Create Your Oracle Apps R12 Lab With Less Than US$1000

Ajith Narayanan
Software Development Advisor, Dell IT
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Who Am I?

Ajith Narayanan
Software Development Advisor
Dell IT

- 8+ years of Oracle DBA experience.
- Blogger :- http://oracledbascriptsfromajith.blogspot.com
- Website Chair:- http://www.oracleracsig.org – Oracle RAC SIG

Agenda

*** You are an Oracle Apps DBA, Now What? Wanna be an architect?

*** Oracle Apps R12 , Multi tier Architecture

*** How do we design the Multi tier architecture and build it?

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You are an Oracle Apps DBA, Now What? Want To Be An Architect?

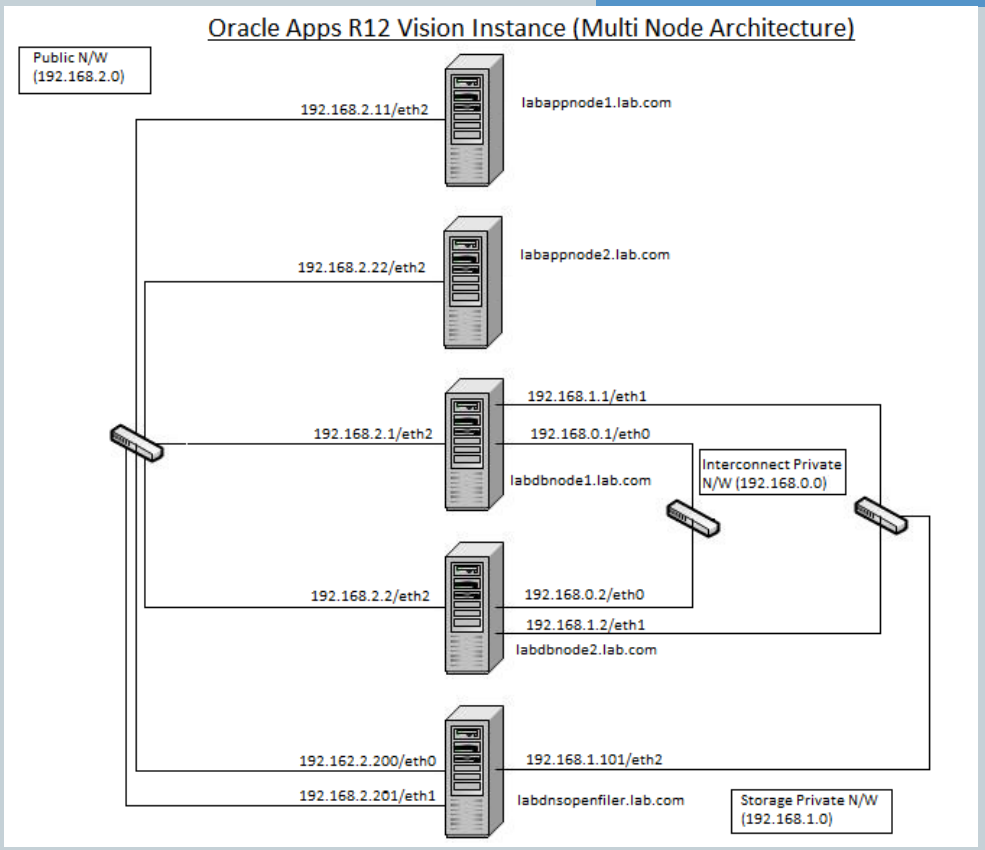
Most of the Oracle Apps DBA does the following on daily basis

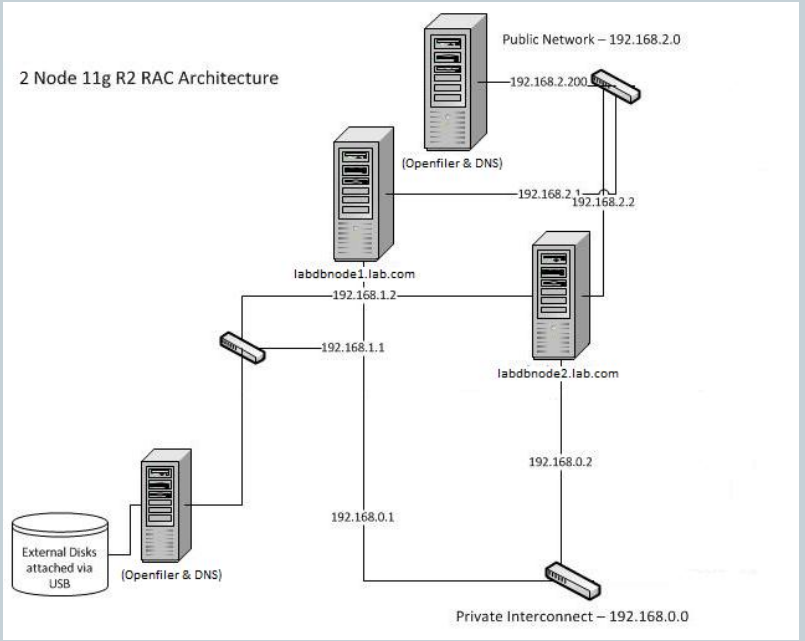
Manage the Oracle Apps Instance 11i or R12

Troubleshoot issues in database, jsp routing issues, forms access , workflows background engine , clones the instance for non-prod's, patching(DB&Apps Tier), look into concurrent manager issues etc.. etc .... and keeps the business as usual, great job indeed !

Have you ever dreamt of designing such a multi tier system by yourself, If you have already dreamt about that, you are already an architect. ☺

Oracle Apps R12 , Multi Tier Architecture





Oracle Apps R12 , Multi tier Architecture - Functions

Node Type	NAME	Version	Function
Application Node1	labappnode1.lab.com	Oracle EBS 12.1.1	WEB Node
Application Node2	labappnode2.lab.com	Oracle EBS 12.1.1	Concurrent Node (Batch Processing)
RAC DB Node1	labdbnode1.lab.com	Oracle RDBMS 11.1.0.7	Clustered DB node1
RAC DB Node2	labdbnode2.lab.com	Oracle RDBMS 11.1.0.7	Clustered DB node2
DNS Server/Openfiler	labdnsopenfiler.lab.com	Openfiler	DNS/SharedStorage

	Apps Tier
E-Business Suite	Oracle EBS R12.1.1
BASE Directory	/u01/app/oracle/ebsR12
ORACLE_HOME	/u01/app/oracle/ebsR12/apps/tech_st/10.1.2
IAS_ORACLE_HOME	/u01/app/oracle/ebsR12/apps/tech_st/10.1.3
APPL_TOP	/u01/app/oracle/ebsR12/apps/apps_st/appl
INST_TOP	/u01/app/oracle/ebsR12/inst/apps/<CONTEXT_NAME>
Port Pool	1
Application OS Owner	applmgr:(oinstall, dba)
OS Platform	Oracle Enterprise Linux 5.7 (64 bit)

	DB Tier
RDBMS	Oracle 11gR1 RAC (11.2.0.2)
ORACLE_BASE	/u01/app/oracle
ORACLE_HOME	/u01/app/oracle/EBSR12
DB_HOME Owner	oracle:(oinstall, dba)
DB LISTENER	LABDB_LISTENER
DB Listener Host/port	node1-vip, node2-vip (TCP:1522)
DB Storage Type, File Management	ASM with OMFs
ASM diskgroups for DB and FRA	DATA (60GB), FRA (10GB)
OS Platform	Oracle Enterprise Linux 5.7 (64 bit)
Clusterware	Oracle 11gR2 Grid Infrastructure 11.2.0.1
Cluster Name	lab
Database Cluster Nodes	node1, node2
Clusterware Home	/u01/app/grid11201 (GRID_HOME)
Clusterware Owner	oracle:(oinstall, dba)
VIPs	node1-vip, node2-vip
SCAN	labdnsopenfiler.lab.com
SCAN VIPs	2 SCAN VIPs resolving labdnsopenfiler.lab.com by DNS
SCAN_LISTENER Host/port	Scan VIPs Endpoint: (TCP:1525)
OCR and Voting Disks Storage Type	ASM
OCR Disks/Voting Disk	+GIS_FILES (Normal Redundancy)

How do we design the Multi tier architecture and build it?

Now that we have plan, How do we build it we less than $1000?

What hardware I had to buy for creating my R12 Lab?

4 port KVM Switch	-1No – ($15 X 1) $15 /-
8 port Gigabit D-Link Switch (Public N/W)	-1No – ($45 X 1) $45 /-
8 port Digisol Switch (Private N/W)	-1No – ($15 X 1) $15 /-
PCI Ethernet cards	-5Nos- ($8X5) $40 /-
USB 2.0 Ethernet Adapter(10/100/1000Mbps) (Interconnect)	-2Nos- ($35 X 2) $70 /-
5 End of life Optiplex Dell Desktops	-5 Nos-($150 X 5) $750/-
Total	= $935 /-

What software I had to buy for creating my R12 Lab? All downloads from OTN for free ☺

- NAS Storage Solution: Openfiler 2.3 (2.6.26.8-1.0.11.smp.pae.gcc3.4.x86.i686)
- Operating System: Oracle Enterprise Linux 5.5 (2.6.18-194.el5PAE)
- Clusterware: Oracle 11g R2 Grid Infrastructure (11.2.0.2)
- Oracle RAC: Oracle RDBMS 11g R2 (11.2.0.2)

Action Plan

–Implementation Goal:

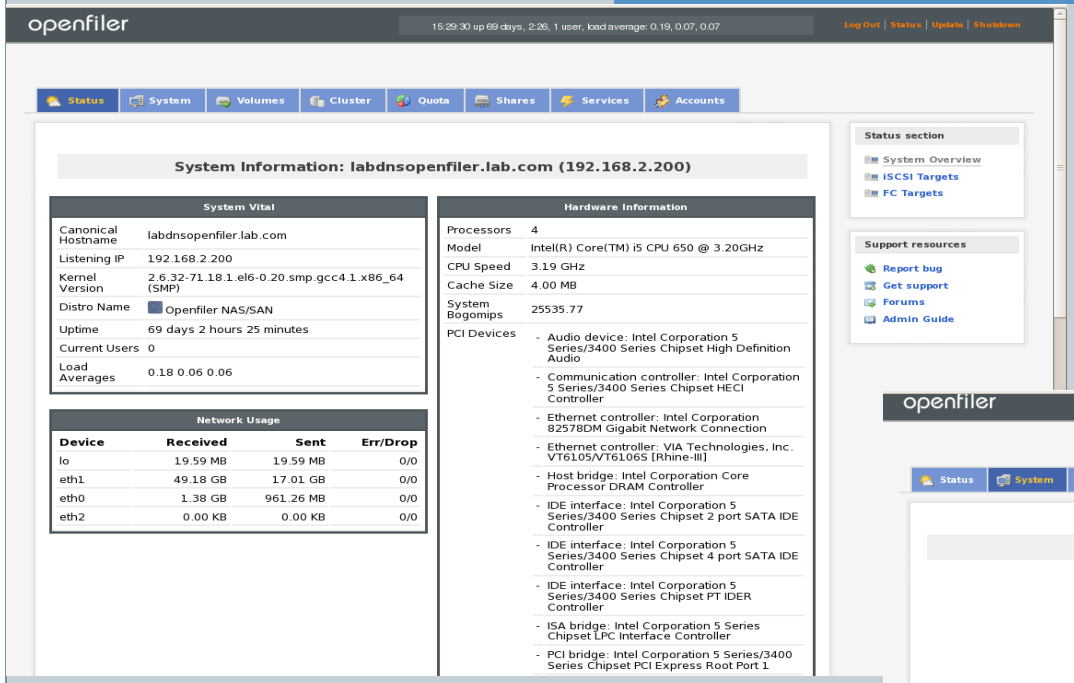
Establish the best practice of configuring EBS R12:

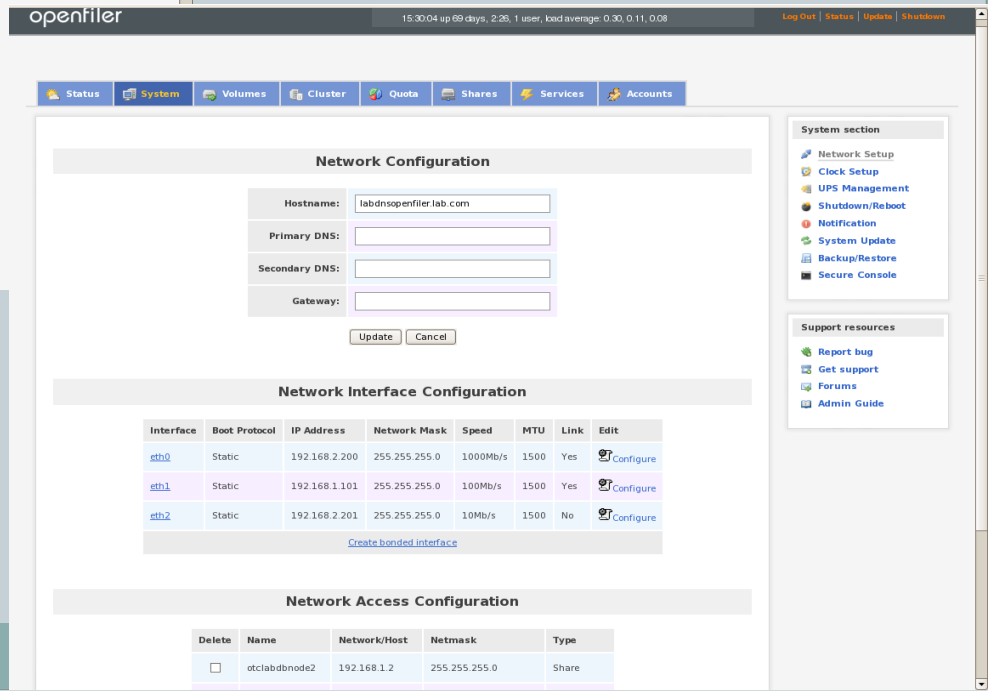
- ☐ On 64 bit Dell desktops.
- ☐ On Linux x86-64 like Oracle Enterprise Linux
- ☐ Enable Apps for RAC by converting database to RAC

Implementation Method:

- ☐ Prepare your multiple nodes
- ☐ Fresh Install EBS R12
- ☐ Install 11g r2 Grid & Database Software Binaries
- ☐ Convert the Database to 11g R2 RAC
- ☐ Establish the Applications for RAC database

Prepare The Shared Storage





Prepare The Shared Storage

Configure the Shared Storage for 11g R2 Grid Infrastructure and RAC Database:

Volume Group: Openfiler
Physical Volume: /dev/sda5 (1st extended partition on the last physical partition of local disk /dev/sda nas-server)
Logical Volumes: data_1

a) Connect to the nas-server using: https://127.0.0.1:446 using openfiler<password>
b) Create the Volume group "grid" and created the two logical volumes asmdisk01 and asmdisk02 for ASM.
c) Assign iSCSI targets to these LUNs so that they can be discovered by the clients (cluster nodes node1, node2)
Steps to Create data_1 of size 25GB.

(1) Clicked on 'Add Volumes" link under the "Volumes" tab.
(2) Filled the appropriate values and press "create"
(3) The 3rd Volume data_1was created.
(4) Assigned the iscsi-target to this newly created volume.
(a) Clicked on "iSCSI-Targets" line under the "Volumes" tab.
(b) Under the "Target Configuration" sub tab, entered the Value of data_1 in the "Target IQN" box and then clicked "Add" as shown in the screen.
(c) Clicked on the "update" on the same screen with all the default values selected.
(d) Went to the "LUN Mapping" sub tab where the iscsi-target is assigned to the new Logical Volume created (data_1)
(e) Clicked the "map" for the volume data_1.
(f) Went to the "Network ACL" tab and allow all the 2 rac nodes to have access on this iscsi-target.

(5) Restarted the iscsi-target on the NAS (service iscsi-target restart)
(6) Restarted the iscsi service and make it start automatic during the restart of system (On All the RAC Nodes):

Prepare The Shared Storage

chkconfig --level 35 iscsi on service iscsi restart

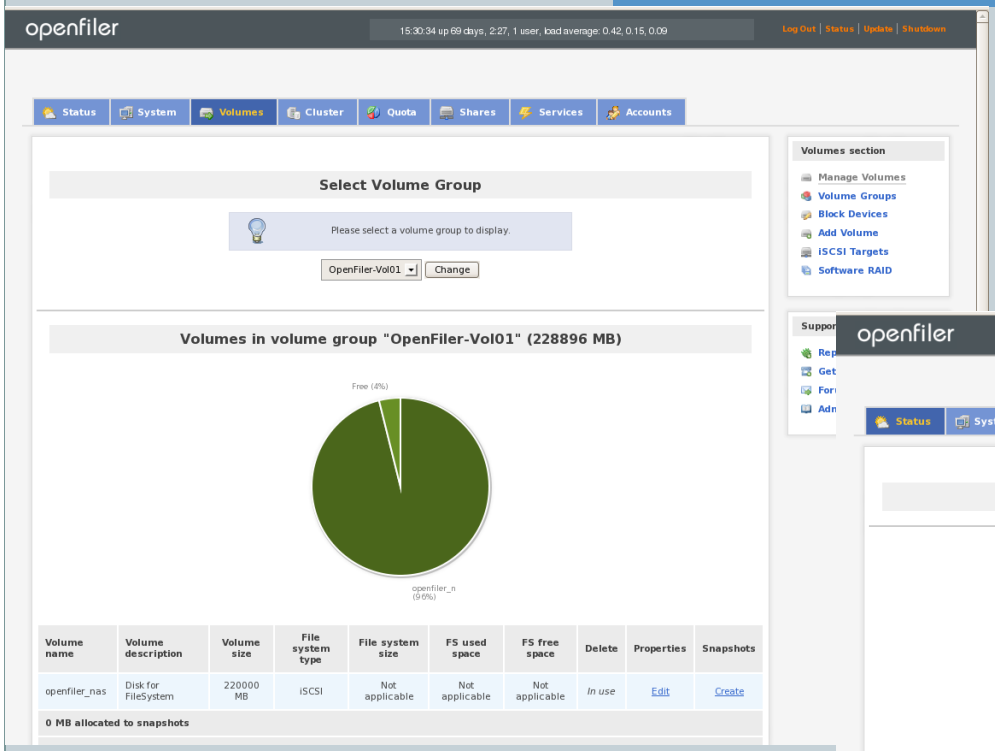
(7) Manually discovered the new lun and make them discover automatic at every startup of iscsi. This set of commands is required for every luns to be discovered on RAC nodes. I am showing it only for asmdisk03 here. (On All the RAC Nodes):

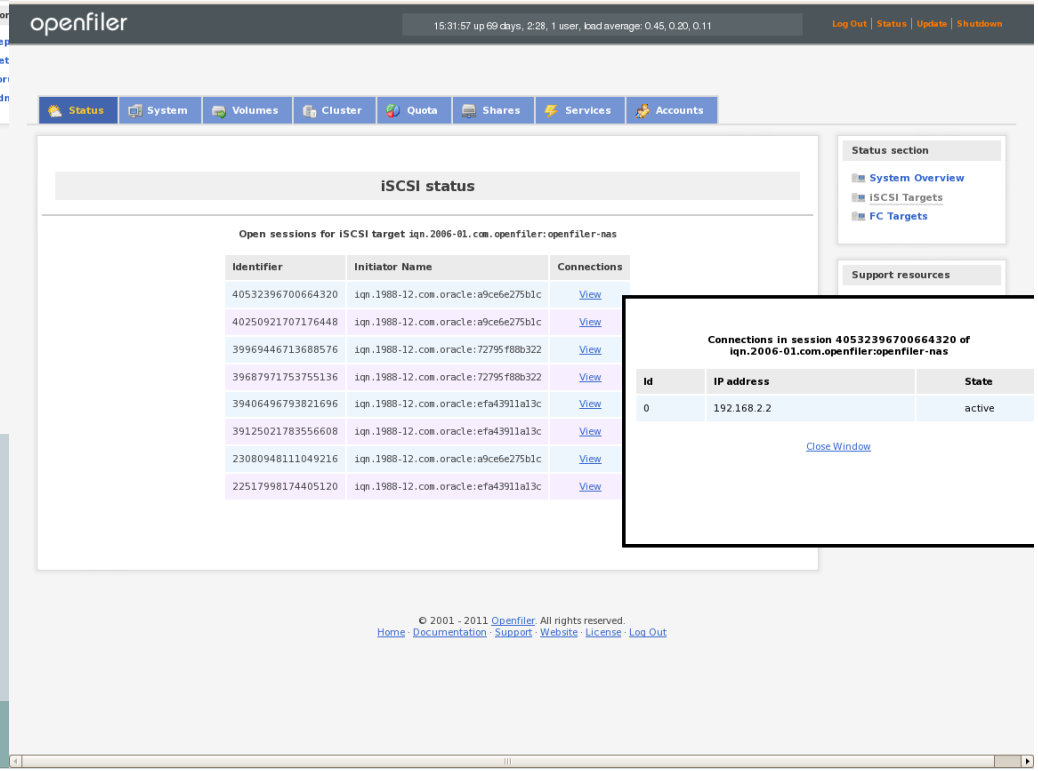
iscsiadm -m discovery -t sendtargets -p 192.168.1.101
iscsiadm -m node -T iqn.2006-01.com.openfiler:data_1-p 192.168.1.101 –l
iscsiadm -m node -T iqn.2006-01.com.openfiler:data_1 -p 192.168.1.101 --op update -n node.startup -v automatic

Configuration Files:

/etc/sysconfig/network (nas-server)

Prepare The Shared Storage





Fresh install Oracle Apps R12

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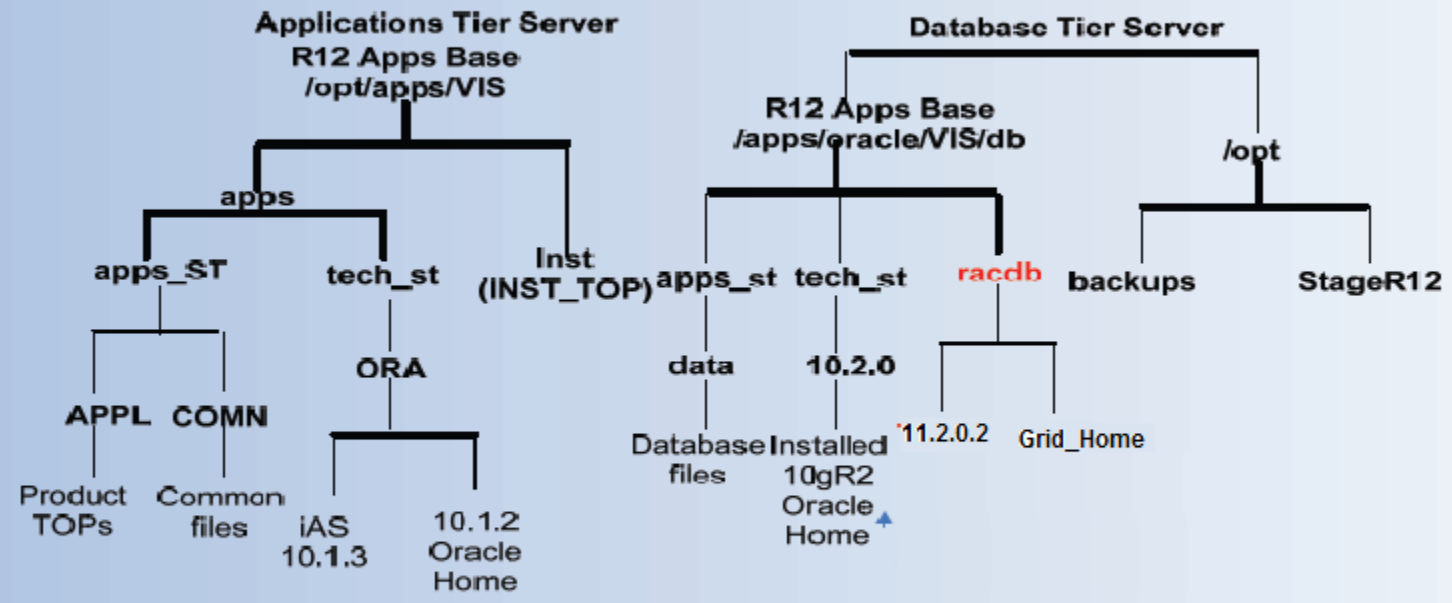
Rapid Install EBS R12

- Database Node and Applications Node File Systems Layout:



- Fresh Install Results:

A Complete working EBS R12 system:

Database tier: single node; Oracle 10.2.0.2 software and Database

Applications tier: two nodes: Applications file systems.

11G R2 Install , Upgrade & RAC Conversion

1) Prepare your system for 11g R2 RAC Conversion
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- Shared storage using iscsi technology, Openfiler is used for mimicking NFS storage
- Network: Public and private network configuration, VIP & SCAN configuration (DNS enabled in Openfiler machine)
- Configure user equivalence between DB nodes
- Runcluvfy

2) Install GI & 11g R2 Binaries
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Direct upgrade to 11gR2 is supported from 9.2.0.8 or higher, 10.1.0.5 or higher, 10.2.0.2 or higher and 11.1.0.6 or higher.
If you have a database 9.2.0.6 then first you need to upgrade to intermediate release i.e 9.2.0.8 then to 11.2.0.1.

Use Pre upgrade script to check (utlu112i.sql)
Need speed for upgrading, so truncate AUD$ table and gather dictionary statistics
Start to upgrade:
- Copy spfile + orapw from Old home -> New home.
- -- Use New home to startup upgrade (startup upgrade;)
- -- Check error in spool file and startup again (startup)
- -- Generate fixed object stats
- SQL> exec dbms_stats.gather_fixed_objects_stats;
- -- Recompile`````SQL> @?/rdbms/admin/utlrp.sql
- -- During recompilation: check number of invalid objects
- -- Post upgrade script
- SQL> @?/rdbms/admin/utlu112s.sql

11G R2 Install , Upgrade & RAC Conversion

Prepare to converttToRAC.xml

$ORACLE_HOME/assistants/rconfig/sampleXMLs

Edit parameters like SourceDbhome, targetdbhome, sourcedbinfo SID, RAC nodes, Instance prefix, convertverify, target database area

Run Rconfig

$ORACLE_HOME/bin/rconfig convertToRAC.XML

Create local & remote listeners(SCAN_NAME)

Enable Autoconfig on DB Tiers

Generate Appsutil.zip from apps tier

- Configure tnsnames.ora on apps tier to point to one DB instance
- Execute $AD_TOP/bin/admkappsutil.pl to create appsutil.zip

Create appsutil in RAC $ORACLE_HOME in DB tier

- Copy appsutil.zip and unzip it to RAC $ORACLE_HOME
- Copy instance information from old $ORACLE_HOME

  Perl $OLD_OH/appsutil/scripts/<context_name>/adperclone .pl database

  Copy context file from $OLD_OH to $RAC_OH/appsutil

Create instance specific XML context file

- Create pairsfile.txt under new $RAC_OH/appsutil/clone

S_undo_tablespace=UNDOTBS2; s_db_clusterInst=2>
S_db_oh=<RAC_OH>

- Run perl adclonectx.pl to create instance specific XML context file

- More details on MOS note:- 388577.1

- Run autoconfig on DB nodes, Prepare to Apps for using RAC nodes.
- Run autoconfig on APP nodes,
  - Prepare tnsnames.ora to RAC node-1
  - Set jdbc_url in context_file to the instance of RAC node1
  - Executing autoconfig, $AD_TOP/bin/adconfig.sh context_file=<context_name>.xml
  - Check tnsnames.ora in $INST_TOP/ora/10.1.2 and 10.1.3
  - Verify oraclelab.dbcfile under $FND_TOP/secure (APPS_JDBC_URL)

Enable Autoconfig on DB Tiers

Enable APPS Tier load balancing

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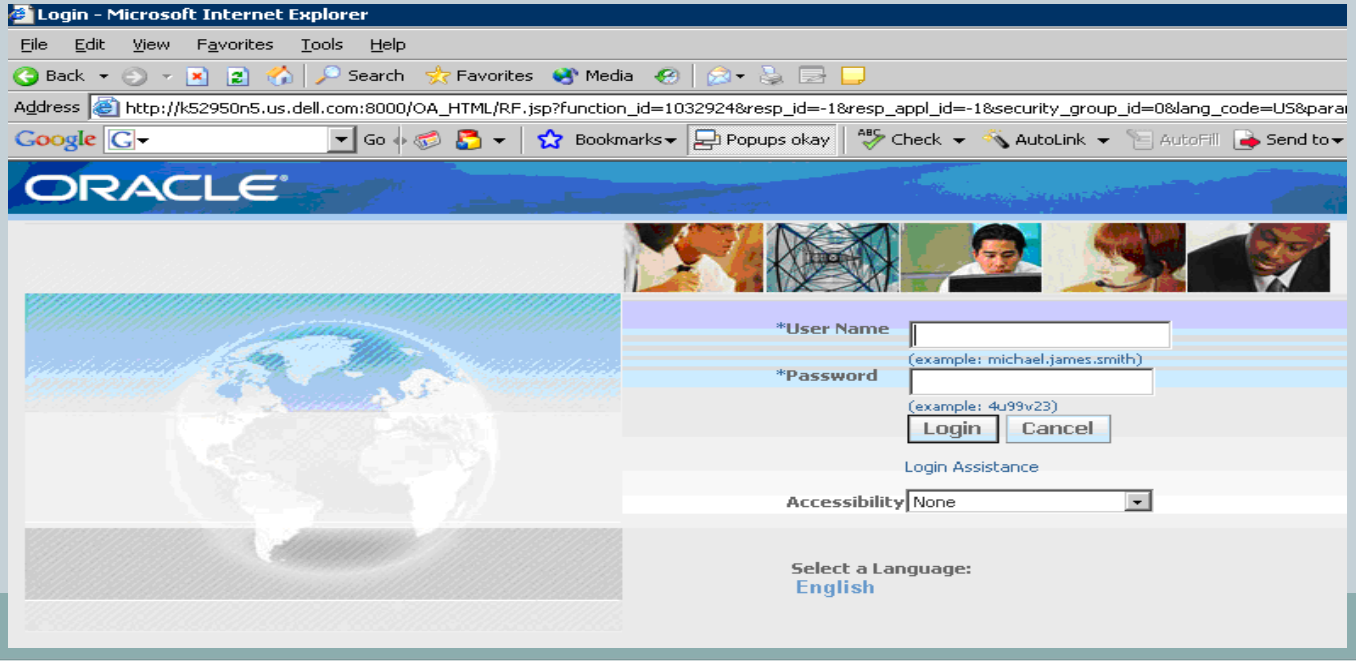
- Edit context file and below variables
- s_tool_two_task - (Forms apps)
- s_weboh_two_task – (Self Service apps)
- s_apps_jdbc_connect_alias-(Self Service apps)

- Run autoconfig.sh $AD_TOP/bin/adconfig.sh

- Profile option “Applications Database ID” to set to dbc file under $FND_TOP/secure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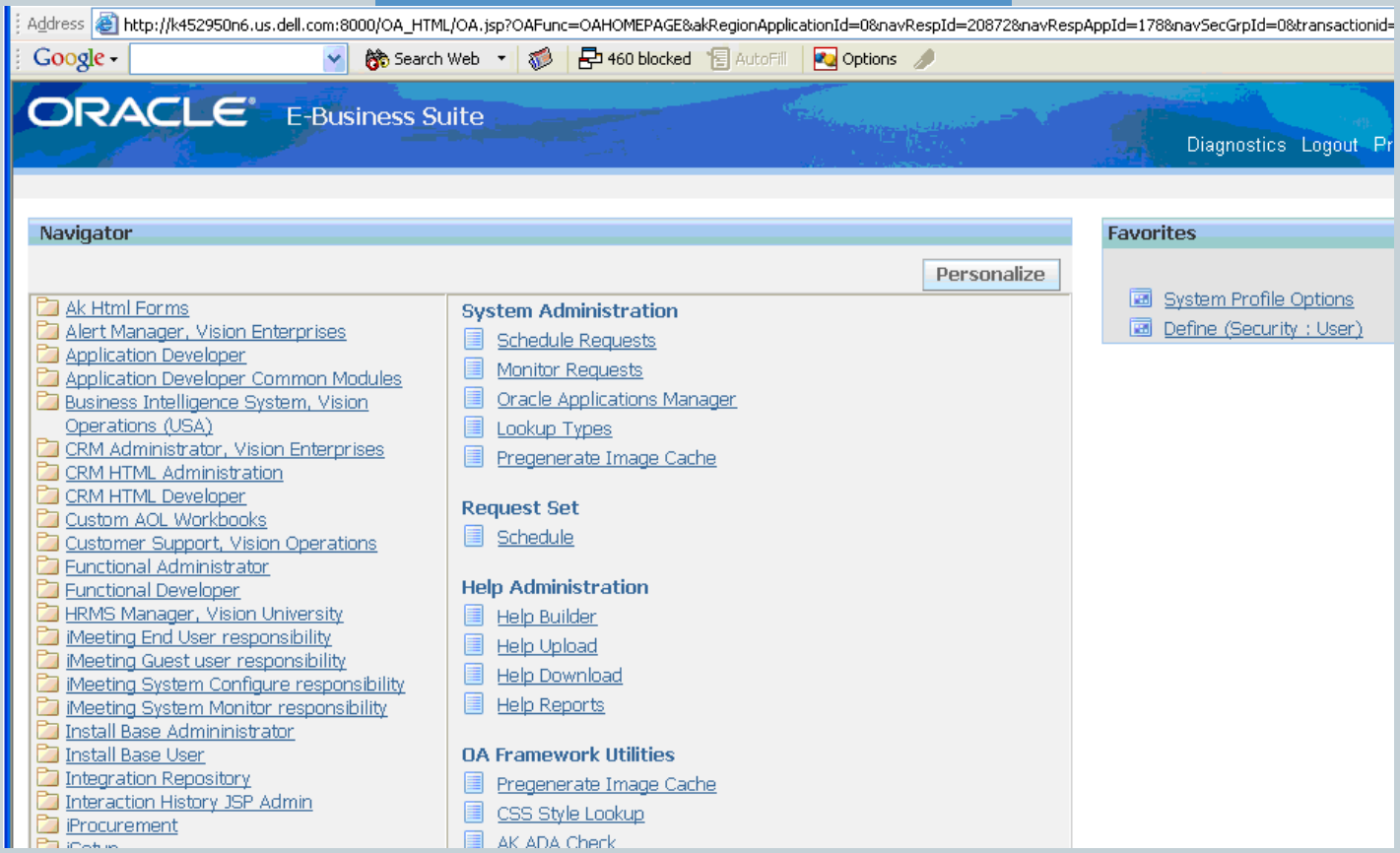
Logged Into Oracle Apps R12



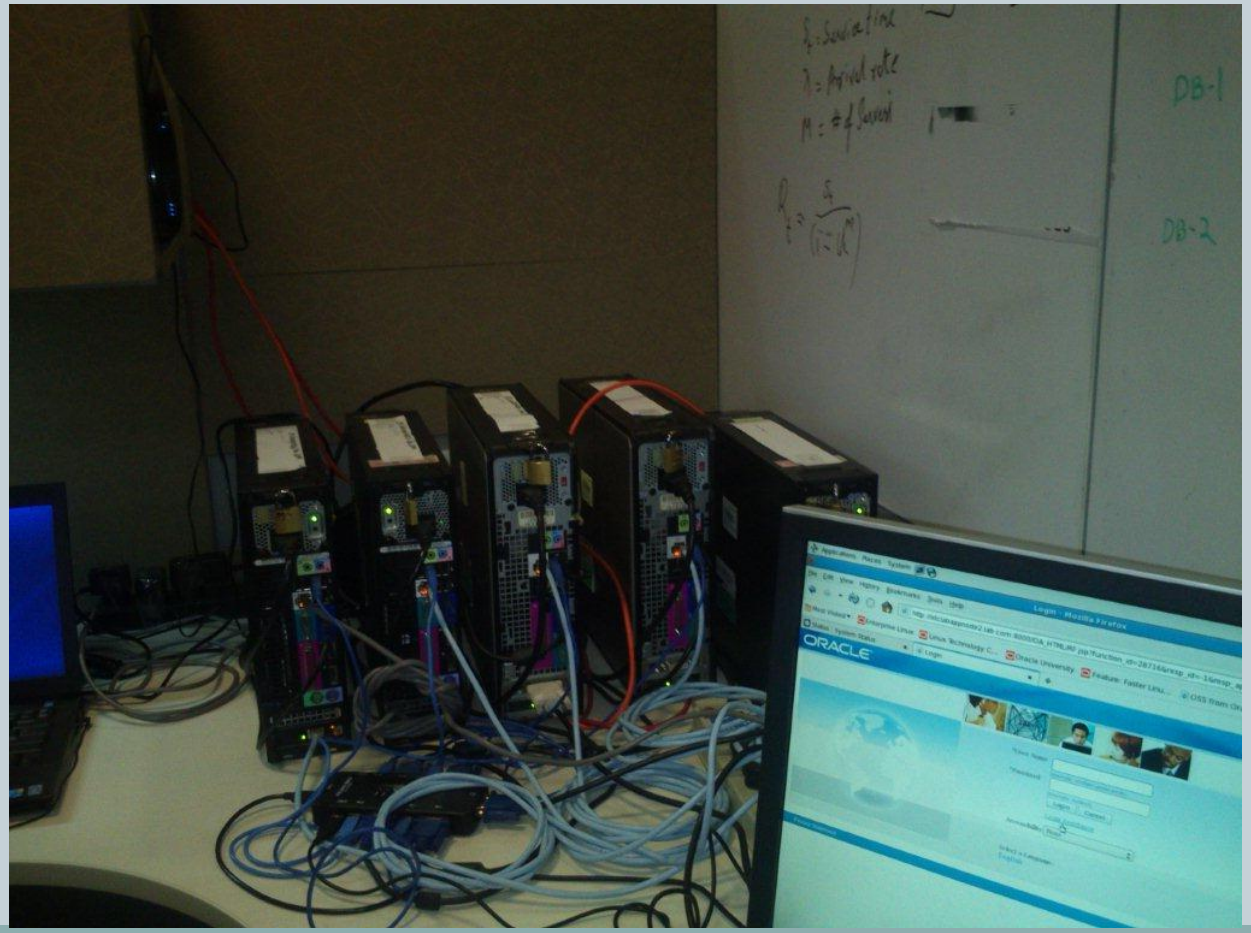
Summary

Generate Appsutil.zip from apps tier

Oracle Apps E-Business Suite R12 fully certified on Linux x86-64
Implementing paths for Oracle E-Business Suite on RAC

1) Preparation of 5 nodes in your multi node architecture. (Installation of OEL 5.7, Openfiler)
2) Preparation of shared storage(iSCSI technology based NFS)
3) Mount the shared NFS mount on the designated DB nodes
4) Fresh install the Oracle Apps R12.1.1 and vision instance
5) Install Oracle 11g R2 Grid and Database Binaries
6) Upgrade your database from 10.1.0.5 to 11.2.0.2
7) Register all the RAC nodes into the 11g R2 Grid
8) Prepare your Middle tier for RAC database.

Your Dream Machine



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Q&A

Thank You