

Consolidation and Oracle 12.2 DBaaS on Kaminario K2

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Introduction

Traditionally, IT organizations have deployed systems and applications using dedicated server infrastructure, as this was primarily driven in support of different departments or line of businesses (LOBs). This kind of segmented alignment of technology to business functions, results in severe underutilization of the technology infrastructure and inefficient utilization of administrative resources managing such deployments. Additionally, such siloed deployments inhibit the ability of IT organizations to respond quickly to changing business needs.

Today's business world is an ever-changing environment of increasing complexity and challenges, requiring corporations to build agility and flexibility into their IT infrastructure to swiftly adapt to changes in the marketplace. IT organization's key initiatives include consolidation of systems, standardization of business processes, the move to shared services, and corporate compliance.

In this jointly co-authored paper by Viscosity North America (Viscosity) and Kaminario, we will illustrate how standardization and consolidation are leading paths to Private Database Cloud and subsequently Database as a Service (DBaaS). Additionally, this paper will outline the steps required to Install and Configure Oracle 12.2 Grid Infrastructure and Database, as well as describe the best practices of the deployment on Kaminario K2 storage array. At the core of this discussion will be Oracle Database 12c Release 2 stack.

Viscosity, is a Kaminario partner as well as an Oracle Platinum Partner. Recognized in the industry for their in-depth expertise in high availability solutions, database technologies, cloud readiness and migrations, application development, big data integration, and performance tuning.

Oracle 12.2 Consolidation on Kaminario

As mentioned earlier, Consolidation is one of the major strategies that organizations are pursuing to achieve greater efficiencies in their operations, lower costs, and improve manageability. Consolidation is generally achievable by employing a solid standardization, rationalization, and simplification strategy.

The decision to consolidate is often a consequence of various initiatives, often directed by cost saving or decommissioning older hardware and leveraging vertical scaling using denser (larger memory/core) servers coupled with stack virtualization. In order to achieve economies of scale, higher server utilization and reduced operational costs: power, space, and administration must be achieved.

Rationalization and simplification are key aspects and precursors to consolidation, as this includes looking for opportunities to simplify and minimize the various infrastructure components (hardware and software) services, processes, and procedures; thus, reducing your administrative overhead. This leads directly to reduced operational expenses (OpEx). The impact on OpEx derives from how effectively you rationalize your environment.

DBaaS requirements

Private clouds consolidate servers, storage, operating systems, databases, and mixed workloads onto a shared hardware and software infrastructure. The higher the consolidation density achieved, the greater the return on investment.

Consolidation lays the groundwork for Private Database Cloud, which builds the foundation for Database as a Service (DBaaS). Deploying databases with a private cloud, is a proven model for the delivery of database services. Consolidation onto shared resources in a private cloud enables IT departments to improve quality of service levels—as measured in terms of database performance, availability, and data security.

DBaaS is a cloud model that enables users to request database resources by using a self-service or an automated provisioning framework. This can be executed by choosing from a predefined service catalog or routed to a “managed self-service” system. DBaaS can simplify IT infrastructure, enabling easy to deliver database functionality to consumers (typically application developers or DevOps organization).

The following are key DbaaS Benefits:

- Faster and simpler database service delivery
- Higher utilization of shared database infrastructure
- Simplified and centralized database management
- Quality of service with standardized database offerings
- Accelerated time-to-market through automated provisioning
- If required, streamlined show-back and charge-back transparency

Before DBaaS can be achieved, the foundation of rationalization, simplification, and standardization (RSS) of the environment needs to be set.

Oracle Database 12c introduces features that are designed to facilitate this database consolidation. A new architecture, Oracle Multitenant, was introduced with Oracle Database 12c which greatly simplifies consolidation of multiple applications onto a shared database environment. By removing all limitations that previously existed with schema consolidation, such as namespace collisions, certification difficulties and so forth, Oracle Multitenant readily allows the creation of a single container database (CDB) that contains one or more pluggable databases (PDBs).

Oracle Database 12c Release 2 Multitenant offers significant advantages for consolidating application workloads and the pathway to DbaaS. These benefits include:

- Simplified Management - Reduce the number of distinct environments to manage; manage many as one.
- Enforces Standards and rationalization
- Agility in deployment of test and development systems
- Streamlined Provisioning

The underlying technology of DBaaS and consolidation, is Oracle Grid Infrastructure and the Oracle Database itself. The database deployment can be RAC, RAC One Node or non-RAC (single instance). The type deployed is highly dependent on the licensing, chargeback model, or availability SLAs. Similarly, consolidation can be in the form of distinct database instances, schema consolidation or can leverage the 12.2 Multitenancy feature.

Oracle RAC 12.2 on Kaminario K2

Private Database Clouds and DBaaS is effectively the consolidation of various workloads onto a common, shared infrastructure. For this reason, a low latency and high throughput storage array systems is a necessity. Kaminario K2 storage array provides this key capability necessary for consolidation. The K2 all flash array, is a storage platform that was designed to optimally accommodate multiple applications and workloads. Its unique scale-out/scale-up architecture allows the K2 to grow with customers' infrastructure needs, delivering agility and flexibility for today's demanding IT requirements. The K2 array provides consistent Low Latency and High Throughput/IOPS, enabling Oracle databases to be highly responsive even under peak demands, and for mixed OLTP and OLAP workloads.

Why is Kaminario All Flash Array (AFA) technology so relevant for Oracle Real Application Cluster (RAC) configurations? First, RAC is highly dependent on low latency network and storage configurations. Oracle's RAC Cache Fusion uses the interconnect to transfer blocks between RAC instances and maintain cache coherency. Any latency delay or congestion impact on this interconnect can have a domino effect on the health of the RAC cluster.

Oracle RAC databases, like any other database, relies heavily on storage throughput and latency. As with network, storage latency plays a key part in the health of the RAC cluster. If there is congestion or delay in the storage response times, this has a major impact on the overall state of the RAC cluster. For example, if a RAC database LGWR process is delayed in flushing redo to disk, then sessions could stack up waiting on 'log file sync' waits. This could lead to cluster wide waits or even hangs. If there is a high consolidation density, then IO "noisy neighbor" issues could easily cause disruptions.

In releases prior to Oracle 12.2, RAC relied completely on the interconnect for cache coherency; however, in Oracle12.2, there is a convergence point with network and storage latency. RAC Cache fusion maintains latency heuristics for network and storage. This is especially poignant for all flash arrays like Kaminario K2. If there is a slight network congestion in the interconnect traffic, then Cache fusion, knowing that Kaminario flash storage is providing sub-millisecond response times, will opt to execute a read from disk rather than use the interconnect for block transfer. This feature provides in-band optimization for block accesses. Additionally, there is no parameter or application change needed for this optimization, it is an "out-of-box" feature.

The ability to scale, is an important feature of the Kaminario K2 for Oracle implementation. K2 supports both scale up, adding capacity, as well as scale out which adds both capacity and compute power. When designing the storage used for a consolidation project, consider both capacity requirements and performance. A single K-Block can provide 6 GB/s read and 2 GB/s write throughput. Depending on required performance choose from a single, dual (that double the above performance), triple or quad K-Block. For a large Oracle implementation, it is recommended to start with a dual K-Block.

ASM Best Practices for Kaminario

An optimal configuration for ASM is one where there is consistent performance. The key areas for ASM best practices include:

- Ensuring consistent LUNs (disk devices) for ASM disks
- Standardize on LUNs per diskgroup and LUN size.
 - For Kaminario AFA systems, four to six disks are generally appropriate. Unlike spinning media, deploying a large number of ASM disk does not provide additional throughput or improve latency. Ensure that the diskgroup is sized to support the capacity of the needed. Note, ASM 12.2 now supports disk sizes greater than 2TB.
- Create a minimal number of diskgroups for DATA. Having additional DATA diskgroups does not provide incremental performance benefits or improve isolation.

For ASM configurations (RAC or non-RAC), use the following best practices:

- Use three disk groups
 - +DATA (for tablespaces, redo logs, control files and temp) with external redundancy
 - +RECO (for the redo logs, control files fast recovery area, archive logs, and backup sets) with external redundancy
 - +OCRVOTE (for RAC - Grid OCR and Vote disks) with normal redundancy. For fresh installs ensure that each disk is at minimum of 80GB
- For heavily consolidated database configurations that require space quota group and other “noisy neighbor” isolation, implement 12.2 ASM Flex Diskgroups (discussed below).
- If deploying more than four node RAC cluster, leverage Flex ASM. With Flex ASM (different than Flex ASM diskgroups), administrators can consolidate all the storage requirements into a single set of disk groups. All of the disk groups are mounted and managed by a small set of Oracle ASM instances running in a single cluster. Be sure to specify the number of Oracle ASM instances with a cardinality setting, the default is three instances.

Flex Diskgroups

A key issue of consolidation and standardization is the “noisy neighbor” concerns; particularly with storage and containment management.

In previous releases, disk group storage attributes were defined only at the disk group level, which was generally quite coarse from a storage management perspective. In 12.2, the concept of ASM flex disk group is introduced to enable users to manage storage at the database level, allowing greater granularity of control. Flex groups are built on the concept of File groups. File groups, are a group of files that share the same set of properties and characteristics and are used to describe database files. A significant benefit of file groups is the capability to have a different availability quota group specification for each database, and thus greater control over “noisy neighbor” storage containment.

The following example illustrates how a flex diskgroup is created.

```
SQL> create diskgroup vna_data flex redundancy disk '/dev/mapper/mpath*'
```

Or convert existing standard diskgroup to flex diskgroup.

```
SQL> alter diskgroup vna_data convert redundancy to flex;
```

Each database that is built on a 12.2 Flex ASM Diskgroup (that has compatible.asm and compatible.rdbms set to 12.2.0.0) will enable file group capabilities; which allows granular storage management, such as redundancy, rebalance power limits and priority, as well as striping and quota groups; i.e., at the file group level. Since the redundancy is now at the file group level, and not at the disk group level, you can convert and change the redundancy of database from normal to high. Note, that you cannot currently change from external to high/normal. A quota group describes an aggregate of space used by one file group or multiple file groups in the same disk group. Thus, a database's files or file group can have specific quota group. A quota is enforced when a file is created and resized.

Change in Communication Protocol between DBAs and Storage Admins

One of the top storage pain points for Oracle DBAs, is the communication of database storage sizing (throughput and capacity) and configuration with Storage Admins. This is because DBAs speak a different language than Storage admins; e.g. transactions vs IOPs and MB/s. Storage Admins size for capacity and DBAs need throughput based sizing. This involves constant dialog on the following:

- Evaluating the number of disks required and storage layout
- Agree on storage type for each file type and define access pattern
- Evaluating use of tiered storage or static layout

With Kaminario all flash array, this communication "gap" becomes virtually non-existent; DBAs simply tell Storage Admin diskgroup size. The storage administrators supporting K2 create the appropriate number of LUNs using standardized LUN sizes. Once the storage is provisioned and presented the DBA creates diskgroups. Thus, there is no more 'back-and-forth-discussions' with Storage Admins.

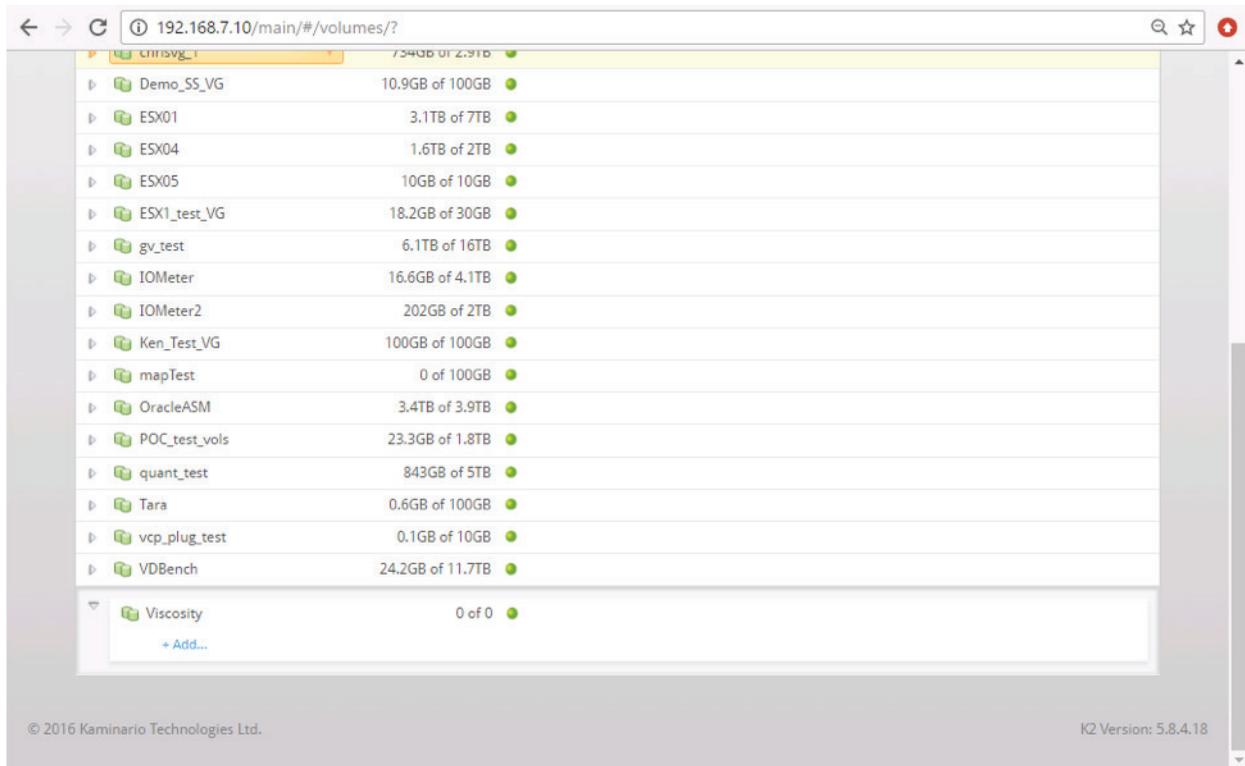
Conclusion

Private Database Clouds and DBaaS are effectively consolidating various workloads onto a common, shared infrastructure. For this reason, a low latency and high throughput storage array system is a necessity. Kaminario K2 storage array provides the key capabilities necessary for consolidation and was designed to accommodate multiple applications and workloads. Its unique scale-out/scale-up architecture allows the K2 to grow with customers' infrastructure needs and meet their key initiatives of consolidation, standardization of business processes, the move to shared services, and corporate compliance.

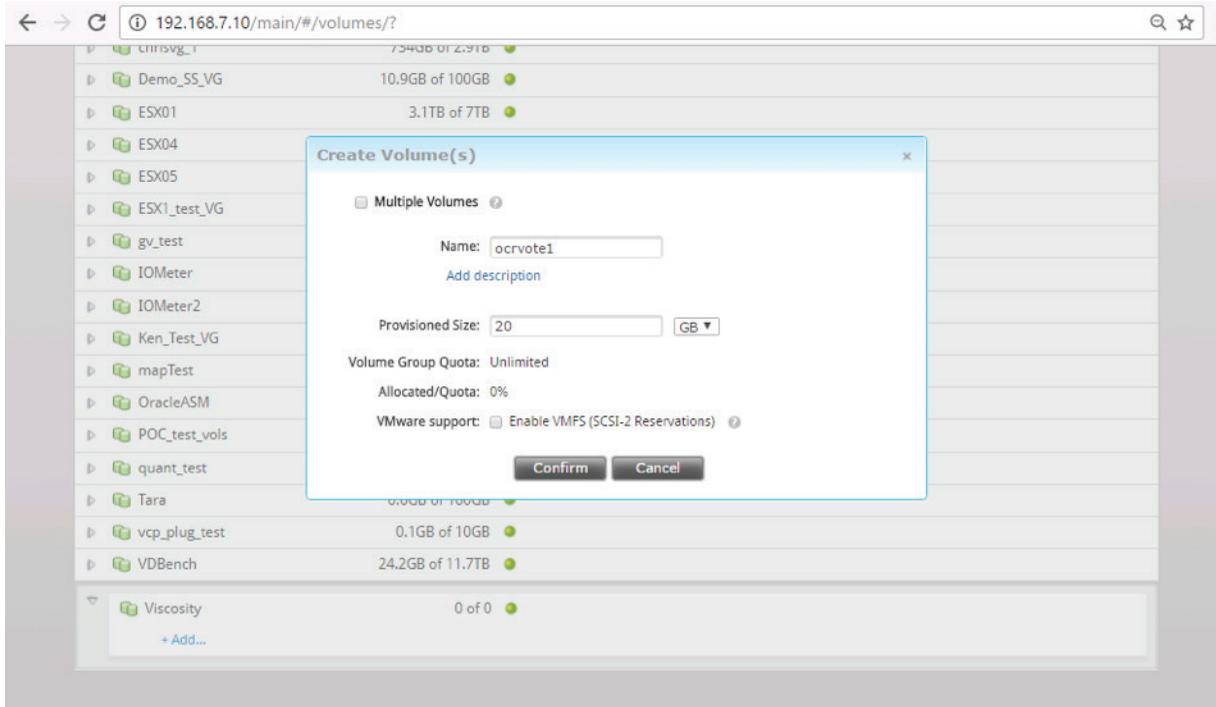
Oracle Grid Infrastructure and RAC Deployment

Preparing Storage

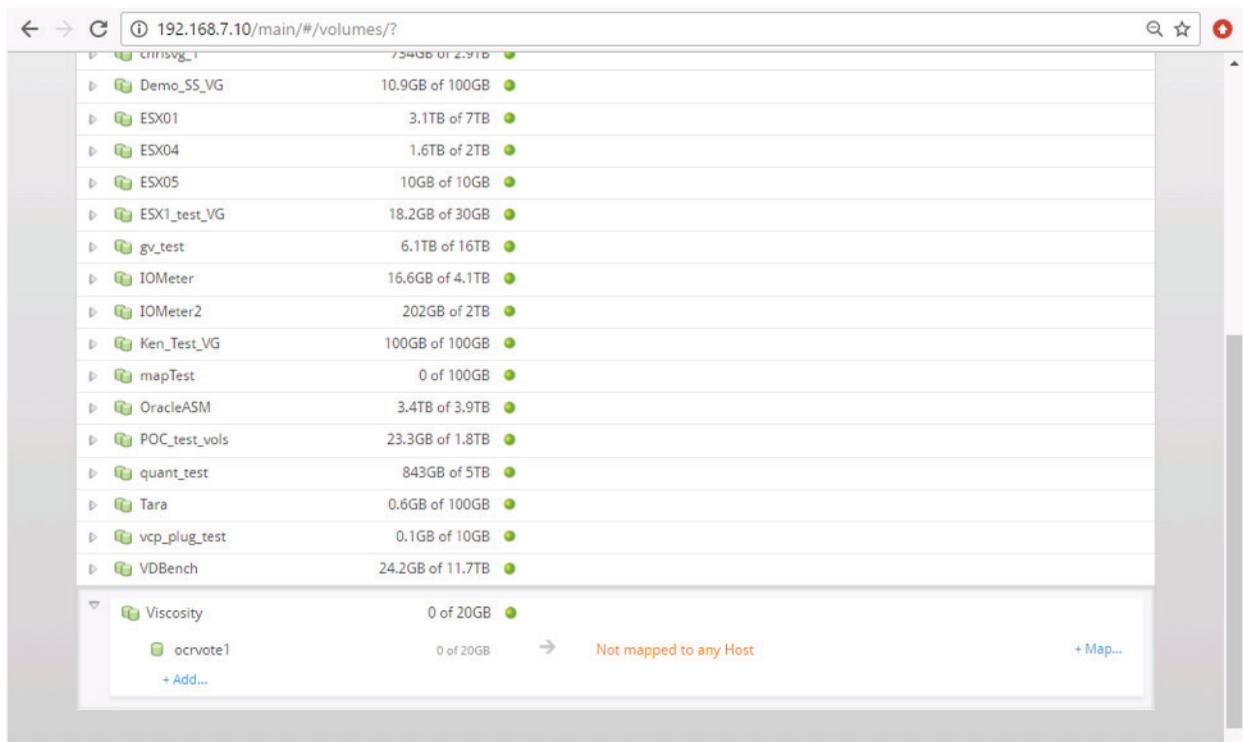
To add the volume to the group Viscosity. In this storage provision, we enabled volumes with non dedupe settings. The ability to select between dedup and non dedup is an important feature of K2 specifically for Oracle implementations.



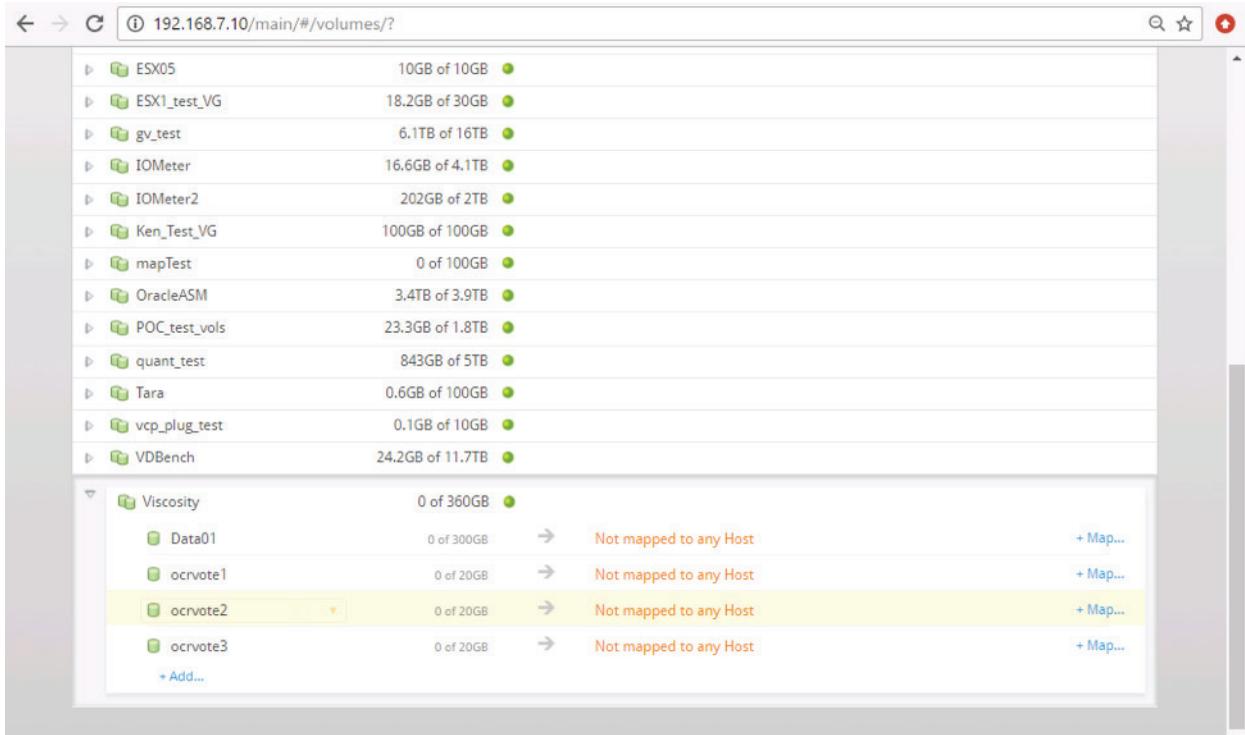
To add a new volume with the +Add option:



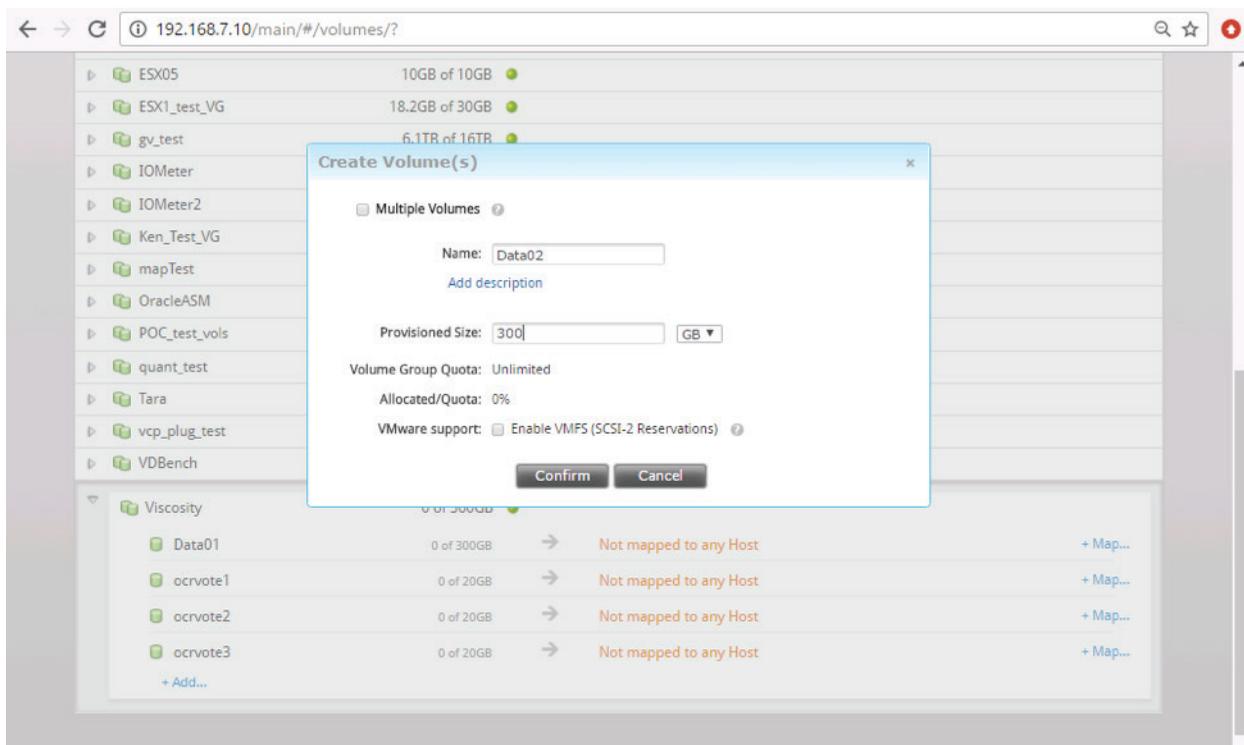
Adding ocrvote volumes of 20 Gig size each of 3 Nos.

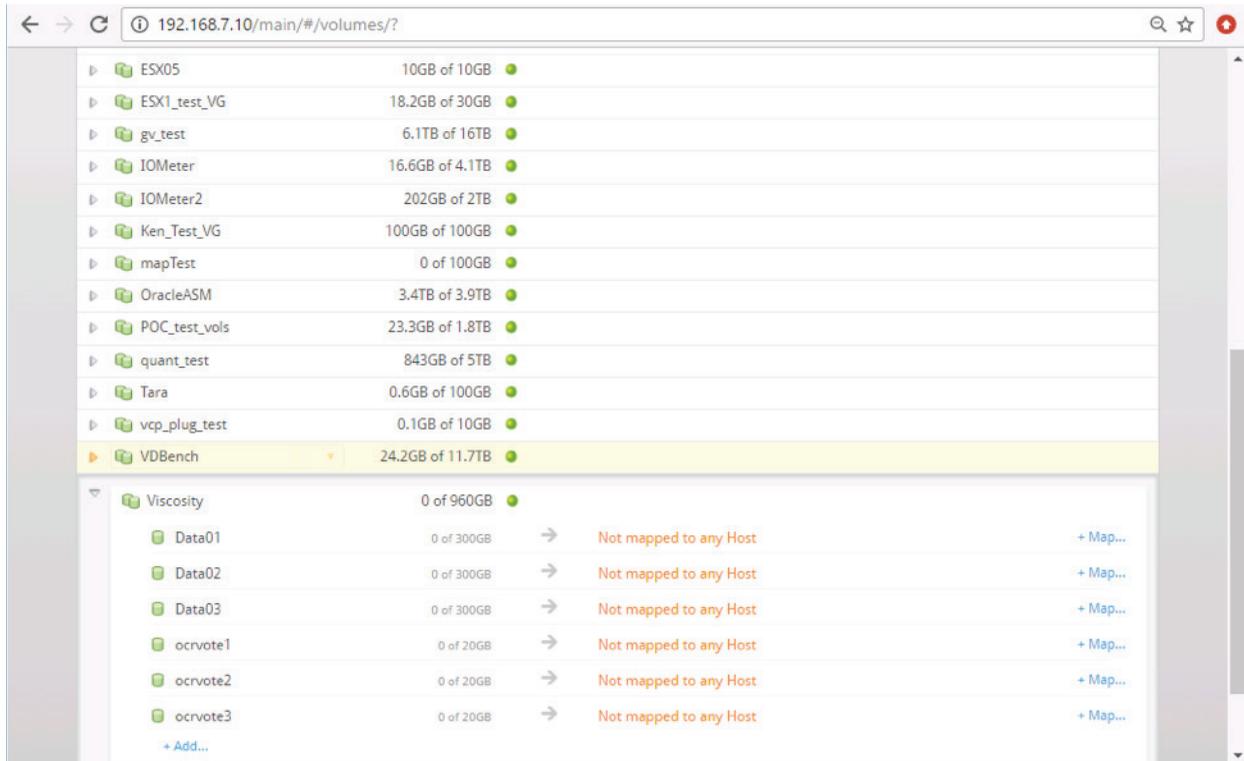


Added three ocrvote volumes.

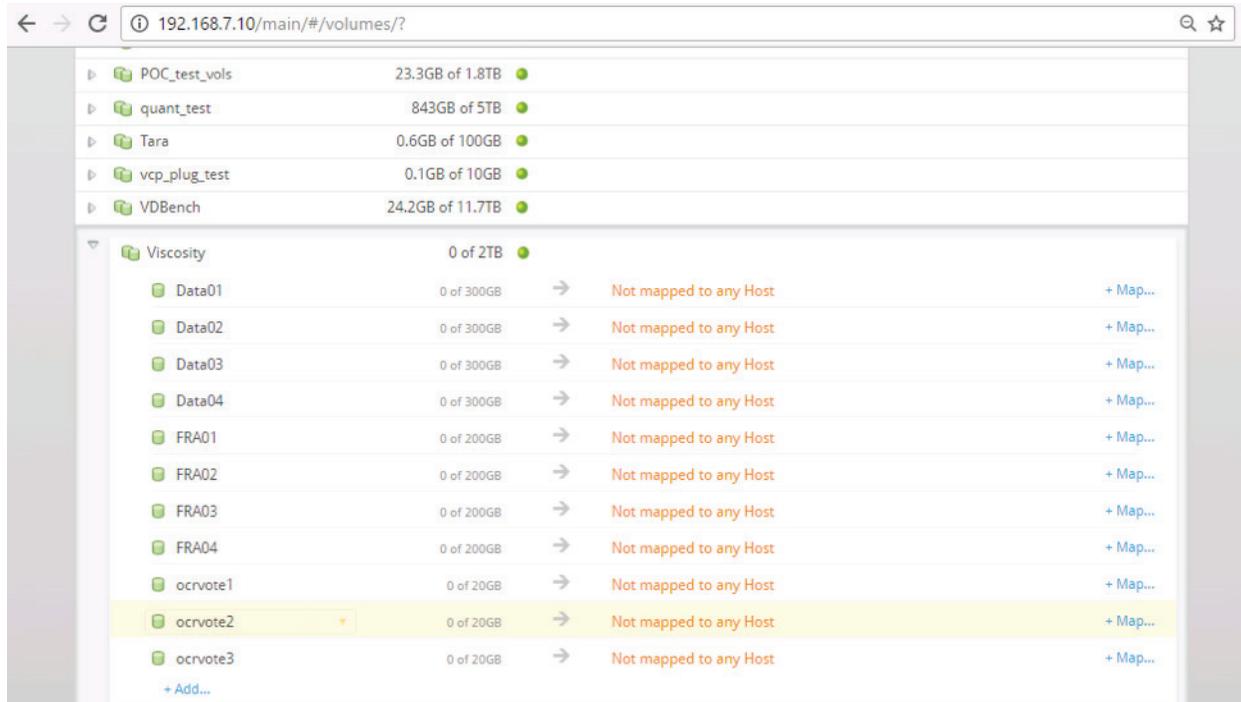


Now Adding data volumes 4 Nos of 300 Gb size each.

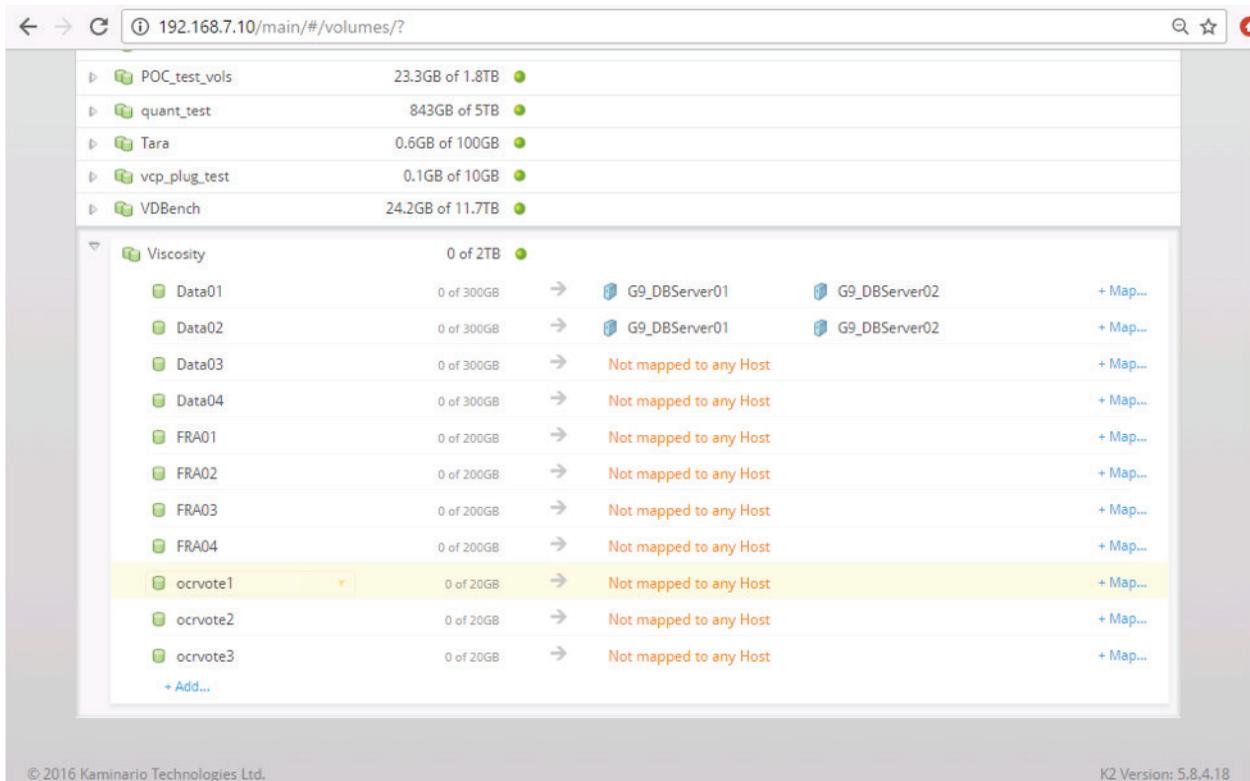
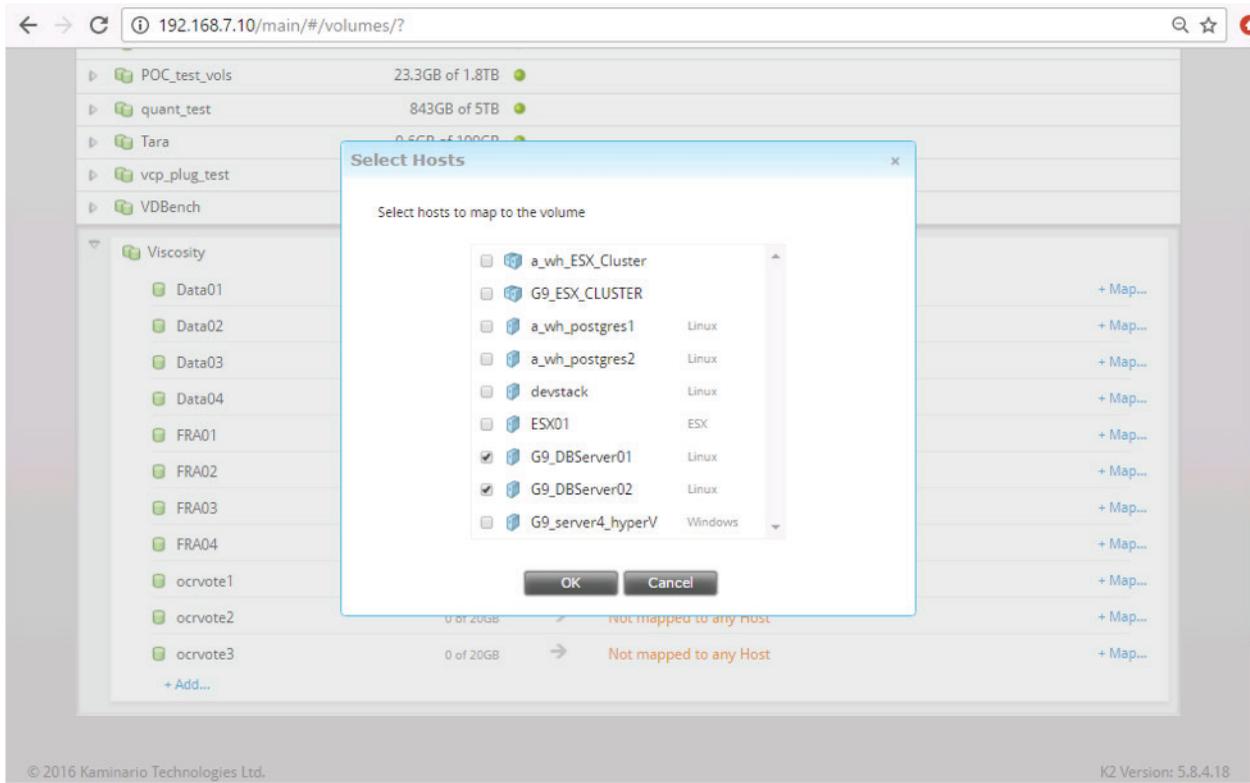




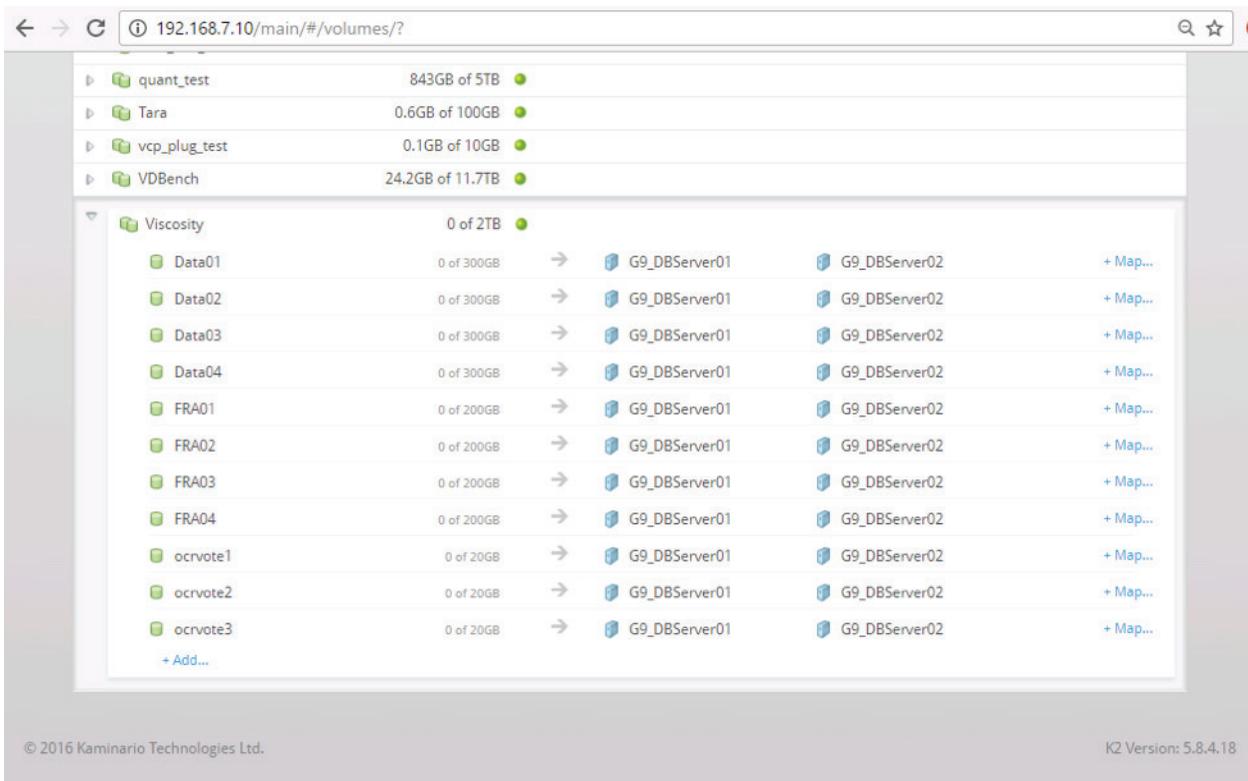
Repeat steps for the 4 volumes for FRA.



Now map the volumes to the Host by selecting the +Map Icon on farther right towards each volume and select Map to existing Host as the option for the first time to add it to dbserver01 and dbserver02 (vna01 and vna02 Linux hosts).



Completed the mapping of all the volumes to the database servers vna01 and vna02.



Next Step:

We need to do the rescan of the volumes to show up on both the nodes:

As Root user:

```
# rescan-scsi-bus.sh
```

In order for this package to work we need to have the `sd3-utils` binaries installed properly of version 1.27 and above on the box. Basically, the Redhat -6 and Redhat -7 has the upgraded version of `sd3-utils` and below was the version which I have for `sd3-utils`.

Now scan for the new luns added to the server .

Checking the `sg3_utils`

```
[root@RAC01 ~]# yum list sg3_utils
Loaded plugins: ulninfo
Installed Packages
sg3_utils.x86_64                1.37-9.e17                @ol7_latest
[root@RAC01 ~]#
```

Run `rescan-scsi-bus.sh` to find the scsi devices without a reboot.
Details are here

<https://access.redhat.com/solutions/1314183>

Then run "multipath" to create new multipath configuration.

You can run "multipath -ll" to view the devices before and after.

https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/DM_Multipath/multipath_options.html

Obtain SCSI id

```
[root@RAC01 by-path]# /usr/lib/udev/scsi_id -g -u -d /dev/dm-3
20024f40053960a40
[root@RAC01 by-path]# /usr/lib/udev/scsi_id -g -u -d /dev/dm-4
20024f40053960a42
[root@RAC01 by-path]# /usr/lib/udev/scsi_id -g -u -d /dev/dm-5
20024f40053960a43
[root@RAC01 by-path]# /usr/lib/udev/scsi_id -g -u -d /dev/dm-6
20024f40053960a44
[root@RAC01 by-path]# /usr/lib/udev/scsi_id -g -u -d /dev/dm-7
20024f40053960a46
[root@RAC01 by-path]# /usr/lib/udev/scsi_id -g -u -d /dev/dm-8
20024f40053960a47
```

Setup of multipath.conf

```
multipaths {
    multipath {
        wwid                20024f40053960a40
        alias                DATA1
        path_grouping_policy multibus
        path_selector        "round-robin 0"
        failback             manual
        rr_weight             priorities
        no_path_retry        5
    }
}
```

```

multipath {
    wwid                20024f40053960a42
    alias               DATA2
    path_grouping_policy multibus
    path_selector       "round-robin 0"
    failback            manual
    rr_weight           priorities
    no_path_retry       5
}
multipath {
    wwid                20024f40053960a43
    alias               DATA3
    path_grouping_policy multibus
    path_selector       "round-robin 0"
    failback            manual
    rr_weight           priorities
    no_path_retry       5
}

```

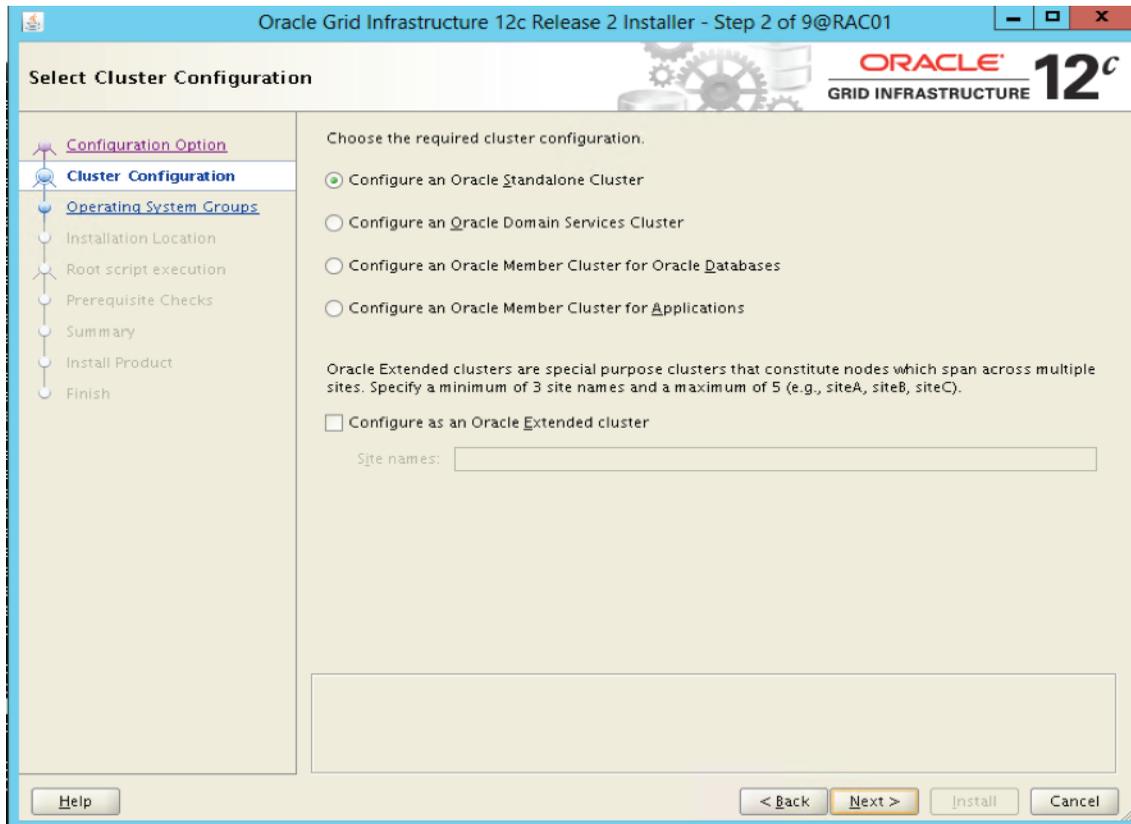
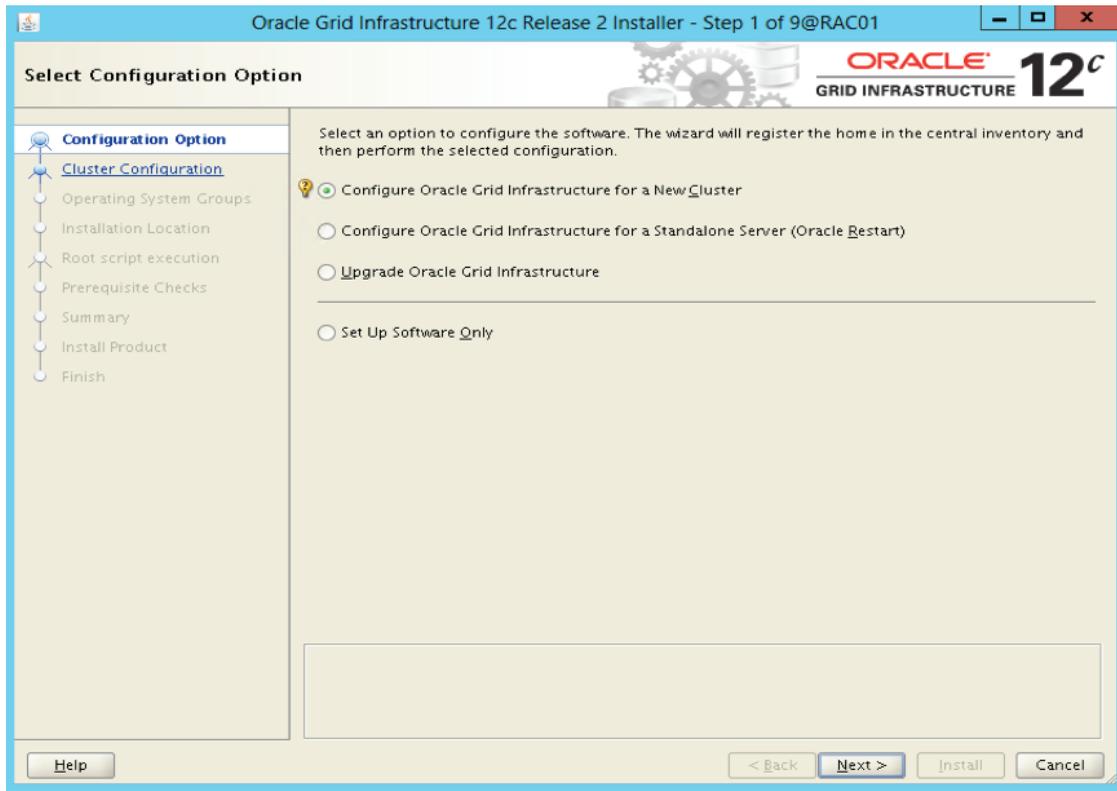
Restart the multipathd daemon

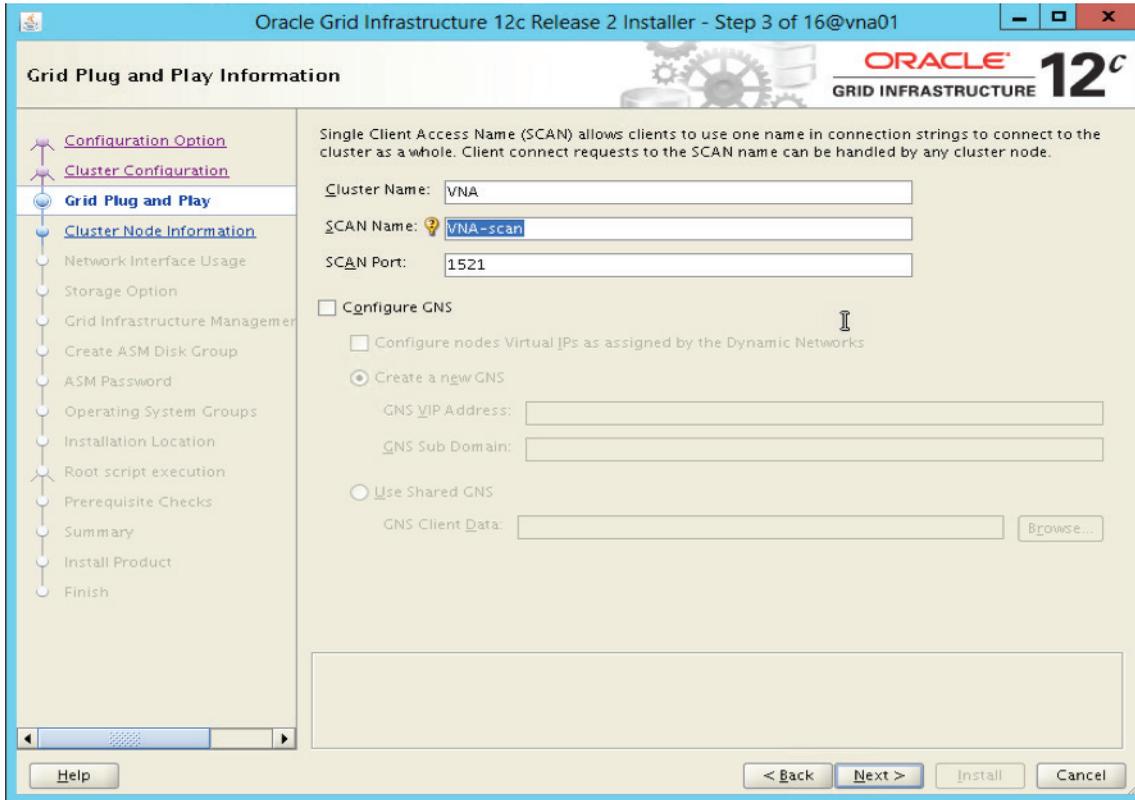
```
[root@RAC01 mapper]# systemctl restart multipathd
```

Now update the udev file

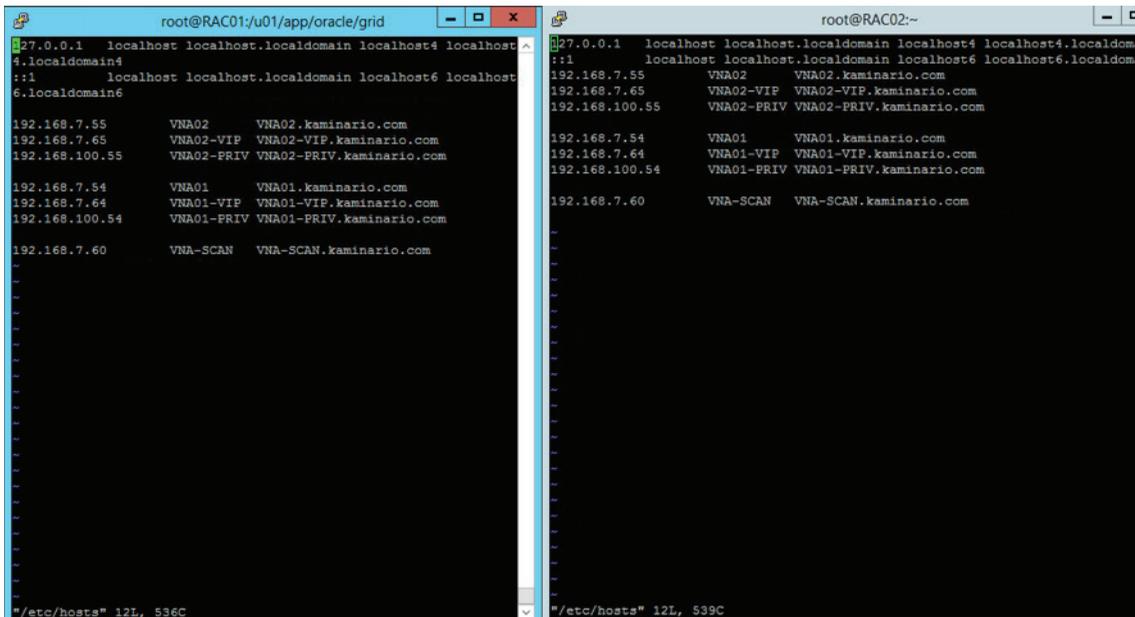
```
[root@RAC01 mapper]# cd /etc/udev/rules.d
[root@RAC01 rules.d]# ls -ltr
total 8
-rw-r--r--. 1 root root 709 Nov  4 2016 70-persistent-ipoib.rules
```

```
[root@RAC02 rules.d]# vi 12-dm-permissions.rules
ENV{DM_NAME}=="DATA1", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="DATA2", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="DATA3", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="DATA4", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="FRA1", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="FRA2", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="FRA3", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="FRA4", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="OCRVOTE1", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="OCRVOTE2", OWNER=="grid", GROUP=="dba", MODE=="660"
ENV{DM_NAME}=="OCRVOTE3", OWNER=="grid", GROUP=="dba", MODE=="660"
```

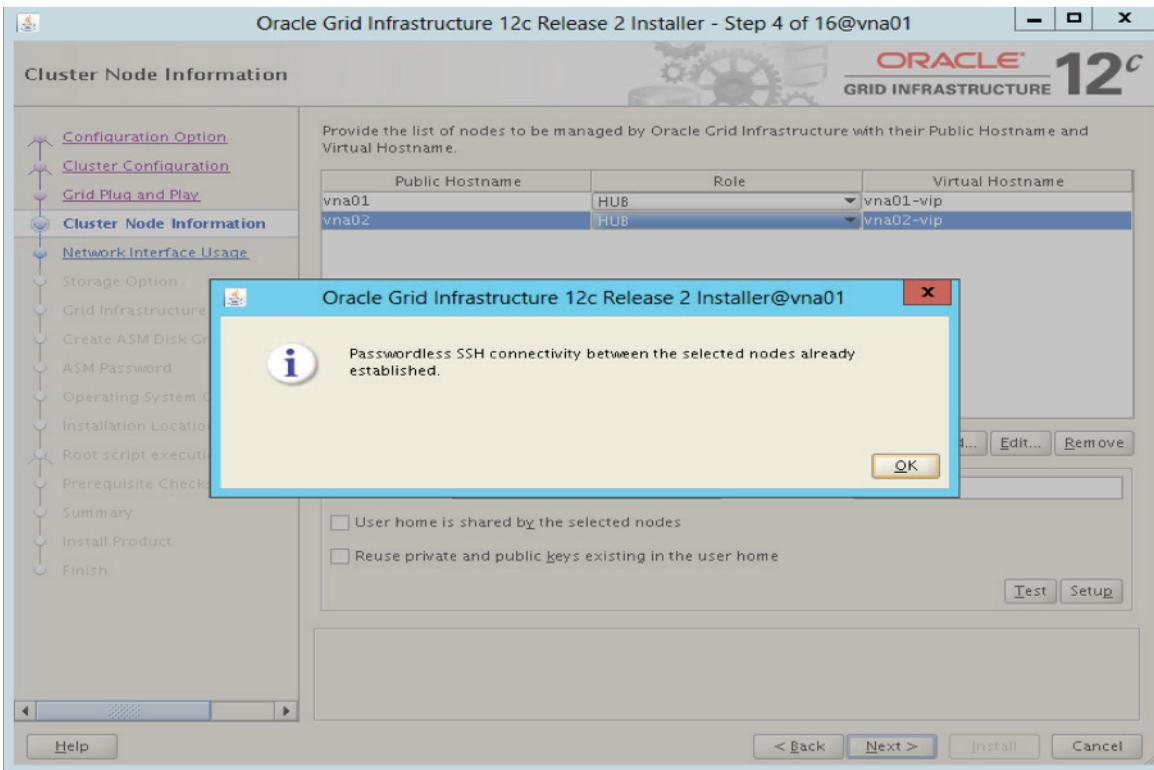
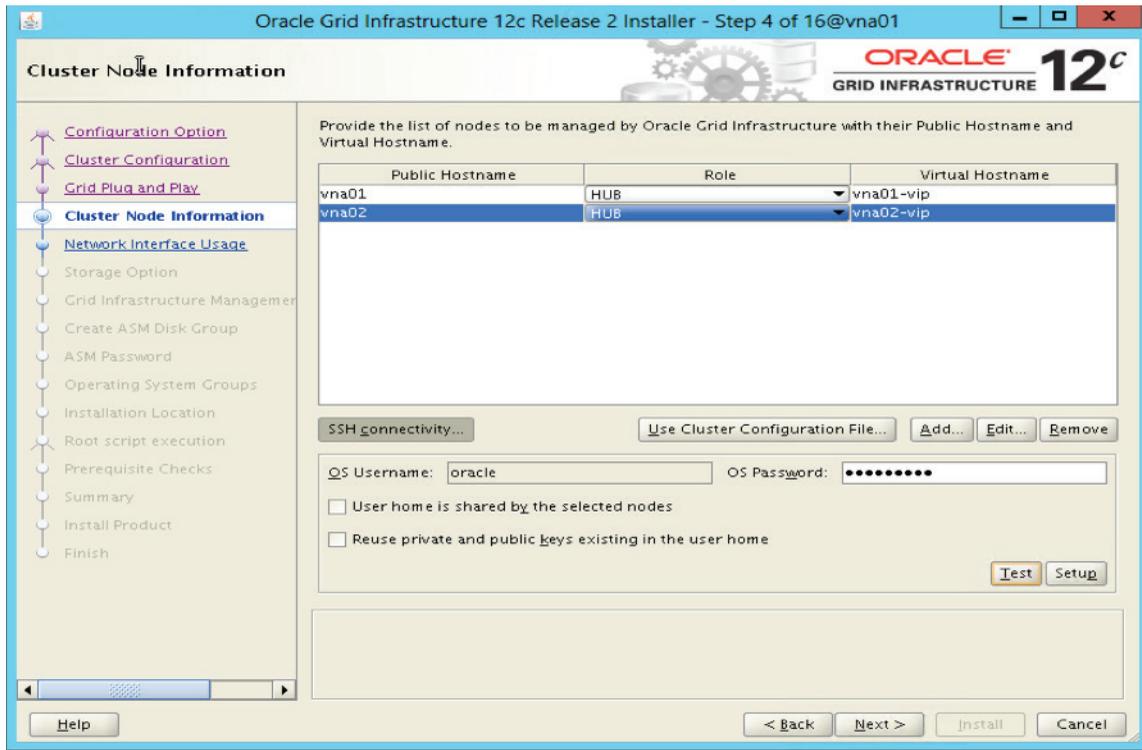





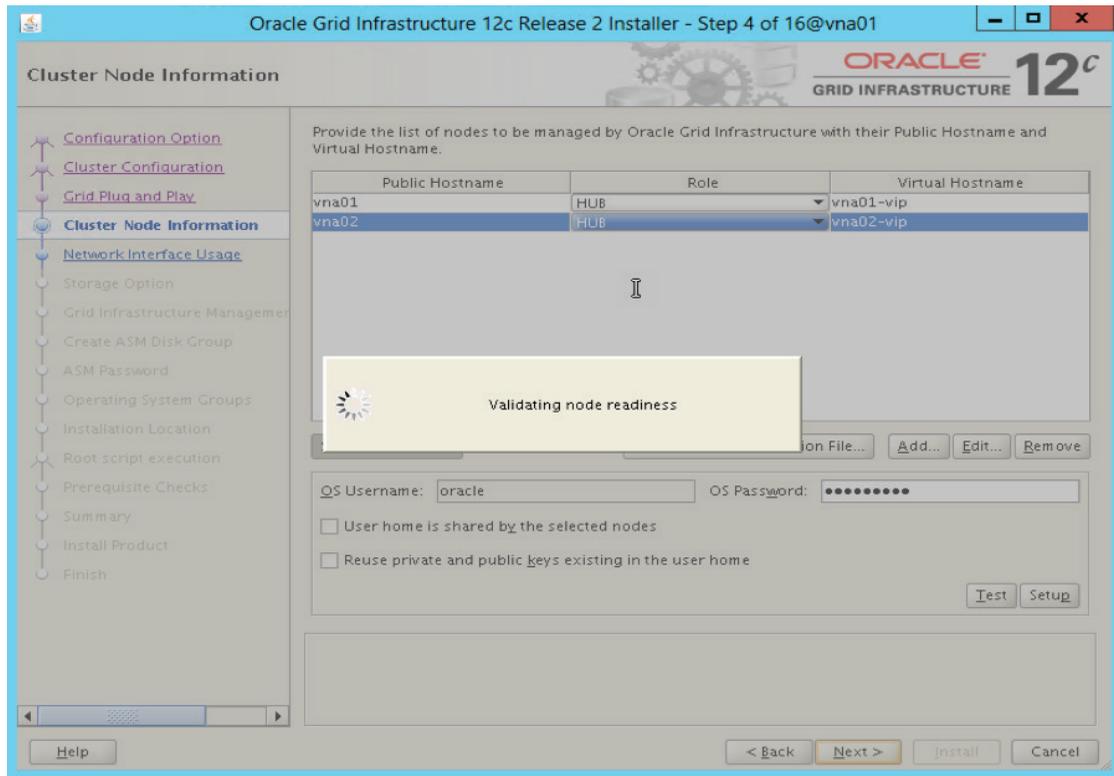
Select Next after setting up the values for the Cluster Name, Scan Name and Port address.



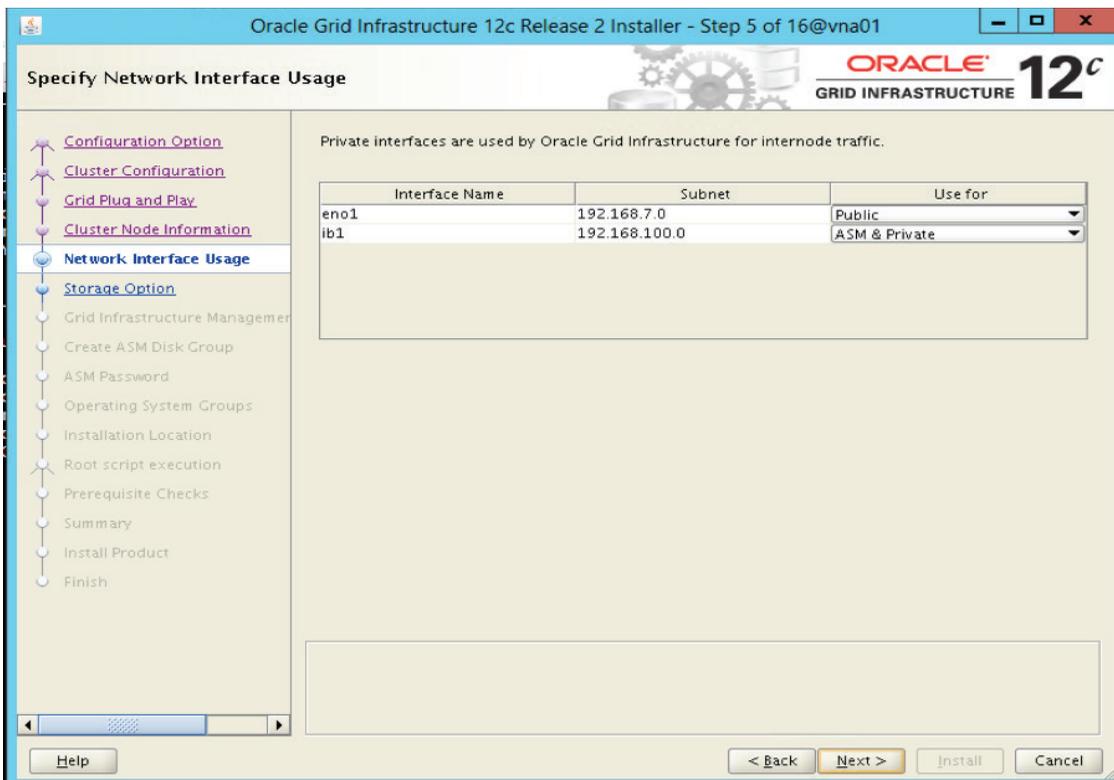
Now on the next screen add all the nodes and test the SSH connectivity as the GRID owner user. In our case it was "Oracle".



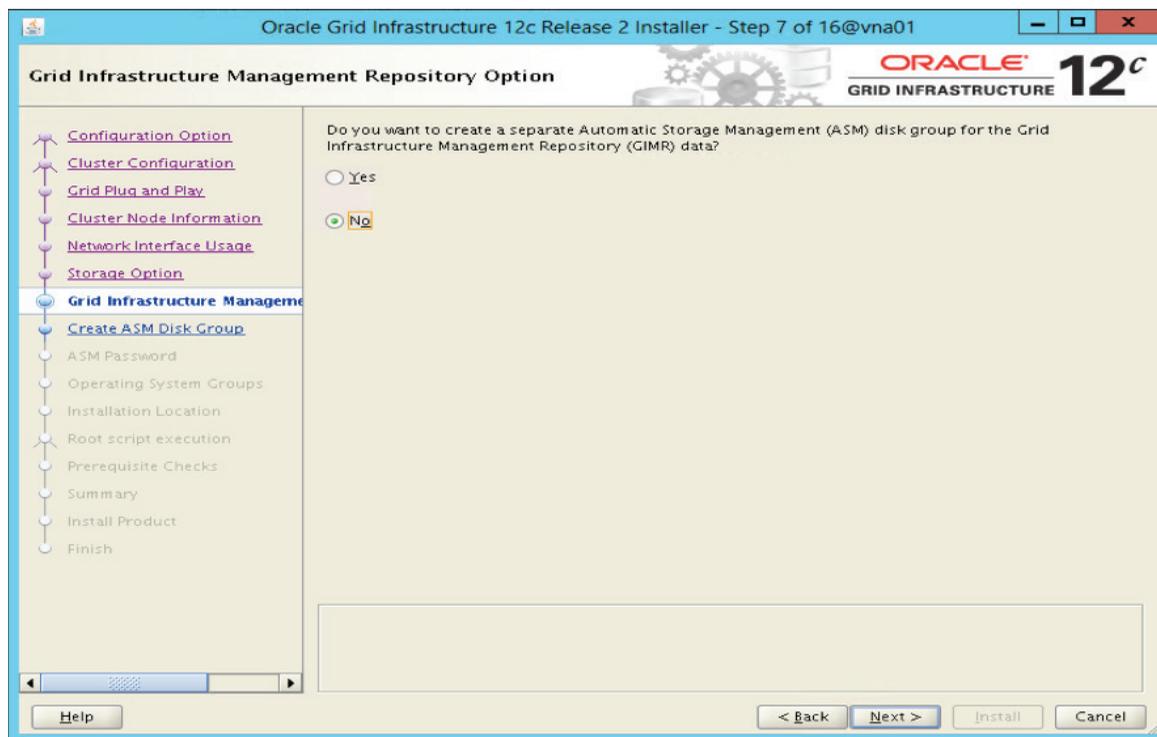
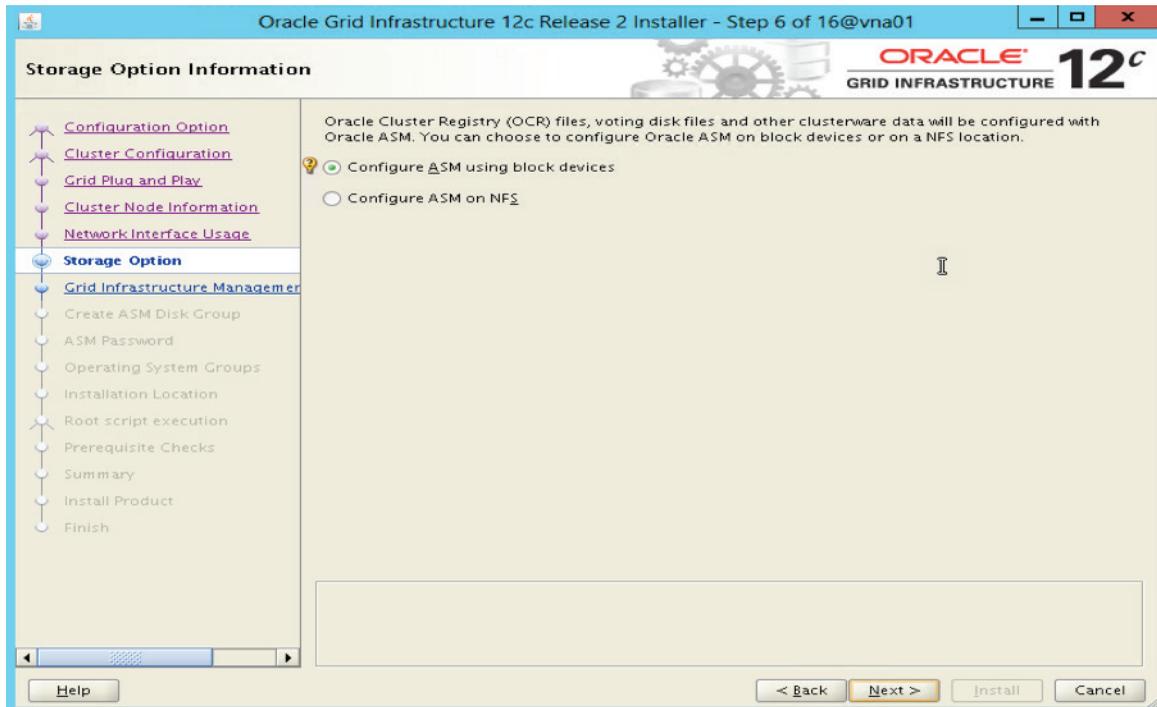
Press OK now and then press Next button.



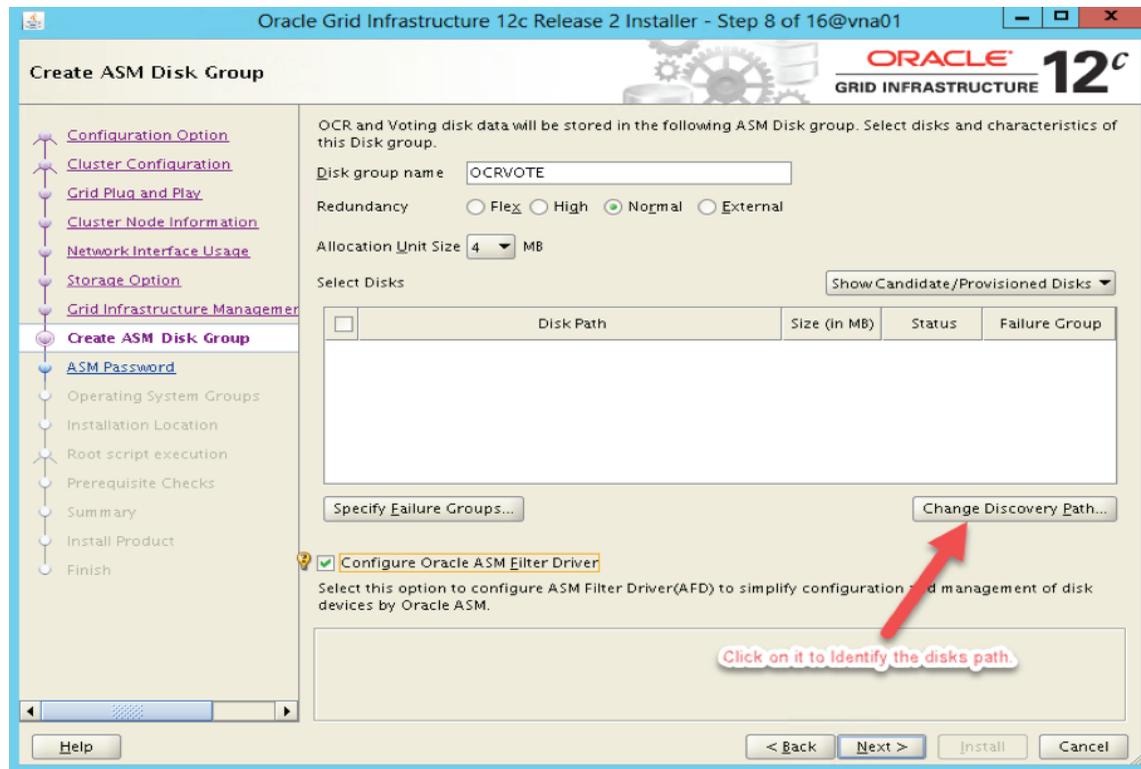
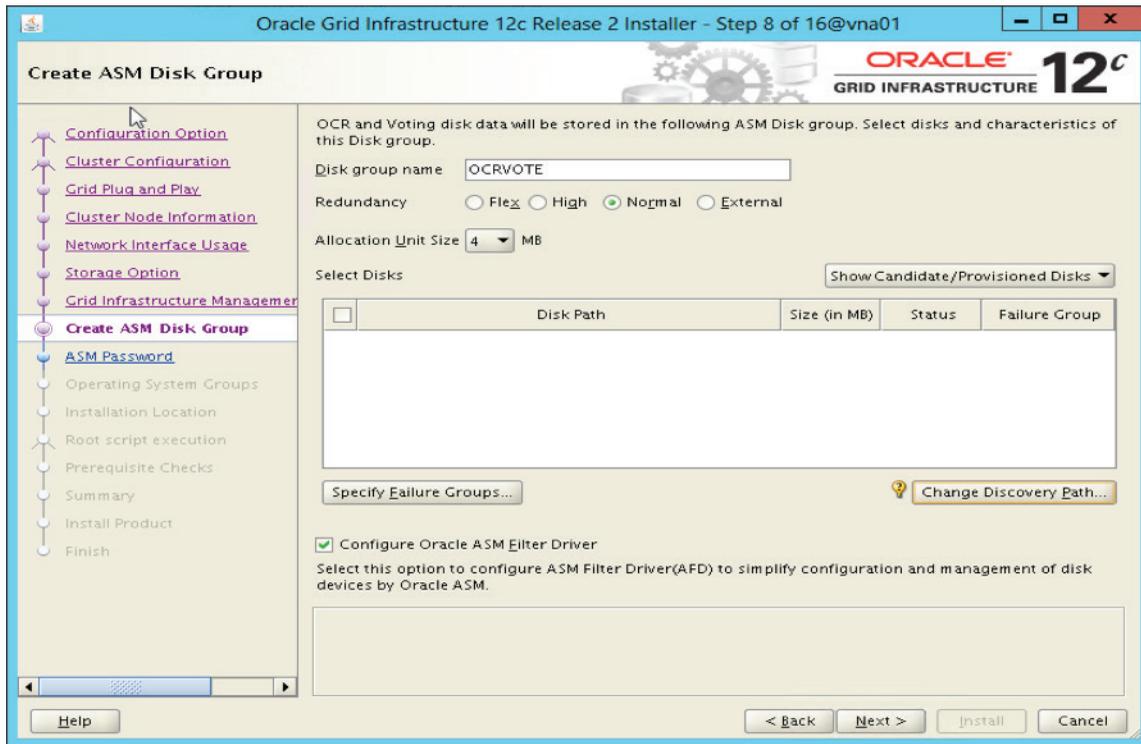
Once the Installer validates all the IP's.



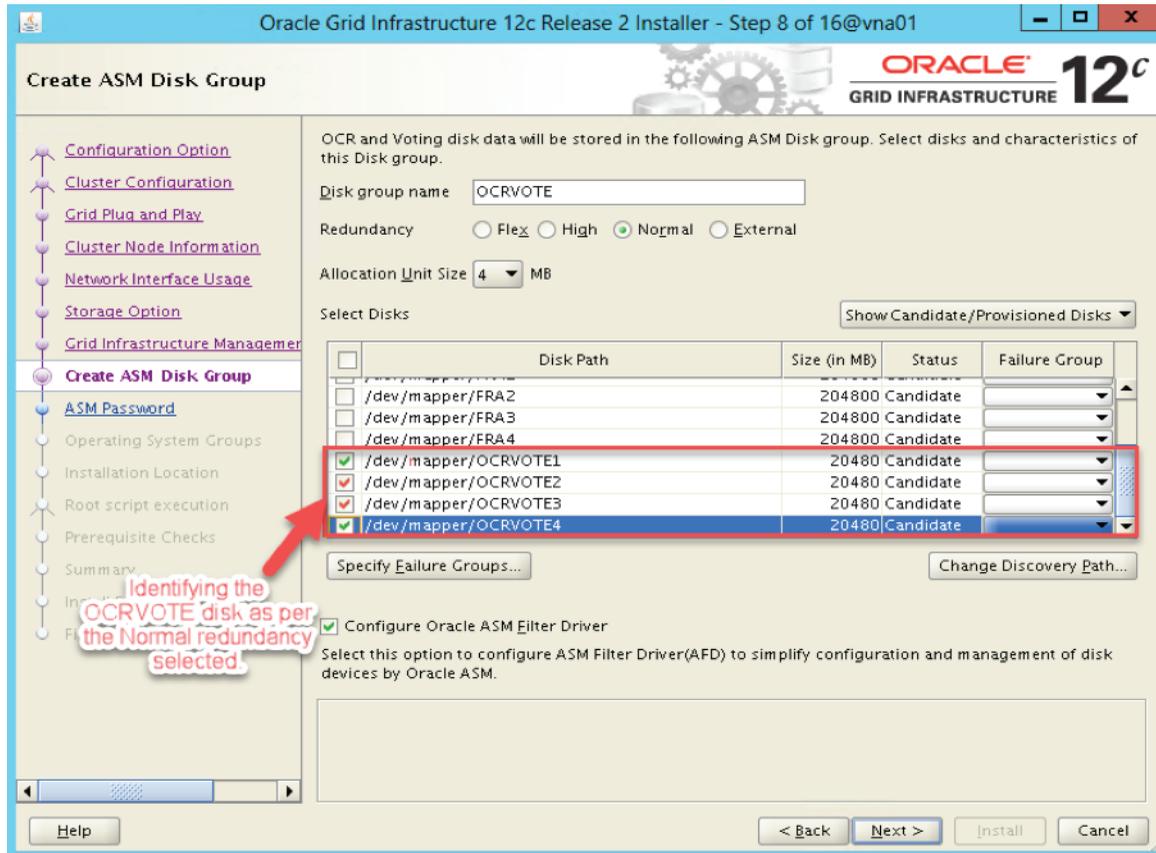
Now Press Next button:



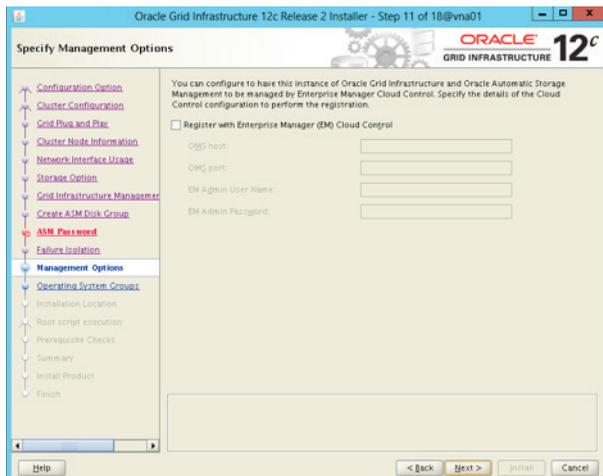
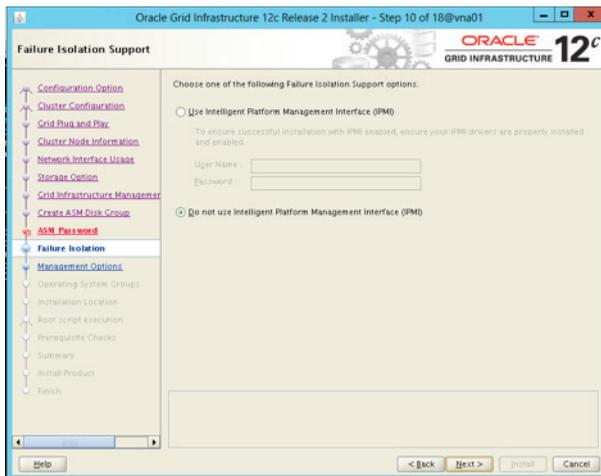
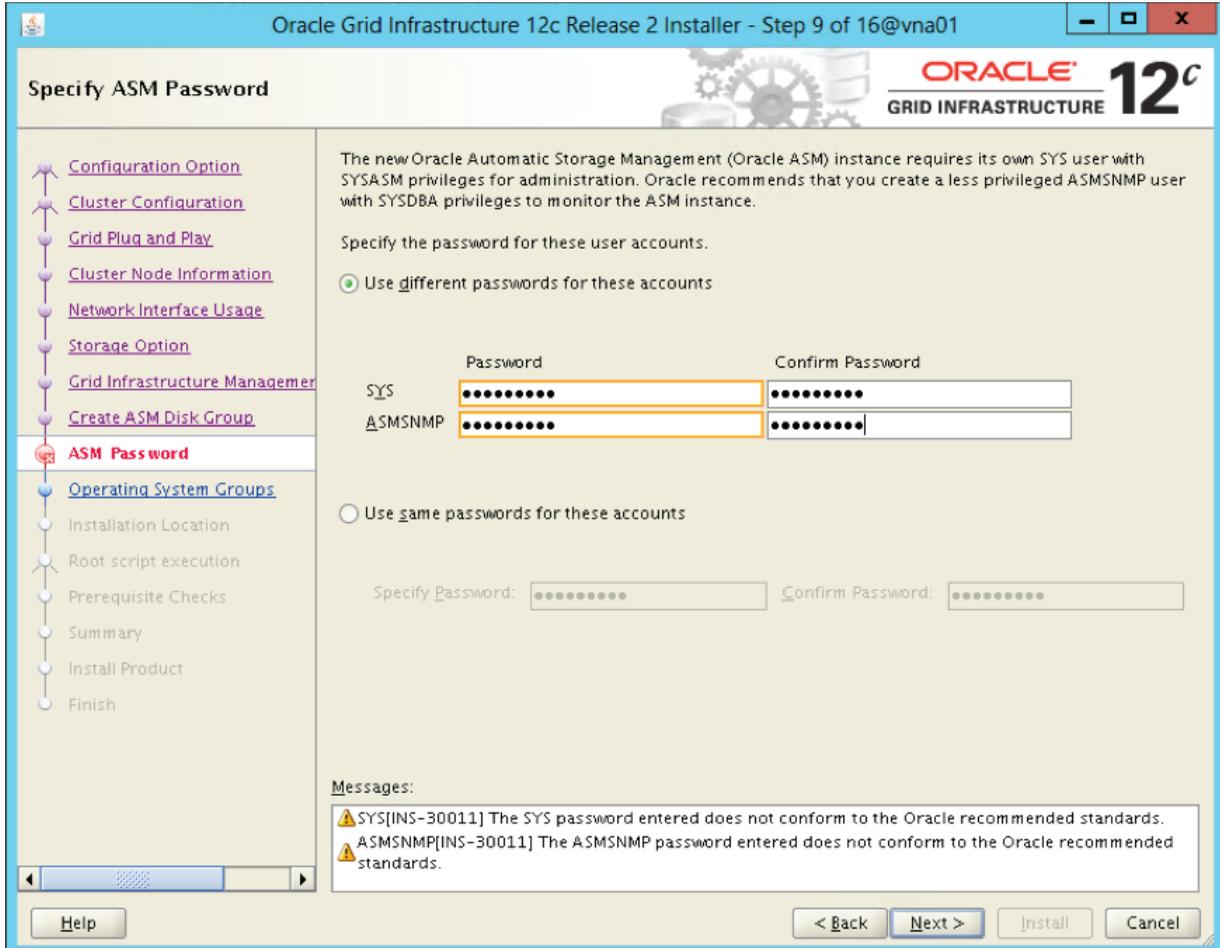
Now press Next button and configure the OCRVOTE disk.



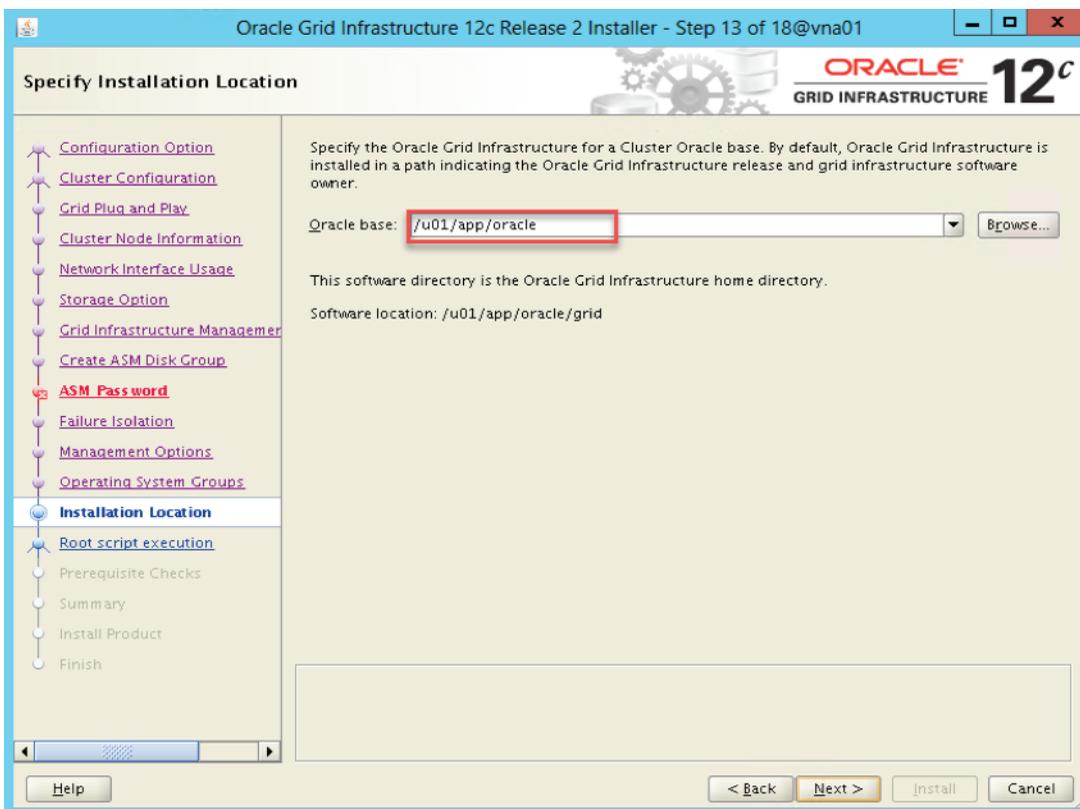
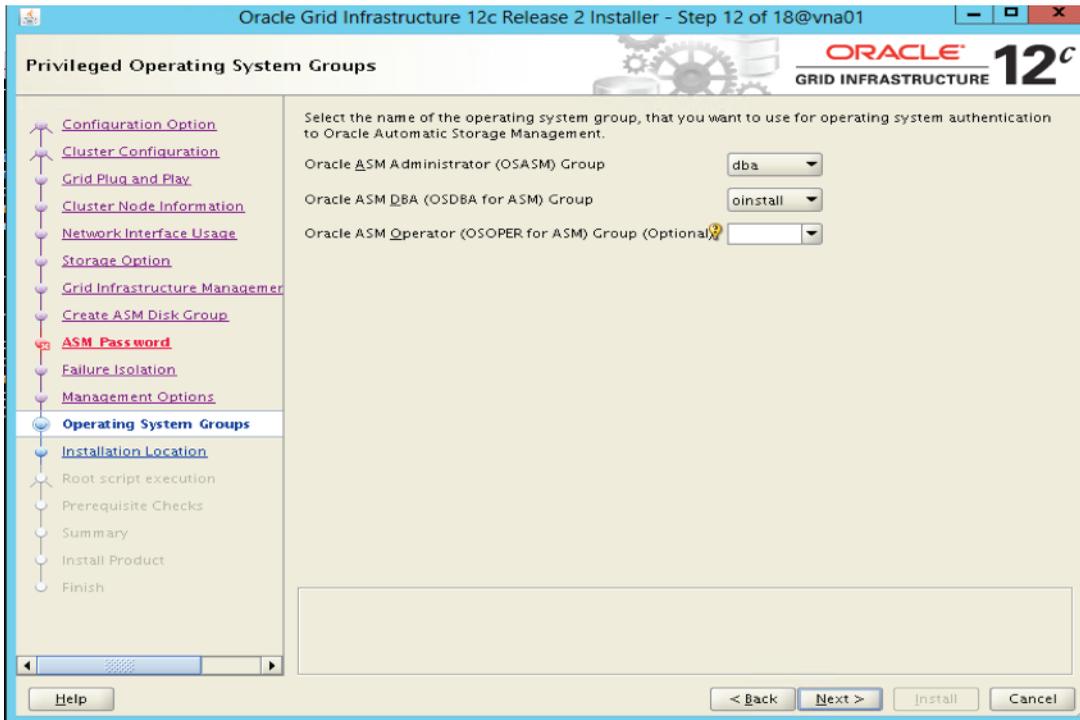
Identify the OCRVOTE disk from the next screen as per the Normal Redundancy selection:

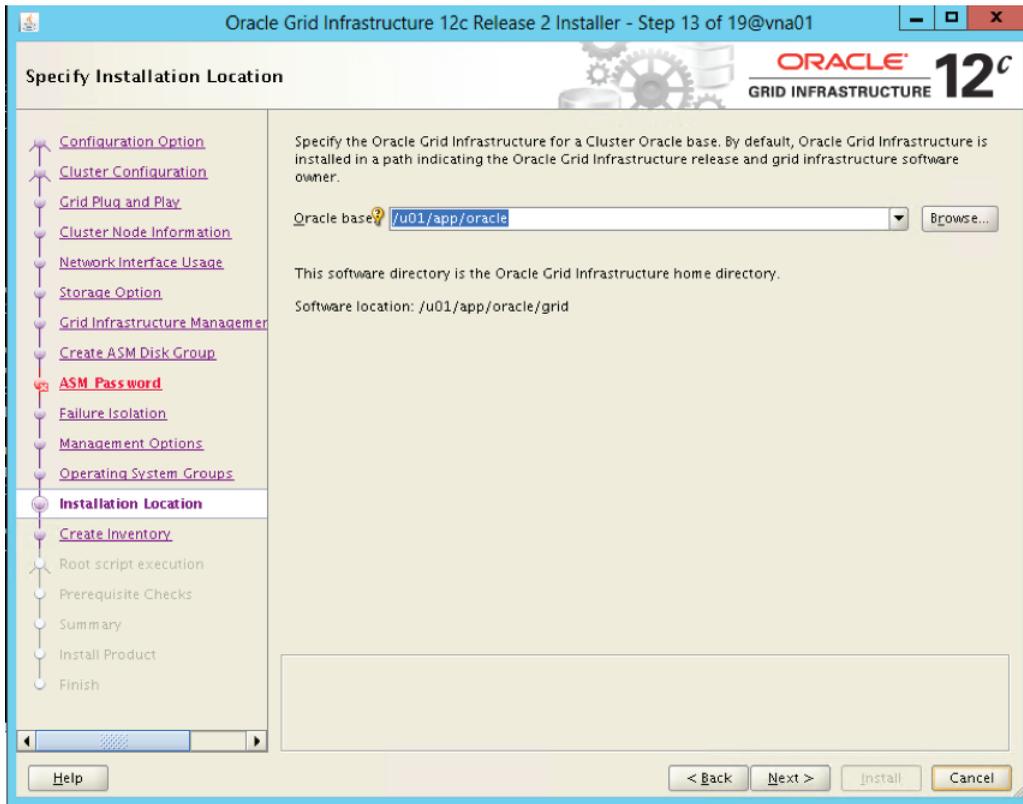


Provide the password :



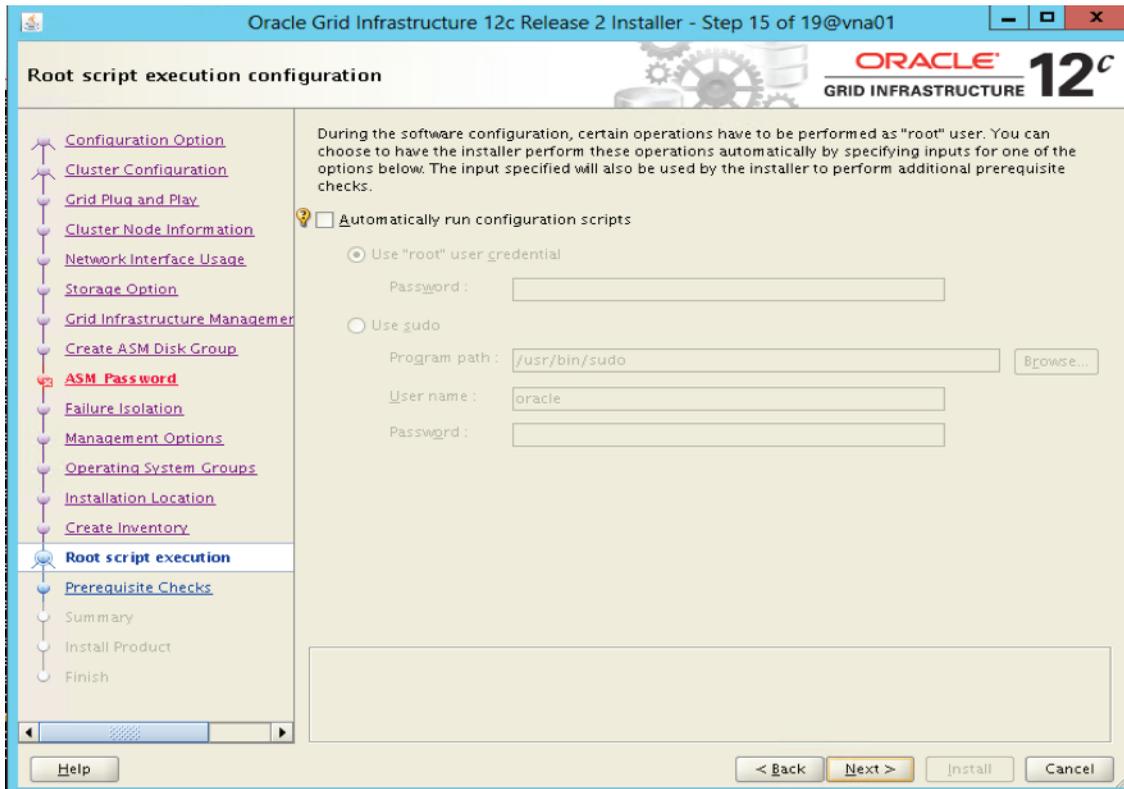
We do not have the Enterprise manager cloud control and hence excluding this option. If you have one then this is the place where we can configure it.



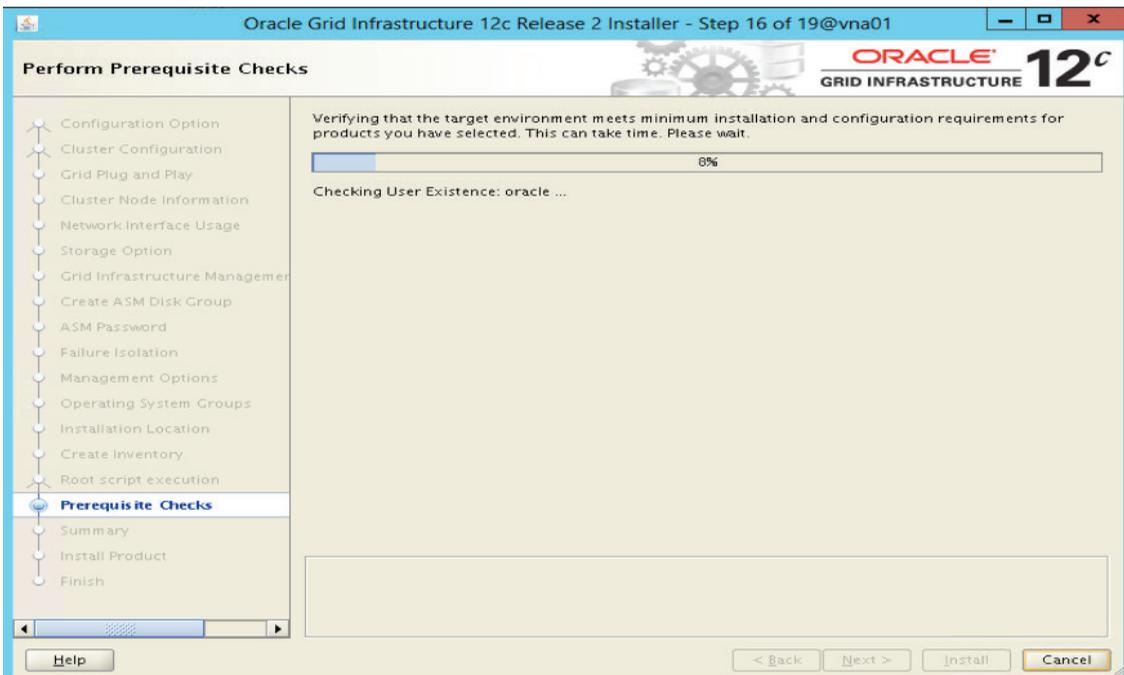


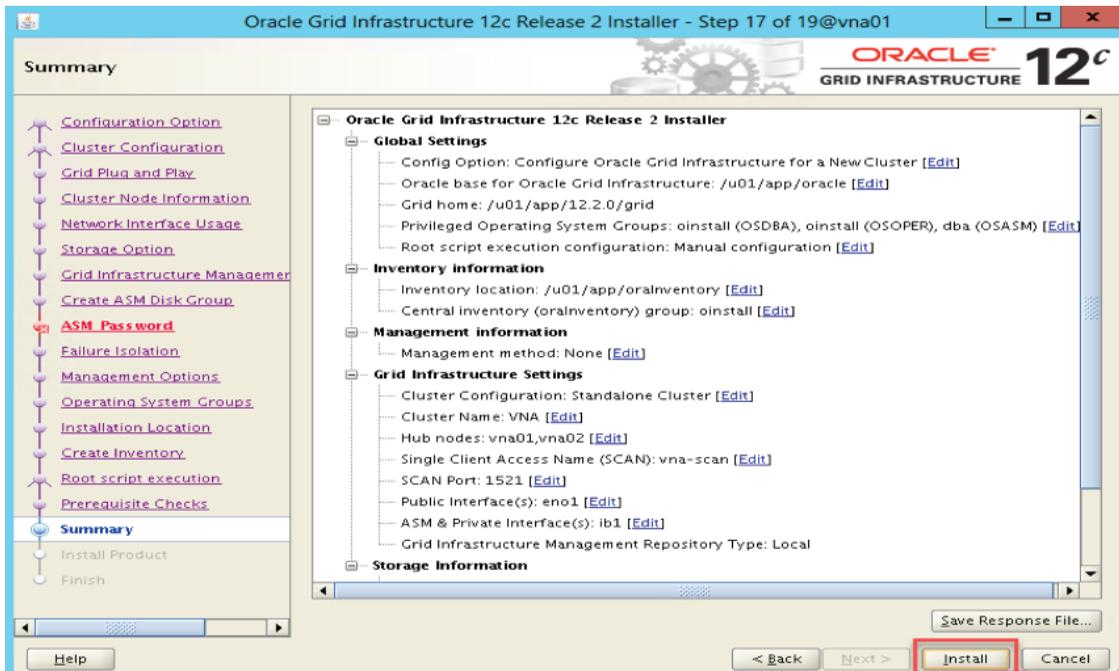
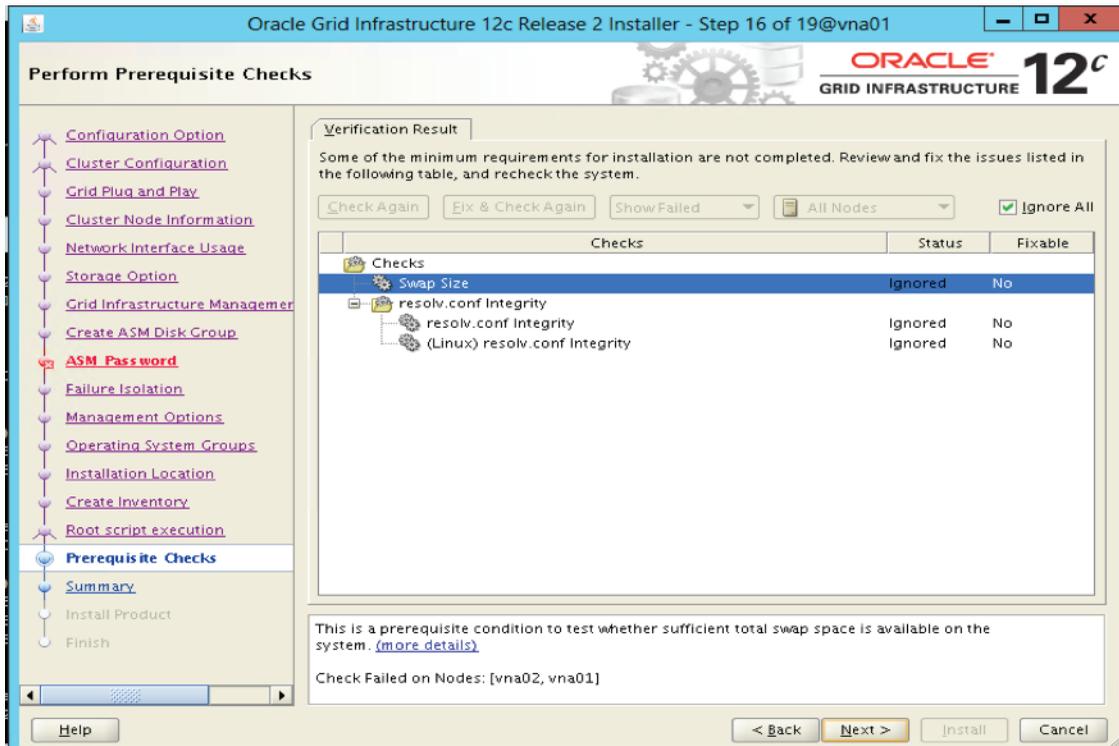
Setting up the orainventory location in the Installer.





Now Performing the Pre-Requirement Checks:





Click on the Install button to kick off the installer.

Install Product

ORACLE 12c GRID INFRASTRUCTURE

Progress: 44%

Saving Cluster Inventory

Status:

- Configure Local Node Succeeded
 - Prepare Succeeded
 - Link binaries Succeeded
 - Setup Succeeded
- Copy Files to Remote Nodes Succeeded
- Configure Remote Nodes Succeeded
 - Prepare Succeeded
 - Setup Succeeded
- Setup Oracle Base Succeeded
- Execute Root Scripts (Current Step)
 - Configure Oracle Grid Infra

Execute Configuration Scripts@vna01

The following configuration scripts need to be executed as the "root" user on each listed cluster node. Each script in the list below is followed by a list of nodes on which it has to be executed.

Scripts	Nodes
/u01/app/orainventory/orainstRoot.sh	vna01, vna02
/u01/app/12.2.0/grid/root.sh	vna01, vna02

To execute the configuration scripts:

1. Open a terminal window
2. Login as "root"
3. Run the scripts
4. Return to this window and click "OK" to continue

Run the script on the local node first. After successful completion, you can start the script in parallel on all other nodes.

Buttons: Help, OK, Cancel

Execute Configuration Scripts@vna01

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Scripts	Nodes
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/u01/app/12.2.0/grid/root.sh	vna01, vna02

To execute the configuration scripts:

1. Open a terminal window
2. Login as "root"
3. Run the scripts
4. Return to this window and click "OK" to continue

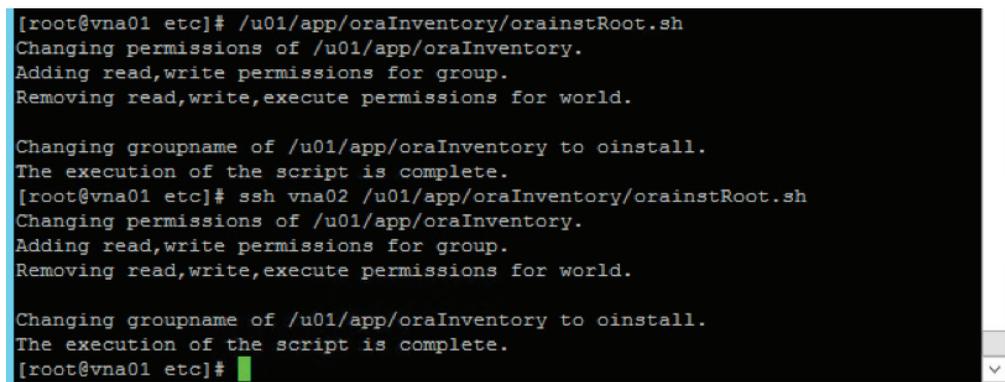
Run the script on the local node first. After successful completion, you can start the script in parallel on all other nodes.

Buttons: Help, OK, Cancel

```
[root@vna01 etc]# /u01/app/oraInventory/orainstRoot.sh
Changing permissions of /u01/app/oraInventory.
Adding read,write permissions for group.
Removing read,write,execute permissions for world.

Changing groupname of /u01/app/oraInventory to oinstall.
The execution of the script is complete.
[root@vna01 etc]# ssh vna02 /u01/app/oraInventory/orainstRoot.sh
Changing permissions of /u01/app/oraInventory.
Adding read,write permissions for group.
Removing read,write,execute permissions for world.

Changing groupname of /u01/app/oraInventory to oinstall.
The execution of the script is complete.
[root@vna01 etc]#
```

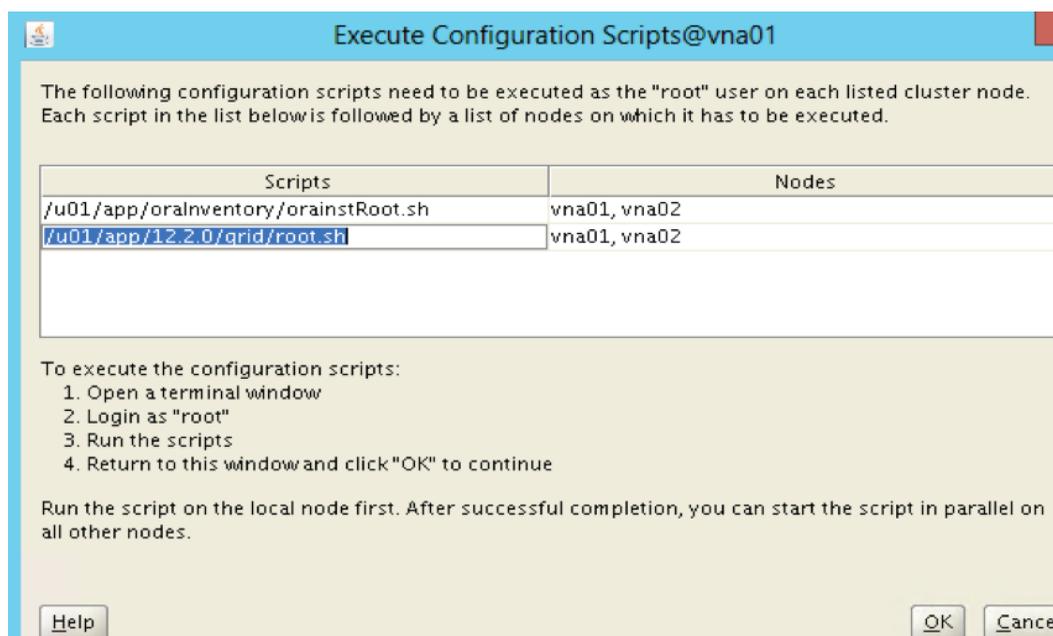


```
[root@vna01 etc]# /u01/app/oraInventory/orainstRoot.sh
Changing permissions of /u01/app/oraInventory.
Adding read,write permissions for group.
Removing read,write,execute permissions for world.

Changing groupname of /u01/app/oraInventory to oinstall.
The execution of the script is complete.
[root@vna01 etc]# ssh vna02 /u01/app/oraInventory/orainstRoot.sh
Changing permissions of /u01/app/oraInventory.
Adding read,write permissions for group.
Removing read,write,execute permissions for world.

Changing groupname of /u01/app/oraInventory to oinstall.
The execution of the script is complete.
[root@vna01 etc]#
```

Now run the second part i.e root.sh



Execute Configuration Scripts@vna01

The following configuration scripts need to be executed as the "root" user on each listed cluster node. Each script in the list below is followed by a list of nodes on which it has to be executed.

Scripts	Nodes
/u01/app/oraInventory/orainstRoot.sh	vna01, vna02
/u01/app/12.2.0/grid/root.sh	vna01, vna02

To execute the configuration scripts:

1. Open a terminal window
2. Login as "root"
3. Run the scripts
4. Return to this window and click "OK" to continue

Run the script on the local node first. After successful completion, you can start the script in parallel on all other nodes.

Buttons: Help, OK, Cancel

Now login as root on each node and run one after another in serial order.

To create a RAC database with Multitenant PDB, the following DBCA template can be used and customized to meet your specification:

```
$ cat /home/oracle/dbca_cdb_pdb.rsp
[GENERAL]
RESPONSEFILE_VERSION=12.2.0
[CREATEDATABASE]
OPERATION_TYPE=createDatabase
createAsContainerDatabase=true
TEMPLATENAME = "General_Purpose.dbc"
SYSPASSWORD = "vna123"
SYSPASSWORD = "vna123"
SYSMANPASSWORD = "vna123"
DBSNMPASSWORD = "vna123"
pdbAdminPassword = "vna123"
CHARACTERSET = "UTF8"
NATIONALCHARACTERSET= "UTF8"
createAsContainerDatabase="true"
pdbName="nvvpdb1"
numberOfPDBs="1"
sid="raccdb"
gdbName=" raccdb"
emConfiguration="DBEXPRESS"
storageType="ASM"
datafileDestination="VNADATA"

$ dbca -silent -createDatabase -responseFile //home/oracle/dbca_cdb_pdb.rsp
```

In this section we will describe how to apply the steps that we went thru to apply the Grid Infrastructure Jul2017 Release Update 12.2.0.1.170718, Patch 26133434.

The Grid Infrastructure Jul2017 Release Update (RU) 12.2.0.1.170718 includes updates for both the Clusterware home and Database home that can be applied in a rolling fashion.

In this blog post we have updated both nodes GI and DB stack.

The details and execution for Node1 are repeated and presented here for Node2 as well.

Configuration: 2 Node RAC cluster on Kaminario K2 AFA.

Patch 26133434 - Grid Infrastructure Jul2017 Release Update 12.2.0.1.170718

Step 1) Upgrade the Opatch version to atleast (12.2.0.1.7). We need to upgrade the OPatch version at GI and DB Homes on all the nodes.

```
[root@vna02 grid]# cd OPatch
[root@vna02 OPatch]# ./opatch version
OPatch Version: 12.2.0.1.9   → Grid Home
OPatch succeeded.
[oracle      @vna01 dbhome_1]$ opatch version
OPatch Version: 12.2.0.1.9   → Database Home
```

Step 2) Patch conflict check:

Node 1 :

```
[oracle@vna01 GI]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir
/home/oracle/software/patches/DB-GI-RU/GI/26133434/26123830
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.
```

PREREQ session

```
Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
  from            : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-20_18-43-33PM_1.log
```

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.

```
[oracle@vna01 GI]$
[oracle@vna01 GI]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir
/home/oracle/software/patches/DB-GI-RU/GI/26133434/26002778
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.
```

PREREQ session

```
Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
  from           : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-20_19-
01-04PM_1.log

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.
[oracle@vna01 GI]$
[oracle@vna01 GI]$
```

From the Database Home :

```
[oracle@vna01 GI]$ . oraenv
ORACLE_SID = [VNADB1] ? VNADB1
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@vna01 GI]$ cd $ORACLE_HOME/OPatch
[oracle@vna01 OPatch]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
-phBaseDir /home/oracle/software/patches/DB-GI-RU/GI/26133434/26123830
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.

PREREQ session

Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
  from           : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-20_19-
03-12PM_1.log

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.
[oracle@vna01 OPatch]$
[oracle@vna01 OPatch]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
-phBaseDir /home/oracle/software/patches/DB-GI-RU/GI/26133434/26002778
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.

PREREQ session

Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
  from           : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-20_19-
03-25PM_1.log
```

```
Invoking prereq "checkconflictagainsthwithdetail"
```

```
Prereq "checkConflictAgainstOHWithDetail" passed.
```

```
OPatch succeeded.
```

```
[oracle@vna01 OPatch]$
```

One-off Patch Conflict Detection and Resolution

```
[root@vna01 OPatch]# $ORACLE_HOME/OPatch/patchauto apply /home/oracle/software/patches/DB-GI-RU/GI/26133434 -analyze
```

```
OPatchauto session is initiated at Wed Sep 20 19:53:25 2017
```

```
System initialization log file is /u01/app/12.2.0/grid/cfgtoollogs/patchautodb/systemconfig2017-09-20_07-53-27PM.log.
```

```
Session log file is /u01/app/12.2.0/grid/cfgtoollogs/patchauto/patchauto2017-09-20_07-53-48PM.log
```

```
The id for this session is QWPL
```

```
Executing OPatch prereq operations to verify patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Executing OPatch prereq operations to verify patch applicability on home /u01/app/12.2.0/grid  
Patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Patch applicability verified successfully on home /u01/app/12.2.0/grid
```

```
Verifying SQL patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Following step failed during analysis:
```

```
/bin/sh -c 'ORACLE_HOME=/u01/app/oracle/product/12.2.0/dbhome_1 ORACLE_SID=VNADB1 /u01/app/oracle/product/12.2.0/dbhome_1/OPatch/datapatch -prereq'
```

```
SQL patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
OPatchAuto successful.
```

Summary

Analysis for applying patches has completed successfully:

```
Host:vna01
```

```
RAC Home:/u01/app/oracle/product/12.2.0/dbhome_1
```

```
==Following patches were SKIPPED:
```

```
Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/25586399
```

```
Reason: This patch is not applicable to this specified target type - "rac_database"
```

```
==Following patches were SUCCESSFULLY analyzed to be applied:
```

```
Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26002778
```

```
Log:
/u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/patchauto/core/patch/patch2017-09-20_19-53-51PM_1.log

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26123830
Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/patchauto/core/patch/patch2017-09-20_19-53-51PM_1.log

Host:vna01
CRS Home:/u01/app/12.2.0/grid

==Following patches were SUCCESSFULLY analyzed to be applied:

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26002778
Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-20_19-53-51PM_1.log

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/25586399
Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-20_19-53-51PM_1.log

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26123830
Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-20_19-53-51PM_1.log

OPatchauto session completed at Wed Sep 20 19:57:09 2017
Time taken to complete the session 3 minutes, 44 seconds
[root@vna01 OPatch]#
```

Now OPatchauto Apply process:

```
[root@vna01 OPatch]# $ORACLE_HOME/OPatch/patchauto apply /home/oracle/software/patches/DB-GI-RU/GI/26133434

OPatchauto session is initiated at Wed Sep 20 20:18:27 2017

System initialization log file is /u01/app/12.2.0/grid/cfgtoollogs/patchautodb/systemconfig2017-09-20_08-18-28PM.log.

Session log file is /u01/app/12.2.0/grid/cfgtoollogs/patchauto/patchauto2017-09-20_08-18-50PM.log
The id for this session is CNCU

Executing OPatch prereq operations to verify patch applicability on home /u01/app/12.2.0/grid

Executing OPatch prereq operations to verify patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
Patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1

Patch applicability verified successfully on home /u01/app/12.2.0/grid

Verifying SQL patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
"/bin/sh -c 'ORACLE_HOME=/u01/app/oracle/product/12.2.0/dbhome_1 ORACLE_SID=VNADB1 /u01/app/oracle/product/12.2.0/dbhome_1/OPatch/datapatch -prereq'" command failed with errors. Please refer to logs for more details. SQL changes, if any, can be analyzed by manually retrying the same command.
```

SQL patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1

Preparing to bring down database service on home /u01/app/oracle/product/12.2.0/dbhome_1
Successfully prepared home /u01/app/oracle/product/12.2.0/dbhome_1 to bring down database service

Bringing down CRS service on home /u01/app/12.2.0/grid
Prepatch operation log file location: /u01/app/oracle/crsdata/vna01/crsconfig/crspatch_vna01_2017-09-20_08-22-15PM.log
CRS service brought down successfully on home /u01/app/12.2.0/grid

Performing prepatch operation on home /u01/app/oracle/product/12.2.0/dbhome_1
Perpatch operation completed successfully on home /u01/app/oracle/product/12.2.0/dbhome_1

Start applying binary patch on home /u01/app/oracle/product/12.2.0/dbhome_1
Binary patch applied successfully on home /u01/app/oracle/product/12.2.0/dbhome_1

Performing postpatch operation on home /u01/app/oracle/product/12.2.0/dbhome_1
Postpatch operation completed successfully on home /u01/app/oracle/product/12.2.0/dbhome_1

Start applying binary patch on home /u01/app/12.2.0/grid
Binary patch applied successfully on home /u01/app/12.2.0/grid

Starting CRS service on home /u01/app/12.2.0/grid
Postpatch operation log file location: /u01/app/oracle/crsdata/vna01/crsconfig/crspatch_vna01_2017-09-20_08-27-01PM.log
CRS service started successfully on home /u01/app/12.2.0/grid

Preparing home /u01/app/oracle/product/12.2.0/dbhome_1 after database service restarted
No step execution required.....
Prepared home /u01/app/oracle/product/12.2.0/dbhome_1 successfully after database service restarted

Trying to apply SQL patch on home /u01/app/oracle/product/12.2.0/dbhome_1
"/bin/sh -c 'ORACLE_HOME=/u01/app/oracle/product/12.2.0/dbhome_1 ORACLE_SID=VNADB1 /u01/app/oracle/product/12.2.0/dbhome_1/OPatch/datapatch'" command failed with errors. Please refer to logs for more details. SQL changes, if any, can be applied by manually retrying the same command.

SQL patch applied successfully on home /u01/app/oracle/product/12.2.0/dbhome_1

OPatchAuto successful.

Summary

Patching is completed successfully. Please find the summary as follows:

Host:vna01

RAC Home:/u01/app/oracle/product/12.2.0/dbhome_1

Summary:

==Following patches were SKIPPED:

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/25586399

Reason: This patch is not applicable to this specified target type - "rac_database"

==Following patches were SUCCESSFULLY applied:

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26002778

Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/patchauto/core/patch/patch2017-09-20_20-23-57PM_1.log

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26123830

Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/patchauto/core/patch/patch2017-09-20_20-23-57PM_1.log

Host:vna01

CRS Home:/u01/app/12.2.0/grid

Summary:

==Following patches were SUCCESSFULLY applied:

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26002778

Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-20_20-24-44PM_1.log

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/25586399

Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-20_20-24-44PM_1.log

Patch: /home/oracle/software/patches/DB-GI-RU/GI/26133434/26123830

Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-20_20-24-44PM_1.log

OPatchauto session completed at Wed Sep 20 20:34:23 2017

Time taken to complete the session 15 minutes, 56 seconds

[root@vna01 OPatch]#

LsInventory Output:

```
[oracle@vna01 OPatch]$ opatch lsinventory
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.

Oracle Home      : /u01/app/12.2.0/grid
Central Inventory : /u01/app/oraInventory
  from            : /u01/app/12.2.0/grid/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/12.2.0/grid/cfgtoollogs/opatch/opatch2017-09-20_20-38-46PM_1.log

Lsinventory Output file location : /u01/app/12.2.0/grid/cfgtoollogs/opatch/lsinv/lsinventory2017-09-20_20-38-46PM.txt
```

Local Machine Information::

```
Hostname: vna01
ARU platform id: 226
ARU platform description:: Linux x86-64

Installed Top-level Products (1):

Oracle Grid Infrastructure 12c                               12.2.0.1.0
There are 1 products installed in this Oracle Home.

Interim patches (3) :

Patch 26123830      : applied on Wed Sep 20 20:26:39 BST 2017
Unique Patch ID: 21405588
Patch description: "DATABASE RELEASE UPDATE: 12.2.0.1.170718 (26123830)"
  Created on 7 Jul 2017, 00:33:59 hrs PST8PDT
  Bugs fixed:
    23026585, 24336249, 24929210, 24942749, 25036474, 25110233, 25410877
    25417050, 25427662, 25459958, 25547901, 25569149, 25600342, 25600421
    25606091, 25655390, 25662088, 24385983, 24923215, 25099758, 25429959
    25662101, 25728085, 25823754, 22594071, 23665623, 23749454, 24326846
    24334708, 24560906, 24573817, 24578797, 24609996, 24624166, 24668398
    24674955, 24744686, 24811725, 24827228, 24831514, 24908321, 24976007
    25184555, 25210499, 25211628, 25223839, 25262869, 25316758, 25337332
    25455795, 25457409, 25539063, 25546608, 25612095, 25643931, 25410017
    22729345, 24485174, 24509056, 24714096, 25329664, 25410180, 25607726
    25957038, 25973152, 26024732, 24376878, 24589590, 24676172, 23548817
    24796092, 24907917, 25044977, 25736747, 25766822, 25856821, 25051628
    24534401, 24835919, 25050160, 25395696, 25430120, 25616359, 25715167
    25967985
```

Patch 25586399 : applied on Wed Sep 20 20:26:17 BST 2017
 Unique Patch ID: 21306685
 Patch description: "ACFS Patch Set Update : 12.2.0.1.170718 (25586399)"
 Created on 16 Jun 2017, 00:35:19 hrs PST8PDT
 Bugs fixed:
 24679041, 24964969, 25098392, 25078431, 25491831

Patch 26002778 : applied on Wed Sep 20 20:25:26 BST 2017
 Unique Patch ID: 21306682
 Patch description: "OCW Patch Set Update : 12.2.0.1.170718 (26002778)"
 Created on 3 Jul 2017, 03:26:30 hrs PST8PDT
 Bugs fixed:
 26144044, 25541343, 25715179, 25493588, 24932026, 24801915, 25832375
 25728787, 25825732, 24578464, 25832312, 25742471, 25790699, 25655495
 25307145, 25485737, 25505841, 25697364, 24663993, 25026470, 25591658
 25537905, 24451580, 25409838, 25371632, 25569634, 25245759, 24665035
 25646592, 25025157, 24732650, 24664849, 24584419, 24423011, 24831158
 25037836, 25556203, 24464953, 24657753, 25197670, 24796183, 20559126
 25197395, 24808260

 OPatch succeeded.

[oracle@vna01 OPatch]

From the Database Home :

[oracle@vna01 OPatch]\$. oraenv

ORACLE_SID = [+ASM1] ? VNADB1

The Oracle base remains unchanged with value /u01/app/oracle

[oracle@vna01 OPatch]\$ export PATH=\$ORACLE_HOME/OPatch:\$PATH

[oracle@vna01 OPatch]\$ which opatch

/u01/app/oracle/product/12.2.0/dbhome_1/OPatch/patch

[oracle@vna01 OPatch]\$ opatch lsinventory

Oracle Interim Patch Installer version 12.2.0.1.9

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Oracle Home : /u01/app/oracle/product/12.2.0/dbhome_1

Central Inventory : /u01/app/oraInventory

from : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc

OPatch version : 12.2.0.1.9

OUI version : 12.2.0.1.4

Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/patch/patch2017-09-20_20-40-03PM_1.log

Lsinventory Output file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/patch/lsinv/lsinventory2017-09-20_20-40-03PM.txt

Local Machine Information::

Hostname: vna01
ARU platform id: 226
ARU platform description:: Linux x86-64

Installed Top-level Products (1):

Oracle Database 12c 12.2.0.1.0

There are 1 products installed in this Oracle Home.

Interim patches (2) :

Patch 26123830 : applied on Wed Sep 20 20:24:26 BST 2017
Unique Patch ID: 21405588
Patch description: "DATABASE RELEASE UPDATE: 12.2.0.1.170718 (26123830)"
Created on 7 Jul 2017, 00:33:59 hrs PST8PDT
Bugs fixed:
23026585, 24336249, 24929210, 24942749, 25036474, 25110233, 25410877
25417050, 25427662, 25459958, 25547901, 25569149, 25600342, 25600421
25606091, 25655390, 25662088, 24385983, 24923215, 25099758, 25429959
25662101, 25728085, 25823754, 22594071, 23665623, 23749454, 24326846
24334708, 24560906, 24573817, 24578797, 24609996, 24624166, 24668398
24674955, 24744686, 24811725, 24827228, 24831514, 24908321, 24976007
25184555, 25210499, 25211628, 25223839, 25262869, 25316758, 25337332
25455795, 25457409, 25539063, 25546608, 25612095, 25643931, 25410017
22729345, 24485174, 24509056, 24714096, 25329664, 25410180, 25607726
25957038, 25973152, 26024732, 24376878, 24589590, 24676172, 23548817
24796092, 24907917, 25044977, 25736747, 25766822, 25856821, 25051628
24534401, 24835919, 25050160, 25395696, 25430120, 25616359, 25715167
25967985

Patch 26002778 : applied on Wed Sep 20 20:24:11 BST 2017
Unique Patch ID: 21306682
Patch description: "OCW Patch Set Update : 12.2.0.1.170718 (26002778)"
Created on 3 Jul 2017, 03:26:30 hrs PST8PDT
Bugs fixed:
26144044, 25541343, 25715179, 25493588, 24932026, 24801915, 25832375
25728787, 25825732, 24578464, 25832312, 25742471, 25790699, 25655495
25307145, 25485737, 25505841, 25697364, 24663993, 25026470, 25591658
25537905, 24451580, 25409838, 25371632, 25569634, 25245759, 24665035
25646592, 25025157, 24732650, 24664849, 24584419, 24423011, 24831158
25037836, 25556203, 24464953, 24657753, 25197670, 24796183, 20559126
25197395, 24808260

OPatch succeeded.
[oracle@vna01 OPatch]\$

Node 2 :

Run OPatch Conflict Check

From GI Home:

```
[oracle@vna02 patches]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
-phBaseDir /home/oracle/patches/26133434/26123830
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.
```

PREREQ session

```
Oracle Home      : /u01/app/12.2.0/grid
Central Inventory : /u01/app/oraInventory
  from           : /u01/app/12.2.0/grid/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/12.2.0/grid/cfgtoollogs/opatch/opatch2017-09-20_20-48-20PM_1.log
```

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.

```
[oracle@vna02 patches]$
[oracle@vna02 patches]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
-phBaseDir /home/oracle/patches/26133434/26002778
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.
```

PREREQ session

```
Oracle Home      : /u01/app/12.2.0/grid
Central Inventory : /u01/app/oraInventory
  from           : /u01/app/12.2.0/grid/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/12.2.0/grid/cfgtoollogs/opatch/opatch2017-09-20_20-48-32PM_1.log
```

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.

```
[oracle@vna02 patches]$
[oracle@vna02 patches]$
[oracle@vna02 patches]$
```

For the DB Home:

```
[oracle@vna02 patches]$ export PATH=$ORACLE_HOME/OPatch:$PATH
[oracle@vna02 patches]$ which opatch
/u01/app/oracle/product/12.2.0/dbhome_1/OPatch/opatch
[oracle@vna02 patches]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
-phBaseDir /home/oracle/patches/26133434/26123830
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.

PREREQ session

Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
   from           : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-20_20-
52-24PM_1.log

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.
[oracle@vna02 patches]$
[oracle@vna02 patches]$
[oracle@vna02 patches]$ $ORACLE_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail
-phBaseDir /home/oracle/patches/26133434/26002778
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.

PREREQ session

Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
   from           : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-20_20-
52-38PM_1.log

Invoking prereq "checkconflictagainsthwithdetail"

Prereq "checkConflictAgainstOHWithDetail" passed.

OPatch succeeded.
[oracle@vna02 patches]$
```

OPATCH Conflict Checks:

```
[root@vna02 12.2.0]# $ORACLE_HOME/OPatch/opatchauto apply /home/oracle/patches/26133434 -analyze
```

```
OPatchauto session is initiated at Thu Sep 21 02:18:32 2017
```

```
System initialization log file is /u01/app/12.2.0/grid/cfgtoollogs/opatchautodb/systemconfig2017-09-21_02-18-33AM.log.
```

```
Session log file is /u01/app/12.2.0/grid/cfgtoollogs/opatchauto/opatchauto2017-09-21_02-18-53AM.log  
The id for this session is NWN8
```

```
Executing OPatch prereq operations to verify patch applicability on home /u01/app/12.2.0/grid
```

```
Executing OPatch prereq operations to verify patch applicability on home /u01/app/oracle/  
product/12.2.0/dbhome_1
```

```
Patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Patch applicability verified successfully on home /u01/app/12.2.0/grid
```

```
Verifying SQL patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
SQL patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
OPatchAuto successful.
```

Summary

Analysis for applying patches has completed successfully:

Host:vna02

RAC Home:/u01/app/oracle/product/12.2.0/dbhome_1

==Following patches were SKIPPED:

Patch: /home/oracle/patches/26133434/25586399

Reason: This patch is not applicable to this specified target type - "rac_database"

==Following patches were SUCCESSFULLY analyzed to be applied:

Patch: /home/oracle/patches/26133434/26002778

Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-18-56AM_1.log

Patch: /home/oracle/patches/26133434/26123830

Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-18-56AM_1.log

```
Host:vna02
CRS Home:/u01/app/12.2.0/grid
```

```
==Following patches were SUCCESSFULLY analyzed to be applied:
```

```
Patch: /home/oracle/patches/26133434/26002778
Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-21_02-18-56AM_1.log
```

```
Patch: /home/oracle/patches/26133434/25586399
Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-21_02-18-56AM_1.log
```

```
Patch: /home/oracle/patches/26133434/26123830
Log: /u01/app/12.2.0/grid/cfgtoollogs/patchauto/core/patch/patch2017-09-21_02-18-56AM_1.log
```

```
OPatchauto session completed at Thu Sep 21 02:22:48 2017
Time taken to complete the session 4 minutes, 16 seconds
[root@vna02 12.2.0]#
```

OPatchauto Apply:

```
[root@vna02 12.2.0]# $ORACLE_HOME/OPatch/patchauto apply /home/oracle/patches/26133434
```

```
OPatchauto session is initiated at Thu Sep 21 02:25:35 2017
```

```
System initialization log file is /u01/app/12.2.0/grid/cfgtoollogs/patchautodb/systemconfig2017-09-21_02-25-36AM.log.
```

```
Session log file is /u01/app/12.2.0/grid/cfgtoollogs/patchauto/patchauto2017-09-21_02-25-57AM.log
The id for this session is PM1S
```

```
Executing OPatch prereq operations to verify patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Executing OPatch prereq operations to verify patch applicability on home /u01/app/12.2.0/grid
Patch applicability verified successfully on home /u01/app/12.2.0/grid
```

```
Patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Verifying SQL patch applicability on home /u01/app/oracle/product/12.2.0/dbhome_1
SQL patch applicability verified successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Preparing to bring down database service on home /u01/app/oracle/product/12.2.0/dbhome_1
Successfully prepared home /u01/app/oracle/product/12.2.0/dbhome_1 to bring down database service
```

```
Bringing down CRS service on home /u01/app/12.2.0/grid
Prepatch operation log file location:
/u01/app/oracle/crsdata/vna02/crsconfig/crspatch_vna02_2017-09-21_02-30-11AM.log
CRS service brought down successfully on home /u01/app/12.2.0/grid
```

```
Performing prepatch operation on home /u01/app/oracle/product/12.2.0/dbhome_1
Perpatch operation completed successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Start applying binary patch on home /u01/app/oracle/product/12.2.0/dbhome_1
Binary patch applied successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Performing postpatch operation on home /u01/app/oracle/product/12.2.0/dbhome_1
Postpatch operation completed successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
Start applying binary patch on home /u01/app/12.2.0/grid
Binary patch applied successfully on home /u01/app/12.2.0/grid
```

```
Starting CRS service on home /u01/app/12.2.0/grid
Postpatch operation log file location: /u01/app/oracle/crsdata/vna02/crsconfig/crspatch_vna02_2017-
09-21_02-34-30AM.log
CRS service started successfully on home /u01/app/12.2.0/grid
```

```
Preparing home /u01/app/oracle/product/12.2.0/dbhome_1 after database service restarted
No step execution required.....
Prepared home /u01/app/oracle/product/12.2.0/dbhome_1 successfully after database
service restarted
```

```
Trying to apply SQL patch on home /u01/app/oracle/product/12.2.0/dbhome_1
SQL patch applied successfully on home /u01/app/oracle/product/12.2.0/dbhome_1
```

```
OPatchAuto successful.
```

Summary

Patching is completed successfully. Please find the summary as follows:

```
Host:vna02
RAC Home:/u01/app/oracle/product/12.2.0/dbhome_1
Summary:
```

```
==Following patches were SKIPPED:
```

```
Patch: /home/oracle/patches/26133434/25586399
Reason: This patch is not applicable to this specified target type - "rac_database"
```

==Following patches were SUCCESSFULLY applied:

Patch: /home/oracle/patches/26133434/26002778

Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-31-39AM_1.log

Patch: /home/oracle/patches/26133434/26123830

Log: /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-31-39AM_1.log

Host:vna02

CRS Home:/u01/app/12.2.0/grid

Summary:

==Following patches were SUCCESSFULLY applied:

Patch: /home/oracle/patches/26133434/26002778

Log: /u01/app/12.2.0/grid/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-32-21AM_1.log

Patch: /home/oracle/patches/26133434/25586399

Log: /u01/app/12.2.0/grid/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-32-21AM_1.log

Patch: /home/oracle/patches/26133434/26123830

Log: /u01/app/12.2.0/grid/cfgtoollogs/opatchauto/core/opatch/opatch2017-09-21_02-32-21AM_1.log

OPatchauto session completed at Thu Sep 21 02:41:44 2017

Time taken to complete the session 16 minutes, 9 seconds

[root@vna02 12.2.0]#

LsInventory Checks:

GRIDHome Inventory

```
[oracle@vna02 ~]$ . oraenv
```

```
ORACLE_SID = [oracle] ? +ASM2
```

```
The Oracle base has been set to /u01/app/oracle
```

```
[oracle@vna02 ~]$ export PATH=$ORACLE_HOME/OPatch:$PATH
```

```
[oracle@vna02 ~]$ which opatch
```

```
/u01/app/12.2.0/grid/OPatch/opatch
```

```
[oracle@vna02 ~]$ opatch lsinventory
```

```
Oracle Interim Patch Installer version 12.2.0.1.9
```

```
Copyright (c) 2017, Oracle Corporation. All rights reserved.
```

```

Oracle Home      : /u01/app/12.2.0/grid
Central Inventory : /u01/app/oraInventory
  from           : /u01/app/12.2.0/grid/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
Log file location : /u01/app/12.2.0/grid/cfgtoollogs/opatch/opatch2017-09-21_02-44-21AM_1.log

```

```

Lsinventory Output file location : /u01/app/12.2.0/grid/cfgtoollogs/opatch/lsinv/lsinventory2017-09-21_02-44-21AM.txt

```

Local Machine Information::

```

Hostname: vna02
ARU platform id: 226
ARU platform description:: Linux x86-64

```

Installed Top-level Products (1):

```

Oracle Grid Infrastructure 12c                               12.2.0.1.0
There are 1 products installed in this Oracle Home.

```

Interim patches (3) :

```

Patch 26123830      : applied on Thu Sep 21 02:34:08 BST 2017
Unique Patch ID: 21405588
Patch description: "DATABASE RELEASE UPDATE: 12.2.0.1.170718 (26123830)"
  Created on 7 Jul 2017, 00:33:59 hrs PST8PDT
  Bugs fixed:
    23026585, 24336249, 24929210, 24942749, 25036474, 25110233, 25410877
    25417050, 25427662, 25459958, 25547901, 25569149, 25600342, 25600421
    25606091, 25655390, 25662088, 24385983, 24923215, 25099758, 25429959
    25662101, 25728085, 25823754, 22594071, 23665623, 23749454, 24326846
    24334708, 24560906, 24573817, 24578797, 24609996, 24624166, 24668398
    24674955, 24744686, 24811725, 24827228, 24831514, 24908321, 24976007
    25184555, 25210499, 25211628, 25223839, 25262869, 25316758, 25337332
    25455795, 25457409, 25539063, 25546608, 25612095, 25643931, 25410017
    22729345, 24485174, 24509056, 24714096, 25329664, 25410180, 25607726
    25957038, 25973152, 26024732, 24376878, 24589590, 24676172, 23548817
    24796092, 24907917, 25044977, 25736747, 25766822, 25856821, 25051628
    224534401, 24835919, 25050160, 25395696, 25430120, 25616359, 25715167
    25967985

```

```
Patch 25586399      : applied on Thu Sep 21 02:33:51 BST 2017
Unique Patch ID: 21306685
Patch description: "ACFS Patch Set Update : 12.2.0.1.170718 (25586399)"
  Created on 16 Jun 2017, 00:35:19 hrs PST8PDT
  Bugs fixed:
    24679041, 24964969, 25098392, 25078431, 25491831
```

```
Patch 26002778      : applied on Thu Sep 21 02:33:01 BST 2017
Unique Patch ID: 21306682
Patch description: "OCW Patch Set Update : 12.2.0.1.170718 (26002778)"
  Created on 3 Jul 2017, 03:26:30 hrs PST8PDT
  Bugs fixed:
    26144044, 25541343, 25715179, 25493588, 24932026, 24801915, 25832375
    25728787, 25825732, 24578464, 25832312, 25742471, 25790699, 25655495
    25307145, 25485737, 25505841, 25697364, 24663993, 25026470, 25591658
    25537905, 24451580, 25409838, 25371632, 25569634, 25245759, 24665035
    25646592, 25025157, 24732650, 24664849, 24584419, 24423011, 24831158
    25037836, 25556203, 24464953, 24657753, 25197670, 24796183, 20559126
    25197395, 24808260
```

```
-----
OPatch succeeded.
[oracle@vna02 ~]$
```

DBHome Inventory:

```
[oracle@vna02 ~]$ export PATH=$ORACLE_HOME/OPatch:$PATH
[oracle@vna02 ~]$ which opatch
/u01/app/oracle/product/12.2.0/dbhome_1/OPatch/opatch
[oracle@vna02 ~]$
[oracle@vna02 ~]$
[oracle@vna02 ~]$ opatch lsinventory
Oracle Interim Patch Installer version 12.2.0.1.9
Copyright (c) 2017, Oracle Corporation. All rights reserved.
```

```
Oracle Home      : /u01/app/oracle/product/12.2.0/dbhome_1
Central Inventory : /u01/app/oraInventory
  from            : /u01/app/oracle/product/12.2.0/dbhome_1/oraInst.loc
OPatch version   : 12.2.0.1.9
OUI version      : 12.2.0.1.4
```

```
Log file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/opatch2017-09-21_02-45-58AM_1.log
```

```
Lsinventory Output file location : /u01/app/oracle/product/12.2.0/dbhome_1/cfgtoollogs/opatch/lsinv/lsinventory2017-09-21_02-45-58AM.txt
```

Local Machine Information::

Hostname: vna02
ARU platform id: 226
ARU platform description:: Linux x86-64

Installed Top-level Products (1):

Oracle Database 12c 12.2.0.1.0
There are 1 products installed in this Oracle Home.

Interim patches (2) :

Patch 26123830 : applied on Thu Sep 21 02:32:03 BST 2017
Unique Patch ID: 21405588
Patch description: "DATABASE RELEASE UPDATE: 12.2.0.1.170718 (26123830)"
Created on 7 Jul 2017, 00:33:59 hrs PST8PDT
Bugs fixed:
23026585, 24336249, 24929210, 24942749, 25036474, 25110233, 25410877
25417050, 25427662, 25459958, 25547901, 25569149, 25600342, 25600421
25606091, 25655390, 25662088, 24385983, 24923215, 25099758, 25429959
25662101, 25728085, 25823754, 22594071, 23665623, 23749454, 24326846
24334708, 24560906, 24573817, 24578797, 24609996, 24624166, 24668398
24674955, 24744686, 24811725, 24827228, 24831514, 24908321, 24976007
25184555, 25210499, 25211628, 25223839, 25262869, 25316758, 25337332
25455795, 25457409, 25539063, 25546608, 25612095, 25643931, 25410017
22729345, 24485174, 24509056, 24714096, 25329664, 25410180, 25607726
25957038, 25973152, 26024732, 24376878, 24589590, 24676172, 23548817
24796092, 24907917, 25044977, 25736747, 25766822, 25856821, 25051628
24534401, 24835919, 25050160, 25395696, 25430120, 25616359, 25715167
25967985

Patch 26002778 : applied on Thu Sep 21 02:31:51 BST 2017
Unique Patch ID: 21306682
Patch description: "OCW Patch Set Update : 12.2.0.1.170718 (26002778)"
Created on 3 Jul 2017, 03:26:30 hrs PST8PDT
Bugs fixed:
26144044, 25541343, 25715179, 25493588, 24932026, 24801915, 25832375
25728787, 25825732, 24578464, 25832312, 25742471, 25790699, 25655495
25307145, 25485737, 25505841, 25697364, 24663993, 25026470, 25591658
25537905, 24451580, 25409838, 25371632, 25569634, 25245759, 24665035
25646592, 25025157, 24732650, 24664849, 24584419, 24423011, 24831158
25037836, 25556203, 24464953, 24657753, 25197670, 24796183, 20559126
25197395, 24808260

OPatch succeeded.
[oracle@vna02 ~]\$



Contact

Contact a business development representative to answer any questions you may have.



Schedule a Demo

Schedule a demo with an engineer and learn if Kaminario's solution works for you.



Request a Quote

Request a quote for your application from our business development team.

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