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# Rac11gR2OnSolaris

# 1. Introduction

# 1.1. Overview of new concepts in 11gR2 Grid Infrastructure

### 1.1.1. SCAN

The single client access name (SCAN) is the address used by all clients connecting to the cluster. The SCAN name is a domain name registered to three IP addresses, either in the domain name service (DNS) or the Grid Naming Service (GNS). The SCAN name eliminates the need to change clients when nodes are added to or removed from the cluster. Clients using SCAN names can also access the cluster using EZCONNECT.

- The Single Client Access Name (SCAN) is a domain name that resolves to all the addresses allocated for the SCAN name. Allocate three addresses to the SCAN name. During Oracle grid infrastructure installation, listeners are created for each of the SCAN addresses, and Oracle grid infrastructure controls which server responds to a SCAN address request. Provide three IP addresses in the DNS to use for SCAN name mapping. This ensures high availability.
- The SCAN addresses need to be on the same subnet as the VIP addresses for nodes in the cluster.
- The SCAN domain name must be unique within your corporate network.

### 1.1.2.GNS

In the past, the host and VIP names and addresses were defined in the DNS or locally in a hosts file. GNS can simplify this setup by using DHCP. To use GNS, DHCP must be configured in the subdomain in which the cluster resides.

## 1.1.3. OCR and Voting on ASM storage

The ability to use ASM diskgroups for Clusterware OCR and Voting disks is a new feature in the Oracle Database 11g Release 2 Grid Infrastructure. If you choose this option and ASM is not yet configured, OUI launches ASM configuration assistant to configure ASM and a diskgroup.

### 1.1.4. Passwordless automatic SSH connectivity

If SSH has not been configured prior the Installation, you can prompt the installer to this for you. The configuration can be tested as well.

## 1.1.5. Intelligent Platform Management interface (IPMI)

Intelligent Platform Management Interface (IPMI) provides a set of common interfaces to computer hardware and firmware that administrators can use to monitor system health and manage the system.

With Oracle Database 11g Release 2, Oracle Clusterware can integrate IPMI to provide failure isolation support and to ensure cluster integrity. You must have the following hardware and software configured to enable cluster nodes to be managed with IPMI:

• Each cluster member node requires a Baseboard Management Controller (BMC) running

firmware compatible with IPMI version 1.5, which supports IPMI over LANs, and configured for remote control.

- Each cluster member node requires an IPMI driver installed on each node.
- The cluster requires a management network for IPMI. This can be a shared network, but Oracle

recommends that you configure a dedicated network.

• Each cluster node's ethernet port used by BMC must be connected to the IPMI management network.

If you intend to use IPMI, then you must provide an administration account username and password to provide when prompted during installation.

### 1.1.6. Time sync

Oracle Clusterware 11g release 2 (11.2) requires time synchronization across all nodes within a cluster when Oracle RAC is deployed. To achieve this you should have your OS configured network time protocol (NTP). The new Oracle Cluster Time Synchronization Service is designed for organizations whose Oracle RAC databases are unable to access NTP services.

## 1.1.7. Clusterware and ASM share the same Oracle Home

The clusterware and ASM share the same home thus we call it Grid Infrastructure home (prior 11gR2 ASM and RDBMS could be installed either in same Oracle home or in separate Oracle homes)

## 1.1.8.ACFS/ADVM

ADVM (ASM dynamic volume manager) and ACFS (ASM cluster file system) are currently not available for Solaris. For details refer to note:

IS ACFS/ADVM SUPPORTED/CERTIFIED ON SOLARIS SPARC 64 PLATFORM? (Doc ID 973387.1)

# **1.2. System Requirements**

## 1.2.1. Hardware Requirements

-Physical memory (at least 1.5 gigabyte (GB) of RAM)

# /usr/sbin/prtconf | grep "Memory size"

-An amount of swap space equal the amount of RAM

#### #/usr/sbin/swap -s

-Temporary space (at least 1 GB) available in /tmp

### # df -h /tmp

-A processor type (CPU) that is certified with the version of the Oracle software being installed

-At minimum of 1024 x 786 display resolution, so that Oracle Universal Installer (OUI) displays correctly

-All servers that will be used in the cluster have the same chip architecture, for example, all SPARC processors or all x86 64-bit processors

-Disk space for software installation locations

You will need at least 4.5 GB of available disk space for the Grid home directory, which includes both the binary files for Oracle Clusterware and Oracle Automatic Storage Management (Oracle ASM) and their associated log files, and at least 4 GB of available disk space for the Oracle Database home directory.

-Shared disk space

An Oracle RAC database is a shared everything database. All data files, control files, redo log files, and the server parameter file (SPFILE) used by the Oracle RAC database must reside on shared storage that is accessible by all the Oracle RAC database instances. The Oracle RAC installation that is described in this guide uses Oracle ASM for the shared storage for Oracle Clusterware and Oracle Database files. The amount of shared disk space is determined by the size of your database.

-Check Operating System Packages:

#### Software Requirements List for Solaris Operating System (x86 64-Bit) Platforms:

Solaris 10 U6 (5.10-2008.10) or later

Packages and Patches for all installations Solaris 10

**SUNWarc SUNWbtool SUNWcsl SUNWhea SUNWlibC SUNWlibm SUNWlibms SUNW**sprot **SUNWtoo** SUNWilof (ISO8859-1) SUNWilcs (ISO8859-15) SUNWi15cs **SUNWxwfnt** 119961-05 or later 119964-14 or later 120754-06 or later 139556-08 or later 139575-03 or later 137104-02 or later

#### Software Requirements List for Solaris Operating System (SPARC 64-Bit):

Solaris 10 U6 (5.10-2008.10) or later

Packages and Patches for all installations Solaris 10

SUNWarc

SUNWbtool SUNWcsl SUNWhea SUNWlibC SUNWlibm SUNWlibms SUNWlibms SUNWsprot SUNWsprot SUNWstoo SUNWi1of (ISO8859-1) SUNWi1of (ISO8859-1) SUNWi1cs (ISO8859-15) SUNWi1cs (ISO8859-15) SUNWi15cs SUNWi15cs SUNWxwfnt 119963-14 or later (SunOS2 5.10: Shared library patch for C++) 120753-06 or later (SunOS2 5.10: Microtasking libraries (libmtsk) patch) 139574-03 or later (SunOS2 5.10: file crle ldd stings elfdump patch, required for Oracle Clusterware))

## 1.2.2. Network Hardware Requirements

-Each node has at least two network interface cards (NIC), or network adapters.

-Public interface names must be the same for all nodes. If the public interface on one node uses the network adapter e1000g0, then you must configure e1000g0 as the public interface on all nodes.

-You should configure the same private interface names for all nodes as well. If e1000g1 is the private interface name for the first node, then e1000g1 should be the private interface name for your second node.

-The network adapter for the public interface must support TCP/IP.

-The network adapter for the private interface must support the user datagram protocol (UDP) using high-speed network adapters and a network switch that supports TCP/IP (Gigabit Ethernet or better).

-For the private network, the end points of all designated interconnect interfaces must be completely reachable on the network. Every node in the cluster should be able to connect to every private network interface in the cluster.

-The host name of each node must conform to the RFC 952 standard, which permits alphanumeric characters. Host names using underscores ("\_") are not allowed.

-If you follow best practices and implement redundant Network adapters please review MOS Note:1069584.1 "11gR2 Grid Infrastructure Multiple Private Network Adapters"

## 1.2.3. IP Address Requirements

-A public IP address for each node

-A virtual IP address for each node

-Three single client access name (SCAN) addresses for the cluster.

(Define the SCAN in your corporate DNS (Domain Name Service) You must ask your network administrator to create a single name, that resolves to 3 IP addresses using a round robin algorithm. The IP addresses must be on the same subnet as your public network in the cluster.)

## 1.2.4. Installation method

This document details the steps installing a 2-node Oracle 11gR2 RAC cluster on Solaris:

-The Oracle Grid Homes binaries are installed on the local disk of each of the RAC nodes.

-The files required by Oracle Clusterware (OCR and Voting disks) are stored in ASM -The installation is explained without GNS and IPMI (additional Information for Installation with GNS and IPMI are explained)

# 2. \*Prepare the cluster nodes for Oracle RAC

The guides include hidden sections, use the  $\mathbb{P}$  and  $\mathbb{T}$  image for each section to show/hide the section or you can Expand all or Collapse all by clicking these buttons. This is implemented using the <u>Twisty Plugin</u> which requires Java Script to be enabled on your browser.

# 2.1. User Accounts

1. Create OS groups using the command below Enter commands as the root user:

#/usr/sbin/groupadd oinstall
#/usr/sbin/groupadd dba
#/usr/sbin/groupadd asmadmin
#/usr/sbin/groupadd asmdba
#/usr/sbin/groupadd asmoper

2. Create the users that will own the Oracle software using the commands:

#/usr/sbin/useradd -g oinstall -G asmadmin,asmdba,asmoper -d /home/grid -m grid #/usr/sbin/useradd -g oinstall -G dba,asmdba -d /home/oracle -m oracle

Note: you might have to disable aufotfs temporary to be able to create the home folders:

#svcadm disable autofs

3. Set the password for the oracle account using the following command. Replace password with your own password.

#### passwd oracle

Changing password for user oracle. New UNIX password: **password** retype new UNIX password: **password** passwd: all authentication tokens updated successfully.

#### passwd grid

Changing password for user oracle. New UNIX password: **password** retype new UNIX password: **password** passwd: all authentication tokens updated successfully. 4. Repeat Step 1 through Step 3 on each node in your cluster.

5. OUI can setup passwordless SSH for you, if you want to configure this yourself, refer to Note. 300548.1

# 2.2. Networking

NOTE: This section is intended to be used for installations NOT using GNS.

1. Determine your cluster name. The cluster name should satisfy the following conditions:

-The cluster name is globally unique throughout your host domain.

-The cluster name is at least 1 character long and less than 15 characters long.

-The cluster name must consist of the same character set used for host names: single-byte alphanumeric characters (a to z, A to Z, and 0 to 9) and hyphens (-).

2. Determine the public host name for each node in the cluster. For the public host name, use the primary host name of each node. In other words, use the name displayed by the hostname command for example: racnode1.

3. Determine the public virtual hostname for each node in the cluster. The virtual host name is a public node name that is used to reroute client requests sent to the node if the node is down. Oracle recommends that you provide a name in the format <public hostname>-vip, for example: racnode1-vip. The virtual hostname must meet the following requirements: -The virtual IP address and the network name must not be currently in use. -The virtual IP address must be on the same subnet as your public IP address.

-The virtual host name for each node should be registered with your DNS.

4. Determine the private hostname for each node in the cluster. This private hostname does not need to be resolvable through DNS and should be entered in the /etc/hosts file. A common naming convention for the private hostname is <public hostname>-pvt.

- The private IP should NOT be accessable to servers not participating in the local cluster.

- The private network should be on standalone dedicated switch(es).

- The private network should NOT be part of a larger overall network topology.

- The private network should be deployed on Gigabit Ethernet or better.

- It is recommended that redundant NICs are configured For Solaris either Sun Trunking (OS based) or Sun IPMP (OS based) More information: <<Note: 283107.1>>

- IPMP in general. When IPMP is used for the interconnect: <<Note: 368464.1>>

**NOTE:** If IPMP is used for public and/or cluster interconnect, critical merge patch 9729439 should be applied to both Grid Infrastructure and RDBMS Oracle homes.

5. Define a SCAN DNS name for the cluster that resolves to three IP addresses (round-robin). SCAN VIPs must NOT be in the /etc/hosts file, it must be resolved by DNS.

6. Even if you are using a DNS, Oracle recommends that you add lines to the /etc/hosts file on each node, specifying the public IP, VIP and private addresses. Configure the /etc/hosts file so that it is similar to the following example:

**NOTE:** The SCAN VIP MUST NOT be in the /etc/hosts file. This will result in only 1 SCAN VIP for the entire cluster.

# cat /etc/hosts # # Internet host table #

# Public IPs

127.0.0.1 localhost 192.168.1.10 public loghost 192.168.1.11 public1

# Private IPs 10.10.10.10 public-priv 10.10.10.11 public1-priv

# VIPS

192.168.1.100 public-vip 192.168.1.101 public1-vip

# 2.3. Synchronizing the Time on ALL Nodes

Ensure that the date and time settings on all nodes are set as closely as possible to the same date and time. Time may be kept in sync with NTP or by using Oracle Cluster Time Synchronization Service (ctssd). For NTP with Solaris 10 the "slewalways yes" option in /etc/inet/ntp.conf should be used. See note 759143.1 for details.

# 2.4. Configuring Kernel Parameters

We need to set the following kernel parameters to values greater than or equal to the recommended values shown below.

set noexec\_user\_stack=1

set semsys:seminfo\_semmni=100

set semsys:seminfo\_semmns=1024

set semsys:seminfo\_semmsl=256

set semsys:seminfo\_semvmx=32767

set shmsys:shminfo\_shmmax=4294967296

set shmsys:shminfo\_shmmni =100

**NOTE:** You may skip to change the parameter if the default setting in your system is higher than Oracle requirement.

Since we are using Solaris 10, we are not required to make changes to the /etc/system file to implement the System V IPC. Solaris 10 uses the resource control facility for its implementation. However, Oracle recommends that you set both resource control and /etc/system/ parameters. Operating system parameters not replaced by resource controls continue to affect performance and security on Solaris 10 systems. For further information, contact your Sun vendor On all nodes:

```
# prctl -n project.max-sem-ids -v 100 -r -i project user.root
# prctl -n project.max-shm-ids -v 100 -r -i project user.root
# prctl -n project.max-shm-memory -v 4 gb -r -i project user.root
# vi /etc/system
```

```
set noexec_user_stack=1
set semsys:seminfo_semmni=100
set semsys:seminfo_semmns=1024
set semsys:seminfo_semmsl=256
set semsys:seminfo_semvmx=32767
set shmsys:shminfo_shmmax=4294967296
set shmsys:shminfo_shmmni =100
```

# init 6

**NOTE:** OUI checks the current settings for various kernel parameters to ensure they meet the minimum requirements for deploying Oracle RAC.

# 2.5. Create the Oracle Inventory Directory

To create the Oracle Inventory directory, enter the following commands as the root user:

```
# mkdir -p /u01/app/oraInventory
# chown -R grid:oinstall /u01/app/oraInventory
# chmod -R 775 /u01/app/oraInventory
```

# 2.6. Creating the Oracle Grid Infrastructure Home Directory

To create the Grid Infrastructure home directory, enter the following commands as the root user:

```
# mkdir -p /u01/11.2.0/grid
# chown -R grid:oinstall /u01/11.2.0/grid
# chmod -R 775 /u01/11.2.0/grid
```

# 2.7. Creating the Oracle Base Directory

To create the Oracle Base directory, enter the following commands as the root user:

# mkdir -p /u01/app/oracle
# mkdir /u01/app/oracle/cfgtoollogs --needed to ensure that dbca is able to run after the rdbms installation.
# chown -R oracle:oinstall /u01/app/oracle
# chmod -R 775 /u01/app/oracle

# 2.8. Creating the Oracle RDBMS Home Directory

To create the Oracle RDBMS Home directory, enter the following commands as the root user:

# mkdir -p /u01/app/oracle/product/11.2.0/db\_1
# chown -R oracle:oinstall /u01/app/oracle/product/11.2.0/db\_1
# chmod -R 775 /u01/app/oracle/product/11.2.0/db\_1

# 2.9. Stage the Oracle Software

It is recommended that you stage the required software onto a local drive on Node 1 of your cluster. Important. Ensure that you use the correct version, either SPARC or x86-64. For the RDBMS software download from OTN:

Oracle Database 11g Release 2 (11.2.0.1.0) for Solaris

For the Grid Infrastructure (clusterware and ASM) software download:

Oracle Database 11g Release 2 Grid Infrastructure (11.2.0.1.0) for Solaris

# 2.10. Check OS Software Requirements

The OUI will check during the install for missing packages and you will have the opportunity to install them at that point during the prechecks. Nevertheless you might want to validate that all required packages have been installed prior to launching the OUI.

**NOTE:** check on all nodes that the Firewall is disabled. Disable if needed:

#svcadm disable ipfilter

# 3. Prepare the shared storage for Oracle RAC

This section describes how to prepare the shared storage for Oracle RAC Each node in a cluster requires external shared disks for storing the Oracle Clusterware (Oracle Cluster Registry and voting disk) files, and Oracle Database files. To ensure high availability of Oracle Clusterware files on Oracle ASM, you need to have at least 2 GB of disk space for Oracle Clusterware files in three separate failure groups, with at least three physical disks. Each disk must have at least 1 GB of capacity to ensure that there is sufficient space to create Oracle Clusterware files. Use the following guidelines when identifying appropriate disk devices: -All of the devices in an Automatic Storage Management disk group should be the same size and have the same performance characteristics.

-A disk group should not contain more than one partition on a single physical disk device.

-Using logical volumes as a device in an Automatic Storage Management disk group is not supported with Oracle RAC.

-The user account with which you perform the installation (oracle) must have write permissions to create the files in the path that you specify. On Solaris 10, you can use format or smc utilities to carve disk or LUNs partitions/slices. It is very important to skip the first Cylinder on the disk to avoid ASM or Oracle Clusterware to overwrite the partition table. So you always start partitioning from cylinder number 3. falling to do so, you will find out after rebooting your machines that data on your disks is erased and Oracle Clusterware will not start and ASM will not be able to recognize any disks. Below I am running the format command from the first solaris node only. This formates the disk with solaris partitions, changes slice 4 to skip the first 3 cylinders and labels the disk.

#### # format

Searching for disks...done AVAILABLE DISK SELECTIONS: 0. c0d0 <DEFAULT cyl 2607 alt 2 hd 255 sec 63> /pci@0,0/pci-ide@1,1/ide@0/cmdk@0,0 1. c2t12d0 <DEFAULT cyl 524 alt 2 hd 128 sec 32> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.ASM10001,0 2. c2t13d0 <DEFAULT cyl 524 alt 2 hd 128 sec 32> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.ASM20001,0 3. c2t14d0 <DEFAULT cyl 524 alt 2 hd 128 sec 32> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.ASM30001,0 4. c2t15d0 <DEFAULT cyl 524 alt 2 hd 128 sec 32> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.ASM40001,0 Specify disk (enter its number): 1 selecting c2t12d0 [disk formatted] FORMAT MENU: disk - select a disk type - select (define) a disk type partition - select (define) a partition table current - describe the current disk format - format and analyze the disk fdisk - run the fdisk program repair - repair a defective sector label - write label to the disk analyze - surface analysis defect - defect list management

backup - search for backup labels verify - read and display labels save - save new disk/partition definitions inquiry - show vendor, product and revision volname - set 8-character volume name !<cmd> - execute <cmd>, then return quit format> fdisk No fdisk table exists. The default partition for the disk is: a 100% "SOLARIS System" partition Type "y" to accept the default partition, otherwise type "n" to edit the partition table.

у

*format> partition* 

PARTITION MENU:

0 - change `0' partition

- 1 change `1' partition
- 2 change `2' partition
- 3 change `3' partition
- 4 change `4' partition
- 5 change `5' partition
- 6 change `6' partition
- 7 change `7' partition

select - select a predefined table

modify - modify a predefined partition table

name - name the current table

print - display the current table

3. Prepare the shared storage for Oracle RAC

label - write partition map and label to the disk *!<cmd> - execute <cmd>, then return* quit partition> 4 Part Tag Flag Cylinders Size Blocks 4 unassigned wm 0 0 (0/0/0) 0 *Enter partition id tag[unassigned]:* Enter partition permission flags[wm]: Enter new starting cyl[0]: 3 Enter partition size[0b, 0c, 3e, 0.00mb, 0.00gb]: 1gb *partition> l* Ready to label disk, continue? y *partition> q* FORMAT MENU: disk - select a disk type - select (define) a disk type partition - select (define) a partition table *current - describe the current disk* format - format and analyze the disk fdisk - run the fdisk program repair - repair a defective sector label - write label to the disk analyze - surface analysis defect - defect list management backup - search for backup labels verify - read and display labels save - save new disk/partition definitions

inquiry - show vendor, product and revision volname - set 8-character volume name !<cmd> - execute <cmd>, then return quit format> q

#

**Note:** do the same for the other disks you want to use with ASM. Enter commands similar to the following on every node to change the owner, group, and permissions on the character raw device file for each disk slice that you want to add to a disk group, where grid is the grid infrastructure installation owner, and asmadmin is the OSASM group:

# chown grid:asmadmin /dev/rdsk/cxtydzs4

# chmod 660 /dev/rdsk/cxtydzs4

Verify the setting with:

# ls -lL /dev/rdsk/cxtydzs4

In this example, the device name specifies slice 4

# 4. Oracle Grid Infrastructure Install

# 4.1. Basic Grid Infrastructure Install (without GNS and IPMI)

As the grid user (grid infrastructure software owner) start the installer by running "runInstaller" from the staged installation media.

#### NOTE:

Be sure the installer is run as the intended software owner, the only supported method to change the software owner is to reinstall.

#xhost +

#su - grid

#DISPLAY=<ip address>:0.0; export DISPLAY

cd into the folder where you staged the grid infrastructure software

./runInstaller





Select radio button 'Install and Configure Grid Infrastructure for a Cluster' and click ' Next> '



Select radio button 'Advanced Installation' and click ' Next> '

X Oracle Grid Infrastructure -	Setting up Grid Infrestructure - St	ep 3 of 9	
Select Product Languages			DATABASE 118
Installation Option Installation Type Product Languages Operating System Groups Installation Location Prerequisite Checks Summary Setup Finish	Select the languages in which your proc Available Languages: Arabic Bengali Brazilian Portuguese Bulgarian Canadian French Catalan Croatian Czech Danish Dutch Egyptian English (United Kingdom) Estonian Finnish French German Greek Hebrew Hungarian Icelandic Indonesian	tuct will run.	Languages:
Help		<	Back Next > Einish Cancel

Accept 'English' as language' and click ' Next> '

X Oracle Grid Infrastructure - S	etting up Grid	l Infrastructure - Step 4 of 15
Grid Plug and Play Information	on	
Installation Option Installation Type Product Languages Grid Plug and Play	Single Client Acc as a whole. Clie Quster Name: SCAN Name:	ccess Name (SCAN) allows clients to use one name in connection strings to connect to the cluster ant connect requests to the SCAN name can be handled by any cluster node. solrac-cluster
Cluster Node Information     Network Interface Usage     Storage Option     OCR Storage     Voting Disk Storage     Operating System Groups     Installation Location     Prerequisite Checks     Summary     Setup     Finish	SCAN Port:	1521  Solrac. For example: grid.example.com  kdress: 130.35.144.1
Help		< Back Next > Einish Cancel

Specify your cluster name and the SCAN name you want to use and click ' Next> ' **Note:** 

Make sure 'Configure GNS' is NOT selected.

X Oracle Grid Infrastructure -	etting up Grid Infrastructure - Step 5 of 15
Cluster Node Information	
Installation Option Installation Type Product Languages	Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Node Name and Virtual Host Name. If Oracle Grid Naming Service (GNS) has been selected and DHCP is enabled, then the Virtual Host Name is automatically configured for each Public Node.
Grid Plug and Play	Hostname Virtual IP Name
Cluster Node Information	solrac1 solrac1-vip
Network Interface Usage     Storage Option     OCR Storage     Voting Disk Storage     Operating System Groups     Installation Location     Prerequisite Checks     Summary     Setup     Enish	
Нер	SSH Connectivity Lise Cluster Configuration File Add Edit Remove

Use the Edit and Add buttons to specify the node names and virtual IP names you configured previously in your /etc/hosts file.

X Edit Cluster No	e Details	
Specify the nam host name manu you will be prom Ho <u>s</u> tname:	for the public IP address. If yo Ily, instead of allowing it to be ted for the virtual IP address. solract	ou want to configure the virtual configured automatically, then
⊻irtual IP Name:	solrac1-vip	OK Cancel

When finished click 'OK' and use the 'SSH Connectivity' button to configure/test the passwordless SSH connectivity between your nodes.

X Oracle Grid Infrastructure -	Setting up Grix Infrastructure - Step	5 of 15	
Cluster Node Information			DATABASE 118
Installation Option Installation Type Product Languages	Provide the list of nodes to be managed by Name. If Oracle Grid Naming Service (GNS) has be automatically configured for each Public No Hostname	Oracle Grid Infrastructure with een selected and DHCP is enable de.	their Public Node Name and Virtual Host ed, then the Virtual Host Name is Virtual IP Name
Grid Plug and Play	solrac1	solrac1-vip	TRUMP P TRUTTS
Cluster Node Information	solrac2	solrac2-vip	
<ul> <li>Network Interface Usage</li> <li>Storage Option</li> <li>OCR Storage</li> <li>Voting Disk Storage</li> <li>Operating System Groups</li> <li>Installation Location</li> <li>Prerequisite Checks</li> <li>Summary</li> <li>Setup</li> <li>Finish</li> </ul>	SSH Connectivity  QS Username: grid User home is shared by the selected r Reuse private and public keys existing	Use Cluster Configure OS Password nodes g in the user home	ation File Add Edit Remove
Help		< <u>B</u> ack	K Next > Einish Cancel

Type in the OS password for the user 'grid' and press 'Setup'

Establishing SSH connectivity between the selected nodes. This may take several minutes. Please wait	
Oracle Grid Infrastructure  Successfully established passwordless SSH connectivity nodes.	between the selected
	<u>Ok</u>

Action: click ' OK '

$\mathbf{X}$ Oracle Grid Infrastructure -	Setting 🌪 Grid Infrastructur	e - Step 6 of 15	
Specify Network Interface	Usage		
Installation Option Installation Type Product Languages Grid Plug and Play	Identify the planned use for each Private interfaces are used by O If there is more than one subnet the interface name with the addit	n global interface shown in the box racle Grid Infrastructure for interno associated with an interface, then tional subnets.	below as Public, Private, or Do Not Use. de traffic. change the interface's attributes to associate
Cluster Node Information	Interface Name	Subnet	Interface Type
Network Interface Usage	aggr1	192.168.1.0	Private 👻
Storage Option	skge0	130.35.144.0	Public •
Voting Disk Storage Operating System Groups Installation Location Prerequisite Checks Summary Setup Finish			
Help			< Back Next > Einish Cance

Click on 'Interface Type' next to the Interfaces you want to use for your cluster and select the correct values for 'Public', 'Private' and 'Do Not Use'. When finished click 'Next>'

#### Note:

If you use multiple NIC's for redundancy the passive interfaces need to be selected here as well. In this example we are using IPMP for public network and Link Aggregation of private interconnect.

X Oracle Grid Infrastructure - S	etting up Grid Infrastructure - Step 7 of 15
Storage Option Information	
<ul> <li>Installation Option</li> <li>Installation Type</li> <li>Product Languages</li> <li>Grid Plug and Play</li> <li>Cluster Node Information</li> <li>Network Interface Usage</li> <li>Storage Option</li> <li>OCR Storage</li> <li>Voting Disk Storage</li> <li>Operating System Groups</li> <li>Installation Location</li> <li>Prerequisite Checks</li> <li>Summary</li> <li>Setup</li> <li>Finish</li> </ul>	You can place Oracle Cluster Registry (OCR) disks and voting disks on ASM storage or on a file system.  ( Automatic Storage Management (ASM) Choose this option to configure OCR and voting disks on ASM storage.  ( Shared File System Choose this option to configure OCR and voting disks on an existing shared file system.
Help	< Back Next > Einish Cancel

Select radio button 'Automatic Storage Management (ASM) and click ' Next> '

X Oracle Grid Infrastructure -	Setting up Grid Infrastructure - Step 8 of 15		
Create ASM Disk Group			<b>11</b> <sup>g</sup>
Installation Option Installation Type Product Languages Grid Plug and Play Cluster Node Information	Select Disk Group Characteristics and select disks Disk Group Name DATA Redundancy High Normal External Add Disks Qandidate Disks All Disks		
Storage Option	Disk Path	Size (in MB)	Status
Create ASM Disk Group ASM Password Operating System Groups Installation Location Prerequiste Checks Summary Setup Finish	idev/rdsk/c1t10d0s0 ✓ /dev/rdsk/c1t6d0s0 ✓ /dev/rdsk/c1t7d0s0 ✓ /dev/rdsk/c1t8d0s0 idev/rdsk/c1t9d0s0	5028 0 5018 0 5018 0 5018 0 5028 0 Change Dis	Candidate Candidate Candidate Candidate Candidate Candidate
Неф	< Back	k Next > Einish	Cancel

Type in a 'Disk Group Name' specify the 'Redundancy' and tick the disks you want to use, when done click ' Next> '

**NOTE:** The number of voting disks that will be created depend on the redundancy level you specify: external will create 1 voting disk, normal will create 3 voting disks, high will create 5 voting disks.

Orac	cle Grid Infrastructure - Setting up Grid Infrastructure - Step 9 of 15	
Specify ASM Password		
Installation Option     Installation Type     Product Languages     Grid Plug and Play     Cluster Node Information	The new Automatic Storage Management (ASM) instance requires its own SYS user with S administration. Oracle recommends that you create a less privileged ASMSNMP user with S monitor the ASM instance. Specify the password for these user accounts. O Use gifferent passwords for these accounts	SYSASM privileges for YSDBA privileges to
Vetwork Interface Usage Storage Option Create ASM Disk Group	Password Confirm Password SYS ASMSNMP	
ASM Password  Operating System Groups Installation Location Prerequisite Checks	Use game passwords for these accounts     Specify Password:	M
Setup Finish		
Help	< <u>B</u> ack <u>N</u> ext >	Einish Cancel

Specify and conform the password you want to use and click ' Next> '

Oracl	e Grid Infrastructure - Setting up Grid Infrastructure - Step 10 of 15
Privileged Operating System	
<ul> <li>Installation Option</li> <li>Installation Type</li> <li>Product Languages</li> <li>Grid Plug and Play</li> <li>Cluster Node Information</li> <li>Network Interface Usage</li> <li>Storage Option</li> <li>Create ASM Disk Group</li> </ul>	Select the name of the operating system group of which you are a member to be used for OS authentication to Automatic Storage Management (ASM). ASM Database Administrator (OSDBA) Group asmober ASM Instance Administration Operator (OSOPER) Group asmoper ASM Instance Administrator (OSASM) Group asmadmin
ASM Password	
V Operating System Groups	
Help	< Back Next > Einish Cancel

Assign the correct OS groups for OS authentication and click ' Next> '

${f X}$ Oracle Grid Infrastructure - Se	etting up GNid Infrastructure - Step 11 of 15	
Specify Installation Location		<b>11</b> <sup>g</sup>
Installation Option Installation Type Product Languages Grid Plug and Play Cluster Node Information	Specify a base location for storing all Oracle software and configuration-related files. This location is base directory. Create one Oracle base for each operating system user. By default, software and configurate installed by version and database name parallel to the Oracle base directory.          Oracle Base:       Au01/app/oracle         Specify a base location for storing Oracle software files separate from database configuration files is	the Oracle onfiguration Browse
Network Interface Usage     Storage Option	base directory. This software directory is the Oracle Grid Infrastructure home directory. Change the below either to specify an alternative location, or to select an existing grid infrastructure home.	defaults
Create ASM Disk Group	Software Location 2 Au01/11.2.0/grid	Browse
Reference in the second		
Prerequisite Checks		
C Summary		
V Setup		
O Pinish		
Help	< Back Next > Einish	Cancel

Specify the locations for your ORACLE\_BASE(/u01/app/oracle) and for the Software location(/u01/11.2.0/grid) and click ' Next> '

### Note:

We created the directories in step 2.6.

X Oracle Grid Infrastructure -	Setting up Grid Infrastructure - Step 12 of 16	
Create Inventory		11 <sup>g</sup>
Installation Option Installation Type Product Languages Grid Plug and Play Cluster Node Information Network Interface Usage Storage Option Create ASM Disk Group ASM Password Operating System Groups	You are starting your first installation on this host. Specify a directory for installation files. This directory the "inventory directory". The installer automatically sets up subdirectories for each product to contain in data. The subdirectory for each product typically requires 150 kilobytes of disk space. Inventory Directory? Au01/app/oralnventory Members of the following operating system group (the primary group) will have write permission to the i directory (oralnventory). oralnventory Group Name: oinstall	r is called wentory Browse
Installation Location		
Create Inventory		
Prerequisite Checks     Summary     Setup     Finish		
Нер	< Back Next > Einish	Cancel

Specify the locations for your Inventory (/u01/app/oraInventory) directory and click ' Next> '

### Note:

We created the directory in step 2.5.

Orac	le Grid Infrastructure - Setting up Grid Infrastructure - Step 13 of 16	
Perform Prerequisite Check		11 <sup>g</sup>
<ul> <li>Installation Option</li> <li>Installation Type</li> <li>Product Languages</li> <li>Grid Plug and Play</li> <li>Cluster Node Information</li> <li>Network Interface Usage</li> <li>Storage Option</li> <li>Create ASM Disk Group</li> <li>ASM Password</li> <li>Operating System Groups</li> <li>Installation Location</li> <li>Create Inventory</li> </ul>	Verifying that the target environment meets minimum installation and configuration requirements for pr have selected. This can take time. Please wait.  15% Checking User Existence: grid	oducts you
Prerequisite Checks		
y Summary		
Setup		
ບໍ່ Finish		
Help	< <u>B</u> ack Next > Einish	Cancel

### Note:

OUI performs certain checks and comes back with the screen below



Check that status of all checks is Succeeded and click ' Next> '

#### Note:

If you have failed checks marked as 'Fixable' click 'Fix & Check again'. This will bring up a window that instructs you to execute fixup scripts. Execute the runfixup.sh script as described on the sceen as root user. Click 'Check Again'and if all checks succeded click 'Next>'

X Oracle Grid Infrastructure -	Setting up Grid Infrastructure - Step 14 of 16
Summary	
<ul> <li>Installation Option</li> <li>Installation Type</li> <li>Product Languages</li> <li>Grid Plug and Play</li> <li>Cluster Node Information</li> <li>Network Interface Usage</li> <li>Storage Option</li> <li>Create ASM Disk Group</li> <li>ASM Password</li> <li>Operating System Groups</li> <li>Installation Location</li> <li>Create Inventory</li> <li>Precedent Checks</li> <li>Summary</li> <li>Setup</li> </ul>	Oracle Grid Infrastructure     Global Settings     Oisk Space: required 3.46 GB available 270.59 GB     Install Option: Install and Configure Grid Infrastructure for a Cluster     Oracle base: AU1/app/oracle     Oracle home: AU1/11_2.0/grid     Source Location: /export/home/oracle/install/grid/install/./stage/products.xml     Inventory information     Inventory location: /U01/app/oralnventory     Central inventory (oralnventory) group:: oinstall     Grid Infrastructure Settings     Cluster Name: solrac-cluster     Local Node: solrac1     Remote Node(s): solrac2     SCAN Name: solrac     SCAN Port: 1521     Public Interfaces: skge0,skge1
U Finish	< Back Next > Enish Cancel

Click ' Finish'

X Oracle Grid Infrastructure -	Setting up Grid Infrastructure - Step 15 of 16	
Setup		TABASE <b>11</b> g
Installation Option Installation Type Product Languages Grid Plug and Play Cluster Node Information	Progress 19% Extracting files to '/u01/11.2.0/grid'.	
Network Interface Usage     Storage Option     Create ASM Disk Group     ASM Password     Operating System Groups     Installation Location     Create Inventory     Prerequisite Checks     Summers	Install Grid Infrastructure for a Cluster Prepare Copy files Link binaries Setup files Perform remote operations Execute Root Scripts for Install Grid Infrastructure for a Cluster Configure Oracle Grid Infrastructure for a Cluster	In Progress Succeeded In Progress Pending Pending Pending Pending
Setup		
J Finish	CRACLE 118 DATABASE 118 Grid Computing	Consolidate on Fast, Reliable, and Scalable Low-Cost Grids
Help	< Beck Next	> Einish Cancel

Wait for the OUI to complete its tasks

X Execute Configuration scrips		
The follow <u>S</u> cripts to I	ing configuration scripts need to be execute be executed:	ed as the "root" user in each cluster node.
Number	Script Location	Nodes
1	/u01/app/oralnventory/orainstRoot.sh	solrac1,solrac2
2	/u01/11.2.0/grid/root.sh	solrac1,solrac2
To execute	the configuration scripts: a terminal window	
2. Log in	n as "root" As seriets in sech sluster node	
A. Return to this window and click "OK" to continue		
Run the so parallel or	cript on the local node first. After successful all the other nodes.	completion, you can run the script in
H	qlp	ОК

### Action:

Follow the instructions on the screen running the orainstRoot.sh and root.sh scripts as root on all nodes before you click 'OK'

#### Note:

The required root scripts MUST BE RUN ON ONE NODE AT A TIME!

Orac	le Grid Infrastructure - Setting up Grid Infrastructure - Step 15 of 16	008
Setup		ACLE 118
🚊 Installation Option	Progress	
	100%	
T Installation Type		
<ul> <li>Product Languages</li> </ul>	Starting 'Oracle Net Configuration Assistant'	
Grid Plug and Play		
Cluster Node Information	_Status	
Vetwork Interface Usage	Install Grid Infrastructure for a Cluster	Succeeded
Storage Option	✓ • Prepare	Succeeded
	<ul> <li>Copy files</li> </ul>	Succeeded
Create ASM Disk Group	<ul> <li>Link binaries</li> </ul>	Succeeded
ASM Password	<ul> <li>Setup files</li> </ul>	Succeeded
Onerating System Groups	<ul> <li>Perform remote operations</li> </ul>	Succeeded
Constraining of stern croups	Execute Root Scripts for Install Grid Infrastructure for a Cluster	Succeeded
A Installation Location	Configure Oracle Grid Infrastructure for a Cluster	In Progress
Create Inventory	Oracle Net Configuration Assistant	In Progress
Descendente Charalte	Automatic Storage Management Configuration Assistant     Cracle Private Interconnect Configuration Assistant	Pending
Prerequisite Checks	Oracle Private Interconnect Configuration Assistant     Oracle Cluster Verification   tilty	Pending
🍦 Summary		
Setup Finish		Details Retry Skip
	ORACLE 118 DataBase 118 Data Warehousing	Extreme Performance Integrated Analytics Enterprise-Ready
Help	< Back Next >	Enish Close

X Oracle Grid Infrastructure	Setting up Grid Infrastructure - Step 16 of 16	
Finish		DATABASE 11
<ul> <li>Installation Option</li> <li>Installation Type</li> <li>Product Languages</li> <li>Grid Plug and Play</li> <li>Cluster Node Information</li> <li>Network Interface Usage</li> <li>Storage Option</li> <li>Create ASM Disk Group</li> <li>ASM Password</li> <li>Operating System Groups</li> <li>Installation Location</li> <li>Create Inventory</li> <li>Prerequisite Checks</li> <li>Summary</li> <li>Setup</li> <li>Finish</li> </ul>	The installation of Oracle Grid Infrastructure for a Cluster was successfu were cancelled or skipped.	I, but some configuration assistants failed,
Help	< 80	ck Next > Enish Qose

You should see the confirmation that the installation of the Grid Infrastructure was successfull. Click 'Close' to finish the install.

# 5. Grid Infrastructure Home Patching

This Chapter is a placeholder

# 6. RDBMS Software Install

As the oracle user (rdbms software owner) start the installer by running "runInstaller" from the staged installation media.

**NOTE:** Be sure the installer is run as the intended software owner, the only supported method to change the software owner is to reinstall.

#### #su - oracle

change into the directory where you staged the rdbms software

#### ./runInstaller



🗙 Oracle Database 11g Release	2 Installer - Installing datab	ase - Step 1 of 9	
Configure Security Updates			DRACLE 118
Configure Security Updates	Provide your email address to be i and initiate configuration manager	nformed of security issues, install the prod . <u>View details</u> .	uct
Grid Options	E <u>m</u> əit:	Easier for you if you use your My Oracle	Support email address/username.
Typical Installation Prerequisite Checks Summary Install Product Finish	My <u>O</u> racle Support Password:		
Неф		< <u>B</u> ack	Next > Finish Cancel

Provide your e-mail address, tick the check box and provide your Oracle Support Password if you want to receive Security Updates from Oracle Support, after click ' Next>'

X Oracle Database 11g Releas	e 2 Installer - Installing database - Step 2 of 9	
Select Installation Option		DATABASE 11g
Configure Security Updates Installation Option Serid Options Install Type Typical Installation Prerequisite Checks Summary Install Product Finish	Select any of the following install options.	
Help		<back next=""> Enish Cancel</back>

Select the option 'Install Database software only' and click ' Next> '

X Oracle Database 11g Releas	e 2 Installer - Installing database - Step 3 of 9
Node Selection	
Configure Security Updates	Select the type of database installation you want to perform.
Grid Options	<u>Real Application Clusters database installation</u>
Install Type	Select nodes (in addition to the local node) in the cluster where the installer should install Oracle RAC.
Typical Installation	Node Name
Prerequisite Checks	v soraci
🖞 Summary	
Install Product	
J Finish	
	SSH Connectivity Select All Deselect All
Help	< Back Next > Enish Cancel

Select 'Real Application Clusters database installation', and select all nodes. If User Equivalent is not configured, click the aSSH Connectivity' button to configure/test the passwordless SSH connectivity between your nodes.

#### Note:

During the Grid Infrastructure installation you configured SSH for the grid user. If you install RDBMS with a different user (recommended) you have to configure it for this user now.

X Oracle Database 11g Relea	se 2 Installer - Installing database - Step 3 of 9
Node Selection	
Configure Security Updates	Select the type of database installation you want to perform.
Install Type     Typical Installation	Select nodes (in addition to the local node) in the cluster where the installer should install Oracle RAC. Node Name
Prerequisite Checks Summary Install Product Finish	✓ solrac1         ✓ solrac2         SSH Qonnectivity         QS Username:       oracle         OS Password:         □ User home is shared by the selected nodes         □ Reuse private and public keys existing in the user home         Itest
Help	<back next=""> Enish Cancel</back>

Type in the OS password for the oracle user and click 'Setup'



Action: click 'OK' and ' Next> '

X Oracle Database 11g Release	2 Installer - Installing database - St	ep 4 of 11	
Select Product Languages			DATABASE 118
Configure Security Updates Installation Option Code Continues Configure Security Updates Configure Sec	Select the languages in which your product <u>Available Languages:</u> Arabic Bengali Brazilian Portuguese Bulgarian Canadian French Catalan Croatian Czech Danish Dutch Egyptian English (United Kingdom) Estonian Finnish French German Greek Hebrew Hungarian Icelandic Indonesiao.	t will run.	Inguages:
Help		< <u>B</u> a	ck Next > Enish Cancel

To confirm English as selected language click ' Next> '



Make sure radio button 'Enterprise Edition' is ticked, click ' Next> '

X Oracle Database 11g Release 2	Installer - Installing database - Step 6 of 11	
Specify Installation Location		11 <sup>g</sup>
Configure Security Updates	Specify an Oracle base path to place all Oracle software and configuration-related files. This location Oracle base directory.	is the
Grid Options	Qracle Base: Au01/app/oracle	Browse
Y Product Languages		
Database Edition	Specify a location for storing Oracle software files. This location is the Oracle home directory.	
Installation Location	Software Location: ///01/app/oracle/product/11.2.0/db_1	Browse
Operating System Groups		
Prerequisite Checks		
Summary		
Install Product		
Finish		
		î
Help	< Back Next > Einish	Cancel

Specify path to your Oracle Base and below to the location where you want to store the software (Oracle home). Click ' Next> '

### Note:

We created the directories in steps 2.7 and 2.8

X Oracle Database 11g Release	2 Installer - Installing database - Step 7 of 11
Privileged Operating System	
Configure Security Updates Installation Option Grid Options Product Languages Database Edition Installation Location Operating System Groups Prerequisite Checks Summary Install Product Finish	SYSDBA and SYSOPER privileges are required to create a database using operating system (OS) authentication. Membership in OSDBA grants the SYSDBA privilege. Select the name of the OSDBA group to grant the SYSDBA privilege. You must be a member of this group. Database Administrator (OSDBA) Group: dba Database Qperator (OSOPER) Group: $?$ oinstal ?
Help	< Back Next > Einish Cancel

Use the drop down menu to select the names of the Database Administrators and Database Operators group and click Next> '

X Oracle Database 11g Release	2 Installer - Installing database - Step 8 of 11
Perform Prerequisite Check	
Configure Security Updates Installation Option Grid Options Product Languages Database Edition Installation Location Operating System Groups Prerequisite Checks Summary Install Product Finish	Verifying that the target environment meets minimum installation and configuration requirements for products you have selected. This can take time. Please wait.           13%           Checking User Existence: oracle
Help	< Back Next > Einish Cancel

### Note:

Oracle Universal Installer performs prerequisite checks.



Check that status of all checks is Succeeded and click ' Next> '

#### Note:

If you have failed checks marked as 'Fixable' click 'Fix & Check again'. This will bring up a window that instructs you to execute fixup scripts. Execute the runfixup.sh script as described on the sceen as root user. Click 'Check Again'and if all checks succeed click 'Next>' If you are sure the unsuccessfull checks can be ignored tick the box 'Ignore All' before you click ' Next> '



Perform a last check that information on the screen is correct before you click â Finish '

X Oracle Database 11g Release	e 2 Installer - Installing database - Step 10 of 11	
Install Product		<b>11</b> <sup>g</sup>
Configure Security Updates Installation Option Grid Options Product Languages Database Edition Installation Location Operating System Groups Prerequisite Checks Summary Install Product Finish	Processing Oracle Database 11g 11.2.0.1.0  Status  Oracle Database installation  Prepare  Copy files  Link binaries  Setup files  Execute Root Scripts for Oracle Database installation  P  DataBase  118  Control  Control	Progress Succeeded Vending Ven
Help	< Back Next > Einis	h Cancel
X Execute Configuration sci	ripts	

cripts to I	pe executed:	
lumber	Script Location	Nodes
	/u01/app/oracle/product/11.2.0/db_1/root.sh	solrac1,solrac2
L		
execute 1. Open 2. Log ir 3. Run t	the configuration scripts: a terminal window a s "root" e scripts in each cluster node	

Log in to a terminal window as root user and run the root.sh script on the first node. When finished do the same for all other nodes in your cluster as well. When finished click 'OK'

#### Note:

root.sh should be run one node at a time.



Click â Close ' to finish the installation of the RDBMS Software.

# 7. RAC Home Patching

This Chapter is a placeholder

# 8. Run ASMCA to create diskgroups

As the grid user start the ASM Configuration Assistant (ASMCA)

#su - grid

cd /u01/11.2.0/grid/bin

./asmca

X ASM Configuration Ass	istant: Configure	ASM: ASM Instances			
	ASM Instances T For Volumes and ASI nodes of the cluster. Tip: To perform opera ASM Instances -	Disk Groups Volumes 7 M Cluster File System(ACFS) ations on an ASM instance, rij	SM Guster File Bys related operations, A pht mouse click on th	tems ASM Dynamic Volume Manager(ADVM) driver must be loade le row.	d on all
	Node	Instance Name	Status	ADVM Driver Status	
	solrac1	+ASM1	Up	Not installed	
	solrac2	+ASM2	Up	Not Installed	
	Refresh				
Help					Exit

Click 'Disk Groupsâ tab

X ASM Configuration Assis	stant: Configure ASM:	Disk Groups				
1010010101010101010101	ASM Instances Disk Gr	oups Volumes	ASM Guster Fr	s Systems		
101010101010000000000	You can choose to create a 11.2 ASM compatibility.	a new disk group o	r add disks to an e	disting disk group. To	create dynamic volume:	s, you need disk groups with
	Tip: To perform operations of Disk Groups	on a disk group, rig	ht mouse click on th	he row.		
	Disk Group Name	Size (GB)	Free (GB)	Usable (GB)	Redundancy	State
	DATA	14.70	13.80	6.75	NORMAL	MOUNTED(2 of 2)
	Create Mount All D	ismount Al				
Help						Exit

## Action:

Click 'Create' to create a new diskgroup

k Gr	oup Name	FRA						
Red	undancy							
edu ailun	n dan cy is achieved by st e groups, and high redund High () Normal () Exter	oring multiple copi dancy from atleast nal (None)	es of the data on d t three different fai	ifferent failure gro lure groups.	oups. Normal r	edundancy needs o	disks from atleast	two different
Sele	ect Member Disks							
uon	how Eligible 🔵 Show Al um failure groups are use r.	d to store voting f	iles in extended clu	sters and do not	contain any us	ser data. It requires	ASM compatibility	of 11.2 or
ন	Disk Path		Header Status	Disk Name	Size (MB)	Failure Group	Quorum	
Г	/dev/grid/disk4		CANDIDATE		5028		Г	
Г	/dev/grid/disk5		CANDIDATE		5028		E .	
5	/dev/rdsk/c1t10d0s0		CANDIDATE		5028			
5	/dev/rdsk/c1t9d0s0		CANDIDATE		5028			
	If you do not see the disk	s which you belie ks considered for	ve are available, c discovery.	heck Disk Discov	ery Path and re	sad/write permissio	ins on the disks. 1	'he Disk
ote: isco	overy Path limits set of dis	the second se					Change Disk D	iscovery Path
ote: isco isk l	overy Path limits set of dis Discovery Path:/dev/grid/ the Show Advanced Or	, ideviraskin	ange the diskgroup	attributes Diskor	roun comnatibil	tv attributes may n	eed to be modified	i based on the
ote: isco isk l k or ige (	overy Path limits set of dis Discovery Path:/dev/grid/ n the Show Advanced Op of diskgroup for different	tions button to che	ange the diskgroup ases or ASM Clust	attributes. Diskgr er File Systems.	oup compatibil	ty attributes may n	eed to be modified	i based on the

Type in a name for the disk group, select the redundancy you want to provide and mark the tick box for the disks you want to assign to the new disk group.

X DiskGroup: Creation		
R	Creating DiskGroup FRA	
DiskGroup: Creation	A created	
	ОК	



X ASM Configuration Ass	istant: Configure ASM	4: Disk Groups				
	ASM Instances Disk	Groups Volumes	ASM Gluster File	Systems		
	You can choose to create 11.2 ASM compatibility. Tip: To perform operation: Disk Groups	e a new disk group o s on a disk group, rig	r add disks to an ex ht mouse click on th	isting disk group. To ie row.	create dynamic volume:	s, you need disk groups with
	Disk Group Name	Size (GB)	Free (GB)	Usable (GB)	Redundancy	State
	DATA	14.70	13.80	6.75	NORMAL	MOUNTED(2 of 2)
	FRA	9.82	9.63	4.82	NORMAL	MOUNTED(2 of 2)
				×		
	Create Mount All	Dismount All				
Help						Exit

Click 'Exit'

X ASM Cor	nfiguration Assist 💶 🗖 🔀
?	Do you really want to quit this application?
	Yes No

### Action:

Click 'Yes'

### Note:

It is Oracle's Best Practise to have an OCR mirror stored in a second disk group. To follow this recommendation add an OCR mirror. Mind that you can only have one OCR in a diskgroup.

### Action:

1. To add OCR mirror to an Oracle ASM disk group, ensure that the Oracle Clusterware stack is running and run the following command as root:

2. # ocrconfig -add +FRA

3. # ocrcheck

# 9. Run DBCA to create the database

As the oracle user start the Database Configuration Assistant (DBCA)

### #su - oracle

\$cd /u01/app/oracle/product/11.2.0/db\_1/bin

#### \$./dbca



Database Configuration Assis	tant : Welcome 📃 🗖 🔀
	Welcome to the Database Configuration Assistant for Oracle Real Application Clusters. The Database Configuration Assistant enables you to create, configure, or delete a cluster database and manage database templates. It also enables you to add and delete instances of a cluster database. Select the database type that you would like to create or administer: © Oracle Real Application Clusters database © Oracle single instance database
Cancel Help	S Back Next >>

#### Action:

Select 'Oracle Real Application Clusters database' and click 'Next'

Database Configuration Ass	stant, Step 1 of 13 : Operations	
	Select the operation that you want to perform: Create a Database Configure Database Options Delete a Database Manage Templates Instance Management ASM configuration operations must be performed using Automatic Storage Mana Configuration Assistant (ASMCA) from Oracle Grid Infrastructure home.	gement
Cancel Help	S Back Next >>	

choose option 'Create a Database' and click 'Next'

Database Configuration As	sistant, St	ep 2 of 14 : Database Templates	
	Template database necessar after datal	s that include datafiles contain pre-created databases. They in minutes, as opposed to an hour or more. Use templates y, such as when you need to change attributes like block siz base creation.	allow you to create a new without datafiles only when e, which cannot be altered
	Select	Template	Includes Datafiles
	۲	General Purpose or Transaction Processing	Yes
	0	Custom Database	No
Vigoritzakierian Novitzakierian	0	Data Warehouse	Yes
Harman Karana Harman			
			Show Details
Cancel Help		<u>S</u> ack	Next >

Select the database template that you want to use for your database and click 'Next'

Database Configuration Ass	istant, Step 3 of 13 : Data	abase Identification	
	Cluster database configura database is dynamic with i effective resource utilizatior servers.	ation can be Policy-Managed or Admin-Managed. A Policy-M nstances managed automatically based on pools of server n. Admin-Managed database results in instances tied to spe	anaged s for ecific
	Configuration Type:	Admin-Managed O Policy-Managed	
_	An Oracle database is un "name.domain".	iquely identified by a Global Database Name, typically of the	e form
	Global Database Name:	ratdb	
A	A database is referenced to be used to name the c	l by an Oracle instance on each cluster database node. Spe luster database instances.	cify a prefix
	SID Prefix	ratdb	
	Select the nodes on whic will always be used, whe	h you want to create the cluster database. The local node "s ther or not it is selected.	solrac1"
	solrac1 solrac2		Select All
			eselect All
Cancel Help		🔇 Back Next >>	

Type in the name you want to use for your database and select all nodes before you click 'Next'

Database Configuration Assist	tant, Step 4 of 12 : Manaş	zement Options	
١	Enterprise Manager	Automatic Maintenance Tasks	1
	Configure Enterprise Mar Register with Grid Cont Management Service Configure Database Co Enable Alert Notificati Outgoing Mail (SMTP) Recipient Email Addre Enable Daily Disk Bai Backup Start Time: OS Usemame: OS Password:	rol for centralized management No Agents Found ontrol for local management ons Server: ess: ckup to Recovery Area  02 00 0 AM C PM	
Cancel Help		≪ Back Next ≫	)

select the options you want to use to manage your database and click 'Next'

Database Configuration As	For security reasons, you database.	atabase Credentials must specify passwords fo strative Passwords	r the following user accounts in the new	
	User Name	Password	Confirm Password	
	SYS			
	SYSTEM			
	Use the Same Admir Password: Confirm Password:	ilstrative Password for All Ar	ccounts	
Cancel Help			🛛 Back 🛛 Next 📎	

Type in the passwords you want to use and click 'Next'

Database Configuration Ass	istant, Step 6 of 12 : Datab	ase File Locations	
	Specify storage type and locat	ions for database files.	
	Storage Type:	Automatic Storage Management (ASM)	-
	Storage Locations:		
	C Use Database File Locati	ons from Template	
	C Has Common Location &	All Delehana Files	
	C Use Common Location to	of All Database Files	
Vaurenteertee	Database Files Location:		Browse)
Annual Statement	Use Oracle-Managed File	s	
Harristaterier Harristaterier	Database Area:	+DATA	Browse)
Viscolitzationer Monitigationer	Multiplay Dada Laga and	(Control Films	
	( multiplex Redo Logs and	Control Piles	
North Adver	If you want to specify d	ifferent locations for any database files, p	pick any of the above options
May 125 Adverses May 125 Adverses	except Oracle-Manage	ed Files and use the Storage page later to	o customize each file
	database files, which	can not be changed on the Storage page	r generates the names for
		•	
		· ·	File Location Variables)
Cancel Help		🔇 Back	Next ≫)

Select the diskgroup you created for the database files and click 'Multiplex Redo Logs and Control Files'. In the popup window define the diskgroup that should contain controlfiles and redo logfile and the diskgroup that should contain the mirrored files.

<b>()</b> It is wri	Aultiplex Redo Logs and Control Files
-	Redo Log and Control File Destinations
1	+DATA
2	+FRA
3	
4	
5	
	OK Cancel Help

Database Configuration A	ssistant, Step 7 of 12 : Recovery	Configuration	
	Choose the recovery options for th Specify Flash Recovery Area This is used as the default for required for automatic disk bas the database files and recover and performance.	e database: all disk based backup and recovery o sed backup using Enterprise Manage y files be located on physically differe	operations, and is also er. Oracle recommends tha ent disks for data protection
Neuropatere Neuropatere Neuropatere	Flash Recovery Area: Flash Recovery Area Size:	+FRA 3882	Browse)
Harrison and Antonio and Anton	Enable Archiving	Edit Archive Mode Parameters	3)
Cancel Hein	1	G Back	(File Location Variables

Specify the diskgroup that was created for the flash recovery area and define the size. If the size is smaller than recommended a warning will popup.

Database Configuration Assis	stant, Step 8 of 12 : Database Content	
	Sample Schemas Custom Scripts Sample Schemas illustrate the use of a layered approach to complexity, and are used to some demonstration programs. Installing this will give you the following schemas in you database: Human Resources, Order Entry, Online Catalog, Product Media, Information Exchange, Sales History. It will also create a tablespace called EXAMPLE. The tablespace be about 130 MB. Specify whether or not to add the Sample Schemas to your database. Sample Schemas	by Fur ace will
Cancel Help	S Back Next S	

Select if you want to have sample schemas created in your database and click 'Next'

Memory	Sizing Chara	acter Sets Connection Mode	
● Typical Memory Size (SGA : Percentage: ⊽ Use Automatic M	and PGA): 265 MB 7 % lemory Management	250 MB Show Memory Distribution)	3928 MB
C Custom Memory Manageme SGA Size: PGA Size:	Automatic Shared 1178 392	I Memory Management	
Total Memory for Or	racie: 1571 M Bytes		
All Initialization Parame	ters)		

Review and change the settings for memory allocation, characterset etc. according to your needs and click 'Next'

Database Configuration Assi	stant, Step 10 of 11	: Database Storage		
Storage	Group 1 2 3 4	Size (K) 51200 51200 51200 51200		
Create Delete			File Loca	ation Variables)
Cancel Help		(3	Back Next >	9

Review the database storage settings and click 'Next'

🗱 Database Configuration Assista	it, Step 11 of 11 : Creation Options	
Se	ct the database creation options: ✓ Create Database ☐ Generate Database Creation Scripts Destination Directory: ✓/u01/app/oracle/admin/racdb/scripts	Browse
Cancel Help	🔇 Bad	k Next > Einish

Ensure the tickbox 'Create Database' is ticked and click 'Finish'

imes Database Configuration Assis					
Create databace with db name."	roedb"				
Create database with up hame					
Creat					
Database Configuration					
Global Database Name: r	acdb				
Database Configuration Type: Admin-Managed Cluster Database					
Node List: solrac1,solrac2					
SID List: racdb1,racdb2					
Management Option Type: 1	Management Option Type: None				
Storage Type: /	Automatic St	torage Management (ASM)			
Memory Configuration Type: /	Automatic Me	emory Management			
Database Configuration	n Details				
Component	Selected				
Oracle JVM	true				
Oracle Text	true				
Oracle XML DB	true				
C	ок са	ancel) (Help)	Save as an HTML file)		

Review again the database configuration details and click 'OK'

X Database Configuration A	ssistant		
Change Assurance	<ul> <li>Copying database for the copying database for the copying and starting at a starting and starting at a starting at a</li></ul>	<b>iles</b> g Oracle instance	
<ul> <li>Reducing the risk and disruption of change</li> <li>Database Replay</li> </ul>	Creating cluster dat Completing Databa		
SQL Performance Analyzer	Clone database creation Log files for the current /u01/app/oracle/cfgtool	n in progress 21% operation are located at: ogs/dbca/ratdb	
		Stop	
			k
$\chi$ Database Configuration Assistant			
Database creation complete. For details /u01/app/oracle/cfgtoollogs/dbca/ratdb.	s check the logfiles at:		
Database Information: Global Database Name: ratdb System Identifier(SID) Prefix: ratdb Server Parameter File name: +DATA	/ratdb/spfileratdb.ora		
Note: All database accounts except SYS locked. Select the Password Managem complete list of locked accounts or to m accounts. From the Password Manager the accounts you will use. Oracle Corpo recommends changing the default pass unlocking the account.	and SYSTEM are ent button to view a anage the database nent window, unlock only ration strongly swords immediately after		
P	assword Management)		
Exit			

The database is now created, you can either change or unlock your passwords or just click Exit to finish the installation.