

# Oracle 12c

## Best Practices for Highly Available Oracle Databases

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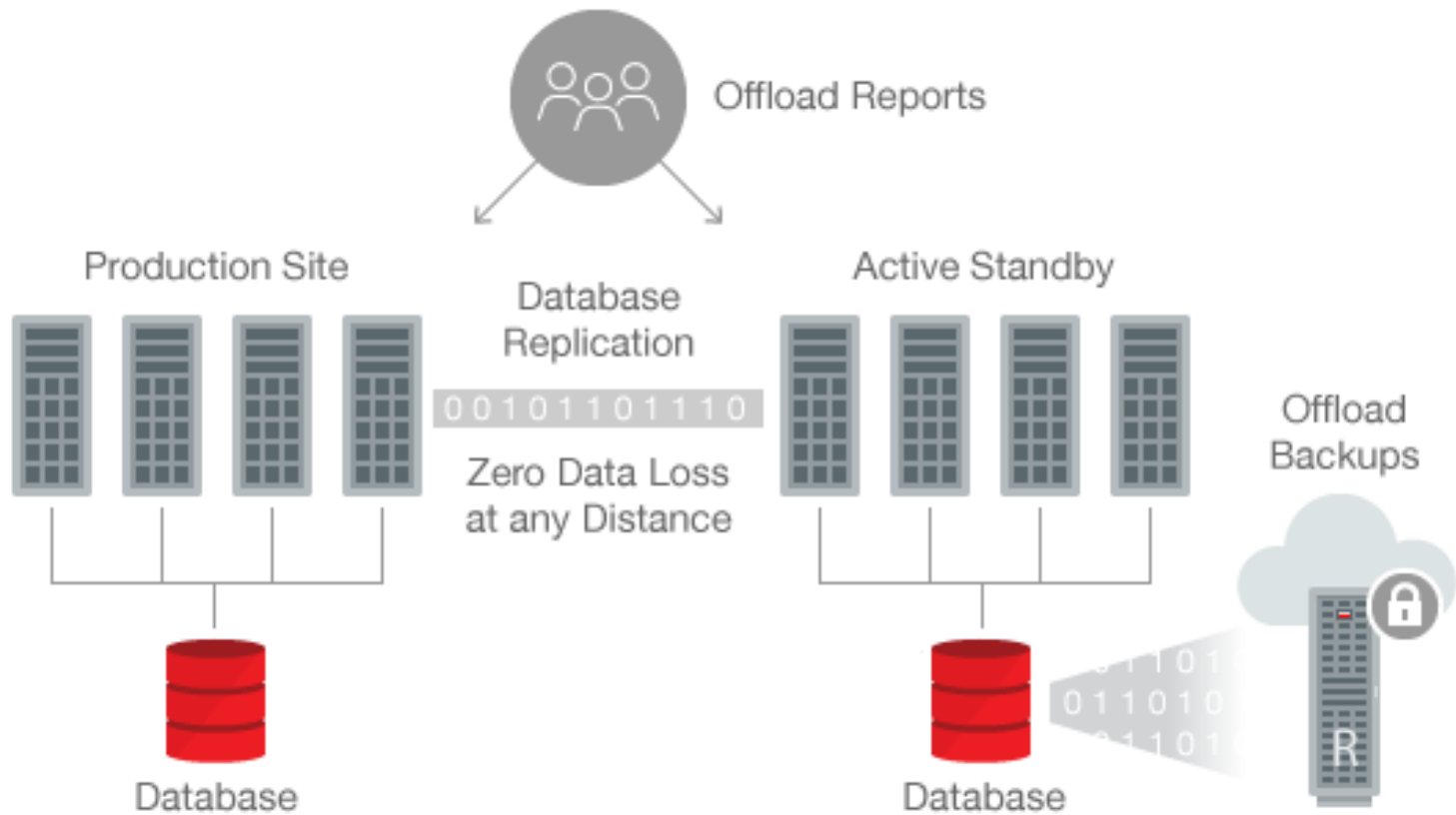


# Goal

- Understand High Availability Concept
- Understand Active Data Guard Concept
- Required Software and License
- SCAN Listener
- Services
- Role-based database services
- TNS Configuration for HA
- How is CNAMEs used for?



# Understand High Availability Concept



# Understand Active Data Guard Concept

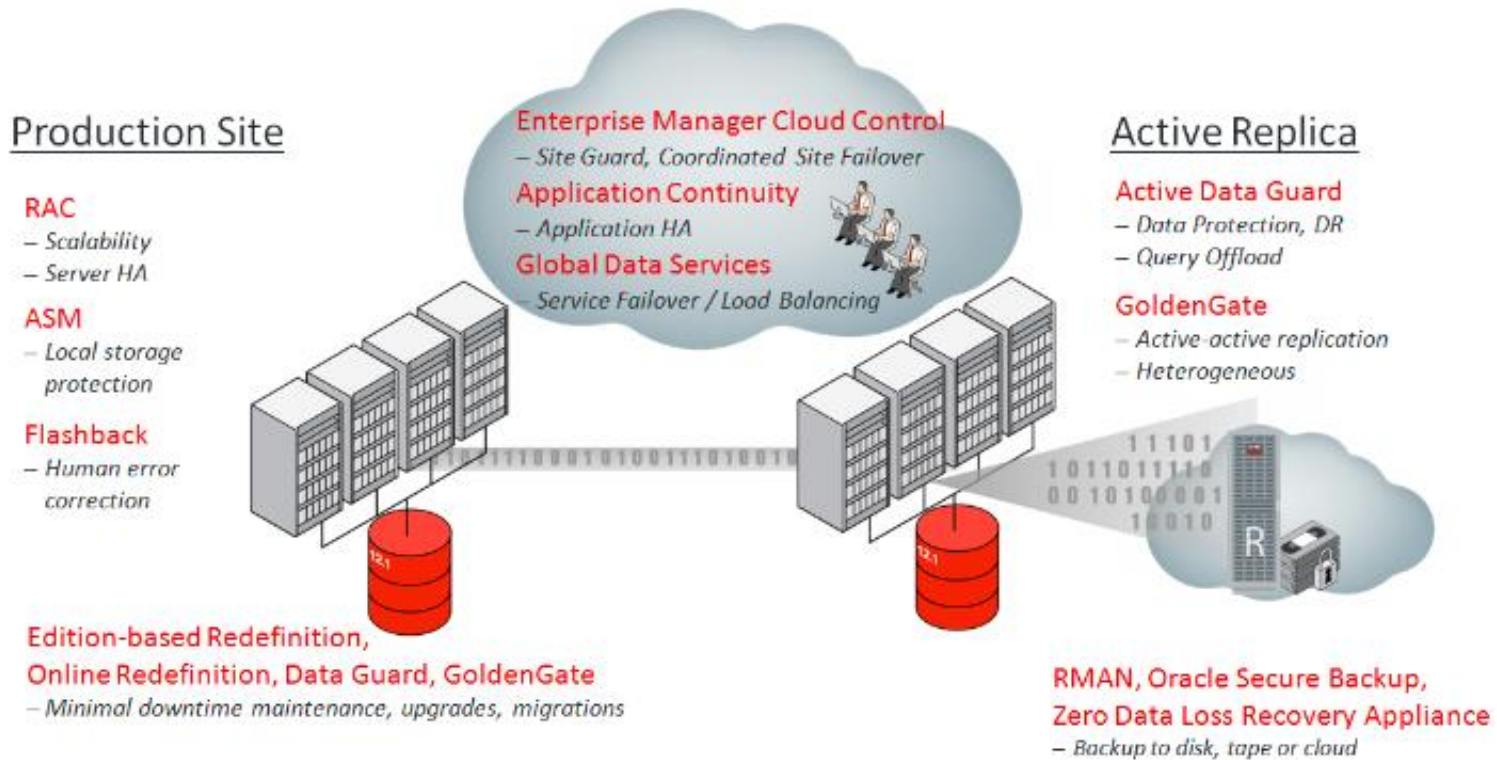


Figure 1: Oracle's High Availability Technologies and the Oracle Maximum Availability Architecture



Data Guard Broker  
Enterprise Manager Cloud Control



# Required Software and License

## Enterprise Edition

+Options

**Real Application Cluster**

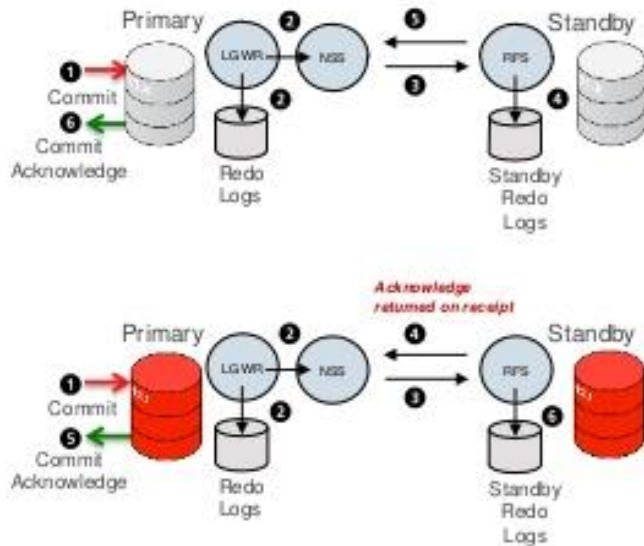
**Active Data Guard**



# What is the new in 12c?

## Data Guard Fast Sync

Reduced Primary Database Impact for Maximum Availability

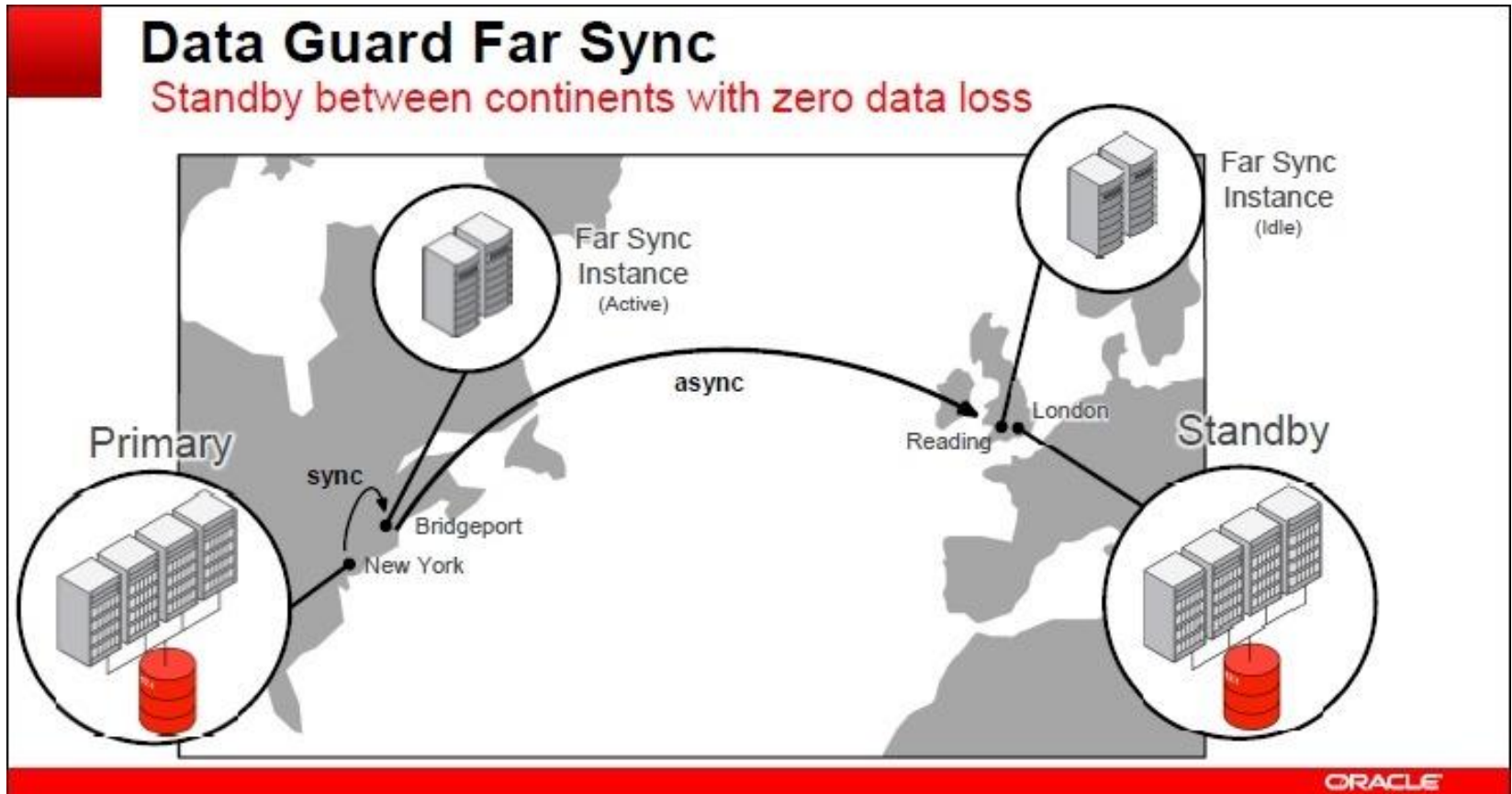


- For SYNC transport: remote site acknowledges received redo before writing it to standby redo logs
- Reduces latency of commit on primary
- Better DR – increased SYNC distance
- If network round-trip latency less than time for local online redo log write, synchronous transport will not impact primary database performance

ORACLE



# What is the new in 12c?



# Role Transition Evolution

TABLE 1: ROLE TRANSITION TIMINGS

Database Releases	Failover Time	Switchover Time
10.2 RAC Database/ Data Guard	60 secs	65 secs
11.2 RAC Database/ Active Data Guard	44 secs	54 secs
12.1.0.1 RAC Database/ Active Data Guard	27 secs	41 secs
12.1.0.2 RAC Database/ Active Data Guard	16 secs	34 secs





# The Database Pillars of High Availability

## Scan Listener

- Load Balance - DNS
- Listener Redundancy

## Services

- Load Balance workload based
- Preferred Instances
- TAF

## Client Configuration

- Connect Settings
- Timeout config
- Services

# SCAN Listener

## Single Client Access Name

- ❑ Define a SCAN using the corporate DNS (Domain Name Service)

### First Execution

```
nslookup proddbscn.example.com
```

```
Server:      143.166.220.125
```

```
Address:    143.166.220.125#53
```

Non-authoritative answer:

```
Name:   proddbscn.example.com
```

```
Address: 10.178.116.225
```

```
Name:   proddbscn.example.com
```

```
Address: 10.178.116.226
```

```
Name:   proddbscn.example.com
```

```
Address: 10.178.116.224
```

### Second Execution

```
nslookup proddbscn.example.com
```

```
Server:      143.166.220.125
```

```
Address:    143.166.220.125#53
```

Non-authoritative answer:

```
Name:   proddbscn.example.com
```

```
Address: 10.178.116.224
```

```
Name:   proddbscn.example.com
```

```
Address: 10.178.116.226
```

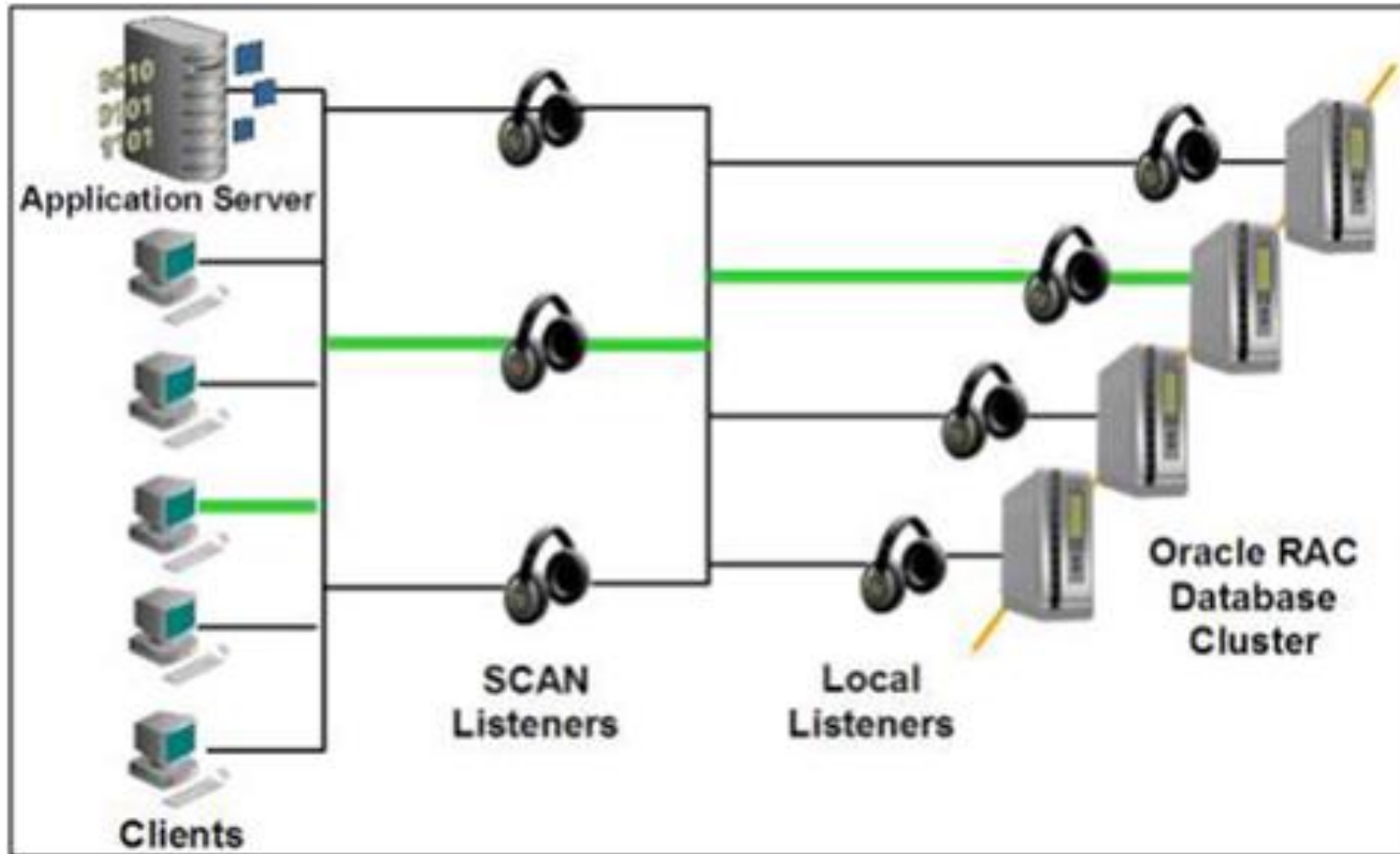
```
Name:   proddbscn.example.com
```

```
Address: 10.178.116.225
```



# SCAN Listener

## Single Client Access Name

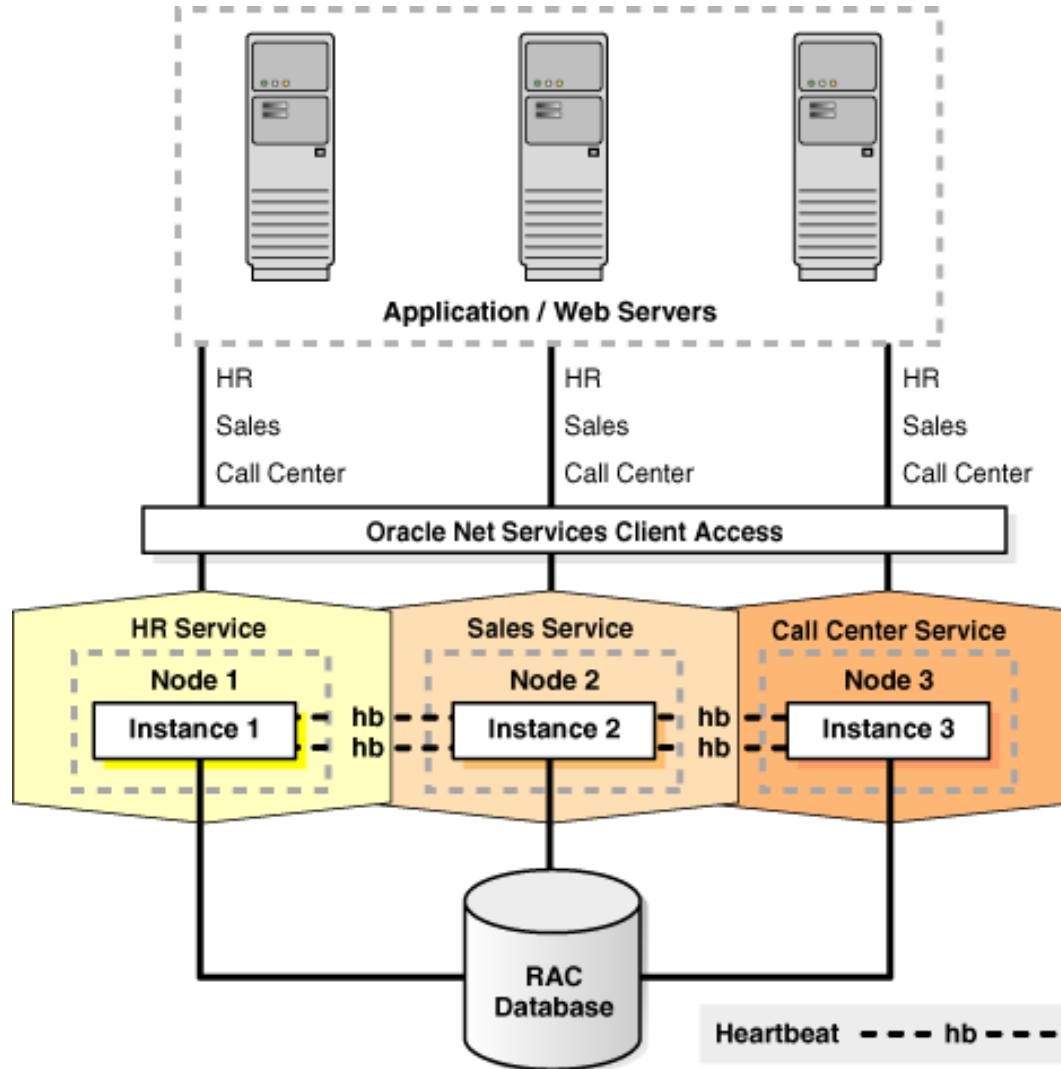


# Why SCAN Listener?

```
PROD =  
(DESCRIPTION =  
  (ADDRESS = (PROTOCOL = TCP)(HOST = prddb01-vip.us.dell.com)(PORT = 1521))  
  (ADDRESS = (PROTOCOL = TCP)(HOST = prddb02-vip.us.dell.com)(PORT = 1521))  
  (ADDRESS = (PROTOCOL = TCP)(HOST = prddb03-vip.us.dell.com)(PORT = 1521))  
  (ADDRESS = (PROTOCOL = TCP)(HOST = prddb04-vip.us.dell.com)(PORT = 1521))  
  (ADDRESS = (PROTOCOL = TCP)(HOST = prddb05-vip.us.dell.com)(PORT = 1521))  
  (LOAD_BALANCE = yes)  
  (CONNECT_DATA=(SERVER=DEDICATED)(service_name=prod))  
)  
)
```

```
PROD =  
(DESCRIPTION =  
  (ADDRESS = (PROTOCOL = TCP)(HOST = prdbscn.us.dell.com)(PORT = 1521))  
  (LOAD_BALANCE = yes)  
  (CONNECT_DATA=(SERVER=DEDICATED)(service_name=prod))  
)  
)
```

# Services



# Services Benefits

- Dynamic Resource Allocation

- High Availability

  - TAF

- Tuning and Monitoring

- Role Based

- Resource Management

  - Database Jobs



# Role-based database services

We can control the startup of database services assigning a Database role.

-l PRIMARY, PHYSICAL\_STANDBY, LOGICAL\_STANDBY and  
SNAPSHOT\_STANDBY

A database service will automatically start based in its role if the service is  
AUTOMATIC and the ROLE matchs with Database ROLE

```
srvctl add service -d prod -s prod_adg_sql -r prod1, prod2, prod3  
-l physical_standby -y AUTO
```



# Services Example

## □ Using Services and Scan Listener with RMAN

```
prod_all_instances=  
  (DESCRIPTION=  
    (ADDRESS_LIST=  
      (ADDRESS=(PROTOCOL=tcp)(HOST=proddbscn.us.dell.com)(PORT=1521)))  
    (CONNECT_DATA=(SERVICE_NAME=prod_all_instances))  
  ))
```

Service name: prod\_all\_instances

Cardinality: 6

Service role: PRIMARY

Preferred instances: prod1, prod2, prod3, prod4, prod5, prod6

Available instances:





# Services Example

```
connect target /
CONFIGURE DEVICE TYPE disk PARALLELISM 24;
CONFIGURE CHANNEL DEVICE TYPE disk CONNECT sys/@prod_all_instances;
CONFIGURE DEFAULT DEVICE TYPE TO disk;
run {
set controlfile autobackup format for device type disk to '/bkp/%F.bck';
backup as compressed backupset incremental level 0 filesperset 1 format '/bkp/full_db_%d_t%t_s%s_p%p'
    database include current controlfile;
backup as compressed backupset filesperset 10 format '/bkp/full_arch_%d_%s_%p' archivelog all;
}
```

```
Starting backup at 06-NOV-15
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=2529 instance=prod2 device type=DISK
allocated channel: ORA_DISK_2
channel ORA_DISK_2: SID=3518 instance=prod4 device type=DISK
allocated channel: ORA_DISK_3
channel ORA_DISK_3: SID=5539 instance=prod3 device type=DISK
allocated channel: ORA_DISK_4
channel ORA_DISK_4: SID=3524 instance=prod6 device type=DISK
allocated channel: ORA_DISK_5
channel ORA_DISK_5: SID=2767 instance=prod5 device type=DISK
allocated channel: ORA_DISK_6
channel ORA_DISK_6: SID=3534 instance=prod2 device type=DISK
allocated channel: ORA_DISK_7
channel ORA_DISK_7: SID=1019 instance=prod3 device type=DISK
allocated channel: ORA_DISK_8
channel ORA_DISK_8: SID=1273 instance=prod4 device type=DISK
```



# TNS configuration for HA

```
PROD =
  (DESCRIPTION_LIST=
    (LOAD_BALANCE=OFF)
    (FAILOVER=ON)
    (DESCRIPTION=
      (CONNECT_TIMEOUT=5)
      (TRANSPORT_CONNECT_TIMEOUT=3)
      (RETRY_COUNT=3)
      (ADDRESS_LIST=
        (LOAD_BALANCE=ON)
        (ADDRESS=(PROTOCOL=TCP)(HOST=proddbscn.us.dell.com)(PORT=1521)))
      (CONNECT_DATA=(SERVICE_NAME=PROD_FORMS_N_WEB))
    )
    (DESCRIPTION=
      (CONNECT_TIMEOUT=5)
      (TRANSPORT_CONNECT_TIMEOUT=3)
      (RETRY_COUNT=3)
      (ADDRESS_LIST=
        (LOAD_BALANCE=ON)
        (ADDRESS=(PROTOCOL=TCP)(HOST=prodrddbscn.us.dell.com)(PORT=1521)))
      (CONNECT_DATA=(SERVICE_NAME=PROD_FORMS_N_WEB))
    )
  )
)
```



# TNS configuration for HA

## SCAN LISTENER

Service "prod\_forms\_n\_web" has 5 instance(s).

Instance "prod1", status READY, has 1 handler(s) for this service...

Instance "prod3", status READY, has 1 handler(s) for this service...

Instance "prod4", status READY, has 1 handler(s) for this service...

Instance "prod5", status READY, has 1 handler(s) for this service...

Instance "prod6", status READY, has 1 handler(s) for this service...

## LOCAL LISTENER NODE 1

Service "prod\_forms\_n\_web" has 1 instance(s).

Instance "prod1", status READY, has 1 handler(s) for this service...



# How is CNAMEs used for?

## CNAME Record

It is short abbreviation for Canonical Name

Provides an alias name for same hostname

Helps create subdomains

**CNAMEs is really useful for server replacement purpose. It avoids changes in app network configuration.**

**We don't need use CNAME in a database switchover.**

# Q&A





The power to do more