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# TRAIL TO TEXAS



## Oracle Applications Release 11/ ... If RAID, Then RAC

Session Leader

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*TRAIL to TEXAS<sup>sm</sup>*

Release 11/Workshops

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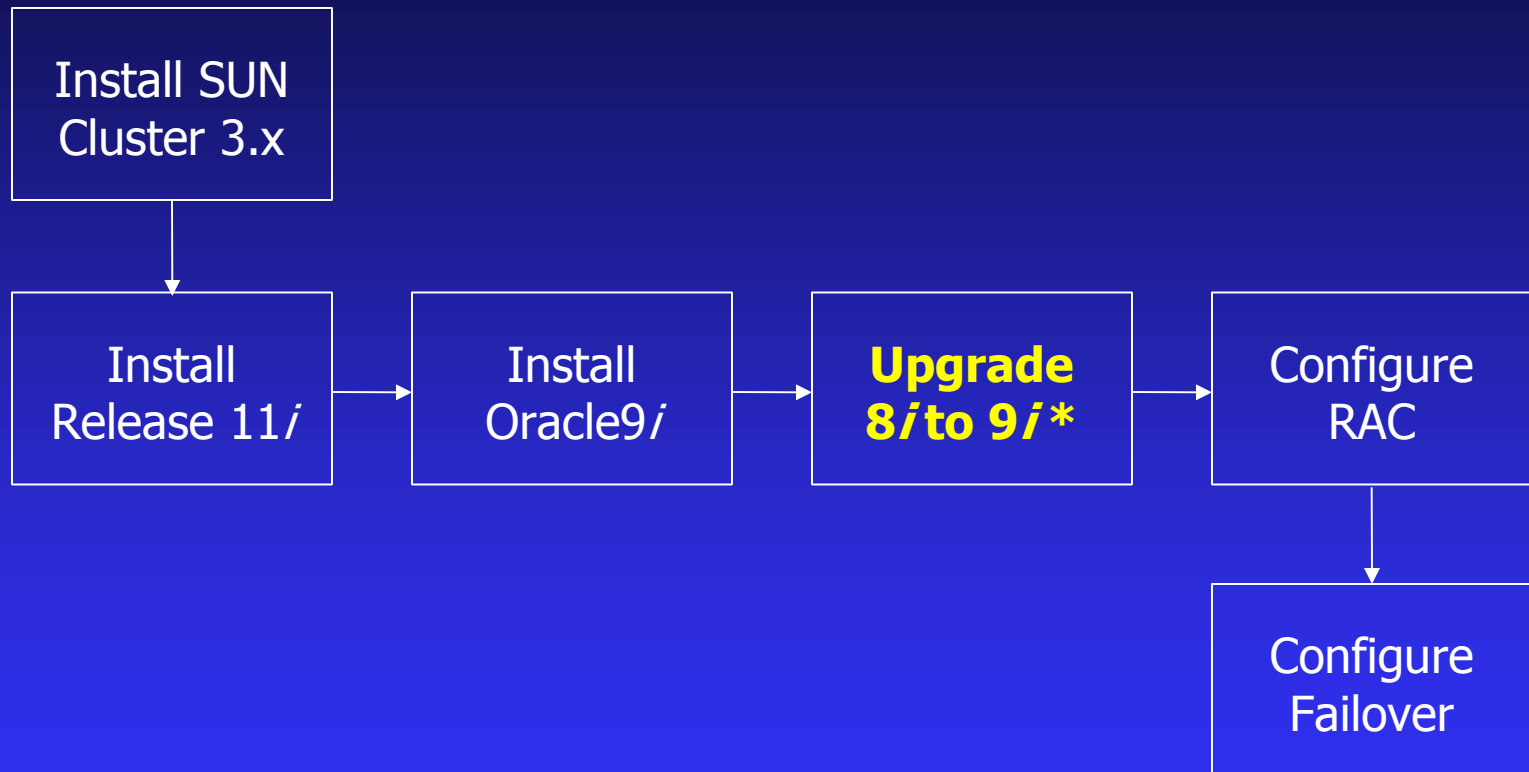
# Introduction *The Decision*

- RAID – Compelling Benefits
  - ◆ Fault Tolerance
  - ◆ Data Availability
  - ◆ High Performance
- The Decision:
  - ◆ If RAID Then RAC...
    - ◆ Real Application Clusters Extend RAID benefits to server
  - ◆ Else...
    - ...there is a reduced SLA

# Introduction *Clustering*

- Cluster defined...
- Raw Filesystem defined...
- Volume Manager defined...
- RAC defined...

# Introduction *Install Overview*



\*Ignore if > 11.5.8 fresh install because Oracle9i is included

# Customer Extends RAID Benefits

- Release 11i and RAC
  - ◆ Customer decided Release 11i would best meet their software needs
  - ◆ Explained that Oracle9i RAC would extend RAID type benefits to the server: Fault Tolerance, Data Availability and High Performance
  - ◆ In a nutshell, the customer was shown that Oracle9i RAC would meet their 5 minutes down time requirement (SLA)

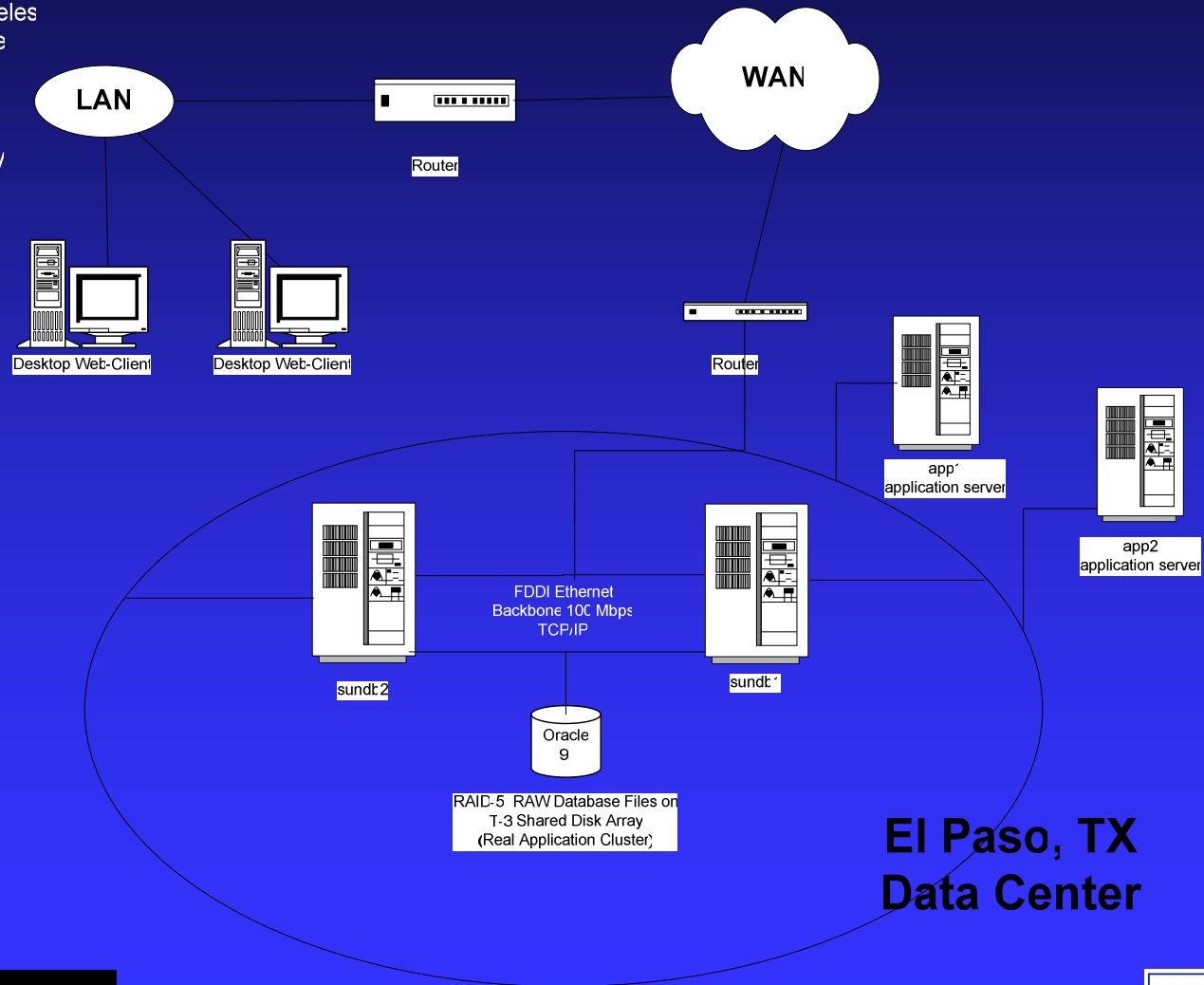
# Customer Selects Hardware

- What was chosen?
  - ◆ SUN V880s: 2 clustered nodes for backend, and 2 non-clustered nodes for middle tier
  - ◆ A T3 storage array is in the same storage enclosure as the SunFire V880 – that means there are two T3 storage arrays connected via an optical hub - the arrays provide both storage that is local to a given database server and storage that is shared between the two database servers

# Implementation – Hardware

The type of LAN shown just below this text will be used at all client locations

- Los Angeles
- Louisville
- El Paso
- Taipai
- Korea
- Germany
- Mexico
- Canada



**El Paso, TX  
Data Center**

# Implementation – SUN Cluster 3.x

- Install SUN Cluster 3.0 (SUN did this)
  - ◆ Recall a cluster is a group of nodes that are interconnected to work as a single, highly available and scalable system – Disk, not memory is shared
  - ◆ Each cluster node is a standalone server that runs its own processes – these processes can communicate with one another to form a virtual single system

# Implementation Detail Overview

- Major Release 11i/ RAC Implementation Tasks
  - ◆ Install Release 11i/ with shared \$APPL\_TOP option
  - ◆ Install Oracle9i/ with RAC option and upgrade
  - ◆ Upgrade Oracle8i/ to Oracle9i/
  - ◆ Switch \$ORACLE\_HOME to Oracle9i/ RAC
  - ◆ Create shared files for RAC
  - ◆ Convert from 1 to 2 Instances
  - ◆ Establish Apps Failover Environment
  - ◆ Replicate Apps installation to all nodes
  - ◆ Set up Parallel Concurrent Processing

# Implementation – Release 11i

- Install Release 11i
  - ◆ Multiple Middle Tiers
    - ◆ Utilize shared APPL\_TOP option
    - ◆ Utilize load balance option
  - ◆ post install steps
  - ◆ backed up database

# Install 9.2 With RAC Option

- This is a separate 9.2.0.x software only install (even if you've installed 11.5.10)
  - ◆ Set ORACLE\_HOME to new oracle home
  - ◆ Start runInstaller from ORACLE\_HOME/bin
  - ◆ Ensure cluster node selection screen shows public aliases
  - ◆ Select products.jar
  - ◆ Choose 9.2.0.4 enterprise edition
  - ◆ Click on software only
  - ◆ Ensure RAC shows in summary
  - ◆ Install software
  - ◆ Enter shared config file
  - ◆ Run root.sh if necessary
  - ◆ Complete installation

# Patch 9.2.0.4 to 9.2.0.5

- Install Oracle Universal Installer 10.1.0.2
  - ◆ Start runInstaller from 9.2.0.5 staging area
  - ◆ Make sure its products.jar is in source location
  - ◆ Make sure all rac nodes are selected on cluster screen
  - ◆ Upgrade installer to 10.1.0.2 of new oracle home
  - ◆ Complete install of 10.1.0.2
- Upgrade 9.2.0.4 to 9.2.0.5
  - ◆ Start runInstaller from <new ohome>/oui/bin
  - ◆ Make sure all rac nodes are selected on cluster screen
  - ◆ Make sure its products.jar is in source location
  - ◆ Select 9.2.0.5 on available products screen
  - ◆ Click install
  - ◆ Run rootpre.sh if necessary
  - ◆ Complete install of 9.2.0.5

# Patch 9.2.0.4 to 9.2.0.5

## ■ Post install tasks

- ◆ Log in as sysdba and start the db with the migration option
- ◆ Turn spooling on
- ◆ Exec:  
`<new_oracle_home>/rdbms/admin/catpatch.sql`
- ◆ Turn spooling off
- ◆ Review spool log
- ◆ Bounce the db

# Switch ORACLE\_HOME to Oracle9i RAC

- Assumes autoconfig is implemented
  - ◆ Execute autoconfig on apps tier
  - ◆ Generate appsutil.zip via  
\$AD\_TOP/bin/admkappsutil.pl
  - ◆ Transfer and unzip in to OLD \$ORACLE\_HOME
  - ◆ Execute autoconfig from OLD \$ORACLE\_HOME using autoconfig in the appsutil path
  - ◆ From the same directory, execute adcfgclone.pl
  - ◆ Shutdown instance
  - ◆ Copy appsutil directory from OLD \$ORACLE\_HOME to NEW \$ORACLE\_HOME
  - ◆ Run adcfgclone.pl from NEW \$ORACLE\_HOME/appsutil/clone/bin

# Switch ORACLE\_HOME to Oracle9i RAC

- Configure other database nodes
  - ◆ Copy the appsutil directory from the NEW \$ORACLE\_HOME mentioned above to the 9.2.0.5 homes of the other db nodes
  - ◆ Run adcfgclone.pl from 9.2.0.5 ORACLE\_HOME/appsutil/clone/bin
  - ◆ Answer prompts with host, domain name, sid and port specific to the node
  - ◆ Source the new db env file and bounce
  - ◆ Exec \$ORACLE\_HOME/rdbms/admin/catclust.sql
  - ◆ Verify tnsnames and listener

# Create Shared Files for RAC

- If Raw files required (OCFS is delivered with Linux and Windows on Oracle9i— other options for UNIX)
  - ◆ Shutdown db
  - ◆ cooked files must become raw
  - ◆ Using veritas, configure shared disk volumes for
    - ◆ database files, redologs, control files, redo logs
    - ◆ use SQL to create veritas statements adding 1M to datafile's size

# Apps Failover Environment – JDBC

- In the shared \$APPL\_TOP:
  - ◆ Verify the dbc file in \$FND\_TOP/secure
    - ◆ Verify above reflects instance name in DB\_NAME
    - ◆ Edit jserv properties JTF wrapper.bin parm to service\_name.dbc
    - ◆ wrapper.bin.parameters=-  
DJTFDBCFILE=sundb1\_mcprod1.dbc

# Apps Failover Environment – JDBC

...

- Edit jserv.properties Web ADI parm to service\_name.dbc
  - ◆ wrapper.bin.parameters=-DBNEDBCFILE=sundb1\_mcprod1.dbc
- RAC instance failure will require minor manual intervention of updating the proceeding with the surviving instance dbc file

# Apps Failover Environment – Net

- Review the 9.2 tnsnames.ora on node1 and node 2
- node 1 example:

```
mcprod=
```

```
(description=(load_balance=off)(failover=off)
```

```
(address_list=
```

```
(address=(protocol=tcp)(host=sunadb1)(port=1522)
```

```
) )  
(address=(protocol=tcp)(host=sunadb2)(port=1522)
```

```
(connect_data=(service_name=mcprod)  
(server=dedicated)))
```

# Apps Failover Environment – Net

...

```
mcprod1= (description=
  (address=(protocol=tcp)(host=sundb1)(port=1522))
  )
(connect_data=(sid=mcprod1)
  (service_name=mcprod)))
mcprod2= (description=
  (address=(protocol=tcp)(host=sundb2)(port=1522))
  )
(connect_data=(sid=mcprod2)
  (service_name=mcprod)))
```

# Apps Failover Environment – Net

...

- If necessary, modify init.ora on each node
  - ◆ example, node 1
    - ◆ service\_names = mcprod
    - ◆ local\_listener = listener\_mcprod1
- modify 8.0.6 tnsnames.ora specifying multiple addresses as above
- modify iAS tnsnames.ora specifying multiple addresses as above

# Replicate Apps installation to all nodes...

- Edit ora files in 8.0.6 and iAS oracle homes with correct host and port info
- Review tnsnames.ora from in 8.0.6 and iAS \$ORACLE\_HOMEs to ensure connect time failover is implemented
- Verify FNDSM\_<sid> entries are correct
- Double check profile options
- Replace \$AD\_TOP/admin/template/tnsnames.ora with one from 8.0.6 \$ORACLE\_HOME (for PCP)

# Set up Parallel Concurrent Processing

- On each cluster node, edit the apps APPL\_TOP context file (<SID>.xml) to enable distributed concurrent processing
  - ◆ <APPLDCP oa\_var="s\_appldcp">ON</APPLDCP>
- Run autoconfig on each cluster node after backing up the 8.0.6 and iAS ora files
- After running autoconfig, put back changes into the above ora files that auto config left out
- Ensure that the tnsnames.ora file on each node contains an instance alias that match GV\$INSTANCE (mcprod1 and mcprod2)

# Set up Parallel Concurrent Processing...

- always ensure that the local node is first in the address list of the tnsnames.ora
- verify FNDSM\_<sid> is in the 8.0.6 init.ora
- startup db and application processes
- using the app, ensure each node is registered (navigation: Install>Nodes)
- using the app, define primary and secondary nodes for all conc mgrs (navigation: Concurrent>Manager>Define)

# Set up Parallel Concurrent Processing...

- Define the ICM on the primary PCP only (sundb1)
- On secondary node (sundb2), specify Internal Monitor primary node as sundb2 and the secondary node as sundb1
- On the above IM, assign a standard work shift with one process
- On the primary node (sundb1), make similar assignments for the Internal monitor except swapping the machine designations
- Edit the TWO\_TASK in the APPSORA.env file on each node to contain the instance name

# Set up Parallel Concurrent Processing...

- Bounce (or start for the first time)
- Verify managers are starting on their respective nodes

# Conclusion

- So, could this customer really recover in 5 minutes?
  - ◆ Yes, for primary cluster node failure:
    - ◆ The database continued to accessible after one of the nodes crashed
    - ◆ concurrent requests were redirected to the secondary node
  - ◆ Yes, for front end failure:
    - ◆ Big-IP was used to balance and keep the front end up if one front end box failed

# Conclusion

- Any scripts or other manual steps necessary to facilitate failover?
  - ◆ Script was created to update `jserv.properties` file to facilitate self-service failover
  - ◆ App user log out/login required

# Conclusion

- RAC implementation has been made easier by use of autoconfig and shared \$APPL\_TOP as well as load balance options of the initial 11.5.10 install
  - ◆ Release 11i increases the complexity of implementing RAC
  - ◆ RAC increases the complexity of managing Release 11i (use oem and veritas volume mgr)
  - ◆ Attention getters
    - ◆ Parallel concurrent processing
    - ◆ Middle tier load balancing
    - ◆ Management of raw files

# Conclusion

- Sources used for this presentation
  - ◆ 11.5.10 Installation guide
  - ◆ MetaLink note 279956.1
  - ◆ Oracle White Paper by Jim Stone: Oracle Applications 11.5.9 with 9i RAC Installation & Configuration Linux and UNIX (generic)
  - ◆ Oracle White paper by Ahmed Alomari of Oracle Corporation: Migrating Your E-business Suite Single Instance to Real Application Clusters (RAC)
  - ◆ Oracle9i Database Migration Manual
  - ◆ Multiple TARs

# Q&A

*Hope you enjoyed this Release 11i session!*

*Remember:*



**Keep It Simple and Supportable<sup>sm</sup>**

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