



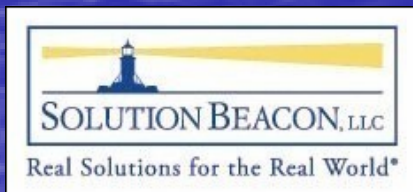
Taking the 11i/ RAC Plunge Session #1276

Lance Reedy
Brian Bent
Authored by: Kevin Dahl

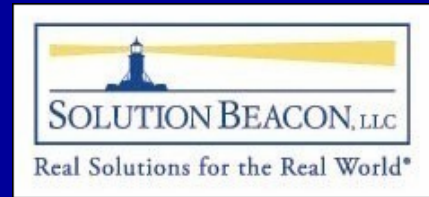
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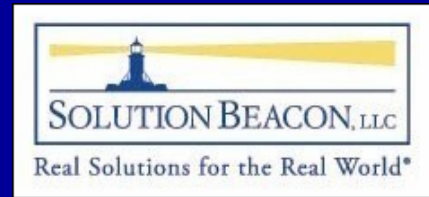
Agenda



- ◆ Introduction
- ◆ 10g RAC benefits and costs
- ◆ ASM Overview
- ◆ High-level process of upgrading to 11i/ 10g RAC
- ◆ Conclusion



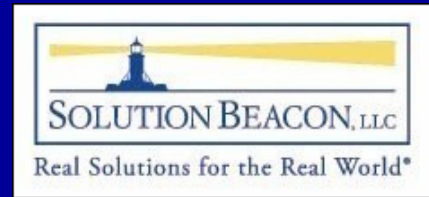
Introduction



- ◆ This presentation is based on a recent upgrade of a Red Hat Linux based non-RAC 11.5.9 / 9i environment to a Red Hat Linux based 11.5.10.2 / 10gR2 environment
- ◆ The focus of this presentation will be an overview of that process with special emphasis on the business justification of RAC, ASM, a Split-Tier configuration for 11.5.10.2 and OATM



10gR2 RAC Cost / Benefit Analysis

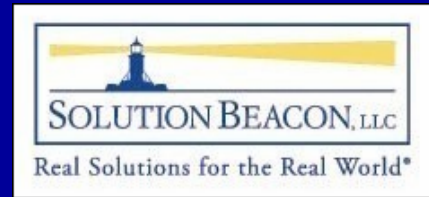


◆ Costs

- Increased time and complexity of implementation and subsequent maintenance
 - ◆ CRS implementation/administration
 - ◆ ASM implementation/administration
 - ◆ Other DBA tasks
- Additional machines to administer
 - ◆ At a minimum, the database tier hardware would double
- Increased license cost



10gR2 RAC Cost / Benefit Analysis cont.

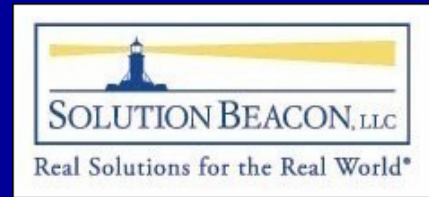


◆ Benefits

- Non-Disaster/Recovery high availability
- Increased performance
- Depending on user base, would be able to use “commodity” hardware and operating system
- Horizontal scalability



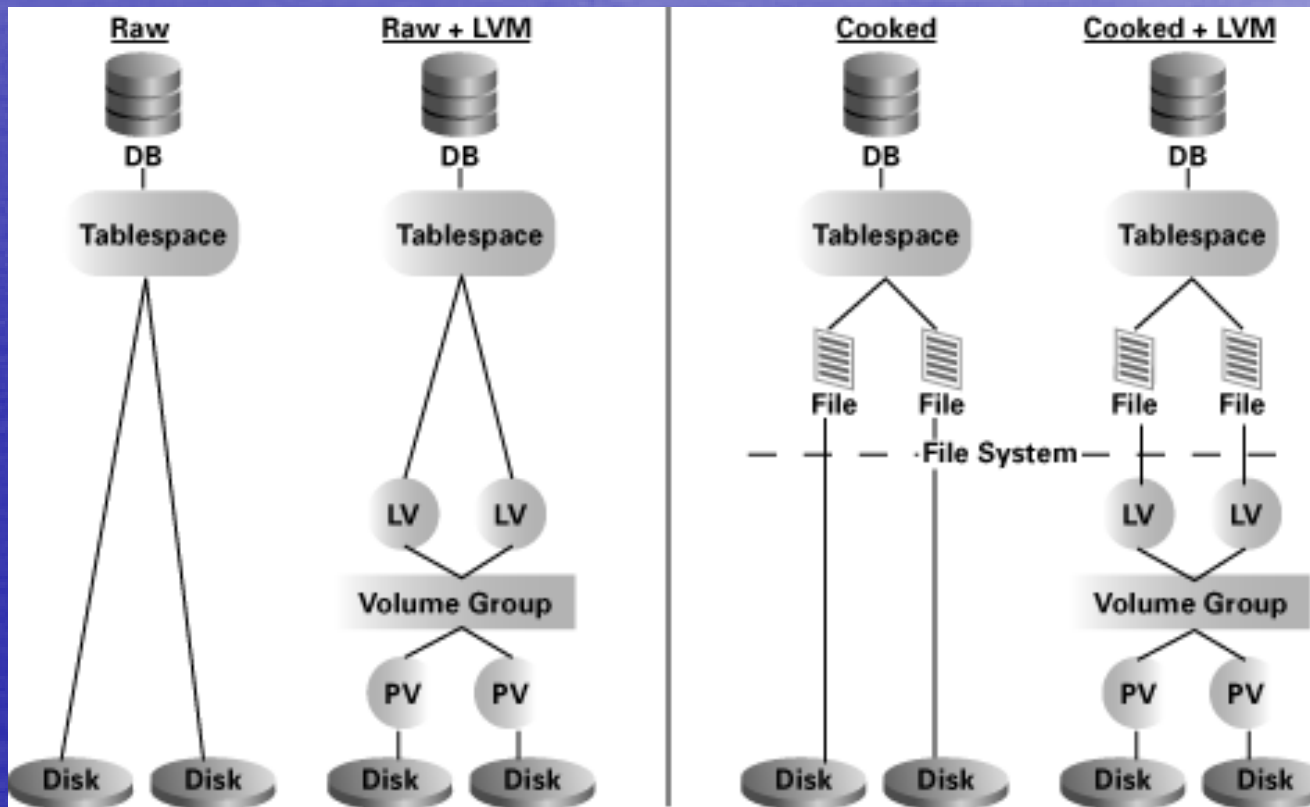
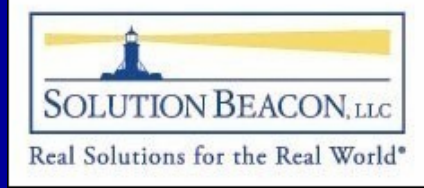
Overview of ASM



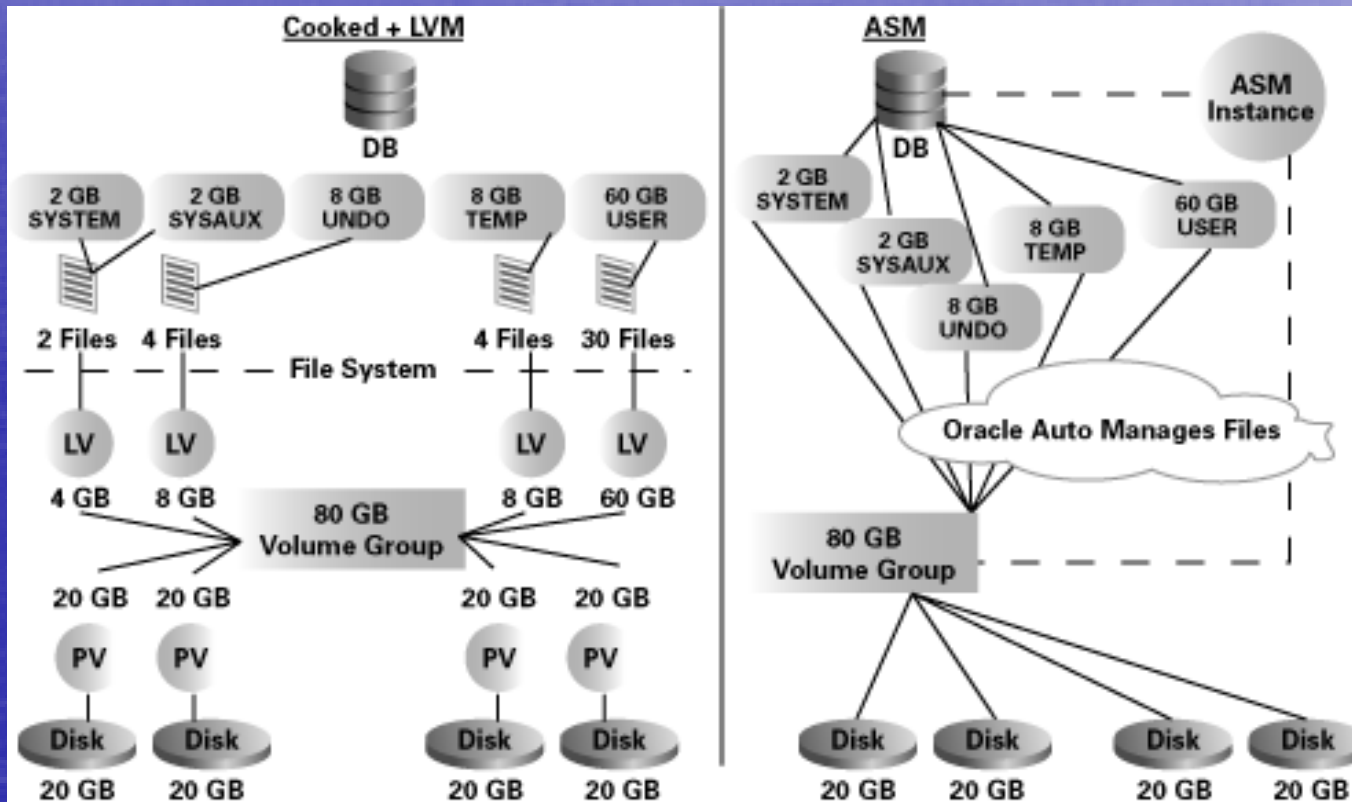
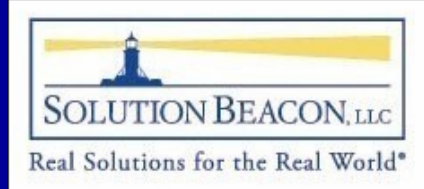
- ◆ The Automatic Storage Management (ASM) feature of Oracle Database 10g provides a **virtualization layer** between the database and storage so that multiple disks can be treated **as a single disk group** and disks can be dynamically added or removed while keeping databases online. Existing data will automatically be spread across available disks for performance and utilization optimization



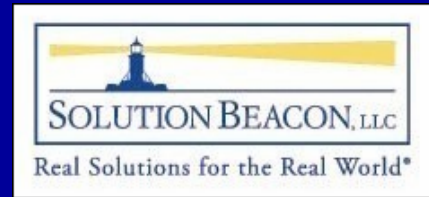
Raw vs. Cooked



Cooked + LVM vs. ASM



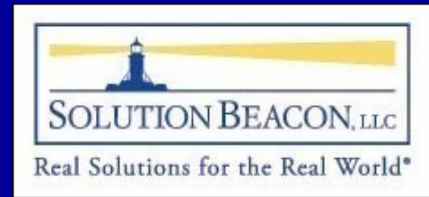
Overview 11*i*/10*g* R2 RAC from 11*i*/9*i*



- ◆ Install 11*i*/software on tier box-upgrade existing 11.5.9 via SB Rapid Migration technique
- ◆ Install Oracle Clusterware 10.2.0.1
- ◆ Install Oracle Database Software 10.2.0.1
- ◆ Install Database Components from Oracle 10*g* (10.2.0.1) Companion CD
- ◆ Upgrade Cluster Ready Services , database software to 10.2.0.2
- ◆ Upgrade Oracle9*i* (9.2.0.6) Database to 10*g* (10.2.0.2)
- ◆ Create ASM Instances/Diskgroups
- ◆ Convert to OATM
- ◆ Convert 10*g* Database to RAC
- ◆ Enable AutoConfig on Applications Database Tier
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- ◆ Conversion to Shared Application File System



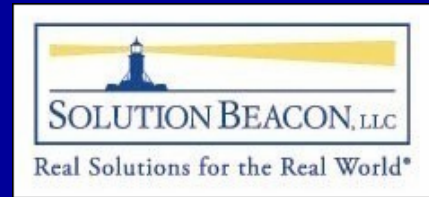
Install 11i/software on tier box-upgrade existing 11.5.9 via SB Rapid Migration technique



- ◆ Using SB's Rapid Migration approach, installed Oracle Applications, brought in the source database so a single tier installed would exist on one of the middle tier boxes
- ◆ Applied pre 3480000 patches
- ◆ Applied patch 3480000
- ◆ Applied post 3480000



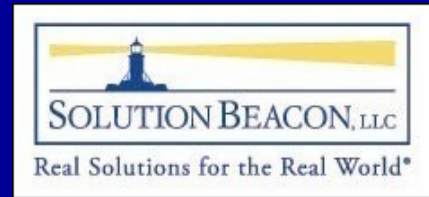
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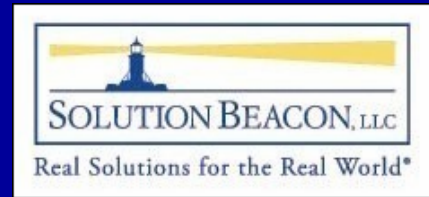
Install Oracle Clusterware 10.2.0.1



- ◆ Cluster - a cluster comprises multiple interconnected computers or servers that appear as if they are one server to end users and applications
- ◆ Oracle Clusterware - a portable cluster management solution that is integrated with the Oracle database. The Oracle Clusterware is also a required component for using RAC
- ◆ RAC uses Oracle Clusterware for the infrastructure to bind multiple servers so that they operate as a single system.
- ◆ Oracle Clusterware requirements:
 - Voting disk – records node membership
 - Oracle Cluster Registry (OCR) - records cluster configuration information
 - Private interconnect – private network used by the nodes (Use Datagram Protocol (UDP) on a Gigabit Ethernet)



Install Oracle Clusterware 10.2.0.1 cont.

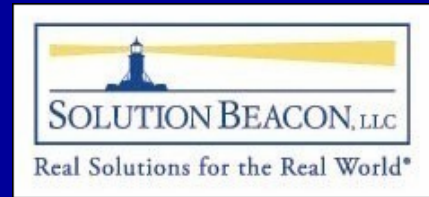


◆ Major Clusterware services

- Cluster Synchronization Services (CSS)
- Cluster Ready Services (CRS)
- Event Management (EVM)
- Oracle Notification Service (ONS)
- RACG
- Process Monitor Daemon (OPROCD)



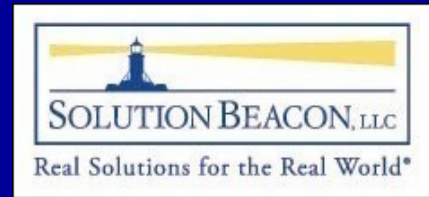
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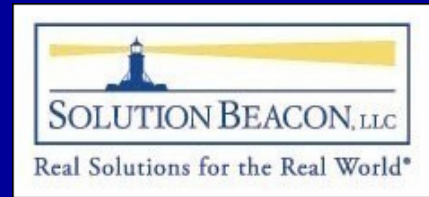
Install Oracle Database Software 10.2.0.1



- ◆ Use runInstaller
- ◆ Clusters will be detected



Overview 11i/10g R2 RAC from 11i/9i



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Install Database Components from Oracle 10g (10.2.0.1) Companion CD

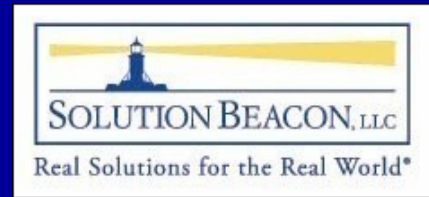


◆ Choose Oracle Database 10g Products 10.2.0.1 Includes

- Oracle JDBC Development Drivers
- Oracle SQLJ
- Oracle Database Examples
- Oracle Text Supplied Knowledge Bases
- Oracle Workflow Server
- Oracle Ultra Search
- Natively Compiled Java Libraries
- JPublisher



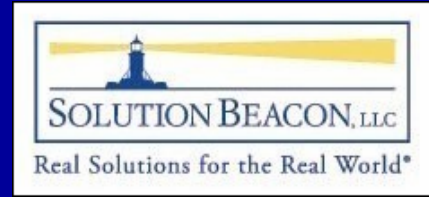
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- ◆ Install Database Components from Oracle 10g (10.2.0.1) Companion CD
- ◆ **Upgrade Cluster Ready Services , database software to 10.2.0.2**
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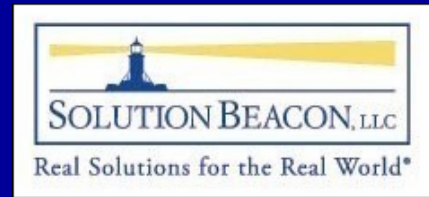
Upgrade Cluster Ready Services , database software to 10.2.0.2



- ◆ Upgrades to version 10.2.0.2
- ◆ Must shutdown cluster ready services first



Overview 11i/10g R2 RAC from 11i/9i



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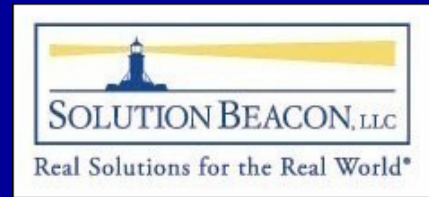
Upgrade Oracle9i (9.2.0.6) Database to 10g (10.2.0.2)



- ◆ Performed manual upgrade
- ◆ Run @utlu102i.sql provided in 10.2.0.2 \$ORACLE_HOME/rdbms/admin against 9i. Analyzes and provides list of tasks
- ◆ Adjust init.ora for 10g
- ◆ With in sqlplus as sysdba, STARTUP UPGRADE
- ◆ Run catupgrade.sql to upgrade the database
- ◆ Run utlu102s.sql to see what has been upgraded
- ◆ Compile invalid objects



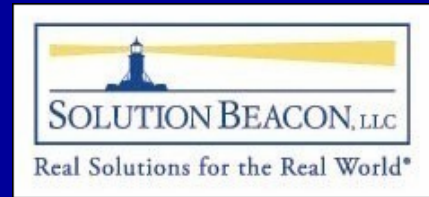
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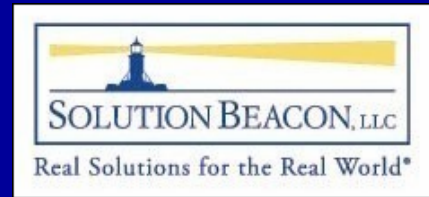
Create ASM Instances/Diskgroups



- ◆ Install/configure ASM support library, ASMLib. To download ASMLib for Linux, go to <http://www.oracle.com/technology/tech/Linux/asmlib>
- ◆ Use fdisk to make raw storage available to ASM
- ◆ Create an ASM disk via oracleasm
- ◆ Install separate ASM oracle home (software only)
- ◆ Create ASM instance via dbca
- ◆ Use 1 disk group



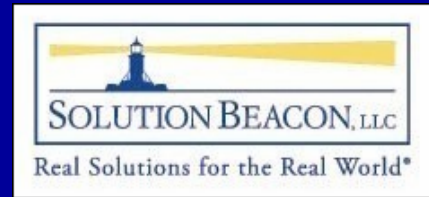
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Convert to OATM

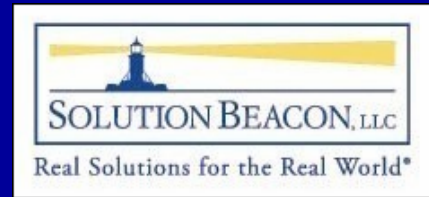


◆ \$FND_TOP/bin/fndtsmig.pl is the OATM migration script and it presents the following menu, which outlines the OATM process

1. Migration Sizing Reports
2. Create New Tablespaces
3. Generate Migration Commands
4. Execute Migration Commands
5. Run Migration Status Reports
6. Run Post Migration Steps
7. Run Customization Steps
8. Run Migration in Batch Mode



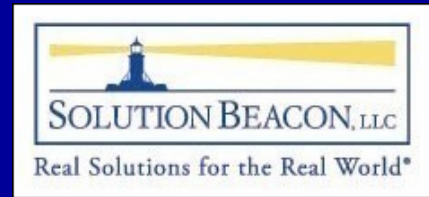
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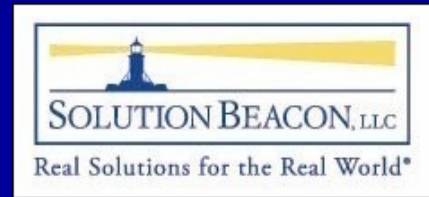
Convert 10g Database to RAC



- ◆ Ensure a new appsutil.zip file is generated on the applications tier and transferred to the primary 10g db tier \$ORACLE_HOME. Then, execute AutoConfig on the 10g db tier
- ◆ On the first RAC node
 - Execute adpreclone.pl on the primary 10g db tier. This will gather db info on the existing node and create a clone subdirectory
 - Ensure the database and database listener are shutdown
 - Ensure the ASM instance(s) are still running
 - Execute adcfgclone.pl. Ensure you respond that this is the first RAC node, there are 2 instances, the service name and the port pool, correct hostnames and instance number. Also, there will only be 1 datatop because ASM is being used
 - Zip the appsutil directory in the 10g \$ORACLE_HOME



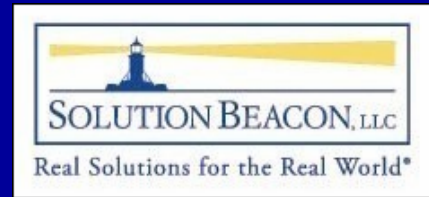
Convert 10g Database to RAC cont.



- ◆ On the second RAC node
 - Copy the zipped appsutil directory from the first RAC node and unzip it in the \$ORACLE_HOME on the second node
 - Run adcfglcone.pl on the second node. Ensure you respond that this is RAC, this Not the first RAC node, the appropriate hostname, sid
- ◆ Edit listener.ora and tnsnames.ora to accommodate RAC
- ◆ Create second undo for the second instance
- ◆ ensure cluster tags are correct in xml files. For example, s_dbCluster must be set to true
- ◆ run AutoConfig on second tier
- ◆ shutdown db
- ◆ Create spfile from pfile;
- ◆ startup database instance



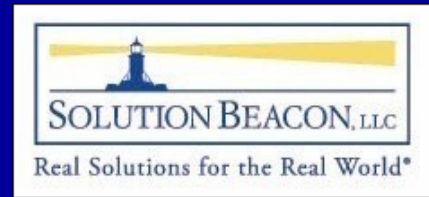
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Enable AutoConfig on Applications Database Tier



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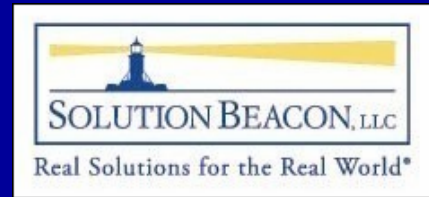
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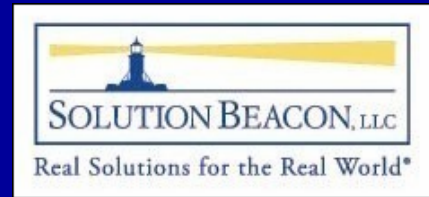
Establish Applications Environment for RAC



- ◆ The tnsnames.ora from node 1 was copied to the 806 tnsnames.ora
- ◆ Test connectivity to one of the instances in the RAC environment before running AutoConfig in the next step
- ◆ Execute AutoConfig by running the command:
`$AD_TOP/bin/adconfig.sh contextfile=$APPL_TOP/admin/<context_file>`
- ◆ Check the `$APPL_TOP/admin/<context_name>/log/<MMDDhhmm>` AutoConfig log file for errors
- ◆ Source the environment by using the latest environment file generated
- ◆ Verify the tnsnames.ora and listener.ora files located in the 8.0.6 ORACLE_HOME, and \$IAS_ORACLE_HOME/network/admin. Ensure that the correct TNS aliases have been generated for load balance and fail over. Ensure that all the aliases are defined using the virtual hostnames
- ◆ Verify the dbc file located at \$FND_SECURE. Ensure that the parameter APPS_JDBC_URL is configured with all instances in the environment and load_balance is set to ON



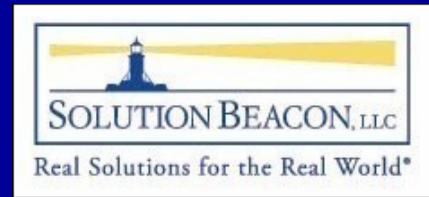
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- ◆ Create ASM Instances/Diskgroups
- ◆ Convert to OATM
- ◆ Convert 10g Database to RAC
- ◆ Enable AutoConfig on Applications Database Tier
- ◆ Establish Applications Environment for RAC
- ◆ **Configure Parallel Concurrent Processing**
- ◆ Conversion to Shared Application File System



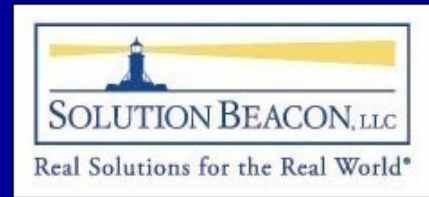
Configure Parallel Concurrent Processing



- ◆ Setup parallel concurrent processing
 - FNDSM must be configured and working on all nodes
 - Internal monitor must be configured and working all nodes
- ◆ Setup transaction managers
 - Must edit RDBMS ifile pointed to by init.ora adding `_lm_global_posts=TRUE` and `_immediate_commit_propagation=TRUE`
 - In apps, change the profile option 'Concurrent: TM Transport Type' to 'QUEUE' and setup secondary and primary nodes names for TMs
- ◆ Load balance concurrent processing tiers
 - Edit context xml file with CP load balance alias and run AutoConfig



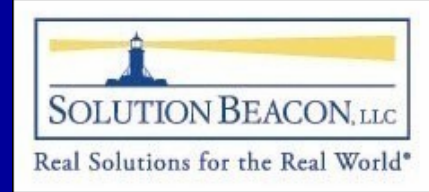
Overview 11i/10g R2 RAC from 11i/9i



- ◆ Install 11i/software on tier box-upgrade existing 11.5.9 via SB Rapid Migration technique
- ◆ Install Oracle Clusterware 10.2.0.1
- ◆ Install Oracle Database Software 10.2.0.1
- ◆ Install Database Components from Oracle 10g (10.2.0.1) Companion CD
- ◆ Upgrade Cluster Ready services , database software to 10.2.0.2
- ◆ Upgrade Oracle9i (9.2.0.6) Database to 10g (10.2.0.2)
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- ◆ Configure Parallel Concurrent Processing
- ◆ **Conversion to Shared Application File System**



Conversion to Shared Application File System



◆ Enable Shared Application File System:

```
$ cd $COMMON_TOP/admin/scripts/<CONTEXT NAME>  
$ adstpall.sh apps/apps  
$ cd $FND_TOP/patch/115/bin  
$ perl -I $AU_TOP/perl txkSOHM.pl
```

- NFS share of the above application file system

◆ Add the new node

- Run preclone on existing system
- Configure node to be added

```
$ cd <AD_TOP>/bin  
$ perl adclonctx.pl sharedappltop \  
contextfile=<Applications Context File for the existing node>
```

```
$ cd <FND_TOP>/patch/115/bin  
$ perl -I <AU_TOP>/perl txkSOHM.pl
```



Conclusion



◆ Do at least 3 test iterations

◆ Presentation references

- Configuring Oracle Applications Release 11i with 10g R2 RAC and ASM – metalink note 362135.1
- Configuring Oracle Applications Release 11i with 10g RAC and 10g ASM – metalink note 312731.1
- Oracle® Applications System Administrator's Guide - Configuration Release 11i Part No. B13925-06
- Advanced Configurations and Topologies for Enterprise Deployments of E-Business Suite 11i - metalink note 217368.1)
- Using Oracle Applications with a Split Configuration Database Tier on Oracle 10g Release 2 – metalink note 369693.1
- Shared APPL_TOP FAQ – metalink note 243880.1
- Sharing the Application Tier File System in Oracle Applications 11i - metalink note 233428.1

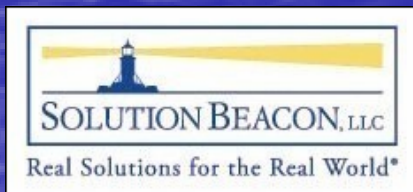


Taking the 11*i*/ RAC Plunge

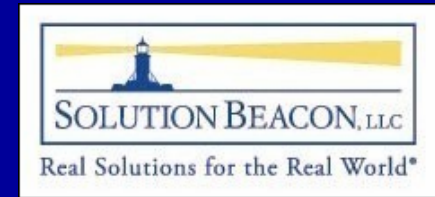
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Questions and Answers



Thank you!
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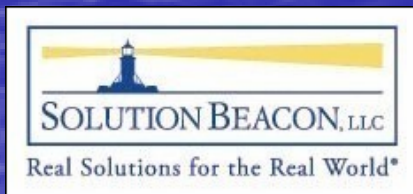
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