountered
Thu Oct 19 14:16:13 2008
Media Recovery Applied until change 22176191
Thu Oct 19 14:16:13 2008
MRP0: Media Recovery Complete: End-Of-REDO (STBDB1)
Resetting standby activation ID 4114129561 (0xf538a299)
Thu Oct 19 14:16:14 2008
MRP0: Background Media Recovery process shutdown (STBDB1)
Thu Oct 19 14:16:15 2008
Switchover: Complete - Database shutdown required (STBDB1)
Thu Oct 19 14:16:15 2008
Completed: ALTER DATABASE COMMIT TO SWITCHOVER TO PHYSICAL STANDBY WITH SESSION
SHUTDOWN
Using STANDBY_ARCHIVE_DEST parameter default value as USE_DB_RECOVERY_FILE_DEST
Thu Oct 19 14:16:15 2008
ALTER SYSTEM SET log_archive_dest_2='' SCOPE=BOTH;
Thu Oct 19 14:16:15 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH;
Thu Oct 19 14:16:26 2008
Shutting down instance: further logons disabled
Thu Oct 19 14:16:26 2008
Stopping background process MMNL
```



```

Thu Oct 19 14:16:27 2008
Stopping background process MMON
Thu Oct 19 14:16:28 2008
Shutting down instance (immediate)
License high water mark = 8
Waiting for shared server 'S001' to die
All dispatchers and shared servers shutdown
Thu Oct 19 14:16:34 2008
alter database CLOSE NORMAL
ORA-1109 signalled during: alter database CLOSE NORMAL...
Thu Oct 19 14:16:34 2008
alter database DISMOUNT
Completed: alter database DISMOUNT
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Shutting down Data Guard Broker processes
Thu Oct 19 14:16:37 2008
Completed: Data Guard Broker shutdown
Thu Oct 19 14:16:38 2008
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Thu Oct 19 14:17:37 2008
Starting ORACLE instance (normal)
LICENSE_MAX_SESSION = 0
LICENSE_SESSIONS_WARNING = 0
Picked latch-free SCN scheme 3
Autotune of undo retention is turned on.
IMODE=BR
ILAT =121
LICENSE_MAX_USERS = 0
SYS auditing is disabled
ksdpec: called for event 13740 prior to event group initialization
Starting up ORACLE RDBMS Version: 10.2.0.2.0.
System parameters with non-default values:
  processes                = 1000
  sessions                  = 1105
  __shared_pool_size        = 255852544
  __large_pool_size         = 4194304
  __java_pool_size          = 4194304
  __streams_pool_size       = 0
  sga_target                = 1073741824
  control_files              = /oracle/STBDB1/origlogA/control01.ctl,
/oracle/STBDB1/origlogB/control02.ctl
  db_file_name_convert       = /oracle/STBDB1/oradata/, /oracle/PRDDB1/oradata/
  log_file_name_convert      = /oracle/PRDDB1/, /oracle/STBDB1/
  db_block_size              = 8192
  __db_cache_size           = 801112064
  db_writer_processes        = 8
  compatible                 = 10.2.0.2
  log_archive_config         = DG_CONFIG=(PRDDB1,STBDB1)
  log_archive_dest_1         = location="/oracle/STBDB1/oraarch/",
valid_for=(ONLINE_LOGFILE,ALL_ROLES)
  log_archive_dest_2         =
  log_archive_dest_state_1   = ENABLE
  log_archive_dest_state_2   = ENABLE
  log_archive_max_processes  = 6
  log_archive_min_succeed_dest = 1
  standby_archive_dest       =
  log_archive_trace          = 0
  log_archive_format         = STBDB1arch_%s_%t_%r.dbf
  fal_client                  =
(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.2)(PORT=1521)))
(CONNECT_DATA=(SERVICE_NAME=STBDB1_XPT)(INSTANCE_NAME=STBDB1)(SERVER=dedicated)))

```

```

fal_server =
(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.1) (PORT=1521))) (C
ONNECT_DATA=(SERVICE_NAME=PRDDB1_XPT) (SERVER=dedicated)))
archive_lag_target = 0
db_file_multiblock_read_count= 16
db_recovery_file_dest = /oracle/STBDB1/flash_recovery_area
db_recovery_file_dest_size= 32212254720
standby_file_management = AUTO
fast_start_mttr_target = 600
log_checkpoints_to_alert = TRUE
recovery_parallelism = 16
undo_management = AUTO
undo_tablespace = UNDOTBS1
undo_retention = 10800
fast_start_parallel_rollback= HIGH
db_block_checking = FALSE
remote_login_passwordfile= EXCLUSIVE
db_domain =
dispatchers = (PROTOCOL=TCP) (SERVICE=STBDB1XDB)
local_listener = LISTENER_DATAGUARD_STBDB1
job_queue_processes = 10
parallel_max_servers = 100
parallel_execution_message_size= 4096
background_dump_dest = /oracle/STBDB1/oratrace/bdump
user_dump_dest = /oracle/STBDB1/oratrace/udump
core_dump_dest = /oracle/STBDB1/oratrace/cdump
db_name = PRDDB1
db_unique_name = STBDB1
open_cursors = 1000
os_authent_prefix =
optimizer_index_cost_adj = 1
pga_aggregate_target = 524288000
dg_broker_start = TRUE
PMON started with pid=2, OS id=22834
PSP0 started with pid=3, OS id=22846
MMAN started with pid=4, OS id=22848
DBW0 started with pid=5, OS id=22850
DBW1 started with pid=6, OS id=22852
DBW2 started with pid=7, OS id=22854
DBW3 started with pid=8, OS id=22856
DBW4 started with pid=9, OS id=22858
DBW5 started with pid=10, OS id=22860
DBW6 started with pid=11, OS id=22862
DBW7 started with pid=12, OS id=22864
LGWR started with pid=13, OS id=22866
CKPT started with pid=14, OS id=22868
SMON started with pid=15, OS id=22870
RECO started with pid=16, OS id=22872
CJQ0 started with pid=17, OS id=22874
MMON started with pid=18, OS id=22876
Thu Oct 19 14:17:40 2008
starting up 1 dispatcher(s) for network address
'(ADDRESS=(PARTIAL=YES) (PROTOCOL=TCP))'...
MMNL started with pid=19, OS id=22878
Thu Oct 19 14:17:40 2008
starting up 1 shared server(s) ...
DMON started with pid=22, OS id=22886
Thu Oct 19 14:17:40 2008
alter database mount
Thu Oct 19 14:17:44 2008
Setting recovery target incarnation to 1
ARCH: STARTING ARCH PROCESSES
ARC0 started with pid=24, OS id=22892
ARC1 started with pid=25, OS id=22894
ARC2 started with pid=26, OS id=22896
ARC3 started with pid=27, OS id=22898
ARC4 started with pid=28, OS id=22900
Thu Oct 19 14:17:45 2008

```

```
ARC0: Archival started
ARC1: Archival started
ARC2: Archival started
ARC3: Archival started
ARC4: Archival started
ARC5: Archival started
ARCH: STARTING ARCH PROCESSES COMPLETE
Thu Oct 19 14:17:45 2008
ARC4: Becoming the 'no FAL' ARCH
ARC4: Becoming the 'no SRL' ARCH
ARC4: Thread not mounted
Thu Oct 19 14:17:45 2008
ARC0: Becoming the heartbeat ARCH
ARC0: Thread not mounted
Thu Oct 19 14:17:45 2008
ARC1: Thread not mounted
Thu Oct 19 14:17:45 2008
ARC3: Thread not mounted
Thu Oct 19 14:17:45 2008
ARC2: Thread not mounted
ARC5 started with pid=29, OS id=22902
ARC5: Thread not mounted
Thu Oct 19 14:17:45 2008
Successful mount of redo thread 1, with mount id 4114112324
Thu Oct 19 14:17:45 2008
Allocated 3981120 bytes in shared pool for flashback generation buffer
Starting background process RVWR
RVWR started with pid=30, OS id=22904
Thu Oct 19 14:17:45 2008
Physical Standby Database mounted.
Completed: alter database mount
Thu Oct 19 14:17:48 2008
Starting Data Guard Broker (DMON)
NSV0 started with pid=23, OS id=22981
INSV started with pid=33, OS id=23289
RSM0 started with pid=34, OS id=23491
Using STANDBY_ARCHIVE_DEST parameter default value as USE_DB_RECOVERY_FILE_DEST
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET
log_archive_dest_1='location="/oracle/STBDB1/oraarch/"', 'valid_for=(ALL_LOGFILES,AL
L_ROLES)' SCOPE=BOTH SID='STBDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET log_archive_dest_state_1='ENABLE' SCOPE=BOTH SID='STBDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET standby_archive_dest='/oracle/STBDB1/oraarch/' SCOPE=BOTH
SID='STBDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET log_archive_trace=0 SCOPE=BOTH SID='STBDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET log_archive_format='STBDB1arch_%s_%t_%r.dbf' SCOPE=SPFILE
SID='STBDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET standby_file_management='AUTO' SCOPE=BOTH SID='*';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET archive_lag_target=0 SCOPE=BOTH SID='*';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET log_archive_max_processes=6 SCOPE=BOTH SID='*';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET log_archive_min_succeed_dest=1 SCOPE=BOTH SID='*';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET
db_file_name_convert='/oracle/STBDB1/oradata/', '/oracle/PRDDB1/oradata/'
SCOPE=SPFILE;
Thu Oct 19 14:19:08 2008
ALTER SYSTEM SET log_file_name_convert='/oracle/PRDDB1/', '/oracle/STBDB1/'
SCOPE=SPFILE;
Thu Oct 19 14:19:08 2008
```

```
ALTER SYSTEM SET
fal_server='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.1)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=PRDDB1_XPT)(SERVER=dedicated)))' SCOPE=BOTH;
Thu Oct 19 14:19:08 2008
ALTER SYSTEM SET
fal_client='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.2)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=STBDB1_XPT)(INSTANCE_NAME=STBDB1)(SERVER=dedicated)))' SCOPE=BOTH;
Thu Oct 19 14:19:08 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE THROUGH ALL SWITCHOVER DISCONNECT
USING CURRENT LOGFILE
Thu Oct 19 14:19:08 2008
Attempt to start background Managed Standby Recovery process (STBDB1)
MRP0 started with pid=35, OS id=23493
Thu Oct 19 14:19:08 2008
MRP0: Background Managed Standby Recovery process started (STBDB1)
Managed Standby Recovery starting Real Time Apply
Thu Oct 19 14:19:13 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[1]: Assigned to RFS process 23522
RFS[1]: Identified database type as 'physical standby'
Primary database is in MAXIMUM PERFORMANCE mode
Thu Oct 19 14:19:13 2008
RFS LogMiner: Client disabled from further notification
Primary database is in MAXIMUM PERFORMANCE mode
RFS[1]: Successfully opened standby log 4: '/oracle/STBDB1/origlogA/log_g4m1.log'
Thu Oct 19 14:19:14 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[2]: Assigned to RFS process 23531
RFS[2]: Identified database type as 'physical standby'
RFS[2]: Successfully opened standby log 5: '/oracle/STBDB1/origlogA/log_g5m1.log'
Thu Oct 19 14:19:14 2008
parallel recovery started with 7 processes
Clearing online redo logfile 1 /oracle/STBDB1/origlogA/log_g1m1.log
Clearing online log 1 of thread 1 sequence number 322
Thu Oct 19 14:19:15 2008
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE THROUGH ALL SWITCHOVER
DISCONNECT USING CURRENT LOGFILE
Thu Oct 19 14:19:20 2008
Clearing online redo logfile 1 complete
Clearing online redo logfile 2 /oracle/STBDB1/origlogA/log_g2m1.log
Clearing online log 2 of thread 1 sequence number 322
Thu Oct 19 14:19:26 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[3]: Assigned to RFS process 23566
RFS[3]: Identified database type as 'physical standby'
Primary database is in MAXIMUM PERFORMANCE mode
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: '/oracle/STBDB1/origlogA/log_g4m1.log'
Thu Oct 19 14:19:26 2008
Clearing online redo logfile 2 complete
Clearing online redo logfile 3 /oracle/STBDB1/origlogA/log_g3m1.log
Clearing online log 3 of thread 1 sequence number 318
Clearing online redo logfile 3 complete
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_321_1_601822185.dbf
Media Recovery Log /oracle/STBDB1/oraarch/STBDB1arch_322_1_601822185.dbf
Media Recovery Waiting for thread 1 sequence 323 (in transit)
Thu Oct 19 14:19:33 2008
Recovery of Online Redo Log: Thread 1 Group 4 Seq 323 Reading mem 0
Mem# 0 errs 0: /oracle/STBDB1/origlogA/log_g4m1.log
Thu Oct 19 14:20:15 2008

alert_PRDDB1.log:

Thu Oct 19 14:15:17 2008
```

```
Primary database is in MAXIMUM PERFORMANCE mode
RFS[8]: Successfully opened standby log 4: '/oracle/PRDDB1/origlogA/log_g4m1.log'
Thu Oct 19 14:15:18 2008
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_318_1_601822185.dbf
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_319_1_601822185.dbf
Media Recovery Waiting for thread 1 sequence 320
Thu Oct 19 14:15:34 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[10]: Assigned to RFS process 27777
RFS[10]: Identified database type as 'physical standby'
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[11]: Assigned to RFS process 28071
RFS[11]: Identified database type as 'physical standby'
RFS[11]: Archived Log: '/oracle/PRDDB1/oraarch/PRDDB1arch_320_1_601822185.dbf'
Thu Oct 19 14:16:08 2008
Media Recovery Log /oracle/PRDDB1/oraarch/PRDDB1arch_320_1_601822185.dbf
Identified End-Of-Redo for thread 1 sequence 320
Thu Oct 19 14:16:08 2008
Media Recovery End-Of-Redo indicator encountered
Thu Oct 19 14:16:08 2008
Media Recovery Continuing
Media Recovery Waiting for thread 1 sequence 321
Thu Oct 19 14:16:15 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL
Thu Oct 19 14:16:19 2008
MRP0: Background Media Recovery cancelled with status 16037
Thu Oct 19 14:16:19 2008
Errors in file /oracle/PRDDB1/oratrace/bdump/PRDDB1_mrp0_25172.trc:
ORA-16037: user requested cancel of managed recovery operation
Managed Standby Recovery not using Real Time Apply
Recovery interrupted!
Thu Oct 19 14:16:22 2008
Errors in file /oracle/PRDDB1/oratrace/bdump/PRDDB1_mrp0_25172.trc:
ORA-16037: user requested cancel of managed recovery operation
Thu Oct 19 14:16:22 2008
MRP0: Background Media Recovery process shutdown (PRDDB1)
Thu Oct 19 14:16:22 2008
Managed Standby Recovery Canceled (PRDDB1)
Thu Oct 19 14:16:22 2008
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL
Thu Oct 19 14:16:22 2008
ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WAIT WITH SESSION SHUTDOWN
Thu Oct 19 14:16:22 2008
ALTER DATABASE SWITCHOVER TO PRIMARY (PRDDB1)
If media recovery active, switchover will wait 900 seconds
SwitchOver after complete recovery through change 22176191
Online log /oracle/PRDDB1/origlogA/log_g1m1.log: Thread 1 Group 1 was previously
cleared
Online log /oracle/PRDDB1/origlogA/log_g2m1.log: Thread 1 Group 2 was previously
cleared
Online log /oracle/PRDDB1/origlogA/log_g3m1.log: Thread 1 Group 3 was previously
cleared
Standby became primary SCN: 22176189
Converting standby mount to primary mount.
Thu Oct 19 14:16:22 2008
Switchover: Complete - Database mounted as primary (PRDDB1)
Completed: ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WAIT WITH SESSION
SHUTDOWN
Thu Oct 19 14:16:22 2008
ARC1: STARTING ARCH PROCESSES
ARC6: Archival started
ARC1: STARTING ARCH PROCESSES COMPLETE
ARC6 started with pid=23, OS id=28107
Thu Oct 19 14:16:40 2008
Shutting down instance: further logons disabled
Thu Oct 19 14:16:40 2008
```

```
Stopping background process CJQ0
Thu Oct 19 14:16:40 2008
Stopping background process MMNL
Thu Oct 19 14:16:41 2008
Stopping background process MMON
Thu Oct 19 14:16:42 2008
Shutting down instance (immediate)
License high water mark = 16
Thu Oct 19 14:16:42 2008
Stopping Job queue slave processes
Thu Oct 19 14:16:42 2008
Job queue slave processes stopped
Waiting for dispatcher 'D000' to shutdown
Thu Oct 19 14:16:42 2008
ARC6: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Thu Oct 19 14:16:44 2008
All dispatchers and shared servers shutdown
Thu Oct 19 14:16:52 2008
ARCH shutting down
ARC5: Archival stopped
Thu Oct 19 14:16:54 2008
alter database CLOSE NORMAL
Thu Oct 19 14:16:54 2008
ORA-1109 signalled during: alter database CLOSE NORMAL...
Thu Oct 19 14:16:54 2008
alter database DISMOUNT
Thu Oct 19 14:16:54 2008
ARC1: Archival disabled due to shutdown: 1089
Shutting down archive processes
Thu Oct 19 14:16:58 2008
ARCH shutting down
ARC4: Archival stopped
Thu Oct 19 14:17:03 2008
ARCH shutting down
ARC3: Archival stopped
Thu Oct 19 14:17:08 2008
ARCH shutting down
ARC2: Archival stopped
Thu Oct 19 14:17:18 2008
ARCH shutting down
Thu Oct 19 14:17:18 2008
ARC0: Archival stopped
Thu Oct 19 14:17:18 2008
Archiving is disabled
Thu Oct 19 14:17:18 2008
Archive process shutdown avoided: 0 active
ARCH shutting down
ARC1: Archival stopped
Thu Oct 19 14:17:23 2008
ARCH shutting down
Thu Oct 19 14:17:23 2008
Completed: alter database DISMOUNT
Thu Oct 19 14:17:23 2008
ARC6: Archival stopped
Thu Oct 19 14:17:23 2008
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Shutting down Data Guard Broker processes
Thu Oct 19 14:17:26 2008
Completed: Data Guard Broker shutdown
Thu Oct 19 14:17:28 2008
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
```

```

Archive process shutdown avoided: 0 active
Thu Oct 19 14:17:46 2008
Starting ORACLE instance (normal)
LICENSE_MAX_SESSION = 0
LICENSE_SESSIONS_WARNING = 0
Picked latch-free SCN scheme 3
Autotune of undo retention is turned on.
IMODE=BR
ILAT =121
LICENSE_MAX_USERS = 0
SYS auditing is disabled
My pid is 28444, priority is -179, running with SCHED_NOAGE policy 8.
ksdpec: called for event 13740 prior to event group initialization
Starting up ORACLE RDBMS Version: 10.2.0.2.0.
System parameters with non-default values:
  processes                = 1000
  sessions                  = 1105
  __shared_pool_size        = 2231369728
  __large_pool_size         = 16777216
  __java_pool_size          = 16777216
  __streams_pool_size       = 0
  sga_target                 = 19327352832
  control_files              = /oracle/PRDDB1/origlogA/control01.ctl,
/oracle/PRDDB1/origlogB/control02.ctl
  db_file_name_convert       = /oracle/PRDDB1/oradata/, /oracle/STBDB1/oradata/
  log_file_name_convert      = /oracle/PRDDB1/, /oracle/STBDB1/
  db_block_size              = 8192
  __db_cache_size           = 17045651456
  db_writer_processes        = 8
  compatible                 = 10.2.0.2
  log_archive_config         = dg_config=(PRDDB1,STBDB1)
  log_archive_dest_1         = location="/oracle/PRDDB1/oraarch/",
valid_for=(ALL_LOGFILES,ALL_ROLES)
  log_archive_dest_2         =
  log_archive_dest_state_1  = ENABLE
  log_archive_dest_state_2  = ENABLE
  log_archive_max_processes = 6
  log_archive_min_succeed_dest = 1
  standby_archive_dest       = /oracle/PRDDB1/oraarch/
  log_archive_trace          = 0
  log_archive_format         = PRDDB1arch_%s_%t_%r.dbf
  fal_client                 =
  (DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.1)(PORT=1521))) (C
ONNECT_DATA=(SERVICE_NAME=PRDDB1_XPT)(INSTANCE_NAME=PRDDB1)(SERVER=dedicated)))
  fal_server                 =
  (DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.0.2)(PORT=1521))) (C
ONNECT_DATA=(SERVICE_NAME=STBDB1_XPT)(SERVER=dedicated)))
  archive_lag_target         = 0
  db_file_multiblock_read_count = 16
  standby_file_management    = auto
  fast_start_mttr_target     = 600
  log_checkpoints_to_alert   = TRUE
  recovery_parallelism       = 16
  undo_management            = AUTO
  undo_tablespace            = UNDOTBS1
  undo_retention              = 10800
  fast_start_parallel_rollback = HIGH
  remote_login_passwordfile = EXCLUSIVE
  db_domain                  =
  dispatchers                = (PROTOCOL=TCP)(SERVICE=PRDDB1XDB)
  local_listener              = LISTENER_DATAGUARD_PRDDB1
  job_queue_processes        = 10
  parallel_max_servers       = 100
  parallel_execution_message_size = 4096
  background_dump_dest       = /oracle/PRDDB1/oratrace/bdump
  user_dump_dest              = /oracle/PRDDB1/oratrace/udump
  core_dump_dest              = /oracle/PRDDB1/oratrace/cdump
  hpux_sched_noage           = 178

```

```

db_name                = PRDDB1
db_unique_name         = PRDDB1
open_cursors           = 1000
os_authent_prefix      =
optimizer_index_cost_adj = 1
query_rewrite_enabled  = FALSE
pga_aggregate_target   = 6442450944
dg_broker_start        = TRUE
PMON started with pid=2, OS id=28450
PSP0 started with pid=3, OS id=28514
MMAN started with pid=4, OS id=28516
DBW0 started with pid=5, OS id=28518
DBW1 started with pid=6, OS id=28520
DBW2 started with pid=7, OS id=28522
DBW3 started with pid=8, OS id=28524
DBW4 started with pid=9, OS id=28526
DBW5 started with pid=10, OS id=28528
DBW6 started with pid=11, OS id=28530
DBW7 started with pid=12, OS id=28532
LGWR started with pid=13, OS id=28534
CKPT started with pid=14, OS id=28536
SMON started with pid=15, OS id=28538
RECO started with pid=16, OS id=28540
CJQ0 started with pid=17, OS id=28542
MMON started with pid=18, OS id=28544
Thu Oct 19 14:17:56 2008
starting up 1 dispatcher(s) for network address
'(ADDRESS=(PARTIAL=YES)(PROTOCOL=TCP))'...
MMNL started with pid=19, OS id=28546
Thu Oct 19 14:17:56 2008
starting up 1 shared server(s) ...
DMON started with pid=22, OS id=28553
Thu Oct 19 14:17:57 2008
alter database mount
Thu Oct 19 14:18:03 2008
Setting recovery target incarnation to 1
Thu Oct 19 14:18:03 2008
Successful mount of redo thread 1, with mount id 4114138455
Thu Oct 19 14:18:03 2008
Database mounted in Exclusive Mode
Completed: alter database mount
Thu Oct 19 14:18:05 2008
Starting Data Guard Broker (DMON)
INSV started with pid=23, OS id=28580
NSV1 started with pid=24, OS id=28582
RSM0 started with pid=26, OS id=28741
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET standby_archive_dest='' SCOPE=BOTH SID='PRDDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET
log_archive_dest_1='location="/oracle/PRDDB1/oraarch/"', 'valid_for=(ONLINE_LOGFILE,
ALL_ROLES)' SCOPE=BOTH SID='PRDDB1';
Thu Oct 19 14:19:07 2008
ALTER SYSTEM SET log_archive_dest_state_1='ENABLE' SCOPE=BOTH SID='PRDDB1';
Thu Oct 19 14:19:08 2008
ALTER SYSTEM SET
log_archive_dest_2='service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOS
T=192.168.0.2)(PORT=1521))) (CONNECT_DATA=(SERVICE_NAME=STBDB1_XPT)(INSTANCE_NAME=ST
BDB1)(SERVER=dedicated)))"' LGWR SYNC AFFIRM delay=0 OPTIONAL max_failure=0
max_connections=1 reopen=300 db_unique_name="STBDB1" register net_timeout=10
valid_for=(online_logfile,primary_role)' SCOPE=BOTH;
Thu Oct 19 14:19:08 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH;
Thu Oct 19 14:19:08 2008
ALTER DATABASE OPEN
Thu Oct 19 14:19:08 2008
Assigning activation ID 4114138455 (0xf538c557)
LGWR: STARTING ARCH PROCESSES

```



```

ARC0 started with pid=27, OS id=28744
ARC1 started with pid=28, OS id=28746
ARC2 started with pid=29, OS id=28748
ARC3 started with pid=30, OS id=28750
ARC4 started with pid=31, OS id=28752
Thu Oct 19 14:19:10 2008
ARC0: Archival started
ARC1: Archival started
ARC2: Archival started
ARC3: Archival started
ARC4: Archival started
ARC5: Archival started
LGWR: STARTING ARCH PROCESSES COMPLETE
ARC5 started with pid=32, OS id=28754
Thu Oct 19 14:19:10 2008
Destination LOG_ARCHIVE_DEST_2 is SYNCHRONIZED
Thu Oct 19 14:19:10 2008
Destination LOG_ARCHIVE_DEST_2 is UNSYNCHRONIZED
*****
LGWR: Setting 'active' archival for destination LOG_ARCHIVE_DEST_2
*****
LNSb started with pid=33, OS id=28756
Thu Oct 19 14:19:13 2008
Destination LOG_ARCHIVE_DEST_2 is SYNCHRONIZED
LGWR: Standby redo logfile selected for thread 1 sequence 322 for destination
LOG_ARCHIVE_DEST_2
Thread 1 advanced to log sequence 322
Thread 1 opened at log sequence 322
  Current log# 1 seq# 322 mem# 0: /oracle/PRDDb1/origlogA/log_g1m1.log
Successful open of redo thread 1
Thu Oct 19 14:19:13 2008
ARC3: STARTING ARCH PROCESSES
Thu Oct 19 14:19:13 2008
ARC1: Becoming the 'no FAL' ARCH
ARC1: Becoming the 'no SRL' ARCH
Thu Oct 19 14:19:13 2008
ARC4: Becoming the heartbeat ARCH
Thu Oct 19 14:19:13 2008
ARC5: LGWR is actively archiving destination LOG_ARCHIVE_DEST_2
Thu Oct 19 14:19:13 2008
SMON: enabling cache recovery
Thu Oct 19 14:19:14 2008
ARC5: Standby redo logfile selected for thread 1 sequence 321 for destination
LOG_ARCHIVE_DEST_2
ARC6 started with pid=34, OS id=28781
Thu Oct 19 14:19:14 2008
ARC6: Archival started
ARC3: STARTING ARCH PROCESSES COMPLETE
Thu Oct 19 14:19:15 2008
Successfully onlined Undo Tablespace 1.
Dictionary check beginning
Dictionary check complete
Thu Oct 19 14:19:15 2008
SMON: enabling tx recovery
Thu Oct 19 14:19:15 2008
Database Characterset is AL32UTF8
Thu Oct 19 14:19:15 2008
Incremental checkpoint up to RBA [0x142.3.0], current log tail at RBA [0x142.13d.0]
Thu Oct 19 14:19:16 2008
replication_dependency_tracking turned off (no async multimaster replication found)
Starting background process QMNC
QMNC started with pid=36, OS id=28831
Thu Oct 19 14:19:17 2008
LOGSTDBY: Validating controlfile with logical metadata
Thu Oct 19 14:19:17 2008
LOGSTDBY: Validation complete
Completed: ALTER DATABASE OPEN
Thu Oct 19 14:19:18 2008

```

```

ALTER SYSTEM SET log_archive_trace=0 SCOPE=BOTH SID='PRDDb1';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET log_archive_format='PRDDb1arch_%s_%t_%r.dbf' SCOPE=SPFILE
SID='PRDDb1';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET standby_archive_dest='' SCOPE=BOTH SID='PRDDb1';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET standby_file_management='auto' SCOPE=BOTH SID='*';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET archive_lag_target=0 SCOPE=BOTH SID='*';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET log_archive_max_processes=6 SCOPE=BOTH SID='*';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET log_archive_min_succeed_dest=1 SCOPE=BOTH SID='*';
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET
db_file_name_convert='/oracle/PRDDb1/oradata/', '/oracle/STBDB1/oradata/'
SCOPE=SPFILE;
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET log_file_name_convert='/oracle/PRDDb1/', '/oracle/STBDB1/'
SCOPE=SPFILE;
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET
log_archive_dest_2='service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP) (HOST=192.168.0.2) (PORT=1521))) (CONNECT_DATA=(SERVICE_NAME=STBDB1_XPT) (INSTANCE_NAME=STBDB1) (SERVER=dedicated)))"' LGWR SYNC AFFIRM delay=0 OPTIONAL max_failure=0
max_connections=1 reopen=300 db_unique_name="STBDB1" register net_timeout=10
valid_for=(online_logfile,primary_role)' SCOPE=BOTH;
Thu Oct 19 14:19:18 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH;
Thu Oct 19 14:19:22 2008
*****
LGWR: Setting 'active' archival for destination LOG_ARCHIVE_DEST_2
*****
LNSb started with pid=33, OS id=29049
Thu Oct 19 14:19:26 2008
LGWR: Standby redo logfile selected for thread 1 sequence 323 for destination
LOG_ARCHIVE_DEST_2
Beginning log switch checkpoint up to RBA [0x143.2.10], SCN: 22176735
Thread 1 advanced to log sequence 323
Current log# 3 seq# 323 mem# 0: /oracle/PRDDb1/origlogA/log_g3m1.log

```

## 11 Known Issues

Die folgenden Probleme sind bekannt und es gibt teilweise bereits Patches. Eine vollständige Liste der behobenen Bugs für DataGuard @ 10.2.0.2 gibt es unter:

[https://metalink.oracle.com/metalink/plsql/f?p=130:14:669475363623995086:::p14\\_database\\_id,p14\\_docid,p14\\_show\\_header,p14\\_show\\_help,p14\\_black\\_frame,p14\\_font:NOT,391116.1,1,1,1,Helvetica#S\\_TANDBY](https://metalink.oracle.com/metalink/plsql/f?p=130:14:669475363623995086:::p14_database_id,p14_docid,p14_show_header,p14_show_help,p14_black_frame,p14_font:NOT,391116.1,1,1,1,Helvetica#S_TANDBY)

### 11.1 Bug 5106952 - FLASHBACK LOG SPACE NOT BEING RECLAIMED

Dieser Bug tritt auf, wenn jemals Restore Points auf der Standby Database erstellt wurden, bzw. auch wenn diese gelöscht wurden. Die Restore Points werden im Controlfile protokolliert. Falls diese Voraussetzung zutrifft, Flashback Database aktiviert ist, werden die Flashback Logs in der Flash Recovery Area nicht aufgeräumt. Ein Patch für 10.2.0.2 HP-UX Itanium wird gerade erstellt.

Workaround: Recreate Controlfile

Fix: Fixed in 11.0

## 11.2 Bug 4395779 - ORA-16086 ERROR EVEN WHEN RECOVERY AREA NOT USED FOR REDO LOGS

Wenn die Flash Recovery Area auf der Standby Datenbank voll ist, kann kein Realtime-Applly mehr stattfinden. Stattdessen werden die Logs erst applied, wenn ein Log Switch stattfindet. Oracle hat einen Backport des Patches für HP-UX Itanium 10.2.0.2 zur Verfügung gestellt.

Workaround:

2 Fälle:

**Fall A:** Die Flashback Logs, die zur Einhaltung der flashback retention notwendig sind, passen in die Flashback Recovery Area. Es sind aber noch einige Flashback Logs im Filesystem, die über die Retention Zeit hinausgehen. In diesem Fall kann Oracle dazu bewegt werden, nicht mehr benötigte Flashback Logs zu löschen, falls diese nicht mehr benötigt werden, um die Retention einzuhalten:

- Reduzieren der FRA von 32GB:  
`ALTER SYSTEM SET db_recovery_file_dest_size='31000M' SCOPE=BOTH;`

**Fall B:** Die Flashback Logs, die zur Einhaltung der Flashback Retention notwendig sind, passen **nicht** in die Flashback Recovery Area. In diesem Fall löscht Oracle auch Flashback Logs, die für die Einhaltung der Retention noch notwendig wären. Die Lösung besteht darin, die Retention Dauer zu reduzieren und danach die Flashback Recovery Area zu reduzieren:

- `ALTER SYSTEM SET db_flashback_retention_target=120 SCOPE=BOTH;`
- Reduzieren der FRA von 32GB:  
`ALTER SYSTEM SET db_recovery_file_dest_size='31000M' SCOPE=BOTH;`

Fix: Fixed in 10.2.0.3, Backport (5106952) available:

## 11.3 Bug 5448588 - Slow LGWR sync performance for large redo write sizes

Ich habe einen Service Request geöffnet, um den Impact dieses Bugs und die Wahrscheinlichkeit zu ermitteln. Bei unseren Tests konnte dieser Bug nicht beobachtet werden.

Fix: Fixed in 10.2.0.3 and 11.0

## 11.4 Bug 5261264 Random memory corruptions during FAL archiving

Dieses Problem konnte bislang nicht beobachtet werden.

Fix: Fixed in 10.2.0.3 and 11.0

Workaround: Shutdown / Restart Database

## 11.5 Bug 4941173 RSM and DMON memory leak

Fix: Fixed in 10.2.0.3 and 11.0

Slow memory leak in Data Guard Broker in the PGA for the DMON and RSM0 processes.

Workaround:

The only workaround is to shutdown the Broker, then restart it.

eg: by setting the DG\_BROKER\_START parameter to FALSE, then back to TRUE.

**Achtung: Für das Monitoring dieses Bugs habe ich ein Prozess-Monitoring für Resident Memory KB via Enterprise Manager eingerichtet.**

## 11.6 Bug [4637668](#) IMU transactions can produce out-of-order redo (OERI [3020] on recovery)

Fix:

- 1) Primary: alter system set "\_in\_memory\_undo"=false scope=spfile;
- 2) Apply Patch 10.2.0.3

Workaround:

1. Find out which Tablespace and which datafile is having the problem. There might be several different tablespaces or datafiles in the error message. In this case, it is tablespace TSI128M\_01 with datafile tsi128m\_04.dbf.

2. Disable the broker configuration:

```
dgmgrl
```

```
connect sys
```

```
disable configuration
```

3. Set the tablespace in online backup mode on PRDDB1:

```
SQL> alter tablespace TSI128M_01 begin backup;
```

4. Copy the datafile from PRDDB1 to STBDB1:

on dbhost1 as user oraclep:

```
cd /oracle/PRDDB1/oradata
```

```
scp tsi128m_04.dbf 192.168.0.2:/oracle/STBDB1/oradata/
```

5. As soon as it is finished, end online backup mode on PRDDB1:

```
SQL> alter tablespace TSI128M_01 end backup;
```

6. Start recovery by enabling the broker configuration:

```
dgmgrl
```

```
connect sys
```

```
enable configuration;
```

7. Check alert log on STBDB1:

last line should read like this. This tells us that realtime apply is occurring. The Sequence# should match the last sequence from primary.

```
Thu May 10 19:15:16 2007  
Recovery of Online Redo Log: Thread 1 Group 6 Seq 2059 Reading mem 0  
  Mem# 0 errs 0: /oracle/STBDB1/origlogB/standby_g6_m1.log
```

```
Test: show database verbose 'STBDB1';
```

```
EDIT DATABASE 'STBDB1' SET PROPERTY 'ApplyParallel'='NO';
```

## 12 TCP Send/Receive Buffer ohne DataGuard Broker

Im einzelnen:

dbhost1: listener.ora:

```
LISTENER_DATAGUARD_PRDDB1 =
```

```
(DESCRIPTION_LIST =
```

```
(DESCRIPTION =
```

```
(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1)(PORT =  
1521)(IP=FIRST)(SEND_BUF_SIZE=327670)(RECV_BUF_SIZE=327670))
```

```
)
```

```
)
```

```
SID_LIST_LISTENER_DATAGUARD_PRDDB1 =
```

```
(SID_LIST =
```

```
(SID_DESC =
```

```
(SDU=32767)
```

```
(SID_NAME = PRDDB1)
# (GLOBAL_DBNAME=PRDDB1_DGMGRL)
(ORACLE_HOME = /oracle/PRDDB1/10.2.0)
)
)
```

dbhost1: tnsnames.ora:

```
STBDB1_DATAGUARD =
(DESCRIPTION =
(SDU=32767)
(SEND_BUF_SIZE=327670)
(RECV_BUF_SIZE=327670)
(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2)(PORT = 1521))
(CONNECT_DATA =
(SID= STBDB1)
)
)
```

dbhost2: listener.ora:

```
LISTENER_DATAGUARD_STBDB1 =
(DESCRIPTION_LIST =
(DESCRIPTION =
(ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.2)(PORT =
1521)(IP=FIRST)(SEND_BUF_SIZE=327670)(RECV_BUF_SIZE=327670))
)
)
```

```
SID_LIST_LISTENER_DATAGUARD_STBDB1 =
```

```
(SID_LIST =  
  (SID_DESC =  
    (SDU=32767)  
    (SID_NAME = STBDB1)  
#   (GLOBAL_DBNAME = STBDB1_DGMGRL)  
    (ORACLE_HOME = /oracle/STBDB1/10.2.0)  
  )  
)
```

dbhost2: tnsnames.ora:

```
PRDDB1_DATAGUARD =  
  (DESCRIPTION =  
    (SEND_BUF_SIZE=327670)  
    (RECV_BUF_SIZE=327670)  
    (SDU=32767)  
    (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.0.1 )(PORT = 1521))  
    (CONNECT_DATA =  
      (SID = PRDDB1)  
    )  
  )
```

## 13 Referenzen

- Oracle Data Guard Concepts and Administration, 10g Release 2 (10.2)
- Oracle Data Guard Broker, 10g Release 2 (10.2)
- <http://www.oracle.com/technology/deploy/availability/htdocs/maa.htm#Database>
- [Oracle Database 10g Release 2 Best Practices: Data Guard Redo Transport & Network Configuration](http://www.oracle.com/technology/deploy/availability/pdf/MAA_WP_10gR2_DataGuardNetworkBestPractices.pdf)  
([http://www.oracle.com/technology/deploy/availability/pdf/MAA\\_WP\\_10gR2\\_DataGuardNetworkBestPractices.pdf](http://www.oracle.com/technology/deploy/availability/pdf/MAA_WP_10gR2_DataGuardNetworkBestPractices.pdf))
- [Oracle Database 10g Release 2 Best Practices: Data Guard Switchover and Failover](http://www.oracle.com/technology/deploy/availability/pdf/MAA_WP_10gR2_SwitchoverFailoverBestPractices.pdf)  
([http://www.oracle.com/technology/deploy/availability/pdf/MAA\\_WP\\_10gR2\\_SwitchoverFailoverBestPractices.pdf](http://www.oracle.com/technology/deploy/availability/pdf/MAA_WP_10gR2_SwitchoverFailoverBestPractices.pdf))

- [http://www.trivadis.com/uploads/tx\\_cabagdownloadarea/TimoutsDataGuard\\_070826.pdf](http://www.trivadis.com/uploads/tx_cabagdownloadarea/TimoutsDataGuard_070826.pdf)