DATAGUARD FAST START FAILOVER IMPLEMENTATION

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Summary

This document describes the implementation of a Dataguard Environment on Windows using Oracle RDBMS 10.2.0.4. The setup includes 3 servers: Primary, Physical Standby and Observer.

The Configuration was setup in maximum availability mode and Fast Start Failover was configured with a 30 seconds threshold.

The observer was setup to be started at server boot and was set to be run by system so that no user can shutdown it. A watchdog process run by a central control application takes care of restarting the observer process in case that is shutdown; the observer process is also configured with the scheduler to be started up at boot time.

The environment

The environment is setup of 3 Windows Server 2003 with 4 cpus and 2GB memory each.

```
Server          DGONE
IP              192.168.2.12
Oracle Home     C:\oracle\product\10.2.0\db_1
Database        SATI
Main Role       Primary

Server          DGTWO
IP              192.168.2.14
Oracle Home     C:\oracle\product\10.2.0\db_1
Database        SATISTD
Main Role       Standby

Server          DGTHREE
IP              192.168.2.16
```


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```
Oracle Home     C:\oracle\product\10.2.0\db_1
Database
Main Role       Data Guard Broker Observer process site
```

Database Checkup

The Database is a standalone partial copy of the main production database, it is updated with specific information at regular intervals and serves as a front end repository for a web application open to the general public so it does require very high availability. In case of primary site crash the time to failover is about 40 seconds.

The database access is read only mostly, except for the periodic uploads of data that maintain it updated.

```
C:\Documents and Settings\AV\Desktop\SCRIPTS> sqlplus / as sysdba

SQL*Plus: Release 10.2.0.4.0 - Production on Sun Dec 14 09:43:57 2008

Copyright (c) 1982, 2007, Oracle.  All Rights Reserved.


Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.4.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> show sga

Total System Global Area 1258291200 bytes
Fixed Size                  1298304 bytes
Variable Size             494928000 bytes
Database Buffers          754974720 bytes
Redo Buffers                7090176 bytes
```

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The Primary database spfile

Configuring a Dataguard environment starts by preparing an Spfile that contains specific parameters that define and control Dataguard operation. When Dataguard Broker is used to manage the environment an spfile must be used because the broker will take over the responsibility to setup and change specific parameters under specific circumstances, like manual switchover, fast start failover, add or remove a standby, reinstate a failed primary, etc.

The Dataguard related parameters could be confusing at the beginning so it is convenient to use some time to become familiar with their meaning and use.

The next table explains the parameters required for configuring Dataguard, they are divided in groups to better explain their functionality.

Names Related Parameters

Parameter	Functionality and comments
db_name	db_name contains the database name, this parameter has the same value on all members of the Dataguard environment, i.e.: Primary Database : ***.db_name='SATI'*** Physical standby : ***.db_name='SATI'***
db_unique_name	db_unique_name is used to identify a database created for reporting or a physical standby. This database must have a unique DB_UNIQUE_NAME. The primary database will have db_unique_name=db_name, while the standby will have db_unique_name set to a unique value that is different from the db_name, i.e. : Primary database : ***.db_unique_name=SATI*** Physical standby : ***.db_unique_name='SATISTD'***

instance_name	Instance_name has the value of the System Identifier; The SID identifies the instance's shared memory on a host. On Dataguard is important to take care that the instance_name is correctly defined on the physical standby with the same value as the db_unique_name, because the broker to establish communications uses this value. A possible error here is to have correctly defined db_unique_name, but because the parameter file was copied from the primary instance name can remain set as the database name, that will make fail the automatic startup of the standby on switchover or failover. Primary database : ***.instance_name='SATI'*** Physical standby : ***.instance_name='SATISTD'***

Network Related Parameters

Parameter	Functionality and comments
fal_server	fal_server specifies the FAL (fetch archive log) server for a standby database. This parameter is relevant only when the database is open on the primary role. On The primary database the standby is configured as fal_server so that in case of role change the primary, converted to standby, will be able to get the required logs to close gaps if needed. Primary database : *.fal_server='(DESCRIPTION= (ADDRESS_LIST= (ADDRESS= (PROTOCOL=TCP) (HOST=DGTWO) (PORT=1522))) (CONNECT_DATA= (SERVICE_NAME= SATISTD_XPT)(SERVER=dedicated)))' Physical standby : *.fal_server='(DESCRIPTION= (ADDRESS_LIST= (ADDRESS= (PROTOCOL=TCP) (HOST=DGONE) (PORT=1522)))(CONNECT_DATA= (SERVICE_NAME= SATI_XPT)(SERVER=dedicated)))'
	fal_client specifies the FAL (fetch archive log) client name that is used by the FAL_SERVER, to refer to the FAL client. The fal_client will point to the same database where it is configured, and will be active only when this database will be mounted on the standby role.

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fal_client	Primary database : *.fal_client='(DESCRIPTION= (ADDRESS_LIST= (ADDRESS= (PROTOCOL=TCP) (HOST=DGONE) (PORT=1522))) (CONNECT_DATA= (SERVICE_NAME= SATI_XPT) (INSTANCE_NAME=SATI) (SERVER=dedicated)))' Physical standby : *.fal_client='(DESCRIPTION= (ADDRESS_LIST= (ADDRESS= (PROTOCOL=TCP) (HOST=DGTWO) (PORT=1522)))(CONNECT_DATA= (SERVICE_NAME= SATISTD_XPT) (INSTANCE_NAME=SATISTD)(SERVER=dedicated)))'
archive_lag_target	archive_lag_target force a log switch after the specified amount of time in seconds elapses. A 0 value is used for real time apply. The recommended value, when not using real time apply is 1800 (30 minutes). Primary database : ***.**archive_lag_target=***0*** Physical standby : ***.**archive_lag_target=***0***
local_listener	local_listener specifies the name of the listeners that are running on the same machine as this instance. The address or address list is specified in the TNSNAMES.ORA Primary database : ***.**local_listener='(ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))' Physical standby : ***.**local_listener='(ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))'
log_archive_config	Log_archive_config enables or disables the sending of redo logs to remote destinations and the receipt of remote redo logs, and specifies the unique database names (DB_UNIQUE_NAME) for each database in the Data Guard configuration. It will have the same value on both the primary and standby databases. Primary database : ***.**log_archive_config='DG_CONFIG=(SATI,SATISTD)' Physical standby : ***.**log_archive_config='DG_CONFIG=(SATI,SATISTD)'

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log_archive_dest_1	The LOG_ARCHIVE_DEST_1 parameter defines the first of up to 10 log archive destinations, each one must specify either the LOCATION or the SERVICE attribute to specify where to archive the redo data. There are several optional attributes. The LOCATION or the SERVICE attribute, must be the first attribute supplied. The other attributes are used to control aspects of how redo transport services transfer data from the primary to the standby database. V$ARCHIVE_DEST view can be queried to see the current settings for each destination. In this example I'm using Location and because the directory structure is identical on both the primary and standby database the location is identical. Primary database : log_archive_dest_1= 'LOCATION="G:\oracle\oradata\SATI\archive" VALID_FOR=(ONLINE_LOGFILE,ALL_ROLES)' Physical standby : log_archive_dest_1= 'LOCATION="G:\oracle\oradata\SATI\archive" VALID_FOR=(ALL_LOGFILES,ALL_ROLES)'
log_archive_dest_state_1	For every log_archive_dest_state_n parameter must be configured a log_archive_dest_state_n parameter as well. This parameter specifies whether the corresponding destination is currently enabled, deferred, disabled or can be used as an alternated location. Primary database : log_archive_dest_state_1=***'enable'*** Physical standby : log_archive_dest_state_1=***'enable'***
log_archive_dest_2	If using Dataguard Broker the broker will automatically setup on the primary database a log_archive_dest_state_2 Primary database : log_archive_dest_state_2='service="DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA=(SERVICE_NAME=SATISTD_XPT)(INSTANCE_NAME=SATISTD)(SERVER=dedicated)))", LGWR SYNC AFFIRM delay=0 OPTIONAL max_failure=0

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log_archive_dest_state_2	max_connections=1 reopen=300 db_unique_name="SATISTD" register net_timeout=180 valid_for=(online_logfile,primary_role)' Primary database : log_archive_dest_state_2=***'enable'*** Physical standby : log_archive_dest_state_2=***'enable'***
log_archive_max_processes	log_archive_max_processes specifies the number of archiver background processes (ARC0 through ARCn) Oracle initially invokes, the maximum is 30. Note that a high number of processes take longer to synchronize on switchover/failover. You can increase dynamically this parameter using alter system in case of load. For manual switchover set it to 2. Increase it only if you have a lot of redo activity and the standby is not updated enough fast. Primary database : log_archive_max_processes=2 Physical standby : log_archive_max_processes=2
log_archive_min_succeed_dest	log_archive_min_succeed_dest defines the minimum number of destinations that must succeed in order for the online logfile to be available for reuse.

Management Related Parameters

Parameter	Functionality and comments
dg_broker_start	dg_broker_start is set to true to enable automatic startup of the Data Guard broker DMON process. Primary database : dg_broker_start=true Physical standby : dg_broker_start=true
standby_file_management	standby_file_management set to AUTO enable automatic standby file management so that operating system file additions and deletions on the primary database are replicated on the standby database. This parameter is only applicable to Physical standby databases.

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	Primary database : standby_file_management=AUTO Physical standby : standby_file_management=AUTO

SQL> show parameters spfile;

NAME TYPE VALUE
---------- ---------- ----------
spfile string C:\ORACLE\PRODUCT\10.2.0\DB_1\DATABASE\SPFILESATI.ORA

```
SATI.__db_cache_size=754974720
SATI.__java_pool_size=8388608
SATI.__large_pool_size=16777216
SATI.__shared_pool_size=209715200
SATI.__streams_pool_size=50331648
*.archive_lag_target=0
*.background_dump_dest='Z:\oracle\admin\SATI\bdump'
*.compatible='10.2.0.4.0'
*.control_files='Z:\oracle\oradata\SATI\control01.ctl','X:\oracle\oradata\SATI\control02.ctl','G:\orac
le\oradata\SATI\control03.ctl'
*.core_dump_dest='Z:\oracle\admin\SATI\cdump'
*.db_block_size=8192
*.db_cache_size=0
*.db_domain=''
*.db_file_multiblock_read_count=16
*.db_files=1024
*.db_name='SATI'
*.db_recovery_file_dest_size=26843545600
*.db_recovery_file_dest='G:\FRA'
*.db_unique_name='SATI'
*.dg_broker_start=TRUE
*.fal_client='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)))(CONNECT_DATA
=(SERVICE_NAME=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))'
```

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```
*.fal_server='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA
=(SERVICE_NAME=SATISTD_XPT)(SERVER=dedicated)))'
*.fast_start_mttr_target=300
*.instance_name='SATI'
*.java_pool_size=0
*.job_queue_processes=50
*.large_pool_size=0
SATI.local_listener='(ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))'
SATISTD.local_listener='(ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))'
*.local_listener='(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522))'
*.LOG_ARCHIVE_CONFIG='DG_CONFIG=(SATI,SATISTD)'
*.LOG_ARCHIVE_DEST_1='LOCATION=G:\oracle\oradata\SATI\archive
VALID_FOR=(ALL_LOGFILES,ALL_ROLES)
DB_UNIQUE_NAME=SATI'
SATI.log_archive_dest_1='location="G:\oracle\oradata\SATI\archive"','valid_for=(ONLINE_LOGFILE,ALL_ROL
ES)'
*.log_archive_dest_2=''
SATI.log_archive_dest_2='location="dgsby"','valid_for=(STANDBY_LOGFILE,STANDBY_ROLE)'
*.LOG_ARCHIVE_DEST_STATE_1='ENABLE'
SATI.log_archive_dest_state_1='ENABLE'
*.log_archive_dest_state_2='ENABLE'
SATI.log_archive_dest_state_2='ENABLE'
*.LOG_ARCHIVE_FORMAT='%t_%s_%r.arc'
SATI.log_archive_format='%t_%s_%r.arc'
*.log_archive_max_processes=2
*.log_archive_min_succeed_dest=1
SATI.log_archive_trace=0
*.open_cursors=1000
*.pga_aggregate_target=524288000
*.processes=150
*.query_rewrite_enabled='TRUE'
*.REMOTE_LOGIN_PASSWORDFILE='EXCLUSIVE'
*.remote_os_authent=TRUE
*.session_max_open_files=20
*.sessions=500
*.sga_max_size=1258291200
*.sga_target=1048576000
*.shared_pool_size=0
```


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```
SATI.standby_archive_dest='dgsby'
*.standby_file_management='AUTO'
*.star_transformation_enabled='TRUE'
*.streams_pool_size=50331648
*.timed_statistics=TRUE
*.undo_management='AUTO'
*.undo_retention=3600
*.undo_tablespace='UNDOTBS1'
*.user_dump_dest='Z:\oracle\admin\SATI\udump'
*.utl_file_dir='Z:\oracle\admin\SATI\bdump'
*.workarea_size_policy='AUTO'
```


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Standby Database Creation On Windows

Enable Force Logging

In order to assure that all transactions are written to the online redologs we enable force logging, that option prevents the execution of nologging operations.

```
ALTER DATABASE FORCE LOGGING;
```

By working in force logging mode there is a performance penalty that we must pay. In some circumstances where we would like to run massive changes that require nologging mode we can stop log apply and at the end of the batch close the gap on the standby using an incremental backup.

For details on this technique please check chapter 12.7 of the Oracle® Data Guard Concepts and Administration 10g Release 2 (10.2), Part Number B14239-05

http://download.oracle.com/docs/cd/B19306_01/server.102/b14239/scenarios.htm#CIHEGFEG

> *12.7 Using RMAN Incremental Backups to Roll Forward a Physical Standby Database*
>
> *In some situations, RMAN incremental backups can be used to synchronize a physical standby database with the primary database. Using the RMAN BACKUP INCREMENTAL FROM SCN command, you can create a backup on the primary database that starts at the standby database's current SCN, which can then be used to roll the standby database forward in time.*

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Create a Password File and Copy it Over to the Standby Site

It is important to create the password file on the primary site and copy the generated file to the standby server. The password file at both sites must be same one. Even creating the password file on the standby site in the same way that was created on the primary site will not work.

```
C: >orapwd
UsagZ: orapwd file=<fname> password=<password> entries=<users> force=<y/n>
ignorecase=<y/n> nosysdba=<y/n>

  where
    file - name of password file (required),
    password - password for SYS (optional),
    entries - maximum number of distinct DBA (required),
    force - whether to overwrite existing file (optional),
    ignorecase - passwords are case-insensitive (optional),
    nosysdba - whether to shut out the SYSDBA logon (optional Database Vault only).

  There must be no spaces around the equal-to (=) character.

C:  >orapwd file=orapwSATI password=<sys_password> force=y
```

Copy password file C:\oracle\product\10.2.0\db_1\database\ orapwSATI.ora From DGONE to the same destination on DGTWO

Create standby redologs

When configuring FSFO we will use the synchronous redo transport mod, LogXptMode=SYNC, this mode does require to use standby redo logs. Redo received via redo transport is written on the Standby Database to the current standby redo log group by a RFS background process. When a log switch occurs on the Primary database,

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the new redo is written to the next standby redo log group, and the previously used standby redo log group is archived by an ARCn background process.

The process of filling and archiving redo log file groups at the Primary database is mirrored at the Standby destination by the sequential filling and archiving of standby redo log groups.

Each standby redo log file must be the same size as the online logs of the Primary database, and in addition the standby redo log must have at least one more group than the online redo logs on the Primary database.

On this case we have 3 online redo log groups with 2 members each on the primary

```
SQL>  select * from v$log;

    GROUP#    THREAD#  SEQUENCE#      BYTES    MEMBERS ARC STATUS           FIRST_CHANGE# FIRST_TIM
---------- ---------- ---------- ---------- ---------- --- ---------------- ------------- ---------
         1          1        297  104857600          2 NO  CURRENT             4127112821 16-NOV-08
         2          1        295  104857600          2 YES INACTIVE            4127112003 16-NOV-08
         3          1        296  104857600          2 YES INACTIVE            4127112226 16-NOV-08

SQL> select * from v$logfile;

    GROUP# STATUS  TYPE    MEMBER                                  IS_
---------- ------- ------- ---------------------------------------- ---
         1         ONLINE  Z:\ORACLE\ORADATA\SATI\REDO01.LOG       NO
         1         ONLINE  X:\ORACLE\ORADATA\SATI\REDO02.LOG       NO
         2         ONLINE  Z:\ORACLE\ORADATA\SATI\REDO11.LOG       NO
         2         ONLINE  X:\ORACLE\ORADATA\SATI\REDO12.LOG       NO
         3         ONLINE  Z:\ORACLE\ORADATA\SATI\REDO21.LOG       NO
         3         ONLINE  X:\ORACLE\ORADATA\SATI\REDO22.LOG       NO

6 rows selected.
```

We will add another 4 standby redo log groups with 2 members each on the primary, when the database will be copied to create the standby the standby redologs will be already there.

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```
SQL> alter database add standby logfile group 4
('Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG','X:\ORACLE\ORADATA\SATI\STDBYREDOG4_02.LOG')
  2  SIZE 104857600;

Database altered.

SQL> alter database add standby logfile group 5
('Z:\ORACLE\ORADATA\SATI\STDBYREDOG5_01.LOG','X:\ORACLE\ORADATA\SATI\STDBYREDOG5_02.LOG')
  2  SIZE 104857600;

Database altered.

SQL> alter database add standby logfile group 6
('Z:\ORACLE\ORADATA\SATI\STDBYREDOG6_01.LOG','X:\ORACLE\ORADATA\SATI\STDBYREDOG6_02.LOG')
  2  SIZE 104857600;

Database altered.

SQL> alter database add standby logfile group 7
('Z:\ORACLE\ORADATA\SATI\STDBYREDOG7_01.LOG','X:\ORACLE\ORADATA\SATI\STDBYREDOG7_02.LOG')
  2  SIZE 104857600;

Database altered.

SQL> SELECT GROUP#,THREAD#,SEQUENCE#,ARCHIVED,STATUS FROM V$STANDBY_LOG;

    GROUP#    THREAD#  SEQUENCE# ARC STATUS
---------- ---------- ---------- --- ----------
         4          0          0 YES UNASSIGNED
         5          0          0 YES UNASSIGNED
         6          0          0 YES UNASSIGNED
         7          0          0 YES UNASSIGNED
```


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Enable Archiving

On 10g we jaut need to mout the database and execute the command

```
SQL> alter database archivelog;

SQL> archive log list
Database log mode              Archive Mode
Automatic archival             Enabled
Archive destination            G:\oracle\oradata\SATI\archive
Oldest online log sequence     295
Next log sequence to archive   297
Current log sequence           297
```

Setup the network using netca or netmgr, edit the tnsnames.ora to register the listeners

One important aspect of preparing the Dataguard environment is to configure the network appropriately. A default configuration can be created and then both the listener.ora and the tnsnames.ora will need to be edited to match the standard requirements of Dataguard

On the listener.ora of each server you will need to manually register the corresponding database using the following syntax:

On the Primary

```
SID_LIST_LISTENER_DGONE =
  (SID_LIST =
    (SID_DESC =
```


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```
      (SID_NAME = SATI)
      (GLOBAL_DBNAME=SATI_DGMGRL)
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
    )
  )
```

On the Standby

```
SID_LIST_LISTENER_DGTWO =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = SATISTD)
      (GLOBAL_DBNAME=SATISTD_DGMGRL)
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
    )
  )
```

These are the listener.ora files:

Listener.ora on primary database

```
# listener.ora Network Configuration FilZ: C:\oracle\product\10.2.0\db_1\network\admin\listener.ora
# Generated by Oracle configuration tools.

LISTENER_DGONE =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    )
  )

SID_LIST_LISTENER_DGONE =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = SATI)
      (GLOBAL_DBNAME=SATI_DGMGRL)
```


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```
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
    )
  )
```

Listener.ora on standby database

```
# listener.ora Network Configuration FilZ: C:\oracle\product\10.2.0\db_1\network\admin\listener.ora
# Generated by Oracle configuration tools.

LISTENER_DGTWO =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    )
  )

SID_LIST_LISTENER_DGTWO =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = SATISTD)
      (GLOBAL_DBNAME=SATISTD_DGMGRL)
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
    )
  )
```

Tnsnames.ora on primary database

```
# tnsnames.ora Network Configuration FilZ: C:\oracle\product\10.2.0\db_1\network\admin\tnsnames.ora
# Generated by Oracle configuration tools.

LISTENER_DGONE =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    )
  )
```

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```
SATI =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATI_DGMGRL)
    )
  )

SATISTD =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATISTD_DGMGRL)
    )
  )


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

Tnsnames.ora on standby database

```
# tnsnames.ora Network Configuration FilZ: C:\oracle\product\10.2.0\db_1\network\admin\tnsnames.ora
# Generated by Oracle configuration tools.

LISTENER_DGTWO =
```


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```
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    )
  )

SATI =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATI_DGMGRL)
    )
  )

SATISTD =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATISTD_DGMGRL)
    )
  )

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


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Shutdown the Primary Database and copy it Over to the Standby Server

On windows I just shared the directories and dragged the directories to the standby site.
On Linux I use ftp or rman.

Create the Database Service on the Standby Server

When implementing Dataguard on Windows, after installing Oracle server on the server that will host the physical standby database, a service needs to be created to for the clone. Startmode is set to manual, because the main role of the database is to be physical standby on which case we will mount it only. In case that the database will assume the primary role, the broker will take care of starting it up and change the role.

```
oradim –NEW –SID SATISTD –STARTMODE manual
```

Startup mount the Primary Database and create a standby controlfile

```
C:\Documents and Settings\AV>SQLPLUS "/AS SYSDBA"

SQL*Plus: Release 10.2.0.3.0 - Production on Wed Nov 19 12:58:23 2008

Copyright (c) 1982, 2006, Oracle.  All Rights Reserved.

Connected to an idle instance.

SQL> startup mount;
ORACLE instance started.
```


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```
Total System Global Area 1258291200 bytes
Fixed Size                  1292180 bytes
Variable Size             654313580 bytes
Database Buffers          595591168 bytes
Redo Buffers                7094272 bytes
Database mounted.
SQL> ALTER DATABASE CREATE STANDBY CONTROLFILE AS 'C:\SATISTD.CTL';

Database altered.

SQL> ALTER DATABASE OPEN;

Database altered.
```

Create a copy of the primary spfile and modify it for the standby

```
SQL> create pfile='c:\standby_pfile.ora' from spfile;

File created.

Edited FilZ:

SATISTD.__db_cache_size=545259520
SATISTD.__java_pool_size=8388608
SATISTD.__large_pool_size=8388608
SATISTD.__shared_pool_size=427819008
SATISTD.__streams_pool_size=50331648
*.archive_lag_target=0
*.background_dump_dest='Z:\oracle\admin\SATI\bdump'
*.compatible='10.2.0.4.0'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
*.control_files='Z:\oracle\oradata\SATI\control01.ctl','X:\oracle\oradata\SATI\control02.ctl','G:\orac
le\oradata\SATI\control03.ctl'
*.core_dump_dest='Z:\oracle\admin\SATI\cdump'
*.db_block_size=8192
*.db_cache_size=0
*.db_domain=''
*.db_file_multiblock_read_count=16
*.db_files=1024
*.db_name='SATI'
*.db_recovery_file_dest_size=26843545600
*.db_recovery_file_dest='G:\FRA'
*.db_unique_name='SATISTD'
*.dg_broker_start=TRUE
*.fal_client='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA
=(SERVICE_NAME=SATISTD_XPT)(INSTANCE_NAME=SATISTD)(SERVER=dedicated)))'
*.fal_server='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)))(CONNECT_DATA
=(SERVICE_NAME=SATI_XPT)(SERVER=dedicated)))'
*.fast_start_mttr_target=300
*.instance_name='SATISTD'
*.java_pool_size=0
*.job_queue_processes=50
*.large_pool_size=0
*.local_listener='(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522))'
*.LOG_ARCHIVE_CONFIG='DG_CONFIG=(SATI,SATISTD)'
*.LOG_ARCHIVE_DEST_1='LOCATION=G:\oracle\oradata\SATI\archive
VALID_FOR=(ALL_LOGFILES,ALL_ROLES)
DB_UNIQUE_NAME=SATISTD'
SATISTD.log_archive_dest_1='location="G:\oracle\oradata\SATI\archive"','valid_for=(ONLINE_LOGFILE,ALL_
ROLES)'
*.log_archive_dest_2='service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=152
2)))(CONNECT_DATA=(SERVICE_NAME=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))"','   LGWR SYNC
AFFIRM delay=0 OPTIONAL max_failure=0 max_connections=1   reopen=300 db_unique_name="SATI" register
net_timeout=180  valid_for=(online_logfile,primary_role)'
*.log_archive_dest_3=''
*.LOG_ARCHIVE_DEST_STATE_1='ENABLE'
SATISTD.log_archive_dest_state_1='ENABLE'
*.log_archive_dest_state_2='ENABLE'
*.log_archive_dest_state_3='ENABLE'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
*.LOG_ARCHIVE_FORMAT='%t_%s_%r.arc'
SATI.log_archive_format='%t_%s_%r.arc'
SATISTD.log_archive_format='%t_%s_%r.arc'
*.log_archive_max_processes=2
*.log_archive_min_succeed_dest=1
SATISTD.log_archive_trace=0
*.open_cursors=1000
*.pga_aggregate_target=524288000
*.processes=150
*.query_rewrite_enabled='TRUE'
*.REMOTE_LOGIN_PASSWORDFILE='EXCLUSIVE'
*.remote_os_authent=TRUE
*.session_max_open_files=20
*.sessions=500
*.sga_max_size=1258291200
*.sga_target=1048576000
*.shared_pool_size=0
SATISTD.standby_archive_dest=''
*.standby_file_management='auto'
*.star_transformation_enabled='TRUE'
*.streams_pool_size=50331648
*.timed_statistics=TRUE
*.undo_management='AUTO'
*.undo_retention=3600
*.undo_tablespace='UNDOTBS1'
*.user_dump_dest='Z:\oracle\admin\SATI\udump'
*.utl_file_dir='Z:\oracle\admin\SATI\bdump'
*.workarea_size_policy='AUTO'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Copy the standby controlfile over to the Standby Server

```
On windows I just shared the directories and dragged the directories to the standby site.
On Linux I usually use ftp.
```

Generate the standby spfile from the pfile you prepared before

To generate the Physical Standby spfile, we start the database in nomount mode with the pfile we created from the primary and edited for the standby database, and we execute the create spfile command.

```
SQL> STARTUP NOMOUNT PFILE='C:\standby_pfile.txt';
ORACLE instance started.

Total System Global Area 1258291200 bytes
Fixed Size                  1292180 bytes
Variable Size             520095852 bytes
Database Buffers          729808896 bytes
Redo Buffers                7094272 bytes
SQL> CREATE SPFILE FROM PFILE='C:\standby_pfile.txt';

File created.

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


ORACLE instance shut down.

SQL> startup mount;
ORACLE instance started.

Total System Global Area 1258291200 bytes
Fixed Size                  1292180 bytes
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Variable Size             520095852 bytes
Database Buffers          729808896 bytes
Redo Buffers                7094272 bytes

SQL> show parameters spfile

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
spfile                               string      C:\ORACLE\PRODUCT\10.2.0\DB_1\
                                                 DATABASE\SPFILESATISTD.ORA
SQL> show parameters local_li

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
local_listener                       string      LISTENER_DGTWO
```

Start Recovery on the standby database and check

```
SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;

Database altered.
```

Check standby alert.log

```
Wed Nov 19 14:31:59 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION
MRP0 started with pid=18, OS id=3540
Managed Standby Recovery not using Real Time Apply
 parallel recovery started with 3 processes
Wed Nov 19 14:32:09 2008
Clearing online redo logfile 1 Z:\ORACLE\ORADATA\SATI\REDO01.LOG
Clearing online log 1 of thread 1 sequence number 300
Wed Nov 19 14:32:09 2008
Errors in file Z:\oracle\admin\SATI\bdump\SATISTD_mrp0_3540.trc:
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
ORA-19527: physical standby redo log must be renamed
ORA-00312: online log 1 thread 1: 'Z:\ORACLE\ORADATA\SATI\REDO01.LOG'

Clearing online redo logfile 1 complete
Media Recovery Waiting for thread 1 sequence 300
Wed Nov 19 14:32:10 2008
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION
Wed Nov 19 14:44:57 2008
Using STANDBY_ARCHIVE_DEST parameter default value as G:\oracle\oradata\SATI\archive
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[1]: Assigned to RFS process 4044
RFS[1]: Identified database type as 'physical standby'
Primary database is in MAXIMUM PERFORMANCE mode
Changing standby controlfile to MAXIMUM PERFORMANCE mode
Primary thread 1 already marked as open; setting 'closed'
Wed Nov 19 14:44:57 2008
RFS LogMiner: Client disabled from further notification
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[2]: Assigned to RFS process 3136
RFS[2]: Identified database type as 'physical standby'
RFS[2]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:45:06 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[3]: Assigned to RFS process 884
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 5: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG5_01.LOG'
Wed Nov 19 14:45:09 2008
Fetching gap sequence in thread 1, gap sequence 300-301
Wed Nov 19 14:45:10 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
Wed Nov 19 14:45:10 2008
Redo Shipping Client Connected as PUBLIC
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Wed Nov 19 14:45:10 2008
RFS[4]: Assigned to RFS process 1500
Wed Nov 19 14:45:10 2008
-- Connected User is Valid
Wed Nov 19 14:45:10 2008
RFS[4]: Identified database type as 'physical standby'
Wed Nov 19 14:45:10 2008
RFS[5]: Assigned to RFS process 3976
RFS[5]: Identified database type as 'physical standby'
Wed Nov 19 14:45:10 2008
RFS[4]: Archived Log: 'G:\ORACLE\ORADATA\SATI\ARCHIVE\1_300_646399178.ARC'
Wed Nov 19 14:45:14 2008
RFS[5]: Archived Log: 'G:\ORACLE\ORADATA\SATI\ARCHIVE\1_301_646399178.ARC'
Wed Nov 19 14:45:39 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_300_646399178.ARC
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_301_646399178.ARC
Wed Nov 19 14:45:49 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_302_646399178.ARC
Media Recovery Waiting for thread 1 sequence 303 (in transit)
Wed Nov 19 14:47:36 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:47:41 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_303_646399178.ARC
Media Recovery Waiting for thread 1 sequence 304 (in transit)
Wed Nov 19 14:50:15 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:50:16 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_304_646399178.ARC
Media Recovery Waiting for thread 1 sequence 305 (in transit)
```

Check redolog apply on the standby

```
SELECT SEQUENCE#, FIRST_TIME, NEXT_TIME FROM V$ARCHIVED_LOG ORDER BY SEQUENCE#;
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
 SEQUENCE# FIRST_TIME     NEXT_TIME
---------- -------------- --------------
       300 16/11/08 17:41 19/11/08 12:58
       301 19/11/08 12:58 19/11/08 13:03
       302 19/11/08 13:03 19/11/08 14:45
       303 19/11/08 14:45 19/11/08 14:48
       304 19/11/08 14:48 19/11/08 14:50
```

Switch a couple of sequences on the primary:

```
SQL> archive log list
Database log mode              Archive Mode
Automatic archival             Enabled
Archive destination            G:\oracle\oradata\SATI\archive
Oldest online log sequence     303
Next log sequence to archive   305
Current log sequence           305

SQL> alter system switch logfile;
System altered.

SQL> alter system switch logfile;
System altered.

SQL> alter system switch logfile;
System altered.

SQL> alter system switch logfile;
System altered.

SQL> alter system switch logfile;
System altered.

SQL> archive log list
Database log mode              Archive Mode
Automatic archival             Enabled
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Archive destination            G:\oracle\oradata\SATI\archive
Oldest online log sequence     308
Next log sequence to archive   310
Current log sequence           310
```

Check again redolog apply on the standby

```
SELECT SEQUENCE#, FIRST_TIME, NEXT_TIME FROM V$ARCHIVED_LOG ORDER BY SEQUENCE# ;

 SEQUENCE# FIRST_TIME     NEXT_TIME
---------- -------------- --------------
       300 16/11/08 17:41 19/11/08 12:58
       301 19/11/08 12:58 19/11/08 13:03
       302 19/11/08 13:03 19/11/08 14:45
       303 19/11/08 14:45 19/11/08 14:48
       304 19/11/08 14:48 19/11/08 14:50
       305 19/11/08 14:50 19/11/08 14:56
       306 19/11/08 14:56 19/11/08 14:56
       307 19/11/08 14:56 19/11/08 14:56
       308 19/11/08 14:56 19/11/08 14:56
       309 19/11/08 14:56 19/11/08 14:56

10 rows selected.

SQL> archive log list
Database log mode              Archive Mode
Automatic archival             Enabled
Archive destination            G:\oracle\oradata\SATI\archive
Oldest online log sequence     306
Next log sequence to archive   0
Current log sequence           310
```

The apply process on the standby alert log

```
-- Connected User is Valid
Wed Nov 19 14:45:10 2008
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
RFS[4]: Identified database type as 'physical standby'
Wed Nov 19 14:45:10 2008
RFS[5]: Assigned to RFS process 3976
RFS[5]: Identified database type as 'physical standby'
Wed Nov 19 14:45:10 2008
RFS[4]: Archived Log: 'G:\ORACLE\ORADATA\SATI\ARCHIVE\1_300_646399178.ARC'
Wed Nov 19 14:45:14 2008
RFS[5]: Archived Log: 'G:\ORACLE\ORADATA\SATI\ARCHIVE\1_301_646399178.ARC'
Wed Nov 19 14:45:39 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_300_646399178.ARC
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_301_646399178.ARC
Wed Nov 19 14:45:49 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_302_646399178.ARC
Media Recovery Waiting for thread 1 sequence 303 (in transit)
Wed Nov 19 14:47:36 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:47:41 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_303_646399178.ARC
Media Recovery Waiting for thread 1 sequence 304 (in transit)
Wed Nov 19 14:50:15 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:50:16 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_304_646399178.ARC
Media Recovery Waiting for thread 1 sequence 305 (in transit)
Wed Nov 19 14:56:17 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:56:21 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_305_646399178.ARC
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_306_646399178.ARC
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_307_646399178.ARC
Media Recovery Waiting for thread 1 sequence 308 (in transit)
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Wed Nov 19 14:56:22 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[6]: Assigned to RFS process 3012
RFS[6]: Identified database type as 'physical standby'
RFS[6]: Successfully opened standby log 5: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG5_01.LOG'
Wed Nov 19 14:56:23 2008
Primary database is in MAXIMUM PERFORMANCE mode
RFS[3]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Nov 19 14:56:27 2008
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_308_646399178.ARC
Media Recovery Log G:\ORACLE\ORADATA\SATI\ARCHIVE\1_309_646399178.ARC
Media Recovery Waiting for thread 1 sequence 310 (in transit)
```

After a while recheck

```
SELECT SEQUENCE#, FIRST_TIME, NEXT_TIME FROM V$ARCHIVED_LOG ORDER BY SEQUENCE#;

 SEQUENCE# FIRST_TIME     NEXT_TIME
---------- -------------- --------------
       300 16/11/08 17:41 19/11/08 12:58
       301 19/11/08 12:58 19/11/08 13:03
       302 19/11/08 13:03 19/11/08 14:45
       303 19/11/08 14:45 19/11/08 14:48
       304 19/11/08 14:48 19/11/08 14:50
       305 19/11/08 14:50 19/11/08 14:56
       306 19/11/08 14:56 19/11/08 14:56
       307 19/11/08 14:56 19/11/08 14:56
       308 19/11/08 14:56 19/11/08 14:56
       309 19/11/08 14:56 19/11/08 14:56
       310 19/11/08 14:56 19/11/08 15:25
       311 19/11/08 15:25 19/11/08 15:26
       312 19/11/08 15:26 19/11/08 15:26
       313 19/11/08 15:26 19/11/08 15:26
       314 19/11/08 15:26 19/11/08 15:26
       315 19/11/08 15:26 19/11/08 15:28
       316 19/11/08 15:28 19/11/08 15:31
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
       317 19/11/08 15:31 19/11/08 15:40
       318 19/11/08 15:40 19/11/08 15:41
       319 19/11/08 15:41 19/11/08 15:41
       320 19/11/08 15:41 19/11/08 15:41

21 rows selected.

SELECT SEQUENCE#,APPLIED FROM V$ARCHIVED_LOG ORDER BY SEQUENCE#;

 SEQUENCE# APP
---------- ---
       300 YES
       301 YES
       302 YES
       303 YES
       304 YES
       305 YES
       306 YES
       307 YES
       308 YES
       309 YES
       310 YES
       311 YES
       312 YES
       313 YES
       314 YES
       315 YES
       316 YES
       317 YES
       318 YES
       319 YES
       320 YES

21 rows selected.
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Configuring Data Guard Broker

Enable flashback database on primary database

```
SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup mount;
ORACLE instance started.

Total System Global Area 1258291200 bytes
Fixed Size                  1292180 bytes
Variable Size             637536364 bytes
Database Buffers          612368384 bytes
Redo Buffers                7094272 bytes
Database mounted.

SQL> select name ,db_unique_name from v$database;

NAME      DB_UNIQUE_NAME
--------- ------------------------------
SATI     SATI

SQL> ALTER SYSTEM SET UNDO_RETENTION=3600 SCOPE=SPFILE;

System altered.

SQL> ALTER SYSTEM SET UNDO_MANAGEMENT='AUTO' SCOPE=SPFILE;

System altered.

SQL> ALTER DATABASE FLASHBACK ON;

Database altered.
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

On The Standby

```
SQL> startup mount;
ORACLE instance started.

Total System Global Area 1258291200 bytes
Fixed Size                  1292180 bytes
Variable Size             520095852 bytes
Database Buffers          729808896 bytes
Redo Buffers                7094272 bytes
Database mounted.
SQL> select name ,db_unique_name from v$database;

NAME      DB_UNIQUE_NAME
--------- ------------------------------
SATI     SATISTD

SQL> ALTER SYSTEM SET UNDO_RETENTION=3600 SCOPE=SPFILE;

System altered.

SQL> ALTER SYSTEM SET UNDO_MANAGEMENT='AUTO' SCOPE=SPFILE;

System altered.

SQL> ALTER DATABASE FLASHBACK ON;

Database altered.

SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;

Database altered.
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Enable database broker on primary database

The broker configuration files are automatically created when the broker is started using ALTER SYSTEM SET DG_BROKER_START=TRUE.

```
SQL> ALTER SYSTEM SET DG_BROKER_START=TRUE SCOPE=BOTH;

System altered.

SQL> show parameters dg_broker

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
dg_broker_config_file1               string      C:\ORACLE\PRODUCT\10.2.0\DB_1\
                                                 DATABASE\DR1SATI.DAT
dg_broker_config_file2               string      C:\ORACLE\PRODUCT\10.2.0\DB_1\
                                                 DATABASE\DR2SATI.DAT
dg_broker_start                      boolean     TRUE
```

Enable database broker on standby database

```
SQL> ALTER SYSTEM SET DG_BROKER_START=TRUE SCOPE=BOTH;

System altered.

SQL> show parameters dg_broker

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
dg_broker_config_file1               string      C:\ORACLE\PRODUCT\10.2.0\DB_1\
                                                 DATABASE\DR1SATISTD.DAT
dg_broker_config_file2               string      C:\ORACLE\PRODUCT\10.2.0\DB_1\
                                                 DATABASE\DR2SATISTD.DAT
dg_broker_start                      boolean     TRUE
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Setup the Local_Listener parameter on the Primary Database

```
SQL> ALTER SYSTEM SET LOCAL_LISTENER='LISTENER_DGONE' SCOPE=BOTH;

System altered.

SQL> show parameters local_listener

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
local_listener                       string      LISTENER_DGONE
```

Setup the Local_Listener parameter on the Standby Database

```
SQL> ALTER SYSTEM SET LOCAL_LISTENER='LISTENER_DGTWO' SCOPE =BOTH;

System altered.

SQL>  show parameters local_listener;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
local_listener                       string      LISTENER_DGTWO
```

Setup the Tnsnames.ora and Listener.ora parameter files on the Primary Database

The listener.ora needs to include a service named *global_db_name_DGMGRL* to enable the broker to start the databases on the event of switchover. This configuration needs to be included on both servers. To setup shutdown the listener, make the changes and restart the listener.

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Listener.ora

```
LISTENER_DGONE =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    )
  )

SID_LIST_LISTENER_DGONE =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = SATI)
      (GLOBAL_DBNAME=SATI_DGMGRL)
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
    )
  )
```

Tnsnames.ora

```
SATI =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATI_DGMGRL)
    )
  )

SATISTD =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
      (SERVICE_NAME = SATISTD_DGMGRL)
    )
  )
```

Check

```
C:\Documents and Settings\AV>lsnrctl status LISTENER_DGONE

LSNRCTL for 32-bit Windows: Version 10.2.0.4.0 - Production on 14-DEC-2008 10:19:22

Copyright (c) 1991, 2007, Oracle.  All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)))
STATUS of the LISTENER
------------------------
Alias                     LISTENER_DGONE
Version                   TNSLSNR for 32-bit Windows: Version 10.2.0.4.0 - Production
Start Date                08-DEC-2008 18:22:44
Uptime                    5 days 15 hr. 56 min. 42 sec
Trace Level               off
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Parameter File   C:\oracle\product\10.2.0\db_1\network\admin\listener.ora
Listener Log File         C:\oracle\product\10.2.0\db_1\network\log\listener_DGONE.log
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=DGONE)(PORT=1522)))
Services Summary...
Service "SATI" has 1 instance(s).
  Instance "SATI", status READY, has 1 handler(s) for this service...
Service "SATI_DGB" has 1 instance(s).
  Instance "SATI", status READY, has 1 handler(s) for this service...
Service "SATI_DGMGRL" has 1 instance(s).
  Instance "SATI", status UNKNOWN, has 1 handler(s) for this service...
Service "SATI_XPT" has 1 instance(s).
  Instance "SATI", status READY, has 1 handler(s) for this service...
The command completed successfully


C:\Documents and Settings\AV>TNSPING SATI

TNS Ping Utility for 32-bit Windows: Version 10.2.0.4.0 - Production on 14-DEC-2008 10:20:13
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Copyright (c) 1997,  2007, Oracle.  All rights reserved.

Used parameter files:
C:\oracle\product\10.2.0\db_1\network\admin\sqlnet.ora


Used TNSNAMES adapter to resolve the alias
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522)) (CONNECT_DATA =
(SERVER
= DEDICATED) (SERVICE_NAME = SATI_DGMGRL)))
OK (20 msec)

C:\Documents and Settings\AV>TNSPING SATISTD

TNS Ping Utility for 32-bit Windows: Version 10.2.0.4.0 - Production on 14-DEC-2008 10:20:17

Copyright (c) 1997,  2007, Oracle.  All rights reserved.

Used parameter files:
C:\oracle\product\10.2.0\db_1\network\admin\sqlnet.ora


Used TNSNAMES adapter to resolve the alias
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522)) (CONNECT_DATA =
(SERVER
= DEDICATED) (SERVICE_NAME = SATISTD_DGMGRL)))
OK (0 msec)

C:\Documents and Settings\AV>SQLPLUS sys@SATI as sysdba

SQL*Plus: Release 10.2.0.4.0 - Production on Sun Dec 14 10:21:09 2008

Copyright (c) 1982, 2007, Oracle.  All Rights Reserved.

Enter password:

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.4.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

C:\Documents and Settings\AV>SQLPLUS sys@SATISTD as sysdba
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
SQL*Plus: Release 10.2.0.4.0 - Production on Sun Dec 14 10:21:09 2008

Copyright (c) 1982, 2007, Oracle.  All Rights Reserved.

Enter password:

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.4.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
```

Setup the Tnsmanes.ora and Listener.ora parameter files on the Standby Database

The listener.ora needs to include a service named *global_db_name_DGMGRL* to enable the broker to start the databases on the event of switchover. This configuration needs to be included on both servers. To setup shutdown the listener, make the changes and restart the listener.

Listener.ora

```
LISTENER_DGTWO =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    )
  )

SID_LIST_LISTENER_DGTWO =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = SATISTD)
      (GLOBAL_DBNAME=SATISTD_DGMGRL)
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
    )
  )
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Tnsnames.ora

```
SATI =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATI_DGMGRL)
    )
  )

SATISTD =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = SATISTD_DGMGRL)
    )
  )
```

Check

```
C:\Documents and Settings\AV>lsnrctl status LISTENER_DGTWO

LSNRCTL for 32-bit Windows: Version 10.2.0.4.0 - Production on 14-DEC-2008 10:40:21

Copyright (c) 1991, 2007, Oracle.  All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))
STATUS of the LISTENER
------------------------
Alias                     listener_DGTWO
Version                   TNSLSNR for 32-bit Windows: Version 10.2.0.4.0 - Production
Start Date                08-DEC-2008 18:22:36
Uptime                    5 days 16 hr. 17 min. 46 sec
Trace Level               off
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Parameter File   C:\oracle\product\10.2.0\db_1\network\admin\listener.ora
Listener Log File         C:\oracle\product\10.2.0\db_1\network\log\listener_DGTWO.log
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=DGTWO)(PORT=1522)))
Services Summary...
Service "SATISTD" has 1 instance(s).
  Instance "SATISTD", status READY, has 1 handler(s) for this service...
Service "SATISTD_DGB" has 1 instance(s).
  Instance "SATISTD", status READY, has 1 handler(s) for this service...
Service "SATISTD_DGMGRL" has 1 instance(s).
  Instance "SATISTD", status UNKNOWN, has 1 handler(s) for this service...
Service "SATISTD_XPT" has 1 instance(s).
  Instance "SATISTD", status READY, has 1 handler(s) for this service...
The command completed successfully


C:\Documents and Settings\AV>TNSPING SATI

TNS Ping Utility for 32-bit Windows: Version 10.2.0.4.0 - Production on 14-DEC-2008 10:41:28

Copyright (c) 1997,  2007, Oracle.  All rights reserved.

Used parameter files:
C:\oracle\product\10.2.0\db_1\network\admin\sqlnet.ora


Used TNSNAMES adapter to resolve the alias
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
(CONNECT_DATA = (SERVER= DEDICATED) (SERVICE_NAME = SATI_DGMGRL)))
OK (0 msec)

C:\Documents and Settings\AV>TNSPING SATISTD

TNS Ping Utility for 32-bit Windows: Version 10.2.0.4.0 - Production on 14-DEC-2008 10:41:31

Copyright (c) 1997,  2007, Oracle.  All rights reserved.
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Used parameter files:
C:\oracle\product\10.2.0\db_1\network\admin\sqlnet.ora


Used TNSNAMES adapter to resolve the alias
Attempting to contact (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
(CONNECT_DATA = (SERVER= DEDICATED) (SERVICE_NAME = SATISTD_DGMGRL)))
OK (30 msec)

C:\Documents and Settings\AV>SQLPLUS SYS@SATI AS SYSDBA

SQL*Plus: Release 10.2.0.4.0 - Production on Sun Dec 14 10:41:41 2008

Copyright (c) 1982, 2007, Oracle.  All Rights Reserved.

Enter password:

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.4.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

C:\Documents and Settings\AV>SQLPLUS SYS@SATISTD AS SYSDBA

SQL*Plus: Release 10.2.0.4.0 - Production on Sun Dec 14 10:41:59 2008

Copyright (c) 1982, 2007, Oracle.  All Rights Reserved.

Enter password:

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.4.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Create the DataGuard Broker Configuration

From within the Broker Command Line interface, DGMGRL create the configuration

```
C:\oracle\product\agent10g\BIN>dgmgrl
DGMGRL for 32-bit Windows: Version 10.2.0.3.0 - Production

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

Welcome to DGMGRL, type "help" for information.
DGMGRL> help

The following commands are availablZ:

add             Add a standby database to the broker configuration
connect         Connect to an Oracle instance
create          Create a broker configuration
disable         Disable a configuration, a database, or Fast-Start Failover
edit            Edit a configuration, database, or instance
enable          Enable a configuration, a database, or Fast-Start Failover
exit            Exit the program
failover        Change a standby database to be the primary database
help            Display description and syntax for a command
quit            Exit the program
reinstate       Change a disabled database into a viable standby database
rem             Comment to be ignored by DGMGRL
remove          Remove a configuration, database, or instance
show            Display information about a configuration, database, or instance
shutdown        Shutdown a currently running Oracle instance
start           Start Fast-Start Failover observer
startup         Start an Oracle database instance
stop            Stop Fast-Start Failover observer
switchover      Switch roles between the primary database and a standby database

Use "help <command>" to see syntax for individual commands

DGMGRL> CONNECT SYS/XXXXXX@SATI
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Connected.

DGMGRL> CREATE CONFIGURATION fsfodg AS
> PRIMARY DATABASE IS SATI
> CONNECT IDENTIFIER IS SATI;
Configuration "fsfodg" created with primary database "SATI"

DGMGRL> ADD DATABASE SATISTD AS
> CONNECT IDENTIFIER IS SATISTD
> MAINTAINED AS PHYSICAL;
Database "SATISTD" added


DGMGRL> show configuration;

Configuration
  NamZ:                fsfodg
  Enabled:             NO
  Protection ModZ:     MaxPerformance
  Fast-Start Failover: DISABLED
  Databases:
    SATI      - Primary database
    SATISTD - Physical standby database

Current status for "SATI":
DISABLED

DGMGRL> SHOW DATABASE VERBOSE SATISTD;

Database
  NamZ:            SATISTD
  RolZ:            PHYSICAL STANDBY
  Enabled:         NO
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD

  Properties:
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
    InitialConnectIdentifier        = 'SATISTD'
    LogXptMode                      = 'SYNC'
    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          = '30'
    LogArchiveMinSucceedDest        = '1'
    DbFileNameConvert               = ''
    LogFileNameConvert              = ''
    FastStartFailoverTarget         = 'SATI'
    StatusReport                    = '(monitor)'
    InconsistentProperties          = '(monitor)'
    InconsistentLogXptProps         = '(monitor)'
    SendQEntries                    = '(monitor)'
    LogXptStatus                    = '(monitor)'
    RecvQEntries                    = '(monitor)'
    HostName                        = 'DGTWO'
    SidName                         = 'SATISTD'
    LocalListenerAddress            = '(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522))'
    StandbyArchiveLocation          = 'G:\ORACLE\ORADATA\SATI\ARCHIVE'
    AlternateLocation               = ''
    LogArchiveTrace                 = '0'
    LogArchiveFormat                = '%t_%s_%r.arc'
    LatestLog                       = '(monitor)'
    TopWaitEvents                   = '(monitor)'

Current status for "SATISTD":
DISABLED
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
DGMGRL> SHOW DATABASE VERBOSE SATI;

Database
  NamZ:            SATI
  RolZ:            PRIMARY
  Enabled:         NO
  Intended StatZ:  ONLINE
  Instance(s):
    SATI

  Properties:
    InitialConnectIdentifier        = 'SATI'
    LogXptMode                      = 'SYNC'
    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          = '30'
    LogArchiveMinSucceedDest        = '1'
    DbFileNameConvert               = ''
    LogFileNameConvert              = ''
    FastStartFailoverTarget         = 'SATISTD'
    StatusReport                    = '(monitor)'
    InconsistentProperties          = '(monitor)'
    InconsistentLogXptProps         = '(monitor)'
    SendQEntries                    = '(monitor)'
    LogXptStatus                    = '(monitor)'
    RecvQEntries                    = '(monitor)'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
    HostName                       = 'DGONE'
    SidName                        = 'SATI'
    LocalListenerAddress           = '(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522))'
    StandbyArchiveLocation         = 'G:\oracle\oradata\SATI\archive'
    AlternateLocation              = ''
    LogArchiveTrace                = '0'
    LogArchiveFormat               = '%t_%s_%r.arc'
    LatestLog                      = '(monitor)'
    TopWaitEvents                  = '(monitor)'

Current status for "SATI":
DISABLED
```

Enable the Broker Configuration

```
DGMGRL> ENABLE CONFIGURATION;
Enabled.
DGMGRL> show configuration;

Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxPerformance
  Fast-Start Failover: DISABLED
  Databases:
    SATI      - Primary database
    SATISTD - Physical standby database

Current status for "fsfodg":
SUCCESS

DGMGRL> ENABLE DATABASE SATISTD;
Enabled.


DGMGRL> show configuration;
```


/

```
Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxPerformance
  Fast-Start Failover: DISABLED
  Databases:
    SATI      - Primary database
    SATISTD - Physical standby database

Current status for "fsfodg":
SUCCESS
```

Configure Data Guard Broker For Switchover

First Check that the configuration is healthy, show database must return success

```
DGMGRL> show database SATI;

Database
  NamZ:            SATI
  RolZ:            PRIMARY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATI

Current status for "SATI":
SUCCESS

DGMGRL> show database SATISTD;

Database
  NamZ:            SATISTD
  RolZ:            PHYSICAL STANDBY
  Enabled:         YES
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD

Current status for "SATISTD":
SUCCESS
```

Set the “LogXptMode” Property to SYNC

```
DGMGRL> EDIT DATABASE SATI SET PROPERTY 'LogXptMode'='SYNC';
Property "LogXptMode" updated
DGMGRL> EDIT DATABASE SATISTD SET PROPERTY 'LogXptMode'='SYNC';
Property "LogXptMode" updated
```

Set the “FastStartFailoverTarget” Property for Both the Primary and Physical Databases

```
DGMGRL> EDIT DATABASE SATI SET PROPERTY FastStartFailoverTarget='SATISTD';
Property "faststartfailovertarget" updated
DGMGRL> EDIT DATABASE SATISTD SET PROPERTY FastStartFailoverTarget='SATI';
Property "faststartfailovertarget" updated
```

Change the Protection Mode to Maximum Availability

```
DGMGRL> EDIT CONFIGURATION SET PROTECTION MODE AS MAXAVAILABILITY;
Succeeded.
```

Start The Observer to Enable Fast Start Failover

Note that the observer process needs to be run on the background of a third productions server all the time in order to provide automatic fast start failover.

```
C:\oracle\product\agent10g\BIN>dgmgrl
DGMGRL for 32-bit Windows: Version 10.2.0.3.0 - Production

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


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Welcome to DGMGRL, type "help" for information.
DGMGRL> connect sys/xxxxxx@SATI
Connected.
DGMGRL> start observer;
Observer started
```

Enable Fast Start Failover

```
DGMGRL> show configuration;
Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxAvailability
  Fast-Start Failover: DISABLED
  Databases:
    SATI      - Primary database
    SATISTD - Physical standby database

Current status for "fsfodg":
SUCCESS

DGMGRL> ENABLE FAST_START FAILOVER;
Enabled.
DGMGRL> show configuration;

Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxAvailability
  Fast-Start Failover: ENABLED
  Databases:
    SATI      - Primary database
    SATISTD - Physical standby database
                - Fast-Start Failover target

Current status for "fsfodg":
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
SUCCESS
```

Check Status On Primary and Standby databases

```
SQL> select DB_UNIQUE_NAME,DATABASE_ROLE,OPEN_MODE,FS_FAILOVER_STATUS,FS_FAILOVER_CURRENT_TARGET from
v$database;

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATI            PRIMARY          READ WRITE SYNCHRONIZED          SATISTD

select DB_UNIQUE_NAME,DATABASE_ROLE,OPEN_MODE,FS_FAILOVER_STATUS,FS_FAILOVER_CURRENT_TARGET from
v$database;

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATISTD         PHYSICAL STANDBY MOUNTED    SYNCHRONIZED          SATISTD
```

Test Switchover

Switchover is used for maintenance on the primary, downtime is required to switch roles between primary and standby databases.

Before starting a switchover is convenient to check that the configuration and the managed databases are healthy

```
DGMGRL> show configuration

Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxAvailability
  Fast-Start Failover: ENABLED
  Databases:
    SATISTD - Physical standby database
               - Fast-Start Failover target
    SATI      - Primary database
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Current status for "fsfodg":
SUCCESS

DGMGRL> show database SATI

Database
  NamZ:            SATI
  RolZ:            PRIMARY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATI

Current status for "SATI":
SUCCESS

DGMGRL> show database SATISTD

Database
  NamZ:            SATISTD
  RolZ:            PHYSICAL STANDBY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD

Current status for "SATISTD":
SUCCESS

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

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

Database dismounted.
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

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

After a successful switchover the primary and the standby needs to be synchronized

Execute this sql statement on both databases:

```
select      DB_UNIQUE_NAME, DATABASE_ROLE, OPEN_MODE, FS_FAILOVER_STATUS,
            FS_FAILOVER_CURRENT_TARGET
from        v$database;
```

```
DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- --------------------------
SATISTD      PRIMARY          READ WRITE SYNCHRONIZED          SATI

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- --------------------------
SATI           PHYSICAL STANDBY MOUNTED    SYNCHRONIZED          SATI
```

Configuring the Observer Process

The Observer process will be in charge of monitoring the Primary and Standby databases; in case of Primary site failure, after checking that the Standby site is ready for the role change it will trigger the failover.

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Once the failed Primary site became available again the Broker will convert it to the standby site and will resume normal activity.
The observer process needs to be run on a productions server that will provide assurance of continuous availability. A watchdog process needs to be put in place to restart the observer immediately in the event that is stopped.

On most productions systems it is possible to define a script that will both check and restart the process in case of failure.

```
#!/bin/ksh
# startobserver
export ORACLE_BASE=/vmractst3/app01/oracle
export ORACLE_HOME=/vmractst3/app01/oracle/product/10.2
export
BASE_PATH=/vmractst3/app01/oracle/scripts/general:/opt/CTEact/bin:/usr/local/sbi
n:/usr/local/bin:/sbin:/bin:/usr/bin:/etc:/usr/local/maint/oraclZ:/usr/ccs/bin:/
usr/openwin/bin:/usr/dt/bin:/usr/local/bin:.
export PATH=$ORACLE_HOME/bin:$BASE_PATH
dgmgrl << eof
connect sys/oracle@whiteowl
STOP OBSERVER;
START OBSERVER;
eof
```

On windows a script can be used to start the Observer process at server startup using the Windows Scheduler.

The same script can be invoked in case that the observer process crash to restart the Observer

```
set ORACLE_HOME=C:\oracle\product\10.2.0\db_1
call dgmgrl -silent sys/xxxxxx@SATI "stop observer"
```


/

```
call dgmgrl -silent sys/xxxxxx@SATI "start observer"
```

Fast Start Failover Test

The FSFO can be tested by either shutting down the server where the primary database run or by shutting down the database with the abort option.

The progress and efficiency of the FSFO can be monitored by doing tail to the Primary and Standby databases alert logs. The whole process is also reflected on the Observer window if running on foreground.

These are the outputs registered during a FSFO test:

Observer Output During FSFO

On the observer output we see the following output:

1. At 17:36:32 the Observer detected a failure on the Primary database SATI and initiated failover to the Standby database SATISTD
2. At 17:37:19 SATISTD is up and running as the Primary, total downtime was 47 seconds.
3. At 17:38:33 the Observer detected that the failed database SATI was mounted and initiates the reinstatement, the database is shut down to perform flashback and recovery until it is synchronized with the new Primary
4. at 17:40:01 SATI is up and synchronized

Database Monitoring During FSFO

Status of the databases before the Failure at 17:36:00

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Primary Database SATI

```
DB_UNIQUE_NAME                 DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
------------------------------ ---------------- ---------- --------------------- ------------------------------
SATI                           PRIMARY          READ WRITE SYNCHRONIZED          SATISTD
```

Standby Database SATISTD

```
DB_UNIQUE_NAME                 DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
------------------------------ ---------------- ---------- --------------------- ------------------------------
SATISTD                        PHYSICAL STANDBY MOUNTED    SYNCHRONIZED          SATISTD
```

Primary Database SATI is Shutdown

```
SQL> shutdown abort
ORACLE instance shut down.
```

Standby Database SATISTD is Converted to Primary

The new primary is up and ready in seconds, the new FSFO target is the failed database SATI and its status is “Reinstate Required”

```
DB_UNIQUE_NAME                 DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS FS_FAILOVER_CURRENT_TARGET
------------------------------ ---------------- ---------- ------------------ ------------------------------
SATISTD                        PRIMARY          READ WRITE REINSTATE REQUIRED SATI
```

The Failed Database is Mounted

```
SQL> connect / as sysdba
Connected to an idle instance.
SQL> startup mount;
ORACLE instance started.

Total System Global Area 1258291200 bytes
Fixed Size                  1298304 bytes
Variable Size             494928000 bytes
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Database Buffers          754974720 bytes
Redo Buffers                7090176 bytes
Database mounted.
SQL> @chkstat
```

Immediately after the database is mounted the broker shuts it down and initiates reinstate, that's why we got ora-3113 when trying to check status:

```
select DB_UNIQUE_NAME,DATABASE_ROLE,OPEN_MODE,FS_FAILOVER_STATUS,FS_FAILOVER_CURRENT_TARGET from v$database
*
ERROR at line 1:
ORA-03113: end-of-file on communication channel
```

Once the database is mounted by the broker it is flashed back and synchronized with the new primary

```
SQL> connect / as sysdba
Connected.
SQL> @chkstat

DB_UNIQUE_NAME                 DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
------------------------------ ---------------- ---------- --------------------- ------------------------------
SATI                           PHYSICAL STANDBY MOUNTED    SYNCHRONIZED          SATI
```

Database Monitoring During FSFO Using the Alert Logs

The alert logs provide the best information to monitor both the FSFO and the Reinstate processes; if available you can use the command "tail -f <alert.log>" to monitor the progress.

This is a summary of the commands executed by the broker at both databases during the FSFO and the Reinstate processes.

SATISTD alert log (Standby converted to Primary)

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Wed Dec 10 17:39:04 2008
RFS[4]: Possible network disconnect with primary database
Wed Dec 10 17:39:07 2008
RFS[3]: Possible network disconnect with primary database
Wed Dec 10 17:39:07 2008
RFS[5]: Possible network disconnect with primary database
Wed Dec 10 17:39:34 2008
Attempting fast-start failover because the threshold of 30 seconds has elapsed.
Wed Dec 10 17:39:34 2008
Initiated fast-start failover to database SATISTD.
Wed Dec 10 17:39:35 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE FINISH FORCE
Wed Dec 10 17:39:35 2008
Terminal Recovery: Stopping real time apply
Wed Dec 10 17:39:36 2008
MRP0: Background Media Recovery cancelled with status 16037
Wed Dec 10 17:39:36 2008
Errors in file Z:\oracle\admin\SATI\bdump\SATISTD_mrp0_2428.trc:
ORA-16037: user requested cancel of managed recovery operation

Managed Standby Recovery not using Real Time Apply
Recovery interrupted!
Recovered data files to a consistent state at change 4134609708
Wed Dec 10 17:39:40 2008
Errors in file Z:\oracle\admin\SATI\bdump\SATISTD_mrp0_2428.trc:
ORA-16037: user requested cancel of managed recovery operation

Wed Dec 10 17:39:41 2008
Terminal Recovery: Stopped real time apply
Managed Standby Recovery not using Real Time Apply
 parallel recovery started with 3 processes
Terminal Recovery timestamp is '12/10/2008 17:39:48'
Terminal Recovery: applying standby redo logs.
Terminal Recovery: thread 1 seq# 721 redo required
Terminal Recovery:
Wed Dec 10 17:39:48 2008
Recovery of Online Redo Log: Thread 1 Group 5 Seq 721 Reading mem 0
  Mem# 0: Z:\ORACLE\ORADATA\SATI\STDBYREDOG5_01.LOG
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  Mem# 1: X:\ORACLE\ORADATA\SATI\STDBYREDOG5_02.LOG
Identified End-Of-Redo for thread 1 sequence 721
Terminal Recovery: Updated next available block for thread 1 sequence 721 lno 5 to value 74605
Wed Dec 10 17:39:49 2008
Incomplete recovery applied all redo ever generated.
Recovery completed through change 4134609709
Terminal Recovery: successful completion
Begin: Standby Redo Logfile archival
End: Standby Redo Logfile archival
Resetting standby activation ID 1481388743 (0x584c32c7)
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE FINISH FORCE
Wed Dec 10 17:39:57 2008
ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WAIT WITH SESSION SHUTDOWN
If media recovery active, switchover will wait 900 seconds
Standby terminal recovery start SCN: 4134609708
RESETLOGS after complete recovery through change 4134609709
Online log Z:\ORACLE\ORADATA\SATI\REDO01.LOG: Thread 1 Group 1 was previously cleared
Online log X:\ORACLE\ORADATA\SATI\REDO02.LOG: Thread 1 Group 1 was previously cleared
Online log Z:\ORACLE\ORADATA\SATI\REDO11.LOG: Thread 1 Group 2 was previously cleared
Online log X:\ORACLE\ORADATA\SATI\REDO12.LOG: Thread 1 Group 2 was previously cleared
Online log Z:\ORACLE\ORADATA\SATI\REDO21.LOG: Thread 1 Group 3 was previously cleared
Online log X:\ORACLE\ORADATA\SATI\REDO22.LOG: Thread 1 Group 3 was previously cleared
Standby became primary SCN: 4134609707
Wed Dec 10 17:39:58 2008
Setting recovery target incarnation to 3
Wed Dec 10 17:39:58 2008
Converting standby mount to primary mount.
Completed: ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY WAIT WITH SESSION SHUTDOWN
Wed Dec 10 17:39:58 2008
ARC0: STARTING ARCH PROCESSES
ARC2: Archival started
ARC2 started with pid=20, OS id=2744
Wed Dec 10 17:39:58 2008
ARC0: STARTING ARCH PROCESSES COMPLETE
ARC0: Becoming the 'no SRL' ARCH
Wed Dec 10 17:40:00 2008
ALTER SYSTEM SET standby_archive_dest='' SCOPE=BOTH SID='SATISTD';
Wed Dec 10 17:40:00 2008
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
ALTER SYSTEM SET
log_archive_dest_1='location="G:\oracle\oradata\SATI\archive"','valid_for=(ONLINE_LOGFILE,ALL_ROLES)'
SCOPE=BOTH SID='SATISTD';
Wed Dec 10 17:40:00 2008
ALTER SYSTEM SET log_archive_dest_state_1='ENABLE' SCOPE=BOTH SID='SATISTD';
Wed Dec 10 17:40:00 2008
ALTER DATABASE SET STANDBY DATABASE TO MAXIMIZE AVAILABILITY
Wed Dec 10 17:40:00 2008
Completed: ALTER DATABASE SET STANDBY DATABASE TO MAXIMIZE AVAILABILITY
Wed Dec 10 17:40:00 2008
ALTER DATABASE OPEN
Wed Dec 10 17:40:01 2008
Assigning activation ID 1481384601 (0x584c2299)
LGWR: Primary database is in MAXIMUM AVAILABILITY mode
LGWR: Destination LOG_ARCHIVE_DEST_1 is not serviced by LGWR
Thread 1 opened at log sequence 1
  Current log# 1 seq# 1 mem# 0: Z:\ORACLE\ORADATA\SATI\REDO01.LOG
  Current log# 1 seq# 1 mem# 1: X:\ORACLE\ORADATA\SATI\REDO02.LOG
Successful open of redo thread 1
Wed Dec 10 17:40:01 2008
SMON: enabling cache recovery
Wed Dec 10 17:40:04 2008
Successfully onlined Undo Tablespace 1.
Dictionary check beginning
Dictionary check complete
Starting control autobackup
Control autobackup written to DISK device
      handle 'G:\ORACLE_BACKUP\SATI\RMAN\DB\SATI_CONTROL_SATIXXX_C-1342263826-20081210-00'
Wed Dec 10 17:40:06 2008
SMON: enabling tx recovery
Wed Dec 10 17:40:06 2008
**************************************************************
WARNING: The following temporary tablespaces contain no files.
         This condition can occur when a backup controlfile has
         been restored.  It may be necessary to add files to these
         tablespaces.  That can be done using the SQL statement:

         ALTER TABLESPACE <tablespace_name> ADD TEMPFILE
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
         Alternatively, if these temporary tablespaces are no longer
         needed, then they can be dropped.
           Empty temporary tablespacZ: TEMP_TOOLS
*******************************************************************
Database Characterset is IW8ISO8859P8
Opening with internal Resource Manager plan
where NUMA PG = 1, CPUs = 4
replication_dependency_tracking turned off (no async multimaster replication found)
Starting background process QMNC
QMNC started with pid=22, OS id=2912
Wed Dec 10 17:40:08 2008
LOGSTDBY: Validating controlfile with logical metadata
Wed Dec 10 17:40:08 2008
LOGSTDBY: Validation complete
Completed: ALTER DATABASE OPEN
Wed Dec 10 17:40:13 2008
ALTER SYSTEM SET standby_archive_dest='' SCOPE=BOTH SID='SATISTD';
Wed Dec 10 17:40:13 2008
ALTER SYSTEM SET log_archive_trace=0 SCOPE=BOTH SID='SATISTD';
Wed Dec 10 17:40:13 2008
ALTER SYSTEM SET log_archive_format='%t_%s_%r.arc' SCOPE=SPFILE SID='SATISTD';
Wed Dec 10 17:40:14 2008
ALTER SYSTEM SET standby_file_management='auto' SCOPE=BOTH SID='*';
Wed Dec 10 17:40:14 2008
ALTER SYSTEM SET archive_lag_target=0 SCOPE=BOTH SID='*';
Wed Dec 10 17:40:14 2008
ALTER SYSTEM SET log_archive_max_processes=2 SCOPE=BOTH SID='*';
Wed Dec 10 17:40:14 2008
ALTER SYSTEM SET log_archive_min_succeed_dest=1 SCOPE=BOTH SID='*';
FSFP started with pid=27, OS id=460
Wed Dec 10 17:40:20 2008
Failover succeeded. Primary database is now SATISTD.
Wed Dec 10 17:40:50 2008
Shutting down archive processes
Wed Dec 10 17:40:55 2008
ARCH shutting down
ARC2: Archival stopped
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Wed Dec 10 17:41:35 2008
ALTER SYSTEM SET
log_archive_dest_2='service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)
))(CONNECT_DATA=(SERVICE_NAME=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))"','   LGWR SYNC AFFIRM
delay=0 OPTIONAL max_failure=0 max_connections=1   reopen=1 db_unique_name="SATI" register
net_timeout=180  valid_for=(online_logfile,primary_role)' SCOPE=BOTH;
Wed Dec 10 17:41:35 2008
ALTER SYSTEM SET log_archive_dest_state_2='RESET' SCOPE=BOTH;
Wed Dec 10 17:42:23 2008
ALTER SYSTEM SET
log_archive_dest_2='service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)
))(CONNECT_DATA=(SERVICE_NAME=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))"','   LGWR SYNC AFFIRM
delay=0 OPTIONAL max_failure=0 max_connections=1   reopen=1 db_unique_name="SATI" register
net_timeout=180  valid_for=(online_logfile,primary_role)' SCOPE=BOTH;
Wed Dec 10 17:42:23 2008
ALTER SYSTEM SET log_archive_dest_state_2='RESET' SCOPE=BOTH;
Wed Dec 10 17:42:47 2008
ALTER SYSTEM SET
log_archive_dest_2='service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)
))(CONNECT_DATA=(SERVICE_NAME=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))"','   LGWR SYNC AFFIRM
delay=0 OPTIONAL max_failure=0 max_connections=1   reopen=300 db_unique_name="SATI" register
net_timeout=180  valid_for=(online_logfile,primary_role)' SCOPE=BOTH;
Wed Dec 10 17:42:47 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH;
Wed Dec 10 17:42:47 2008
ALTER SYSTEM ARCHIVE LOG
Wed Dec 10 17:42:47 2008
Destination LOG_ARCHIVE_DEST_2 is UNSYNCHRONIZED
*************************************************************
LGWR: Setting 'active' archival for destination LOG_ARCHIVE_DEST_2
*************************************************************
LNSb started with pid=31, OS id=388
Wed Dec 10 17:42:55 2008
LGWR: Standby redo logfile selected to archive thread 1 sequence 2
LGWR: Standby redo logfile selected for thread 1 sequence 2 for destination LOG_ARCHIVE_DEST_2
Wed Dec 10 17:42:55 2008
Thread 1 advanced to log sequence 2 (LGWR switch)
  Current log# 2 seq# 2 mem# 0: Z:\ORACLE\ORADATA\SATI\REDO11.LOG
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  Current log# 2 seq# 2 mem# 1: X:\ORACLE\ORADATA\SATI\REDO12.LOG
Wed Dec 10 17:42:55 2008
ARCH: LGWR is actively archiving destination LOG_ARCHIVE_DEST_2
ARCH: Standby redo logfile selected for thread 1 sequence 1 for destination LOG_ARCHIVE_DEST_2
Wed Dec 10 17:44:05 2008
Destination LOG_ARCHIVE_DEST_2 is SYNCHRONIZED
LGWR: Standby redo logfile selected to archive thread 1 sequence 3
LGWR: Standby redo logfile selected for thread 1 sequence 3 for destination LOG_ARCHIVE_DEST_2
Wed Dec 10 17:44:05 2008
Thread 1 advanced to log sequence 3 (LGWR switch)
  Current log# 3 seq# 3 mem# 0: Z:\ORACLE\ORADATA\SATI\REDO21.LOG
  Current log# 3 seq# 3 mem# 1: X:\ORACLE\ORADATA\SATI\REDO22.LOG
```

SATI alert log (Failed Primary Reinstated and converted to Standby)

```
Wed Dec 10 17:39:42 2008
Shutting down instance (abort)
License high water mark = 7
Instance terminated by USER, pid = 3416
Wed Dec 10 17:41:51 2008
Starting ORACLE instance (normal)
LICENSE_MAX_SESSION = 0
LICENSE_SESSIONS_WARNING = 0
Picked latch-free SCN scheme 2
Autotune of undo retention is turned on.
IMODE=BR
ILAT =55
LICENSE_MAX_USERS = 0
SYS auditing is disabled
ksdpec: called for event 13740 prior to event group initialization
Starting up ORACLE RDBMS Version: 10.2.0.4.0.
System parameters with non-default values:
  processes                = 150
  sessions                 = 500
  timed_statistics         = TRUE
  sga_max_size             = 1258291200
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  __shared_pool_size       = 209715200
  shared_pool_size         = 0
  __large_pool_size        = 16777216
  large_pool_size          = 0
  __java_pool_size         = 8388608
  java_pool_size           = 0
  __streams_pool_size      = 50331648
  streams_pool_size        = 50331648
  sga_target               = 1048576000
  control_files            = Z:\ORACLE\ORADATA\SATI\CONTROL01.CTL,
X:\ORACLE\ORADATA\SATI\CONTROL02.CTL, G:\ORACLE\ORADATA\SATI\CONTROL03.CTL
  db_block_size            = 8192
  __db_cache_size          = 754974720
  db_cache_size            = 0
  compatible               = 10.2.0.4.0
  log_archive_config       = DG_CONFIG=(SATI,SATISTD)
  log_archive_dest_1       = location="G:\oracle\oradata\SATI\archive",
valid_for=(ONLINE_LOGFILE,ALL_ROLES)
  log_archive_dest_2       =
service="(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA=(SER
VICE_NAME=SATISTD_XPT)(INSTANCE_NAME=SATISTD)(SERVER=dedicated)))",    LGWR SYNC AFFIRM delay=0
OPTIONAL max_failure=0 max_connections=1   reopen=300 db_unique_name="SATISTD" register
net_timeout=180  valid_for=(online_logfile,primary_role)
  log_archive_dest_state_1 = ENABLE
  log_archive_dest_state_2 = ENABLE
  log_archive_max_processes= 2
  log_archive_min_succeed_dest= 1
  standby_archive_dest     =
  log_archive_trace        = 0
  log_archive_format       = %t_%s_%r.arc
  fal_client               =
(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)))(CONNECT_DATA=(SERVICE_NAME
=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))
  fal_server               =
(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA=(SERVICE_NAME
=SATISTD_XPT)(SERVER=dedicated)))
  archive_lag_target       = 0
  db_files                 = 1024
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
db_file_multiblock_read_count= 16
db_recovery_file_dest    = G:\FRA
db_recovery_file_dest_size= 26843545600
standby_file_management  = AUTO
fast_start_mttr_target   = 300
undo_management          = AUTO
undo_tablespace          = UNDOTBS1
undo_retention           = 3600
remote_os_authent        = TRUE
remote_login_passwordfile= EXCLUSIVE
db_domain                =
instance_name            = SATI
local_listener           = (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
utl_file_dir             = Z:\oracle\admin\SATI\bdump
job_queue_processes      = 50
background_dump_dest     = Z:\ORACLE\ADMIN\SATI\BDUMP
user_dump_dest           = Z:\ORACLE\ADMIN\SATI\UDUMP
core_dump_dest           = Z:\ORACLE\ADMIN\SATI\CDUMP
session_max_open_files   = 20
db_name                  = SATI
db_unique_name           = SATI
open_cursors             = 1000
star_transformation_enabled= TRUE
query_rewrite_enabled    = TRUE
pga_aggregate_target     = 524288000
workarea_size_policy     = AUTO
dg_broker_start          = TRUE
PMON started with pid=2, OS id=488
PSP0 started with pid=3, OS id=548
MMAN started with pid=4, OS id=3920
DBW0 started with pid=5, OS id=2408
LGWR started with pid=6, OS id=2440
CKPT started with pid=7, OS id=2756
SMON started with pid=8, OS id=3620
RECO started with pid=9, OS id=3128
CJQ0 started with pid=10, OS id=3800
MMON started with pid=11, OS id=1144
MMNL started with pid=12, OS id=3068
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
DMON started with pid=13, OS id=3384
Wed Dec 10 17:41:52 2008
ALTER DATABASE   MOUNT
Wed Dec 10 17:41:56 2008
Setting recovery target incarnation to 2
Wed Dec 10 17:41:56 2008
Successful mount of redo thread 1, with mount id 1481496160
Wed Dec 10 17:41:56 2008
Allocated 7966612 bytes in shared pool for flashback generation buffer
Starting background process RVWR
RVWR started with pid=15, OS id=2180
Wed Dec 10 17:41:56 2008
Database mounted in Exclusive Mode
Completed: ALTER DATABASE   MOUNT
Wed Dec 10 17:41:59 2008
Starting Data Guard Broker (DMON)
NSV0 started with pid=16, OS id=568
INSV started with pid=18, OS id=2840
Wed Dec 10 17:42:06 2008
ALTER SYSTEM SET log_archive_dest_state_2='RESET' SCOPE=BOTH;
NSV0 started with pid=19, OS id=1528
RSM0 started with pid=20, OS id=376
Wed Dec 10 17:42:27 2008
ALTER SYSTEM SET log_archive_dest_2='' SCOPE=BOTH;
Wed Dec 10 17:42:27 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH;
Wed Dec 10 17:42:27 2008
FLASHBACK DATABASE TO SCN 4134609707
Flashback Restore Start
Flashback Restore Complete
Flashback Media Recovery Start
 parallel recovery started with 3 processes
Wed Dec 10 17:42:35 2008
Recovery of Online Redo Log: Thread 1 Group 1 Seq 721 Reading mem 0
  Mem# 0: Z:\ORACLE\ORADATA\SATI\REDO01.LOG
  Mem# 1: X:\ORACLE\ORADATA\SATI\REDO02.LOG
Wed Dec 10 17:42:39 2008
Incomplete Recovery applied until change 4134609708
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Flashback Media Recovery Complete
Completed: FLASHBACK DATABASE TO SCN 4134609707
Wed Dec 10 17:42:41 2008
alter database convert to physical standby
Clearing standby activation ID 1481388743 (0x584c32c7)
The primary database controlfile was created using the
'MAXLOGFILES 37' clause.
There is space for up to 34 standby redo logfiles
Use the following SQL commands on the standby database to create
standby redo logfiles that match the primary databasZ:
ALTER DATABASE ADD STANDBY LOGFILE 'srl1.f' SIZE 104857600;
ALTER DATABASE ADD STANDBY LOGFILE 'srl2.f' SIZE 104857600;
ALTER DATABASE ADD STANDBY LOGFILE 'srl3.f' SIZE 104857600;
ALTER DATABASE ADD STANDBY LOGFILE 'srl4.f' SIZE 104857600;
Completed: alter database convert to physical standby
Wed Dec 10 17:42:42 2008
Shutting down instancZ: further logons disabled
Wed Dec 10 17:42:42 2008
Stopping background process CJQ0
Wed Dec 10 17:42:43 2008
Stopping background process MMNL
Wed Dec 10 17:42:44 2008
Stopping background process MMON
Wed Dec 10 17:42:44 2008
Shutting down instance (immediate)
License high water mark = 7
Wed Dec 10 17:42:44 2008
Stopping Job queue slave processes, flags = 7
Wed Dec 10 17:42:44 2008
Job queue slave processes stopped
Wed Dec 10 17:42:51 2008
alter database CLOSE NORMAL
ORA-1109 signalled during: alter database CLOSE NORMAL...
Wed Dec 10 17:42:51 2008
alter database DISMOUNT
Completed: alter database DISMOUNT
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Archiving is disabled
Archive process shutdown avoided: 0 active
Shutting down Data Guard Broker processes
Wed Dec 10 17:42:53 2008
Completed: Data Guard Broker shutdown
Wed Dec 10 17:42:55 2008
ARCH: Archival disabled due to shutdown: 1089
Shutting down archive processes
Archiving is disabled
Archive process shutdown avoided: 0 active
Wed Dec 10 17:42:56 2008
Starting ORACLE instance (normal)
LICENSE_MAX_SESSION = 0
LICENSE_SESSIONS_WARNING = 0
Picked latch-free SCN scheme 2
Autotune of undo retention is turned on.
IMODE=BR
ILAT =55
LICENSE_MAX_USERS = 0
SYS auditing is disabled
ksdpec: called for event 13740 prior to event group initialization
Starting up ORACLE RDBMS Version: 10.2.0.4.0.
System parameters with non-default values:
  processes                = 150
  sessions                 = 500
  timed_statistics         = TRUE
  sga_max_size             = 1258291200
  __shared_pool_size       = 209715200
  shared_pool_size         = 0
  __large_pool_size        = 16777216
  large_pool_size          = 0
  __java_pool_size         = 8388608
  java_pool_size           = 0
  __streams_pool_size      = 50331648
  streams_pool_size        = 50331648
  sga_target               = 1048576000
  control_files            = Z:\ORACLE\ORADATA\SATI\CONTROL01.CTL,
X:\ORACLE\ORADATA\SATI\CONTROL02.CTL, G:\ORACLE\ORADATA\SATI\CONTROL03.CTL
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  db_block_size            = 8192
  __db_cache_size          = 754974720
  db_cache_size            = 0
  compatible               = 10.2.0.4.0
  log_archive_config       = DG_CONFIG=(SATI,SATISTD)
  log_archive_dest_1       = location="G:\oracle\oradata\SATI\archive",
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= 2
  log_archive_min_succeed_dest= 1
  standby_archive_dest     =
  log_archive_trace        = 0
  log_archive_format       = %t_%s_%r.arc
  fal_client               =
(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)))(CONNECT_DATA=(SERVICE_NAME
=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))
  fal_server               =
(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA=(SERVICE_NAME
=SATISTD_XPT)(SERVER=dedicated)))
  archive_lag_target       = 0
  db_files                 = 1024
  db_file_multiblock_read_count= 16
  db_recovery_file_dest    = G:\FRA
  db_recovery_file_dest_size= 26843545600
  standby_file_management  = AUTO
  fast_start_mttr_target   = 300
  undo_management          = AUTO
  undo_tablespace          = UNDOTBS1
  undo_retention           = 3600
  remote_os_authent        = TRUE
  remote_login_passwordfile= EXCLUSIVE
  db_domain                =
  instance_name            = SATI
  local_listener           = (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
  utl_file_dir             = Z:\oracle\admin\SATI\bdump
  job_queue_processes      = 50
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  background_dump_dest     = Z:\ORACLE\ADMIN\SATI\BDUMP
  user_dump_dest           = Z:\ORACLE\ADMIN\SATI\UDUMP
  core_dump_dest           = Z:\ORACLE\ADMIN\SATI\CDUMP
  session_max_open_files   = 20
  db_name                  = SATI
  db_unique_name           = SATI
  open_cursors             = 1000
  star_transformation_enabled= TRUE
  query_rewrite_enabled    = TRUE
  pga_aggregate_target     = 524288000
  workarea_size_policy     = AUTO
  dg_broker_start          = TRUE
PMON started with pid=2, OS id=2172
PSP0 started with pid=3, OS id=2320
MMAN started with pid=4, OS id=3324
DBW0 started with pid=5, OS id=3820
LGWR started with pid=6, OS id=3244
CKPT started with pid=7, OS id=3984
SMON started with pid=8, OS id=1872
RECO started with pid=9, OS id=3768
CJQ0 started with pid=10, OS id=3988
MMON started with pid=11, OS id=2016
MMNL started with pid=12, OS id=3840
DMON started with pid=13, OS id=3280
Wed Dec 10 17:42:56 2008
alter database  mount
Wed Dec 10 17:43:00 2008
Setting recovery target incarnation to 2
ARCH: STARTING ARCH PROCESSES
ARC0 started with pid=15, OS id=888
Wed Dec 10 17:43:00 2008
ARC0: Archival started
ARC1 started with pid=16, OS id=756
Wed Dec 10 17:43:00 2008
ARC1: Archival started
ARCH: STARTING ARCH PROCESSES COMPLETE
Wed Dec 10 17:43:00 2008
ARC0: Becoming the 'no FAL' ARCH
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
ARC0: Becoming the 'no SRL' ARCH
ARC0: Thread not mounted
Wed Dec 10 17:43:00 2008
Successful mount of redo thread 1, with mount id 1481482656
Wed Dec 10 17:43:00 2008
Allocated 7966612 bytes in shared pool for flashback generation buffer
Starting background process RVWR
RVWR started with pid=17, OS id=1828
Wed Dec 10 17:43:01 2008
Physical Standby Database mounted.
Wed Dec 10 17:43:01 2008
ARC1: Becoming the heartbeat ARCH
Completed: alter database  mount
Wed Dec 10 17:43:04 2008
Starting Data Guard Broker (DMON)
INSV started with pid=18, OS id=1040
NSV0 started with pid=19, OS id=3944
RSM0 started with pid=20, OS id=3380
Using STANDBY_ARCHIVE_DEST parameter default value as USE_DB_RECOVERY_FILE_DEST
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET log_archive_dest_2='location="dgsby"','valid_for=(STANDBY_LOGFILE,STANDBY_ROLE)'
SCOPE=BOTH SID='SATI';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET log_archive_dest_state_2='ENABLE' SCOPE=BOTH SID='SATI';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET standby_archive_dest='dgsby' SCOPE=BOTH SID='SATI';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET log_archive_trace=0 SCOPE=BOTH SID='SATI';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET log_archive_format='%t_%s_%r.arc' SCOPE=SPFILE SID='SATI';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET standby_file_management='AUTO' SCOPE=BOTH SID='*';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET archive_lag_target=0 SCOPE=BOTH SID='*';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET log_archive_max_processes=2 SCOPE=BOTH SID='*';
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET log_archive_min_succeed_dest=1 SCOPE=BOTH SID='*';
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET
fal_server='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522)))(CONNECT_DATA=(
SERVICE_NAME=SATISTD_XPT)(SERVER=dedicated)))' SCOPE=BOTH;
Wed Dec 10 17:43:19 2008
ALTER SYSTEM SET
fal_client='(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522)))(CONNECT_DATA=(
SERVICE_NAME=SATI_XPT)(INSTANCE_NAME=SATI)(SERVER=dedicated)))' SCOPE=BOTH;
Wed Dec 10 17:43:19 2008
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE  THROUGH ALL SWITCHOVER DISCONNECT  USING CURRENT
LOGFILE
MRP0 started with pid=23, OS id=2548
Managed Standby Recovery starting Real Time Apply
 parallel recovery started with 3 processes
Wed Dec 10 17:43:28 2008
Waiting for all non-current ORLs to be archived...
Clearing online redo logfile 1 Z:\ORACLE\ORADATA\SATI\REDO01.LOG
Clearing online log 1 of thread 1 sequence number 721
Wed Dec 10 17:43:28 2008
Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE  THROUGH ALL SWITCHOVER DISCONNECT  USING
CURRENT LOGFILE
Wed Dec 10 17:43:30 2008
Clearing online redo logfile 1 complete
Clearing online redo logfile 2 Z:\ORACLE\ORADATA\SATI\REDO11.LOG
Clearing online log 2 of thread 1 sequence number 719
Wed Dec 10 17:43:31 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[1]: Assigned to RFS process 3180
RFS[1]: Identified database type as 'physical standby'
Primary database is in MAXIMUM AVAILABILITY mode
Changing standby controlfile to RESYNCHRONIZATION level
Wed Dec 10 17:43:32 2008
RFS LogMiner: Client disabled from further notification
Wed Dec 10 17:43:32 2008
Clearing online redo logfile 2 complete
Clearing online redo logfile 3 Z:\ORACLE\ORADATA\SATI\REDO21.LOG
Clearing online log 3 of thread 1 sequence number 720
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Clearing online redo logfile 3 complete
Media Recovery Waiting for thread 1 sequence 721
Wed Dec 10 17:43:35 2008
Primary database is in MAXIMUM AVAILABILITY mode
Standby controlfile consistent with primary
RFS[1]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Dec 10 17:43:37 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[2]: Assigned to RFS process 3536
RFS[2]: Identified database type as 'physical standby'
Wed Dec 10 17:43:37 2008
Redo Shipping Client Connected as PUBLIC
-- Connected User is Valid
RFS[3]: Assigned to RFS process 3808
RFS[3]: Identified database type as 'physical standby'
Wed Dec 10 17:43:39 2008
RFS[2]: Successfully opened standby log 5: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG5_01.LOG'
RFS[2]: Detected missing archivals for Branch(resetlogs_id): 646399178
RFS[2]: Last archived SCN: 0:-160415356  Last change SCN: 0:-160357587
RFS[2]: New Archival REDO Branch(resetlogs_id): 673119597  Prior: 646399178
RFS[2]: Archival Activation ID: 0x584c2299 Current: 0x0
RFS[2]: Effect of primary database OPEN RESETLOGS
RFS[2]: Managed Standby Recovery process is active
New incarnation branch detected in ArchiveLog, filename Z:\ORACLE\ORADATA\SATI\STDBYREDOG5_01.LOG
Inspection of file changed rdi from 2 to 3
Setting recovery target incarnation to 3
Wed Dec 10 17:43:40 2008
Setting recovery target incarnation to 3
Wed Dec 10 17:43:44 2008
RFS[3]: Archived Log: 'C:\ORACLE\PRODUCT\10.2.0\DB_1\DATABASE\DGSBY1_721_646399178.ARC'
Wed Dec 10 17:43:45 2008
MRP0: Incarnation has changed! Retry recovery...
Wed Dec 10 17:43:45 2008
Errors in file Z:\oracle\admin\SATI\bdump\SATI_mrp0_2548.trc:
ORA-19906: recovery target incarnation changed during recovery

Managed Standby Recovery not using Real Time Apply
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Recovery interrupted!
Wed Dec 10 17:43:49 2008
Errors in file Z:\oracle\admin\SATI\bdump\SATI_mrp0_2548.trc:
ORA-19906: recovery target incarnation changed during recovery

Wed Dec 10 17:44:09 2008
Managed Standby Recovery starting Real Time Apply
 parallel recovery started with 3 processes
Media Recovery start incarnation depth : 1, target inc# : 3, irscn : 4134609709
Wed Dec 10 17:44:15 2008
Waiting for all non-current ORLs to be archived...
Media Recovery Log C:\ORACLE\PRODUCT\10.2.0\DB_1\DATABASE\DGSBY1_721_646399178.ARC
Identified End-Of-Redo for thread 1 sequence 721
Wed Dec 10 17:44:15 2008
Media Recovery End-Of-Redo indicator encountered
Wed Dec 10 17:44:15 2008
Media Recovery Continuing
Media Recovery Log C:\ORACLE\PRODUCT\10.2.0\DB_1\DATABASE\DGSBY1_1_673119597.ARC
Media Recovery Waiting for thread 1 sequence 2 (in transit)
Wed Dec 10 17:44:21 2008
Recovery of Online Redo Log: Thread 1 Group 4 Seq 2 Reading mem 0
  Mem# 0: Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG
  Mem# 1: X:\ORACLE\ORADATA\SATI\STDBYREDOG4_02.LOG
Wed Dec 10 17:44:46 2008
Primary database is in MAXIMUM AVAILABILITY mode
Changing standby controlfile to MAXIMUM AVAILABILITY level
RFS[1]: Successfully opened standby log 4: 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG'
Wed Dec 10 17:44:47 2008
Media Recovery Log C:\ORACLE\PRODUCT\10.2.0\DB_1\DATABASE\DGSBY1_2_673119597.ARC
Media Recovery Waiting for thread 1 sequence 3 (in transit)
Wed Dec 10 17:44:47 2008
Recovery of Online Redo Log: Thread 1 Group 4 Seq 3 Reading mem 0
  Mem# 0: Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG
  Mem# 1: X:\ORACLE\ORADATA\SATI\STDBYREDOG4_02.LOG
Wed Dec 10 17:57:59 2008
db_recovery_file_dest_size of 25600 MB is 4.70% 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.
```

DGMGRL CHECKUPS

There are several checkup commands that can be executed from within DGMGRL to obtain the status of each one of the Dataguard components. If at the last line of the output of any acomponent there is a line having SUCCESS status, that means the component is healthy.

```
C:\Documents and Settings\AV\Desktop\SCRIPTS>dgmgrl sys/xxxxxx@SATISTD
DGMGRL for 32-bit Windows: Version 10.2.0.4.0 - Production

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

Welcome to DGMGRL, type "help" for information.
Connected.
DGMGRL> SHOW CONFIGURATION

Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxAvailability
  Fast-Start Failover: ENABLED
  Databases:
    SATISTD - Primary database
    SATI      - Physical standby database
                - Fast-Start Failover target

Current status for "fsfodg":
SUCCESS
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
DGMGRL> SHOW DATABASE SATI

Database
  NamZ:            SATI
  RolZ:            PHYSICAL STANDBY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATI

Current status for "SATI":
SUCCESS

DGMGRL> SHOW DATABASE SATISTD

Database
  NamZ:            SATISTD
  RolZ:            PRIMARY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD

Current status for "SATISTD":
SUCCESS

DGMGRL> SHOW DATABASE SATISTD

Database
  NamZ:            SATISTD
  RolZ:            PRIMARY
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  Enabled:          YES
  Intended StatZ:   ONLINE
  Instance(s):
    SATISTD

Current status for "SATISTD":
SUCCESS

DGMGRL> SHOW INSTANCE SATI

Instance 'SATI' of database 'SATI'
  Host NamZ:        DGONE

Current status for "SATI":
SUCCESS

DGMGRL> SHOW INSTANCE SATISTD

Instance 'SATISTD' of database 'SATISTD'
  Host NamZ:        DGTWO

Current status for "SATISTD":
SUCCESS

DGMGRL> SHOW DATABASE VERBOSE SATI

Database
  NamZ:             SATI
  RolZ:             PHYSICAL STANDBY
  Enabled:          YES
  Intended StatZ:   ONLINE
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Instance(s):
  SATI

Properties:
  InitialConnectIdentifier         = 'SATI'
  ObserverConnectIdentifier        = ''
  LogXptMode                       = 'SYNC'
  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           = '2'
  LogArchiveMinSucceedDest         = '1'
  DbFileNameConvert                = ''
  LogFileNameConvert               = ''
  FastStartFailoverTarget          = 'SATISTD'
  StatusReport                     = '(monitor)'
  InconsistentProperties           = '(monitor)'
  InconsistentLogXptProps          = '(monitor)'
  SendQEntries                     = '(monitor)'
  LogXptStatus                     = '(monitor)'
  RecvQEntries                     = '(monitor)'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
    HostName                       = 'DGONE'
    SidName                        = 'SATI'
    LocalListenerAddress           =
'(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522))'
    StandbyArchiveLocation         = 'dgsby'
    AlternateLocation              = ''
    LogArchiveTrace                = '0'
    LogArchiveFormat               = '%t_%s_%r.arc'
    LatestLog                      = '(monitor)'
    TopWaitEvents                  = '(monitor)'

Current status for "SATI":
SUCCESS

DGMGRL> SHOW DATABASE VERBOSE SATISTD

Database
  NamZ:            SATISTD
  RolZ:            PRIMARY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD

  Properties:
    InitialConnectIdentifier       = 'SATISTD'
    ObserverConnectIdentifier      = ''
    LogXptMode                     = 'SYNC'
    Dependency                     = ''
    DelayMins                      = '0'
    Binding                        = 'OPTIONAL'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
    MaxFailure                     = '0'
    MaxConnections                 = '1'
    ReopenSecs                     = '300'
    NetTimeout                     = '180'
    LogShipping                    = 'ON'
    PreferredApplyInstance         = ''
    ApplyInstanceTimeout           = '0'
    ApplyParallel                  = 'AUTO'
    StandbyFileManagement          = 'auto'
    ArchiveLagTarget               = '0'
    LogArchiveMaxProcesses         = '2'
    LogArchiveMinSucceedDest       = '1'
    DbFileNameConvert              = ''
    LogFileNameConvert             = ''
    FastStartFailoverTarget        = 'SATI'
    StatusReport                   = '(monitor)'
    InconsistentProperties         = '(monitor)'
    InconsistentLogXptProps        = '(monitor)'
    SendQEntries                   = '(monitor)'
    LogXptStatus                   = '(monitor)'
    RecvQEntries                   = '(monitor)'
    HostName                       = 'DGTWO'
    SidName                        = 'SATISTD'
    LocalListenerAddress           =
'(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522))'
    StandbyArchiveLocation         = 'G:\oracle\oradata\SATI\archive'
    AlternateLocation              = ''
    LogArchiveTrace                = '0'
    LogArchiveFormat               = '%t_%s_%r.arc'
    LatestLog                      = '(monitor)'
    TopWaitEvents                  = '(monitor)'
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Current status for "SATISTD":
SUCCESS

DGMGRL> SHOW INSTANCE VERBOSE SATI

Instance 'SATI' of database 'SATI'
  Host NamZ:       DGONE
  PFILZ:

  Properties:
    HostName                       = 'DGONE'
    SidName                        = 'SATI'
    LocalListenerAddress           =
'(ADDRESS=(PROTOCOL=TCP)(HOST=DGONE)(PORT=1522))'
    StandbyArchiveLocation         = 'dgsby'
    AlternateLocation              = ''
    LogArchiveTrace                = '0'
    LogArchiveFormat               = '%t_%s_%r.arc'
    LatestLog                      = '(monitor)'
    TopWaitEvents                  = '(monitor)'

Current status for "SATI":
SUCCESS

DGMGRL> SHOW INSTANCE VERBOSE SATISTD

Instance 'SATISTD' of database 'SATISTD'
  Host NamZ:       DGTWO
  PFILZ:
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  Properties:
    HostName                       = 'DGTWO'
    SidName                        = 'SATISTD'
    LocalListenerAddress           =
'(ADDRESS=(PROTOCOL=TCP)(HOST=DGTWO)(PORT=1522))'
    StandbyArchiveLocation         = 'G:\oracle\oradata\SATI\archive'
    AlternateLocation              = ''
    LogArchiveTrace                = '0'
    LogArchiveFormat               = '%t_%s_%r.arc'
    LatestLog                      = '(monitor)'
    TopWaitEvents                  = '(monitor)'

Current status for "SATISTD":
SUCCESS
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Client Failover Configuration

In order to provide ininterupted service in case of primary failure a failover configuration needs to be implemented, this can be achieved for single instances and RAC using database services, and a network configuration that point to all servers that can have the primary role.

On the client side it is very important to set on the '***sqlnet.ora***' file the parameter SQLNET.OUTBOUND_CONNECT_TIMEOUT = 3, to assure that the failed connections will not wait for TCP timeout but will immediately proceed to the next host if the primary is unavailable

```
SQL > exec DBMS_SERVICE.CREATE_SERVICE (
service_name => 'fsfo',
network_name => 'fsfo', failover_method => 'BASIC',
failover_type => 'SELECT',
failover_retries => 180,
failover_delay => 1);

PL/SQL procedure successfully completed.

SQL > CREATE OR REPLACE TRIGGER manage_dgservice
after startup on database
DECLARE
role VARCHAR(30);
BEGIN
SELECT DATABASE_ROLE INTO role FROM V$DATABASE;
IF role = 'PRIMARY' THEN
DBMS_SERVICE.START_SERVICE('fsfo');
END IF;
END;
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
/

Trigger created.

SQL> ALTER SYSTEM ARCHIVE LOG CURRENT;
```

On tnsnames.ora define this entry

```
fsfo =
 (DESCRIPTION =
  (ADDRESS_LIST =
  (ADDRESS = (PROTOCOL = TCP)(HOST = DGONE)(PORT = 1522))
  (ADDRESS = (PROTOCOL = TCP)(HOST = DGTWO)(PORT = 1522))
  (LOAD_BALANCE = yes)
   )
  (CONNECT_DATA=
  (SERVICE_NAME=fsfo)
   )
  )
```

On sqlnet.ora add this line

SQLNET.OUTBOUND_CONNECT_TIMEOUT = 3

DATAGUARD FAST START FAILOVER IMPLEMENTATION

Test client failover

1. from dgmgrl check that configuration and database status return SUCCESS

```
DGMGRL> connect sys@SATI
Password:
Connected.

DGMGRL> show configuration;

Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxAvailability
  Fast-Start Failover: ENABLED
  Databases:
    SATISTD - Physical standby database
                - Fast-Start Failover target
    SATI      - Primary database
Current status for "fsfodg":
SUCCESS

DGMGRL> show database SATI

Database
  NamZ:            SATI
  RolZ:            PRIMARY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATI
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Current status for "SATI":
SUCCESS

DGMGRL> show database SATISTD

Database
  NamZ:            SATISTD
  RolZ:            PHYSICAL STANDBY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD
Current status for "SATISTD":
SUCCESS

DGMGRL> show database SATI

Database
  NamZ:            SATI
  RolZ:            PRIMARY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATI
Current status for "SATI":
SUCCESS
```

2. Connect from a client server using the ‘fsfo’ service, check the instance namZ:

```
SQL> select instance_name from v$instance;
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
INSTANCE_NAME
----------------
SATI
```

3. From the client server, connected throug the ‘fsfo’ service start a long running query, i.e. ‘*select 1,2,3 from dba_source’* and check how long it takes to complete, you may repeat a couple of times to get it cached and get the best time.

```
SQL> select 1,2,3 from dba_source
         1          2          3
         1          2          3
...
...
         1          2          3
         1          2          3

140829 rows selected.

Elapsed: 00:0:30.12
```

4. From the client server, connected throug the ‘fsfo’ service issue again the same long running query, immediately move to the primary database and shut down it using the abort option.

```
SQL> select 1,2,3 from dba_source
         1          2          3
         1          2          3
...
SQL> shutdown abort
```

5. The ‘*shutdown abort’* triggers a FSFO that will complete in about 30 seconds

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

6. At the client screen you will notice that the output from '*select 1,2,3 from dba_source'* stops and then continue until finished

```
...                                  <<<<<< Database shutdown abort here
...
         1          2          3
         1          2          3

140829 rows selected.

Elapsed: 00:01:23.23 <<<<<< the select took longer but finished
```

7. at the client check the instance name '

```
SQL> select instance_name from v$instance;

INSTANCE_NAME
----------------
SATISTD   <<<<<

Elapsed: 00:00:00.07
```

8. Connect to the failed primary, mount it up and check the FSFO status

```
SQL> startup mount
ORACLE instance started.

Total System Global Area 1258291200 bytes
Fixed Size                  1298304 bytes
Variable Size             436207744 bytes
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
Database Buffers          813694976 bytes
Redo Buffers                7090176 bytes
Database mounted.

SQL> select DB_UNIQUE_NAME, DATABASE_ROLE, OPEN_MODE, FS_FAILOVER_STATUS, FS_FAILOVER_CURRENT_TARGET
From v$database;

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATI            PHYSICAL STANDBY MOUNTED    BYSTANDER


SQL> /

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATI            PHYSICAL STANDBY MOUNTED    REINSTATE IN PROGRESS SATI

SQL> /

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATI            PHYSICAL STANDBY MOUNTED    UNSYNCHRONIZED        SATI

SQL> /

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATI            PHYSICAL STANDBY MOUNTED    SYNCHRONIZED          SATI
```

9. From DGMGRL switchover back to the primary site

```
DGMGRL> connect sys@SATI
Password:
Connected.
```


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
DGMGRL> show configuration
Configuration
  NamZ:                fsfodg
  Enabled:             YES
  Protection ModZ:     MaxAvailability
  Fast-Start Failover: ENABLED
  Databases:
    SATISTD - Primary database
    SATI      - Physical standby database
                - Fast-Start Failover target

Current status for "fsfodg":
SUCCESS

DGMGRL> show database SATI
Database
  NamZ:            SATI
  RolZ:            PHYSICAL STANDBY
  Enabled:         YES
  Intended StatZ:  ONLINE
  Instance(s):
    SATI

Current status for "SATI":
SUCCESS

DGMGRL> show database SATISTD
Database
  NamZ:            SATISTD
  RolZ:            PRIMARY
  Enabled:         YES
```

DATAGUARD FAST START FAILOVER IMPLEMENTATION

```
  Intended StatZ:  ONLINE
  Instance(s):
    SATISTD

Current status for "SATISTD":
SUCCESS

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

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

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


/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

10. Check status of both sites

```
C: >sqlplus sys@SATI as sysdba

SQL*Plus: Release 10.2.0.4.0 - Production on Sun Dec 28 16:55:22 2008
Copyright (c) 1982, 2007, Oracle.  All Rights Reserved.

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.4.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
```

```
SQL> select DB_UNIQUE_NAME, DATABASE_ROLE, OPEN_MODE, FS_FAILOVER_STATUS, FS_FAILOVER_CURRENT_TARGET
From v$database;

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATI            PRIMARY          READ WRITE SYNCHRONIZED          SATISTD


SQL> connect sys@SATISTD as sysdba

Enter password:
Connected.

SQL> /

DB_UNIQUE_NAME  DATABASE_ROLE    OPEN_MODE  FS_FAILOVER_STATUS    FS_FAILOVER_CURRENT_TARGET
--------------- ---------------- ---------- --------------------- ------------------------------
SATISTD         PHYSICAL STANDBY MOUNTED    SYNCHRONIZED          SATISTD
```


/

Summary of main commands used on this document

Following there is a list of the main commands used on this document with a brief explanation of the functionality that is invoked with the command.

Command	Description
`alter database force logging;`	Switch off no logging operations at the database level
`orapwd file=orapwSATI password=<sys_password> force=y`	Create the password file on the primary database
`alter database add standby logfile group 4 ( 'Z:\ORACLE\ORADATA\SATI\STDBYREDOG4_01.LOG', 'X:\ORACLE\ORADATA\SATI\STDBYREDOG4_02.LOG') SIZE 104857600;`	Create standby redologs, they need to be the same size as online logs, we need to create at least one standby group more than total number of online groups.

`startup mount;`
`alter database archivelog;`
`alter database open;`
	Mount the database, enable archive log mode and open the database

`oradim –NEW –SID SATISTD –STARTMODE manual`	Create a database service on Windows
`alter database create standby controlfile as 'c:\SATISTD.ctl';`	Create a stnadby controlfile on the primary database, to be copied to the standby
`create pfile='c:\standby_pfile.ora' from spfile;`	Create a pfile from the primary database to be edited for the physical standby
`create spfile from pfile='c:\standby_pfile.txt';`	Create an spfile on the default location, ?/database on windows
`alter database recover managed standby database disconnect from session;`	Start recovery on the physical standby
`select sequence#, first_time, next_time from v$archived_log order by sequence#;`	Check redo apply on the physical standby
`alter system set dg_broker_start=true scope=both;`	Enable the dataguard broker
dgmgrl sys/<passwd>@SATISTD	Connect to the broker command line utility dgmgrl

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

create configuration fsfodg as primary database is SATI connect identifier is SATI;	Create Dataguard configuration form dgmngrl
add database SATISTD as connect identifier is SATISTD maintained as physical;	Add database to the broker configuration
show configuration;	show broker configuration and status
show database verbose SATISTD;	Show broker database configuration
show instance verbose SATISTD;	Show broker instance configuration
enable configuration;	Enable broker configuration
enable database SATISTD;	Enable database in broker configuration
edit database SATI set property 'logxptmode'='sync';	Set database property logxptmode to sync on broker, to enable FSFO
edit configuration set protection mode as maxavailability;	Change configuration protection mode to max availability, to enable FSFO
enable fast_start failover;	Enable FSFO
select db_unique_name, database_role, open_mode, fs_failover_status, fs_failover_current_target from v$database;	Check FSFO status on both Primary and Standby Databases
switchover to SATISTD;	From within DGMGRL start switchover

/

DATAGUARD FAST START FAILOVER IMPLEMENTATION

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7. Oracle Database Oracle Clusterware and Oracle Real Application Clusters Administration and Deployment Guide (Part #14197)
   http://download-west.oracle.com/docs/cd/B19306_01/rac.102/b14197/toc.htm

8. Workload Management with Oracle Real Application Clusters 10g (Provides a detailed explanation of the implementation of Services, FAN and Fast Connection Failover in a RAC environment.):
   http://www.oracle.com/technology/products/database/clustering/pdf/twpracwkldmgmt.pdf

DATAGUARD FAST START FAILOVER IMPLEMENTATION

9. Oracle Data Guard Broker (Part #B14230)
   http://otn.oracle.com/pls/db102/db102.to_toc?partno=b14230

10. Oracle Database PL/SQL Packages and Types Reference (Part #B14261)
    http://otn.oracle.com/pls/db102/db102.to_toc?partno=b14261

11. Oracle Call Interface Programmer's Guide (Part #B14250)
    http://otn.oracle.com/pls/db102/db102.to_toc?partno=b14250

12. Oracle Data Guard Concepts and Administration (Part #B14239)
    http://otn.oracle.com/pls/db102/db102.to_toc?partno=b14239

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