**DATAGUARD(DR)**

DR is a data block to data block replica of production database. With below configuration

1) same OS

2) same database software

3) same resources

DR is disaster recovery solution.

PROD -------------resotore----------------> DR

continuously

sync

mount --------> archivelog apply

open( open read only) --------> no archivelog apply

Active dataguard (open read only) --------> apply archivelog

(need license)

DR used :

1) security of data

2) load balancing

3) DR DRILL testing

4) Backup Recovery

DR DRILL is used for testing purpose in which prod database shift to DR location & DR to prod location.

Prod ------------------------------------->DR

<------------------------------------

**DR DILL**=Switch Over + Switch Back

**Failover** : due to some incident production DB loss so Activate DR as production and new standby creation.

**LNS** ( Log Network server) is a process of prod DB and take online redo or archive and transfer to RFS..

**RFS** (Remote file server) RFS is a process of DR DB which add redo to standby

**MRP** (Medai Recovery Process) is a main process of DR to apply stand by redo/archive to DB .

Both prod and DR site have online redo as well as stand by redo , se depend on role it will work. redo file is optional.

**v$managed\_standby**

**Standby Type:**

**Physical Standby:**

Stage –mount

Open read only (archivelog apply)

Create physical standby db

**Redo transport + Redo apply**

Reporting purpose.

**Snapshot Standby:**

Stage – open(read write)

Archivelog not apply received from production

Create physical standby then convert into snapshot

For Application testing use Snapshot Standby.

Example:

For application new module testing first we create physical standby at 11:00am then we convert into snapshot which create guaranteed **restorepoints**, after convert this we can open DB open in read write mode so application team can do any thing like insert update delete etc..and all these changes store in **flashback logs**..and redo/arcvhivelog received from prod won’t apply to DR..and suppose we are completed testing at 12:00pm ..so again then we convert into physical standby and all changes we are done on DR are store in **flashback logs** which will revert and then start **MRP** Process , so allredo/archivelog which received from prod from 11:00 am to 12:00pm will apply to physical standby..

**v$recovery\_area\_usage**

**Redo transport + Redo apply**

**Logical Standby:**

Create physical standby then convert into logical.

Stage-open(read write)

**Redo transport + SQL Apply**

Defined schema /table , so it will replica/sync of that only

Ex: Emp table of scott schema

So here take only SQL of emp tbale of scott schema from redo/archive which is coming from prod DB and then run that query on SGA and apply to DB ..

It’s rarely use.

Here DB resource(RAM, CPU etc) required more as compared to other bcoz of query.

**Sync** : wait for acknowledgement from standby.

**Async**: Production not wait for acknowledgement from standby.

**Affirm**: Production write after standby redolog write.

**Noaffirm:** Prodcution write before or after standby redolog write.

**Sync Affirm:** No Arcvhivelog

**Sync Noaffirm:**  No Archivelog

**Async Affirm:** Archivelog

**Async Noaffirm:** Archivelog

**Affirm,Noaffirm:-**  it’s an attribute to control the disk I/O behaviour of the standby

**Sync,Async:-** it’s to control the primary to standby network behaviour.

**Standby Protection Mode:**

Protection Mode apply only on **Phsical Standby**

|  |  |  |
| --- | --- | --- |
| **Maximum Performance** | **Maximum Availability** | **Maximum Protection(Sync+Affirm)** |
| Standby Redolog is optional | Mandatory | Mandatory |
| Async+NOAFFIRM is default | No default | No default |
| Redo transport+Redo apply (if n/w is ok)  Archive apply (if n/w issue) | If n/w ok – redo transport +redo apply (protection) +    If n/w issue –archive apply(performance) | If n/w issue then production into hang stage and more persist than production may be down. |
| No impact on production if standby or n/w issue | No impact on production. |  |
| More data lost | Some data lost but not more like performance | Zero data lost |

When due to any issue(natural) Production Database loss then we activate DR as a primary database

then the amount of data loss will be depend on **protection mode.**

Default protection mode is **Maximum Performance.**

We can check protection mode in **v$database**

**Protection\_mode(column)**