



Integrated Cloud Applications & Platform Services

Oracle Database 12c R2: Clusterware Administration

Activity Guide

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Practices for Lesson 1: Introduction to Clusterware

Practices for Lesson 1

There are no practices for this lesson.

Practices for Lesson 2: Oracle Clusterware Architecture

Practice 2-1: Laboratory Introduction

Overview

In this practice, you will be familiarized with the laboratory environment for this course.

Tasks

Access to your laboratory environment will be through a graphical display running on your classroom workstation or hosted on a remote machine. Your instructor will provide you with instructions to access your practice environment.

The practice environment for this course is hosted on a server running Oracle Virtual Machine (OVM). In turn, OVM hosts numerous virtual machines (VMs). Each VM is a logically separate server that will be used to run Oracle Database 12c Release 2 software (12.2.0.1), including Clusterware, Automatic Storage Management (ASM) and Real Application Clusters (RAC).

1. Open a terminal window as the `root` user. Review the `/etc/hosts` file. You should see output similar to the example displayed below. It shows that your environment is configured with six VMs, which you will use to form a cluster in upcoming practices. `dns` in the output is a gateway VM.

```
[oracle@dns ~] su -
Password: *****
[root@dns ~]# more /etc/hosts
# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1      localhost.localdomain localhost
::1            localhost6.localdomain6 localhost6

192.0.2.101    host01.example.com      host01
192.0.2.102    host02.example.com      host02
192.0.2.103    host03.example.com      host03
192.0.2.104    host04.example.com      host04
192.0.2.105    host05.example.com      host05
192.0.2.1      dns.example.com        dns

[root@dns ~]#
```

2. Check that the DHCPD is running on the DNS server. You will configure nodes VIPs using the DHCPD service later. Exit the root account.

```
[root@dns ~]# service dhcpcd status
dhcpcd (pid 16923) is running...
[root@dns ~]# exit
[oracle@dns ~]$
```

3. Using SSH, connect to host01 as the root OS user. Enter the root password when you are prompted for the password.

```
[oracle@dns ~] ssh root@host01
root@host01's password: *****
[root@host01 ~]#
```

4. Your environment has been pre-configured with a series of shared disk devices that will be used by Oracle Clusterware and ASM. Execute the following command to identify the shared disks.

```
[root@host01 ~]# ls -l /dev/c1*
brw-rw----. 1 grid asmadmin 202, 33 Oct 23 19:51 /dev/c1_DATA1_dsk1
brw-rw----. 1 grid asmadmin 202, 43 Oct 23 19:51 /dev/c1_DATA1_dsk10
brw-rw----. 1 grid asmadmin 202, 44 Oct 23 19:51 /dev/c1_DATA1_dsk11
brw-rw----. 1 grid asmadmin 202, 45 Oct 23 19:51 /dev/c1_DATA1_dsk12
brw-rw----. 1 grid asmadmin 202, 110 Oct 23 19:51 /dev/c1_MGMT_dsk13
brw-rw----. 1 grid asmadmin 202, 111 Oct 23 19:51 /dev/c1_MGMT_dsk14
brw-rw----. 1 grid asmadmin 202, 98 Oct 23 19:51 /dev/c1_MGMT_dsk2
brw-rw----. 1 grid asmadmin 202, 99 Oct 23 19:51 /dev/c1_MGMT_dsk3
brw-rw----. 1 grid asmadmin 202, 101 Oct 23 19:51 /dev/c1_MGMT_dsk4
brw-rw----. 1 grid asmadmin 202, 102 Oct 23 19:51 /dev/c1_MGMT_dsk5
brw-rw----. 1 grid asmadmin 202, 103 Oct 23 19:51 /dev/c1_MGMT_dsk6
brw-rw----. 1 grid asmadmin 202, 104 Oct 23 19:51 /dev/c1_MGMT_dsk7
brw-rw----. 1 grid asmadmin 202, 105 Oct 23 19:51 /dev/c1_MGMT_dsk8
brw-rw----. 1 grid asmadmin 202, 106 Oct 23 19:51 /dev/c1_MGMT_dsk9
brw-rw----. 1 grid asmadmin 202, 65 Oct 23 19:51 /dev/c1_SPARE_dsk1
brw-rw----. 1 grid asmadmin 202, 74 Oct 23 19:51 /dev/c1_SPARE_dsk10
brw-rw----. 1 grid asmadmin 202, 75 Oct 23 19:51 /dev/c1_SPARE_dsk11
brw-rw----. 1 grid asmadmin 202, 76 Oct 23 19:51 /dev/c1_SPARE_dsk12
brw-rw----. 1 grid asmadmin 202, 77 Oct 23 19:51 /dev/c1_SPARE_dsk13
brw-rw----. 1 grid asmadmin 202, 78 Oct 23 19:51 /dev/c1_SPARE_dsk14
brw-rw----. 1 grid asmadmin 202, 79 Oct 23 19:51 /dev/c1_SPARE_dsk15
brw-rw----. 1 grid asmadmin 202, 66 Oct 23 19:51 /dev/c1_SPARE_dsk2
brw-rw----. 1 grid asmadmin 202, 67 Oct 23 19:51 /dev/c1_SPARE_dsk3
brw-rw----. 1 grid asmadmin 202, 69 Oct 23 19:51 /dev/c1_SPARE_dsk5
brw-rw----. 1 grid asmadmin 202, 70 Oct 23 19:51 /dev/c1_SPARE_dsk6
```

```
brw-rw----. 1 grid asmadmin 202, 71 Oct 23 19:51 /dev/c1_SPARE_dsk7
brw-rw----. 1 grid asmadmin 202, 72 Oct 23 19:51 /dev/c1_SPARE_dsk8
brw-rw----. 1 grid asmadmin 202, 73 Oct 23 19:51 /dev/c1_SPARE_dsk9

[root@host01 ~]#
```

5. Examine host02 to confirm that the shared disk devices are also visible on that node.

```
[root@host01 ~]# ssh host02 "ls -l /dev/c1*"
brw-rw----. 1 grid asmadmin 202, 33 Oct 23 19:51 /dev/c1_DATA1_dsk1
brw-rw----. 1 grid asmadmin 202, 43 Oct 23 19:51 /dev/c1_DATA1_dsk10
brw-rw----. 1 grid asmadmin 202, 44 Oct 23 19:51 /dev/c1_DATA1_dsk11
brw-rw----. 1 grid asmadmin 202, 45 Oct 23 19:51 /dev/c1_DATA1_dsk12
brw-rw----. 1 grid asmadmin 202, 46 Oct 23 19:51 /dev/c1_DATA1_dsk13
brw-rw----. 1 grid asmadmin 202, 47 Oct 23 19:51 /dev/c1_DATA1_dsk14
brw-rw----. 1 grid asmadmin 202, 34 Oct 23 19:51 /dev/c1_DATA1_dsk2
brw-rw----. 1 grid asmadmin 202, 35 Oct 23 19:51 /dev/c1_DATA1_dsk3
brw-rw----. 1 grid asmadmin 202, 37 Oct 23 19:51 /dev/c1_DATA1_dsk4
brw-rw----. 1 grid asmadmin 202, 38 Oct 23 19:51 /dev/c1_DATA1_dsk5
brw-rw----. 1 grid asmadmin 202, 39 Oct 23 19:51 /dev/c1_DATA1_dsk6
brw-rw----. 1 grid asmadmin 202, 40 Oct 23 19:51 /dev/c1_DATA1_dsk7
brw-rw----. 1 grid asmadmin 202, 41 Oct 23 19:51 /dev/c1_DATA1_dsk8
brw-rw----. 1 grid asmadmin 202, 42 Oct 23 19:51 /dev/c1_DATA1_dsk9
brw-rw----. 1 grid asmadmin 202, 49 Oct 23 19:51 /dev/c1_FRA_dsk1
brw-rw----. 1 grid asmadmin 202, 59 Oct 23 19:51 /dev/c1_FRA_dsk10
brw-rw----. 1 grid asmadmin 202, 60 Oct 23 19:51 /dev/c1_FRA_dsk11
brw-rw----. 1 grid asmadmin 202, 61 Oct 23 19:51 /dev/c1_FRA_dsk12
brw-rw----. 1 grid asmadmin 202, 62 Oct 23 19:51 /dev/c1_FRA_dsk13
brw-rw----. 1 grid asmadmin 202, 63 Oct 23 19:51 /dev/c1_FRA_dsk14
brw-rw----. 1 grid asmadmin 202, 50 Oct 23 19:51 /dev/c1_FRA_dsk2
brw-rw----. 1 grid asmadmin 202, 51 Oct 23 19:51 /dev/c1_FRA_dsk3
brw-rw----. 1 grid asmadmin 202, 53 Oct 23 19:51 /dev/c1_FRA_dsk4
brw-rw----. 1 grid asmadmin 202, 54 Oct 23 19:51 /dev/c1_FRA_dsk5
brw-rw----. 1 grid asmadmin 202, 55 Oct 23 19:51 /dev/c1_FRA_dsk6
brw-rw----. 1 grid asmadmin 202, 56 Oct 23 19:51 /dev/c1_FRA_dsk7
brw-rw----. 1 grid asmadmin 202, 57 Oct 23 19:51 /dev/c1_FRA_dsk8
brw-rw----. 1 grid asmadmin 202, 58 Oct 23 19:51 /dev/c1_FRA_dsk9
brw-rw----. 1 grid asmadmin 202, 97 Oct 23 19:51 /dev/c1_MGMT_dsk1
brw-rw----. 1 grid asmadmin 202, 107 Oct 23 19:51 /dev/c1_MGMT_dsk10
brw-rw----. 1 grid asmadmin 202, 108 Oct 23 19:51 /dev/c1_MGMT_dsk11
brw-rw----. 1 grid asmadmin 202, 109 Oct 23 19:51 /dev/c1_MGMT_dsk12
brw-rw----. 1 grid asmadmin 202, 110 Oct 23 19:51 /dev/c1_MGMT_dsk13
brw-rw----. 1 grid asmadmin 202, 111 Oct 23 19:51 /dev/c1_MGMT_dsk14
brw-rw----. 1 grid asmadmin 202, 98 Oct 23 19:51 /dev/c1_MGMT_dsk2
brw-rw----. 1 grid asmadmin 202, 99 Oct 23 19:51 /dev/c1_MGMT_dsk3
brw-rw----. 1 grid asmadmin 202, 101 Oct 23 19:51 /dev/c1_MGMT_dsk4
```

```

brw-rw----. 1 grid asmadmin 202, 102 Oct 23 19:51 /dev/c1_MGMT_dsk5
brw-rw----. 1 grid asmadmin 202, 103 Oct 23 19:51 /dev/c1_MGMT_dsk6
brw-rw----. 1 grid asmadmin 202, 104 Oct 23 19:51 /dev/c1_MGMT_dsk7
brw-rw----. 1 grid asmadmin 202, 105 Oct 23 19:51 /dev/c1_MGMT_dsk8
brw-rw----. 1 grid asmadmin 202, 106 Oct 23 19:51 /dev/c1_MGMT_dsk9
brw-rw----. 1 grid asmadmin 202, 65 Oct 23 19:51 /dev/c1_SPARE_dsk1
brw-rw----. 1 grid asmadmin 202, 74 Oct 23 19:51 /dev/c1_SPARE_dsk10
brw-rw----. 1 grid asmadmin 202, 75 Oct 23 19:51 /dev/c1_SPARE_dsk11
brw-rw----. 1 grid asmadmin 202, 76 Oct 23 19:51 /dev/c1_SPARE_dsk12
brw-rw----. 1 grid asmadmin 202, 77 Oct 23 19:51 /dev/c1_SPARE_dsk13
brw-rw----. 1 grid asmadmin 202, 78 Oct 23 19:51 /dev/c1_SPARE_dsk14
brw-rw----. 1 grid asmadmin 202, 79 Oct 23 19:51 /dev/c1_SPARE_dsk15
brw-rw----. 1 grid asmadmin 202, 66 Oct 23 19:51 /dev/c1_SPARE_dsk2
brw-rw----. 1 grid asmadmin 202, 67 Oct 23 19:51 /dev/c1_SPARE_dsk3
brw-rw----. 1 grid asmadmin 202, 69 Oct 23 19:51 /dev/c1_SPARE_dsk5
brw-rw----. 1 grid asmadmin 202, 70 Oct 23 19:51 /dev/c1_SPARE_dsk6
brw-rw----. 1 grid asmadmin 202, 71 Oct 23 19:51 /dev/c1_SPARE_dsk7
brw-rw----. 1 grid asmadmin 202, 72 Oct 23 19:51 /dev/c1_SPARE_dsk8
brw-rw----. 1 grid asmadmin 202, 73 Oct 23 19:51 /dev/c1_SPARE_dsk9

[root@host01 ~]#

```

6. Examine host03 to confirm that the shared disk devices are also visible on that node.

```

[root@host01 ~]# ssh host03 "ls -l /dev/c1*"
brw-rw----. 1 grid asmadmin 202, 33 Oct 23 19:51 /dev/c1_DATA1_dsk1
brw-rw----. 1 grid asmadmin 202, 43 Oct 23 19:51 /dev/c1_DATA1_dsk10
brw-rw----. 1 grid asmadmin 202, 44 Oct 23 19:51 /dev/c1_DATA1_dsk11
brw-rw----. 1 grid asmadmin 202, 45 Oct 23 19:51 /dev/c1_DATA1_dsk12
brw-rw----. 1 grid asmadmin 202, 46 Oct 23 19:51 /dev/c1_DATA1_dsk13
brw-rw----. 1 grid asmadmin 202, 47 Oct 23 19:51 /dev/c1_DATA1_dsk14
brw-rw----. 1 grid asmadmin 202, 34 Oct 23 19:51 /dev/c1_DATA1_dsk2
brw-rw----. 1 grid asmadmin 202, 35 Oct 23 19:51 /dev/c1_DATA1_dsk3
brw-rw----. 1 grid asmadmin 202, 37 Oct 23 19:51 /dev/c1_DATA1_dsk4
brw-rw----. 1 grid asmadmin 202, 38 Oct 23 19:51 /dev/c1_DATA1_dsk5
brw-rw----. 1 grid asmadmin 202, 39 Oct 23 19:51 /dev/c1_DATA1_dsk6
brw-rw----. 1 grid asmadmin 202, 40 Oct 23 19:51 /dev/c1_DATA1_dsk7
brw-rw----. 1 grid asmadmin 202, 41 Oct 23 19:51 /dev/c1_DATA1_dsk8
brw-rw----. 1 grid asmadmin 202, 42 Oct 23 19:51 /dev/c1_DATA1_dsk9
brw-rw----. 1 grid asmadmin 202, 49 Oct 23 19:51 /dev/c1_FRA_dsk1
brw-rw----. 1 grid asmadmin 202, 59 Oct 23 19:51 /dev/c1_FRA_dsk10
brw-rw----. 1 grid asmadmin 202, 60 Oct 23 19:51 /dev/c1_FRA_dsk11
brw-rw----. 1 grid asmadmin 202, 61 Oct 23 19:51 /dev/c1_FRA_dsk12
brw-rw----. 1 grid asmadmin 202, 62 Oct 23 19:51 /dev/c1_FRA_dsk13
brw-rw----. 1 grid asmadmin 202, 63 Oct 23 19:51 /dev/c1_FRA_dsk14

```

```

brw-rw----. 1 grid asmadmin 202,   50 Oct 23 19:51 /dev/c1_FRA_dsk2
brw-rw----. 1 grid asmadmin 202,   51 Oct 23 19:51 /dev/c1_FRA_dsk3
brw-rw----. 1 grid asmadmin 202,   53 Oct 23 19:51 /dev/c1_FRA_dsk4
brw-rw----. 1 grid asmadmin 202,   54 Oct 23 19:51 /dev/c1_FRA_dsk5
brw-rw----. 1 grid asmadmin 202,   55 Oct 23 19:51 /dev/c1_FRA_dsk6
brw-rw----. 1 grid asmadmin 202,   56 Oct 23 19:51 /dev/c1_FRA_dsk7
brw-rw----. 1 grid asmadmin 202,   57 Oct 23 19:51 /dev/c1_FRA_dsk8
brw-rw----. 1 grid asmadmin 202,   58 Oct 23 19:51 /dev/c1_FRA_dsk9
brw-rw----. 1 grid asmadmin 202,   97 Oct 23 19:51 /dev/c1_MGMT_dsk1
brw-rw----. 1 grid asmadmin 202,  107 Oct 23 19:51 /dev/c1_MGMT_dsk10
brw-rw----. 1 grid asmadmin 202,  108 Oct 23 19:51 /dev/c1_MGMT_dsk11
brw-rw----. 1 grid asmadmin 202,  109 Oct 23 19:51 /dev/c1_MGMT_dsk12
brw-rw----. 1 grid asmadmin 202,  110 Oct 23 19:51 /dev/c1_MGMT_dsk13
brw-rw----. 1 grid asmadmin 202,  111 Oct 23 19:51 /dev/c1_MGMT_dsk14
brw-rw----. 1 grid asmadmin 202,   98 Oct 23 19:51 /dev/c1_MGMT_dsk2
brw-rw----. 1 grid asmadmin 202,   99 Oct 23 19:51 /dev/c1_MGMT_dsk3
brw-rw----. 1 grid asmadmin 202,  101 Oct 23 19:51 /dev/c1_MGMT_dsk4
brw-rw----. 1 grid asmadmin 202,  102 Oct 23 19:51 /dev/c1_MGMT_dsk5
brw-rw----. 1 grid asmadmin 202,  103 Oct 23 19:51 /dev/c1_MGMT_dsk6
brw-rw----. 1 grid asmadmin 202,  104 Oct 23 19:51 /dev/c1_MGMT_dsk7
brw-rw----. 1 grid asmadmin 202,  105 Oct 23 19:51 /dev/c1_MGMT_dsk8
brw-rw----. 1 grid asmadmin 202,  106 Oct 23 19:51 /dev/c1_MGMT_dsk9
brw-rw----. 1 grid asmadmin 202,   65 Oct 23 19:51 /dev/c1_SPARE_dsk1
brw-rw----. 1 grid asmadmin 202,   74 Oct 23 19:51 /dev/c1_SPARE_dsk10
brw-rw----. 1 grid asmadmin 202,   75 Oct 23 19:51 /dev/c1_SPARE_dsk11
brw-rw----. 1 grid asmadmin 202,   76 Oct 23 19:51 /dev/c1_SPARE_dsk12
brw-rw----. 1 grid asmadmin 202,   77 Oct 23 19:51 /dev/c1_SPARE_dsk13
brw-rw----. 1 grid asmadmin 202,   78 Oct 23 19:51 /dev/c1_SPARE_dsk14
brw-rw----. 1 grid asmadmin 202,   79 Oct 23 19:51 /dev/c1_SPARE_dsk15
brw-rw----. 1 grid asmadmin 202,   66 Oct 23 19:51 /dev/c1_SPARE_dsk2
brw-rw----. 1 grid asmadmin 202,   67 Oct 23 19:51 /dev/c1_SPARE_dsk3
brw-rw----. 1 grid asmadmin 202,   69 Oct 23 19:51 /dev/c1_SPARE_dsk5
brw-rw----. 1 grid asmadmin 202,   70 Oct 23 19:51 /dev/c1_SPARE_dsk6
brw-rw----. 1 grid asmadmin 202,   71 Oct 23 19:51 /dev/c1_SPARE_dsk7
brw-rw----. 1 grid asmadmin 202,   72 Oct 23 19:51 /dev/c1_SPARE_dsk8
brw-rw----. 1 grid asmadmin 202,   73 Oct 23 19:51 /dev/c1_SPARE_dsk9

```

[root@host01 ~]#

7. Examine host04 and host05 as well. Leaf Nodes in Oracle Flex Clusters do not require direct access to shared storage. However, if you are planning to run Oracle database instances in Leaf Nodes (Reader Nodes), the direct shared storage access is required. You will see how these nodes can participate in the cluster in upcoming practices.

```
[root@host01 ~]# ssh host04 "ls -l /dev/c1*"
brw-rw----. 1 grid asmadmin 202, 33 Oct 23 19:51 /dev/c1_DATA1_dsk1
brw-rw----. 1 grid asmadmin 202, 43 Oct 23 19:51 /dev/c1_DATA1_dsk10
brw-rw----. 1 grid asmadmin 202, 44 Oct 23 19:51 /dev/c1_DATA1_dsk11
brw-rw----. 1 grid asmadmin 202, 45 Oct 23 19:51 /dev/c1_DATA1_dsk12
brw-rw----. 1 grid asmadmin 202, 46 Oct 23 19:51 /dev/c1_DATA1_dsk13
brw-rw----. 1 grid asmadmin 202, 47 Oct 23 19:51 /dev/c1_DATA1_dsk14
brw-rw----. 1 grid asmadmin 202, 34 Oct 23 19:51 /dev/c1_DATA1_dsk2
brw-rw----. 1 grid asmadmin 202, 35 Oct 23 19:51 /dev/c1_DATA1_dsk3
brw-rw----. 1 grid asmadmin 202, 37 Oct 23 19:51 /dev/c1_DATA1_dsk4
brw-rw----. 1 grid asmadmin 202, 38 Oct 23 19:51 /dev/c1_DATA1_dsk5
brw-rw----. 1 grid asmadmin 202, 39 Oct 23 19:51 /dev/c1_DATA1_dsk6
brw-rw----. 1 grid asmadmin 202, 40 Oct 23 19:51 /dev/c1_DATA1_dsk7
brw-rw----. 1 grid asmadmin 202, 41 Oct 23 19:51 /dev/c1_DATA1_dsk8
brw-rw----. 1 grid asmadmin 202, 42 Oct 23 19:51 /dev/c1_DATA1_dsk9
brw-rw----. 1 grid asmadmin 202, 49 Oct 23 19:51 /dev/c1_FRA_dsk1
brw-rw----. 1 grid asmadmin 202, 59 Oct 23 19:51 /dev/c1_FRA_dsk10
brw-rw----. 1 grid asmadmin 202, 60 Oct 23 19:51 /dev/c1_FRA_dsk11
brw-rw----. 1 grid asmadmin 202, 61 Oct 23 19:51 /dev/c1_FRA_dsk12
brw-rw----. 1 grid asmadmin 202, 62 Oct 23 19:51 /dev/c1_FRA_dsk13
brw-rw----. 1 grid asmadmin 202, 63 Oct 23 19:51 /dev/c1_FRA_dsk14
brw-rw----. 1 grid asmadmin 202, 50 Oct 23 19:51 /dev/c1_FRA_dsk2
brw-rw----. 1 grid asmadmin 202, 51 Oct 23 19:51 /dev/c1_FRA_dsk3
brw-rw----. 1 grid asmadmin 202, 53 Oct 23 19:51 /dev/c1_FRA_dsk4
brw-rw----. 1 grid asmadmin 202, 54 Oct 23 19:51 /dev/c1_FRA_dsk5
brw-rw----. 1 grid asmadmin 202, 55 Oct 23 19:51 /dev/c1_FRA_dsk6
brw-rw----. 1 grid asmadmin 202, 56 Oct 23 19:51 /dev/c1_FRA_dsk7
brw-rw----. 1 grid asmadmin 202, 57 Oct 23 19:51 /dev/c1_FRA_dsk8
brw-rw----. 1 grid asmadmin 202, 58 Oct 23 19:51 /dev/c1_FRA_dsk9
brw-rw----. 1 grid asmadmin 202, 97 Oct 23 19:51 /dev/c1_MGMT_dsk1
brw-rw----. 1 grid asmadmin 202, 107 Oct 23 19:51 /dev/c1_MGMT_dsk10
brw-rw----. 1 grid asmadmin 202, 108 Oct 23 19:51 /dev/c1_MGMT_dsk11
brw-rw----. 1 grid asmadmin 202, 109 Oct 23 19:51 /dev/c1_MGMT_dsk12
brw-rw----. 1 grid asmadmin 202, 110 Oct 23 19:51 /dev/c1_MGMT_dsk13
brw-rw----. 1 grid asmadmin 202, 111 Oct 23 19:51 /dev/c1_MGMT_dsk14
brw-rw----. 1 grid asmadmin 202, 98 Oct 23 19:51 /dev/c1_MGMT_dsk2
brw-rw----. 1 grid asmadmin 202, 99 Oct 23 19:51 /dev/c1_MGMT_dsk3
brw-rw----. 1 grid asmadmin 202, 101 Oct 23 19:51 /dev/c1_MGMT_dsk4
brw-rw----. 1 grid asmadmin 202, 102 Oct 23 19:51 /dev/c1_MGMT_dsk5
brw-rw----. 1 grid asmadmin 202, 103 Oct 23 19:51 /dev/c1_MGMT_dsk6
brw-rw----. 1 grid asmadmin 202, 104 Oct 23 19:51 /dev/c1_MGMT_dsk7
```

```

brw-rw----. 1 grid asmadmin 202, 105 Oct 23 19:51 /dev/c1_MGMT_dsk8
brw-rw----. 1 grid asmadmin 202, 106 Oct 23 19:51 /dev/c1_MGMT_dsk9
brw-rw----. 1 grid asmadmin 202, 65 Oct 23 19:51 /dev/c1_SPARE_dsk1
brw-rw----. 1 grid asmadmin 202, 74 Oct 23 19:51 /dev/c1_SPARE_dsk10
brw-rw----. 1 grid asmadmin 202, 75 Oct 23 19:51 /dev/c1_SPARE_dsk11
brw-rw----. 1 grid asmadmin 202, 76 Oct 23 19:51 /dev/c1_SPARE_dsk12
brw-rw----. 1 grid asmadmin 202, 77 Oct 23 19:51 /dev/c1_SPARE_dsk13
brw-rw----. 1 grid asmadmin 202, 78 Oct 23 19:51 /dev/c1_SPARE_dsk14
brw-rw----. 1 grid asmadmin 202, 79 Oct 23 19:51 /dev/c1_SPARE_dsk15
brw-rw----. 1 grid asmadmin 202, 66 Oct 23 19:51 /dev/c1_SPARE_dsk2
brw-rw----. 1 grid asmadmin 202, 67 Oct 23 19:51 /dev/c1_SPARE_dsk3
brw-rw----. 1 grid asmadmin 202, 69 Oct 23 19:51 /dev/c1_SPARE_dsk5
brw-rw----. 1 grid asmadmin 202, 70 Oct 23 19:51 /dev/c1_SPARE_dsk6
brw-rw----. 1 grid asmadmin 202, 71 Oct 23 19:51 /dev/c1_SPARE_dsk7
brw-rw----. 1 grid asmadmin 202, 72 Oct 23 19:51 /dev/c1_SPARE_dsk8
brw-rw----. 1 grid asmadmin 202, 73 Oct 23 19:51 /dev/c1_SPARE_dsk9

[root@host01 ~]# ssh host05 "ls -l /dev/c1*"
brw-rw----. 1 grid asmadmin 202, 33 Oct 23 19:51 /dev/c1_DATA1_dsk1
brw-rw----. 1 grid asmadmin 202, 43 Oct 23 19:51 /dev/c1_DATA1_dsk10
brw-rw----. 1 grid asmadmin 202, 44 Oct 23 19:51 /dev/c1_DATA1_dsk11
brw-rw----. 1 grid asmadmin 202, 45 Oct 23 19:51 /dev/c1_DATA1_dsk12
brw-rw----. 1 grid asmadmin 202, 46 Oct 23 19:51 /dev/c1_DATA1_dsk13
brw-rw----. 1 grid asmadmin 202, 47 Oct 23 19:51 /dev/c1_DATA1_dsk14
brw-rw----. 1 grid asmadmin 202, 34 Oct 23 19:51 /dev/c1_DATA1_dsk2
brw-rw----. 1 grid asmadmin 202, 35 Oct 23 19:51 /dev/c1_DATA1_dsk3
brw-rw----. 1 grid asmadmin 202, 37 Oct 23 19:51 /dev/c1_DATA1_dsk4
brw-rw----. 1 grid asmadmin 202, 38 Oct 23 19:51 /dev/c1_DATA1_dsk5
brw-rw----. 1 grid asmadmin 202, 39 Oct 23 19:51 /dev/c1_DATA1_dsk6
brw-rw----. 1 grid asmadmin 202, 40 Oct 23 19:51 /dev/c1_DATA1_dsk7
brw-rw----. 1 grid asmadmin 202, 41 Oct 23 19:51 /dev/c1_DATA1_dsk8
brw-rw----. 1 grid asmadmin 202, 42 Oct 23 19:51 /dev/c1_DATA1_dsk9
brw-rw----. 1 grid asmadmin 202, 49 Oct 23 19:51 /dev/c1_FRA_dsk1
brw-rw----. 1 grid asmadmin 202, 59 Oct 23 19:51 /dev/c1_FRA_dsk10
brw-rw----. 1 grid asmadmin 202, 60 Oct 23 19:51 /dev/c1_FRA_dsk11
brw-rw----. 1 grid asmadmin 202, 61 Oct 23 19:51 /dev/c1_FRA_dsk12
brw-rw----. 1 grid asmadmin 202, 62 Oct 23 19:51 /dev/c1_FRA_dsk13
brw-rw----. 1 grid asmadmin 202, 63 Oct 23 19:51 /dev/c1_FRA_dsk14
brw-rw----. 1 grid asmadmin 202, 50 Oct 23 19:51 /dev/c1_FRA_dsk2
brw-rw----. 1 grid asmadmin 202, 51 Oct 23 19:51 /dev/c1_FRA_dsk3
brw-rw----. 1 grid asmadmin 202, 53 Oct 23 19:51 /dev/c1_FRA_dsk4
brw-rw----. 1 grid asmadmin 202, 54 Oct 23 19:51 /dev/c1_FRA_dsk5
brw-rw----. 1 grid asmadmin 202, 55 Oct 23 19:51 /dev/c1_FRA_dsk6
brw-rw----. 1 grid asmadmin 202, 56 Oct 23 19:51 /dev/c1_FRA_dsk7
brw-rw----. 1 grid asmadmin 202, 57 Oct 23 19:51 /dev/c1_FRA_dsk8
brw-rw----. 1 grid asmadmin 202, 58 Oct 23 19:51 /dev/c1_FRA_dsk9

```

```

brw-rw----. 1 grid asmadmin 202, 97 Oct 23 19:51 /dev/c1_MGMT_dsk1
brw-rw----. 1 grid asmadmin 202, 107 Oct 23 19:51 /dev/c1_MGMT_dsk10
brw-rw----. 1 grid asmadmin 202, 108 Oct 23 19:51 /dev/c1_MGMT_dsk11
brw-rw----. 1 grid asmadmin 202, 109 Oct 23 19:51 /dev/c1_MGMT_dsk12
brw-rw----. 1 grid asmadmin 202, 110 Oct 23 19:51 /dev/c1_MGMT_dsk13
brw-rw----. 1 grid asmadmin 202, 111 Oct 23 19:51 /dev/c1_MGMT_dsk14
brw-rw----. 1 grid asmadmin 202, 98 Oct 23 19:51 /dev/c1_MGMT_dsk2
brw-rw----. 1 grid asmadmin 202, 99 Oct 23 19:51 /dev/c1_MGMT_dsk3
brw-rw----. 1 grid asmadmin 202, 101 Oct 23 19:51 /dev/c1_MGMT_dsk4
brw-rw----. 1 grid asmadmin 202, 102 Oct 23 19:51 /dev/c1_MGMT_dsk5
brw-rw----. 1 grid asmadmin 202, 103 Oct 23 19:51 /dev/c1_MGMT_dsk6
brw-rw----. 1 grid asmadmin 202, 104 Oct 23 19:51 /dev/c1_MGMT_dsk7
brw-rw----. 1 grid asmadmin 202, 105 Oct 23 19:51 /dev/c1_MGMT_dsk8
brw-rw----. 1 grid asmadmin 202, 106 Oct 23 19:51 /dev/c1_MGMT_dsk9
brw-rw----. 1 grid asmadmin 202, 65 Oct 23 19:51 /dev/c1_SPARE_dsk1
brw-rw----. 1 grid asmadmin 202, 74 Oct 23 19:51 /dev/c1_SPARE_dsk10
brw-rw----. 1 grid asmadmin 202, 75 Oct 23 19:51 /dev/c1_SPARE_dsk11
brw-rw----. 1 grid asmadmin 202, 76 Oct 23 19:51 /dev/c1_SPARE_dsk12
brw-rw----. 1 grid asmadmin 202, 77 Oct 23 19:51 /dev/c1_SPARE_dsk13
brw-rw----. 1 grid asmadmin 202, 78 Oct 23 19:51 /dev/c1_SPARE_dsk14
brw-rw----. 1 grid asmadmin 202, 79 Oct 23 19:51 /dev/c1_SPARE_dsk15
brw-rw----. 1 grid asmadmin 202, 66 Oct 23 19:51 /dev/c1_SPARE_dsk2
brw-rw----. 1 grid asmadmin 202, 67 Oct 23 19:51 /dev/c1_SPARE_dsk3
brw-rw----. 1 grid asmadmin 202, 69 Oct 23 19:51 /dev/c1_SPARE_dsk5
brw-rw----. 1 grid asmadmin 202, 70 Oct 23 19:51 /dev/c1_SPARE_dsk6
brw-rw----. 1 grid asmadmin 202, 71 Oct 23 19:51 /dev/c1_SPARE_dsk7
brw-rw----. 1 grid asmadmin 202, 72 Oct 23 19:51 /dev/c1_SPARE_dsk8
brw-rw----. 1 grid asmadmin 202, 73 Oct 23 19:51 /dev/c1_SPARE_dsk9
[root@host01 ~]#

```

8. The nodes have all been preconfigured with the requirements for installing Oracle Database 12c. This includes the OS user accounts required for a role separated installation. Using `su`, assume the identity of the `grid` user.

```

[root@host01 ~]# su - grid
[grid@host01 ~]$ 

```

9. Examine the `grid` user account and take note of the OS groups that it is associated with.

```

[grid@host01 ~]$ id
uid=54322(grid) gid=54321(oinstall)
groups=54321(oinstall),54322(dba),54327(asdba),54328(asmoper),5
4329(asmadmin),54359(oper)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
[grid@host01 ~]$ 

```

10. Exit the grid session.

```
[grid@host01 ~]$ exit
logout
[root@host01 ~]#
```

11. Using `su`, assume the identity of the `oracle` user and examine the user account to identify the OS groups associated with it.

```
[root@host01 ~]# su - oracle
[oracle@host01 ~]$ id
uid=54321(oracle) gid=54321(oinstall)
groups=54321(oinstall), 54322(dba), 54324(backupdba), 54325(dgdba),
54326(kmdba), 54327(asmdba), 54330(racdba), 54359(oper)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
[oracle@host01 ~]$
```

The `root`, `grid` and `oracle` OS user accounts have all been pre-configured to enable passwordless SSH between the cluster nodes. For the `grid` and `oracle` users, this is required to install Oracle Database 12c. For the `root` user, this configuration simplifies some of the practice tasks. (as you have already seen in steps 5 and 6 above).

12. Confirm the configuration of passwordless SSH for the `oracle` and `grid` OS users.

```
[oracle@host01 ~]$ ssh host02 hostname
host02.example.com
[oracle@host01 ~]$ ssh host03 hostname
host03.example.com
[oracle@host01 ~]$ ssh host04 hostname
host04.example.com
[oracle@host01 ~]$ ssh host05 hostname
host05.example.com

[oracle@host01 ~]$ su - grid
Password:
[grid@host01 ~]$ ssh host02 hostname
host02.example.com
[grid@host01 ~]$ ssh host03 hostname
host03.example.com
[grid@host01 ~]$ ssh host04 hostname
host04.example.com
[grid@host01 ~]$ ssh host05 hostname
host05.example.com
[grid@host01 ~]$
```

13. Exit your terminal session.

Note: Each of the following practice exercises will instruct you to initiate one or more terminal sessions using different user accounts. Ensure that you always start a new terminal session when instructed to do so, and exit all of your terminal sessions at the end of each practice.

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Practices for Lesson 3: Cluster Configuration Options

Practices for Lesson 3

There are no practices for this lesson.

Practices for Lesson 4: Grid Infrastructure Preinstallation Tasks

Practice 4-1: Preinstallation Tasks

Overview

In this practice, you will perform required Preinstallation tasks for Oracle12c Release 2 Grid Infrastructure.

Tasks

The Oracle Preinstallation RPM was installed on all five of your cluster nodes as part of the class setup to perform the basic prerequisites. You will perform the following additional tasks that are required before installing Oracle Grid Infrastructure. These tasks include:

- Creating base directory
 - Setting shell limits
 - Editing profile entries
1. SSH to host01 as the `root` user. The cluster will use CTSSD for time synchronization between cluster nodes so NTPD will not be used. Check that NTPD is **not** running on any cluster nodes. If it is running, stop NTPD using the service `ntpd stop` command.

Perform this step on all five of your nodes.

```
[oracle@dns ~] $ ssh root@host01
Password: *****
[root@host01 ~]# service ntpd status
ntp is stopped
[root@host01 ~]# ssh host02 service ntpd status
ntp is stopped
[root@host01 ~]# ssh host03 service ntpd status
ntp is stopped
[root@host01 ~]# ssh host04 service ntpd status
ntp is stopped
[root@host01 ~]# ssh host05 service ntpd status
ntp is stopped
[root@host01 ~]#
```

2. As the `root` user, start the local naming cache daemon is running on all five cluster nodes.

Perform these steps on all five of your nodes.

```
[root@host01 ~]# service nscd start
Starting nscd: [ OK ]
[root@host01 ~]# ssh host02 service nscd start
Starting nscd: [ OK ]
[root@host01 ~]# ssh host03 service nscd start
Starting nscd: [ OK ]
```

```
[root@host01 ~]# ssh host04 service nscd start
Starting nscd: [ OK ]
[root@host01 ~]# ssh host05 service nscd start
Starting nscd: [ OK ]
[root@host01 ~]#
```

3. As the root user, run the /stage/GRID/labs/less_04/limits.sh script on host01. This script replaces the profile for the oracle and grid users and replaces /etc/profile. It replaces the /etc/security/limits.conf file with a new one with entries for oracle and grid. Cat the /stage/GRID/labs/less_04/bash_profile and /stage/GRID/labs/less_04/profile to view the new files.

```
[root@host01 ~]# cat /stage/GRID/labs/less_04/bash_profile
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
    . ~/.bashrc
fi

# User specific environment and startup programs

PATH=/home/oracle/firefox:$PATH:$HOME/bin
export PATH

umask 022

[root@host01 ~]# cat /stage/GRID/labs/less_04/profile
# /etc/profile

# System wide environment and startup programs, for login setup
# Functions and aliases go in /etc/bashrc

pathmunge () {
    if ! echo $PATH | /bin/egrep -q "(:|$)${1}($|:)" ; then
        if [ "$2" = "after" ] ; then
            PATH=$PATH:$1
        else

            PATH=$1:$PATH
        fi
    fi
}

# ksh workaround
if [ -z "$EUID" -a -x /usr/bin/id ] ; then
    EUID=`id -u`
    UID=`id -ru`
```

```

fi

# Path manipulation
if [ "$EUID" = "0" ]; then
    pathmunge /sbin
    pathmunge /usr/sbin
    pathmunge /usr/local/sbin
fi

# No core files by default
ulimit -S -c 0 > /dev/null 2>&1

if [ -x /usr/bin/id ]; then
    USER=`id -un`
    LOGNAME=$USER
    MAIL="/var/spool/mail/$USER"
fi

HOSTNAME=`/bin/hostname`
HISTSIZE=1000

if [ -z "$INPUTRC" -a ! -f "$HOME/.inputrc" ]; then
    INPUTRC=/etc/inputrc
fi

export PATH USER LOGNAME MAIL HOSTNAME HISTSIZE INPUTRC

for i in /etc/profile.d/*.sh ; do
    if [ -r "$i" ]; then
        . $i
    fi
done

if [ $USER = "oracle" ] || [ $USER = "grid" ]; then
    umask 022
    if [ $SHELL = "/bin/ksh" ]; then
        ulimit -p 16384
        ulimit -n 65536
        ulimit -s 10240
    else
        ulimit -u 16384 -n 65536 -s 10240
    fi
fi

unset i
unset pathmunge

[root@host01 ~]# cat /stage/GRID/labs/less_04/limits.conf
#
#       - priority - the priority to run user process with
#       - locks - max number of file locks the user can hold
#       - sigpending - max number of pending signals

```

```

#           - msgqueue - max memory used by POSIX message queues
(bytes)
#           - nice - max nice priority allowed to raise to
#           - rtprio - max realtime priority
#<domain>      <type>   <item>        <value>

#*          soft    core       0
#*          hard    rss        10000
#@student    hard    nproc      20
#@faculty    soft    nproc      20
#@faculty    hard    nproc      50
#ftp         hard    nproc      0
#@student    -      maxlogins  4
# End of file
oracle  soft  nofile     131072
oracle  hard  nofile     131072
oracle  soft  nproc 131072
oracle  hard  nproc 131072
oracle  soft  core  unlimited
oracle  hard  core  unlimited
oracle  soft  memlock 3500000
oracle  hard  memlock 3500000
oracle  soft  stack   10240
oracle  hard  stack   32768
grid    soft  nofile     131072
grid    hard  nofile     131072
grid    soft  nproc 131072
grid    hard  nproc 131072
grid    soft  core  unlimited
grid    hard  core  unlimited
grid    soft  memlock 3500000
grid    hard  memlock 3500000
grid    soft  stack   10240
grid    hard  stack   32768

# Recommended stack hard limit 32MB for oracle installations
# oracle  hard  stack   32768

[root@host01 ~]# cat /stage/GRID/labs/less_04/limits.sh
scp /stage/GRID/labs/less_04/bash_profile
host01:/home/oracle/.bash_profile
scp /stage/GRID/labs/less_04/bash_profile
host01:/home/grid/.bash_profile
scp /stage/GRID/labs/less_04/limits.conf
host01:/etc/security/limits.conf
scp /etc/profile host01:/root/etc_profile
scp /stage/GRID/labs/less_04/profile host01:/etc/profile

scp /stage/GRID/labs/less_04/bash_profile
host02:/home/oracle/.bash_profile
scp /stage/GRID/labs/less_04/bash_profile
host02:/home/grid/.bash_profile

```

```

scp /stage/GRID/labs/less_04/limits.conf
host02:/etc/security/limits.conf
scp /etc/profile host02:/root/etc_profile
scp /stage/GRID/labs/less_04/profile host02:/etc/profile

scp /stage/GRID/labs/less_04/bash_profile
host03:/home/oracle/.bash_profile
scp /stage/GRID/labs/less_04/bash_profile
host03:/home/grid/.bash_profile
scp /stage/GRID/labs/less_04/limits.conf
host03:/etc/security/limits.conf
scp /etc/profile host03:/root/etc_profile
scp /stage/GRID/labs/less_04/profile host03:/etc/profile

scp /stage/GRID/labs/less_04/bash_profile
host04:/home/oracle/.bash_profile
scp /stage/GRID/labs/less_04/bash_profile
host04:/home/grid/.bash_profile
scp /stage/GRID/labs/less_04/limits.conf
host04:/etc/security/limits.conf
scp /etc/profile host04:/root/etc_profile
scp /stage/GRID/labs/less_04/profile host04:/etc/profile

scp /stage/GRID/labs/less_04/bash_profile
host05:/home/oracle/.bash_profile
scp /stage/GRID/labs/less_04/bash_profile
host05:/home/grid/.bash_profile
scp /stage/GRID/labs/less_04/limits.conf
host05:/etc/security/limits.conf
scp /etc/profile host05:/root/etc_profile
scp /stage/GRID/labs/less_04/profile host05:/etc/profile

```

	100%	194	0.2KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
limits.conf	100%	1276	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
limits.conf	100%	1276	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
limits.conf	100%	1276	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00
limits.conf	100%	1276	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
bash_profile	100%	194	0.2KB/s	00:00

bash_profile	100%	194	0.2KB/s	00:00
limits.conf	100%	1276	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
profile	100%	1279	1.3KB/s	00:00
 [root@host01 ~] #				

4. Create the installation directories for both grid and oracle-owned software. Set the ownership and permissions of the directories as shown below: Do this on all five hosts. Use the /stage/GRID/labs/less_04/cr_dir.sh script to save time.

```
[root@host01 ~]# cat /stage/GRID/labs/less_04/cr_dir.sh
#!/bin/bash

mkdir -p /u01/app/12.2.0/grid
mkdir -p /u01/app/grid
mkdir -p /u01/app/oracle
chown -R grid:oinstall /u01
chown oracle:oinstall /u01/app/oracle
chmod -R 775 /u01/

ssh host02 mkdir -p /u01/app/12.2.0/grid
ssh host02 mkdir -p /u01/app/grid
ssh host02 mkdir -p /u01/app/oracle
ssh host02 chown -R grid:oinstall /u01
ssh host02 chown oracle:oinstall /u01/app/oracle
ssh host02 chmod -R 775 /u01/

ssh host03 mkdir -p /u01/app/12.2.0/grid
ssh host03 mkdir -p /u01/app/grid
ssh host03 mkdir -p /u01/app/oracle
ssh host03 chown -R grid:oinstall /u01
ssh host03 chown oracle:oinstall /u01/app/oracle
ssh host03 chmod -R 775 /u01/

ssh host04 mkdir -p /u01/app/12.2.0/grid
ssh host04 mkdir -p /u01/app/grid
ssh host04 mkdir -p /u01/app/oracle
ssh host04 chown -R grid:oinstall /u01
ssh host04 chown oracle:oinstall /u01/app/oracle
ssh host04 chmod -R 775 /u01/

ssh host05 mkdir -p /u01/app/12.2.0/grid
ssh host05 mkdir -p /u01/app/grid
ssh host05 mkdir -p /u01/app/oracle
```

```
ssh host05 chown -R grid:oinstall /u01
ssh host05 chown oracle:oinstall /u01/app/oracle
ssh host05 chmod -R 775 /u01/
[root@host01 ~]# /stage/GRID/labs/less_04/cr_dir.sh
[root@host01 ~]#
```

5. Close all terminal windows opened for these practices.

Practices for Lesson 5: Grid Infrastructure Installation

Practice 5-1: Configuring a Standalone Flex Cluster

Overview

In this practice, you will install and configure a new Flex Cluster with Flex ASM. You will install to three nodes; host01, host02 and host04. You will designate host01 and host02 to be HUB nodes and host04 will be designated as a LEAF node.

1. From a terminal in the dns server, change to the root account. First, set the time across all nodes using the command shown below. Then restart the NAMED service to ensure viability and availability of the services for the software installation.

```
[oracle@dns ~]$ su -
Password:

[root@dns ~]# TIME=`date +%T`;for H in host01 host02 host03
host04 host05;do ssh $H date -s $TIME;done
root@host01's password:
Wed Jun 17 08:25:14 UTC 2015
root@host02's password:
Wed Jun 17 08:25:14 UTC 2015
root@host03's password:
Wed Jun 17 08:25:14 UTC 2015
root@host04's password:
Wed Jun 17 08:25:14 UTC 2015
root@host05's password:
Wed Jun 17 08:25:14 UTC 2015

[root@dns ~]# service named restart
Stopping named:                                     [  OK   ]
Starting named:                                     [  OK   ]
[root@dns ~]# exit
Logout

[oracle@dns ~]$
```

2. Open a terminal window on your dns node and ssh to host01 as the grid user. Unzip the /stage/clusterware.zip file to /u01/app/12.2.0/grid on host01.

```
[oracle@dns ~]# ssh -X grid@host01
grid@host01's password:

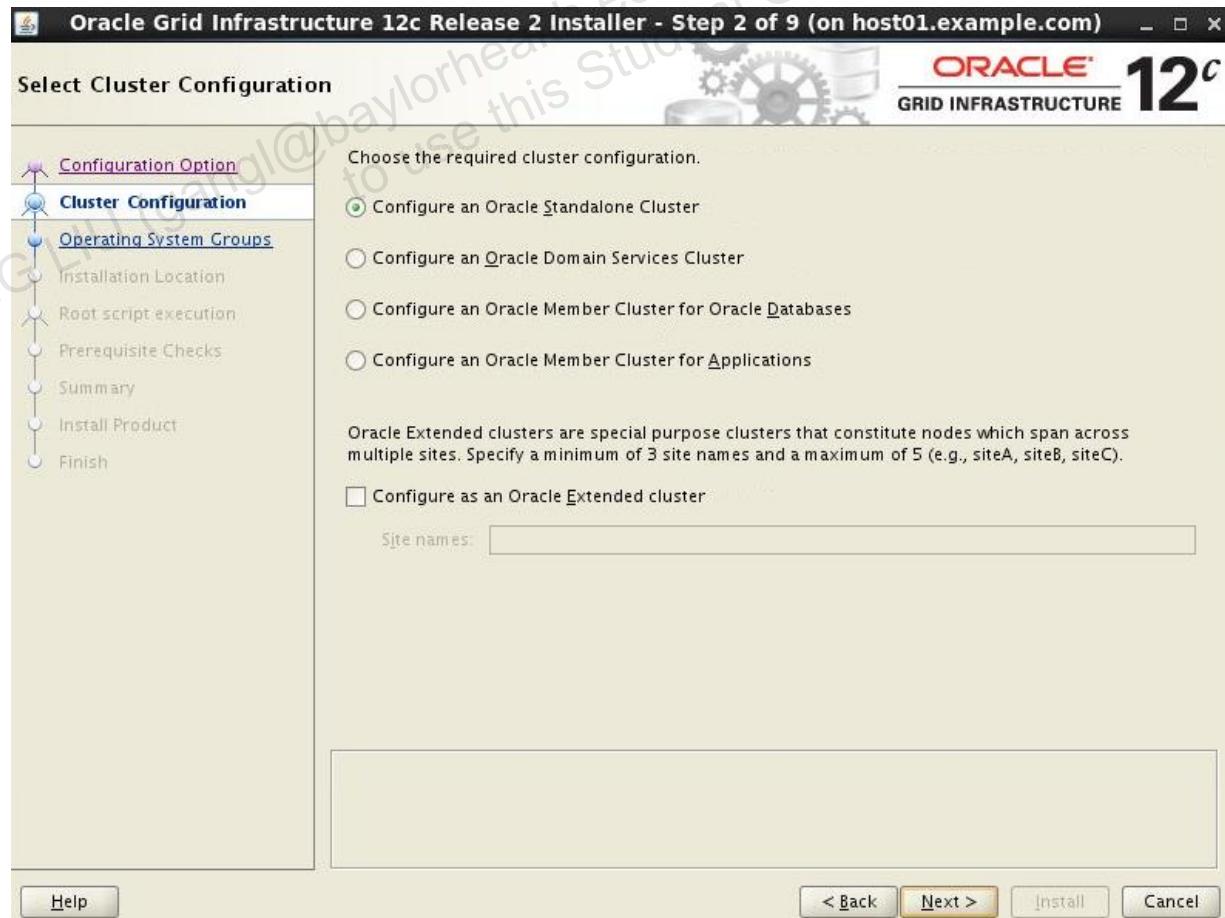
[grid@host01 ~]$ unzip -d /u01/app/12.2.0/grid /stage/clusterware.zip

...
[grid@host01 ~]$
```

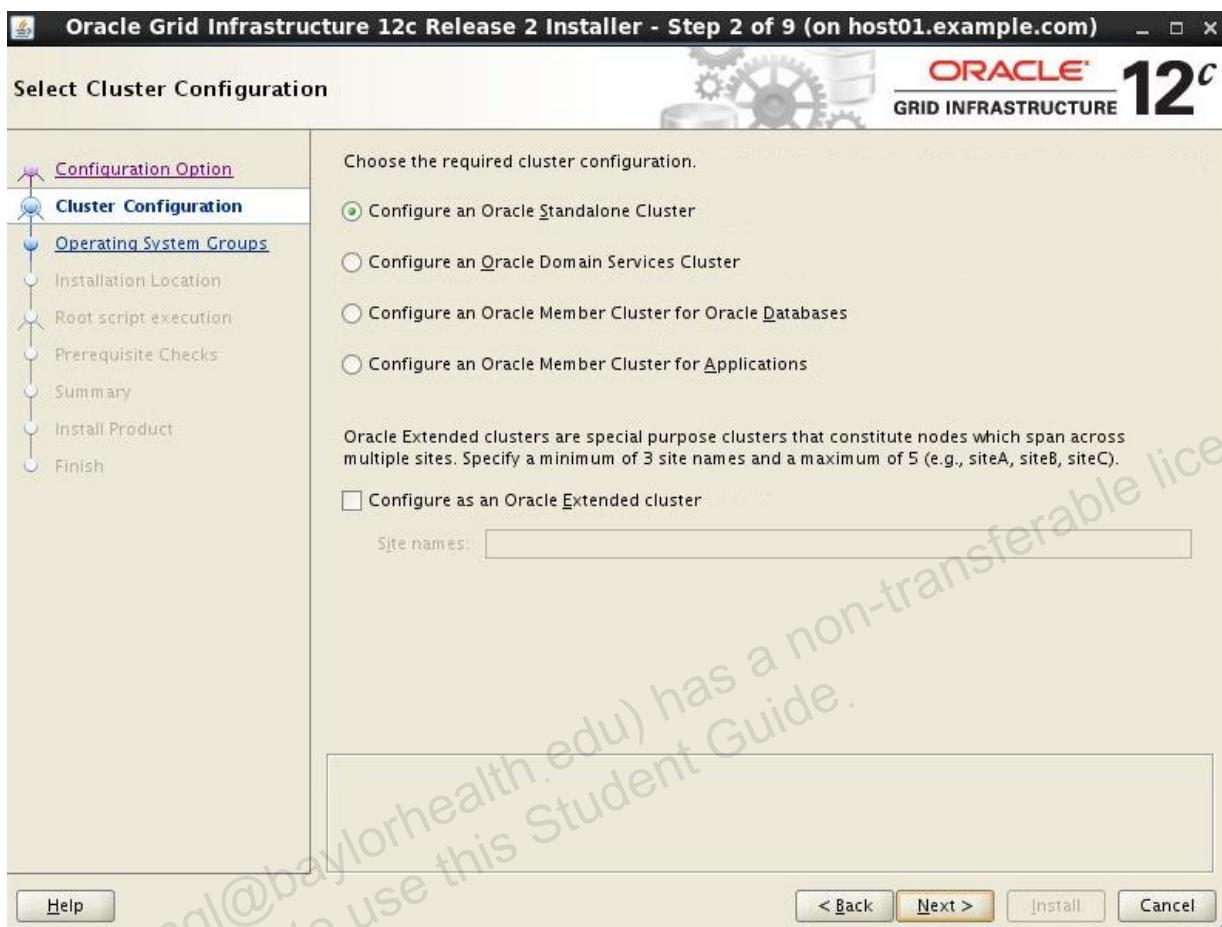
3. As the grid user, change your working directory to /u01/app/12.2.0/grid and execute the gridSetup.sh script.

```
[grid@host01 ~]$ cd /u01/app/12.2.0/grid
[grid@host01 grid]$ ./gridSetup.sh
```

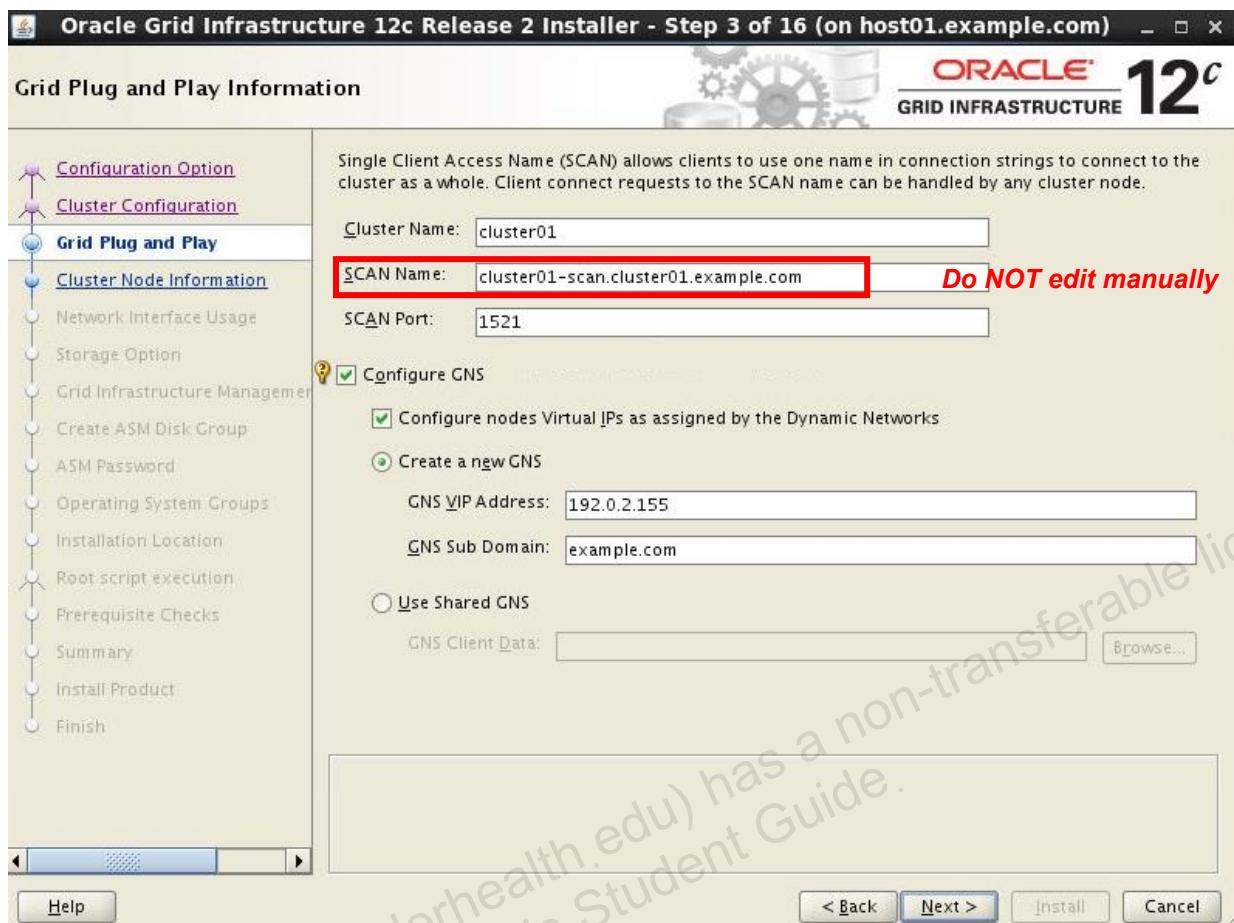
4. On the Select Configuration Option page, select “Configure Oracle Grid Infrastructure for a New Cluster and click “Next”.



5. On the Select Cluster Configuration page, select “Configure an Oracle Standalone Cluster” and click “Next”.

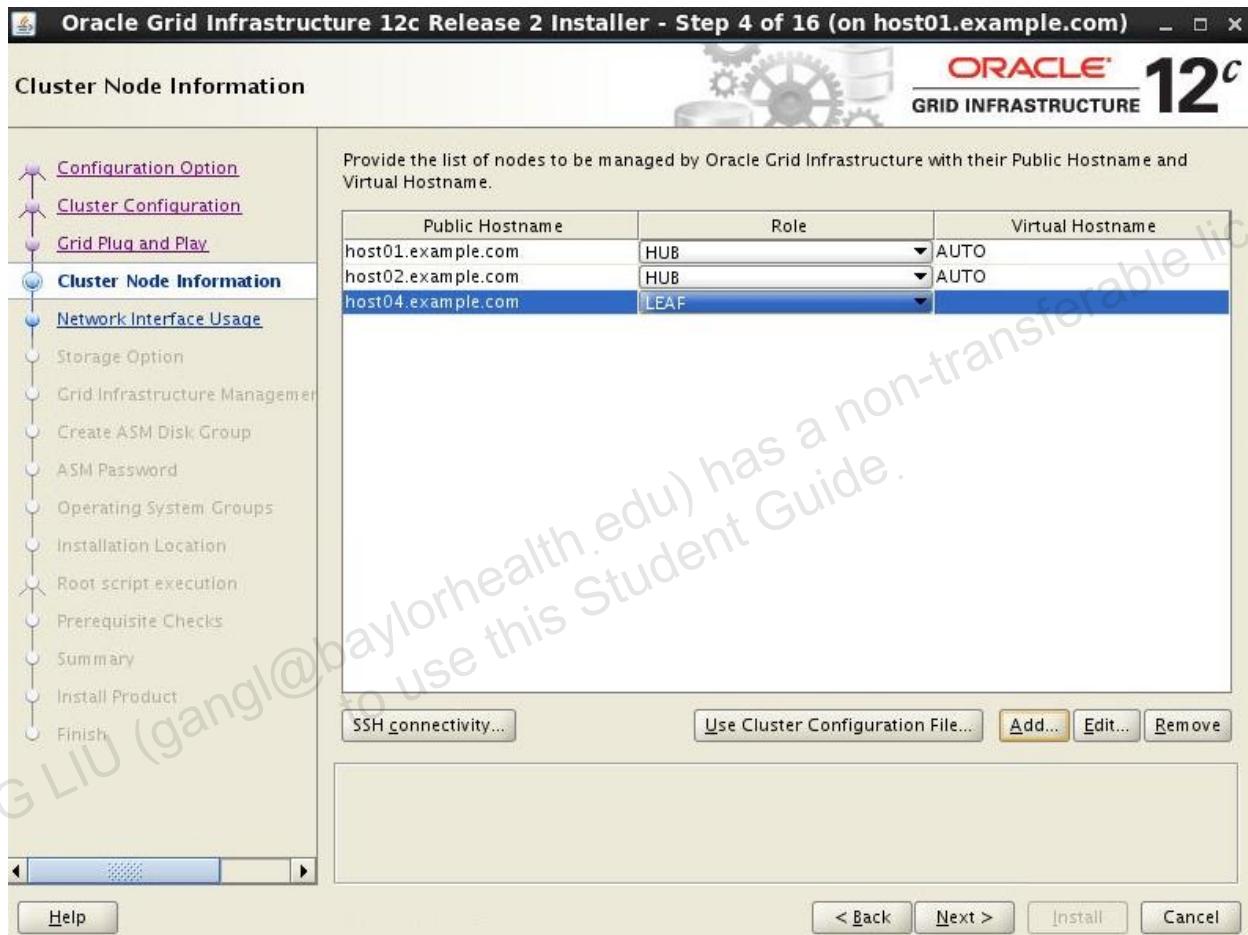


6. On the Grid Plug and Play Information page, enter the following settings:
- Cluster Name: cluster01
 - SCAN Name: **cluster01-scan.cluster01.example.com** (Auto-filled, Do NOT edit it manually)
 - SCAN Port: 1521
 - Click the “Configure GNS” check box
 - Click the “Configure nodes Virtual IPs as assigned by the Dynamic Networks”
 - Click the “Create a new GNS” radio button
 - GNS VIP Address: 192.0.2.155
 - GNS Sub Domain: **example.com**

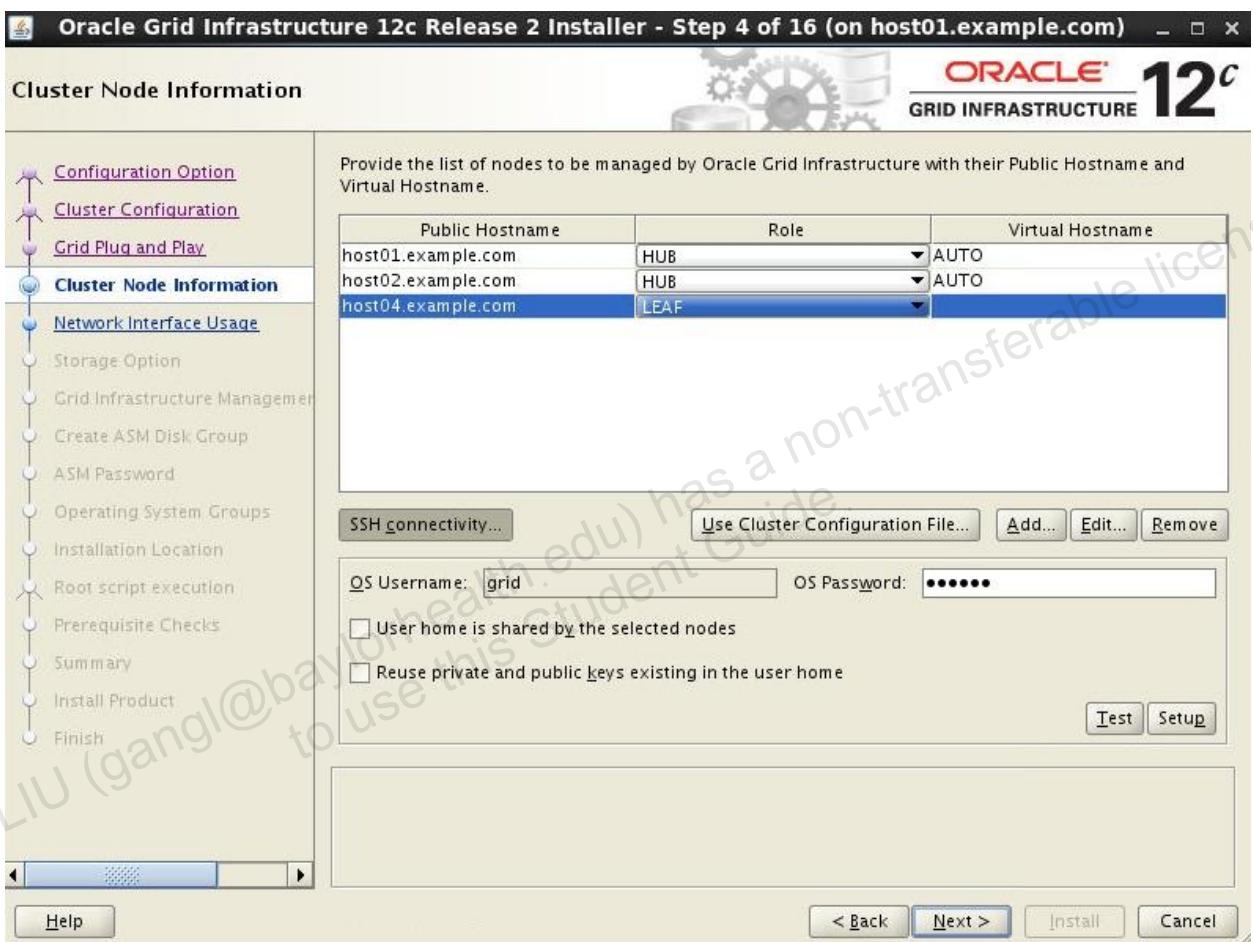


7. On the Cluster Node Information screen, click Add to begin the process of specifying additional cluster nodes. Click the Add button and add host02.example.com. Make sure to set Node Role to **HUB**, and click OK. Click the add button again and add host04.example.com. Make sure the Node Role is set to **LEAF** and click OK.

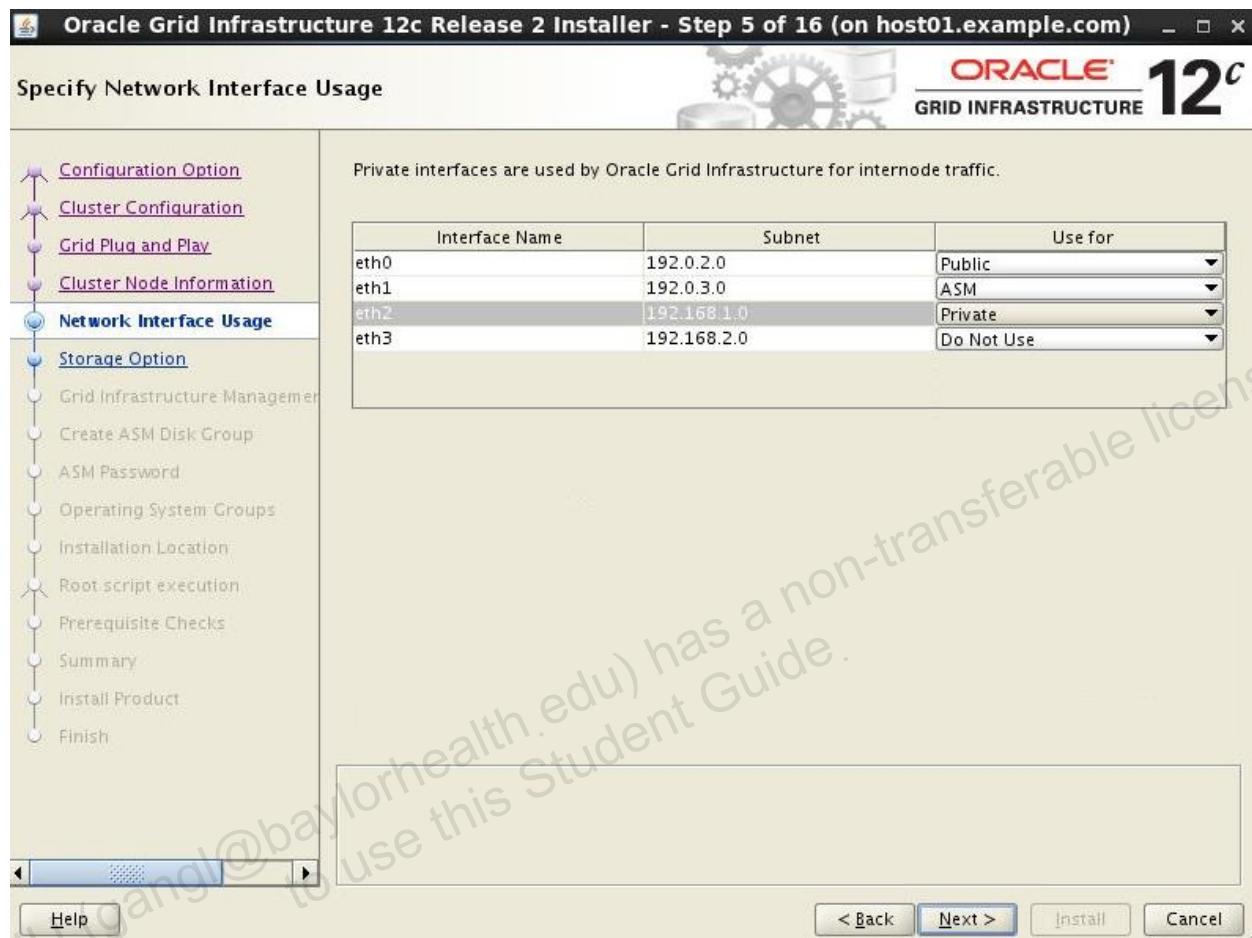
- host01.example.com (**HUB**)
- host02.example.com (**HUB**)
- host04.example.com (**LEAF**)



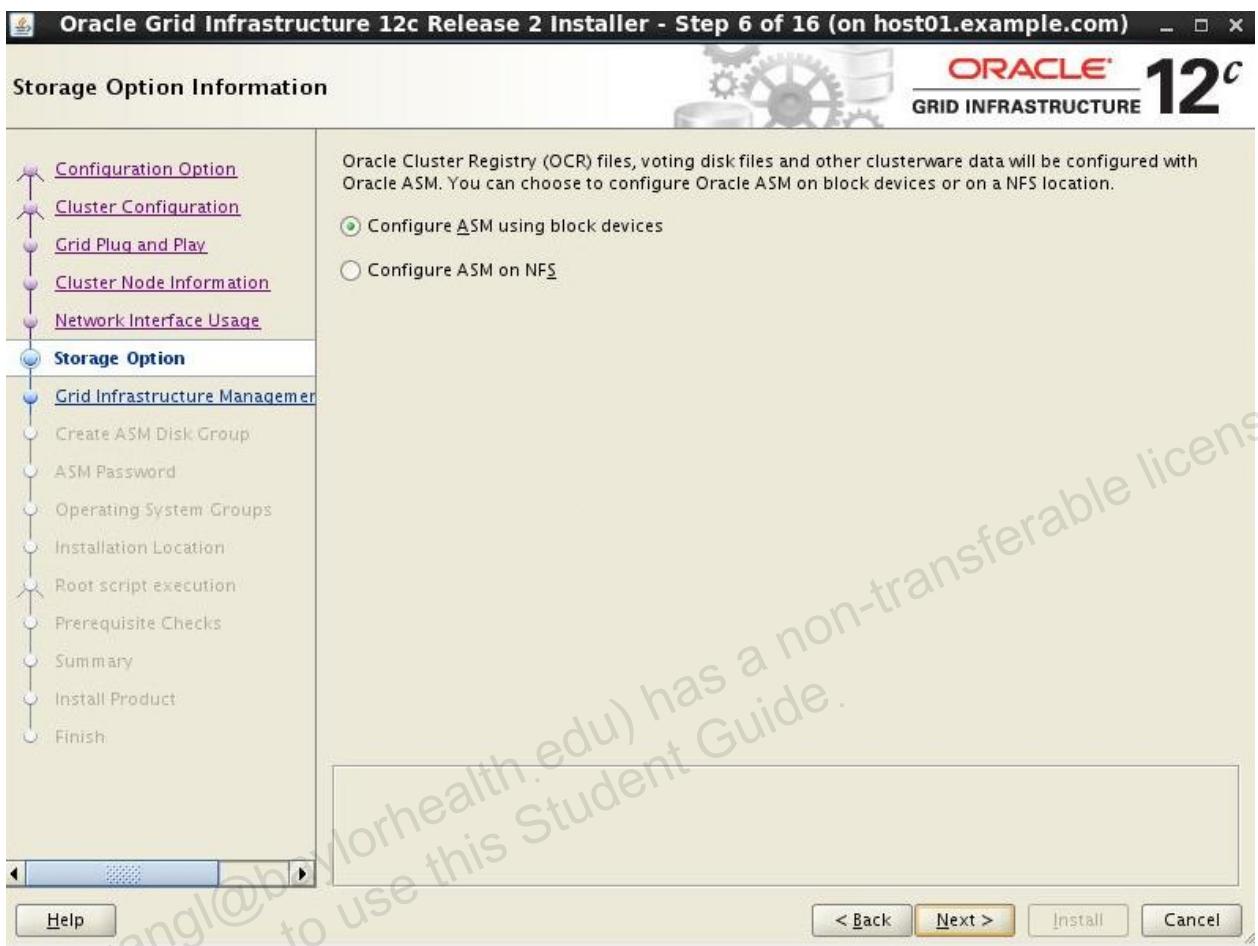
8. Click the SSH Connectivity button. Enter the grid password (*please refer to the Course Practice Environment: Security Credentials page for account passwords*) into the OS Password field and click Test to confirm that the required SSH connectivity is configured across the cluster. Your lab environment is preconfigured with the required SSH connectivity so you will next see a dialog confirming this. Click OK to continue. Review the information in the Cluster Node Information page and click Next. Your screen Cluster Node Information page should look like the one below:



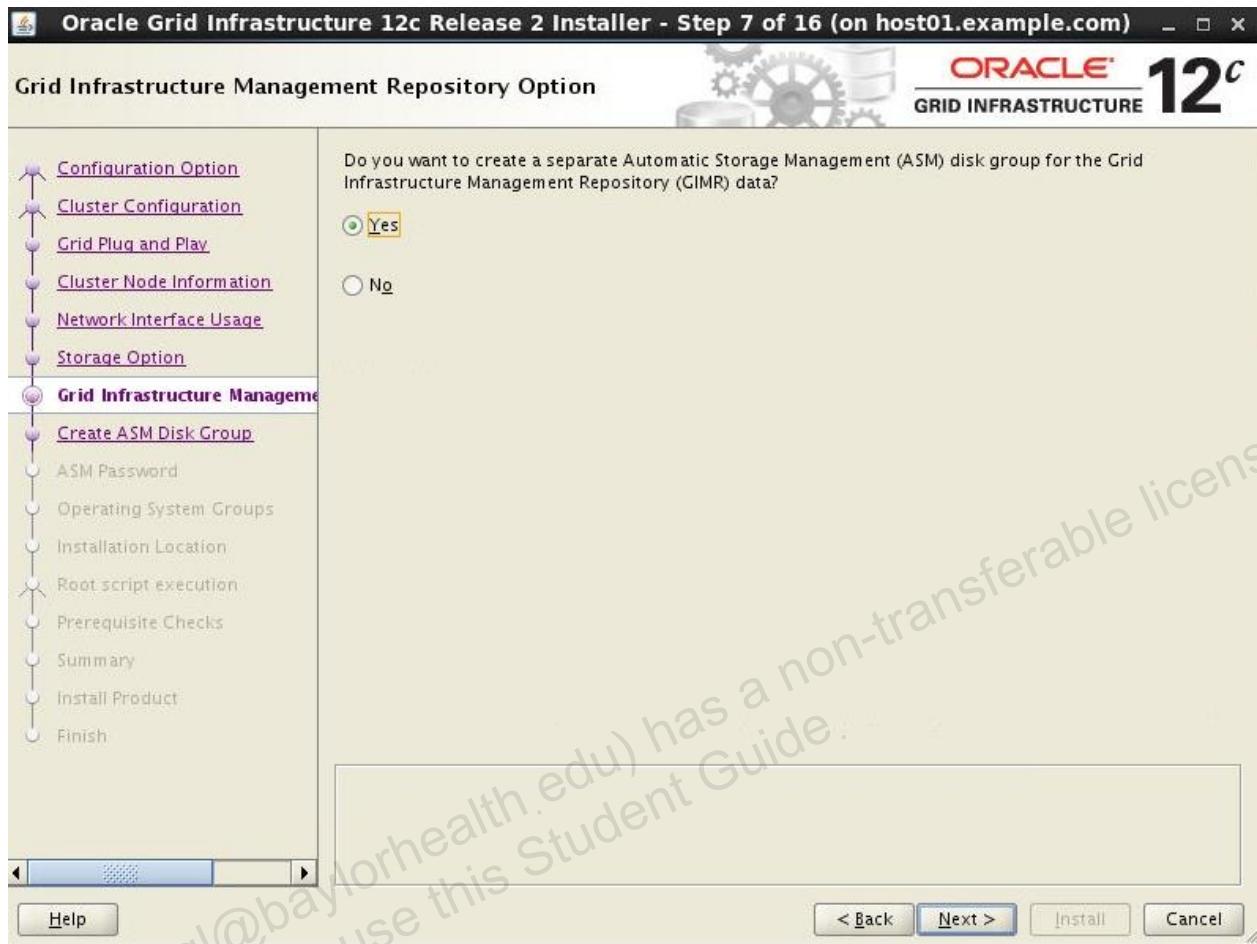
9. On the Specify Network Interface Usage page select Public for eth0, ASM for eth1, and Private for eth2. The eth3 interface should be designated “Do not use”. Click Next to continue.



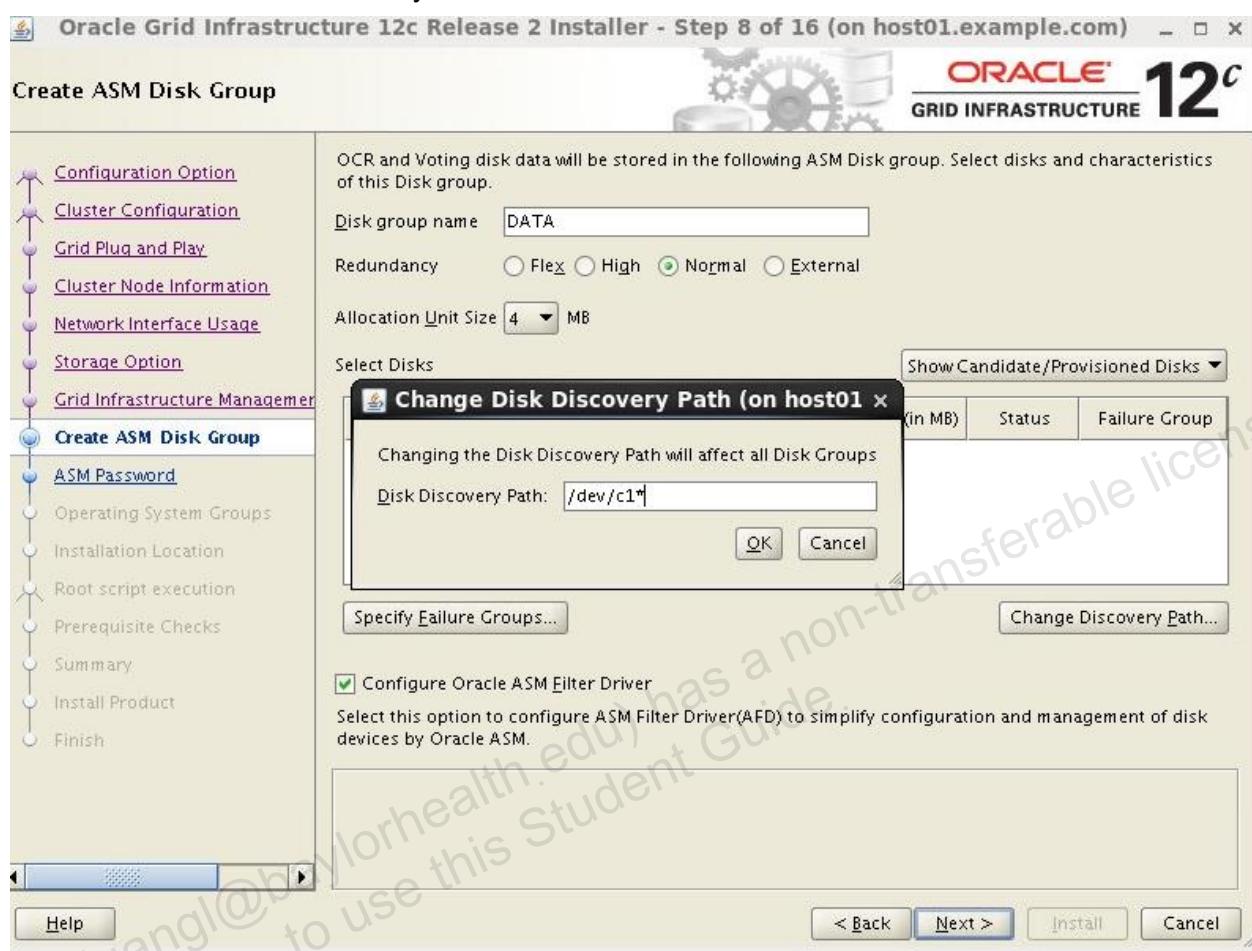
10. On the Storage Option Information page, click the “Configure ASM using block devices” button, and click Next.



11. On the Grid Infrastructure Management Repository Option page, click Yes then click Next.

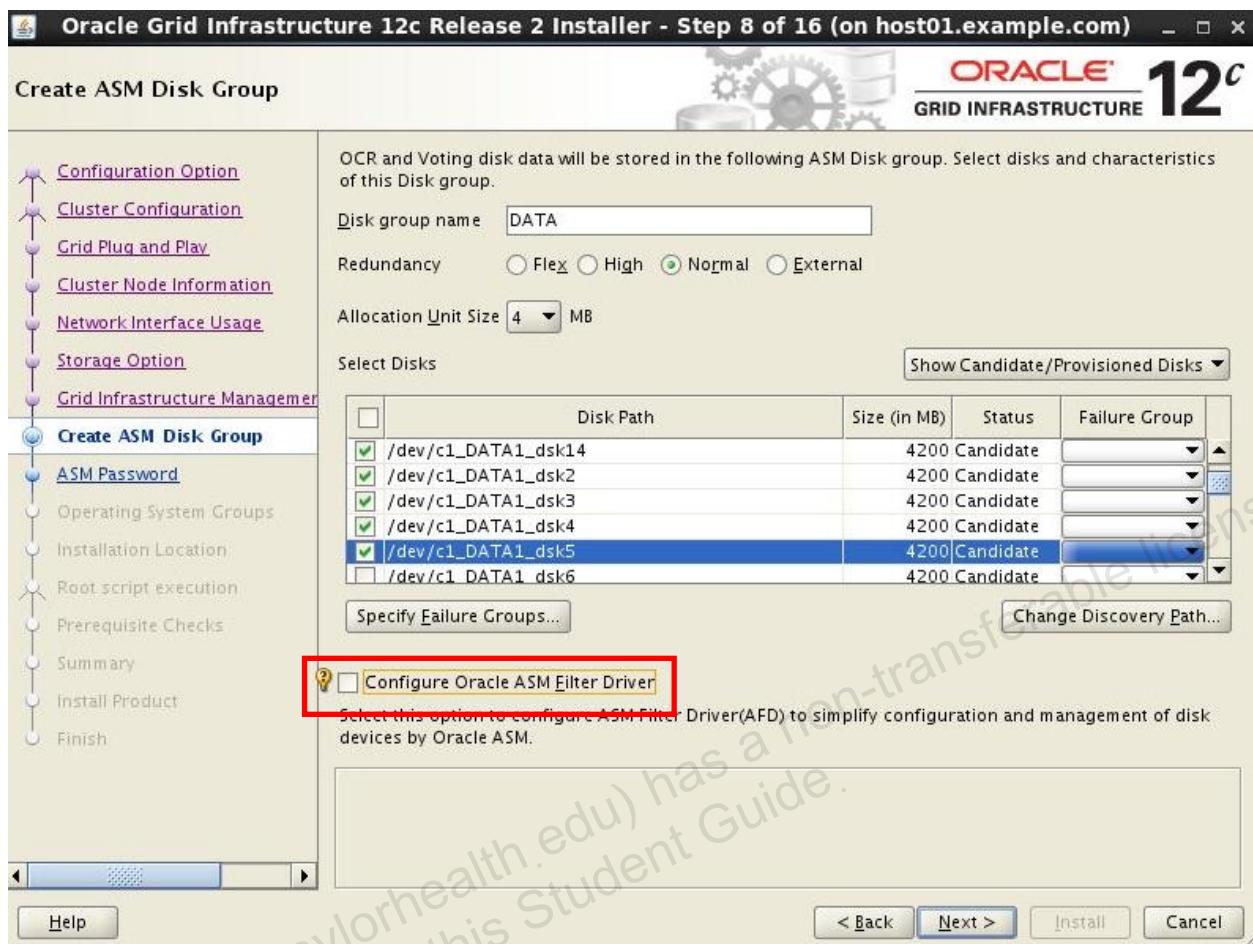


12. On the Create ASM Disk Group page, click the “Change Discovery Path” button. Enter `/dev/c1*` in the Disk Discovery Path field and click OK.

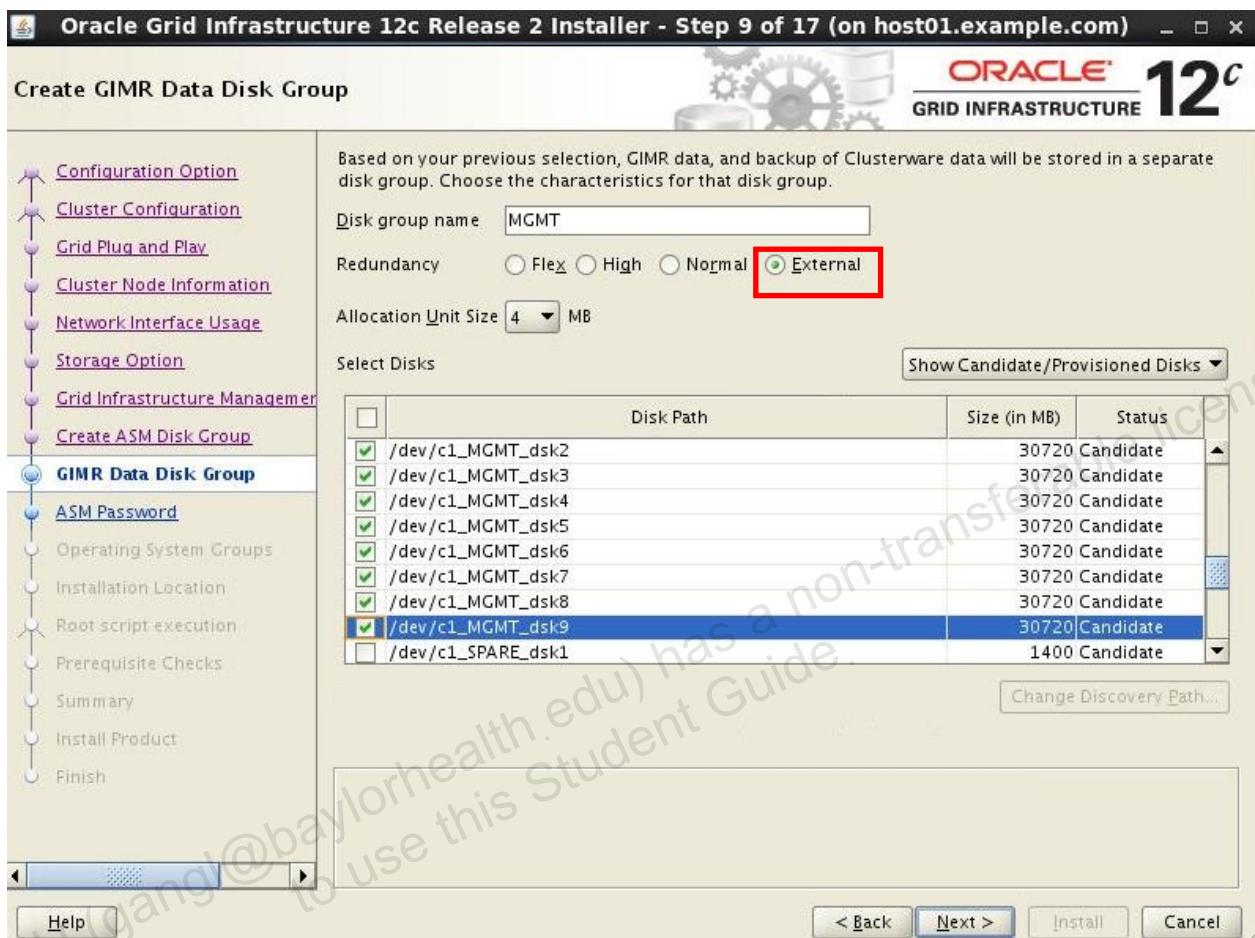


13. On the Create ASM Disk Group screen, select *the first 10 candidate disks (c1_DATA1 disks)* in the list for the DATA disk group. Make sure Redundancy is **Normal** and the “Configure Oracle ASM Filter Driver” check box is **NOT selected**. Click “Next”.

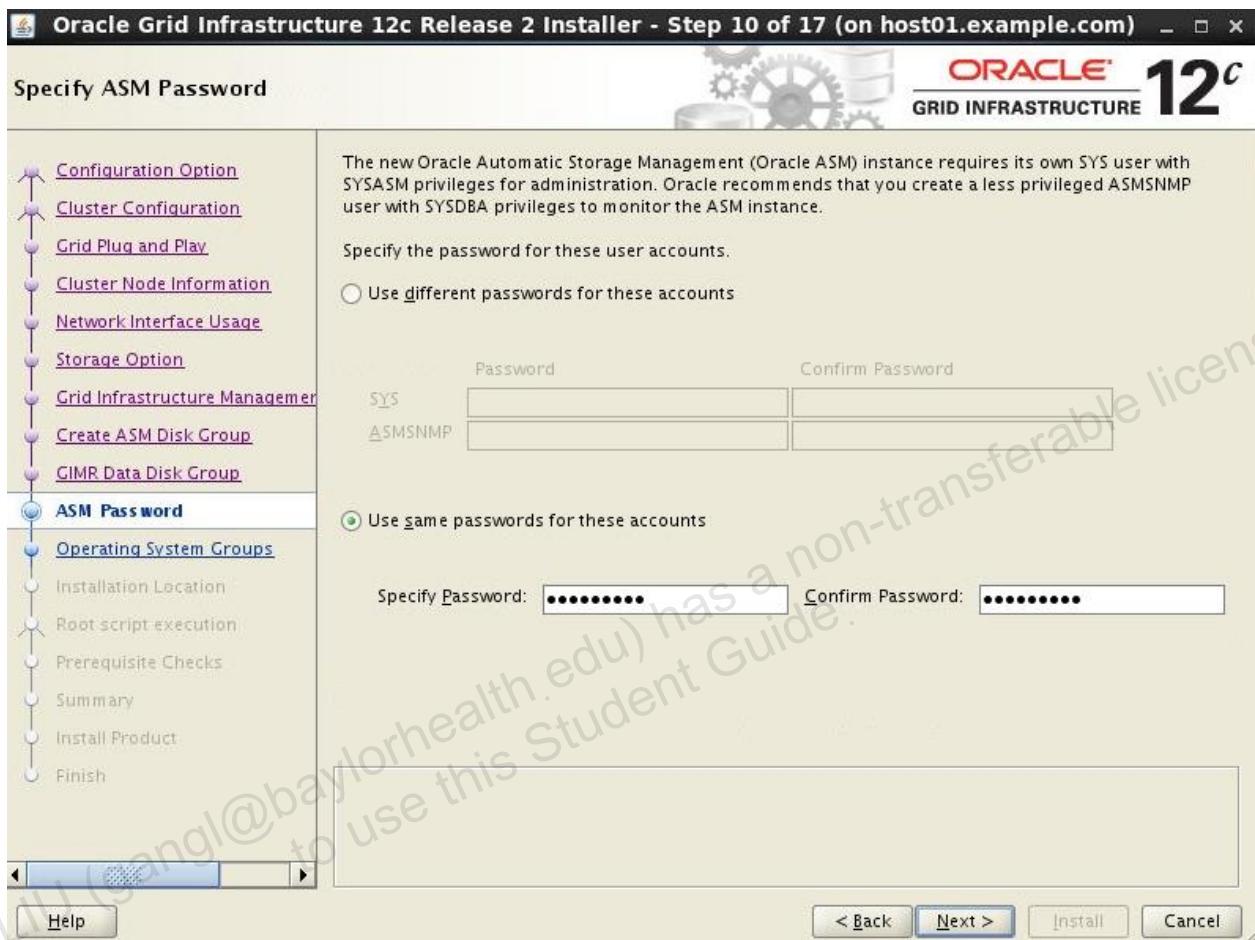
- `/dev/c1_DATA1_dsk1`
- `/dev/c1_DATA1_dsk10`
- `/dev/c1_DATA1_dsk11`
- `/dev/c1_DATA1_dsk12`
- `/dev/c1_DATA1_dsk13`
- `/dev/c1_DATA1_dsk14`
- `/dev/c1_DATA1_dsk2`
- `/dev/c1_DATA1_dsk3`
- `/dev/c1_DATA1_dsk4`
- `/dev/c1_DATA1_dsk5`



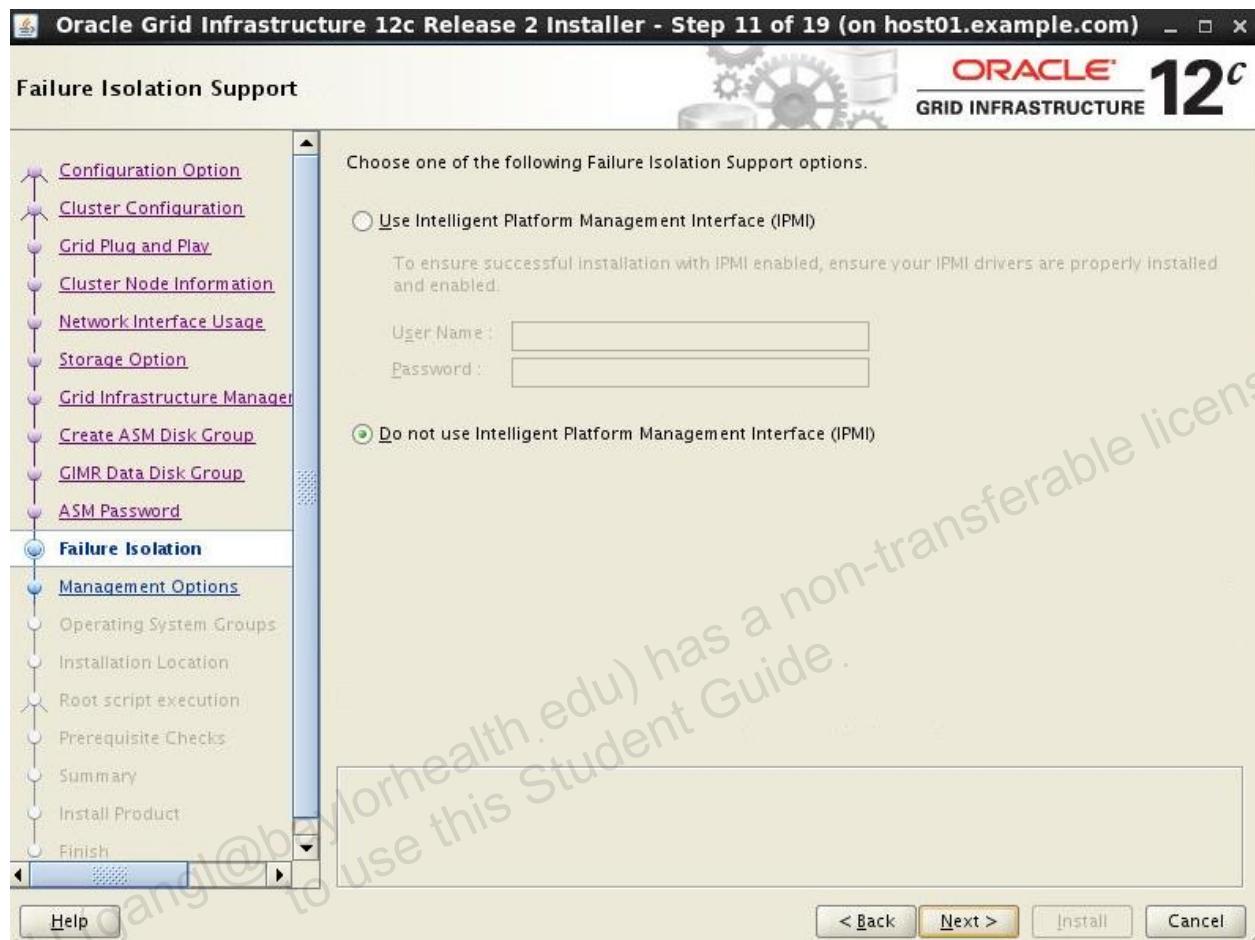
14. On the Create GIMR Data Disk Group page, select **All** candidate disks (`c1_MGMT1_dsk1~c1_MGMT_dsk14` disks) in the list for the MGMT disk group. There will be 14 disks. Set the Redundancy to **External**. Click “Next” to continue.



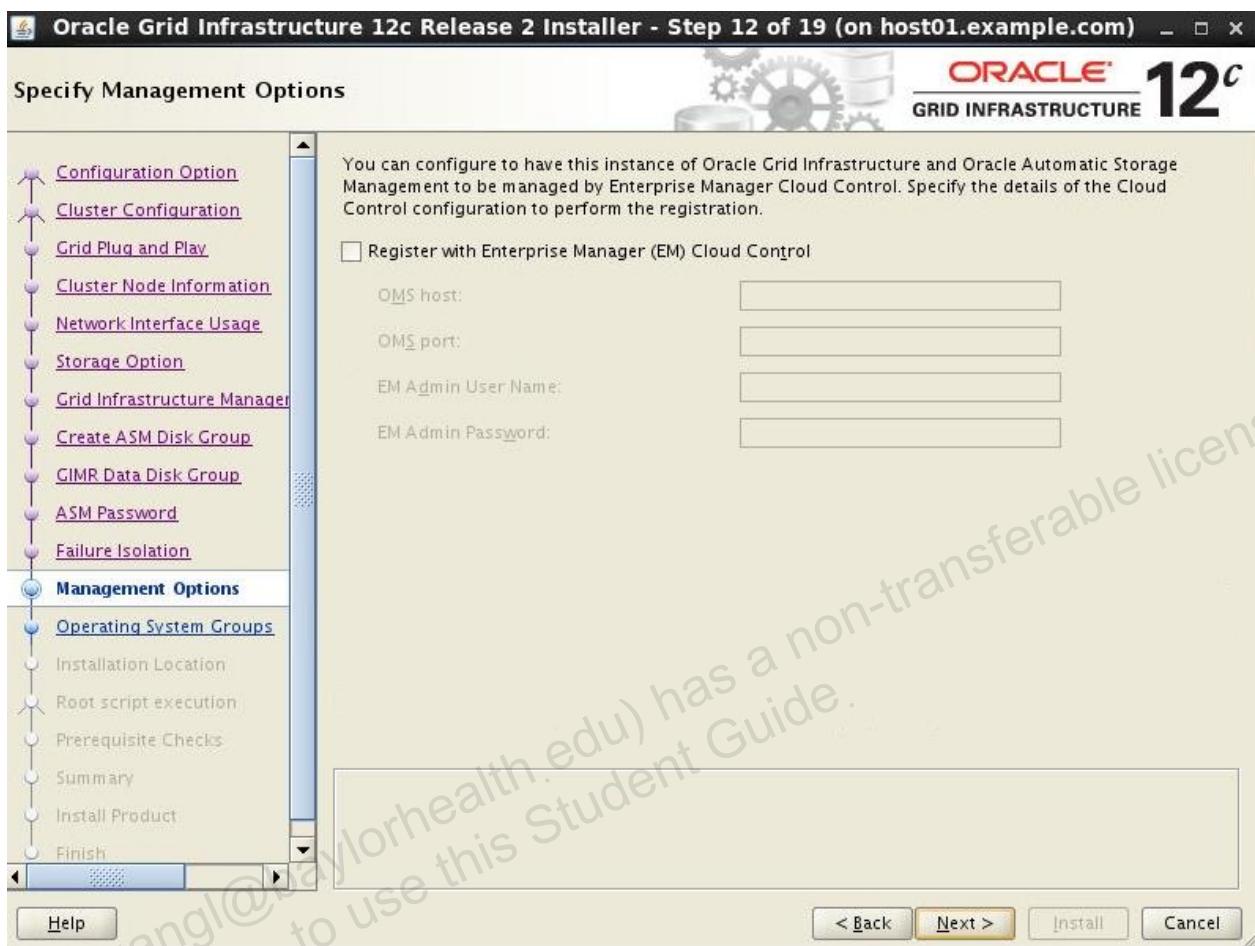
15. On the Specify ASM Password page, click the “Use same passwords for these accounts” radio button and enter the SYS password (as specified in the **Course Practice Environment: Security Credentials** page) in the Specify Password and Confirm Password fields. Click “Next” to continue.



16. On the Failure Isolation Support screen, click Next to accept the default setting (Do not use IPMI).



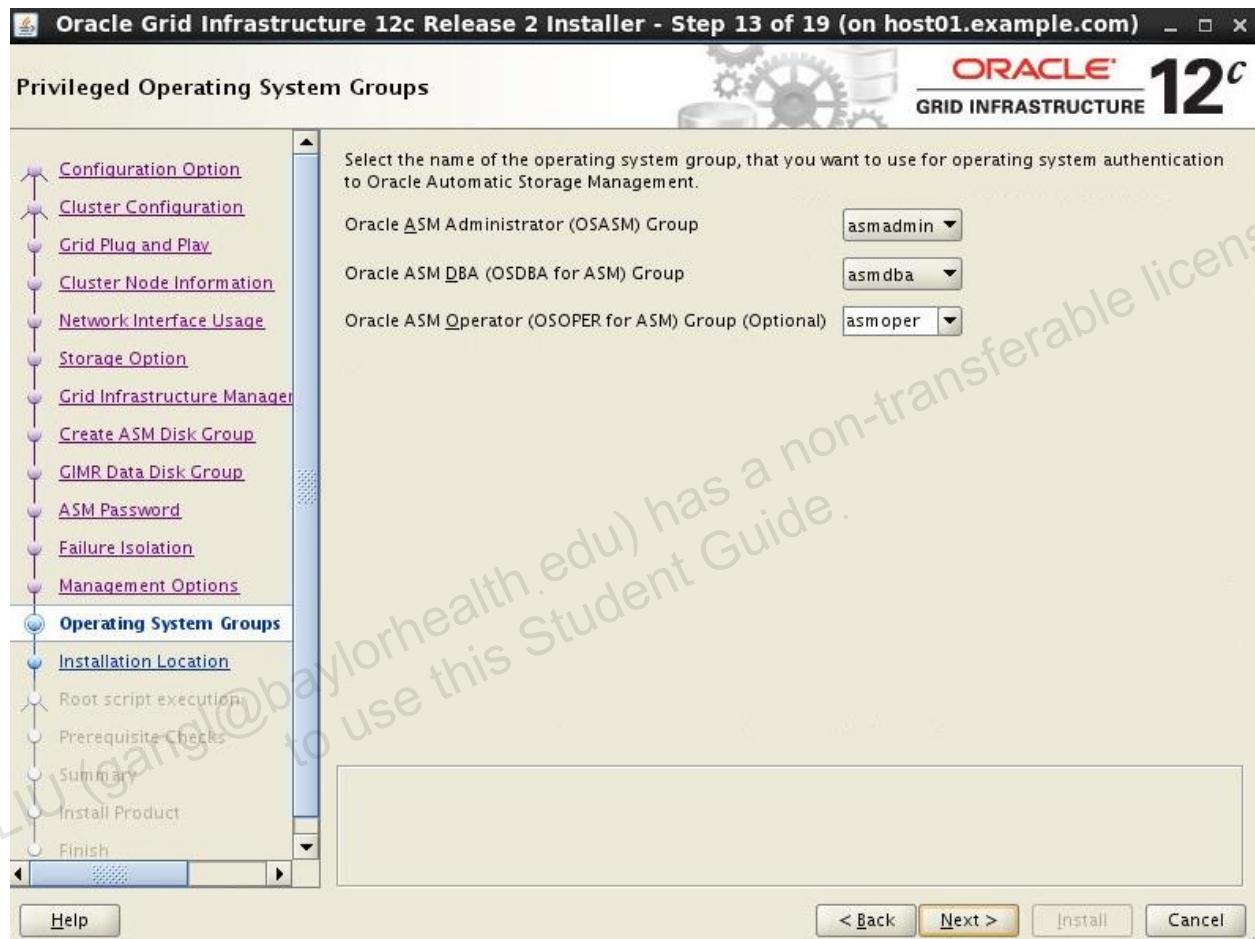
17. On the Specify Management Options screen, accept the defaults (nothing selected) and click Next to continue.



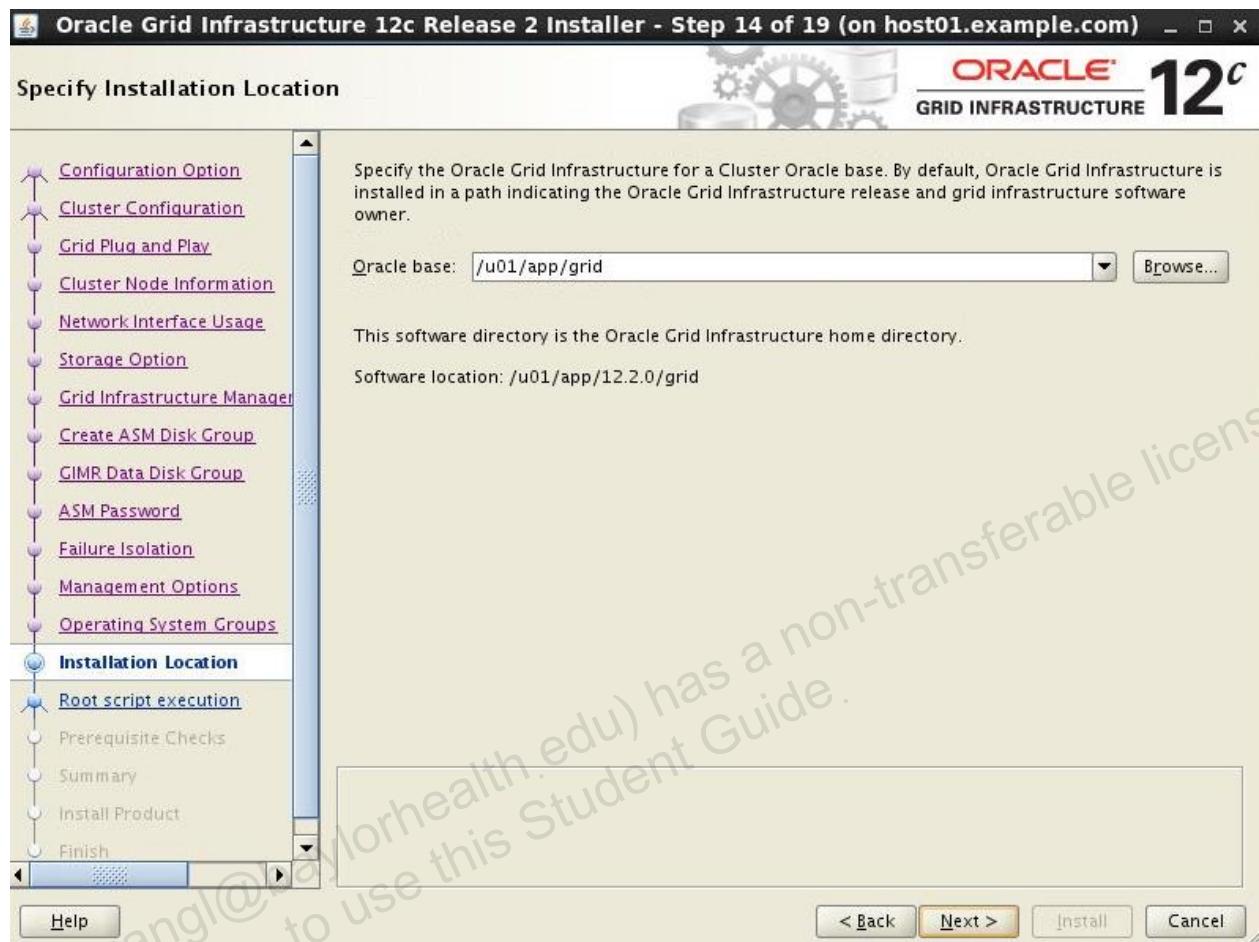
18. On the Privileged Operating System Groups screen, the values should default to the following:

- Oracle ASM Administrator Group: asmadmin
- Oracle ASM DBA Group: asmdba
- Oracle ASM Operator Group : asmoper

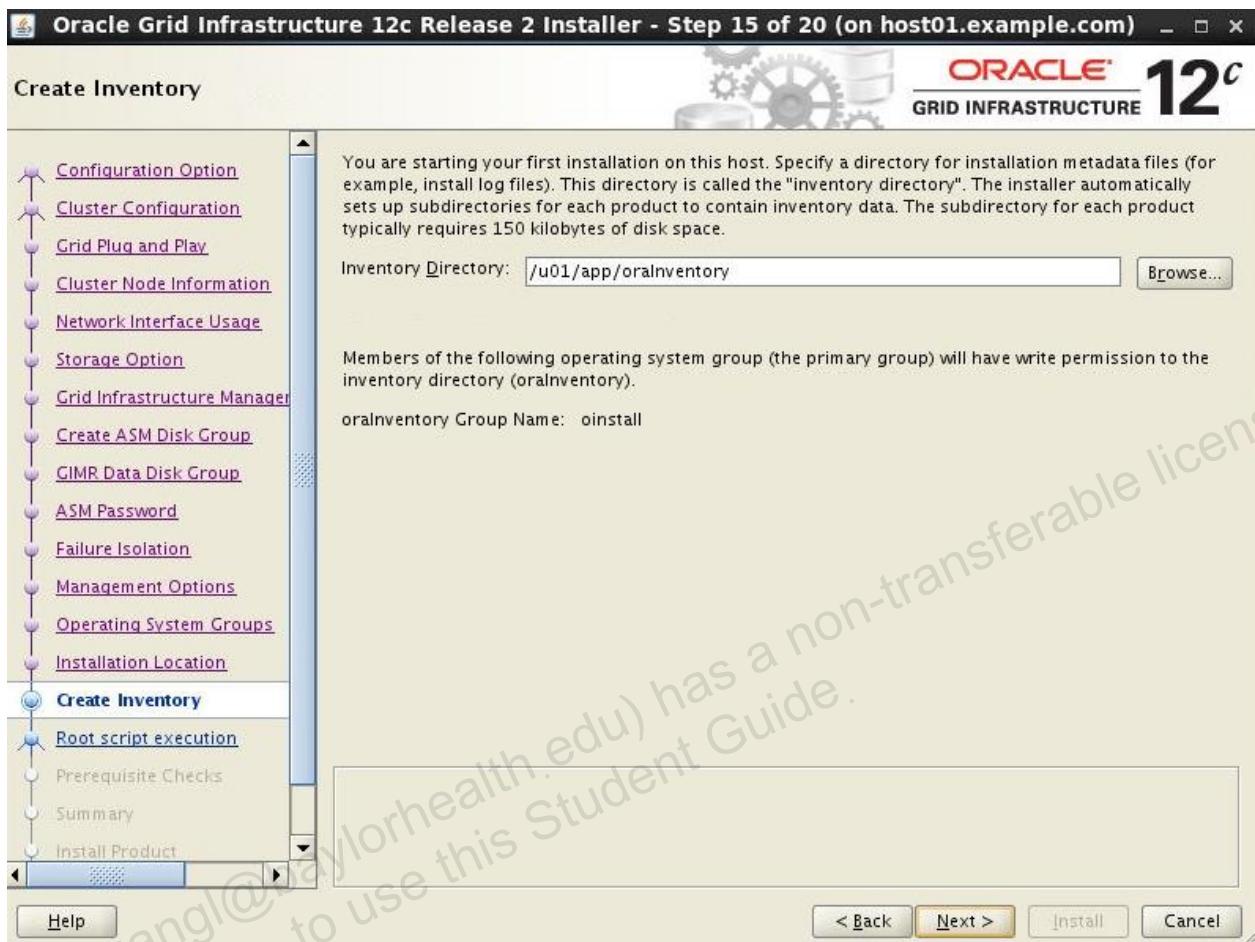
Click Next to accept the default values.



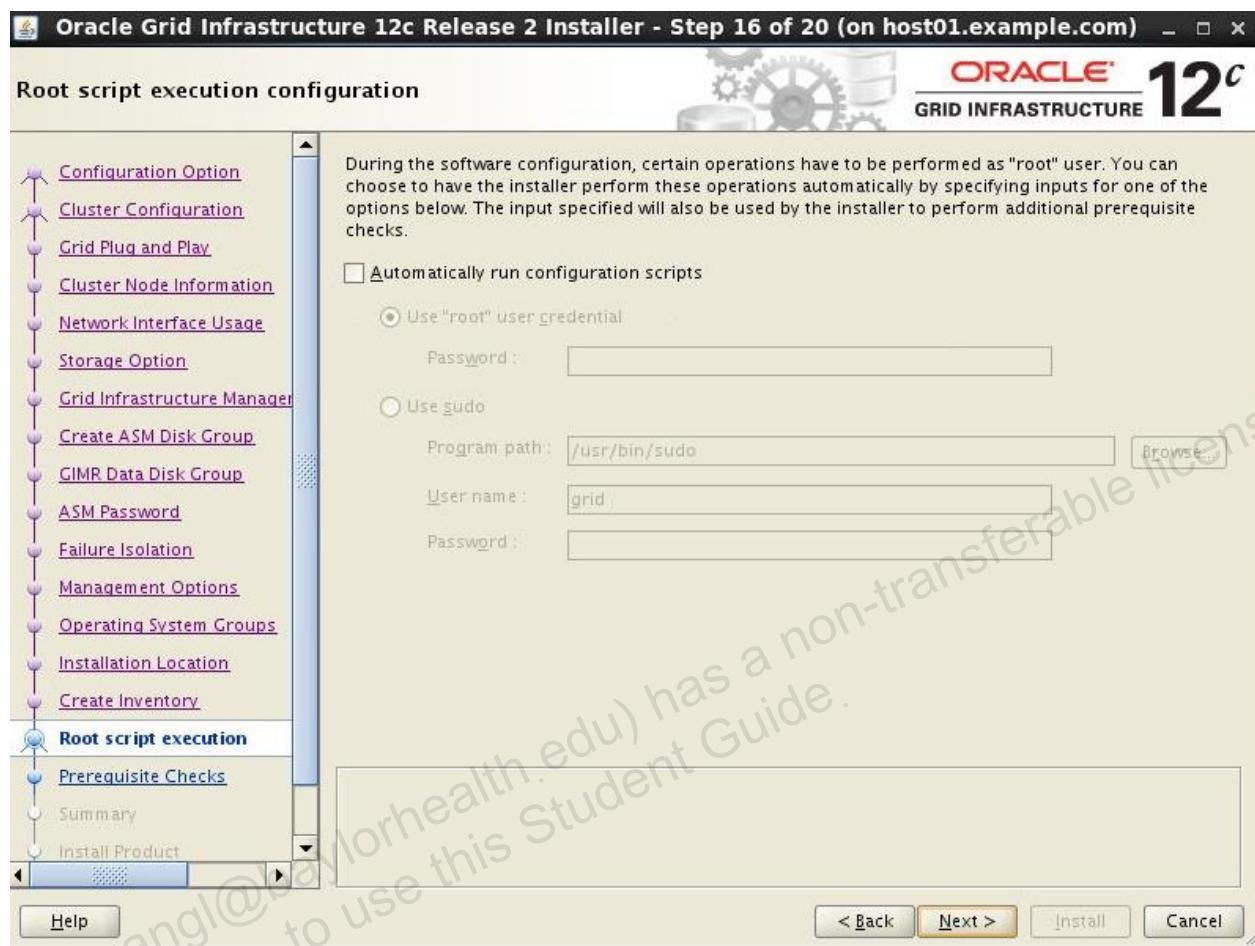
19. On the Specify Installation Location page, Oracle base should default to /u01/app/grid. Accept this value and click “Next” to continue.



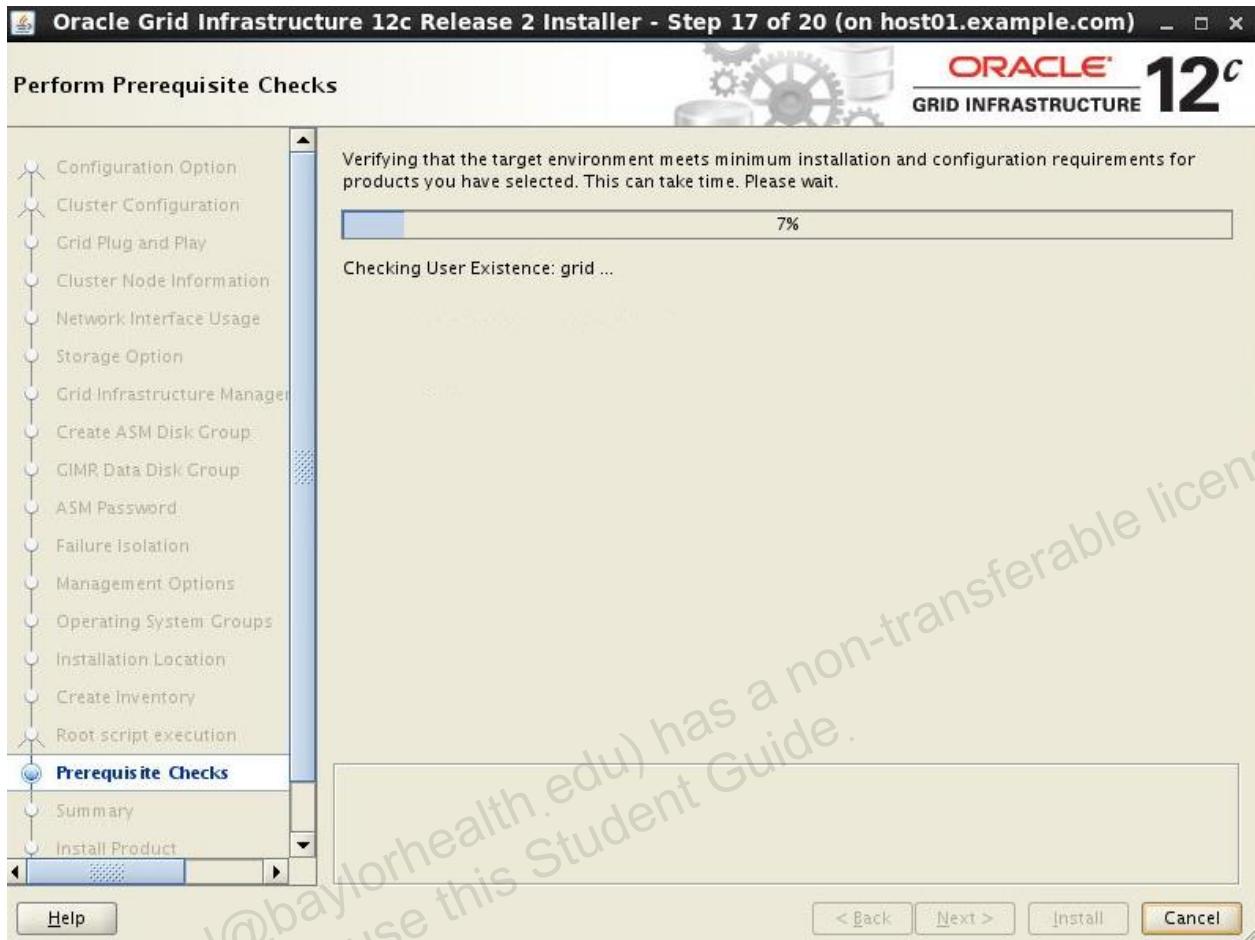
20. On the Create Inventory screen, click Next to accept the default installation inventory location of /u01/app/oraInventory.



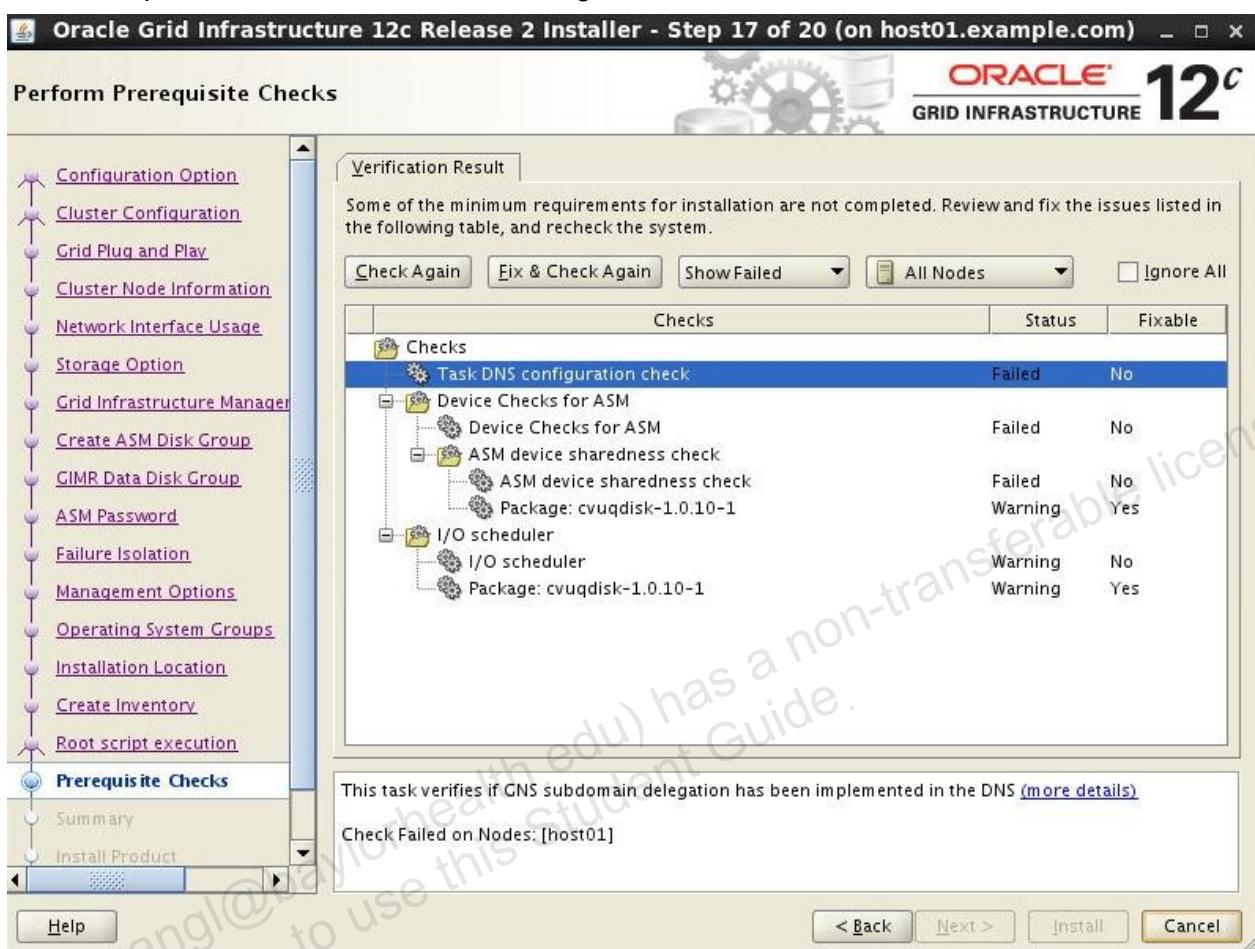
21. On the Root script execution configuration page, accept the default and click “Next” to continue.



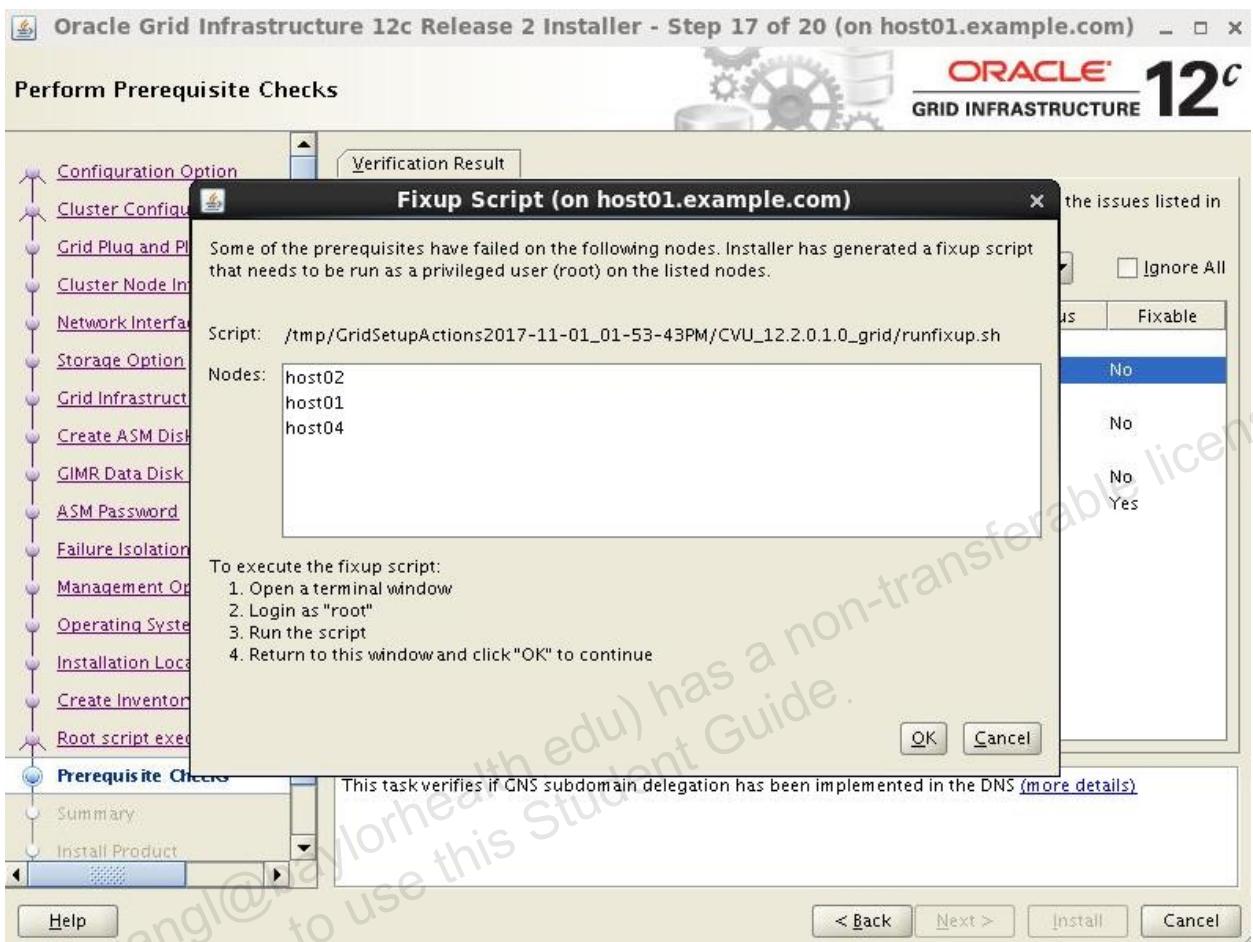
22. Wait while a series of prerequisite checks are performed.



23. On the Perform Prerequisite Checks page, a list of exceptions is displayed after the checks have completed. Click the Fix and Check Again button.



24. The Fixup Script dialog box will appear. The generated script will need to be run on host01, host02, and host04 as the root user.



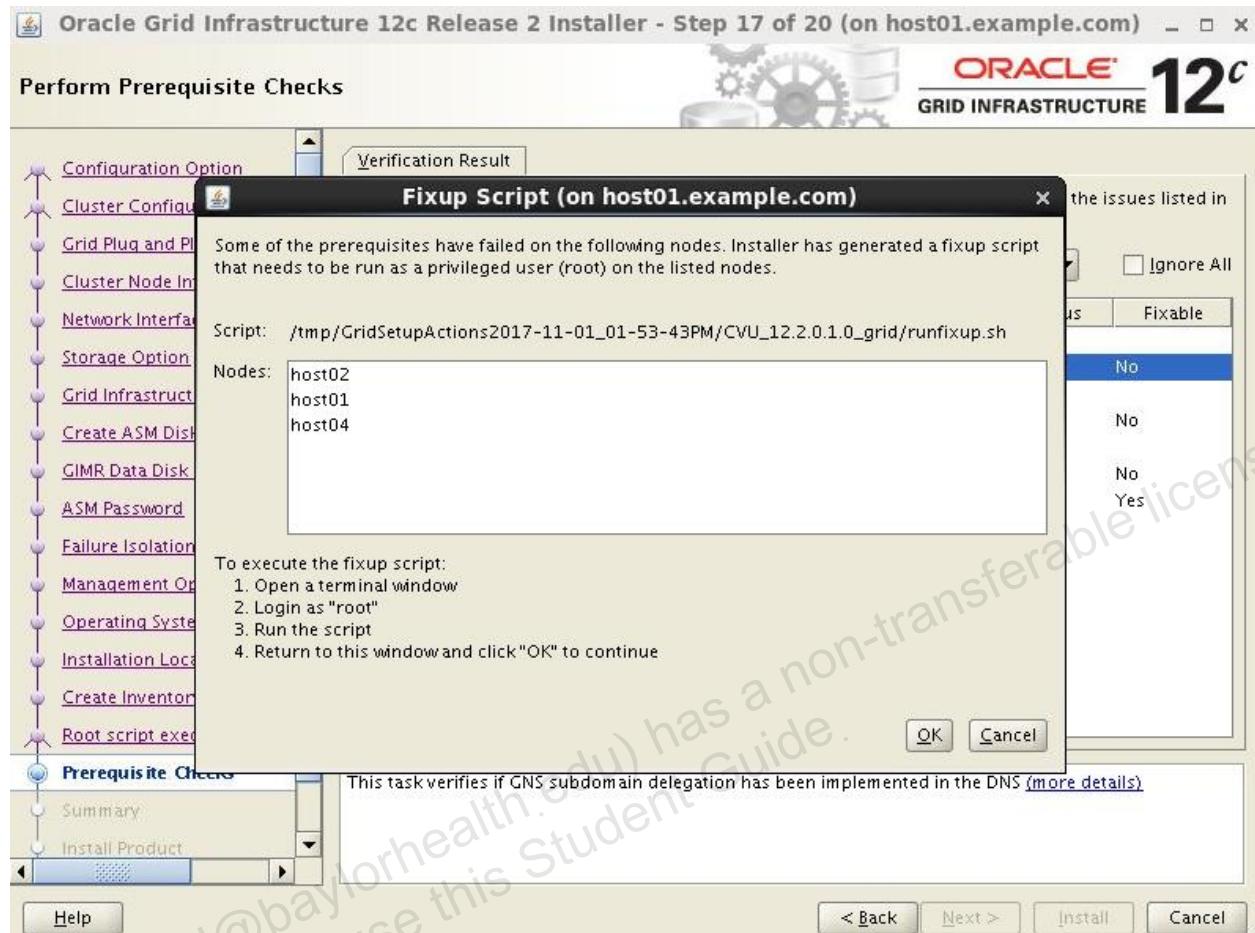
25. Open a new terminal window and ssh as root to host01. Run the fixup script on host01, host02, and then run it on host04. (Your script name will vary from the example as the filename contains a timestamp.)

```
[oracle@dns ~]$ ssh root@host01
root@host01's Password:
[root@host01 ~]# /tmp/GridSetupActions2017-11-01_01-53-43PM/CVU_12.2.0.1.0_grid/runfixup.sh
All Fix-up operations were completed successfully.

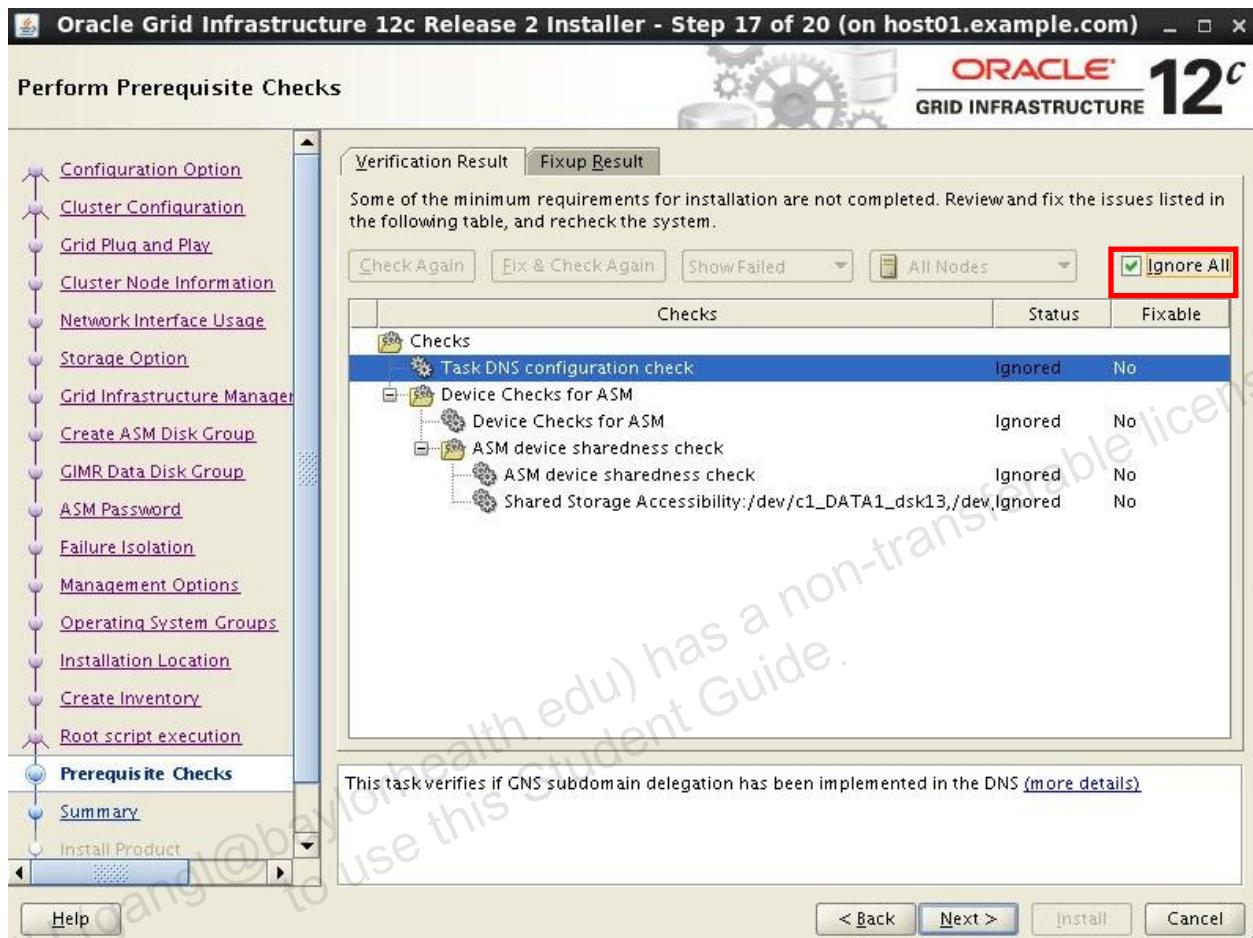
[root@host01 ~]# ssh host02 /tmp/GridSetupActions2017-11-01_01-53-43PM/CVU_12.2.0.1.0_grid/runfixup.sh
All Fix-up operations were completed successfully.

[root@host01 ~]# ssh host04 /tmp/GridSetupActions2017-11-01_01-53-43PM/CVU_12.2.0.1.0_grid/runfixup.sh
All Fix-up operations were completed successfully.
[root@host01 ~]#
```

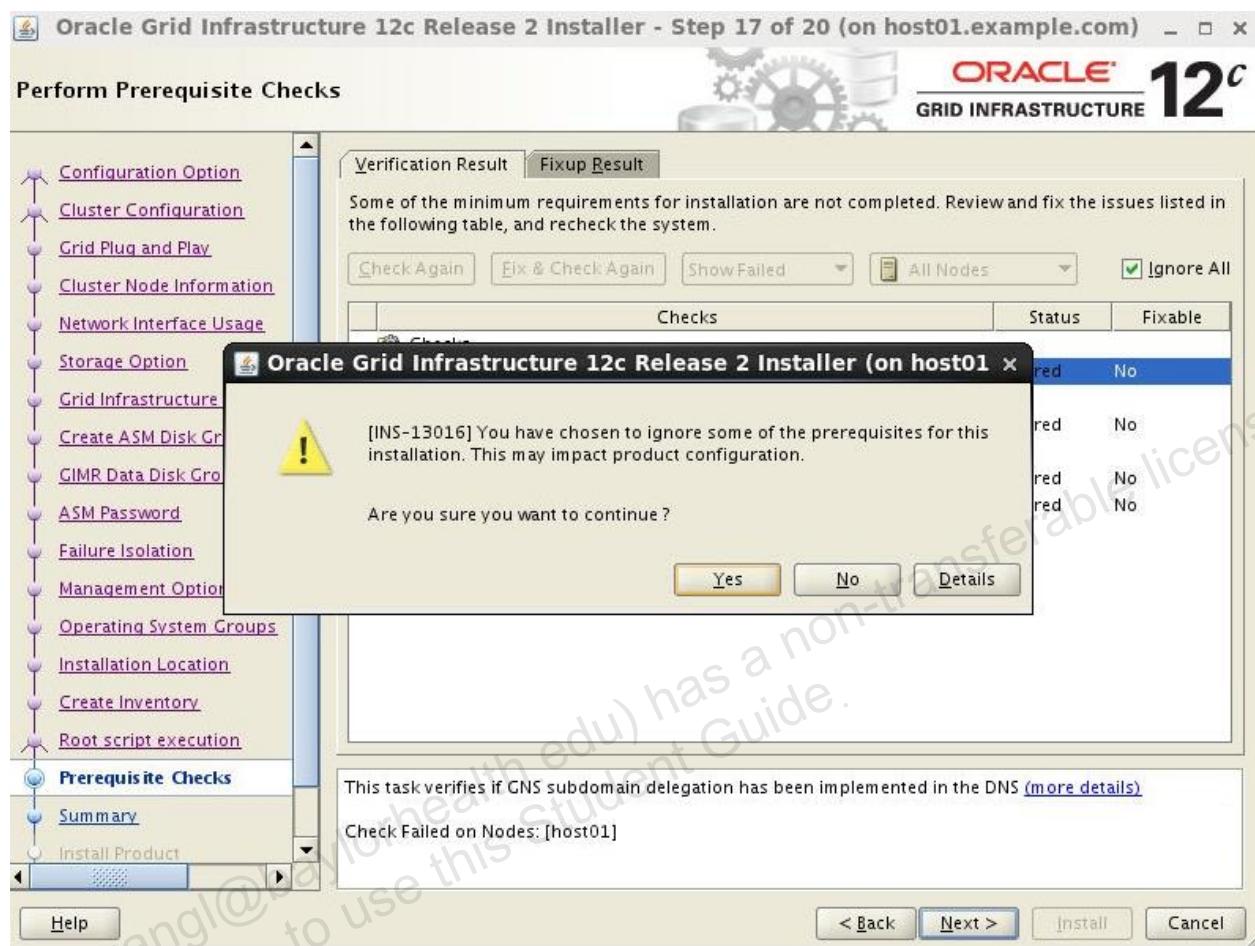
26. Return to the installer and click OK on the Fixup Script dialog box.



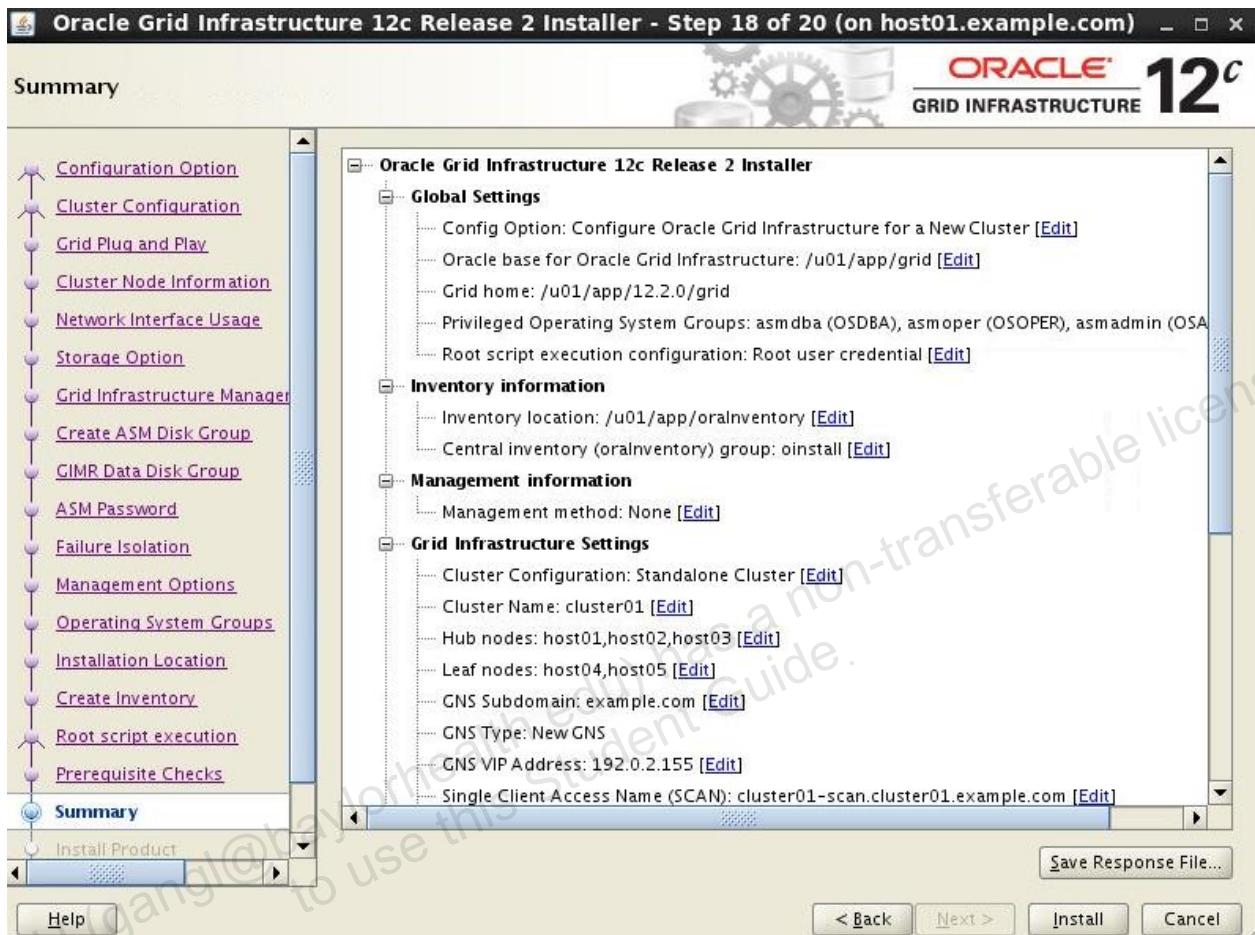
27. After dismissing the Fixup Script dialog box, prerequisites will be checked again. The DNS and ASM exceptions can be ignored. Click the “Ignore All” check box and click “Next” to continue.



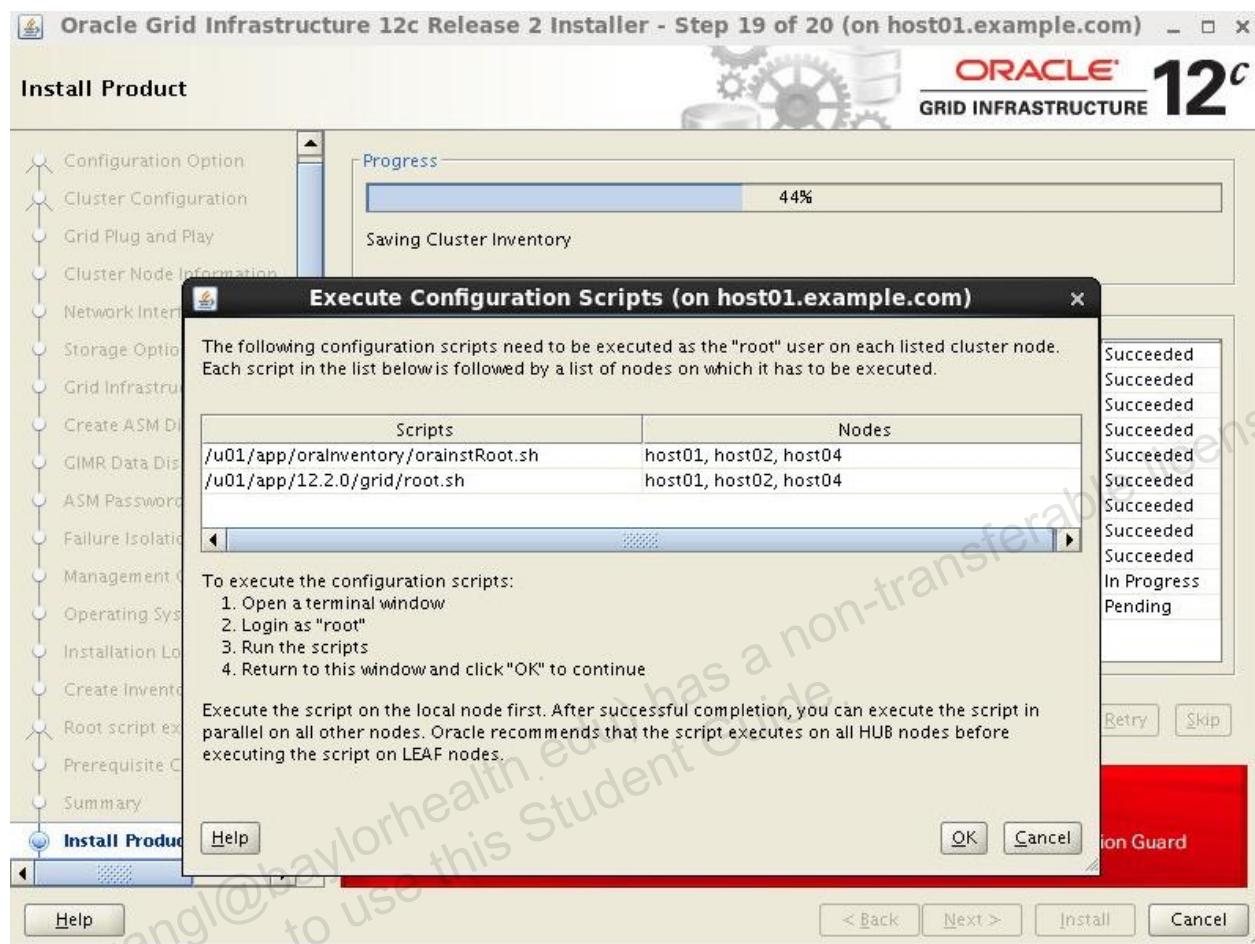
28. A dialog box will appear asking you to confirm your decision to proceed. Click Yes to continue.



29. Examine the Summary screen. When ready, click Install to begin the installation. Oracle Grid Infrastructure release 12.2 will now install on the cluster. The Install Product screen follows the course of the installation.



30. After the installer runs for a short time (*about 5min*), you will be prompted to run the root scripts at 44%.



31. Return to the root terminal opened in a previous step. Run the `orainstRoot.sh` script on `host01`, and then execute it on `host02` and `host04`. When finished, run `root.sh` on `host01`, and then execute it on `host02` and `host04`. *This step takes about 20~25 min to complete.*

```
[root@host01 ~]# /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@host01 ~]# ssh host02 /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@host01 ~]# ssh host04 /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@host01 ~]# /u01/app/12.2.0/grid/root.sh  
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= grid  
ORACLE_HOME= /u01/app/12.2.0/grid
```

Enter the full pathname of the local bin directory:
[/usr/local/bin]:

The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to
overwrite.

Creating /etc/oratab file...

Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

Relinking oracle with rac_on option

Using configuration parameter file:

```
/u01/app/12.2.0/grid/crs/install/crsconfig_params
```

The log of current session can be found at:

```
/u01/app/grid/crsdata/host01/crsconfig/rootcrs_host01_2017-06-  
07_00-42-44AM.log
```

2017/06/07 00:58:23 CLSRSC-594: Executing installation step 1 of
19: 'SetupTFA'.

...

Successfully replaced voting disk group with +DATA.

CRS-4256: Updating the profile

CRS-4266: Voting file(s) successfully replaced

```
## STATE      File Universal Id                               File Name Disk
group
--  -----
1. ONLINE    ca2b084c68824f2bbf65548255ab8d34
(/dev/c1_DATA1_dsk13) [DATA]
2. ONLINE    70c602d402f74f70bfbcf27fc9b8dfc
(/dev/c1_DATA1_dsk2) [DATA]
3. ONLINE    81eef02f6bcf4fd9bf1faf966f9f4503
(/dev/c1_DATA1_dsk14) [DATA]
Located 3 voting disk(s).

CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host01'

...
2017/06/07 00:56:38 CLSRSC-325: Configure Oracle Grid
Infrastructure for a Cluster ... succeeded

[root@host01 ~]#
```

```
[root@host01 ~]# ssh host02 /u01/app/12.2.0/grid/root.sh
Performing root user operation.

The following environment variables are set as:
ORACLE_OWNER= grid
ORACLE_HOME=  /u01/app/12.2.0/grid

Enter the full pathname of the local bin directory:
[/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to
overwrite.

Creating /etc/oratab file...
Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

Relinking oracle with rac_on option
Using configuration parameter file:
/u01/app/12.2.0/grid/crs/install/crsconfig_params
The log of current session can be found at:
/u01/app/grid/crsdata/host02/crsconfig/rootcrs_host02_2017-06-
07_00-58-17AM.log
```

```
2017/06/07 00:58:23 CLSRSC-594: Executing installation step 1 of
19: 'SetupTFA'.
...
2017/06/07 01:04:33 CLSRSC-594: Executing installation step 19
of 19: 'PostConfig'.
2017/06/07 01:04:47 CLSRSC-325: Configure Oracle Grid
Infrastructure for a Cluster ... succeeded

[root@host01 ~]# ssh host04 /u01/app/12.2.0/grid/root.sh
Performing root user operation.

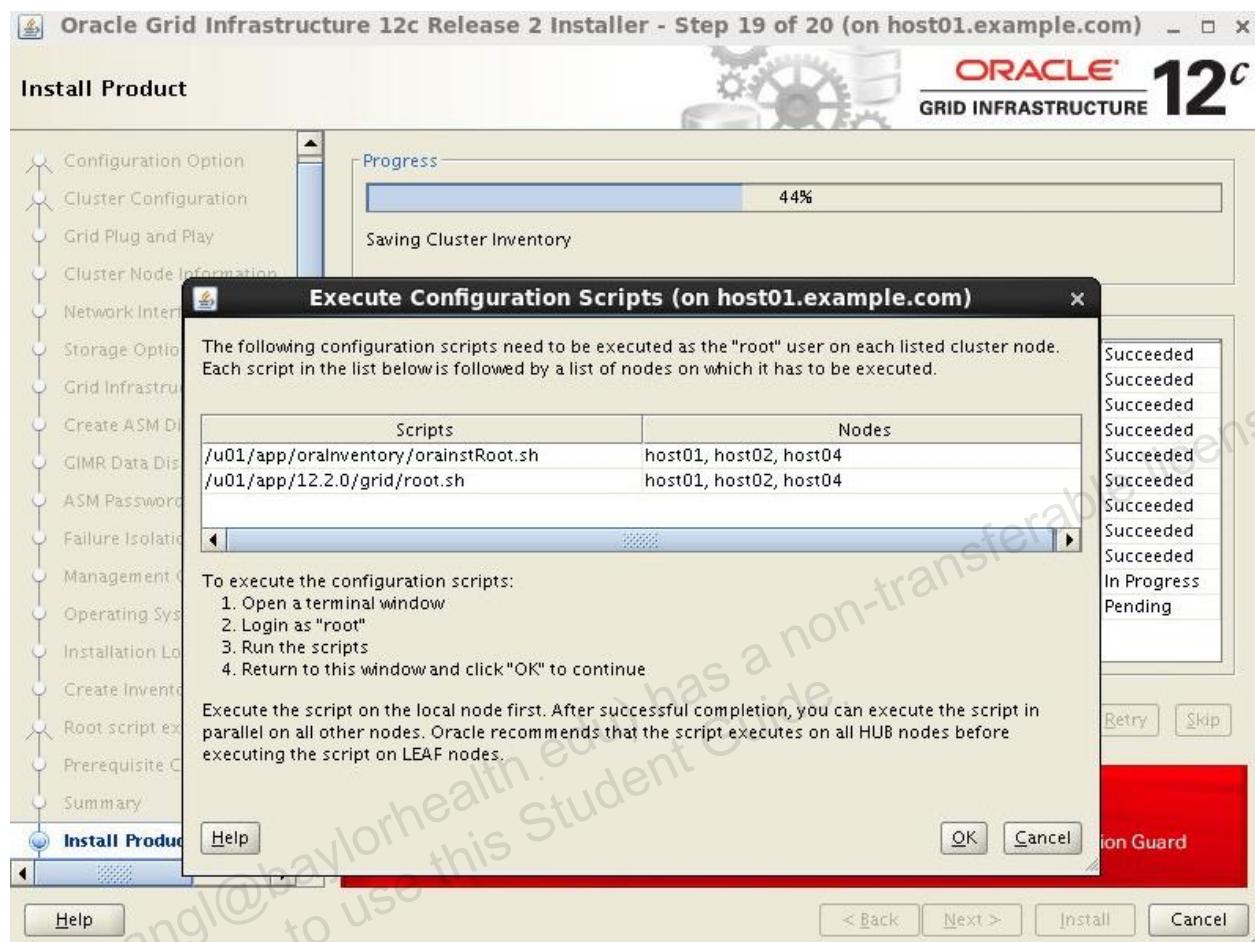
The following environment variables are set as:
ORACLE_OWNER= grid
ORACLE_HOME= /u01/app/12.2.0/grid

Enter the full pathname of the local bin directory:
[/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to
overwrite.

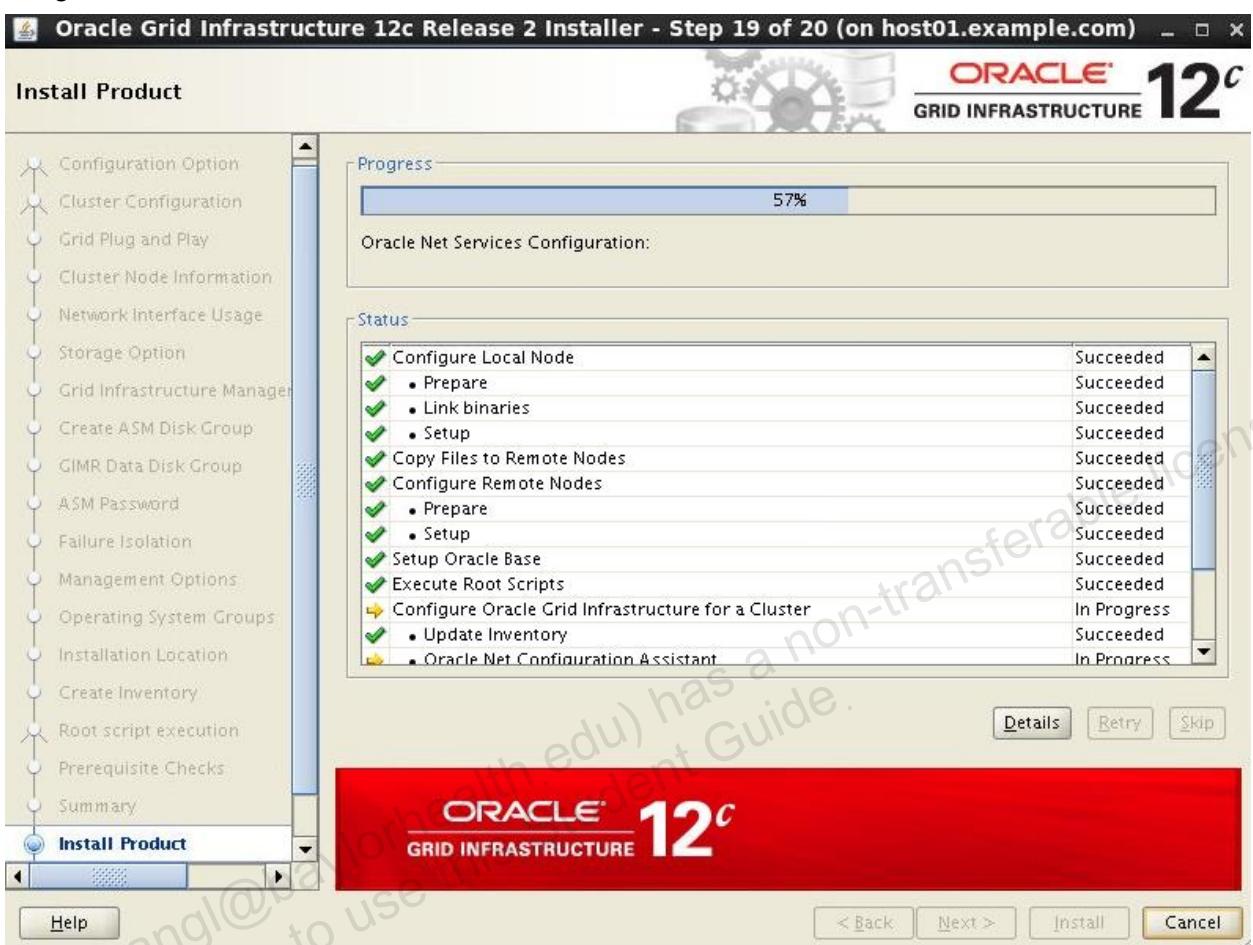
Creating /etc/oratab file...
Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Relinking oracle with rac_on option
Using configuration parameter file:
/u01/app/12.2.0/grid/crs/install/crsconfig_params
The log of current session can be found at:
/u01/app/grid/crsdata/host04/crsconfig/rootcrs_host04_2017-06-
07_00-58-17AM.log
2017/06/07 00:58:23 CLSRSC-594: Executing installation step 1 of
19: 'SetupTFA'.
...
2017/06/07 01:04:33 CLSRSC-594: Executing installation step 19
of 19: 'PostConfig'.
2017/06/07 01:04:47 CLSRSC-325: Configure Oracle Grid
Infrastructure for a Cluster ... succeeded

[root@host01 ~]#
```

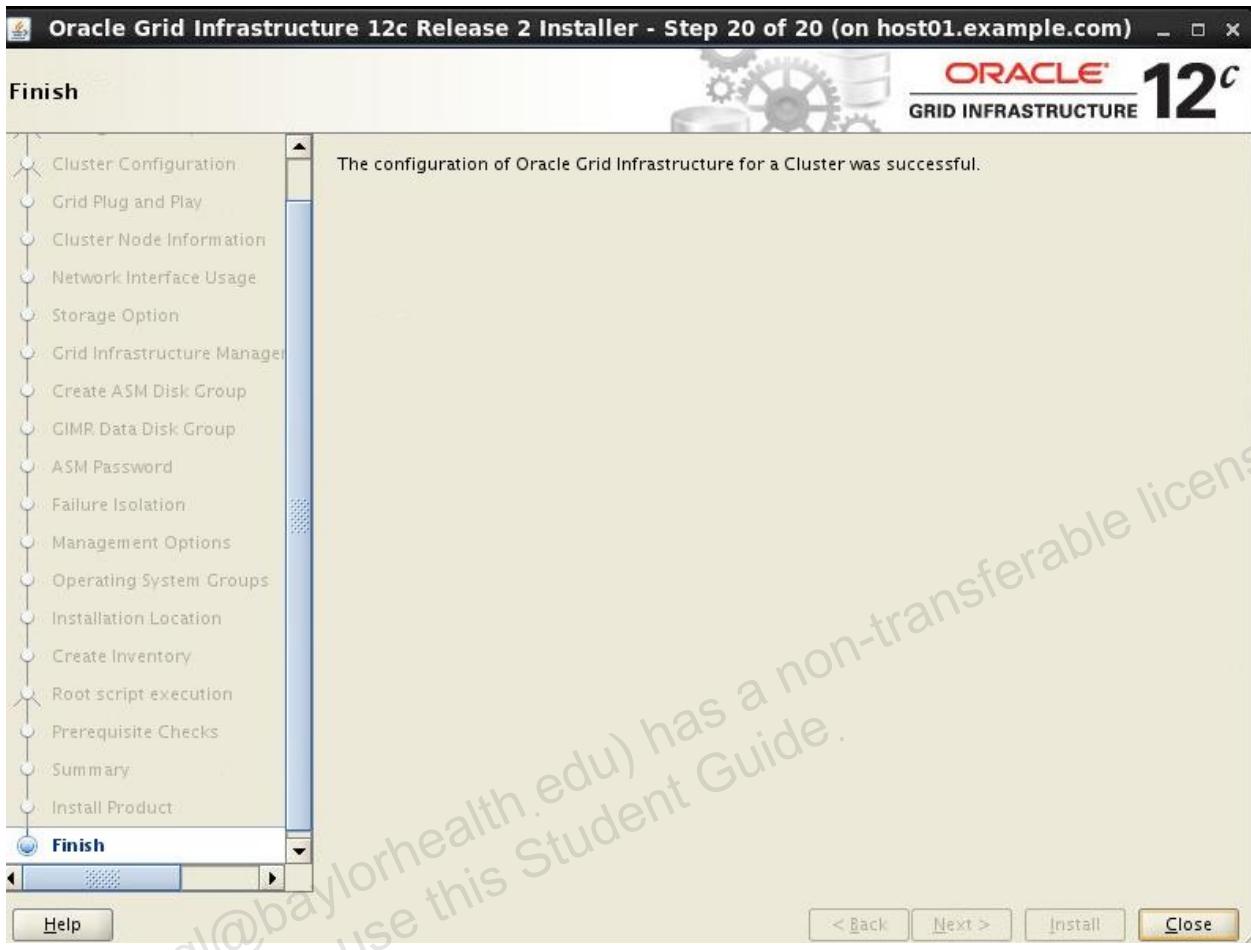
32. Return to the installer and click OK in the dialog box to indicate the root scripts have been run.



33. Continue monitoring the installation. It takes about **30min** to complete the installation at this stage.



34. When the installation is complete, click “Close”.



35. Back in your terminal session, configure the environment using the `oraenv` script. Enter `+ASM1` when you are prompted for an `ORACLE_SID` value.

```
[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid
[grid@host01 ~]$
```

36. Now check the configuration of the nodes, asm, and cluster.

```
[grid@host01 ~]$ crsctl get cluster class
CRS-41008: Cluster class is 'Standalone Cluster'

[grid@host01 ~]$ crsctl get cluster mode status
Cluster is running in "flex" mode

[grid@host01 ~]$ crsctl get cluster configuration
Name      : cluster01
Class     : Standalone Cluster
```

```
Type      : flex
The cluster is not extended.

[grid@host01 ~]$ crsctl get node role status -all
Node 'host01' active role is 'hub'
Node 'host02' active role is 'hub'
Node 'host04' active role is 'leaf'

[grid@host01 ~]$ asmcmd showclustermode
ASM cluster : Flex mode enabled

[grid@host01 ~]$
```

37. Check the status of the cluster. Ensure that all the listed services are online on all the cluster nodes.

```
[grid@host01 ~]$ crsctl check cluster -all
*****
host01:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
host02:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
host04:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
[grid@host01 ~]$
```

38. List the Clusterware resources. Ensure that all the Clusterware resources are running as shown in the following output.

[grid@host01 ~]\$ crsctl status resource -t				
<hr/>				
Name	Target	State	Server	State details
<hr/>				
Local Resources				
<hr/>				
ora.ASMNET1LSNR_ASM.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.DATA.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.LISTENER.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.LISTENER_LEAF.lsnr				
	OFFLINE	OFFLINE	host04	STABLE
ora.MGMT.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.chad				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host04	STABLE
ora.net1.network				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.ons				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.proxy_advm				
	OFFLINE	OFFLINE	host01	STABLE
	OFFLINE	OFFLINE	host02	STABLE
<hr/>				
Cluster Resources				
<hr/>				
ora.LISTENER_SCAN1.lsnr				
1	ONLINE	ONLINE	host02	STABLE
ora.LISTENER_SCAN2.lsnr				
1	ONLINE	ONLINE	host01	STABLE

ora.listener_SCAN3.lsnr					
1	ONLINE	ONLINE	host01	STABLE	
ora.mgmtlsnr					
1	ONLINE	ONLINE	host01	169.254.191.252	
				192.168.1.101	
				STABLE	
ora.asm					
1	ONLINE	ONLINE	host01	Started, STABLE	
2	ONLINE	ONLINE	host02	Started, STABLE	
3	OFFLINE	OFFLINE		STABLE	
ora.cvu					
1	ONLINE	ONLINE	host01	STABLE	
ora.gns					
1	ONLINE	ONLINE	host01	STABLE	
ora.gns.vip					
1	ONLINE	ONLINE	host01	STABLE	
ora.host01.vip					
1	ONLINE	ONLINE	host01	STABLE	
ora.host02.vip					
1	ONLINE	ONLINE	host02	STABLE	
ora.mgmtdb					
1	ONLINE	ONLINE	host01	Open, STABLE	
ora.qosmserver					
1	ONLINE	ONLINE	host01	STABLE	
ora.scan1.vip					
1	ONLINE	ONLINE	host02	STABLE	
ora.scan2.vip					
1	ONLINE	ONLINE	host01	STABLE	
ora.scan3.vip					
1	ONLINE	ONLINE	host01	STABLE	
<hr/>					
[grid@host01 ~]\$					

39. Close all terminal windows opened for this practice.

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Practices for Lesson 6: Managing Cluster Nodes

Practice 6-1: Add a New Hub Node to the Cluster

Overview

In this practice, you will use `addnode.sh` in graphical mode to extend your cluster by adding `host03` as the third hub node.

- Establish a terminal session connected to `host01` as the `grid` OS user. Ensure that you specify the `-x` option for `ssh` to configure the `x` environment properly for the `grid` user.

```
[oracle@dns ~] $ ssh -X grid@host01
grid@host01's password: *****
[grid@host01 ~]$
```

- Make sure that you can connect from your `host01` to `host03` without being prompted for passwords. Exit back to `host01` when finished.

```
[grid@host01 ~]$ ssh host03
[grid@host03 ~]$ exit
logout
Connection to host03 closed.
[grid@host01 ~]$
```

- Make sure that you set up your environment variables correctly for the `grid` user to point to your grid installation.

```
[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid
[grid@host01 ~]$
```

- Check your pre-grid installation for `host03` node using the Cluster Verification Utility.

```
[grid@host01 ~]$ cluvfy stage -pre crsinst -n host03

Verifying Physical Memory ...PASSED
Verifying Available Physical Memory ...PASSED
Verifying Swap Size ...PASSED
Verifying Free Space:
host03:/usr,host03:/var,host03:/etc,host03:/u01/app/12.2.0/grid,
host03:/sbin,host03:/tmp ...PASSED
Verifying User Existence: grid ...
    Verifying Users With Same UID: 54322 ...PASSED
Verifying User Existence: grid ...PASSED
Verifying Group Existence: asmadmin ...PASSED
Verifying Group Existence: asmdba ...PASSED
```

```
Verifying Group Existence: oinstall ...PASSED
Verifying Group Membership: asmdba ...PASSED
Verifying Group Membership: asmadmin ...PASSED
Verifying Group Membership: oinstall(Primary) ...PASSED
Verifying Run Level ...PASSED
Verifying Hard Limit: maximum open file descriptors ...PASSED
Verifying Soft Limit: maximum open file descriptors ...PASSED
Verifying Hard Limit: maximum user processes ...PASSED
Verifying Soft Limit: maximum user processes ...PASSED
Verifying Soft Limit: maximum stack size ...PASSED
Verifying Architecture ...PASSED
Verifying OS Kernel Version ...PASSED
Verifying OS Kernel Parameter: semmsl ...PASSED
Verifying OS Kernel Parameter: semmns ...PASSED
Verifying OS Kernel Parameter: semopm ...PASSED
Verifying OS Kernel Parameter: semmni ...PASSED
Verifying OS Kernel Parameter: shmmmax ...PASSED
Verifying OS Kernel Parameter: shmmni ...PASSED
Verifying OS Kernel Parameter: shmall ...PASSED
Verifying OS Kernel Parameter: file-max ...PASSED
Verifying OS Kernel Parameter: ip_local_port_range ...PASSED
Verifying OS Kernel Parameter: rmem_default ...PASSED
Verifying OS Kernel Parameter: rmem_max ...PASSED
Verifying OS Kernel Parameter: wmem_default ...PASSED
Verifying OS Kernel Parameter: wmem_max ...PASSED
Verifying OS Kernel Parameter: aio-max-nr ...PASSED
Verifying OS Kernel Parameter: panic_on_oops ...PASSED
Verifying Package: binutils-2.20.51.0.2 ...PASSED
Verifying Package: compat-libcap1-1.10 ...PASSED
Verifying Package: compat-libstdc++-33-3.2.3 (x86_64) ...PASSED
Verifying Package: libgcc-4.4.7 (x86_64) ...PASSED
Verifying Package: libstdc++-4.4.7 (x86_64) ...PASSED
Verifying Package: libstdc++-devel-4.4.7 (x86_64) ...PASSED
Verifying Package: sysstat-9.0.4 ...PASSED
Verifying Package: ksh ...PASSED
Verifying Package: make-3.81 ...PASSED
Verifying Package: glibc-2.12 (x86_64) ...PASSED
Verifying Package: glibc-devel-2.12 (x86_64) ...PASSED
Verifying Package: libaio-0.3.107 (x86_64) ...PASSED
Verifying Package: libaio-devel-0.3.107 (x86_64) ...PASSED
Verifying Package: nfs-utils-1.2.3-15 ...PASSED
```

```

Verifying Package: e2fsprogs-1.42.8 ...PASSED
Verifying Package: e2fsprogs-libs-1.42.8 (x86_64) ...PASSED
Verifying Package: smartmontools-5.43-1 ...PASSED
Verifying Package: net-tools-1.60-110 ...PASSED
Verifying Users With Same UID: 0 ...PASSED
Verifying Current Group ID ...PASSED
Verifying Root user consistency ...PASSED
Verifying Node Connectivity ...
    Verifying Hosts File ...PASSED
    Verifying Check that maximum (MTU) size packet goes through
    subnet ...PASSED
Verifying Node Connectivity ...PASSED
Verifying Multicast check ...PASSED
Verifying Network Time Protocol (NTP) ...
    Verifying '/etc/ntp.conf' ...PASSED
    Verifying '/var/run/ntp.pid' ...PASSED
Verifying Network Time Protocol (NTP) ...PASSED
Verifying Same core file name pattern ...PASSED
Verifying User Mask ...PASSED
Verifying User Not In Group "root": grid ...PASSED
Verifying Time zone consistency ...PASSED
Verifying DNS/NIS name service ...PASSED
Verifying Domain Sockets ...PASSED
Verifying /boot mount ...PASSED
Verifying File system mount options for path GI_HOME ...PASSED
Verifying Daemon "avahi-daemon" not configured and
running ...PASSED
Verifying Daemon "proxyt" not configured and running ...PASSED
Verifying loopback network interface address ...PASSED
Verifying Grid Infrastructure home path:
/u01/app/12.2.0/grid ...
    Verifying '/u01/app/12.2.0/grid' ...PASSED
Verifying Grid Infrastructure home path:
/u01/app/12.2.0/grid ...PASSED
Verifying User Equivalence ...PASSED
Verifying /dev/shm mounted as temporary file system ...PASSED
Verifying File system mount options for path /var ...PASSED
Verifying zeroconf check ...PASSED
Verifying ASM Filter Driver configuration ...PASSED

Pre-check for cluster services setup was successful.

CVU operation performed:          stage -pre crsinst

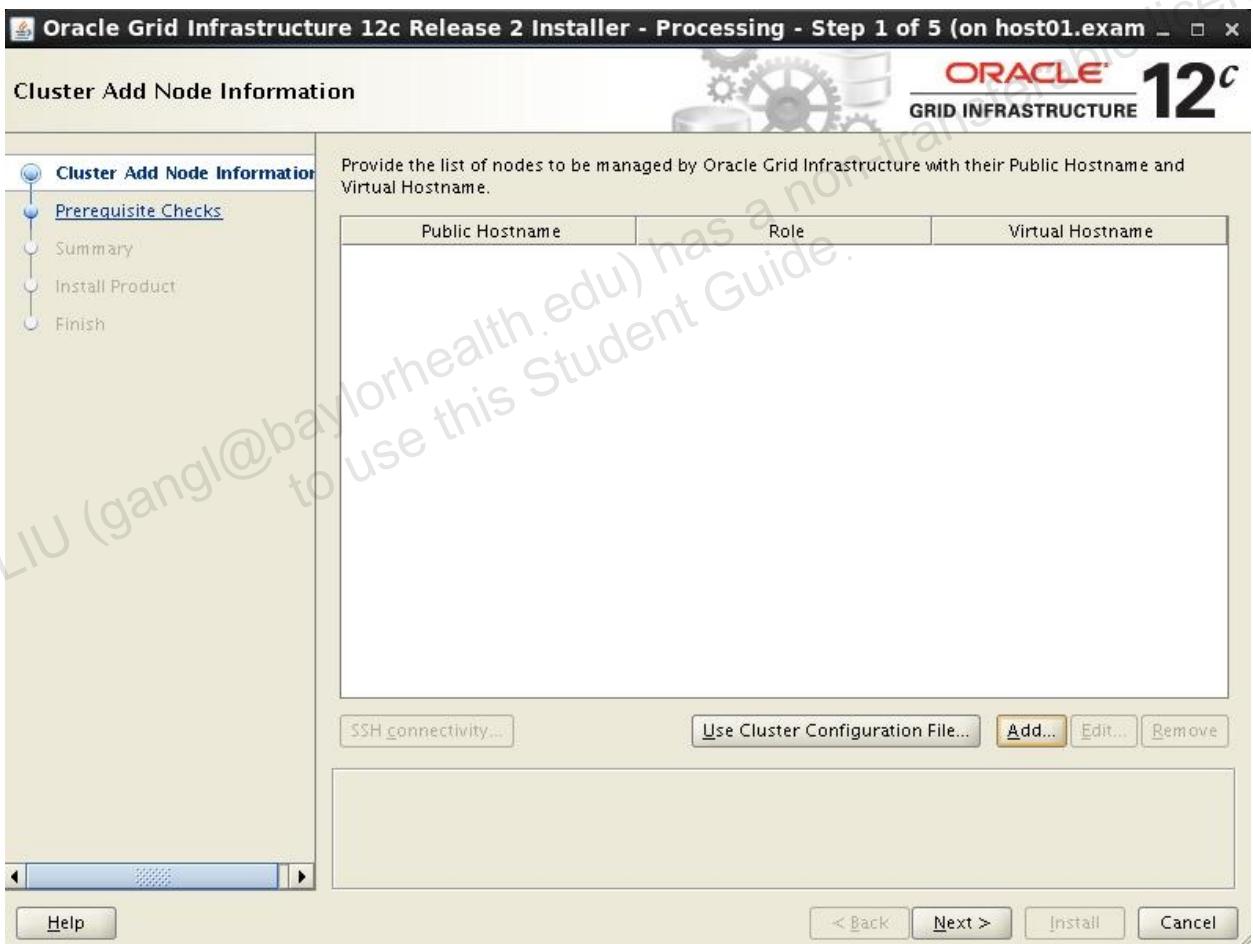
```

```
Date: Nov 3, 2017 12:49:56 PM
CVU home: /u01/app/12.2.0/grid/
User: grid
[grid@host01 ~] $
```

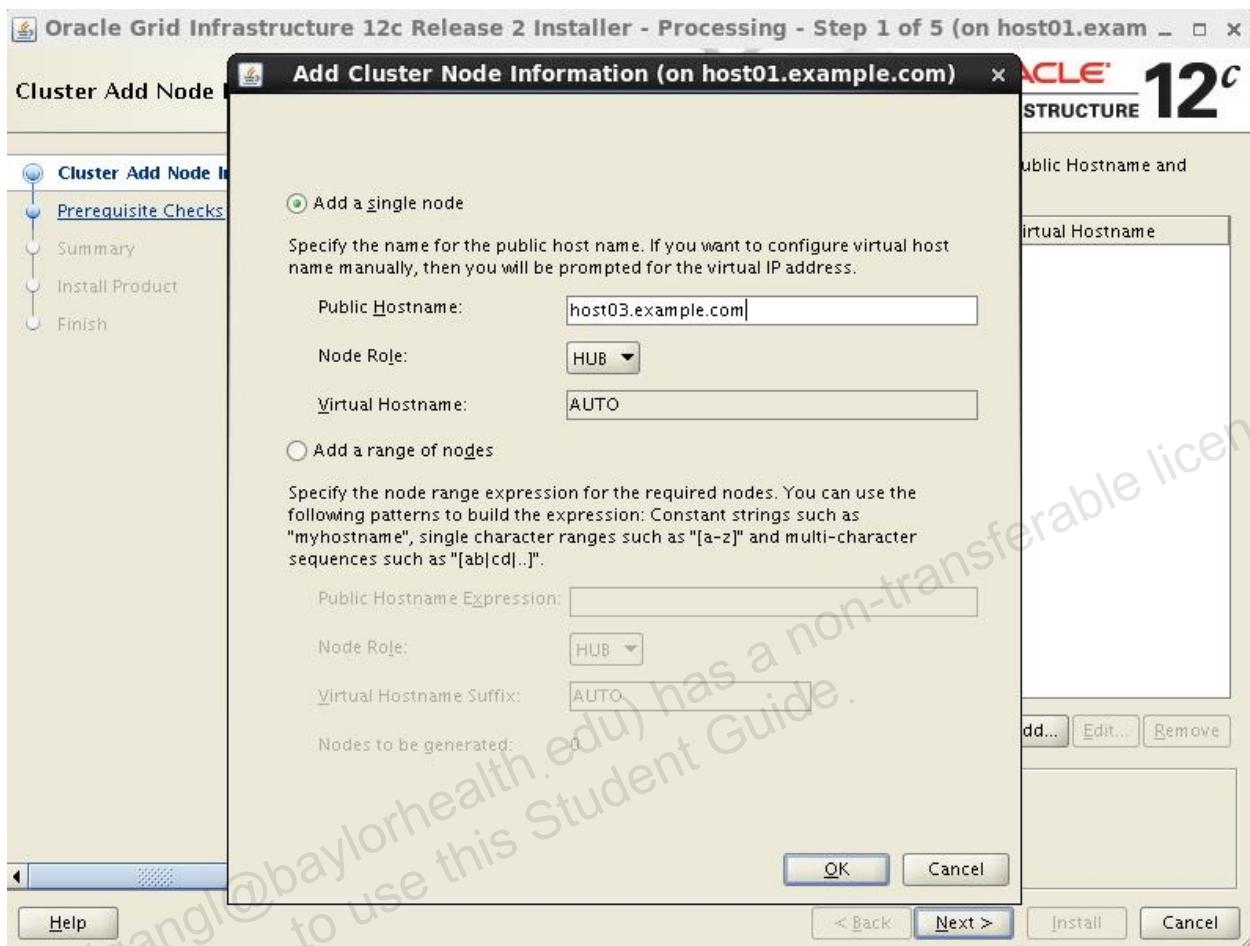
5. Change directory to \$ORACLE_HOME/addnode and execute addnode.sh.

```
[grid@host01 ~]$ cd $ORACLE_HOME/addnode
[grid@host01 addnode]$ ./addnode.sh
```

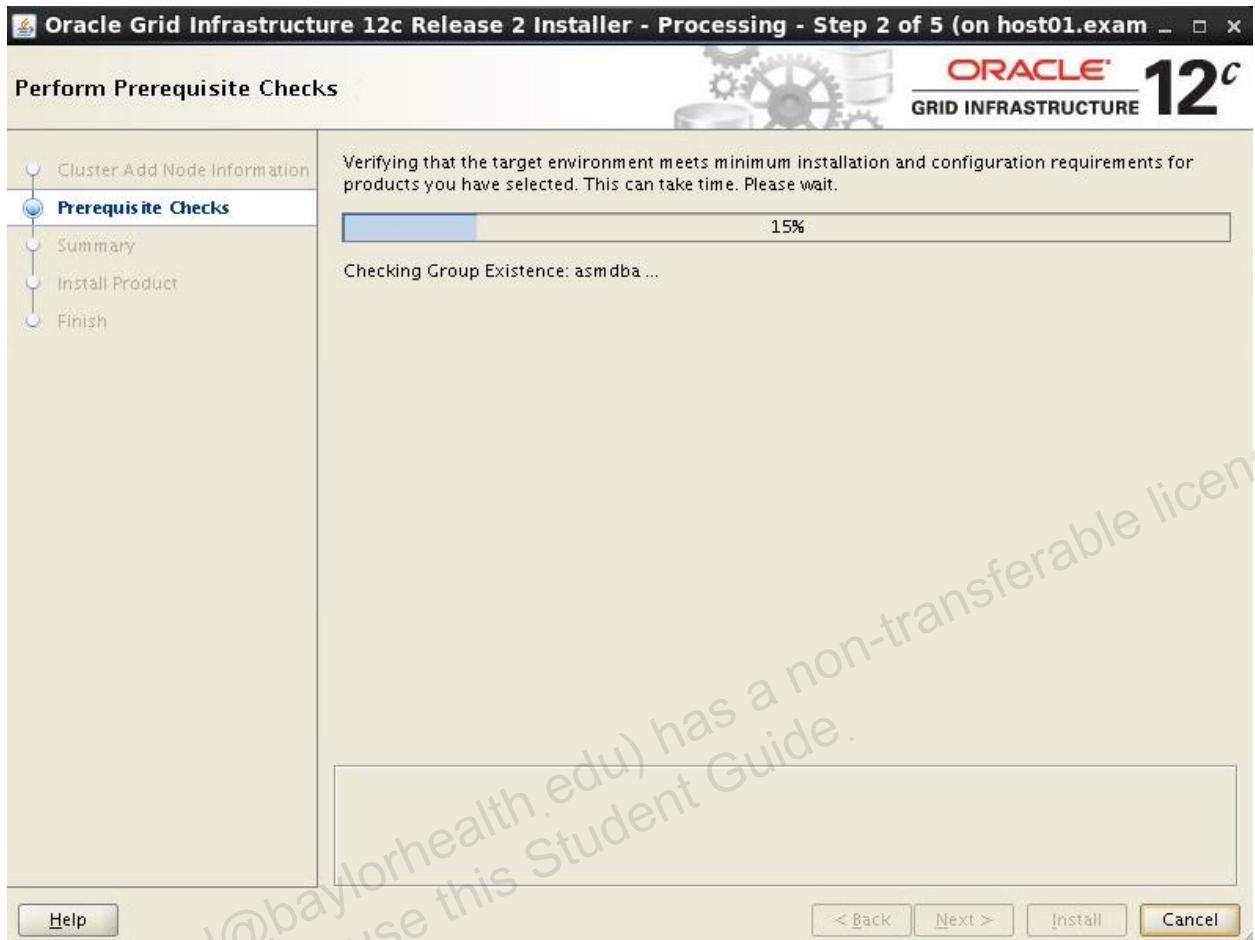
6. On the Cluster Add Node Information screen, click Add to add the hostname for the node to be added.



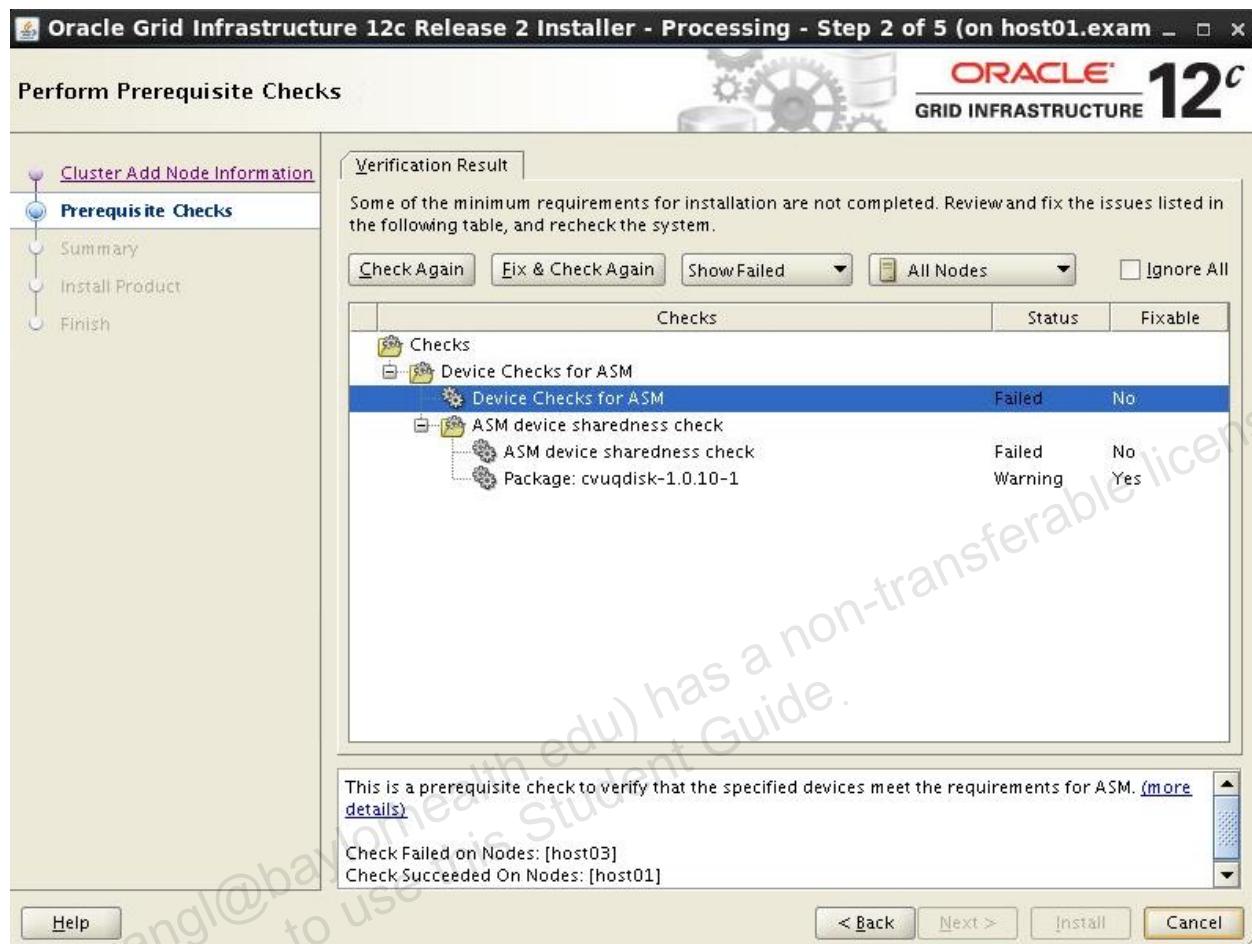
7. Enter host03.example.com for the Public Hostname and select HUB as the Node Role. Click OK, then click Next to continue.



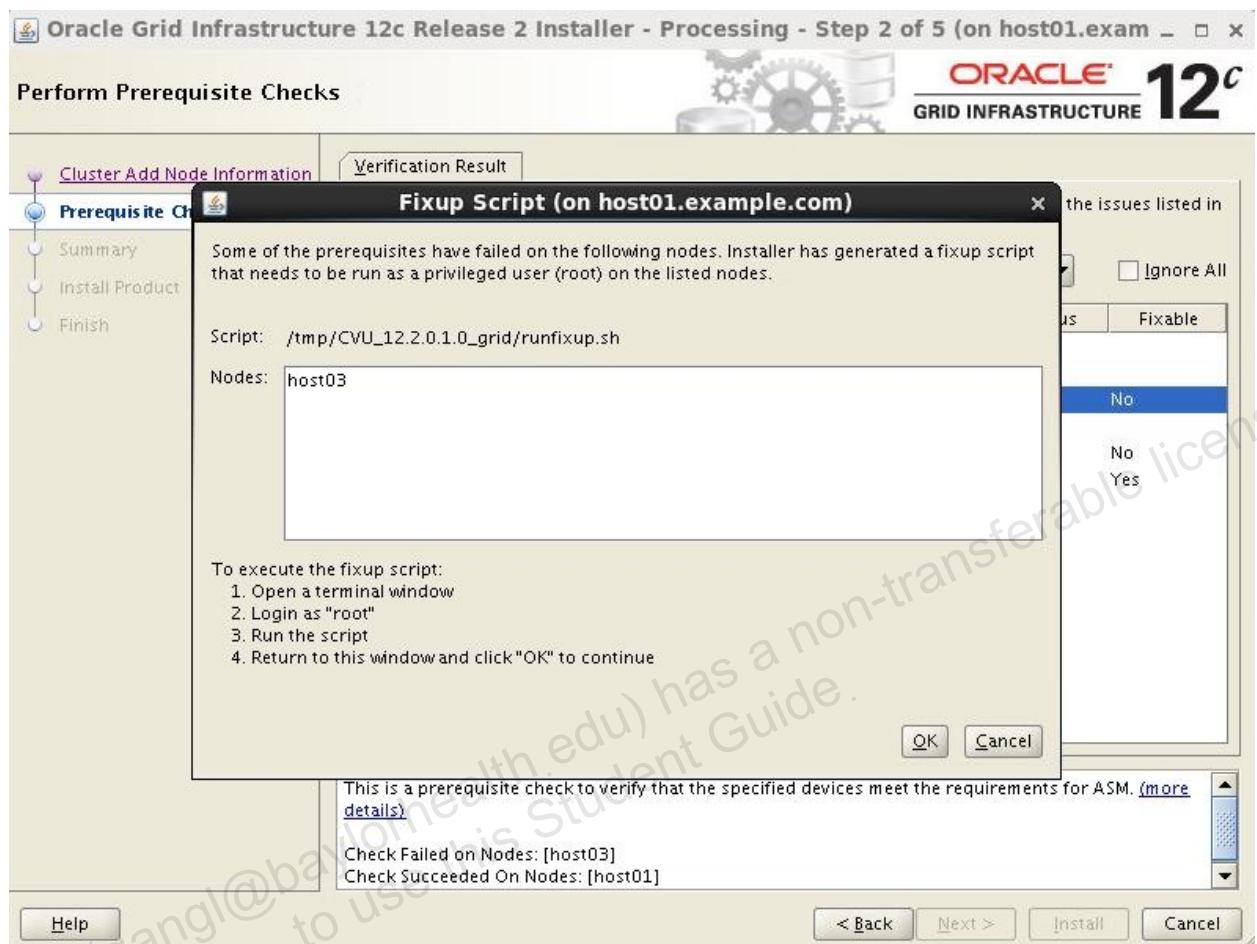
- Wait while a series of prerequisite checks are performed.



9. On the Perform Prerequisite Checks page, a list of exceptions is displayed after the checks have completed. Click the Fix and Check Again button.



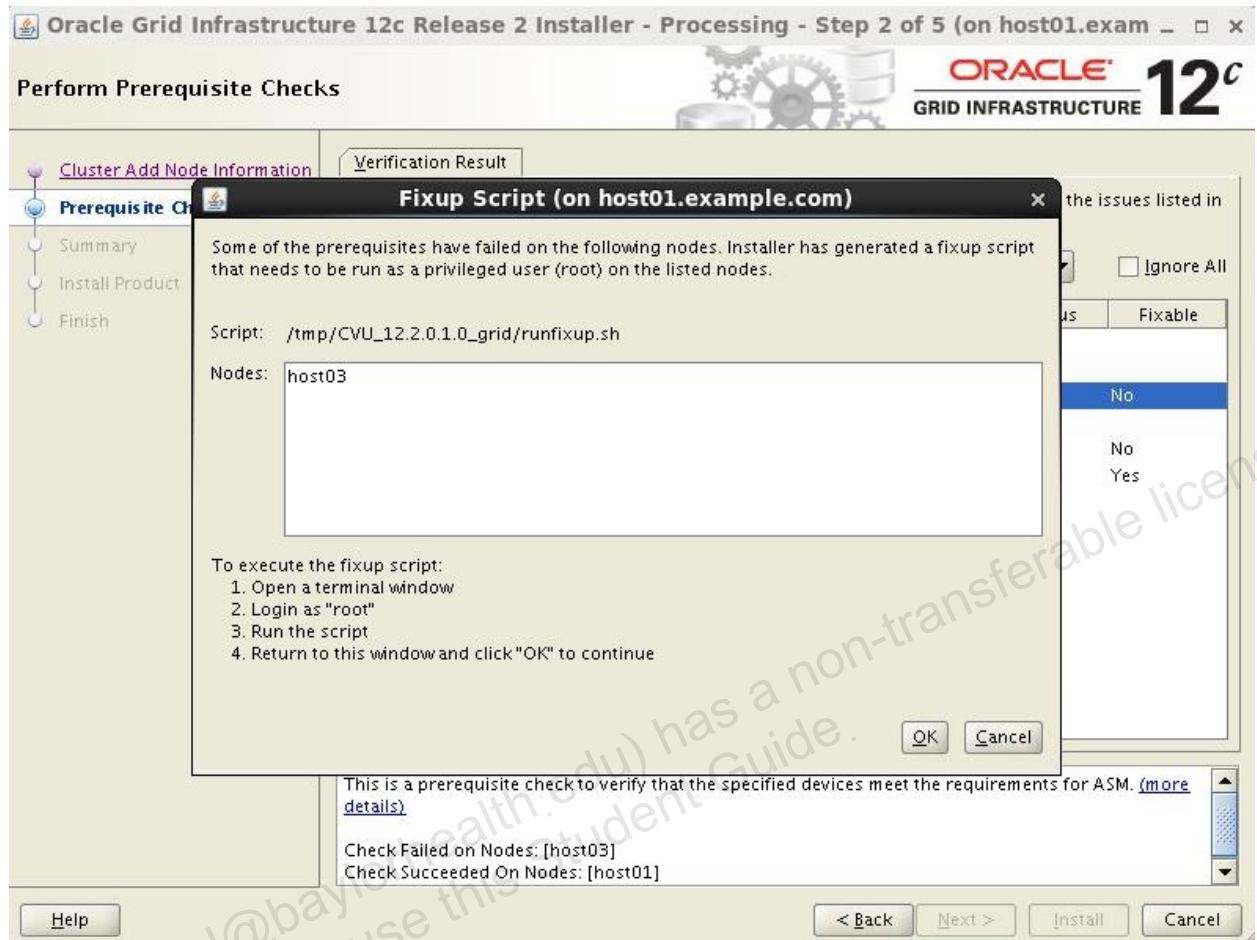
10. The Fixup Script dialog box will appear. The generated script will need to be run on host03 as the root user.



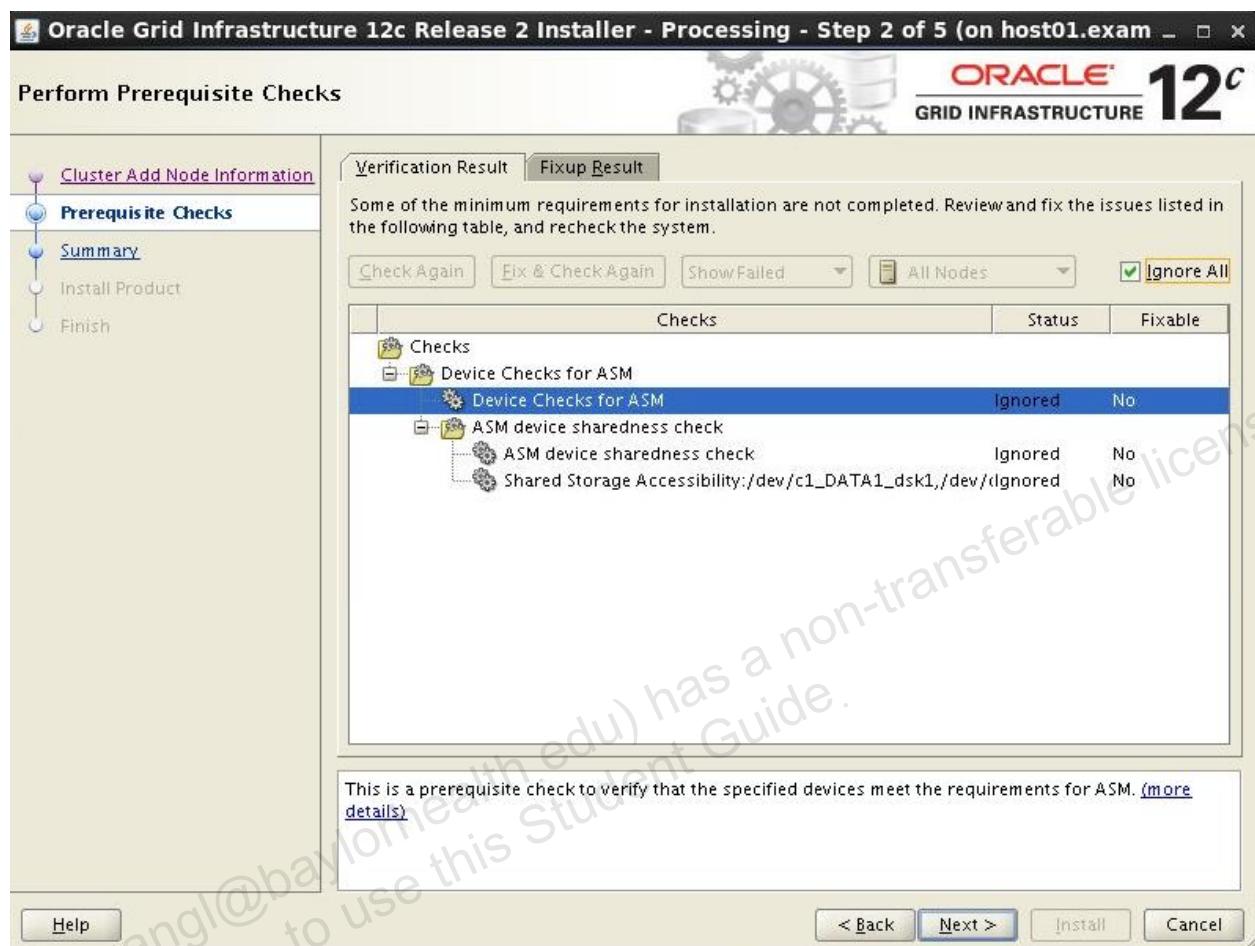
11. Open a new terminal window and ssh as root to host03. Run the fixup script. (Your script name will vary from the example as the filename contains a timestamp.)

- [oracle@dns ~]\$ **ssh root@host03**
- root@host03's Password:
-
- [root@host03 ~]# /tmp/CVU_12.2.0.1.0_grid/runfixup.sh
- All Fix-up operations were completed successfully.
-
- [root@host03 ~]#

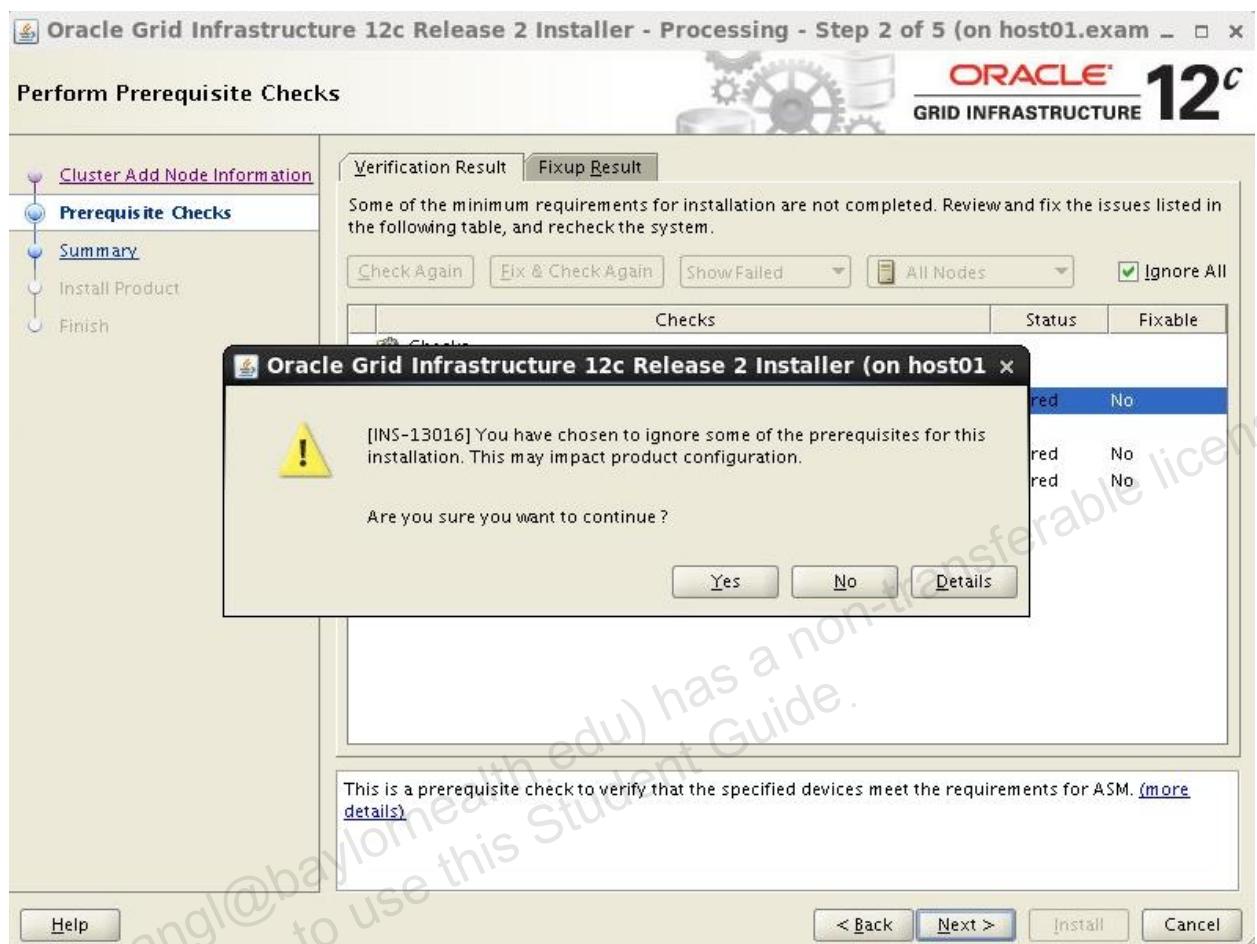
12. Return to the installer and click OK on the Fixup Script dialog box.



13. After dismissing the Fixup Script dialog box, prerequisites will be checked again. The ASM exceptions can be ignored. Click the “Ignore All” check box and click “Next” to continue.



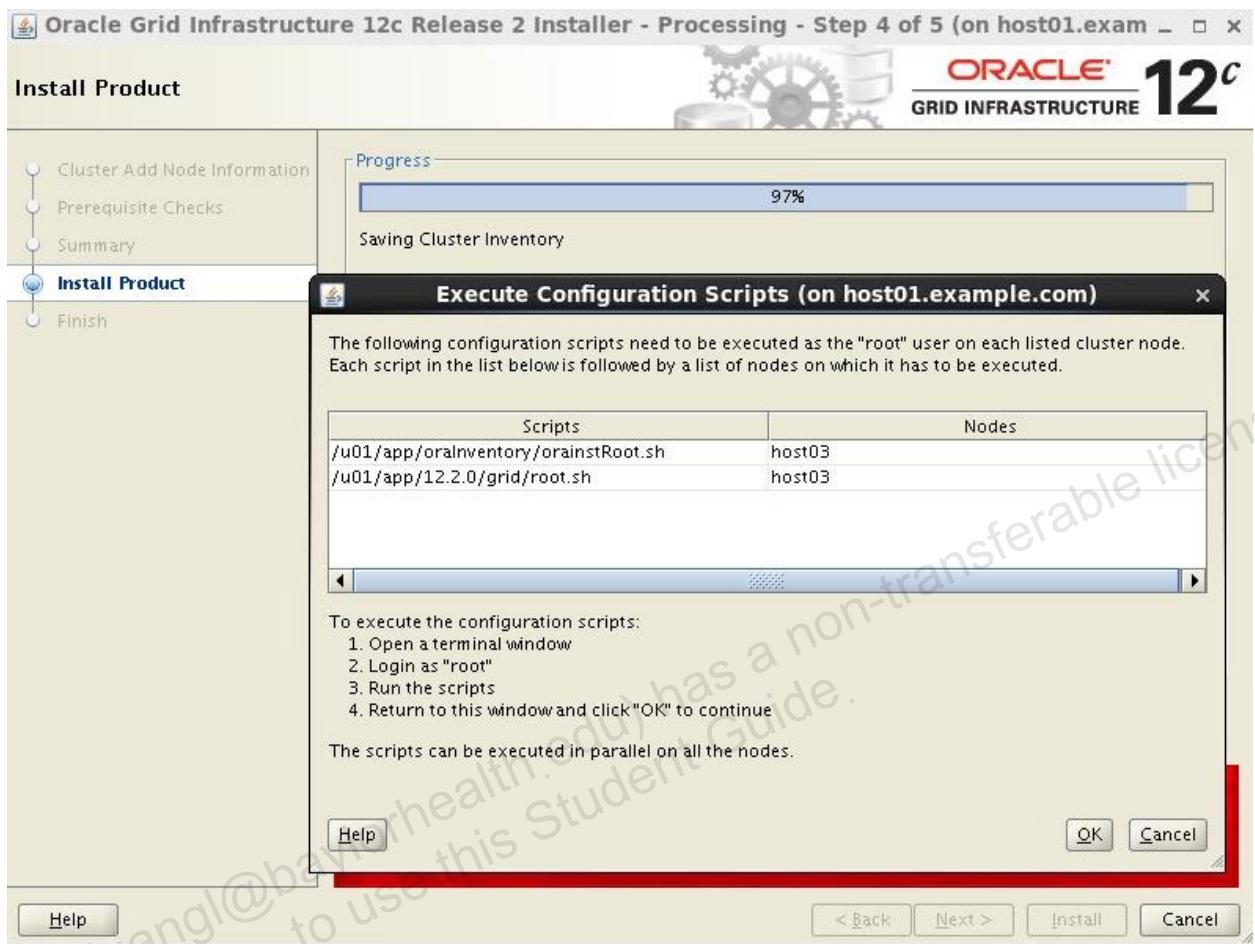
14. A dialog box will appear asking you to confirm your decision to proceed. Click Yes to continue.



15. Examine the Summary screen. When ready, click Install to begin the installation. Oracle Grid Infrastructure release 12.2 will now install on host03. The Install Product screen follows the course of the installation.



16. After the installer runs for a short time (*about 5min*), you will be prompted to run the `root` scripts at 97%.



17. Return to the terminal connected to `host01` as `root` user. The Execute Configuration Scripts dialog box will prompt you to run the `root` scripts on `host03`. Run the `orainstRoot.sh` script first.

```
[root@host01 ~]# ssh host03 /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@host01 ~]#
```

18. Next, execute the `root.sh` script on host03. *It takes about 6~8min to complete.*

```
[root@host01 ~]# ssh host03 /u01/app/12.2.0/grid/root.sh
```

Performing root user operation.

The following environment variables are set as:

```
ORACLE_OWNER= grid  
ORACLE_HOME= /u01/app/12.2.0/grid
```

Enter the full pathname of the local bin directory:
[/usr/local/bin]:

The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to
overwrite.

Creating /etc/oratab file...

Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

Relinking oracle with rac_on option

Using configuration parameter file:

```
/u01/app/12.2.0/grid/crs/install/crsconfig_params
```

The log of current session can be found at:

```
/u01/app/grid/crsdata/host03/crsconfig/rootcrs_host03_2017-11-  
03_01-22-59PM.log
```

2017/11/03 13:23:10 CLSRSC-594: Executing installation step 1 of
19: 'SetupTFA'.

2017/11/03 13:23:10 CLSRSC-4001: Installing Oracle Trace File
Analyzer (TFA) Collector.

2017/11/03 13:23:39 CLSRSC-4002: Successfully installed Oracle
Trace File Analyzer (TFA) Collector.

2017/11/03 13:23:39 CLSRSC-594: Executing installation step 2 of
19: 'ValidateEnv'.

2017/11/03 13:23:45 CLSRSC-363: User ignored prerequisites
during installation

2017/11/03 13:23:45 CLSRSC-594: Executing installation step 3 of
19: 'CheckFirstNode'.

2017/11/03 13:23:46 CLSRSC-594: Executing installation step 4 of
19: 'GenSiteGUIDs'.

2017/11/03 13:23:47 CLSRSC-594: Executing installation step 5 of
19: 'SaveParamFile'.

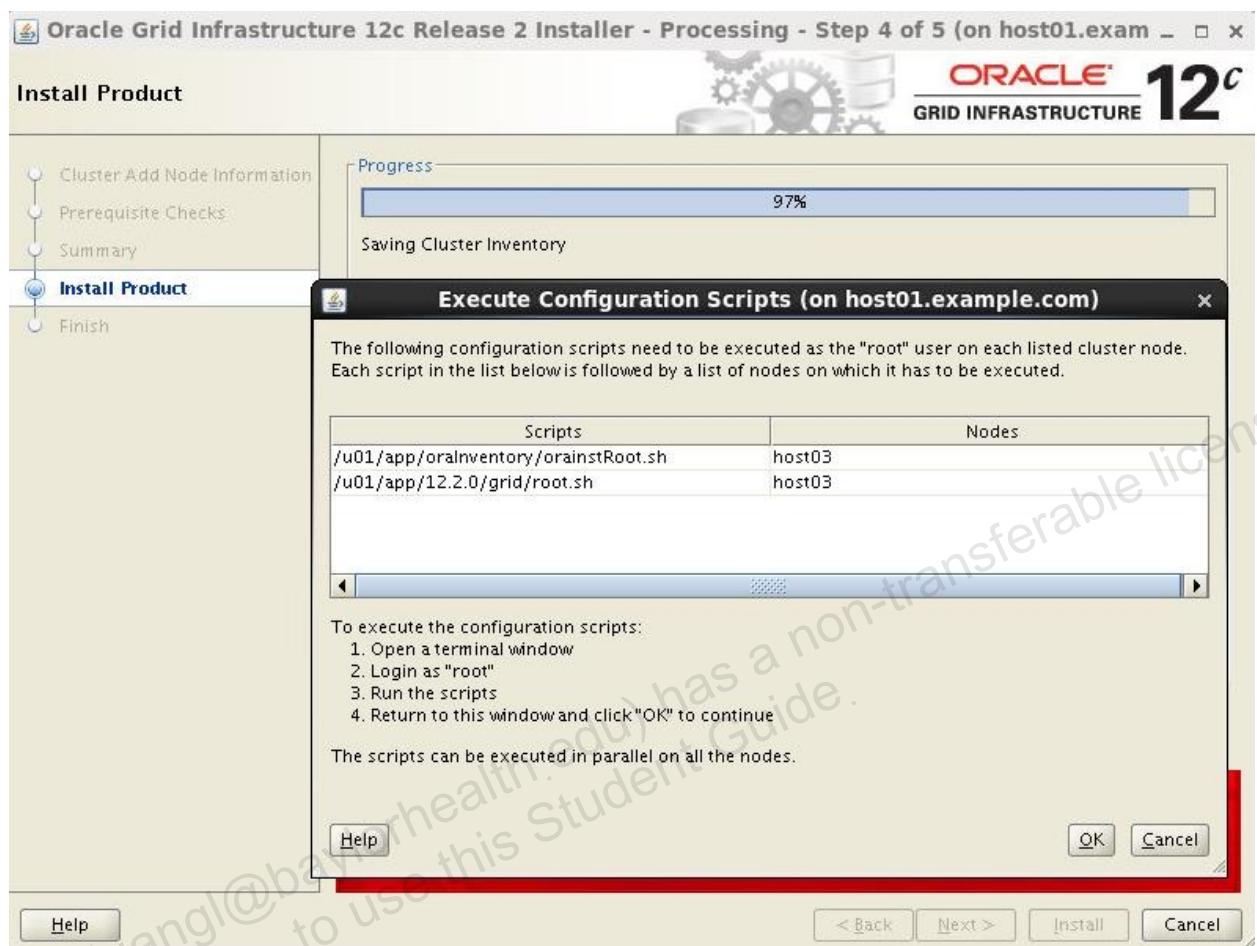
```
2017/11/03 13:23:50 CLSRSC-594: Executing installation step 6 of  
19: 'SetupOSD'.  
2017/11/03 13:23:52 CLSRSC-594: Executing installation step 7 of  
19: 'CheckCRSConfig'.  
2017/11/03 13:23:54 CLSRSC-594: Executing installation step 8 of  
19: 'SetupLocalGPNP'.  
2017/11/03 13:23:55 CLSRSC-594: Executing installation step 9 of  
19: 'ConfigOLR'.  
2017/11/03 13:23:59 CLSRSC-594: Executing installation step 10  
of 19: 'ConfigCHMOS'.  
2017/11/03 13:23:59 CLSRSC-594: Executing installation step 11  
of 19: 'CreateOHASD'.  
2017/11/03 13:24:01 CLSRSC-594: Executing installation step 12  
of 19: 'ConfigOHASD'.  
2017/11/03 13:24:16 CLSRSC-330: Adding Clusterware entries to  
file 'oracle-ohasd.conf'  
2017/11/03 13:24:35 CLSRSC-594: Executing installation step 13  
of 19: 'InstallAFD'.  
2017/11/03 13:24:37 CLSRSC-594: Executing installation step 14  
of 19: 'InstallACFS'.  
CRS-2791: Starting shutdown of Oracle High Availability  
Services-managed resources on 'host03'  
CRS-2793: Shutdown of Oracle High Availability Services-managed  
resources on 'host03' has completed  
CRS-4133: Oracle High Availability Services has been stopped.  
CRS-4123: Oracle High Availability Services has been started.  
2017/11/03 13:25:26 CLSRSC-594: Executing installation step 15  
of 19: 'InstallKA'.  
2017/11/03 13:25:28 CLSRSC-594: Executing installation step 16  
of 19: 'InitConfig'.  
CRS-2791: Starting shutdown of Oracle High Availability  
Services-managed resources on 'host03'  
CRS-2793: Shutdown of Oracle High Availability Services-managed  
resources on 'host03' has completed  
CRS-4133: Oracle High Availability Services has been stopped.  
CRS-4123: Oracle High Availability Services has been started.  
CRS-2791: Starting shutdown of Oracle High Availability  
Services-managed resources on 'host03'  
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host03'  
CRS-2677: Stop of 'ora.drivers.acfs' on 'host03' succeeded  
CRS-2793: Shutdown of Oracle High Availability Services-managed  
resources on 'host03' has completed  
CRS-4133: Oracle High Availability Services has been stopped.  
2017/11/03 13:25:42 CLSRSC-594: Executing installation step 17  
of 19: 'StartCluster'.
```

```
CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.mdnsd' on 'host03'
CRS-2672: Attempting to start 'ora.evmd' on 'host03'
CRS-2676: Start of 'ora.mdnsd' on 'host03' succeeded
CRS-2676: Start of 'ora.evmd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.gpnpd' on 'host03'
CRS-2676: Start of 'ora.gpnpd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'host03'
CRS-2676: Start of 'ora.gipcd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host03'
CRS-2676: Start of 'ora.cssdmonitor' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host03'
CRS-2672: Attempting to start 'ora.diskmon' on 'host03'
CRS-2676: Start of 'ora.diskmon' on 'host03' succeeded
CRS-2676: Start of 'ora.cssd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'host03'
CRS-2672: Attempting to start 'ora.ctssd' on 'host03'
CRS-2676: Start of 'ora.ctssd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host03'
CRS-2676: Start of 'ora.crf' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host03'
CRS-2676: Start of 'ora.crsd' on 'host03' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-6017: Processing resource auto-start for servers: host03
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN2.lsnr' on 'host01'
CRS-2672: Attempting to start 'ora.net1.network' on 'host03'
CRS-2672: Attempting to start 'ora.chad' on 'host03'
CRS-2672: Attempting to start 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
CRS-2677: Stop of 'ora.LISTENER_SCAN2.lsnr' on 'host01' succeeded
CRS-2676: Start of 'ora.net1.network' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.scan2.vip' on 'host01'
CRS-2672: Attempting to start 'ora.ons' on 'host03'
CRS-2676: Start of 'ora.chad' on 'host03' succeeded
CRS-2677: Stop of 'ora.scan2.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.scan2.vip' on 'host03'
CRS-2676: Start of 'ora.scan2.vip' on 'host03' succeeded
```

```
CRS-2672: Attempting to start 'ora.LISTENER_SCAN2.lsnr' on
'host03'
CRS-2676: Start of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.ons' on 'host03' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN2.lsnr' on 'host03'
succeeded
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-6016: Resource auto-start has completed for server host03
CRS-6024: Completed start of Oracle Cluster Ready Services-
managed resources
CRS-4123: Oracle High Availability Services has been started.
2017/11/03 13:28:06 CLSRSC-343: Successfully started Oracle
Clusterware stack
2017/11/03 13:28:06 CLSRSC-594: Executing installation step 18
of 19: 'ConfigNode'.
clscfg: EXISTING configuration version 5 detected.
clscfg: version 5 is 12c Release 2.
Successfully accumulated necessary OCR keys.
Creating OCR keys for user 'root', privgrp 'root'..
Operation successful.
2017/11/03 13:28:22 CLSRSC-594: Executing installation step 19
of 19: 'PostConfig'.
2017/11/03 13:28:32 CLSRSC-325: Configure Oracle Grid
Infrastructure for a Cluster ... succeeded

[root@host01 ~]#
```

19. When the root scripts have finished running on host03, return to the Execute Configuration Scripts dialog box and click OK.



20. Click Close on the Finish screen when prompted by the OUI.



21. Back in your terminal session to host01 as root user. Set your environment and execute the crsctl stat res -t command to verify that all local and cluster resources are running on host03 as expected.

```
[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# crsctl stat res -t

-----
| Name          | Target | State   | Server | State details |
-----
| Local Resources |
-----
| ora.ASMNET1LSNR_ASM.lsnr |
|           ONLINE  ONLINE    host01    STABLE |
|           ONLINE  ONLINE    host02    STABLE |
```

	ONLINE	ONLINE	host03	STABLE
ora.DATA.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER_LEAF.lsnr				
	OFFLINE	OFFLINE	host04	STABLE
ora.MGMT.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.chad				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host04	STABLE
ora.net1.network				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.ons				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.proxy_advm				
	OFFLINE	OFFLINE	host01	STABLE
	OFFLINE	OFFLINE	host02	STABLE
	OFFLINE	OFFLINE	host03	STABLE
<hr/>				
Cluster Resources				
<hr/>				
ora.LISTENER_SCAN1.lsnr				
	1	ONLINE	host02	STABLE
ora.LISTENER_SCAN2.lsnr				
	1	ONLINE	host03	STABLE
ora.LISTENER_SCAN3.lsnr				
	1	ONLINE	host01	STABLE
ora.MGMLSNR				

	1	ONLINE	ONLINE	host01	169.254.191.252 192.168.1.101, STABLE
ora.asm					
	1	ONLINE	ONLINE	host01	Started, STABLE
	2	ONLINE	ONLINE	host02	Started, STABLE
	3	ONLINE	ONLINE	host03	Started, STABLE
ora.cvu					
	1	ONLINE	ONLINE	host01	STABLE
ora.gns					
	1	ONLINE	ONLINE	host01	STABLE
ora.gns.vip					
	1	ONLINE	ONLINE	host01	STABLE
ora.host01.vip					
	1	ONLINE	ONLINE	host01	STABLE
ora.host02.vip					
	1	ONLINE	ONLINE	host02	STABLE
ora.host03.vip					
	1	ONLINE	ONLINE	host03	STABLE
ora.mgmtdb					
	1	ONLINE	ONLINE	host01	Open, STABLE
ora.qosmserver					
	1	ONLINE	ONLINE	host01	STABLE
ora.scan1.vip					
	1	ONLINE	ONLINE	host02	STABLE
ora.scan2.vip					
	1	ONLINE	ONLINE	host03	STABLE
ora.scan3.vip					
	1	ONLINE	ONLINE	host01	STABLE
<hr/>					
[root@host01 ~]#					

22. Close all terminal windows opened for these practices.

Practice 6-2: Add a New Leaf Node to the Cluster

Overview

In this practice, you will use `addnode.sh` in silent mode to extend your cluster by adding `host05` as the second leaf node.

- Establish a terminal session connected to `host01` as the `grid` OS user.

```
[oracle@dns ~]$ ssh grid@host01
grid@host01's password: *****
[grid@host01 ~]$
```

- Make sure that you can connect from your `host01` to `host05` without being prompted for passwords. Exit back to `host01` when finished.

```
[grid@host01 ~]$ ssh host05
[grid@host05 ~]$ exit
logout
Connection to host05 closed.
[grid@host01 ~]$
```

- Execute `.oraenv` to set your environment. Set the SID to `+ASM1`.

```
[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid
[grid@host01 ~]$
```

- Change directory to `$ORACLE_HOME/addnode` and run `addnode.sh` silently and add `host05` to your cluster as a leaf node. *It takes about 10min to complete this step.*

```
[grid@host01 ~]$ cd $ORACLE_HOME/addnode
[grid@host01 addnode]$ ./addnode.sh -silent
"CLUSTER_NEW_NODES={host05}" "CLUSTER_NEW_NODE_ROLES={leaf}"

***** Wait for a few moments to see the following output *****

[WARNING] [INS-13014] Target environment does not meet some
optional requirements.

CAUSE: Some of the optional prerequisites are not met. See
logs for details. /u01/app/oraInventory/logs/addNodeActions2017-
11-03_02-10-42-PM.log

ACTION: Identify the list of failed prerequisite checks from
the log: /u01/app/oraInventory/logs/addNodeActions2017-11-03_02-
10-42-PM.log. Then either from the log file or from installation
```

manual find the appropriate configuration to meet the prerequisites and fix it manually.

Prepare Configuration in progress.

Prepare Configuration successful.

..... 7% Done.

Copy Files to Remote Nodes in progress.

..... 12% Done.

..... 17% Done.

.....

Copy Files to Remote Nodes successful.

You can find the log of this install session at:

/u01/app/oraInventory/logs/addNodeActions2017-11-03_02-10-42-PM.log

Instantiate files in progress.

Instantiate files successful.

..... 49% Done.

Saving cluster inventory in progress.

..... 83% Done.

Saving cluster inventory successful.

The Cluster Node Addition of /u01/app/12.2.0/grid was successful.

Please check '/u01/app/12.2.0/grid/inventory/silentInstall2017-11-03_2-10-40-PM.log' for more details.

Setup Oracle Base in progress.

Setup Oracle Base successful.

..... 90% Done.

Update Inventory in progress.

Update Inventory successful.

..... 97% Done.

As a root user, execute the following script(s):

1. /u01/app/oraInventory/orainstRoot.sh

```
2. /u01/app/12.2.0/grid/root.sh

Execute /u01/app/oraInventory/orainstRoot.sh on the following
nodes:
[host05]
Execute /u01/app/12.2.0/grid/root.sh on the following nodes:
[host05]

The scripts can be executed in parallel on all the nodes.

..... 100% Done.

Successfully Setup Software.

[grid@host01 addnode]$
```

5. Open a terminal connected to host01 as root user. Run the `orainstRoot.sh` script.

```
[oracle@dns ~]$ ssh root@host01
root@host01's password:

[root@host01 ~]# ssh host05 /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@host01 ~]#
```

6. Next, execute the `root.sh` script on host05. Optionally, while the root script execution is in progress, you may want to review the log file in another terminal window. *It takes 5min to complete this step.*

```
[root@host01 ~]# ssh host05 /u01/app/12.2.0/grid/root.sh
Check
/u01/app/12.2.0/grid/install/root_host05.example.com_2017-11-
03_14-24-46-448448128.log for the output of root script

***** Wait for a few moments to complete *****

[root@host01 ~]# ssh host05
[root@host05 ~]# cat
/u01/app/12.2.0/grid/install/root_host05.example.com_2017-11-
03_14-24-46-448448128.log
```

Performing root user operation.

The following environment variables are set as:

```
ORACLE_OWNER= grid  
ORACLE_HOME= /u01/app/12.2.0/grid  
Copying dbhome to /usr/local/bin ...  
Copying oraenv to /usr/local/bin ...  
Copying coraenv to /usr/local/bin ...
```

Creating /etc/oratab file...

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

Relinking oracle with rac_on option

Using configuration parameter file:

/u01/app/12.2.0/grid/crs/install/crsconfig_params

The log of current session can be found at:

/u01/app/grid CRSdata/host05/crsconfig/rootcrs_host05_2017-11-03_02-25-04PM.log

2017/11/03 14:25:18 CLSRSC-594: Executing installation step 1 of 19: 'SetupTFA'.

2017/11/03 14:25:18 CLSRSC-4001: Installing Oracle Trace File Analyzer (TFA) Collector.

2017/11/03 14:25:51 CLSRSC-4002: Successfully installed Oracle Trace File Analyzer (TFA) Collector.

2017/11/03 14:25:51 CLSRSC-594: Executing installation step 2 of 19: 'ValidateEnv'.

2017/11/03 14:25:55 CLSRSC-363: User ignored prerequisites during installation

2017/11/03 14:25:55 CLSRSC-594: Executing installation step 3 of 19: 'CheckFirstNode'.

2017/11/03 14:25:55 CLSRSC-594: Executing installation step 4 of 19: 'GenSiteGUIDs'.

2017/11/03 14:25:56 CLSRSC-594: Executing installation step 5 of 19: 'SaveParamFile'.

2017/11/03 14:26:00 CLSRSC-594: Executing installation step 6 of 19: 'SetupOSD'.

2017/11/03 14:26:02 CLSRSC-594: Executing installation step 7 of 19: 'CheckCRSConfig'.

2017/11/03 14:26:03 CLSRSC-594: Executing installation step 8 of 19: 'SetupLocalGPNP'.

2017/11/03 14:26:05 CLSRSC-594: Executing installation step 9

```
of 19: 'ConfigOLR'.
2017/11/03 14:26:09 CLSRSC-594: Executing installation step 10
of 19: 'ConfigCHMOS'.
2017/11/03 14:26:09 CLSRSC-594: Executing installation step 11
of 19: 'CreateOHASD'.
2017/11/03 14:26:10 CLSRSC-594: Executing installation step 12
of 19: 'ConfigOHASD'.
2017/11/03 14:26:26 CLSRSC-330: Adding Clusterware entries to
file 'oracle-ohasd.conf'
2017/11/03 14:26:46 CLSRSC-594: Executing installation step 13
of 19: 'InstallAFD'.
2017/11/03 14:26:47 CLSRSC-594: Executing installation step 14
of 19: 'InstallACFS'.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host05'
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host05' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Oracle High Availability Services has been started.
2017/11/03 14:27:27 CLSRSC-594: Executing installation step 15
of 19: 'InstallKA'.
2017/11/03 14:27:28 CLSRSC-594: Executing installation step 16
of 19: 'InitConfig'.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host05'
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host05' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Oracle High Availability Services has been started.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host05'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host05'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host05' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host05' has completed
CRS-4133: Oracle High Availability Services has been stopped.
2017/11/03 14:27:42 CLSRSC-594: Executing installation step 17
of 19: 'StartCluster'.
CRS-4123: Starting Oracle High Availability Services-managed
resources
CRS-2672: Attempting to start 'ora.mdnsd' on 'host05'
CRS-2672: Attempting to start 'ora.evmd' on 'host05'
CRS-2676: Start of 'ora.mdnsd' on 'host05' succeeded
CRS-2676: Start of 'ora.evmd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.gpnpd' on 'host05'
CRS-2676: Start of 'ora.gpnpd' on 'host05' succeeded
```

```

CRS-2672: Attempting to start 'ora.gipcd' on 'host05'
CRS-2676: Start of 'ora.gipcd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host05'
CRS-2676: Start of 'ora.cssdmonitor' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host05'
CRS-2672: Attempting to start 'ora.diskmon' on 'host05'
CRS-2676: Start of 'ora.diskmon' on 'host05' succeeded
CRS-2676: Start of 'ora.cssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'host05'
CRS-2672: Attempting to start 'ora.ctssd' on 'host05'
CRS-2676: Start of 'ora.ctssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host05'
CRS-2676: Start of 'ora.storage' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host05'
CRS-2676: Start of 'ora.crf' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host05'
CRS-2676: Start of 'ora.crsd' on 'host05' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host05' succeeded
CRS-6017: Processing resource auto-start for servers: host05
CRS-2672: Attempting to start 'ora.chad' on 'host05'
CRS-2676: Start of 'ora.chad' on 'host05' succeeded
CRS-6016: Resource auto-start has completed for server host05
CRS-6024: Completed start of Oracle Cluster Ready Services-managed resources
CRS-4123: Oracle High Availability Services has been started.
2017/11/03 14:28:21 CLSRSC-343: Successfully started Oracle Clusterware stack
2017/11/03 14:28:21 CLSRSC-594: Executing installation step 18 of 19: 'ConfigNode'.
Successfully accumulated necessary OCR keys.
Creating OCR keys for user 'root', privgrp 'root'..
Operation successful.
2017/11/03 14:28:28 CLSRSC-594: Executing installation step 19 of 19: 'PostConfig'.
2017/11/03 14:28:32 CLSRSC-325: Configure Oracle Grid Infrastructure for a Cluster ... succeeded

[root@host05 ~]# exit
logout
Connection to host05 closed.
[root@host01 ~]#

```

7. Execute `crsctl stat res -t` and ensure the `ora.LISTENER_LEAF.lsnr` resource is located on host05. The resource status should be OFFLINE.

Name	Target	State	Server	State details
<hr/>				
Local Resources				
<hr/>				
ora.ASMNET1LSNR_ASM.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.DATA.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER_LEAF.lsnr				
	OFFLINE	OFFLINE	host04	STABLE
	OFFLINE	OFFLINE	host05	STABLE
ora.MGMT.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.chad				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host04	STABLE
	ONLINE	ONLINE	host05	STABLE
ora.net1.network				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.ons				
	ONLINE	ONLINE	host01	STABLE

	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.proxy_advm				
	OFFLINE	OFFLINE	host01	STABLE
	OFFLINE	OFFLINE	host02	STABLE
	OFFLINE	OFFLINE	host03	STABLE
<hr/>				
Cluster Resources				
<hr/>				
ora.LISTENER_SCAN1.lsnr				
1	ONLINE	ONLINE	host02	STABLE
ora.LISTENER_SCAN2.lsnr				
1	ONLINE	ONLINE	host03	STABLE
ora.LISTENER_SCAN3.lsnr				
1	ONLINE	ONLINE	host01	STABLE
ora.MGMTLSNR				
1	ONLINE	ONLINE	host01	169.254.191.252
				192.168.1.101,
				STABLE
ora.asm				
1	ONLINE	ONLINE	host01	Started, STABLE
2	ONLINE	ONLINE	host02	Started, STABLE
3	ONLINE	ONLINE	host03	Started, STABLE
ora.cvu				
1	ONLINE	ONLINE	host01	STABLE
ora.gns				
1	ONLINE	ONLINE	host01	STABLE
ora.gns.vip				
1	ONLINE	ONLINE	host01	STABLE
ora.host01.vip				
1	ONLINE	ONLINE	host01	STABLE
ora.host02.vip				
1	ONLINE	ONLINE	host02	STABLE
ora.host03.vip				
1	ONLINE	ONLINE	host03	STABLE
ora.mgmtdb				
1	ONLINE	ONLINE	host01	Open, STABLE
ora.qosmserver				
1	ONLINE	ONLINE	host01	STABLE
ora.scan1.vip				
1	ONLINE	ONLINE	host02	STABLE
ora.scan2.vip				

```
1           ONLINE  ONLINE      host03      STABLE
ora.scan3.vip
1           ONLINE  ONLINE      host01      STABLE
-----
[root@host01 ~]#
```

At this point, you have configured a Flex Cluster with Flex ASM using all available nodes. Next, you will install database software and create a RAC database on the cluster. In preparation for this, you will now create another ASM disk group to host the Fast Recovery Area (FRA).

8. Open a new terminal connected to host01 using the -X option as grid user. Start the ASM Configuration Assistant (asmca).

```
[oracle@dns ~]$ ssh -X grid@host01
grid@host01's password: *****

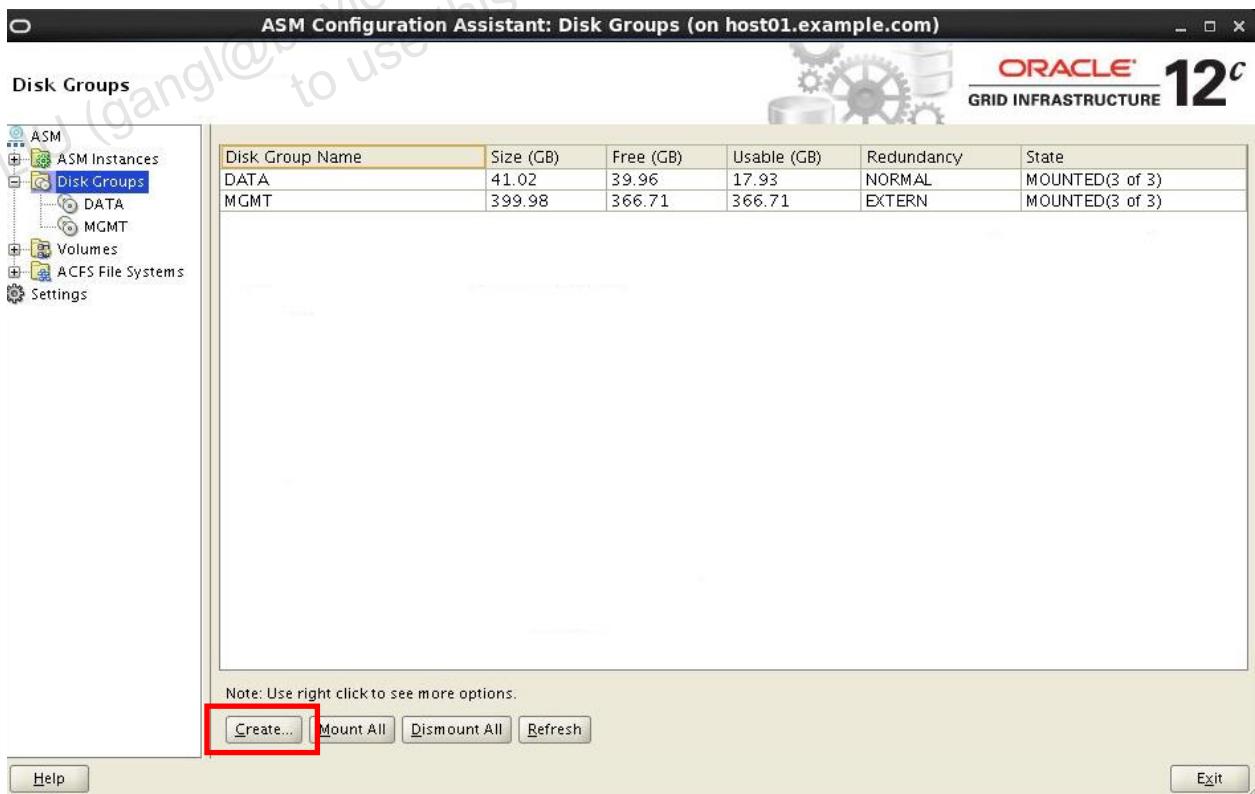
[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ asmca
```

9. After the ASM Configuration Assistant appears, click on Disk Groups.



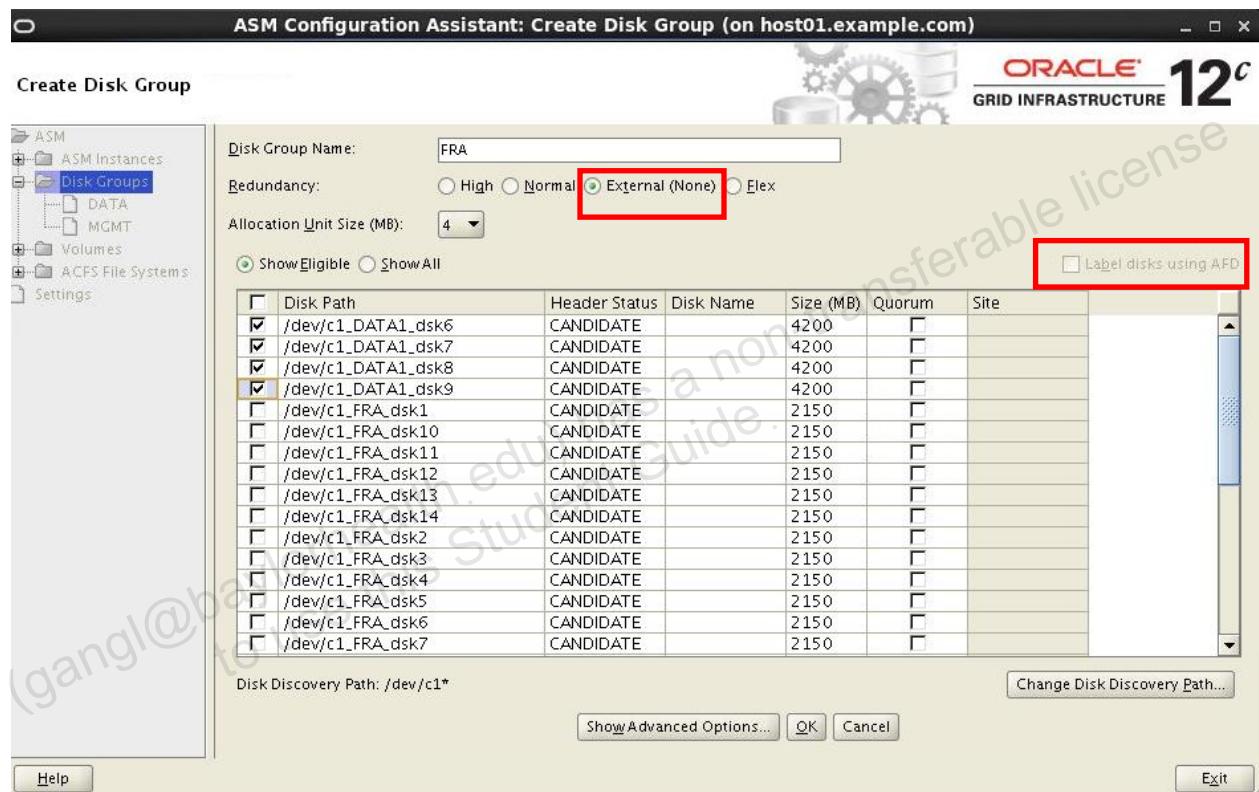
10. Click on Create.



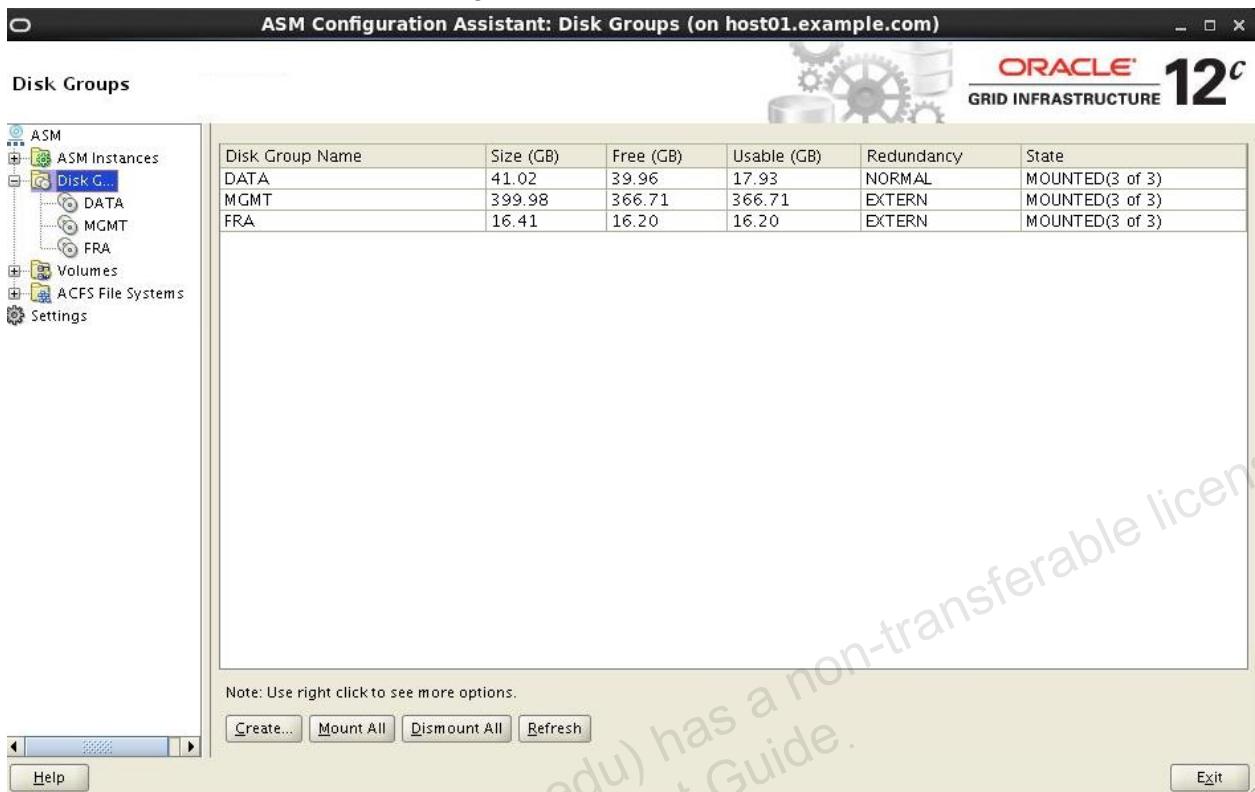
11. In the Create Disk Group window, enter FRA as the disk group name and select the following four candidate disks (c1_DATA1_dsk).

- /dev/c1_DATA1_dsk6
- /dev/c1_DATA1_dsk7
- /dev/c1_DATA1_dsk8
- /dev/c1_DATA1_dsk9

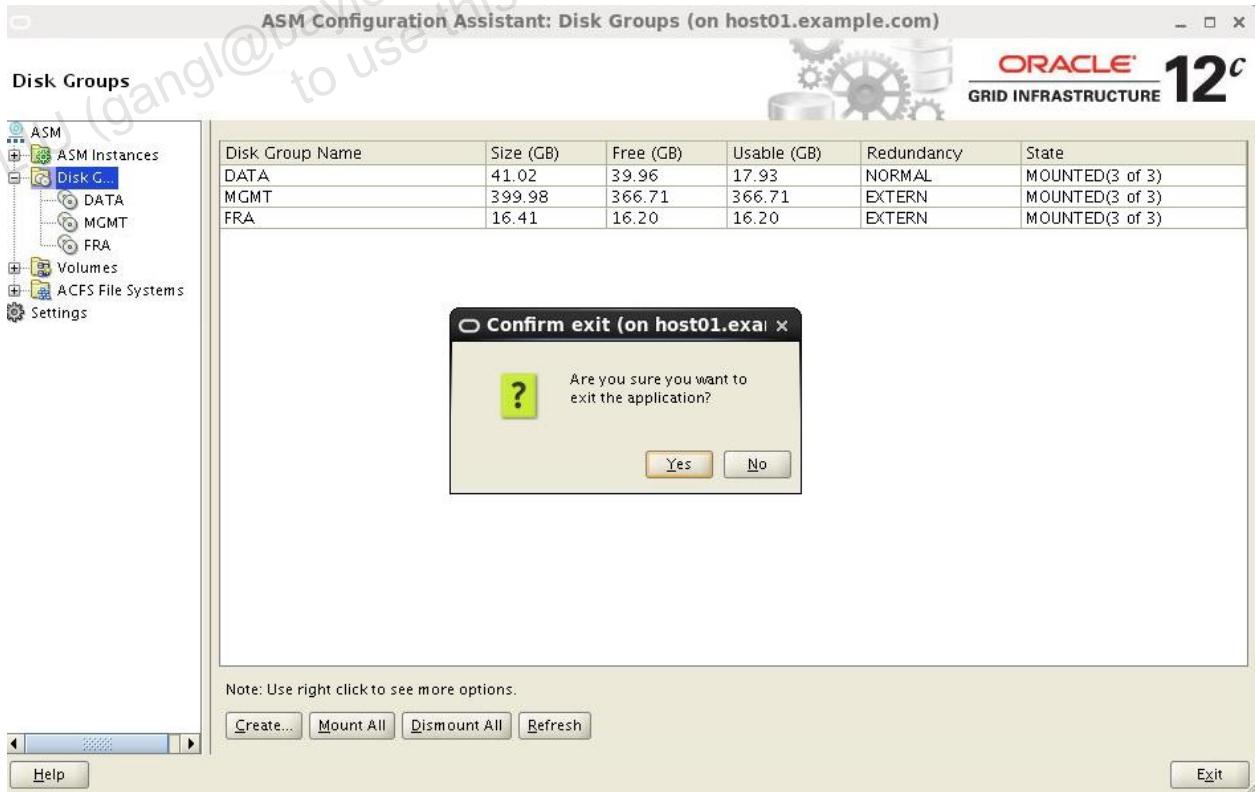
Make sure the Redundancy is ***External*** and The ***Label disks using AFD*** is NOT selected. Then click OK to create the disk group.



12. Click Exit to quit the ASM Configuration Assistant.



13. Click Yes to confirm that you want to quit the ASM Configuration Assistant.



14. Close all terminal windows opened for these practices.

Practice 6-3: Installing RAC Database Software

Overview

In this practice, you will install the database software to both hub and leaf nodes in your cluster.

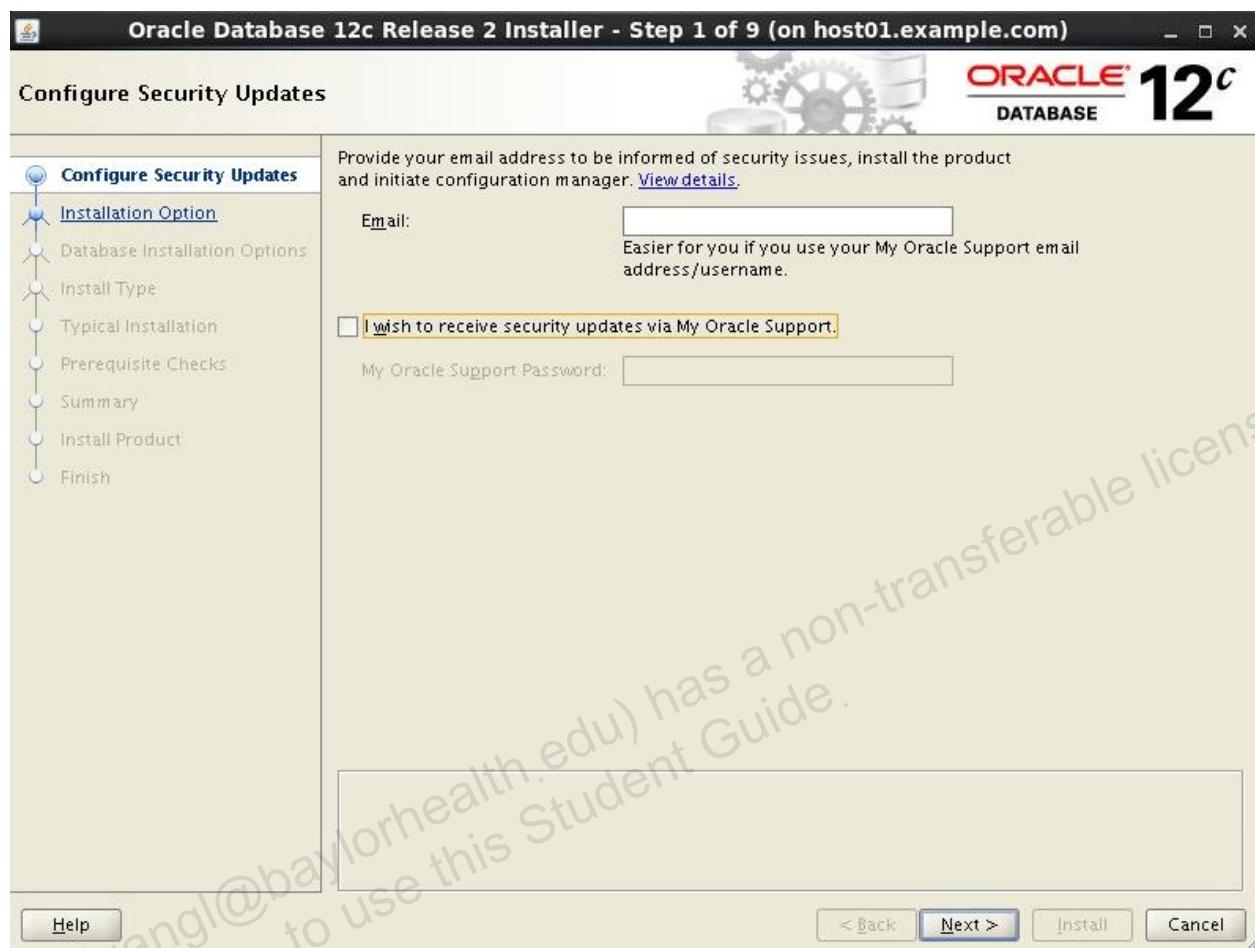
1. Open a terminal window as `root` on `host01`. Change the permissions on `/u01/app` to allow the `oracle` user write privileges. Repeat these commands on `host02`, `host03`, `host04`, and `host05`.

```
[oracle@dns ~]$ ssh root@host01  
root@host01's password:  
[root@host01 ~]# chmod 775 /u01/app  
[root@host01 ~]# ssh host02 chmod 775 /u01/app  
[root@host01 ~]# ssh host03 chmod 775 /u01/app  
[root@host01 ~]# ssh host04 chmod 775 /u01/app  
[root@host01 ~]# ssh host05 chmod 775 /u01/app  
  
[root@host01 ~]#
```

2. Open a new terminal window and `ssh` to `host01` as the `oracle` user. Change the working directory to `/stage/database` and execute `runInstaller`.

```
[oracle@dns ~]$ ssh -X oracle@host01  
oracle@host01's password:  
  
[oracle@host01 ~]$ cd /stage/database  
[oracle@host01 database]$ ./runInstaller
```

3. On the Configure Security Updates page, uncheck “I wish to receive security updates via My Oracle Support” and click Next.



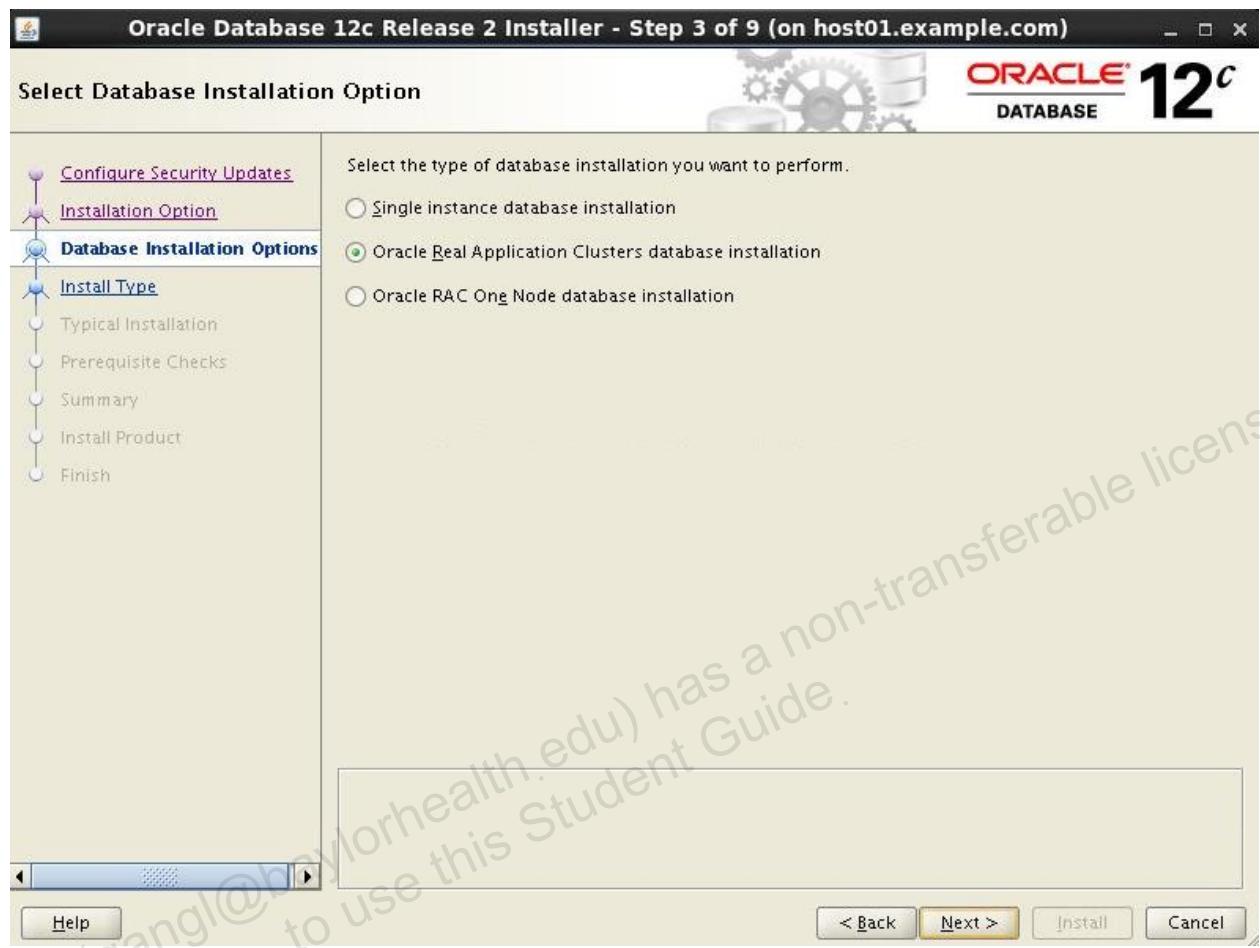
- Click Yes on the dialog box confirming your wish regarding security updates.



5. On the Select Installation Option page, select “Install database software only” and click Next.

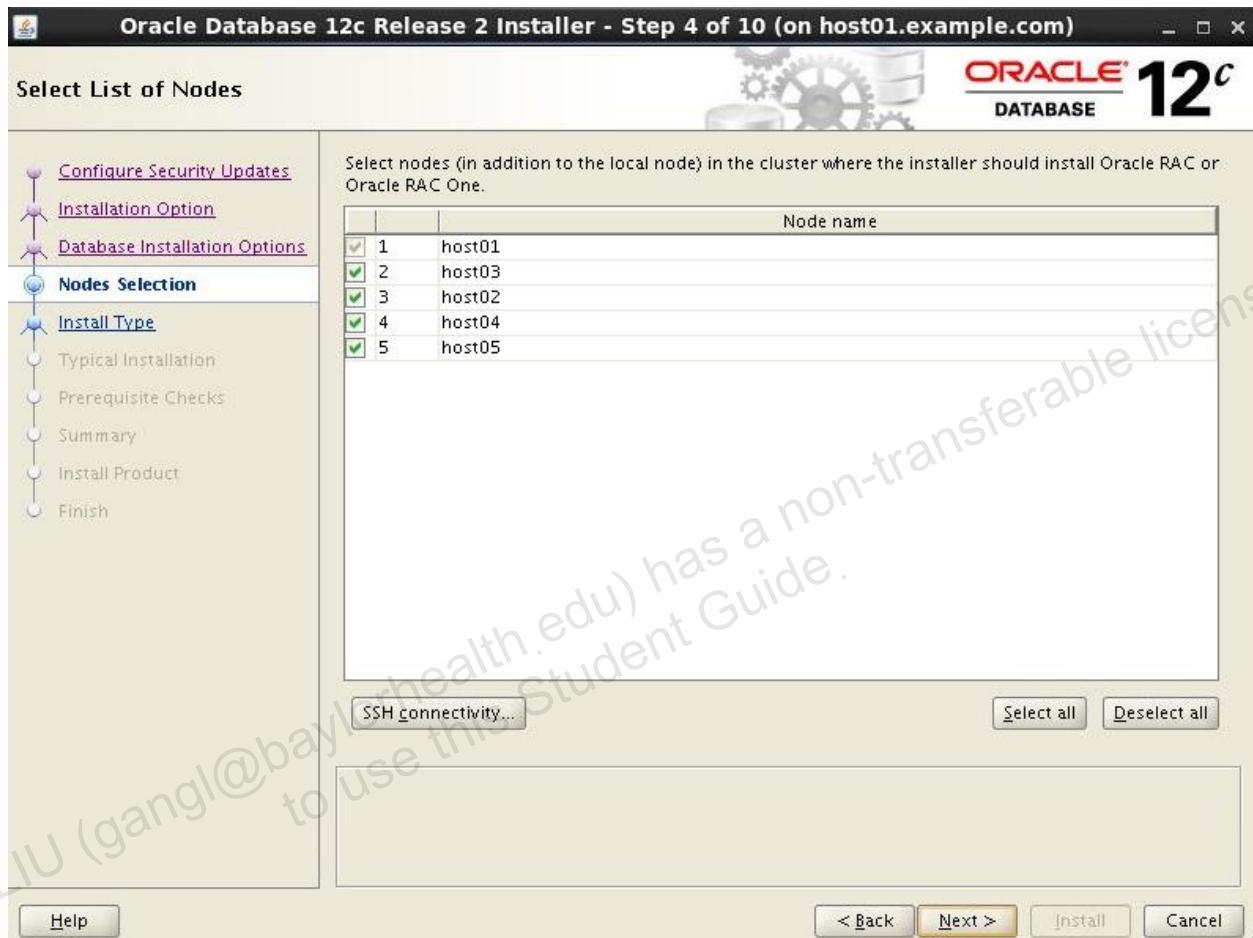


6. On the Select Database Installation Option page select “Oracle Real Application Clusters database installation” and click Next.



7. On the Select List of Nodes page, ensure all nodes are checked and click Next.

Note: Oracle recommends that you install the Oracle Database software on all the cluster nodes, even Leaf Nodes. This simplifies things if you ever want to convert a Leaf Node to a Hub Node and run database instances on it or if you plan to run database instances in the Leaf Nodes.



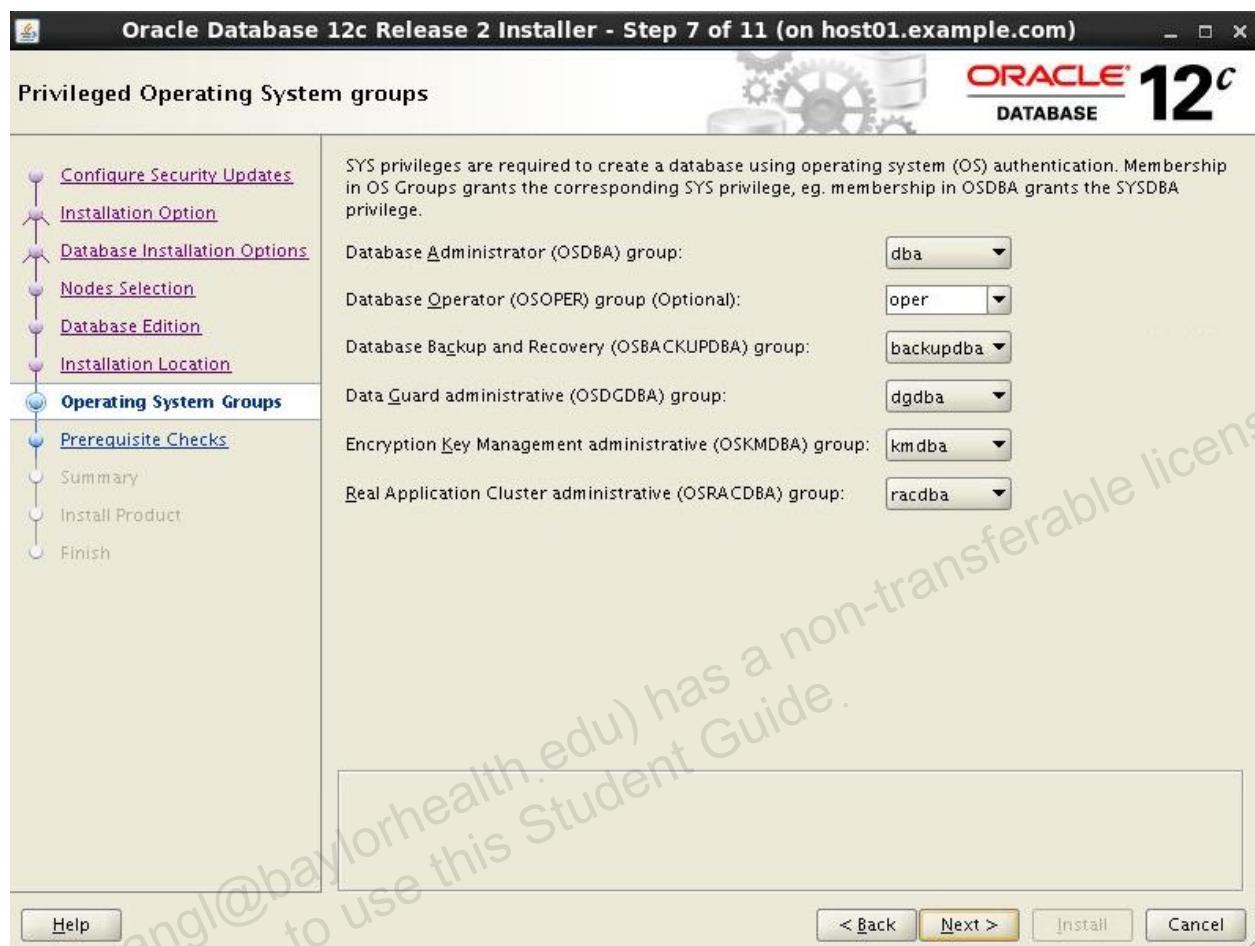
8. On the Select Database Edition page, ensure “Enterprise Edition” is selected and click Next.



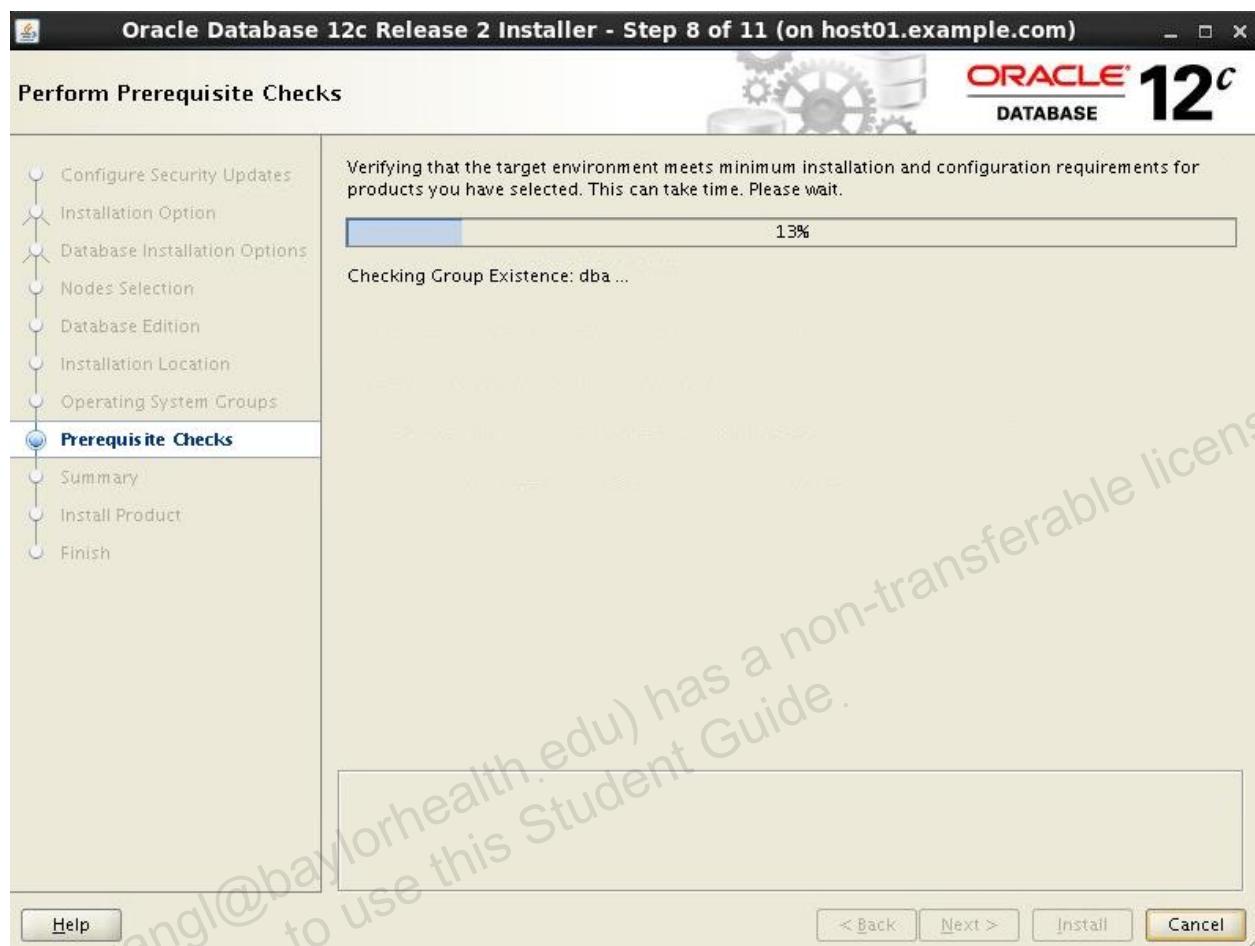
9. On the Specify Installation Location page, accept the defaults as shown here and click Next.



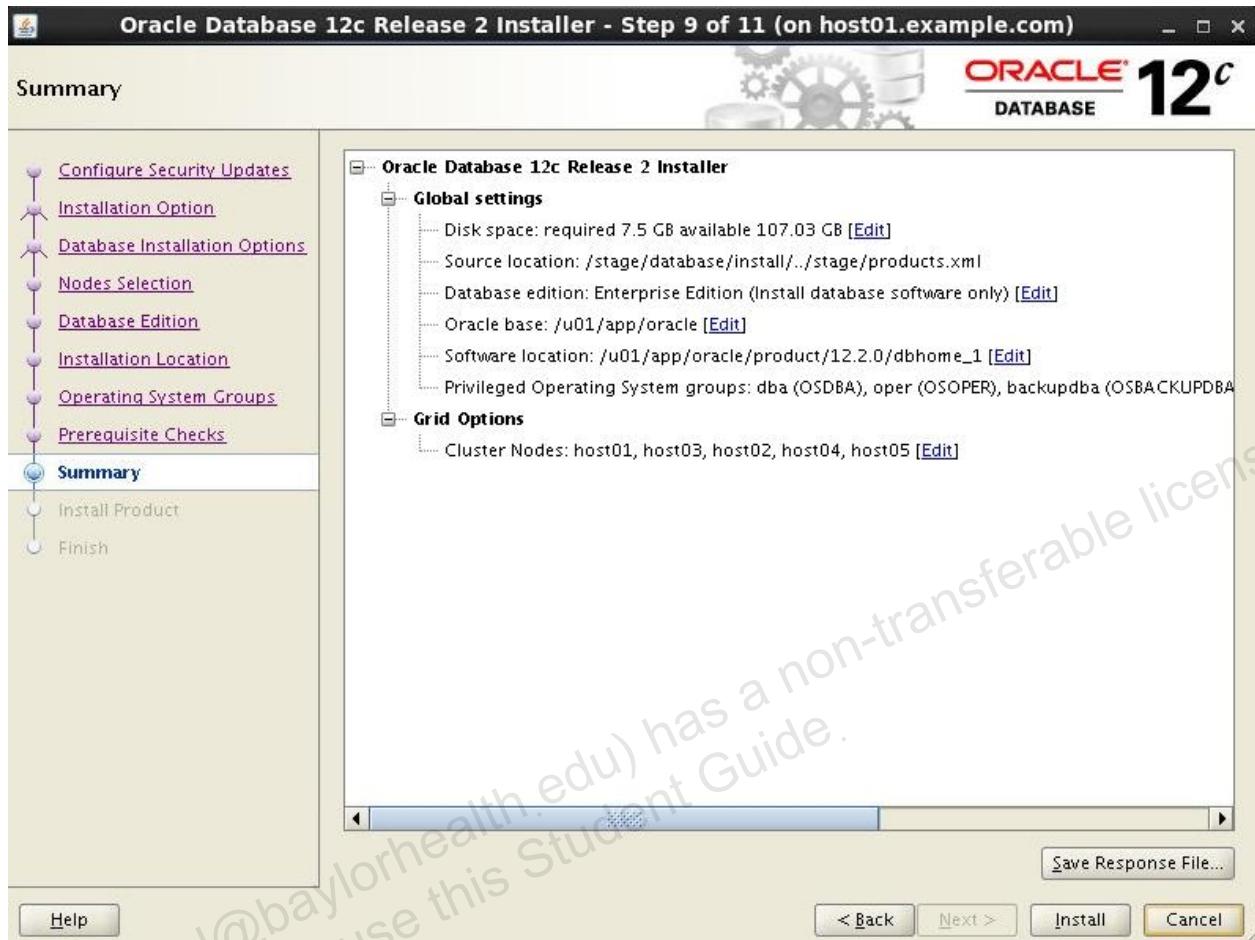
10. On the Privileged Operating System groups, accept the defaults as shown here and click Next.



11. The Perform Prerequisite Checks page shows the progress of checks performed before the installation begins.



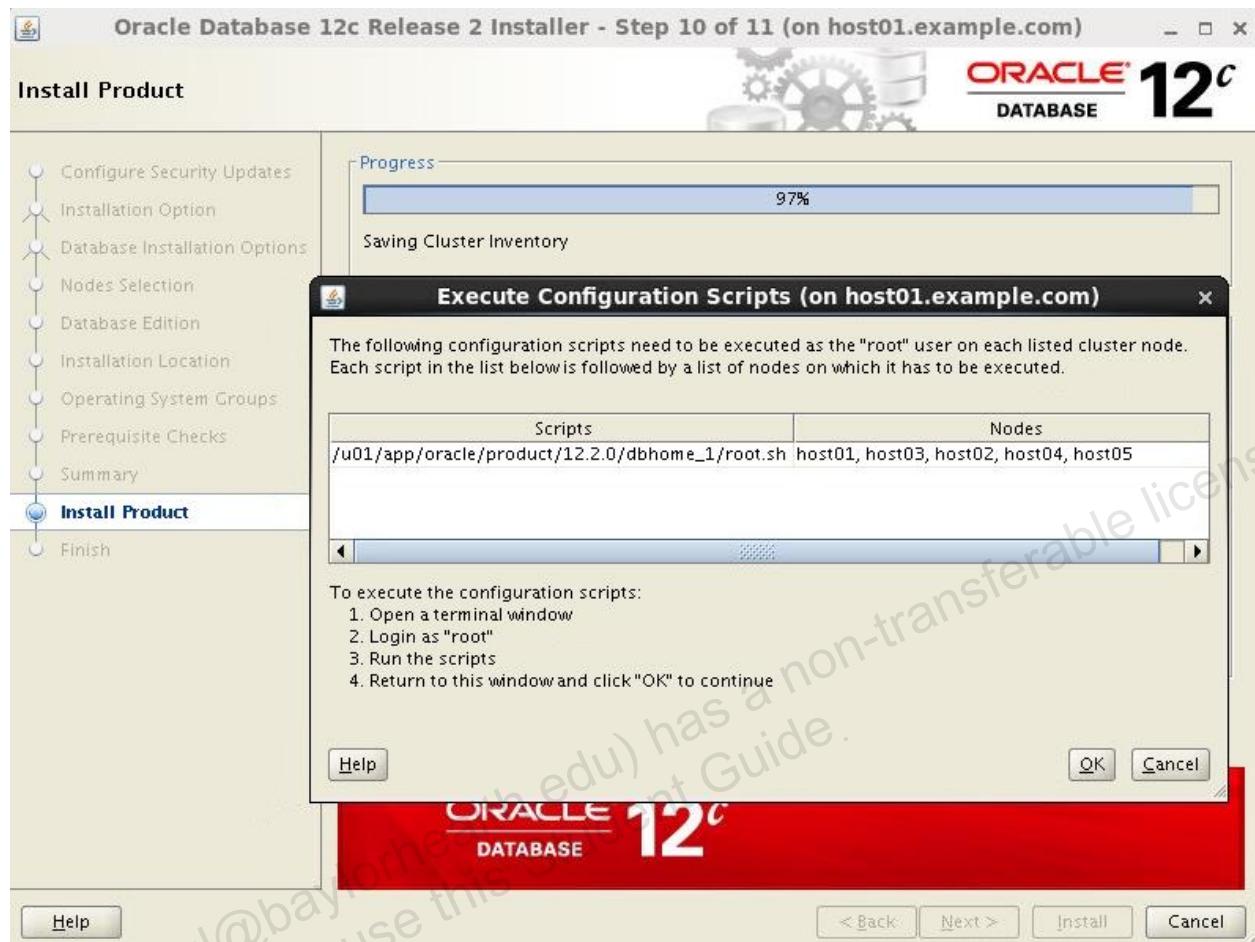
12. Review the information on the Summary page and click Next.



13. Monitor the installation on the Install Product page. It takes about **25min** to complete the installation steps at this stage.



14. At the end of the installation, you will be prompted to run the `root` scripts.



15. Return to the `root` terminal and run the `root` scripts on host01, host02, host03, host04, and host05.

```
[root@host01 ~]#
/u01/app/oracle/product/12.2.0/dbhome_1/root.sh
Performing root user operation.

The following environment variables are set as:
ORACLE_OWNER= oracle
ORACLE_HOME= /u01/app/oracle/product/12.2.0/dbhome_1

Enter the full pathname of the local bin directory:
[/usr/local/bin]:
The contents of "dbhome" have not changed. No need to
overwrite.
The contents of "oraenv" have not changed. No need to
overwrite.
The contents of "coraenv" have not changed. No need to
overwrite.
```

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.

```
[root@host01 ~]# ssh host02  
/u01/app/oracle/product/12.2.0/dbhome_1/root.sh  
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle  
ORACLE_HOME= /u01/app/oracle/product/12.2.0/dbhome_1
```

Enter the full pathname of the local bin directory:
[/usr/local/bin]:

The contents of "dbhome" have not changed. No need to overwrite.

The contents of "oraenv" have not changed. No need to overwrite.

The contents of "coraenv" have not changed. No need to overwrite.

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

```
[root@host01 ~]# ssh host03  
/u01/app/oracle/product/12.2.0/dbhome_1/root.sh  
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle  
ORACLE_HOME= /u01/app/oracle/product/12.2.0/dbhome_1
```

Enter the full pathname of the local bin directory:
[/usr/local/bin]:

The contents of "dbhome" have not changed. No need to overwrite.

The contents of "oraenv" have not changed. No need to overwrite.

The contents of "coraenv" have not changed. No need to overwrite.

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.

```
[root@host01 ~]# ssh host04  
/u01/app/oracle/product/12.2.0/dbhome_1/root.sh  
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle  
ORACLE_HOME= /u01/app/oracle/product/12.2.0/dbhome_1
```

Enter the full pathname of the local bin directory:
[/usr/local/bin]:

The contents of "dbhome" have not changed. No need to overwrite.

The contents of "oraenv" have not changed. No need to overwrite.

The contents of "coraenv" have not changed. No need to overwrite.

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

```
[root@host01 ~]# ssh host05  
/u01/app/oracle/product/12.2.0/dbhome_1/root.sh  
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle  
ORACLE_HOME= /u01/app/oracle/product/12.2.0/dbhome_1
```

Enter the full pathname of the local bin directory:
[/usr/local/bin]:

The contents of "dbhome" have not changed. No need to overwrite.

The contents of "oraenv" have not changed. No need to overwrite.

The contents of "coraenv" have not changed. No need to overwrite.

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.

```
[root@host01 ~]#
```

16. After the root scripts have been run, return to the installer and click OK on the dialog box.



17. Click Close on the Finish page to dismiss the installer.



18. Close all terminals opened for this practice.

Practice 6-4: Creating a RAC Database

Overview

In this practice, create a RAC database in the Hub Nodes.

1. Open a terminal window on your dns node and ssh to host01 as the oracle user.
Set the environment for the Oracle database software.

```
[oracle@dns ~]$ ssh -X host01
oracle@host01's password:

[oracle@host01 ~]$ export
ORACLE_HOME=/u01/app/oracle/product/12.2.0/dbhome_1

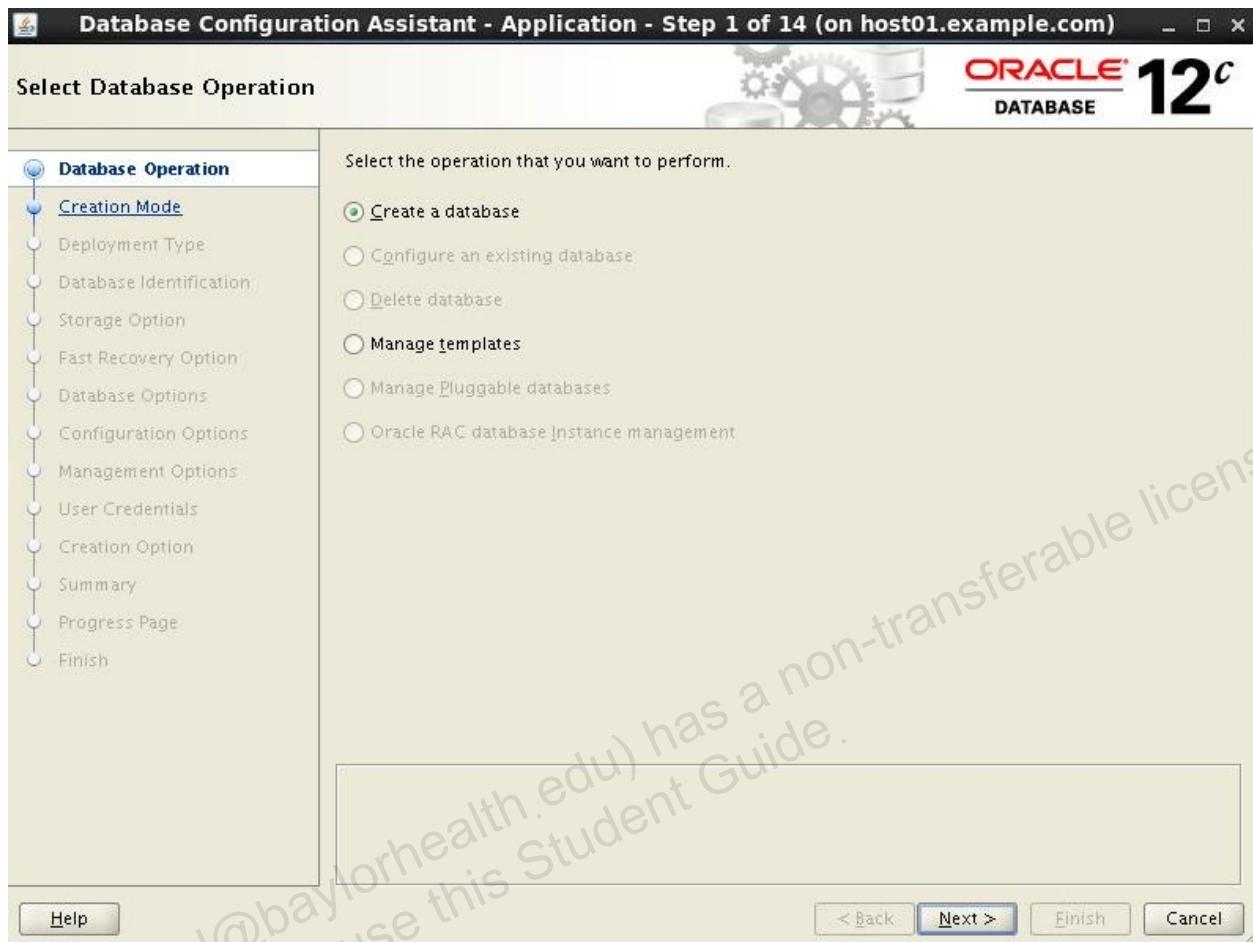
[oracle@host01 ~]$ export PATH=$PATH:$ORACLE_HOME/bin

[oracle@host01 ~]$
```

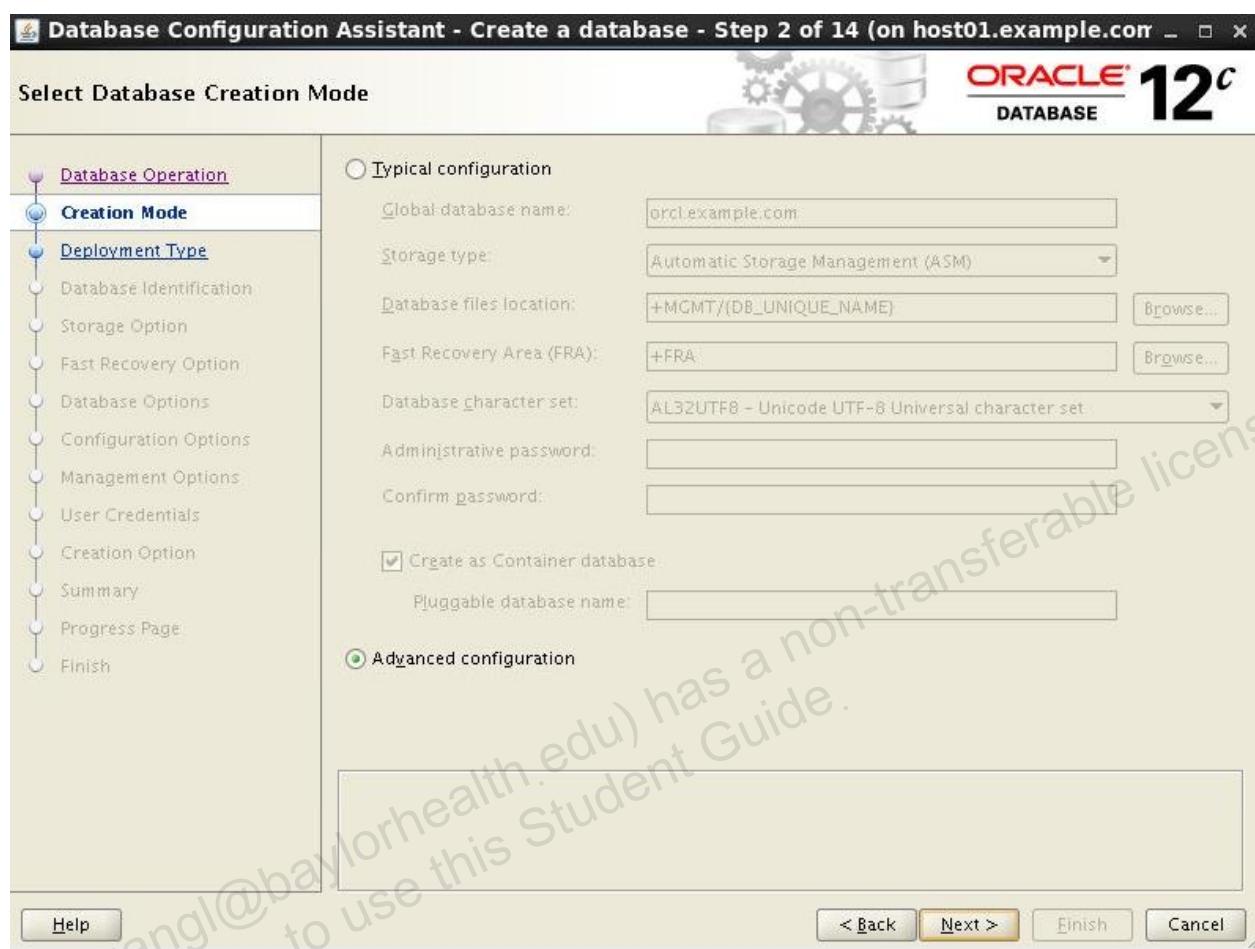
2. Change directory to \$ORACLE_HOME/bin and run DBCA.

```
[oracle@host01 ~]$ dbca
```

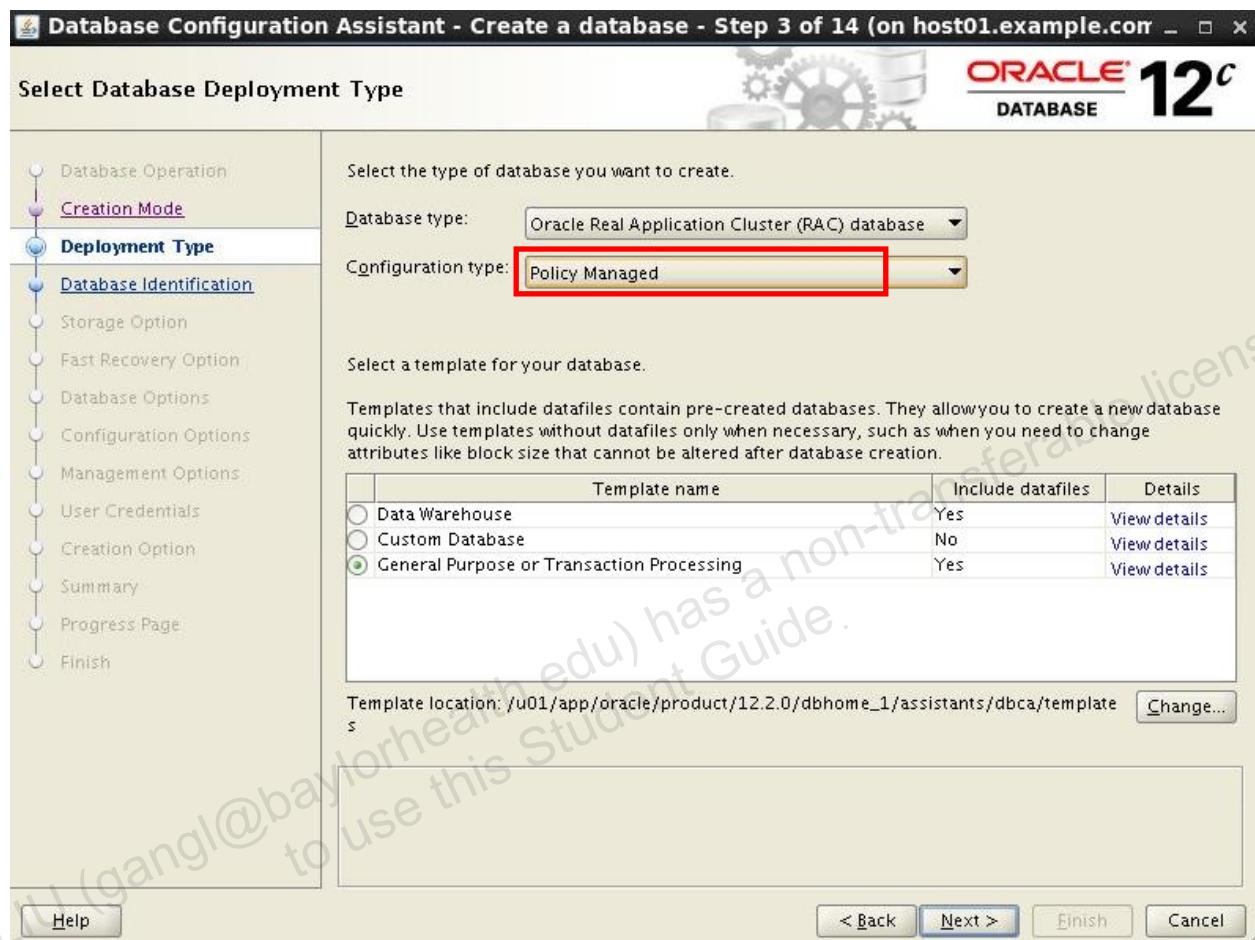
3. On the “Select Database Operation” page, select Create a database and click Next.



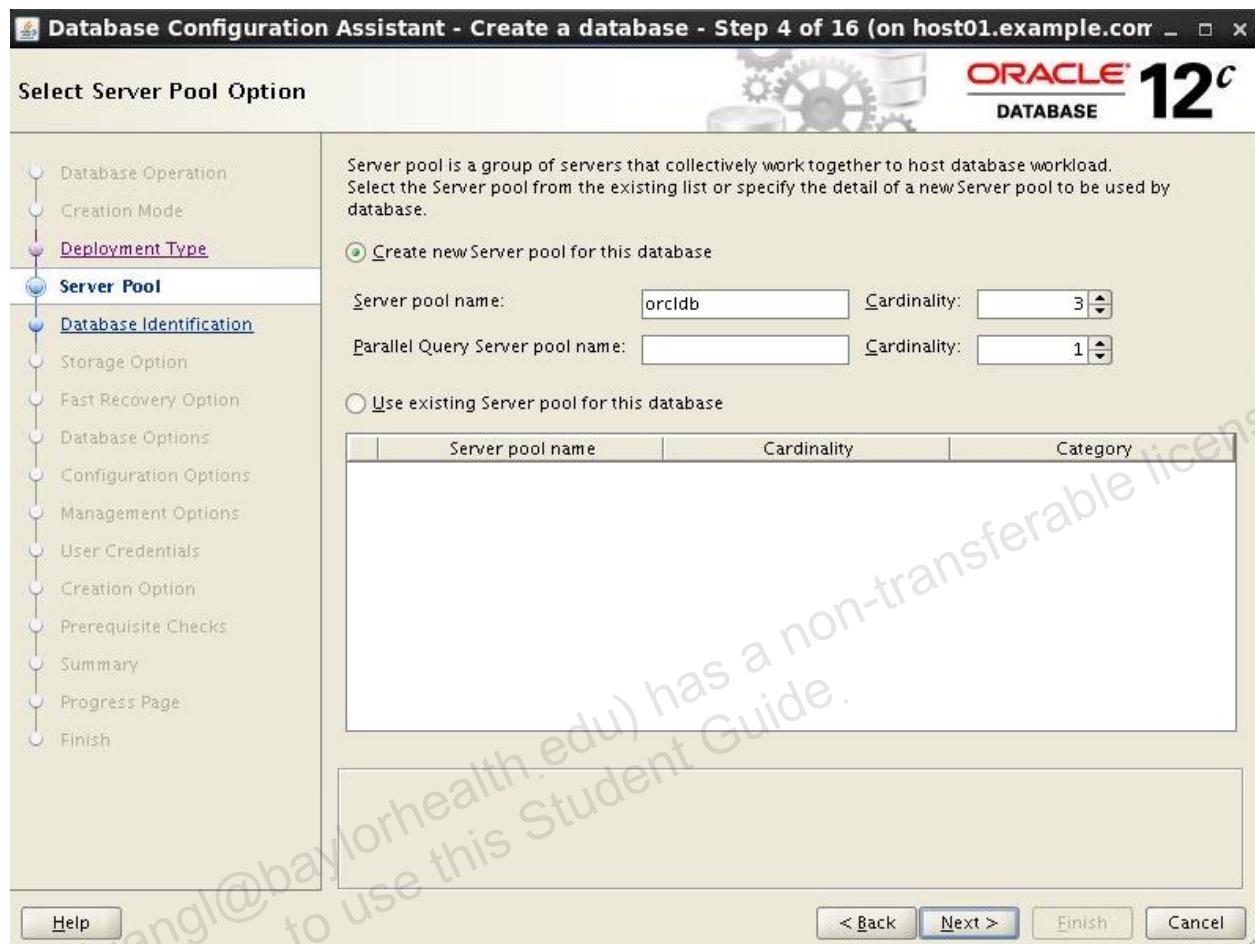
4. On The “Select Database Creation Mode” page, select “Advanced configuration” and click Next.



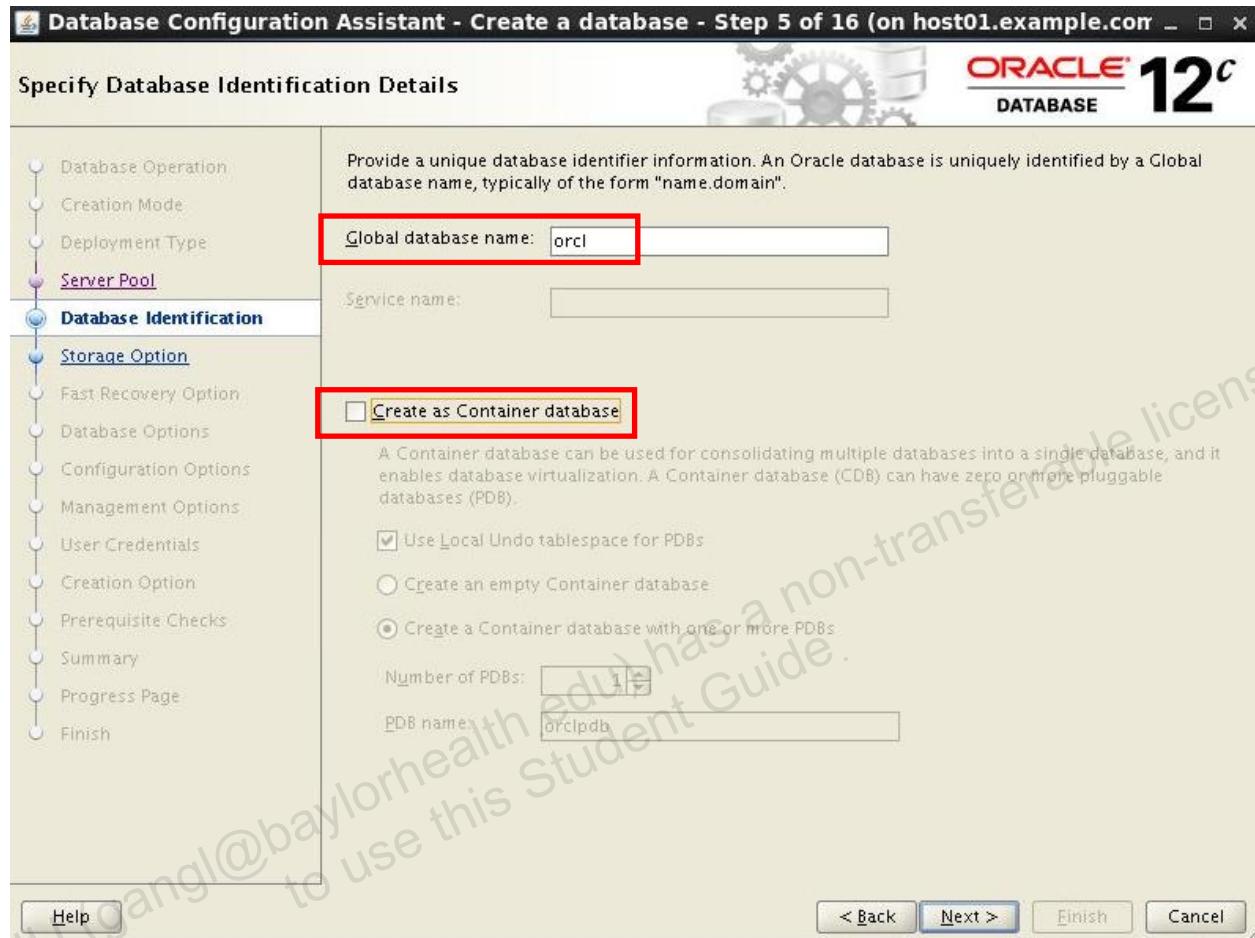
5. On the “Select Database Deployment Type” page, select “Oracle Real Application Cluster (RAC) database” from the Database type pull-down list and “Policy Managed” from the Configuration type pull-down list. Select the “General Purpose or Transaction Processing” template and click Next.



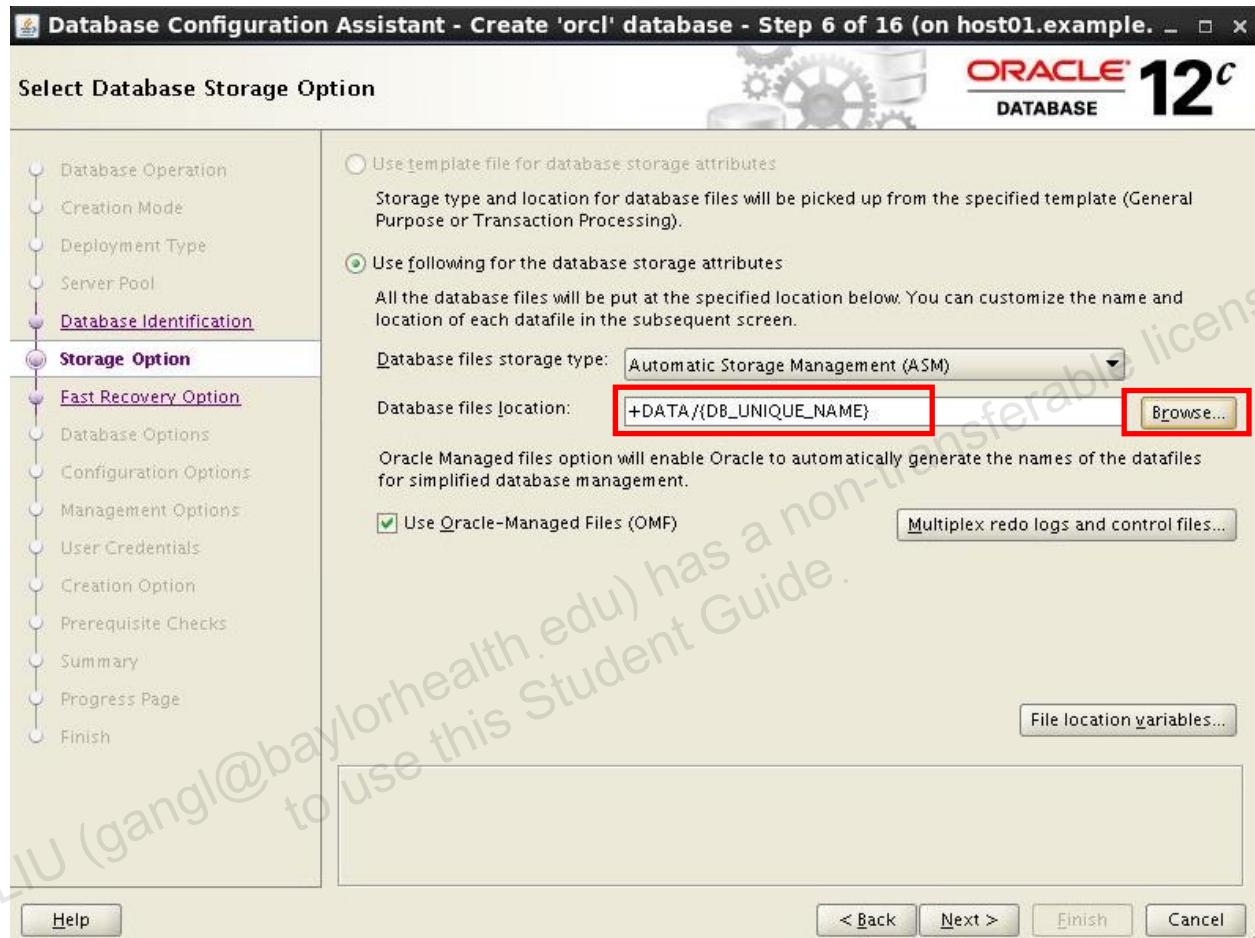
6. On the Select Server Pool Option page, specify `orcldb` for the Server pool Name and set its cardinality to **3**. Click Next to proceed.



7. Ensure the Global database name is `orcl`. Do **NOT** accept the default Global database name. Make sure the Create as Container database check box is **NOT** checked. Click Next to continue.



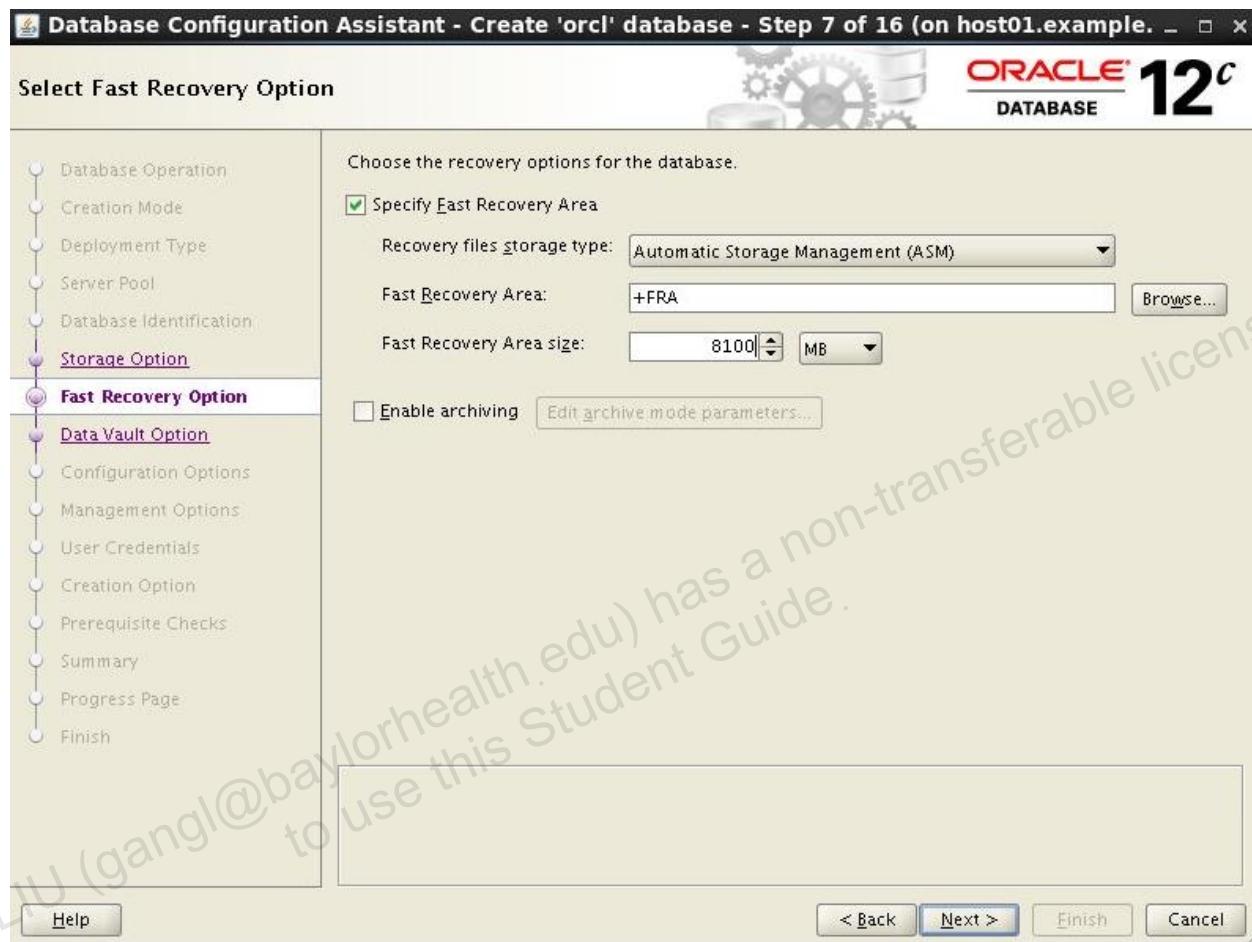
8. On the Select Database Storage Option page, click the “Use following for the database storage attributes” button. Make sure “Automatic Storage Management (ASM)” is selected from the Database files storage type pull down list and the Database files location is **+DATA/{DB_UNIQUE_NAME}**. Make sure the “Use Oracle-Managed Files (OMF)” check box is selected and click Next.



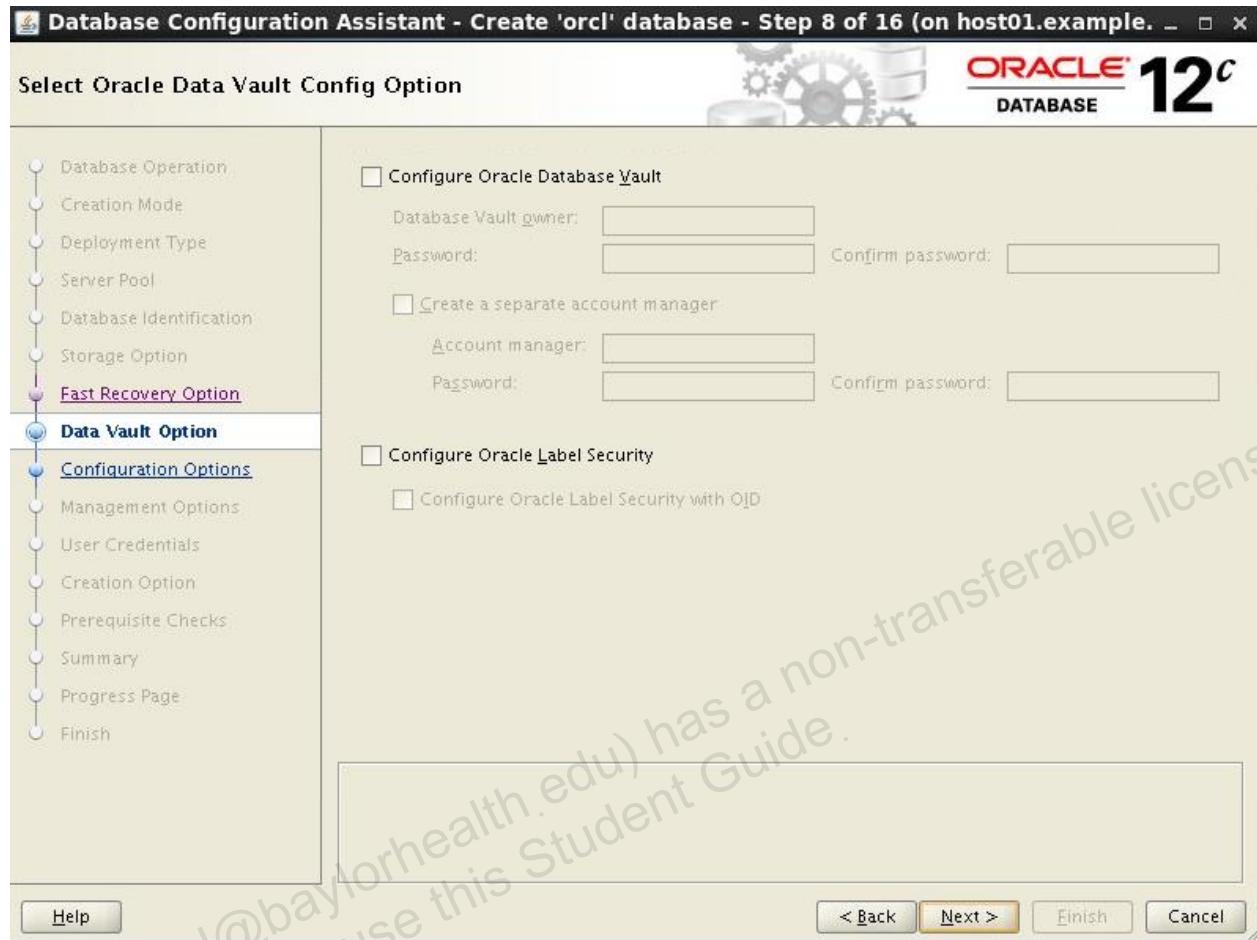
9. On the Select Fast Recovery Option, make the following adjustments:

- Fast Recovery Area: +FRA
- Fast Recovery Area Size: 8100

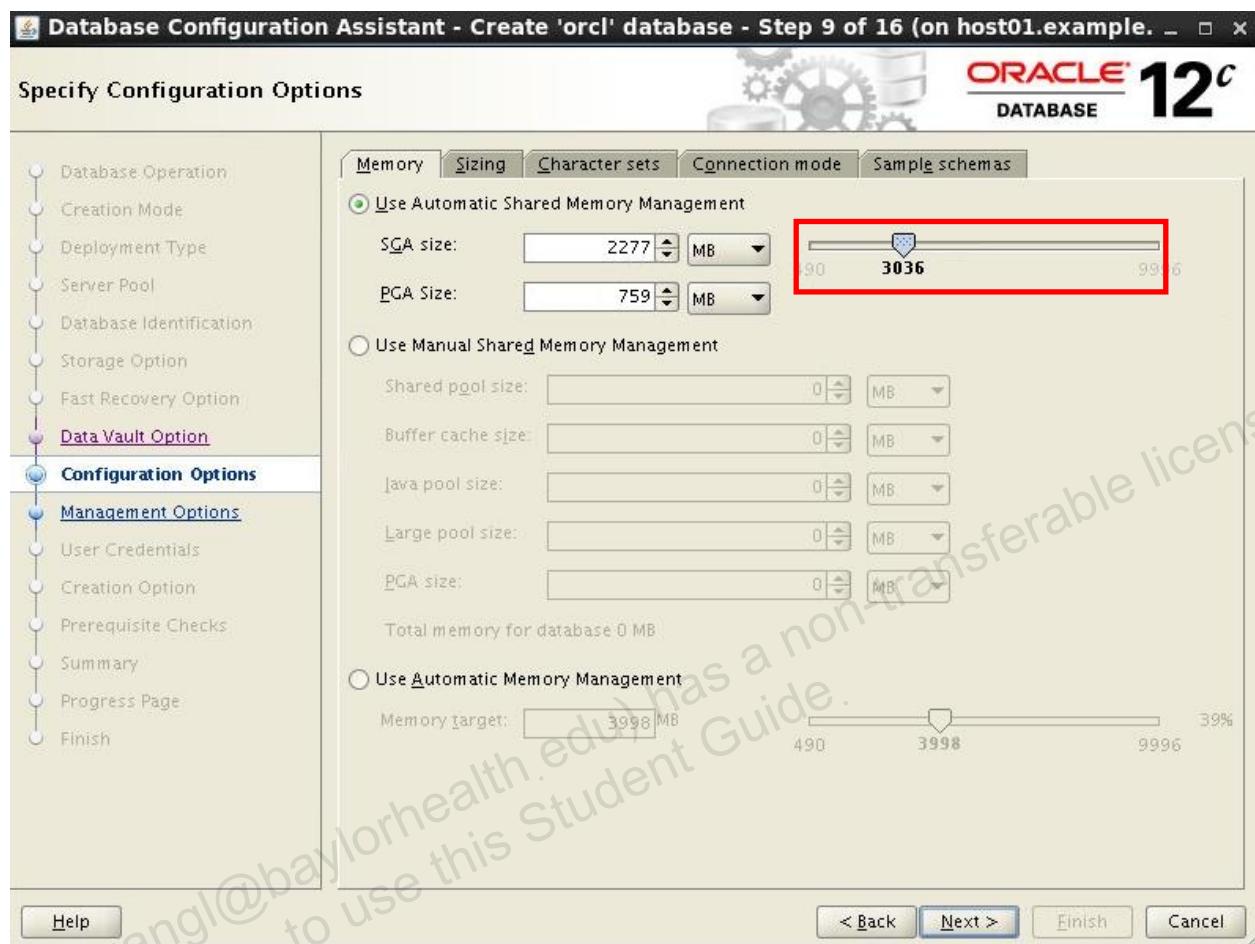
Click Next to continue.



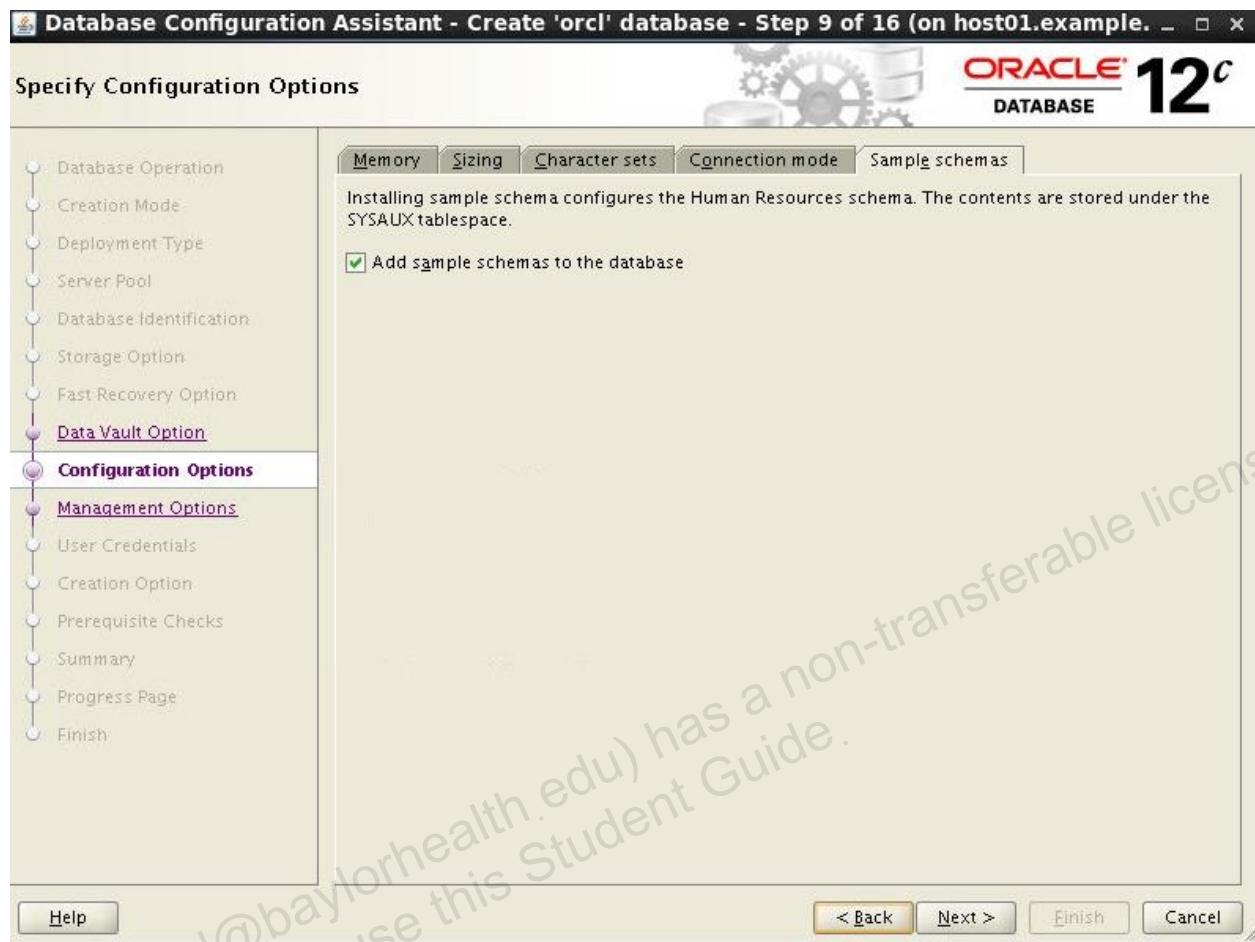
10. On the Select Oracle Data Vault Config Option page, click Next.



11. On the Specify Configuration Options page, set Memory Size (SGA and PGA) to around 3000. Click the Sample Schemas folder tab.



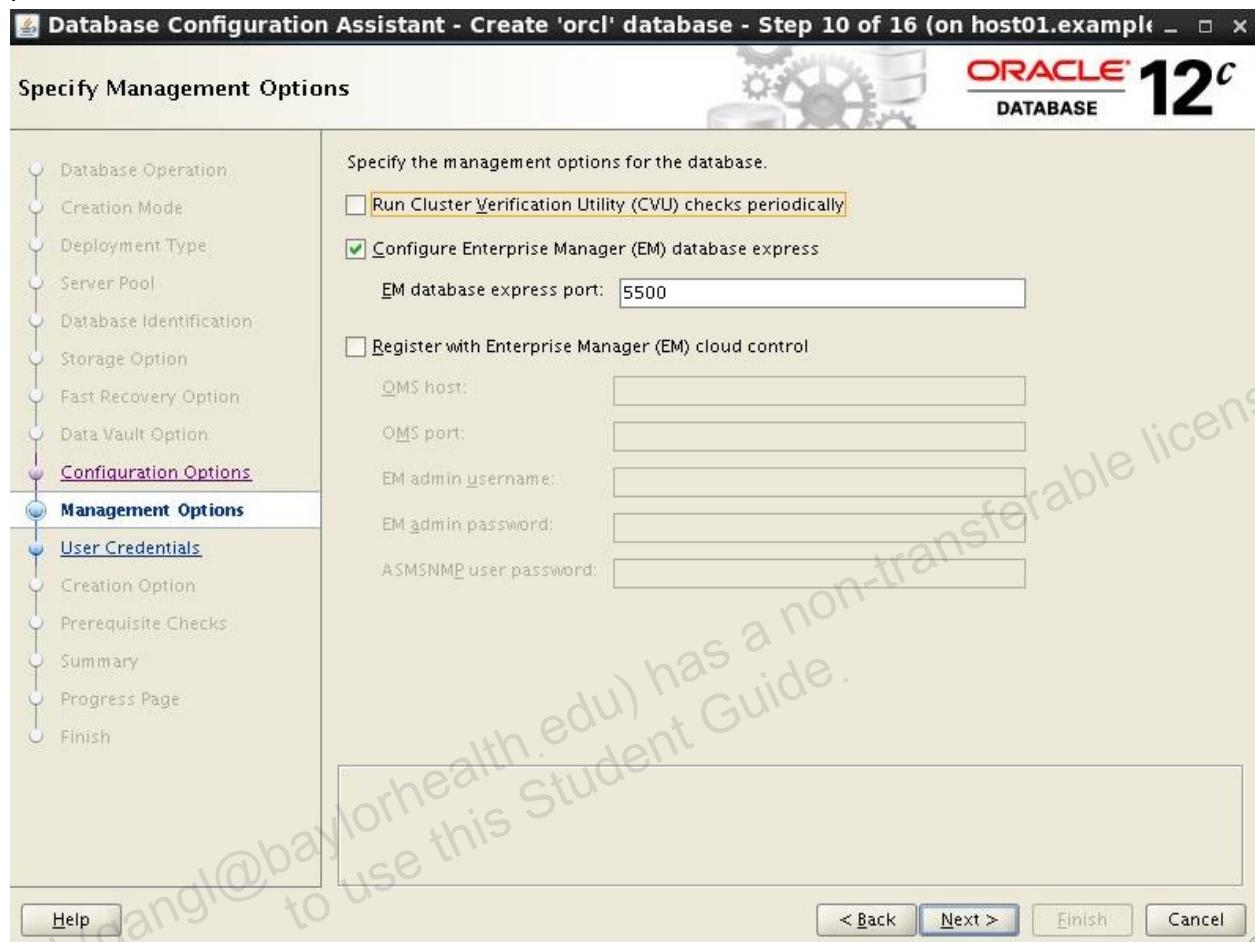
12. Click the “Add sample schemas to the database” check box and click Next.



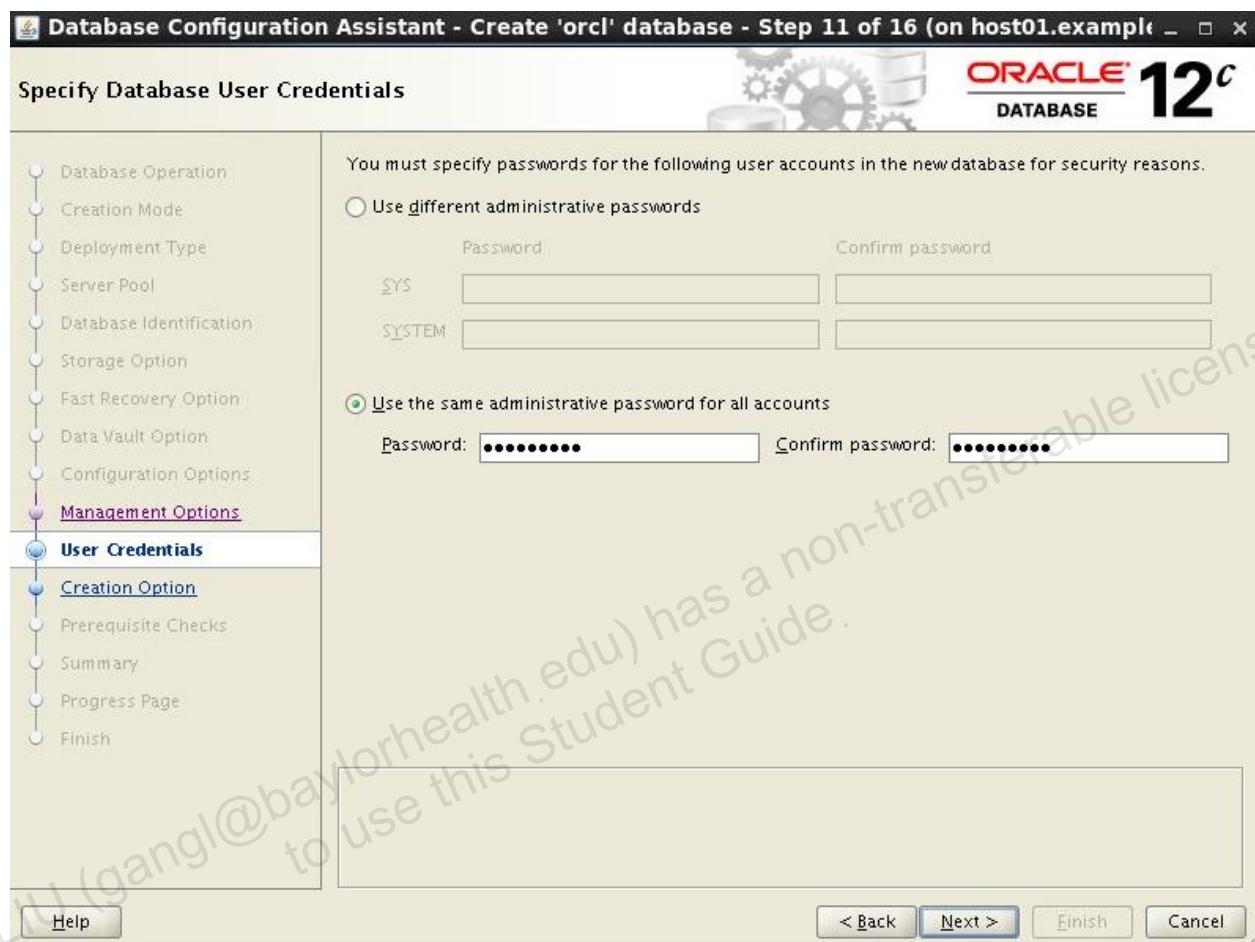
13. Click Yes to dismiss the dialog box.



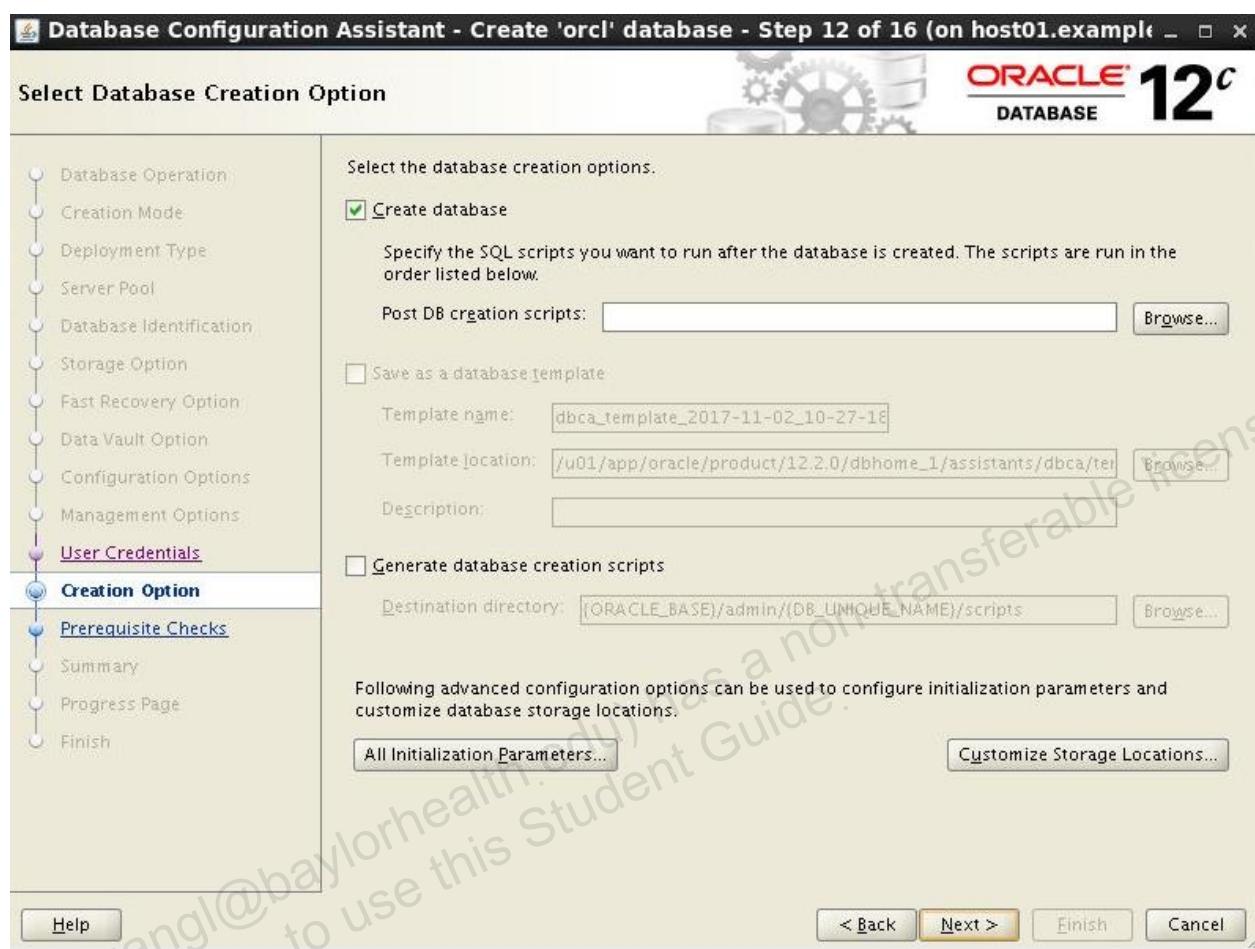
14. On the Management Options screen, uncheck Run Cluster Verification Utility (CVU) Checks Periodically. Ensure Configure EM Database Express is **checked** and accept the default port value of 5500. Click next to continue.



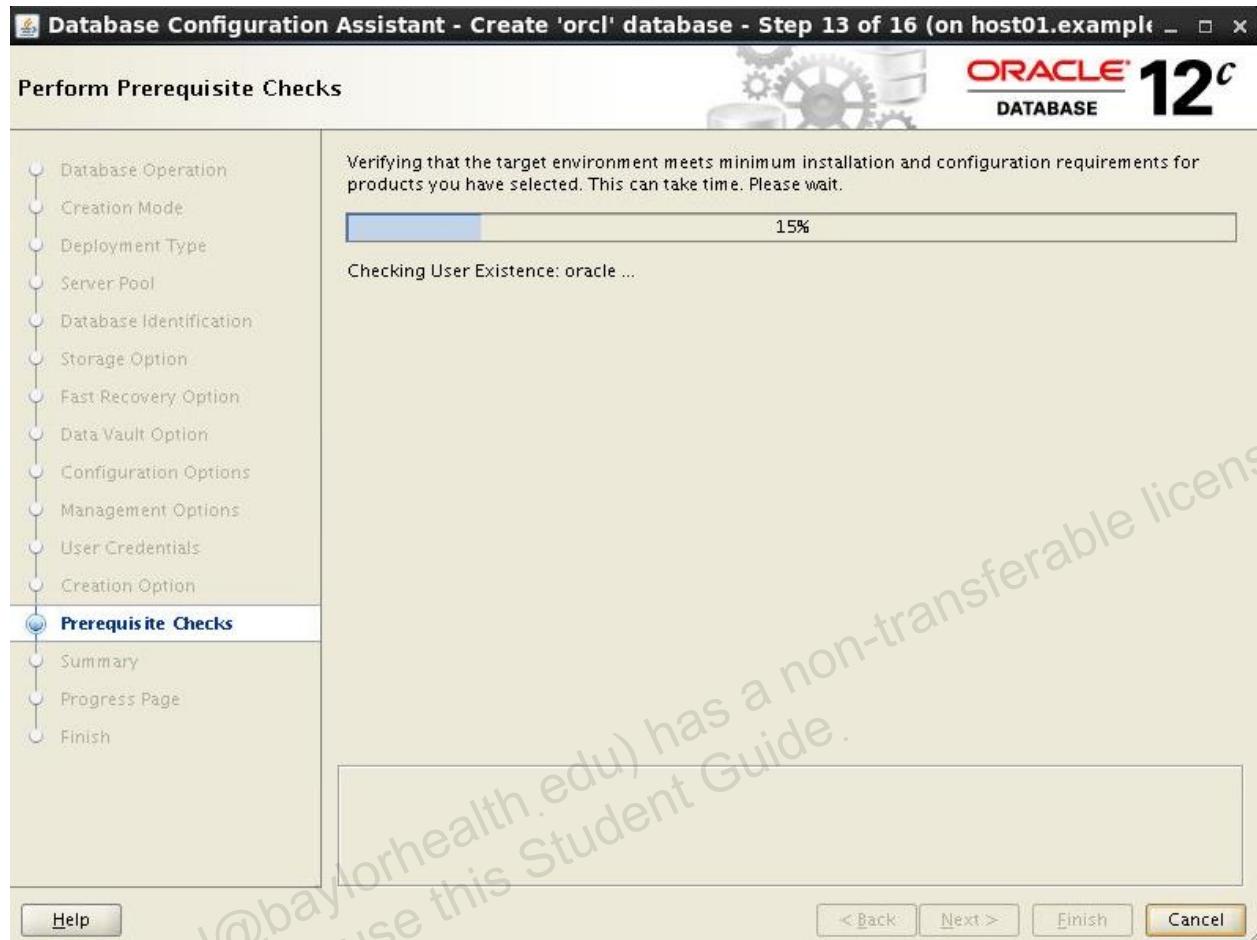
15. On the Specify database User Credentials page, click the “Use the same administrative password for all accounts” button. Enter the `sys` password (*please refer to the Course Practice Environment: Security Credentials page for account passwords*) in both the Password and Confirm Password fields and click Next.



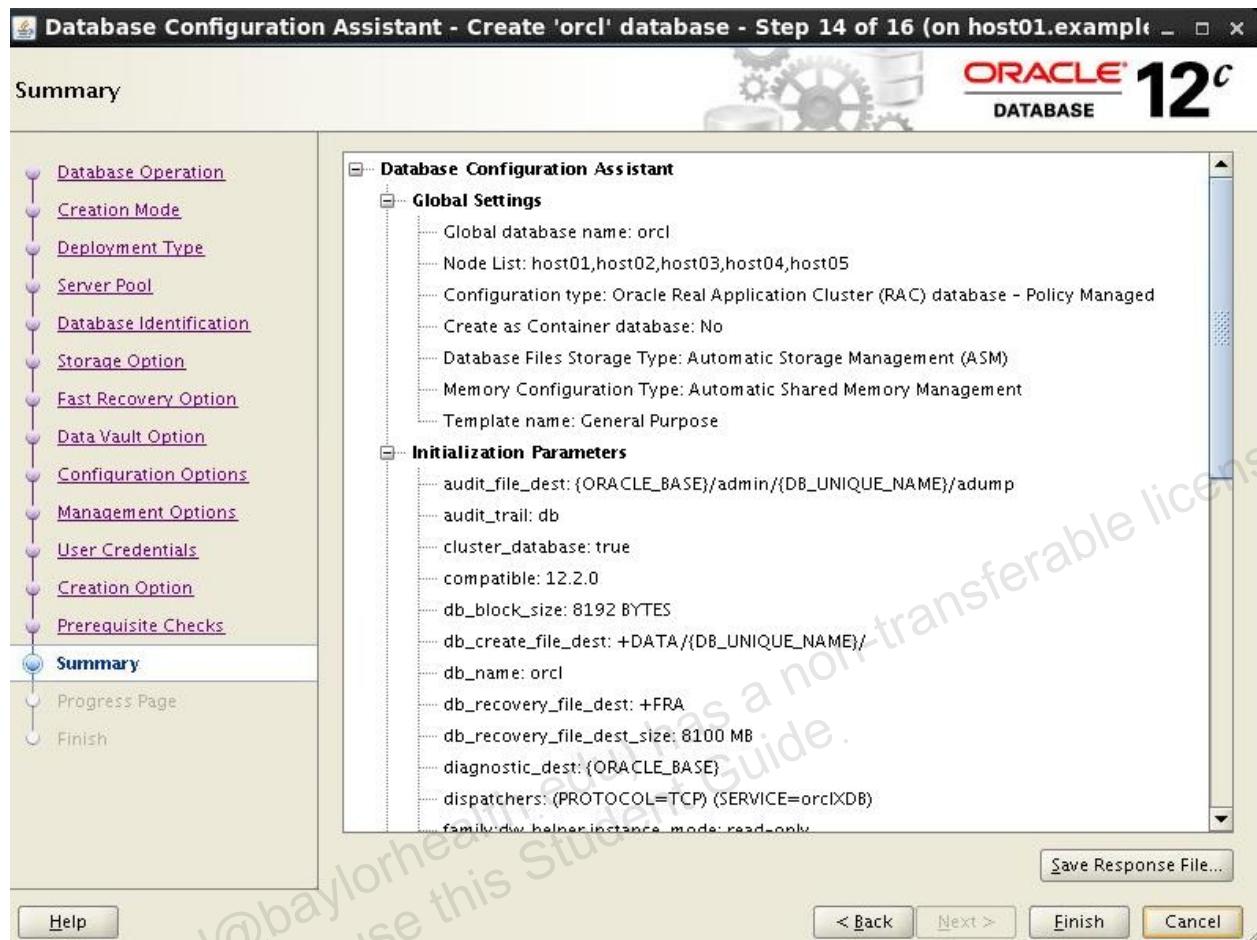
16. On the Select Database Creation Options page, make sure the “Create database” check box is selected and click Next.



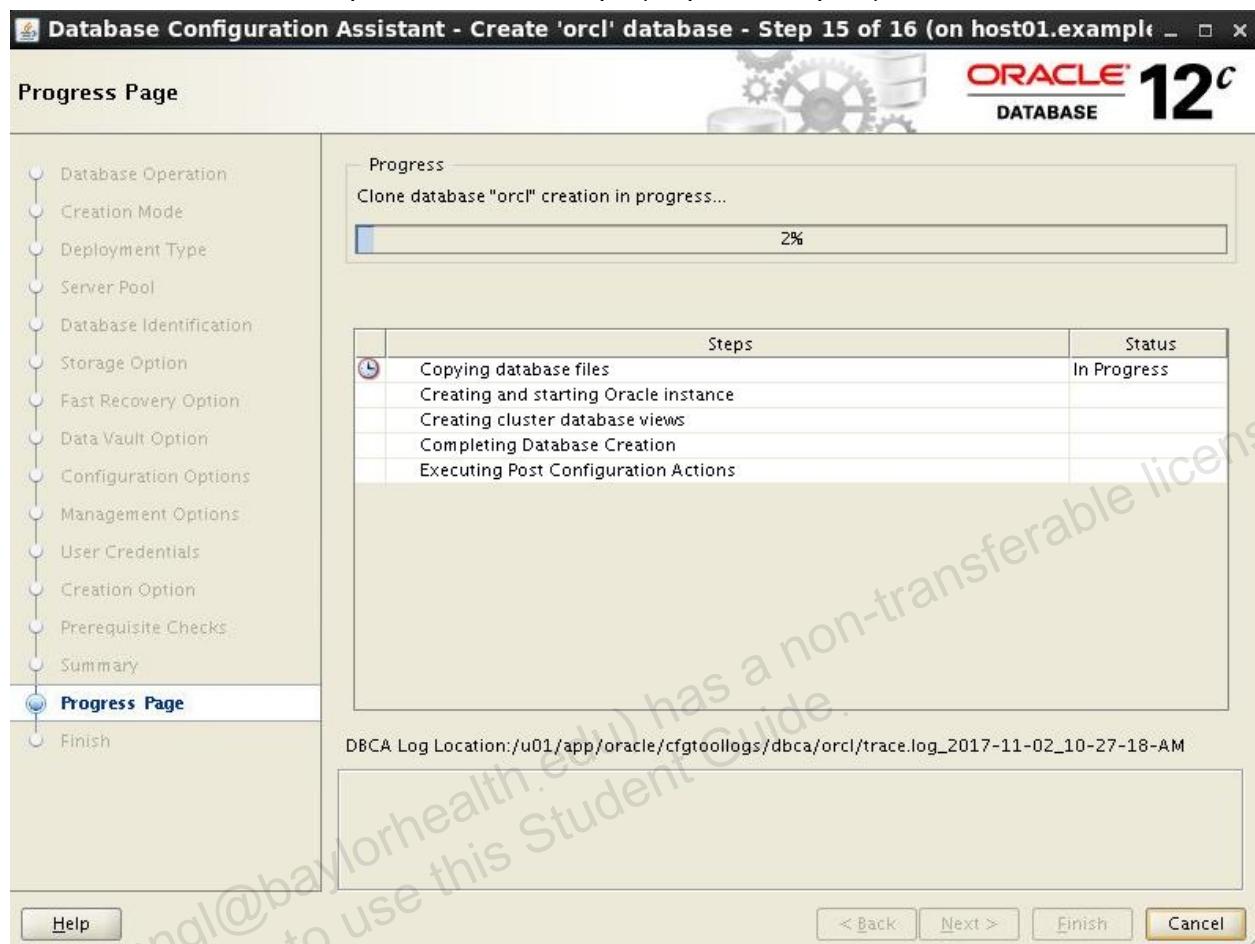
17. Wait while a series of prerequisite checks are performed.



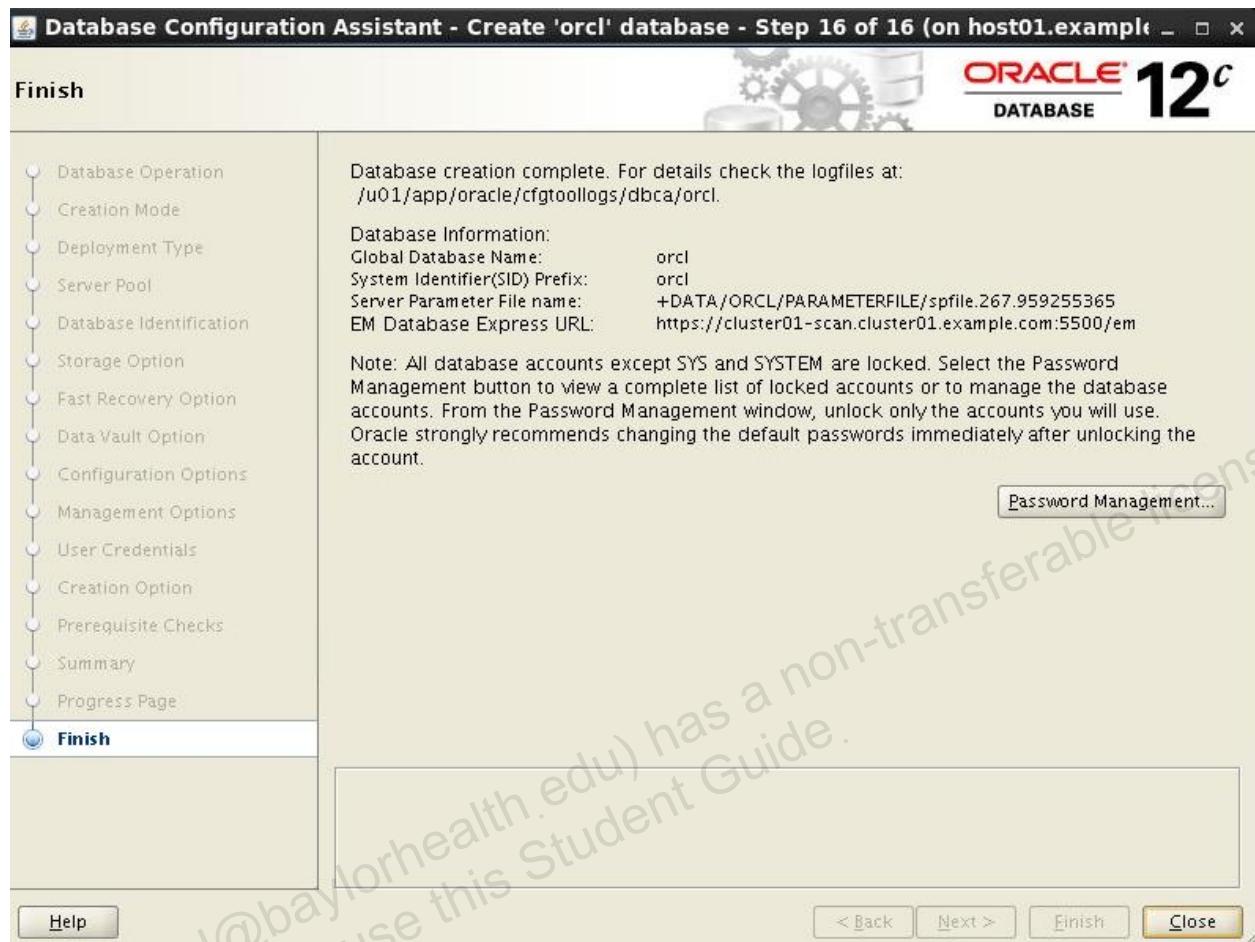
18. On the Summary page, review the information and click Finish.



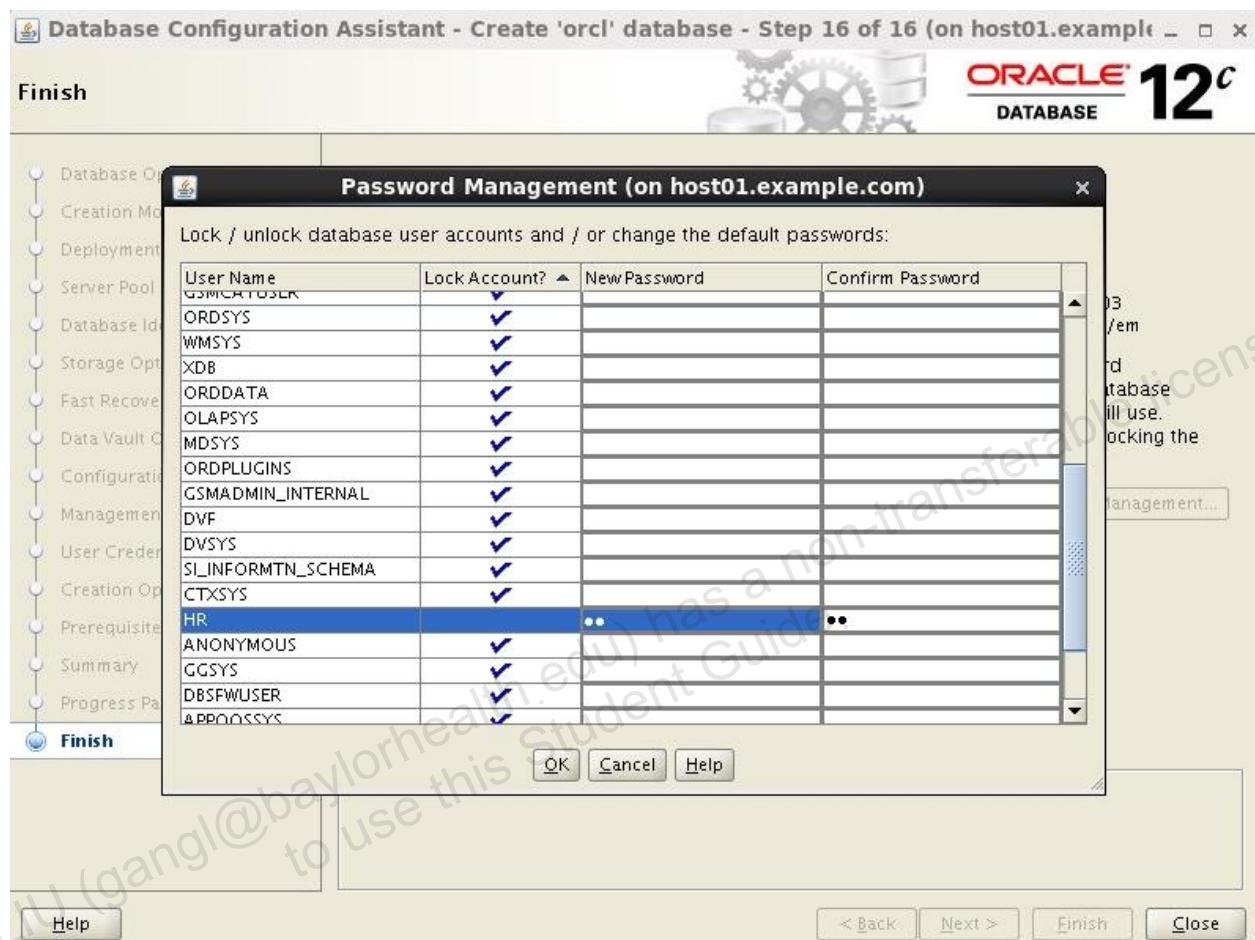
19. Wait a few moments and follow the database creation process on the Progress Page. *It takes about 20min to complete the rest of steps (step 19 ~ step 25).*



20. On the Finish page, click the “Password Management” button.



21. Select the HR account and enter the HR password (*please refer to the Course Practice Environment: Security Credentials page for account passwords*) in the New Password and Confirm Password fields, click the Lock Account field to unlock the account and click OK.



22. Click Yes to dismiss the dialog box.



23. Click Close to dismiss DBCA.



24. Return to the oracle terminal and check the database status and configuration details with SRVCTL.

```
[oracle@host01 ~]$ srvctl status database -db orcl
Instance orcl_1 is running on node host02
Instance orcl_2 is running on node host03
Instance orcl_3 is running on node host01

[oracle@host01 ~]$ srvctl config database -db orcl
Database unique name: orcl
Database name: orcl
Oracle home: /u01/app/oracle/product/12.2.0/dbhome_1
Oracle user: oracle
Spfile: +DATA/ORCL/PARAMETERFILE/spfile.297.958993403
Password file: +DATA/ORCL/PASSWORD/pwdorcl.284.958993065
Domain:
Start options: open
Stop options: immediate
```

```
Database role: PRIMARY
Management policy: AUTOMATIC
Server pools: orcldb
Disk Groups: FRA,DATA
Mount point paths:
Services:
Type: RAC
Start concurrency:
Stop concurrency:
OSDBA group: dba
OSOPER group: oper
Database instances:
Configured nodes:
CSS critical: no
CPU count: 0
Memory target: 0
Maximum memory: 0
Default network number for database services:
Database is policy managed

[oracle@host01 ~]$
```

25. Close all terminals opened for this practice.

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Practices for Lesson 7: Traditional Clusterware Management

Practice 7-1: Verifying, Starting, and Stopping Oracle Clusterware

Overview

In this practice, you check the status of Oracle Clusterware using both the operating system commands and the `crsctl` utility. You will also start and stop Oracle Clusterware.

1. Connect to the first node of your cluster as the `grid` user. You can use the `oraenv` script to configure your environment.

```
[oracle@dns ~] ssh grid@host01
Password: *****

[grid@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01~] $
```

2. Using operating system commands, verify that the Oracle Clusterware daemon processes are running on the current node. (Hint: Most of the Oracle Clusterware daemon processes have names that end with `.bin`.)

```
[grid@host01~]$ pgrep -l d.bin
4898 ohasd.bin
5061 mdnsd.bin
5068 evmd.bin
5115 gpnpd.bin
5163 gipcd.bin
5227 ocssd.bin
5832 octssd.bin
6318 osysmond.bin
6420 crsd.bin
8641 gnsd.bin

[grid@host01 ~] $
```

3. Using the `crsctl` utility, verify that Oracle Clusterware is running on the current node.

```
[grid@host01 ~]$ crsctl check crs
CRS-4638: Oracle High Availability Services is online
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online

[grid@host01 ~] $
```

4. Verify the status of all cluster resources that are being managed by Oracle Clusterware for all nodes.

[grid@host01 ~]\$ crsctl stat res -t				
Name	Target	State	Server	State details
<hr/>				
Local Resources				
<hr/>				
ora.ASMNET1LSNR_ASM.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.DATA.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.FRA.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER_LEAF.lsnr				
	OFFLINE	OFFLINE	host04	STABLE
	OFFLINE	OFFLINE	host05	STABLE
ora.MGMT.dg				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.chad				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host04	STABLE
	ONLINE	ONLINE	host05	STABLE
ora.net1.network				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.ons				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE

	ONLINE	ONLINE	host03	STABLE
ora.proxy_advm				
	OFFLINE	OFFLINE	host01	STABLE
	OFFLINE	OFFLINE	host02	STABLE
	OFFLINE	OFFLINE	host03	STABLE
<hr/>				
Cluster Resources				
<hr/>				
ora.LISTENER_SCAN1.lsnr				
	1	ONLINE	ONLINE	host02
ora.LISTENER_SCAN2.lsnr				
	1	ONLINE	ONLINE	host03
ora.LISTENER_SCAN3.lsnr				
	1	ONLINE	ONLINE	host01
ora.MGMTLSNR				
	1	ONLINE	ONLINE	host01
				169.254.191.252
				192.168.1.101, STABLE
ora.asm				
	1	ONLINE	ONLINE	host01
	2	ONLINE	ONLINE	host02
	3	ONLINE	ONLINE	host03
ora.csv				
	1	ONLINE	ONLINE	host01
ora.gns				
	1	ONLINE	ONLINE	host01
ora.gns.vip				
	1	ONLINE	ONLINE	host01
ora.host01.vip				
	1	ONLINE	ONLINE	host01
ora.host02.vip				
	1	ONLINE	ONLINE	host02
ora.host03.vip				
	1	ONLINE	ONLINE	host03
ora.mgmtdb				
	1	ONLINE	ONLINE	host01
ora.orcl.db				
	1	ONLINE	ONLINE	host02
				Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE
	2	ONLINE	ONLINE	host03
				Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE
	3	ONLINE	ONLINE	host01
				Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE

```

ora.qosmserver
  1      ONLINE  ONLINE    host01      STABLE
ora.scan1.vip
  1      ONLINE  ONLINE    host02      STABLE
ora.scan2.vip
  1      ONLINE  ONLINE    host03      STABLE
ora.scan3.vip
  1      ONLINE  ONLINE    host01      STABLE

[grid@host01 ~]$

```

5. Attempt to stop Oracle Clusterware on the current node while logged in as the `grid` user. What happens and why?

```

[grid@host01 ~]$ crsctl stop crs
CRS-4563: Insufficient user privileges.

CRS-4000: Command Stop failed, or completed with errors.

[grid@host01 ~]$

```

6. Switch to the `root` account, set the environment with `oraenv` and stop Oracle Clusterware only on the current node.

```

[grid@host01 ~]$ su -
Password:

[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# crsctl stop crs
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host01'
CRS-2673: Attempting to stop 'ora.crsd' on 'host01'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host01'
CRS-2673: Attempting to stop 'ora.chad' on 'host01'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host01'
CRS-2673: Attempting to stop 'ora.gns' on 'host01'
CRS-2673: Attempting to stop 'ora.qosmserver' on 'host01'
CRS-2677: Stop of 'ora.gns' on 'host01' succeeded
CRS-2677: Stop of 'ora.orcl.db' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host01'

```

```
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN3.lsnr' on 'host01'
CRS-2673: Attempting to stop 'ora.cvu' on 'host01'
CRS-2673: Attempting to stop 'ora.gns.vip' on 'host01'
CRS-2677: Stop of 'ora.DATA.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.FRA.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.LISTENER_SCAN3.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.scan3.vip' on 'host01'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01'
CRS-2677: Stop of 'ora.cvu' on 'host01' succeeded
CRS-2677: Stop of 'ora.qosmserver' on 'host01' succeeded
CRS-2677: Stop of 'ora.gns.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.scan3.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01' succeeded
CRS-2677: Stop of 'ora.chad' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.chad' on 'host02'
CRS-2673: Attempting to stop 'ora.chad' on 'host03'
CRS-2673: Attempting to stop 'ora.chad' on 'host04'
CRS-2673: Attempting to stop 'ora.chad' on 'host05'
CRS-2677: Stop of 'ora.chad' on 'host02' succeeded
CRS-2677: Stop of 'ora.chad' on 'host03' succeeded
CRS-2677: Stop of 'ora.chad' on 'host05' succeeded
CRS-2677: Stop of 'ora.chad' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.mgmtdb' on 'host01'
CRS-2677: Stop of 'ora.mgmtdb' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.MGMTLSNR' on 'host01'
CRS-2677: Stop of 'ora.MGMTLSNR' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.host01.vip' on 'host01'
CRS-2677: Stop of 'ora.host01.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.MGMTLSNR' on 'host02'
CRS-2672: Attempting to start 'ora.gns.vip' on 'host03'
CRS-2672: Attempting to start 'ora.qosmserver' on 'host02'
CRS-2672: Attempting to start 'ora.cvu' on 'host03'
CRS-2676: Start of 'ora.cvu' on 'host03' succeeded
CRS-2676: Start of 'ora.gns.vip' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.gns' on 'host03'
```

```
CRS-2676: Start of 'ora.MGMTLSNR' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.mgmtdb' on 'host02'
CRS-2676: Start of 'ora.gns' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.scan3.vip' on 'host02'
CRS-2672: Attempting to start 'ora.host01.vip' on 'host03'
CRS-2676: Start of 'ora.host01.vip' on 'host03' succeeded
CRS-2676: Start of 'ora.scan3.vip' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN3.lsnr' on 'host02'
CRS-2676: Start of 'ora.qosmserver' on 'host02' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN3.lsnr' on 'host02' succeeded
CRS-2676: Start of 'ora.mgmtdb' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.chad' on 'host02'
CRS-2672: Attempting to start 'ora.chad' on 'host03'
CRS-2672: Attempting to start 'ora.chad' on 'host04'
CRS-2672: Attempting to start 'ora.chad' on 'host05'
CRS-2676: Start of 'ora.chad' on 'host03' succeeded
CRS-2676: Start of 'ora.chad' on 'host05' succeeded
CRS-2676: Start of 'ora.chad' on 'host04' succeeded
CRS-2676: Start of 'ora.chad' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host01'
CRS-2677: Stop of 'ora.ons' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host01'
CRS-2677: Stop of 'ora.net1.network' on 'host01' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host01' has completed
CRS-2677: Stop of 'ora.crsd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2673: Attempting to stop 'ora.crf' on 'host01'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host01'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host01'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host01'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host01' succeeded
CRS-2677: Stop of 'ora.crf' on 'host01' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host01' succeeded
CRS-2677: Stop of 'ora.mdnsd' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host01'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host01'
CRS-2673: Attempting to stop 'ora.evmd' on 'host01'
CRS-2677: Stop of 'ora.ctssd' on 'host01' succeeded
```

```

CRS-2677: Stop of 'ora.evmd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host01'
CRS-2677: Stop of 'ora.gipcd' on 'host01' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host01' has completed
CRS-4133: Oracle High Availability Services has been stopped.

[root@host01 ~]#

```

7. Attempt to check the status of Oracle Clusterware now that it has been successfully stopped.

```

[root@host01 ~]# crsctl check cluster
CRS-4639: Could not contact Oracle High Availability Services
CRS-4000: Command Check failed, or completed with errors.

[root@host01 ~]#

```

8. Connect to the second node of your cluster and verify that Oracle Clusterware is still running on that node. Set your environment for the second node by using the oraenv utility. **Note:** Your ASM instance name on host02 may be different because the ASM instances in the clustered environment are running in the Flex ASM configuration.

```

[root@host01 ~]# ssh host02
[root@host02 ~]# ps -ef|grep smon_+ASM
grid      14937      1  0 Nov01 ?          00:00:11 asm_smon_+ASM2
root      20135  18609  0 12:19 pts/0      00:00:00 grep smon_+ASM
[root@host02 ~]# . oraenv
ORACLE_SID = [root] ? +ASM2
The Oracle base has been set to /u01/app/grid

[root@host02 ~]# crsctl check crs
CRS-4638: Oracle High Availability Services is online
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online

[root@host02 ~]#

```

9. Verify that all cluster resources are running on the remaining nodes, stopped on the first node, and that the VIP resources from the first node have migrated or failed over to other nodes. When you are finished, exit from host02.

[root@host02 ~]# crsctl stat res -t				
Name	Target	State	Server	State details
Local Resources				
ora.ASMNET1LSNR_ASM.lsnr				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.DATA.dg				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.FRA.dg				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER.lsnr				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.LISTENER_LEAF.lsnr				
	OFFLINE	OFFLINE	host04	STABLE
	OFFLINE	OFFLINE	host05	STABLE
ora.MGMT.dg				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.chad				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host04	STABLE
	ONLINE	ONLINE	host05	STABLE
ora.net1.network				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.ons				
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.proxy_advm				
	OFFLINE	OFFLINE	host02	STABLE
	OFFLINE	OFFLINE	host03	STABLE
Cluster Resources				
ora.LISTENER_SCAN1.lsnr				

1	ONLINE	ONLINE	host02	STABLE
ora.LISTENER_SCAN2.lsnr				
1	ONLINE	ONLINE	host03	STABLE
ora.LISTENER_SCAN3.lsnr				
1	ONLINE	ONLINE	host02	STABLE
ora.MGMTLSNR				
1	ONLINE	ONLINE	host02	169.254.126.78 192.168.1.102, STABLE
ora.asm				
1	ONLINE	OFFLINE		STABLE
2	ONLINE	ONLINE	host02	Started, STABLE
3	ONLINE	ONLINE	host03	Started, STABLE
ora.cvu				
1	ONLINE	ONLINE	host03	STABLE
ora.gns				
1	ONLINE	ONLINE	host03	STABLE
ora.gns.vip				
1	ONLINE	ONLINE	host03	STABLE
ora.host01.vip				
1	ONLINE	INTERMEDIATE	host03	FAILED OVER, STABLE
ora.host02.vip				
1	ONLINE	ONLINE	host02	STABLE
ora.host03.vip				
1	ONLINE	ONLINE	host03	STABLE
ora.mgmtdb				
1	ONLINE	ONLINE	host02	Open, STABLE
ora.orcl.db				
1	ONLINE	ONLINE	host02	Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE
2	ONLINE	ONLINE	host03	Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE
3	ONLINE	OFFLINE		STABLE
ora.qosmserver				
1	ONLINE	ONLINE	host02	STABLE
ora.scan1.vip				
1	ONLINE	ONLINE	host02	STABLE
ora.scan2.vip				
1	ONLINE	ONLINE	host03	STABLE
ora.scan3.vip				
1	ONLINE	ONLINE	host02	STABLE

```
[root@host02 ~]# exit
logout
Connection to host02 closed.
```

```
[root@host01 ~]#
```

10. Restart Oracle Clusterware on host01 as the root user. Exit from the root account back to grid and verify the results of the crsctl start crs command you just executed. *It takes about 2 min for the entire stack to be up.*

```
[root@host01 ~]# crsctl start crs -wait
CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.evmd' on 'host01'
CRS-2672: Attempting to start 'ora.mdnsd' on 'host01'
CRS-2676: Start of 'ora.evmd' on 'host01' succeeded
CRS-2676: Start of 'ora.mdnsd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.gnpd' on 'host01'
CRS-2676: Start of 'ora.gnpd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'host01'
CRS-2676: Start of 'ora.gipcd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host01'
CRS-2676: Start of 'ora.cssdmonitor' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host01'
CRS-2672: Attempting to start 'ora.diskmon' on 'host01'
CRS-2676: Start of 'ora.diskmon' on 'host01' succeeded
CRS-2676: Start of 'ora.cssd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'host01'
CRS-2672: Attempting to start 'ora.ctssd' on 'host01'
CRS-2676: Start of 'ora.ctssd' on 'host01' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host01'
CRS-2676: Start of 'ora.asm' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host01'
CRS-2676: Start of 'ora.storage' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host01'
CRS-2676: Start of 'ora.crf' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host01'
CRS-2676: Start of 'ora.crsd' on 'host01' succeeded
CRS-6023: Starting Oracle Cluster Ready Services-managed resources
CRS-6017: Processing resource auto-start for servers: host01
CRS-2673: Attempting to stop 'ora.host01.vip' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN1.lsnr' on 'host02'
CRS-2672: Attempting to start 'ora.ons' on 'host01'
CRS-2672: Attempting to start 'ora.chad' on 'host01'
```

```

CRS-2677: Stop of 'ora.LISTENER_SCAN1.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.scan1.vip' on 'host02'
CRS-2677: Stop of 'ora.host01.vip' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.host01.vip' on 'host01'
CRS-2676: Start of 'ora.chad' on 'host01' succeeded
CRS-2677: Stop of 'ora.scan1.vip' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.scan1.vip' on 'host01'
CRS-2676: Start of 'ora.host01.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.LISTENER.lsnr' on 'host01'
CRS-2676: Start of 'ora.ons' on 'host01' succeeded
CRS-2676: Start of 'ora.scan1.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN1.lsnr' on 'host01'
CRS-2676: Start of 'ora.LISTENER.lsnr' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host01'
CRS-2676: Start of 'ora.LISTENER_SCAN1.lsnr' on 'host01' succeeded
CRS-2676: Start of 'ora.asm' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.DATA.dg' on 'host01'
CRS-2676: Start of 'ora.DATA.dg' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.FRA.dg' on 'host01'
CRS-2676: Start of 'ora.FRA.dg' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.orcl.db' on 'host01'
CRS-2676: Start of 'ora.orcl.db' on 'host01' succeeded
CRS-6016: Resource auto-start has completed for server host01
CRS-6024: Completed start of Oracle Cluster Ready Services-managed
resources
CRS-4123: Oracle High Availability Services has been started.

```

```

[root@host01 ~]# exit
logout
Connection to host01 closed.

```

```
[grid@host01 ~]$ crsctl stat res -t
```

Name	Target	State	Server	State details
<hr/>				
Local Resources				
ora.ASMNET1LSNR_ASM.lsnr				
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.DATA.dg				
	ONLINE	ONLINE	host01	STABLE

	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.FRA.dg	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host01	STABLE
ora.LISTENER.lsnr	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	OFFLINE	OFFLINE	host04	STABLE
ora.LISTENER_LEAF.lsnr	OFFLINE	OFFLINE	host05	STABLE
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.MGMT.dg	ONLINE	ONLINE	host04	STABLE
	ONLINE	ONLINE	host05	STABLE
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.chad	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host04	STABLE
	ONLINE	ONLINE	host05	STABLE
	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
ora.net1.network	ONLINE	ONLINE	host03	STABLE
	ONLINE	ONLINE	host04	STABLE
	ONLINE	ONLINE	host05	STABLE
ora.ons	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
ora.proxy_advm	ONLINE	ONLINE	host01	STABLE
	ONLINE	ONLINE	host02	STABLE
	ONLINE	ONLINE	host03	STABLE
	OFFLINE	OFFLINE	host01	STABLE
Cluster Resources	OFFLINE	OFFLINE	host02	STABLE
	OFFLINE	OFFLINE	host03	STABLE
	OFFLINE	OFFLINE	host04	STABLE
ora.LISTENER_SCAN1.lsnr	1	ONLINE	ONLINE	host02
	1	ONLINE	ONLINE	host03
ora.LISTENER_SCAN2.lsnr	1	ONLINE	ONLINE	host01
	1	ONLINE	ONLINE	host02
ora.LISTENER_SCAN3.lsnr	1	ONLINE	ONLINE	host03
	1	ONLINE	ONLINE	host04
ora.MGMLSNR	1	ONLINE	ONLINE	host01
	1	ONLINE	ONLINE	169.254.191.252

				192.168.1.101, STABLE	
ora.asm					
1	ONLINE	ONLINE	host01	Started, STABLE	
2	ONLINE	ONLINE	host02	Started, STABLE	
3	ONLINE	ONLINE	host03	Started, STABLE	
ora.cvu					
1	ONLINE	ONLINE	host01	STABLE	
ora.gns					
1	ONLINE	ONLINE	host01	STABLE	
ora.gns.vip					
1	ONLINE	ONLINE	host01	STABLE	
ora.host01.vip					
1	ONLINE	ONLINE	host01	STABLE	
ora.host02.vip					
1	ONLINE	ONLINE	host02	STABLE	
ora.host03.vip					
1	ONLINE	ONLINE	host03	STABLE	
ora.mgmtdb					
1	ONLINE	ONLINE	host02	Open, STABLE	
ora.orcl.db					
1	ONLINE	ONLINE	host02	Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE	
	2	ONLINE	ONLINE	host03	Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE
	3	ONLINE	ONLINE	host01	Open, HOME=/u01/app/oracle/product/12.2.0/dbhome_1, STABLE
ora.qosmserver					
1	ONLINE	ONLINE	host01	STABLE	
ora.scan1.vip					
1	ONLINE	ONLINE	host02	STABLE	
ora.scan2.vip					
1	ONLINE	ONLINE	host03	STABLE	
ora.scan3.vip					
1	ONLINE	ONLINE	host01	STABLE	
[grid@host01 ~]\$					

11. Relocate the Grid Infrastructure management repository back to host01. *It takes about 2 min to relocate the mgmtdb database to host01.*

```
[grid@host01 ~]$ crsctl stat res ora.mgmtdb -t
-----
Name          Target  State       Server      State details
-----
Cluster Resources
-----
ora.mgmtdb
  1           ONLINE  ONLINE    host02      Open, STABLE
-----
```



```
[grid@host01 ~]$ srvctl relocate mgmtdb -n host01
```



```
[grid@host01 ~]$ crsctl stat res ora.mgmtdb -t
-----
Name          Target  State       Server      State details
-----
Cluster Resources
-----
ora.mgmtdb
  1           ONLINE  ONLINE    host01      Open, STABLE
-----
```



```
[grid@host01 ~]$
```

12. Close all terminal windows opened for this practice.

Practice 7-2: Adding and Removing Oracle Clusterware Configuration Files

Overview

In this practice, you determine the current location of your voting disks and Oracle Cluster Registry (OCR) files. You will then add another OCR location and remove it.

- As the `grid` user, use the `crsctl` utility to determine the location of the voting disks that are currently used by your Oracle Clusterware installation.

```
[oracle@dns ~] ssh grid@host01
grid@host01's Password:

[grid@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ crsctl query css votedisk

## STATE      File Universal Id          File Name Disk group
-- -----
1. ONLINE    6f6bd660cbf44fddb3725c430680708 (/dev/c1_DATA1_dsk13) [DATA]
2. ONLINE    86e3cd63608f4f9dbf5a4d553fe08914 (/dev/c1_DATA1_dsk2) [DATA]
3. ONLINE    a6dcacf199ed4f60bf08658066c71a2c (/dev/c1_DATA1_dsk14) [DATA]
Located 3 voting disk(s).

[grid@host01 ~]$
```

- Use the `ocrcheck` utility to determine the location of the Oracle Clusterware Registry (OCR) files.

```
[grid@host01 ~]$ ocrcheck -config
Oracle Cluster Registry configuration is :
Device/File Name : +DATA

[grid@host01 ~]$
```

3. Verify that the FRA ASM disk group is currently online for all nodes using the `crsctl` utility.

```
[grid@host01 ~]$ crsctl stat res ora.FRA.dg -t
-----
Name          Target  State       Server           State details
-----
Local Resources
-----
ora.FRA.dg
      ONLINE  ONLINE    host01        STABLE
      ONLINE  ONLINE    host02        STABLE
      ONLINE  ONLINE    host03        STABLE
-----
[grid@host01 ~]$
```

4. Switch to the `root` account and add a second OCR location that is to be stored in the FRA ASM disk group. Set the environment with `oraenv` and use the `ocrcheck` command to verify the results.

```
[grid@host01 ~]$ su -
Password:

[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# ocrconfig -add +FRA

[root@host01 ~]# ocrcheck -config
Oracle Cluster Registry configuration is :
Device/File Name      :      +DATA
Device/File Name      :      +FRA

[root@host01 ~]#
```

5. Examine the contents of the `ocr.loc` configuration file to see the changes made to the file referencing the new OCR location.

```
[root@host01 ~]# cat /etc/oracle/ocr.loc
#Device/file getting replaced by device
+FRA/cluster01/OCRFILE/registry.255.959349633
ocrconfig_loc=+DATA/cluster01/OCRFILE/registry.255.958919641
ocrmirrorconfig_loc=+FRA/cluster01/OCRFILE/registry.255.959349633
```

```
[root@host01 ~]#
```

6. Open a connection to your second node as the `root` user, set your environment and remove the second OCR file that was added from the first node. Exit the remote connection and verify the results when completed.

```
[root@host01 ~]# ssh host02

[root@host02 ~]# ps -ef|grep smon_+ASM
grid      14937      1  0 Nov01 ?          00:00:11  asm_smon_+ASM2
root     22610 22487  0 14:02 pts/0        00:00:00 grep smon_+ASM

[root@host02 ~]# . oraenv
ORACLE_SID = [root] ? +ASM2
The Oracle base has been set to /u01/app/grid

[root@host02 ~]# ocrconfig -delete +FRA

[root@host02 ~]# exit
logout
Connection to host02 closed.

[root@host01 ~]# ocrcheck -config
Oracle Cluster Registry configuration is :
Device/File Name : +DATA

[root@host01 ~]#
```

7. Close all terminal windows opened for this practice.

Practice 7-3: Performing a Backup of the OCR and OLR

Overview

In this practice, you determine the location of the Oracle Cluster Registry (OCR) and Oracle Local Registry (OLR) and perform backups of the OCR and OLR files.

- As the `root` user, use the `ocrconfig` utility to list the automatic backups of the Oracle Cluster Registry (OCR) and the node or nodes on which they have been performed.
Note: You will see backups listed only if it has been more than four hours since Grid Infrastructure was installed. Your list will most likely look slightly different from the example below.

```
[oracle@dns ~] ssh root@host01
root@host01's Password: *****

[root@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# ocrconfig -showbackup
host01      2017/11/06 10:57:18
+MGMT:/cluster01/OCRBACKUP/backup00.ocr.281.959338631      0
host01      2017/11/06 06:57:10
+MGMT:/cluster01/OCRBACKUP/backup01.ocr.287.959324223      0
host01      2017/11/06 02:57:00
+MGMT:/cluster01/OCRBACKUP/backup02.ocr.285.959309811      0
host01      2017/11/05 02:55:55
+MGMT:/cluster01/OCRBACKUP/day.ocr.282.959223357      0
host01      2017/11/01 18:53:00
+MGMT:/cluster01/OCRBACKUP/week.ocr.283.958935181      0
PROT-25: Manual backups for the Oracle Cluster Registry are not
available

[root@host01 ~]#
```

- Perform a manual backup of the OCR. **Note:** Your output may vary slightly.

```
[root@host01 ~]# ocrconfig -manualbackup
host02      2017/11/06 14:09:18
+MGMT:/cluster01/OCRBACKUP/backup_20171106_140918.ocr.284.959350159
0

[root@host01 ~]#
```

3. Use the `crsctl` utility to determine the OCR locations that are currently used by your Oracle Clusterware installation. **Note:** Your output may vary slightly.

```
[root@host01 ~]# ocrconfig -showbackup manual
host02      2017/11/06 14:09:18
+MGMT:/cluster01/OCRBACKUP/backup_20171106_140918.ocr.284.959350159
0

[root@host01 ~]#
```

4. Determine the location of the Oracle Local Registry (OLR) using the `ocrcheck` utility. When finished, log out as the `root` user.

```
[root@host01 ~]# ocrcheck -local
Status of Oracle Local Registry is as follows :
      Version          :        4
      Total space (kbytes)   :    409568
      Used space (kbytes)    :     1060
      Available space (kbytes) :    408508
      ID                  : 967673553
      Device/File Name       :
                           /u01/app/12.2.0/grid/cdata/host01.olr
      Device/File integrity check succeeded

      Local registry integrity check succeeded

      Logical corruption check succeeded

[root@host01 ~]#
```

5. Perform a manual backup of the OLR. **Note:** Your output may vary slightly.

```
[root@host01 ~]# ocrconfig -local -manualbackup
host01      2018/01/16 18:02:39
/u01/app/12.2.0/grid/cdata/host01/backup_20180116_180239.olr      0

host01      2018/01/12 14:38:54
/u01/app/12.2.0/grid/cdata/host01/backup_20180112_143854.olr      0

host01      2018/01/10 21:48:06
/u01/app/12.2.0/grid/cdata/host01/backup_20180110_214806.olr      0

[root@host01 ~]#
```

6. Close all terminal windows opened for this practice.

Practice 7-4: Configuring Network Interfaces Using oifcfg

Overview

In this practice, you add a new interface to create an HAIP configuration for the cluster.

- As the `grid` user, ensure that Oracle Clusterware is running on all of the cluster nodes.

```
[oracle@dns ~] ssh grid@host01
grid@host01's Password:

[grid@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ olsnodes -s
host01 Active
host02 Active
host03 Active
host04 Active
host05 Active

[grid@host01 ~]$
```

- Check the list of available network interfaces and ascertain what they are being used for in the current cluster configuration

```
[grid@host01 ~]$ oifcfg iflist
eth0 192.0.2.0
eth1 192.0.3.0
eth2 192.168.1.0
eth2 169.254.0.0
eth3 192.168.2.0

[grid@host01 ~]$ oifcfg getif
eth0 192.0.2.0 global public
eth1 192.0.3.0 global asm
eth2 192.168.1.0 global cluster_interconnect

[grid@host01 ~]$
```

3. The `eth0` interface is currently used for the public interface, `eth1` is used for ASM, and `eth2` is used for the private interconnect. We'll add `eth3` to the interconnect configuration. Ensure that the replacement interface is configured and operational in the operating system on all of the nodes.

```
[grid@host01 ~]$ /sbin/ifconfig eth3
eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE
          inet addr:192.168.2.101 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:ce/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:3381801 errors:0 dropped:0 overruns:0 frame:0
            TX packets:3054 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:3376954309 (3.1 GiB) TX bytes:446884 (436.4 KiB)

[grid@host01 ~]$ ssh host02 /sbin/ifconfig eth3
eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:FE
          inet addr:192.168.2.102 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:fe/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:2922820 errors:0 dropped:0 overruns:0 frame:0
            TX packets:2675 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2883083829 (2.6 GiB) TX bytes:385136 (376.1 KiB)

[grid@host01 ~]$ ssh host03 /sbin/ifconfig eth3
eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:42
          inet addr:192.168.2.103 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:42/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:2917841 errors:0 dropped:0 overruns:0 frame:0
            TX packets:2597 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2880792638 (2.6 GiB) TX bytes:384164 (375.1 KiB)

[grid@host01 ~]$ ssh host04 /sbin/ifconfig eth3
eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:AF
          inet addr:192.168.2.104 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:af/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:2891615 errors:0 dropped:0 overruns:0 frame:0
            TX packets:592 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2855084313 (2.6 GiB) TX bytes:127948 (124.9 KiB)

[grid@host01 ~]$ ssh host05 /sbin/ifconfig eth3
eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:68
          inet addr:192.168.2.105 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:68/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:2891826 errors:0 dropped:0 overruns:0 frame:0
            TX packets:331 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2855208479 (2.6 GiB) TX bytes:50162 (48.9 KiB)

[grid@host01 ~]$
```

4. Switch user to root, set the Grid environment, and add eth3 to the cluster configuration as a global private interconnect.

```
[grid@host01 ~]$ su -
Password:

[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# oifcfg setif -global
eth3/192.168.2.0:cluster_interconnect

[root@host01 ~]#
```

5. Verify that the new interface has been added to the cluster configuration.

```
[root@host01 ~]$ oifcfg getif
eth0 192.0.2.0  global  public
eth1 192.0.3.0  global  asm
eth2 192.168.1.0 global  cluster_interconnect
eth3 192.168.2.0 global  cluster_interconnect

[root@host01 ~]#
```

6. Stop Clusterware on all nodes of the cluster.

```
[root@host01 ~]# crsctl stop cluster -all
CRS-2673: Attempting to stop 'ora.crsd' on 'host05'
CRS-2673: Attempting to stop 'ora.crsd' on 'host04'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host04'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host05'
CRS-2673: Attempting to stop 'ora.chad' on 'host05'
CRS-2673: Attempting to stop 'ora.chad' on 'host04'
CRS-2677: Stop of 'ora.chad' on 'host05' succeeded
CRS-2677: Stop of 'ora.chad' on 'host04' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host05' has completed
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host04' has completed
CRS-2677: Stop of 'ora.crsd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host05'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host05'
CRS-2677: Stop of 'ora.crsd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host04'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host04'
CRS-2673: Attempting to stop 'ora.evmd' on 'host05'
```

```
CRS-2673: Attempting to stop 'ora.evmd' on 'host04'
CRS-2673: Attempting to stop 'ora.storage' on 'host04'
CRS-2673: Attempting to stop 'ora.storage' on 'host05'
CRS-2677: Stop of 'ora.storage' on 'host05' succeeded
CRS-2677: Stop of 'ora.storage' on 'host04' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host04' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host04' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host05' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host05' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host04'
CRS-2677: Stop of 'ora.cssd' on 'host04' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host05'
CRS-2677: Stop of 'ora.cssd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.crsd' on 'host01'
CRS-2673: Attempting to stop 'ora.crsd' on 'host03'
CRS-2790: Starting shutdown of Cluster Ready Services-managed resources on server 'host01'
CRS-2673: Attempting to stop 'ora.crsd' on 'host02'
CRS-2673: Attempting to stop 'ora.chad' on 'host01'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host01'
CRS-2790: Starting shutdown of Cluster Ready Services-managed resources on server 'host03'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host03'
CRS-2673: Attempting to stop 'ora.gns' on 'host03'
CRS-2790: Starting shutdown of Cluster Ready Services-managed resources on server 'host02'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host02'
CRS-2673: Attempting to stop 'ora.qosmserver' on 'host02'
CRS-2677: Stop of 'ora.gns' on 'host03' succeeded
CRS-2677: Stop of 'ora.orcl.db' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN2.lsnr' on 'host03'
CRS-2673: Attempting to stop 'ora.cvu' on 'host03'
CRS-2673: Attempting to stop 'ora.gns.vip' on 'host03'
CRS-2677: Stop of 'ora.orcl.db' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN1.lsnr' on 'host01'
CRS-2677: Stop of 'ora.DATA.dg' on 'host03' succeeded
CRS-2677: Stop of 'ora.FRA.dg' on 'host03' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host03'
CRS-2677: Stop of 'ora.chad' on 'host01' succeeded
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host03' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN2.lsnr' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.chad' on 'host02'
```

```
CRS-2673: Attempting to stop 'ora.chad' on 'host03'
CRS-2673: Attempting to stop 'ora.host03.vip' on 'host03'
CRS-2673: Attempting to stop 'ora.scan2.vip' on 'host03'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host01' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN1.lsnr' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
CRS-2677: Stop of 'ora.gns.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.orcl.db' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.scan1.vip' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host02'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN3.lsnr' on 'host02'
CRS-2677: Stop of 'ora.cvu' on 'host03' succeeded
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.host02.vip' on 'host02'
CRS-2677: Stop of 'ora.LISTENER_SCAN3.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.scan3.vip' on 'host02'
CRS-2677: Stop of 'ora.scan2.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.scan1.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.host02.vip' on 'host02' succeeded
CRS-2677: Stop of 'ora.host03.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.qosmserver' on 'host02' succeeded
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03' succeeded
CRS-2677: Stop of 'ora.scan3.vip' on 'host02' succeeded
CRS-2677: Stop of 'ora.chad' on 'host02' succeeded
CRS-2677: Stop of 'ora.chad' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.mgmtdb' on 'host01'
CRS-2673: Attempting to stop 'ora.ons' on 'host03'
CRS-2677: Stop of 'ora.ons' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host03'
CRS-2677: Stop of 'ora.net1.network' on 'host03' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host03' has completed
CRS-2677: Stop of 'ora.crsd' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host03'
CRS-2673: Attempting to stop 'ora.evmd' on 'host03'
CRS-2673: Attempting to stop 'ora.storage' on 'host03'
CRS-2677: Stop of 'ora.storage' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host03'
CRS-2677: Stop of 'ora.mgmtdb' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.MGMTLSNR' on 'host01'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host01'
CRS-2677: Stop of 'ora.FRA.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.DATA.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.ctssd' on 'host03' succeeded
CRS-2677: Stop of 'ora.MGMTLSNR' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.host01.vip' on 'host01'
CRS-2677: Stop of 'ora.evmd' on 'host03' succeeded
```

```
CRS-2677: Stop of 'ora.host01.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host03'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host03'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host03'
CRS-2677: Stop of 'ora.cssd' on 'host03' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host02'
CRS-2677: Stop of 'ora.FRA.dg' on 'host02' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host02' succeeded
CRS-2677: Stop of 'ora.DATA.dg' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host02'
CRS-2677: Stop of 'ora.asm' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02'
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host01'
CRS-2677: Stop of 'ora.ons' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host01'
CRS-2677: Stop of 'ora.net1.network' on 'host01' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host01' has completed
CRS-2677: Stop of 'ora.crsd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host01'
CRS-2673: Attempting to stop 'ora.evmd' on 'host01'
CRS-2673: Attempting to stop 'ora.storage' on 'host01'
CRS-2677: Stop of 'ora.storage' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.ctssd' on 'host01' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host01' succeeded
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host02'
CRS-2677: Stop of 'ora.ons' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host02'
CRS-2677: Stop of 'ora.net1.network' on 'host02' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host02' has completed
CRS-2677: Stop of 'ora.crsd' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host02'
CRS-2673: Attempting to stop 'ora.evmd' on 'host02'
CRS-2673: Attempting to stop 'ora.storage' on 'host02'
CRS-2677: Stop of 'ora.storage' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host02'
CRS-2677: Stop of 'ora.ctssd' on 'host02' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host02' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host01'
```

```

CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host02'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host02'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host02'
CRS-2677: Stop of 'ora.cssd' on 'host02' succeeded

[root@host01 ~]#

```

7. Restart Clusterware on all nodes.

```

[root@host01 ~]# crsctl start cluster -all
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host04'
CRS-2672: Attempting to start 'ora.evmd' on 'host04'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host05'
CRS-2672: Attempting to start 'ora.evmd' on 'host01'
CRS-2672: Attempting to start 'ora.evmd' on 'host05'
CRS-2672: Attempting to start 'ora.evmd' on 'host02'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host03'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host02'
CRS-2672: Attempting to start 'ora.evmd' on 'host03'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host01'
CRS-2676: Start of 'ora.cssdmonitor' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host04'
CRS-2676: Start of 'ora.cssdmonitor' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host01'
CRS-2672: Attempting to start 'ora.diskmon' on 'host01'
CRS-2676: Start of 'ora.cssdmonitor' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host05'
CRS-2672: Attempting to start 'ora.diskmon' on 'host05'
CRS-2672: Attempting to start 'ora.diskmon' on 'host04'
CRS-2676: Start of 'ora.cssdmonitor' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host02'
CRS-2672: Attempting to start 'ora.diskmon' on 'host02'
CRS-2676: Start of 'ora.cssdmonitor' on 'host03' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host05' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host01' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host03'
CRS-2676: Start of 'ora.diskmon' on 'host04' succeeded
CRS-2676: Start of 'ora.evmd' on 'host02' succeeded
CRS-2676: Start of 'ora.evmd' on 'host05' succeeded
CRS-2676: Start of 'ora.evmd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.diskmon' on 'host03'
CRS-2676: Start of 'ora.evmd' on 'host04' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host03' succeeded
CRS-2676: Start of 'ora.evmd' on 'host03' succeeded

```

```
CRS-2676: Start of 'ora.cssd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.ctssd' on 'host01'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host01'
CRS-2676: Start of 'ora.cssd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.ctssd' on 'host03'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host03'
CRS-2676: Start of 'ora.cssd' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.ctssd' on 'host02'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host02'
CRS-2676: Start of 'ora.ctssd' on 'host01' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host03' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host02' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host03'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host01'
CRS-2676: Start of 'ora.asm' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host01'
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host02'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host02'
CRS-2676: Start of 'ora.asm' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host02'
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host03'
CRS-2676: Start of 'ora.storage' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host03'
CRS-2676: Start of 'ora.crsd' on 'host03' succeeded
CRS-2676: Start of 'ora.storage' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host02'
CRS-2676: Start of 'ora.storage' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host01'
CRS-2676: Start of 'ora.crsd' on 'host02' succeeded
CRS-2676: Start of 'ora.crsd' on 'host01' succeeded
CRS-2676: Start of 'ora.cssd' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host04'
CRS-2676: Start of 'ora.cssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host04'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host05'
CRS-2672: Attempting to start 'ora.ctssd' on 'host04'
CRS-2672: Attempting to start 'ora.storage' on 'host05'
CRS-2672: Attempting to start 'ora.ctssd' on 'host05'
CRS-2676: Start of 'ora.storage' on 'host04' succeeded
CRS-2676: Start of 'ora.storage' on 'host05' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host04' succeeded
```

```

CRS-2672: Attempting to start 'ora.crsd' on 'host04'
CRS-2676: Start of 'ora.ctssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host05'
CRS-2676: Start of 'ora.crsd' on 'host05' succeeded
CRS-2676: Start of 'ora.crsd' on 'host04' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host05' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host04' succeeded
[root@host01 ~]#

```

8. Use ifconfig to determine view how Clusterware has implemented HAIP. Inspect the HAIP configuration on all three of your Hub nodes.

```

[root@host01 ~]# ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
          inet addr:192.0.2.101 Bcast:192.0.2.255 Mask:255.255.255.0
          inet6 addr: fe80::21:f6ff:fedc:36/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:7017899 errors:0 dropped:0 overruns:0 frame:0
          TX packets:4555129 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3498119077 (3.2 GiB) TX bytes:67935413168 (63.2 GiB)

eth0:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
          inet addr:192.0.2.233 Bcast:192.0.2.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth0:2    Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
          inet addr:192.0.2.236 Bcast:192.0.2.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:DF
          inet addr:192.0.3.101 Bcast:192.0.3.255 Mask:255.255.255.0
          inet6 addr: fe80::21:f6ff:fedc:df/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:3073743 errors:0 dropped:0 overruns:0 frame:0
          TX packets:148175 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2964146516 (2.7 GiB) TX bytes:79274834 (75.6 MiB)

eth2      Link encap:Ethernet HWaddr 00:21:F6:DC:00:EF
          inet addr:192.168.1.101 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::21:f6ff:fedc:ef/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:28889586 errors:0 dropped:0 overruns:0 frame:0
          TX packets:23676520 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:29209360347 (27.2 GiB) TX bytes:14737459274 (13.7 GiB)

eth2:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:EF
          inet addr:169.254.71.176 Bcast:169.254.127.255
          Mask:255.255.128.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE

```

```

        inet addr:192.168.2.101  Bcast:192.168.2.255  Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:ce/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3429124 errors:0 dropped:0 overruns:0 frame:0
          TX packets:36770 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3417353172 (3.1 GiB)  TX bytes:18653461 (17.7 MiB)

eth3:1      Link encap:Ethernet  HWaddr 00:21:F6:DC:00:CE
          inet addr:169.254.176.79  Bcast:169.254.255.255
Mask:255.255.128.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:15775100 errors:0 dropped:0 overruns:0 frame:0
          TX packets:15775100 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:12518938699 (11.6 GiB)  TX bytes:12518938699 (11.6 GiB)

[root@host01 ~]# ssh host02 ifconfig -a
eth0      Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
        inet addr:192.0.2.102  Bcast:192.0.2.255  Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:8c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4449978 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1595208 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:18822537739 (17.5 GiB)  TX bytes:435576482 (415.3 MiB)

eth0:1    Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
        inet addr:192.0.2.237  Bcast:192.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth0:2    Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
        inet addr:192.0.2.238  Bcast:192.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth1      Link encap:Ethernet  HWaddr 00:21:F6:DC:00:6B
        inet addr:192.0.3.102  Bcast:192.0.3.255  Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:6b/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3079481 errors:0 dropped:0 overruns:0 frame:0
          TX packets:145425 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2969069620 (2.7 GiB)  TX bytes:78843960 (75.1 MiB)

eth2      Link encap:Ethernet  HWaddr 00:21:F6:DC:00:80
        inet addr:192.168.1.102  Bcast:192.168.1.255  Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:80/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:18240200 errors:0 dropped:0 overruns:0 frame:0
          TX packets:20711595 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:10701454361 (9.9 GiB)  TX bytes:17449501263 (16.2 GiB)

```

```

eth2:1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:80
inet addr:169.254.105.68  Bcast:169.254.127.255
Mask:255.255.128.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:FE
inet addr:192.168.2.102  Bcast:192.168.2.255  Mask:255.255.255.0
inet6 addr: fe80::221:f6ff:fedc:fe/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2954342 errors:0 dropped:0 overruns:0 frame:0
          TX packets:57338 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2901338014 (2.7 GiB)  TX bytes:39938704 (38.0 MiB)

eth3:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:FE
inet addr:169.254.223.129  Bcast:169.254.255.255
Mask:255.255.128.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

lo       Link encap:Local Loopback
inet addr:127.0.0.1  Mask:255.0.0.0
inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:3433775 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3433775 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1176119357 (1.0 GiB)  TX bytes:1176119357 (1.0 GiB)

[root@host01 ~]# ssh host03 ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD
inet addr:192.0.2.103  Bcast:192.0.2.255  Mask:255.255.255.0
inet6 addr: fe80::221:f6ff:fedc:bd/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4133077 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1238491 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:18954825789 (17.6 GiB)  TX bytes:289647298 (276.2 MiB)

eth0:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD
inet addr:192.0.2.155  Bcast:192.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth0:4    Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD
inet addr:192.0.2.234  Bcast:192.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth0:5    Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD
inet addr:192.0.2.239  Bcast:192.0.2.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:3F
inet addr:192.0.3.103  Bcast:192.0.3.255  Mask:255.255.255.0
inet6 addr: fe80::221:f6ff:fedc:3f/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3026021 errors:0 dropped:0 overruns:0 frame:0
          TX packets:109405 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2938478383 (2.7 GiB)  TX bytes:60134632 (57.3 MiB)

```

```

eth2      Link encap:Ethernet HWaddr 00:21:F6:DC:00:27
          inet addr:192.168.1.103 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:27/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:16921672 errors:0 dropped:0 overruns:0 frame:0
            TX packets:16756324 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:10301651789 (9.5 GiB) TX bytes:12497510842 (11.6 GiB)

eth2:1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:27
          inet addr:169.254.54.39 Bcast:169.254.127.255
Mask:255.255.128.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:42
          inet addr:192.168.2.103 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:42/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:3014557 errors:0 dropped:0 overruns:0 frame:0
            TX packets:47225 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2948070601 (2.7 GiB) TX bytes:40246965 (38.3 MiB)

eth3:1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:42
          inet addr:169.254.168.71 Bcast:169.254.255.255
Mask:255.255.128.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING MTU:65536 Metric:1
            RX packets:2463849 errors:0 dropped:0 overruns:0 frame:0
            TX packets:2463849 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:0
            RX bytes:848508332 (809.2 MiB) TX bytes:848508332 (809.2 MiB)

[root@host01 ~]#

```

Instead of using eth2 and eth3 directly, Clusterware has configured private VIPs on eth2:1 and eth3:1 using IP addresses on the reserved 169.254..* subnet to support HAIP.*

9. As the root user, use the ifdown command to bring down the eth2 interface. Wait a few moments and run ifconfig -a. What do you observe?

```
[root@host01 ~]# ifdown eth2

[root@host01 ~]# ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
          inet addr:192.0.2.101 Bcast:192.0.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:36/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:7023110 errors:0 dropped:0 overruns:0 frame:0
            TX packets:4560680 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:3499811902 (3.2 GiB) TX bytes:67937389982 (63.2 GiB)

eth0:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
          inet addr:192.0.2.233 Bcast:192.0.2.255 Mask:255.255.255.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth0:2    Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
          inet addr:192.0.2.236 Bcast:192.0.2.255 Mask:255.255.255.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:DF
          inet addr:192.0.3.101 Bcast:192.0.3.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:df/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:3074114 errors:0 dropped:0 overruns:0 frame:0
            TX packets:148434 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2964270692 (2.7 GiB) TX bytes:79388598 (75.7 MiB)

eth2      Link encap:Ethernet HWaddr 00:21:F6:DC:00:EF
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:28907802 errors:0 dropped:0 overruns:0 frame:0
          TX packets:23690457 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:29219824202 (27.2 GiB) TX bytes:14754148893 (13.7 GiB)

eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE
          inet addr:192.168.2.101 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:ce/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:3445242 errors:0 dropped:0 overruns:0 frame:0
            TX packets:59647 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:3430103063 (3.1 GiB) TX bytes:36628454 (34.9 MiB)

eth3:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE
          inet addr:169.254.176.79 Bcast:169.254.255.255
          Mask:255.255.128.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth3:2    Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE
          inet addr:169.254.71.176 Bcast:169.254.127.255
          Mask:255.255.128.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
```

```

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:15781549 errors:0 dropped:0 overruns:0 frame:0
          TX packets:15781549 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:12520611317 (11.6 GiB)  TX bytes:12520611317 (11.6 GiB)

[root@host01 ~]# oifcfg iflist -p
eth0  192.0.2.0  UNKNOWN
eth1  192.0.3.0  UNKNOWN
eth3  192.168.2.0  PRIVATE
eth3  169.254.128.0  UNKNOWN
eth3  169.254.0.0  UNKNOWN

```

Note that the eth2 interface has no IP address, indicative that it is down. Note the HAIP interconnect configured on eth2:1 has been failed over to eth3:2.

10. Use ifconfig -a to check the HAIP interfaces on host02 and host03.

```

[root@host01 ~]# ssh host02 ifconfig -a
eth0      Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
          inet addr:192.0.2.102  Bcast:192.0.2.255  Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:8c/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
            RX packets:3063785 errors:0 dropped:0 overruns:0 frame:0
            TX packets:946429 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:17847466563 (16.6 GiB)  TX bytes:194099846 (185.1 MiB)

eth0:1    Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
          inet addr:192.0.2.155  Bcast:192.0.2.255  Mask:255.255.255.0
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth0:2    Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
          inet addr:192.0.2.240  Bcast:192.0.2.255  Mask:255.255.255.0
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth0:4    Link encap:Ethernet  HWaddr 00:21:F6:DC:00:8C
          inet addr:192.0.2.237  Bcast:192.0.2.255  Mask:255.255.255.0
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

eth1      Link encap:Ethernet  HWaddr 00:21:F6:DC:00:6B
          inet addr:192.0.3.102  Bcast:192.0.3.255  Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:6b/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1

```

```

RX packets:2120796 errors:0 dropped:0 overruns:0 frame:0
TX packets:59000 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:2144526168 (1.9 GiB) TX bytes:31230217 (29.7 MiB)

eth2      Link encap:Ethernet HWaddr 00:21:F6:DC:00:80
          inet addr:192.168.1.102 Bcast:192.168.1.255
          Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:80/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:12216057 errors:0 dropped:0 overruns:0 frame:0
          TX packets:12671061 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8481967086 (7.8 GiB) TX bytes:9616779184 (8.9 GiB)

eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:FE
          inet addr:192.168.2.102 Bcast:192.168.2.255
          Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:fe/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:2195746 errors:0 dropped:0 overruns:0 frame:0
          TX packets:98255 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2250417676 (2.0 GiB) TX bytes:84976272 (81.0 MiB)

eth3:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:FE
          inet addr:169.254.232.141 Bcast:169.254.255.255
          Mask:255.255.128.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth3:2    Link encap:Ethernet HWaddr 00:21:F6:DC:00:FE
          inet addr:169.254.36.219 Bcast:169.254.127.255
          Mask:255.255.128.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:65536 Metric:1
          RX packets:2627004 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2627004 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1149242623 (1.0 GiB) TX bytes:1149242623 (1.0 GiB)

[root@host01 ~]# ssh host03 ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD

```

```

        inet addr:192.0.2.103 Bcast:192.0.2.255 Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:bd/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:2940240 errors:0 dropped:0 overruns:0 frame:0
          TX packets:805396 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:18061534395 (16.8 GiB) TX bytes:152182227 (145.1 MiB)

eth0:1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD
        inet addr:192.0.2.239 Bcast:192.0.2.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth0:2      Link encap:Ethernet HWaddr 00:21:F6:DC:00:BD
        inet addr:192.0.2.238 Bcast:192.0.2.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth1        Link encap:Ethernet HWaddr 00:21:F6:DC:00:3F
        inet addr:192.0.3.103 Bcast:192.0.3.255 Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:3f/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:2109023 errors:0 dropped:0 overruns:0 frame:0
          TX packets:44506 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2139185973 (1.9 GiB) TX bytes:23085333 (22.0 MiB)

eth2        Link encap:Ethernet HWaddr 00:21:F6:DC:00:27
        inet addr:192.168.1.103 Bcast:192.168.1.255
          Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:27/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:11910055 errors:0 dropped:0 overruns:0 frame:0
          TX packets:9392515 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8762521776 (8.1 GiB) TX bytes:6516471892 (6.0 GiB)

eth3        Link encap:Ethernet HWaddr 00:21:F6:DC:00:42
        inet addr:192.168.2.103 Bcast:192.168.2.255
          Mask:255.255.255.0
        inet6 addr: fe80::221:f6ff:fedc:42/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:2156981 errors:0 dropped:0 overruns:0 frame:0
          TX packets:66980 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2192681315 (2.0 GiB) TX bytes:52579367 (50.1 MiB)

eth3:1      Link encap:Ethernet HWaddr 00:21:F6:DC:00:42

```

```

inet addr:169.254.214.49 Bcast:169.254.255.255
Mask:255.255.128.0
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth3:2 Link encap:Ethernet HWaddr 00:21:F6:DC:00:42
inet addr:169.254.100.1 Bcast:169.254.127.255
Mask:255.255.128.0
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
inet6 addr: ::1/128 Scope:Host
UP LOOPBACK RUNNING MTU:65536 Metric:1
RX packets:1868581 errors:0 dropped:0 overruns:0 frame:0
TX packets:1868581 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:389271287 (371.2 MiB) TX bytes:389271287 (371.2 MiB)

[root@host01 ~]#

```

11. Use the **ifup** command to bring up the **eth2** interface on **host01**. Use **ifconfig** to check the HAIP configuration.

```

[root@host01 ~]# ifup eth2
Determining if ip address 192.168.1.101 is already in use for device
eth2...

[root@host01 ~]# ifconfig -a
eth0 Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
inet addr:192.0.2.101 Bcast:192.0.2.255 Mask:255.255.255.0
inet6 addr: fe80::221:f6ff:fedc:36/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:7017899 errors:0 dropped:0 overruns:0 frame:0
TX packets:4555129 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:3498119077 (3.2 GiB) TX bytes:67935413168 (63.2 GiB)

eth0:1 Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
inet addr:192.0.2.233 Bcast:192.0.2.255 Mask:255.255.255.0
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth0:2 Link encap:Ethernet HWaddr 00:21:F6:DC:00:36
inet addr:192.0.2.236 Bcast:192.0.2.255 Mask:255.255.255.0
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth1 Link encap:Ethernet HWaddr 00:21:F6:DC:00:DF
inet addr:192.0.3.101 Bcast:192.0.3.255 Mask:255.255.255.0
inet6 addr: fe80::221:f6ff:fedc:df/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:3073743 errors:0 dropped:0 overruns:0 frame:0
TX packets:148175 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000

```

```

RX bytes:2964146516 (2.7 GiB) TX bytes:79274834 (75.6 MiB)

eth2      Link encap:Ethernet HWaddr 00:21:F6:DC:00:EF
          inet addr:192.168.1.101 Bcast:192.168.1.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:ef/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:28889586 errors:0 dropped:0 overruns:0 frame:0
            TX packets:23676520 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:29209360347 (27.2 GiB) TX bytes:14737459274 (13.7 GiB)

eth2:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:EF
          inet addr:169.254.71.176 Bcast:169.254.127.255
Mask:255.255.128.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

eth3      Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE
          inet addr:192.168.2.101 Bcast:192.168.2.255 Mask:255.255.255.0
          inet6 addr: fe80::221:f6ff:fedc:ce/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
            RX packets:3429124 errors:0 dropped:0 overruns:0 frame:0
            TX packets:36770 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:3417353172 (3.1 GiB) TX bytes:18653461 (17.7 MiB)

eth3:1    Link encap:Ethernet HWaddr 00:21:F6:DC:00:CE
          inet addr:169.254.176.79 Bcast:169.254.255.255
Mask:255.255.128.0
            UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING MTU:65536 Metric:1
            RX packets:15775100 errors:0 dropped:0 overruns:0 frame:0
            TX packets:15775100 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:0
            RX bytes:12518938699 (11.6 GiB) TX bytes:12518938699 (11.6 GiB)

[root@host01 ~]# oifcfg iflist -p
eth0  192.0.2.0  UNKNOWN
eth1  192.0.3.0  UNKNOWN
eth2  192.168.1.0  PRIVATE
eth2  169.254.0.0  UNKNOWN
eth3  192.168.2.0  PRIVATE
eth3  169.254.128.0  UNKNOWN

```

The HAIP configuration on eth2:1 has been restored.

12. Close all terminal windows opened for this practice.

Practice 7-5: Working with SCANS, SCAN Listeners, and GNS

Overview

In this practice, you will remove and add GNS, SCAN, and SCAN listener components.

- As the grid user, use `srvctl` to check the status and configuration of the GNS on your cluster.

```
[oracle@dns ~] ssh grid@host01
grid@host01's Password:

[grid@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ srvctl status gns
GNS is running on node host03.
GNS is enabled on node host03.

[grid@host01 ~]$ srvctl config gns -detail
GNS is enabled.
GNS is listening for DNS server requests on port 53
GNS is using port 5353 to connect to mDNS
GNS status: OK.
Domain served by GNS: example.com
GNS version: 12.2.0.1.0
Globally unique identifier of the cluster where GNS is running:
33fccc768099ef70ff813913a8de20fe
Name of the cluster where GNS is running: cluster01
Cluster type: server.
GNS log level: 1.
GNS listening addresses: tcp://192.0.2.155:34228.
GNS instance role: primary
GNS is individually enabled on nodes:
GNS is individually disabled on nodes:

[grid@host01 ~]$
```

- Use `srvctl` to check the status and configuration of the SCAN VIPs on your cluster.

Note: Since the VIPs are cluster resources, they may not be running on the same hosts as the example below.

```
[grid@host01 ~]$ srvctl status scan -verbose
SCAN VIP scan1 is enabled
SCAN VIP scan1 is running on node host01
SCAN VIP scan2 is enabled
SCAN VIP scan2 is running on node host02
```

```

SCAN VIP scan3 is enabled
SCAN VIP scan3 is running on node host03

[grid@host01 ~]$ srvctl config scan -all
SCAN name: cluster01-scan.cluster01.example.com, Network: 1
Subnet IPv4: 192.0.2.0/255.255.255.0/eth0, dhcp
Subnet IPv6:
SCAN 1 IPv4 VIP: -/scan1-vip/192.0.2.236
SCAN VIP is enabled.
SCAN VIP is individually enabled on nodes:
SCAN VIP is individually disabled on nodes:
SCAN 2 IPv4 VIP: -/scan2-vip/192.0.2.238
SCAN VIP is enabled.
SCAN VIP is individually enabled on nodes:
SCAN VIP is individually disabled on nodes:
SCAN 3 IPv4 VIP: -/scan3-vip/192.0.2.234
SCAN VIP is enabled.
SCAN VIP is individually enabled on nodes:
SCAN VIP is individually disabled on nodes:

[grid@host01 ~]$
```

3. Use `srvctl` to check the status and configuration of the SCAN Listeners on your cluster.

```

[grid@host01 ~]$ srvctl status scan_listener
SCAN Listener LISTENER_SCAN1 is enabled
SCAN listener LISTENER_SCAN1 is running on node host01
SCAN Listener LISTENER_SCAN2 is enabled
SCAN listener LISTENER_SCAN2 is running on node host02
SCAN Listener LISTENER_SCAN3 is enabled
SCAN listener LISTENER_SCAN3 is running on node host03

[grid@host01 ~]$ srvctl config scan_listener
SCAN Listener LISTENER_SCAN1 exists. Port: TCP:1521
Registration invited nodes:
Registration invited subnets:
SCAN Listener is enabled.
SCAN Listener is individually enabled on nodes:
SCAN Listener is individually disabled on nodes:
SCAN Listener LISTENER_SCAN2 exists. Port: TCP:1521
Registration invited nodes:
Registration invited subnets:
SCAN Listener is enabled.
SCAN Listener is individually enabled on nodes:
SCAN Listener is individually disabled on nodes:
```

```
SCAN Listener LISTENER_SCAN3 exists. Port: TCP:1521
Registration invited nodes:
Registration invited subnets:
SCAN Listener is enabled.
SCAN Listener is individually enabled on nodes:
SCAN Listener is individually disabled on nodes:

[grid@host01 ~]$
```

4. Use the `host` command to check the resolution of the SCANS on your cluster. Take note of the IPs assigned to the SCANS and the GNS specifics.

```
[grid@host01 ~]$ host -a cluster01-scan.cluster01.example.com
Trying "cluster01-scan.cluster01.example.com"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 1619
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 1, ADDITIONAL: 1

;; QUESTION SECTION:
;cluster01-scan.cluster01.example.com. IN ANY

;; ANSWER SECTION:
cluster01-scan.cluster01.example.com. 0 IN A      192.0.2.234
cluster01-scan.cluster01.example.com. 0 IN A      192.0.2.238
cluster01-scan.cluster01.example.com. 0 IN A      192.0.2.236

;; AUTHORITY SECTION:
cluster01.example.com. 86400    IN      NS      cluster01-
gns.example.com.

;; ADDITIONAL SECTION:
cluster01-gns.example.com. 86400 IN      A       192.0.2.155

Received 146 bytes from 192.0.2.1#53 in 16 ms

[grid@host01 ~]$
```

5. Use `srvctl` to stop the GNS VIP.

```
[grid@host01 ~]$ srvctl stop gns
PRCN-2018 : Current user grid is not a privileged user

[grid@host01 ~]$
```

6. Open a terminal to host01 as the root user and stop the GNS. Check the status.

Note: Stopping the GNS VIP must be done by a privileged user.

```
[oracle@dns ~] ssh root@host01
root@host01's Password:

[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# srvctl stop gns

[root@host01 ~]# srvctl status gns
GNS is not running.
GNS is enabled.

[root@host01 ~]# crsctl stat res -t -w "TYPE = ora.gns.type"
-----
Name          Target  State       Server           State details
-----
Cluster Resources
-----
ora.gns        1      OFFLINE OFFLINE           STABLE
-----
[root@host01 ~]#
```

7. Attempt to remove GNS VIP as root user.

```
[root@host01 ~]# srvctl remove gns
PRKF-1338 : GNS cannot be removed because one or more leaf nodes are
present.

[root@host01 ~]#
```

8. Return to the grid user session to stop the SCAN Listeners on the cluster. Verify they have been stopped, then remove them.

```
[grid@host01 ~]$ srvctl stop scan_listener

[grid@host01 ~]$ srvctl status scan_listener
SCAN Listener LISTENER_SCAN1 is enabled
SCAN listener LISTENER_SCAN1 is not running
SCAN Listener LISTENER_SCAN2 is enabled
SCAN listener LISTENER_SCAN2 is not running
SCAN Listener LISTENER_SCAN3 is enabled
```

```
SCAN listener LISTENER_SCAN3 is not running

[grid@host01 ~]$ crsctl stat res -t -w "TYPE =
ora.scan_listener.type"
-----
Name          Target  State       Server      State details
-----
Cluster Resources
-----
ora.LISTENER_SCAN1.lsnr
  1        OFFLINE  OFFLINE           STABLE
ora.LISTENER_SCAN2.lsnr
  1        OFFLINE  OFFLINE           STABLE
ora.LISTENER_SCAN3.lsnr
  1        OFFLINE  OFFLINE           STABLE
-----

[grid@host01 ~]$ srvctl remove scan_listener
Remove scan listener? (y/[n]) y

[grid@host01 ~]$ srvctl status scan_listener
PRCS-1103 : Could not find any Single Client Access Name (SCAN)
listener resources using filter TYPE=ora.scan_listener.type on
network 1

[grid@host01 ~]$
```

9. Use srvctl to stop the SCAN VIPs.

```
[grid@host01 ~]$ srvctl stop scan

[grid@host01 ~]$ srvctl status scan
SCAN VIP scan1 is enabled
SCAN VIP scan1 is not running
SCAN VIP scan2 is enabled
SCAN VIP scan2 is not running
SCAN VIP scan3 is enabled
SCAN VIP scan3 is not running

[grid@host01 ~]$ crsctl stat res -t -w "TYPE = ora.scan_vip.type"
-----
Name          Target  State       Server      State
details
-----
Cluster Resources
-----
```

```

ora.scan1.vip
  1      OFFLINE OFFLINE                      STABLE
ora.scan2.vip
  1      OFFLINE OFFLINE                      STABLE
ora.scan3.vip
  1      OFFLINE OFFLINE                      STABLE
-----
[grid@host01 ~]$

```

10. Attempt to remove the SCANS as `grid` user and recheck status and configuration.

```

[grid@host01 ~]$ srvctl remove scan
Remove the scan? (y/[n]) y
PRCS-1024 : Failed to remove Single Client Access Name Virtual
Internet Protocol(VIP) resources cluster01-
scan.cluster01.example.com
PRCN-2018 : Current user grid is not a privileged user
PRCN-2018 : Current user grid is not a privileged user
PRCN-2018 : Current user grid is not a privileged user

[grid@host01 ~]$

```

11. Switch to the `root` terminal window and remove the SCAN VIPs. **Note:** SCAN VIPs must be removed by a privileged user.

```

[root@host01 ~]# srvctl remove scan
Remove the scan? (y/[n]) y

[root@host01 ~]# srvctl config scan
PRCS-1102 : Could not find any Single Client Access Name (SCAN)
Virtual Internet Protocol (VIP) resources using filter
TYPE=ora.scan_vip.type on network 1

[root@host01 ~]#

```

12. Use the `host` command to re-check the operating system resolution of the SCANS on your cluster. Use `tnsping` to check SCAN resolution on the database side. Note the TNS-12541 returned by the `tnsping` command.

```

[root@host01 ~]# host -a cluster01-scan.cluster01.example.com
Trying "cluster01-scan.cluster01.example.com"
;; connection timed out; trying next origin
Trying "cluster01-scan.cluster01.example.com.example.com"
Host cluster01-scan.cluster01.example.com not found: 3 (NXDOMAIN)
Received 115 bytes from 192.0.2.1#53 in 2 ms

```

```
[root@host01 ~]$ tnsping cluster01-scan.cluster01.example.com

TNS Ping Utility for Linux: Version 12.2.0.1.0 - Production on 07-
NOV-2017 15:10 :39

Copyright (c) 1997, 2016, Oracle. All rights reserved.

Used parameter files:
/u01/app/12.2.0/grid/network/admin/sqlnet.ora

TNS-03505: Failed to resolve name

[root@host01 ~]#
```

13. Start and check the GNS VIP status and configuration.

```
[root@host01 ~]# srvctl start gns

[root@host01 ~]# srvctl status gns
GNS is running on node host01.
GNS is enabled on node host01.

[root@host01 ~]# srvctl config gns -detail
GNS is enabled.
GNS is listening for DNS server requests on port 53
GNS is using port 5353 to connect to mDNS
GNS status: OK
Domain served by GNS: example.com
GNS version: 12.2.0.1.0
Globally unique identifier of the cluster where GNS is running:
33fccc768099ef70ff813913a8de20fe
Name of the cluster where GNS is running: cluster01
Cluster type: server.
GNS log level: 1.
GNS listening addresses: tcp://192.0.2.155:57347.
GNS instance role: primary
GNS is individually enabled on nodes:
GNS is individually disabled on nodes:

[root@host01 ~]#
```

14. Add and start the SCAN VIPs. Verify the status.

```
[root@host01 ~]# srvctl add scan -scanname cluster01-  
scan.cluster01.example.com  
  
[root@host01 ~]# srvctl start scan  
  
[root@host01 ~]# srvctl status scan  
SCAN VIP scan1 is enabled  
SCAN VIP scan1 is running on node host02  
SCAN VIP scan2 is enabled  
SCAN VIP scan2 is running on node host01  
SCAN VIP scan3 is enabled  
SCAN VIP scan3 is running on node host03  
  
[root@host01 ~]#
```

15. Return to the grid user session. Add and start the SCAN Listeners back to your cluster. Verify the status and configuration.

```
[grid@host01 ~]$ srvctl add scan_listener  
  
[grid@host01 ~]$ srvctl start scan_listener  
  
[grid@host01 ~]$ srvctl status scan_listener  
SCAN Listener LISTENER_SCAN1 is enabled  
SCAN listener LISTENER_SCAN1 is running on node host02  
SCAN Listener LISTENER_SCAN2 is enabled  
SCAN listener LISTENER_SCAN2 is running on node host01  
SCAN Listener LISTENER_SCAN3 is enabled  
SCAN listener LISTENER_SCAN3 is running on node host03  
  
[grid@host01 ~]$ crsctl stat res -t -w "TYPE = ora.scan_vip.type"  
-----  
Name          Target  State       Server           State  
details  
-----  
Cluster Resources  
-----  
ora.scan1.vip  
    1        ONLINE  ONLINE      host02          STABLE  
ora.scan2.vip  
    1        ONLINE  ONLINE      host01          STABLE  
ora.scan3.vip  
    1        ONLINE  ONLINE      host03          STABLE  
-----
```

```
[grid@host01 ~]$ srvctl config scan
SCAN name: cluster01-scan.cluster01.example.com, Network: 1
Subnet IPv4: 192.0.2.0/255.255.255.0/eth0, dhcp
Subnet IPv6:
SCAN 1 IPv4 VIP: -/scan1-vip/192.0.2.244
SCAN VIP is enabled.
SCAN VIP is individually enabled on nodes:
SCAN VIP is individually disabled on nodes:
SCAN 2 IPv4 VIP: -/scan2-vip/192.0.2.245
SCAN VIP is enabled.
SCAN VIP is individually enabled on nodes:
SCAN VIP is individually disabled on nodes:
SCAN 3 IPv4 VIP: -/scan3-vip/192.0.2.240
SCAN VIP is enabled.
SCAN VIP is individually enabled on nodes:
SCAN VIP is individually disabled on nodes:

[grid@host01 ~]$
```

16. Use the host and tnsping commands to check the resolution of the SCANS. Execute tnsping three times. It should resolve to each IP listed by the host command.

```
[grid@host01 ~]$ host -a cluster01-scan.cluster01.example.com
Trying "cluster01-scan.cluster01.example.com"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 63439
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 1, ADDITIONAL: 1

;; QUESTION SECTION:
;cluster01-scan.cluster01.example.com. IN ANY

;; ANSWER SECTION:
cluster01-scan.cluster01.example.com. 0 IN A      192.0.2.240
cluster01-scan.cluster01.example.com. 0 IN A      192.0.2.244
cluster01-scan.cluster01.example.com. 0 IN A      192.0.2.245

;; AUTHORITY SECTION:
cluster01.example.com. 86400    IN      NS      cluster01-
gns.example.com.

;; ADDITIONAL SECTION:
cluster01-gns.example.com. 86400 IN      A      192.0.2.155

Received 146 bytes from 192.0.2.1#53 in 16 ms
```

```
[grid@host01 ~]$ tnsping cluster01-scan.cluster01.example.com

TNS Ping Utility for Linux: Version 12.2.0.1.0 - Production on 07-
NOV-2017 15:31:39

Copyright (c) 1997, 2016, Oracle. All rights reserved.

Used parameter files:
/u01/app/12.2.0/grid/network/admin/sqlnet.ora

Used EZCONNECT adapter to resolve the alias
Attempting to contact
(DESCRIPTION=(CONNECT_DATA=(SERVICE_NAME=)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.244) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.245)
) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.240) (PORT=1521))
OK (0 msec)

[grid@host01 ~]$ tnsping cluster01-scan.cluster01.example.com

TNS Ping Utility for Linux: Version 12.2.0.1.0 - Production on 07-
NOV-2017 15:32:18

Copyright (c) 1997, 2016, Oracle. All rights reserved.

Used parameter files:
/u01/app/12.2.0/grid/network/admin/sqlnet.ora

Used EZCONNECT adapter to resolve the alias
Attempting to contact
(DESCRIPTION=(CONNECT_DATA=(SERVICE_NAME=)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.240) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.244)
) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.245) (PORT=1521))
OK (0 msec)

[grid@host01 ~]$ tnsping cluster01-scan.cluster01.example.com

TNS Ping Utility for Linux: Version 12.2.0.1.0 - Production on 07-
NOV-2017 15:32:28

Copyright (c) 1997, 2016, Oracle. All rights reserved.

Used parameter files:
/u01/app/12.2.0/grid/network/admin/sqlnet.ora

Used EZCONNECT adapter to resolve the alias
```

```
Attempting to contact
(DESCRIPTION=(CONNECT_DATA=(SERVICE_NAME=)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.245) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.240) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP) (HOST=192.0.2.244) (PORT=1521)))
OK (0 msec)

[grid@host01 ~] $
```

17. Close all terminal windows opened for this practice.

Practice 7-6: Recovering From Voting Disk Corruptions

Overview

In this practice, you will recover from a Voting Disk corruption.

1. Open a terminal from your desktop to host01 as the grid user and set the environment. Use crsctl to locate your voting disks.

```
[oracle@dns ~] ssh -X grid@host01
Password: *****
[grid@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ crsctl query css votedisk

##  STATE      File Universal Id                               File Name Disk group
--  -----  -----
1. ONLINE    504453c97f784f2fbfc527c338d37f02 (/dev/c1_DATA1_dsk13) [DATA]
2. ONLINE    a3f0a976552b4f1dbf3f64646da5d447 (/dev/c1_DATA1_dsk2)   [DATA]
3. ONLINE    e792a12d9f004fd0bf9612fd8c6a1bf3 (/dev/c1_DATA1_dsk14) [DATA]

Located 3 voting disk(s).

[grid@host01 ~]$
```

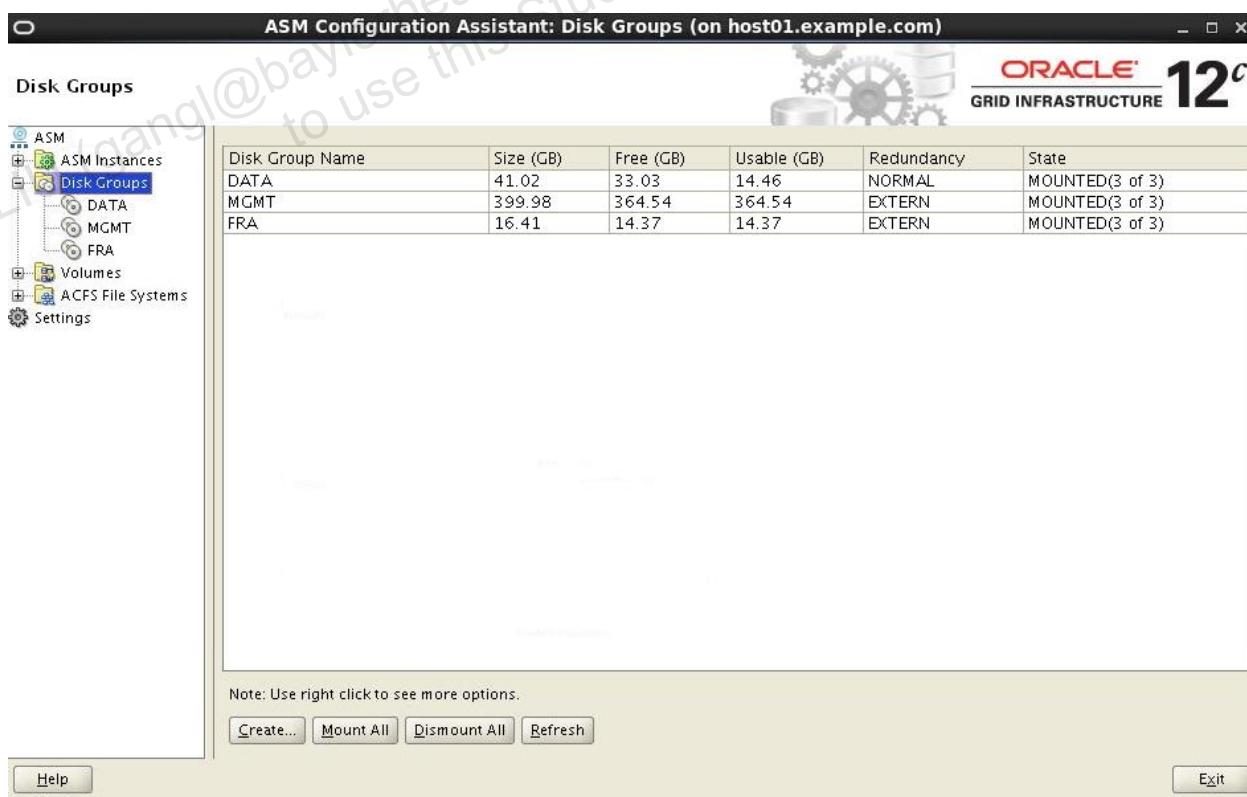
2. Use asmca to create a disk group called LABDG using normal redundancy.

```
[grid@host01 ~]$ asmca
```

3. After the ASM Configuration Assistant appears, click on Disk Groups.



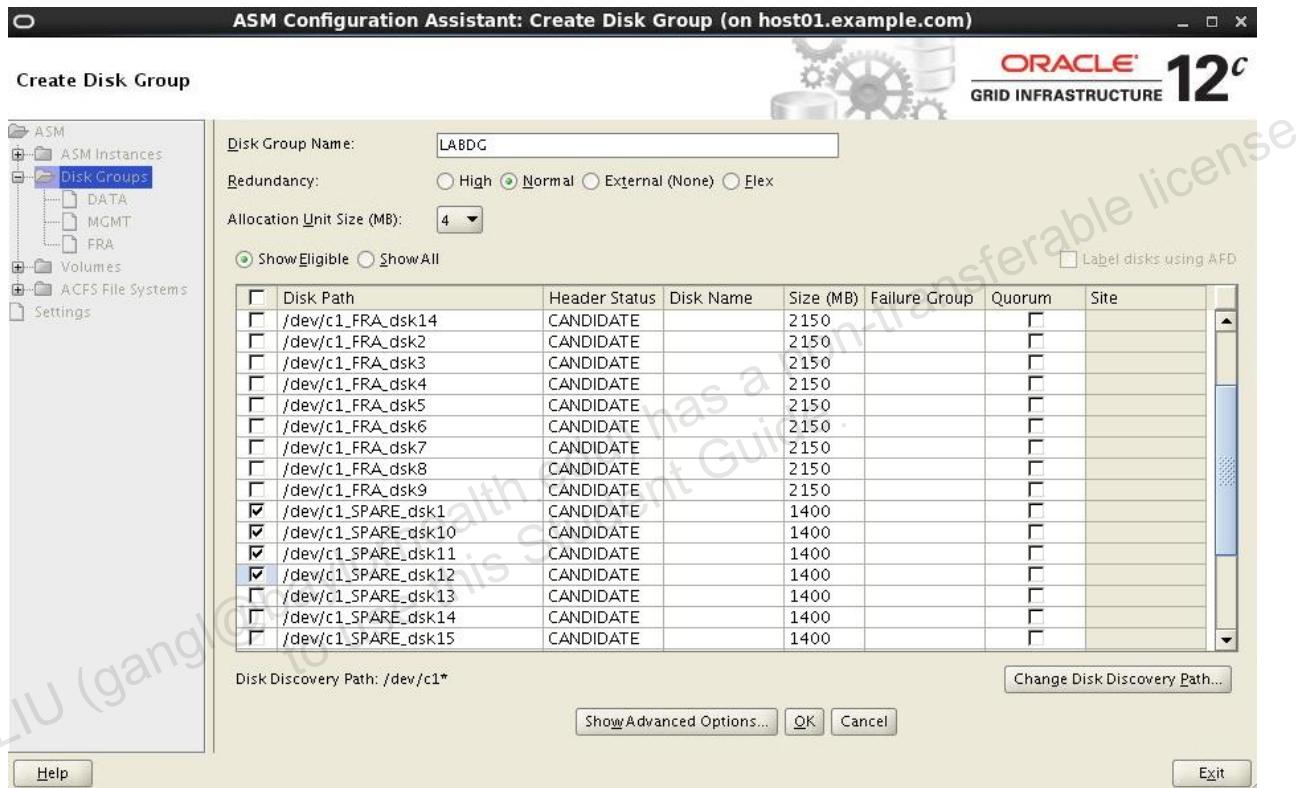
4. Click on Create.



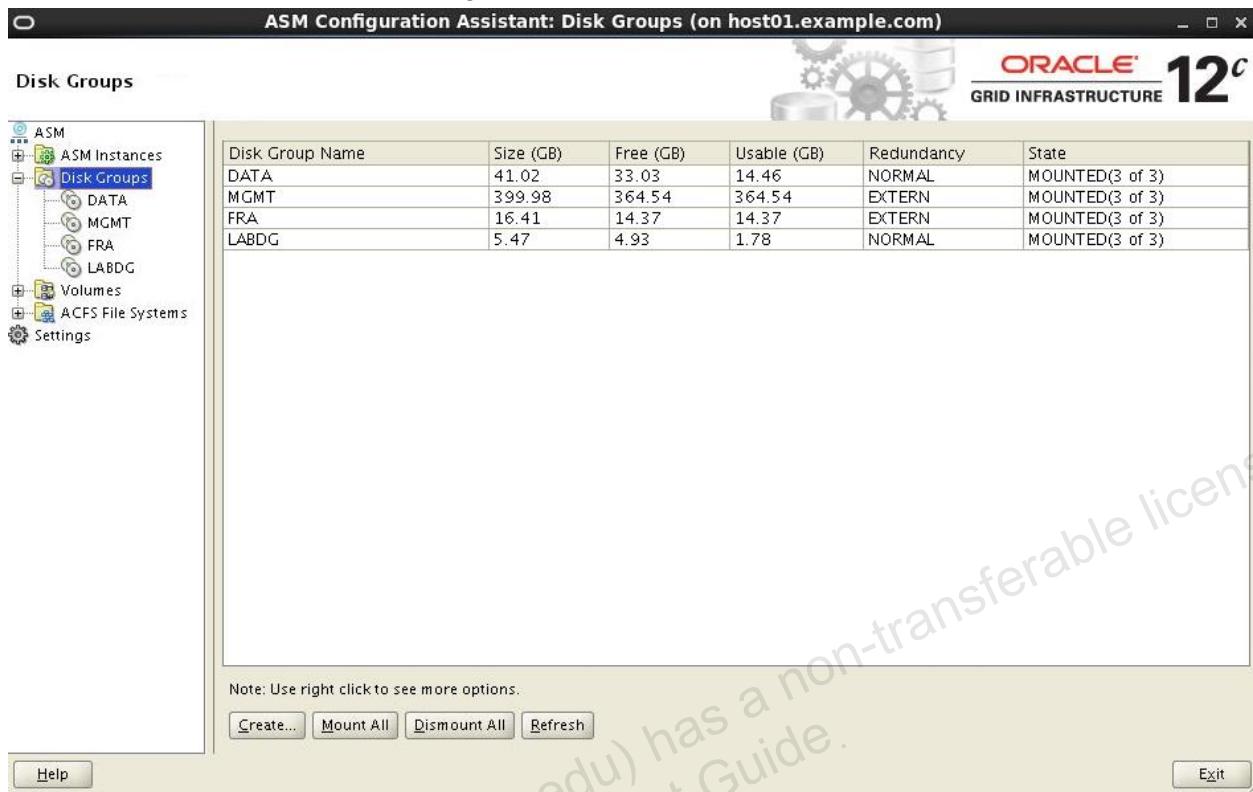
5. In the Create Disk Group window, enter LABDG as the disk group name and select the following four candidate disks (c1_SPARE_dsk).

- /dev/c1_SPARE_dsk1
- /dev/c1_SPARE_dsk10
- /dev/c1_SPARE_dsk11
- /dev/c1_SPARE_dsk12

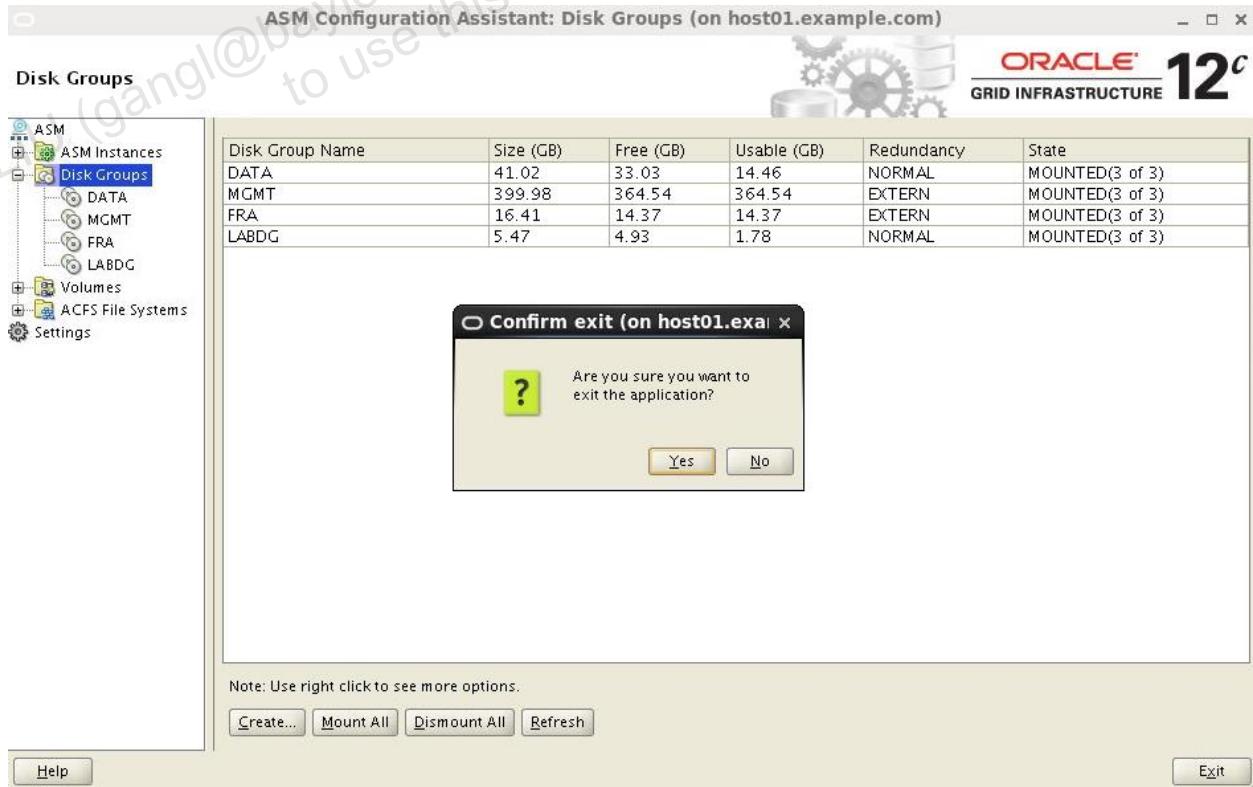
Make sure the Redundancy is **NORMAL** and The *Label disks using AFD* is NOT selected. Then click OK to create the disk group.



6. Click Exit to quit the ASM Configuration Assistant.



7. Click Yes to confirm that you want to quit the ASM Configuration Assistant.



8. Use `crsctl` to view the LABDG disk group resource.

```
[grid@host01 ~]$ crsctl stat res ora.LABDG.dg -t
-----
Name          Target  State       Server      State details
-----
Local Resources
-----
ora.LABDG.dg
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
    ONLINE  ONLINE   host03      STABLE
-----
[grid@host01 ~]$
```

9. Open a terminal from your desktop to host01 as the `root` user. Stop Clusterware on all nodes, then stop high availability services on all nodes. Restart it in exclusive mode on host01.

```
[oracle@dns ~] ssh root@host01
Password: *****

[root@host01~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# crsctl stop cluster -all
CRS-2673: Attempting to stop 'ora.crsd' on 'host04'
CRS-2673: Attempting to stop 'ora.crsd' on 'host05'
CRS-2677: Stop of 'ora.crsd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host04'
...
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded

[root@host01 ~]# crsctl stop crs -f
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host01'
...
CRS-4133: Oracle High Availability Services has been stopped.

[root@host01 ~]# ssh host02 /u01/app/12.2.0/grid/bin/crsctl stop crs -f
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host02'
...
[root@host01 ~]# ssh host03 /u01/app/12.2.0/grid/bin/crsctl stop crs -f
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host03'
```

```
...
[root@host01 ~]# ssh host04 /u01/app/12.2.0/grid/bin/crsctl stop crs -f
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host04'
...
[root@host01 ~]# ssh host05 /u01/app/12.2.0/grid/bin/crsctl stop crs -f
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host05'
...
[root@host01 ~]# crsctl start crs -excl
CRS-4123: Oracle High Availability Services has been started.
CRS-2672: Attempting to start 'ora.evmd' on 'host01'
CRS-2672: Attempting to start 'ora.mdnsd' on 'host01'
CRS-2676: Start of 'ora.evmd' on 'host01' succeeded
CRS-2676: Start of 'ora.mdnsd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.gnpd' on 'host01'
CRS-2676: Start of 'ora.gnpd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host01'
CRS-2672: Attempting to start 'ora.gipcd' on 'host01'
CRS-2676: Start of 'ora.cssdmonitor' on 'host01' succeeded
CRS-2676: Start of 'ora.gipcd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host01'
CRS-2672: Attempting to start 'ora.diskmon' on 'host01'
CRS-2676: Start of 'ora.diskmon' on 'host01' succeeded
CRS-2676: Start of 'ora.cssd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host01'
CRS-2672: Attempting to start 'ora.ctssd' on 'host01'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host01'
CRS-2676: Start of 'ora.crf' on 'host01' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host01' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host01'
CRS-2676: Start of 'ora.asm' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host01'
CRS-2676: Start of 'ora.storage' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host01'
CRS-2676: Start of 'ora.crsd' on 'host01' succeeded
[root@host01 ~]#
```

10. From the grid terminal window, list the ASM disk groups using asmcmd.

```
[grid@host01 ~]$ asmcmd lsdg

State      Type     Rebal   Sector  Logical_Sector  Block       AU
Total_MB   Free_MB  Req_mir_free_MB  Usable_file_MB  Offline_disks
Voting_files Name
MOUNTED    NORMAL   N              512           512        4096    4194304
42000      33824          4200           14812          0
Y DATA/
MOUNTED    EXTERN   N              512           512        4096    4194304
16800      14716          0            14716          0
N FRA/
MOUNTED    NORMAL   N              512           512        4096    4194304
5600       5048            1400           1824          0
N LABDG/
MOUNTED    EXTERN   N              512           512        4096    4194304
409584     373284          0            373284          0
N MGMT/

[grid@host01 ~]$
```

11. From the grid terminal window, list voting disks again, and then replace them on the LABDG disk group. List the voting disks again to verify the replacement.

```
[grid@host01 ~]$ crsctl query css votedisk
## STATE      File Universal Id                      File Name Disk group
-- -----
1. ONLINE    504453c97f784f2fbfc527c338d37f02 (/dev/c1_DATA1_dsk13) [DATA]
2. ONLINE    a3f0a976552b4f1dbf3f64646da5d447 (/dev/c1_DATA1_dsk2) [DATA]
3. ONLINE    e792a12d9f004fd0bf9612fd8c6a1bf3 (/dev/c1_DATA1_dsk14) [DATA]

Located 3 voting disk(s).

[grid@host01 ~]$ crsctl replace votedisk +LABDG
Successful addition of voting disk 92e8696206324f82bf987d0847cd3373.
Successful addition of voting disk bba9081a91374f19bf070de307a8cbe1.
Successful addition of voting disk 1e96c65c1e954f6cbf295496be930e50.
Successful deletion of voting disk 504453c97f784f2fbfc527c338d37f02.
Successful deletion of voting disk a3f0a976552b4f1dbf3f64646da5d447.
Successful deletion of voting disk e792a12d9f004fd0bf9612fd8c6a1bf3.
Successfully replaced voting disk group with +LABDG.
CRS-4266: Voting file(s) successfully replaced

[grid@host01 ~]$ crsctl query css votedisk
## STATE      File Universal Id                      File Name Disk group
-- -----
1. ONLINE    92e8696206324f82bf987d0847cd3373 (/dev/c1_SPARE_dsk1) [LABDG]
2. ONLINE    bba9081a91374f19bf070de307a8cbe1 (/dev/c1_SPARE_dsk10) [LABDG]
3. ONLINE    1e96c65c1e954f6cbf295496be930e50 (/dev/c1_SPARE_dsk11) [LABDG]

Located 3 voting disk(s).

[grid@host01 ~]$
```

12. Moving the voting disk to a new disk group constitutes a major change in the cluster configuration. Perform a manual OCR backup as the `root` user.

```
[root@host01 ~]# ocrconfig -manualbackup

host01      2017/11/14 15:07:44
+MGMT:/cluster01/OCRBACKUP/backup_20171114_150744.ocr.289.960044865      0

[root@host01 ~]#
```

13. As the `grid` user, list the LABDG disks using `asmcmd`, and then corrupt the LABDG disks as the `root` user using `dd` to corrupt them. Be **very** careful to use the correct device when corrupting the disks.

```
[grid@host01 ~]# asmcmd lsdsk -G LABDG
Path
/dev/c1_SPARE_dsk1
/dev/c1_SPARE_dsk10
/dev/c1_SPARE_dsk11
/dev/c1_SPARE_dsk12

***** Switch to root terminal *****

[root@host01 ~]# dd if=/dev/zero of=/dev/c1_SPARE_dsk1 bs=1M
count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB) copied, 0.00858544 s, 1.2 GB/s

[root@host01 ~]# dd if=/dev/zero of=/dev/c1_SPARE_dsk10 bs=1M
count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB) copied, 0.0147129 s, 713 MB/s

[root@host01 ~]# dd if=/dev/zero of=/dev/c1_SPARE_dsk11 bs=1M
count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB) copied, 0.0151781 s, 691 MB/s

[root@host01 ~]# dd if=/dev/zero of=/dev/c1_SPARE_dsk12 bs=1M
count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB) copied, 0.0096223 s, 1.1 GB/s

[root@host01 ~]#
```

14. Check the cluster resources. What do you see? Stop Clusterware on host01.

```
[root@host01 ~]# crsctl stat res -t|more
CRS-4535: Cannot communicate with Cluster Ready Services
CRS-4000: Command Status failed, or completed with errors.
```

Clusterware is now non-responsive on host01.

```
[root@host01 ~]# crsctl stop crs -f
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host01'
CRS-2673: Attempting to stop 'ora.crsd' on 'host01'
CRS-2677: Stop of 'ora.crsd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.storage' on 'host01'
CRS-2673: Attempting to stop 'ora.crf' on 'host01'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host01'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host01'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host01'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host01' succeeded
CRS-2677: Stop of 'ora.crf' on 'host01' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host01' succeeded
CRS-2677: Stop of 'ora.storage' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.mdnsd' on 'host01' succeeded
GCRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host01'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host01'
CRS-2673: Attempting to stop 'ora.evmd' on 'host01'
CRS-2677: Stop of 'ora.evmd' on 'host01' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host01'
CRS-2677: Stop of 'ora.gipcd' on 'host01' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host01' has completed
CRS-4133: Oracle High Availability Services has been stopped.
```

```
[root@host01 ~]#
```

15. Start CRS on host01 in exclusive mode.

```
[root@host01 ~]# crsctl start crs -excl
CRS-4123: Oracle High Availability Services has been started.
CRS-2672: Attempting to start 'ora.evmd' on 'host01'
CRS-2672: Attempting to start 'ora.mdnscd' on 'host01'
CRS-2676: Start of 'ora.mdnscd' on 'host01' succeeded
CRS-2676: Start of 'ora.evmd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.gpnpd' on 'host01'
CRS-2676: Start of 'ora.gpnpd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host01'
CRS-2672: Attempting to start 'ora.gipcd' on 'host01'
CRS-2676: Start of 'ora.cssdmonitor' on 'host01' succeeded
CRS-2676: Start of 'ora.gipcd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host01'
CRS-2672: Attempting to start 'ora.diskmon' on 'host01'
CRS-2676: Start of 'ora.diskmon' on 'host01' succeeded
CRS-2676: Start of 'ora.cssd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host01'
CRS-2672: Attempting to start 'ora.ctssd' on 'host01'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host01'
CRS-2676: Start of 'ora.crf' on 'host01' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host01' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host01'
CRS-2676: Start of 'ora.asm' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host01'
CRS-2676: Start of 'ora.storage' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host01'
CRS-2676: Start of 'ora.crsd' on 'host01' succeeded

[root@host01 ~]#
```

16. Review the `ocssd.trc` file in the `/u01/app/grid/diag/crs/host01/crs/trace` directory. What do you observe?

```
[root@host01 ~]# cd /u01/app/grid/diag/crs/host01/crs/trace/
[root@host01 trace]# cat ocssd.trc|grep "Insufficient voting files
found"
2017-11-14 15:23:32.903 :      CSSD:2678961920:
clssnmvVerifyCommittedConfigVFs: Insufficient voting files found,
found 0 of 0 configured, needed 1 voting files

[root@host01 trace]# vi ocssd.trc

***** Enter /2017-11-14 15:23:32.903 (in this example)*****
...
```

```

2017-11-14 15:23:32.903 : CSSD:2678961920: clssnmvDiskVerify:
Successful discovery of 0 disks

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmCompleteInitVFDiscovey: Completing initial voting file
discovery

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmvFindInitialConfigs: No voting files found

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmInitDummyConfig: Rimhub misscount 30

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmCompleteVFDiscovey: Completing voting file discovery

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmvVerifyCommittedConfigVFs: configured Sites = 0, Incative
sites = 0, Minimum Sites required = 1

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmvVerifyCommittedConfigVFs: Insufficient voting files found,
found 0 of 0 configured, needed 1 voting files

2017-11-14 15:23:32.903 : CSSD:2678961920:
clssnmCompleteVFDiscovey: Committed configuration for CIN
0:1510673012:0

2017-11-14 15:23:32.903 : CSSD:2678961920: misscount
30 reboot latency 3
200 short I/O timeout 27
30 grace period 0
99 active version 12.2.0.1.0
2017-11-14 15:23:32.903 : CSSD:2678961920: hub size
2017-11-14 15:23:32.903 : CSSD:2678961920: Listing unique IDs
for 0 voting files:

2017-11-14 15:23:32.903 : CSSD:3735252992: clssnmOpenGIPCEndp:
opening cluster listener on gipcha://host01:nm2_cluster01
...
***** :q! to quit the editor *****

[root@host01 trace]# cd
[root@host01 ~]#

```

17. Restore the voting disks to the +DATA disk group from the OCR backup.

```

[root@host01 ~]# crsctl replace votedisk +DATA
Successful addition of voting disk 1fd685a1e9fd4f38bf5e4f95ea5b14a3.
Successful addition of voting disk f1a30af0bdc04f11bf69403495bdb2cb.
Successful addition of voting disk cf1cac8d1eb14f55bf60b7b72ec786e5.
Successfully replaced voting disk group with +DATA.
CRS-4266: Voting file(s) successfully replaced

```

```
[root@host01 ~]# crsctl query css votedisk
##  STATE    File Universal Id                      File Name Disk group
--  -----
1. ONLINE  1fd685a1e9fd4f38bf5e4f95ea5b14a3  (/dev/c1_DATA1_dsk13) [DATA]
2. ONLINE  f1a30af0bdc04f11bf69403495bdb2cb  (/dev/c1_DATA1_dsk2)  [DATA]
3. ONLINE  cf1cac8d1eb14f55bf60b7b72ec786e5  (/dev/c1_DATA1_dsk14) [DATA]
Located 3 voting disk(s).

[root@host01 ~]#
```

18. Since CRS is running on host01 in exclusive mode, stop it there and restart Clusterware normally on all nodes.

```
[root@host01 ~]# crsctl stop crs
CRS-2791: Starting shutdown of Oracle High Availability Services-managed resources on 'host01'
CRS-2673: Attempting to stop 'ora.crsd' on 'host01'
CRS-2677: Stop of 'ora.crsd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host01'
CRS-2673: Attempting to stop 'ora.gnpd' on 'host01'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host01'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host01'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host01' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.crf' on 'host01'
CRS-2673: Attempting to stop 'ora.evmd' on 'host01'
CRS-2673: Attempting to stop 'ora.storage' on 'host01'
CRS-2677: Stop of 'ora.gnpd' on 'host01' succeeded
CRS-2677: Stop of 'ora.mdnsd' on 'host01' succeeded
CRS-2677: Stop of 'ora.storage' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.crf' on 'host01' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on 'host01'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host01'
CRS-2677: Stop of 'ora.gipcd' on 'host01' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'host01' has completed
CRS-4133: Oracle High Availability Services has been stopped.

[root@host01 ~]# crsctl start crs
CRS-4123: Oracle High Availability Services has been started.

[root@host01 ~]# ssh host02 /u01/app/12.2.0/grid/bin/crsctl start crs
```

```

CRS-4123: Oracle High Availability Services has been started.

[root@host01 ~]# ssh host03 /u01/app/12.2.0/grid/bin/crsctl start crs
CRS-4123: Oracle High Availability Services has been started.

[root@host01 ~]# ssh host04 /u01/app/12.2.0/grid/bin/crsctl start crs
CRS-4123: Oracle High Availability Services has been started.

[root@host01 ~]# ssh host05 /u01/app/12.2.0/grid/bin/crsctl start crs -wait

CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.mdnscd' on 'host05'
CRS-2672: Attempting to start 'ora.evmd' on 'host05'
CRS-2676: Start of 'ora.mdnscd' on 'host05' succeeded
CRS-2676: Start of 'ora.evmd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.gpnpcd' on 'host05'
CRS-2676: Start of 'ora.gpnpcd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'host05'
CRS-2676: Start of 'ora.gipcd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host05'
CRS-2676: Start of 'ora.cssdmonitor' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host05'
CRS-2672: Attempting to start 'ora.diskmon' on 'host05'
CRS-2676: Start of 'ora.diskmon' on 'host05' succeeded
CRS-2676: Start of 'ora.cssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'host05'
CRS-2672: Attempting to start 'ora.ctssd' on 'host05'
CRS-2676: Start of 'ora.ctssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host05'
CRS-2676: Start of 'ora.storage' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host05'
CRS-2676: Start of 'ora.crf' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host05'
CRS-2676: Start of 'ora.crsd' on 'host05' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host05' succeeded
CRS-6017: Processing resource auto-start for servers:
CRS-2672: Attempting to start 'ora.ons' on 'host01'
CRS-2672: Attempting to start 'ora.cvu' on 'host01'
CRS-2672: Attempting to start 'ora.qosmserver' on 'host01'
CRS-5017: The resource action "ora.LABDG.dg start" encountered the following error:
ORA-15032: not all alterations performed
ORA-15017: diskgroup "LABDG" cannot be mounted
ORA-15040: diskgroup is incomplete
. For details refer to "(:CLSN00107:)" in
"/u01/app/grid/diag/crs/host01/crs/trace/crsd_oraagent_grid.trc".

```

```
CRS-2674: Start of 'ora.LABDG.dg' on 'host01' failed
CRS-2679: Attempting to clean 'ora.LABDG.dg' on 'host01'
CRS-2681: Clean of 'ora.LABDG.dg' on 'host01' succeeded
CRS-2676: Start of 'ora.cvu' on 'host01' succeeded
CRS-2676: Start of 'ora.ons' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.host01.vip' on 'host01'
CRS-2672: Attempting to start 'ora.scan1.vip' on 'host01'
CRS-2672: Attempting to start 'ora.scan3.vip' on 'host01'
CRS-2672: Attempting to start 'ora.scan2.vip' on 'host01'
CRS-2672: Attempting to start 'ora.host04.vip' on 'host01'
CRS-2672: Attempting to start 'ora.host03.vip' on 'host01'
CRS-2672: Attempting to start 'ora.host05.vip' on 'host01'
CRS-2672: Attempting to start 'ora.host02.vip' on 'host01'
CRS-2676: Start of 'ora.host01.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.LISTENER.lsnr' on 'host01'
CRS-2672: Attempting to start 'ora.MGMTLSNR' on 'host01'
CRS-2676: Start of 'ora.scan1.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN1.lsnr' on 'host01'
CRS-2676: Start of 'ora.scan3.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN3.lsnr' on 'host01'
CRS-2676: Start of 'ora.scan2.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN2.lsnr' on 'host01'
CRS-2676: Start of 'ora.host04.vip' on 'host01' succeeded
CRS-2676: Start of 'ora.host03.vip' on 'host01' succeeded
CRS-2676: Start of 'ora.MGMTLSNR' on 'host01' succeeded
CRS-2676: Start of 'ora.LISTENER.lsnr' on 'host01' succeeded
CRS-2676: Start of 'ora.host05.vip' on 'host01' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN1.lsnr' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.mgmtdb' on 'host01'
CRS-2676: Start of 'ora.host02.vip' on 'host01' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN3.lsnr' on 'host01' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN2.lsnr' on 'host01' succeeded
CRS-2676: Start of 'ora.qosmserver' on 'host01' succeeded
CRS-2676: Start of 'ora.mgmtdb' on 'host01' succeeded
CRS-6017: Processing resource auto-start for servers: host05
CRS-2672: Attempting to start 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
CRS-2672: Attempting to start 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02'
CRS-2673: Attempting to stop 'ora.host02.vip' on 'host01'
CRS-2672: Attempting to start 'ora.ons' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN1.lsnr' on 'host01'
CRS-2672: Attempting to start 'ora.ons' on 'host02'
CRS-2673: Attempting to stop 'ora.host03.vip' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN2.lsnr' on 'host01'
CRS-2672: Attempting to start 'ora.net1.network' on 'host04'
CRS-2672: Attempting to start 'ora.net1.network' on 'host05'
CRS-2672: Attempting to start 'ora.chad' on 'host04'
CRS-2672: Attempting to start 'ora.chad' on 'host03'
CRS-2672: Attempting to start 'ora.chad' on 'host02'
```

```
CRS-2672: Attempting to start 'ora.chad' on 'host01'
CRS-2672: Attempting to start 'ora.chad' on 'host05'
CRS-2677: Stop of 'ora.LISTENER_SCAN1.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.scan1.vip' on 'host01'
CRS-2677: Stop of 'ora.LISTENER_SCAN2.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.scan2.vip' on 'host01'
CRS-2676: Start of 'ora.net1.network' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.host04.vip' on 'host01'
CRS-2676: Start of 'ora.net1.network' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.host05.vip' on 'host01'
CRS-2677: Stop of 'ora.host02.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.host02.vip' on 'host02'
CRS-2676: Start of 'ora.chad' on 'host02' succeeded
CRS-2676: Start of 'ora.chad' on 'host03' succeeded
CRS-2676: Start of 'ora.chad' on 'host04' succeeded
CRS-2676: Start of 'ora.chad' on 'host05' succeeded
CRS-2677: Stop of 'ora.host05.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.host05.vip' on 'host05'
CRS-2676: Start of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03' succeeded
CRS-2676: Start of 'ora.host05.vip' on 'host05' succeeded
CRS-2676: Start of 'ora.ons' on 'host03' succeeded
CRS-2676: Start of 'ora.host02.vip' on 'host02' succeeded
CRS-2676: Start of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.LISTENER.lsnr' on 'host02'
CRS-2676: Start of 'ora.ons' on 'host02' succeeded
CRS-2677: Stop of 'ora.scan2.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.scan2.vip' on 'host03'
CRS-2677: Stop of 'ora.scan1.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.scan1.vip' on 'host02'
CRS-2677: Stop of 'ora.host03.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.host03.vip' on 'host03'
CRS-2676: Start of 'ora.chad' on 'host01' succeeded
CRS-2677: Stop of 'ora.host04.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.host04.vip' on 'host04'
CRS-2676: Start of 'ora.scan2.vip' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN2.lsnr' on 'host03'
CRS-2676: Start of 'ora.host04.vip' on 'host04' succeeded
CRS-2676: Start of 'ora.scan1.vip' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN1.lsnr' on 'host02'
CRS-2676: Start of 'ora.host03.vip' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.LISTENER.lsnr' on 'host03'
CRS-2676: Start of 'ora.LISTENER.lsnr' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host02'
CRS-2676: Start of 'ora.LISTENER_SCAN2.lsnr' on 'host03' succeeded
CRS-2676: Start of 'ora.LISTENER.lsnr' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.LISTENER_SCAN1.lsnr' on 'host02' succeeded
CRS-2676: Start of 'ora.asm' on 'host02' succeeded
```

```

CRS-2672: Attempting to start 'ora.DATA.dg' on 'host02'
CRS-2676: Start of 'ora.DATA.dg' on 'host02' succeeded
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.DATA.dg' on 'host03'
CRS-2672: Attempting to start 'ora.FRA.dg' on 'host02'
CRS-2672: Attempting to start 'ora.FRA.dg' on 'host03'
CRS-2676: Start of 'ora.FRA.dg' on 'host02' succeeded
CRS-2676: Start of 'ora.DATA.dg' on 'host03' succeeded
CRS-2676: Start of 'ora.FRA.dg' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.orcl.db' on 'host02'
CRS-2672: Attempting to start 'ora.orcl.db' on 'host01'
CRS-2676: Start of 'ora.orcl.db' on 'host02' succeeded
CRS-2676: Start of 'ora.orcl.db' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host01'
CRS-2677: Stop of 'ora.orcl.db' on 'host01' succeeded
CRS-5702: Resource 'ora.orcl.db' is already running on 'host02'
CRS-2672: Attempting to start 'ora.orcl.db' on 'host03'
CRS-2676: Start of 'ora.orcl.db' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.orcl.db' on 'host01'
CRS-2676: Start of 'ora.orcl.db' on 'host01' succeeded
CRS-6016: Resource auto-start has completed for server host01
CRS-6016: Resource auto-start has completed for server host02
CRS-6016: Resource auto-start has completed for server host03
CRS-6016: Resource auto-start has completed for server host04
CRS-6016: Resource auto-start has completed for server host05
CRS-6024: Completed start of Oracle Cluster Ready Services-managed
resources
CRS-4123: Oracle High Availability Services has been started.

[root@host01 ~]#

```

19. Check the LABDG resource status. The LABDG resource is OFFLINE because the disk headers have been corrupted. Remove the LABDG resource using the `srvctl` utility.

```

[root@host01 ~]# crsctl stat res -t -w "NAME = ora.LABDG.dg"
-----
Name          Target   State        Server           State
details

-----
Local Resources

-----
ora.LABDG.dg
      OFFLINE OFFLINE    host01        STABLE
      OFFLINE OFFLINE    host02        STABLE
      OFFLINE OFFLINE    host03        STABLE
-----

[root@host01 ~]# srvctl remove diskgroup -diskgroup LABDG -force

```

```
[root@host01 ~]# crsctl stat res -t -w "NAME = ora.LABDG.dg"
[root@host01 ~]#
```

20. As the grid user, determine where the management repository is running. If the management repository is not running on host01, then relocate it there.

```
[grid@host01 ~]# crsctl stat res ora.mgmtdb -t
-----
Name          Target   State        Server      State details
-----
Cluster Resources
-----
ora.mgmtdb
    1           ONLINE  ONLINE      host02      Open, STABLE
-----

[grid@host01 ~]$ srvctl relocate mgmtdb -n host01

[grid@host01 ~]$ crsctl stat res ora.mgmtdb -t
-----
Name          Target   State        Server      State details
-----
Cluster Resources
-----
ora.mgmtdb
    1           ONLINE  ONLINE      host01      Open, STABLE
-----

[grid@host01 ~]$
```

21. Close all terminals opened for this practice.

Practices for Lesson 8: Policy-Based Cluster Management

Practice 8-1: Configuring and Using Policy-Based Cluster Management

Overview

In this practice, you will configure server categories and the policy set. You will examine the effect of various changes to verify the dynamic nature of policy-based cluster management.

1. Connect to the first node of your cluster as the `grid` user. You can use the `oraenv` script to set your environment correctly. ***Do not use the root account at any time during this practice!***

```
[oracle@dns ~]# ssh grid@host01
grid@host01's password:

[grid@host01 ~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid
[grid@host01~] $
```

2. Examine the extended server attributes associated with `host01`, `host02` and `host03`. Notice that the attributes identify these nodes as Hub Nodes in the cluster.

```
[grid@host01 ~]$ crsctl status server host01 -f
NAME=host01
MEMORY_SIZE=9997
CPU_COUNT=2
CPU_CLOCK_RATE=2194
CPU_HYPERTHREADING=0
CPU_EQUIVALENCY=1000
DEPLOYMENT=other
CONFIGURED_CSS_ROLE=hub
RESOURCE_USE_ENABLED=1
SERVER_LABEL=
PHYSICAL_HOSTNAME=
CSS_CRITICAL=no
CSS_CRITICAL_TOTAL=0
RESOURCE_TOTAL=0
SITE_NAME=cluster01
STATE=ONLINE
ACTIVE_POOLS=ora.orcldb
STATE_DETAILS=
ACTIVE_CSS_ROLE=hub

[grid@host01 ~]$ crsctl status server host02 -f
NAME=host02
MEMORY_SIZE=9997
```

```
CPU_COUNT=2
CPU_CLOCK_RATE=2194
CPU_HYPERTHREADING=0
CPU_EQUIVALENCY=1000
DEPLOYMENT=other
CONFIGURED_CSS_ROLE=hub
RESOURCE_USE_ENABLED=1
SERVER_LABEL=
PHYSICAL_HOSTNAME=
CSS_CRITICAL=no
CSS_CRITICAL_TOTAL=0
RESOURCE_TOTAL=0
SITE_NAME=cluster01
STATE=ONLINE
ACTIVE_POOLS=ora.orcldb
STATE_DETAILS=
ACTIVE_CSS_ROLE=hub

[grid@host01 ~] $ crsctl status server host03 -f
NAME=host03
MEMORY_SIZE=9997
CPU_COUNT=2
CPU_CLOCK_RATE=2194
CPU_HYPERTHREADING=0
CPU_EQUIVALENCY=1000
DEPLOYMENT=other
CONFIGURED_CSS_ROLE=hub
RESOURCE_USE_ENABLED=1
SERVER_LABEL=
PHYSICAL_HOSTNAME=
CSS_CRITICAL=no
CSS_CRITICAL_TOTAL=0
RESOURCE_TOTAL=0
SITE_NAME=cluster01
STATE=ONLINE
ACTIVE_POOLS=ora.orcldb
STATE_DETAILS=
ACTIVE_CSS_ROLE=hub

[grid@host01 ~] $
```

3. Examine the extended server attributes associated with host04 and host05. Notice that they are identified as Leaf Nodes in this Flex Cluster.

```
[grid@host01 ~]$ crsctl status server host04 -f
NAME=host04
MEMORY_SIZE=9997
CPU_COUNT=2
CPU_CLOCK_RATE=2194
CPU_HYPERTHREADING=0
CPU_EQUIVALENCY=1000
DEPLOYMENT=other
CONFIGURED_CSS_ROLE=leaf
RESOURCE_USE_ENABLED=1
SERVER_LABEL=
PHYSICAL_HOSTNAME=
CSS_CRITICAL=no
CSS_CRITICAL_TOTAL=0
RESOURCE_TOTAL=0
SITE_NAME=cluster01
STATE=ONLINE
ACTIVE_POOLS=Free
STATE_DETAILS=
ACTIVE_CSS_ROLE=leaf

[grid@host01 ~]$ crsctl status server host05 -f
NAME=host05
MEMORY_SIZE=9740
CPU_COUNT=2
CPU_CLOCK_RATE=2194
CPU_HYPERTHREADING=0
CPU_EQUIVALENCY=1000
DEPLOYMENT=other
CONFIGURED_CSS_ROLE=leaf
RESOURCE_USE_ENABLED=1
SERVER_LABEL=
PHYSICAL_HOSTNAME=
CSS_CRITICAL=no
CSS_CRITICAL_TOTAL=0
RESOURCE_TOTAL=0
SITE_NAME=cluster01
STATE=ONLINE
ACTIVE_POOLS=Free
STATE_DETAILS=
ACTIVE_CSS_ROLE=leaf
```

4. Examine the built-in category definitions. These are implicitly used to categorize the cluster nodes as Hub Nodes or Leaf Nodes based on the ACTIVE_CSS_ROLE setting. Note that these categories also exist in a standard cluster, however in a standard cluster all the nodes are designated as Hub Nodes.

```
[grid@host01 ~]$ crsctl status category
NAME=ora.hub.category
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIVE_CSS_ROLE=hub
EXPRESSION=

NAME=ora.leaf.category
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIVE_CSS_ROLE=leaf
EXPRESSION=

[grid@host01 ~]$
```

5. Examine the servers that are associated with the inbuilt categories. Confirm that the server-to-category mappings are as expected.

```
[grid@host01 ~]$ crsctl status server -category ora.hub.category
NAME=host01
STATE=ONLINE

NAME=host02
STATE=ONLINE

NAME=host03
STATE=ONLINE

[grid@host01 ~]$ crsctl status server -category ora.leaf.category
NAME=host04
STATE=ONLINE

NAME=host05
STATE=ONLINE

[grid@host01 ~]$
```

6. Create a user-defined category which includes the servers that contain more than 9000MB of system memory.

```
[grid@host01 ~]$ crsctl add category big -attr
"EXPRESSION='(MEMORY_SIZE > 9000)'"
[grid@host01 ~]$
```

7. Examine the category definition that you created in the previous step. Notice that the category definition includes `ACTIVE_CSS_ROLE=hub` by default. You could modify the `ACTIVE_CSS_ROLE` attribute if you wanted to categorize Leaf Nodes.

```
[grid@host01 ~]$ crsctl status category big
NAME=big
ACL=owner:grid:rwx,pgrp:oinstall:rwx,other::r--
ACTIVE_CSS_ROLE=hub
EXPRESSION=(MEMORY_SIZE > 9000)

[grid@host01 ~]$
```

8. Examine the servers associated with the big category. Confirm that host01, host02 and host03 are associated with the big category.

```
[grid@host01 ~]$ crsctl status server -category big
NAME=host01
STATE=ONLINE

NAME=host02
STATE=ONLINE

NAME=host03
STATE=ONLINE

[grid@host01 ~]$
```

9. Examine the categories associated with the host01 server. Notice that a server can be associated with multiple categories.

```
[grid@host01 ~]$ crsctl status category -server host01
NAME=big
ACL=owner:grid:rwx,pgrp:oinstall:rwx,other::r--
ACTIVE_CSS_ROLE=hub
EXPRESSION=(MEMORY_SIZE > 9000)

NAME=ora.hub.category
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIVE_CSS_ROLE=hub
EXPRESSION=

[grid@host01 ~]$
```

At this point, you have configured a category and examined category definitions along with server-to-category associations. Next, you will make use of the category definitions as you configure and exercise policy-based cluster management.

10. Examine the policy set. At this point, no policy set configuration has been performed so the only policy listed is the `Current` policy. The `Current` policy is a special built-in policy which contains all of the currently active server pool definitions.

```
[grid@host01 ~]$ crsctl status policyset
ACL=owner:grid:rwx,pgrp:oinstall:rwx,other::r--
LAST_ACTIVATED_POLICY=
SERVER_POOL_NAMES=Free
POLICY
  NAME=Current
  DESCRIPTION=This policy is built-in and managed automatically to
reflect current configuration
  SERVERPOOL
    NAME=Free
    IMPORTANCE=0
    MAX_SIZE=-1
    MIN_SIZE=0
    SERVER_CATEGORY=
    SERVER_NAMES=
  SERVERPOOL
    NAME=Generic
    IMPORTANCE=0
    MAX_SIZE=-1
    MIN_SIZE=0
    SERVER_CATEGORY=
    SERVER_NAMES=
  SERVERPOOL
    NAME=ora.orcldb
    IMPORTANCE=0
    MAX_SIZE=3
    MIN_SIZE=0
    SERVER_CATEGORY=ora.hub.category
    SERVER_NAMES=
[grid@host01 ~]$
```

11. Examine the policy set definition provided in the file located at /stage/GRID/labs/less_08/policyset.txt. The policy set definition contains two policies. The day policy enables the `orcldb` server pool to use two Hub Nodes while not providing any allocation for the `bigpool` server pool. The night policy still prioritizes the `orcldb` server pool, however it also provides an allocation for the `bigpool` server pool. Notice that the `bigpool` server pool references the big server category that you defined earlier in this practice.

```
[grid@host01 ~] $ cat /stage/GRID/labs/less_08/policyset.txt
SERVER_POOL_NAMES=Free bigpool ora.orcldb
POLICY
NAME=day
DESCRIPTION=The day policy
SERVERPOOL

    NAME=ora.orcldb
    IMPORTANCE=10
    MAX_SIZE=3
    MIN_SIZE=1
    SERVER_CATEGORY=ora.hub.category
SERVERPOOL
    NAME=bigpool
    IMPORTANCE=0
    MAX_SIZE=0
    MIN_SIZE=0
    SERVER_CATEGORY=big
POLICY
NAME=night
DESCRIPTION=The night policy
SERVERPOOL
    NAME=ora.orcldb
    IMPORTANCE=10
    MAX_SIZE=3
    MIN_SIZE=1
    SERVER_CATEGORY=ora.hub.category
SERVERPOOL
    NAME=bigpool
    IMPORTANCE=5
    MAX_SIZE=1
    MIN_SIZE=1
    SERVER_CATEGORY=big

[grid@host01 ~] $
```

12. Modify the policy set to load the configuration file.

```
[grid@host01 ~]$ crsctl modify policyset -file
/stage/GRID/labs/less_08/policyset.txt
[grid@host01 ~]$
```

13. Reexamine the policy set to confirm that the configuration file was loaded in the previous step. Notice that the `LAST_ACTIVATED_POLICY` attribute is not set and the `Current` policy is unchanged from what you observed earlier. This is because no policies have been activated yet.

```
[grid@host01 ~]$ crsctl status policyset
ACL=owner:grid:rwx,pgrp:oinstall:rwx,other::r--
LAST_ACTIVATED_POLICY=
SERVER_POOL_NAMES=Free bigpool ora.orcldb
POLICY
  NAME=Current
    DESCRIPTION=This policy is built-in and managed automatically to
reflect current configuration
    SERVERPOOL
      NAME=Free
      IMPORTANCE=0
      MAX_SIZE=-1
      MIN_SIZE=0
      SERVER_CATEGORY=
      SERVER_NAMES=
    SERVERPOOL
      NAME=Generic
      IMPORTANCE=0
      MAX_SIZE=-1
      MIN_SIZE=0
      SERVER_CATEGORY=
      SERVER_NAMES=
    SERVERPOOL
      NAME=ora.orcldb
      IMPORTANCE=0
      MAX_SIZE=3
      MIN_SIZE=0
      SERVER_CATEGORY=ora.hub.category
      SERVER_NAMES=
POLICY
  NAME=day
    DESCRIPTION=The day policy
    SERVERPOOL
      NAME=Free
      IMPORTANCE=0
```

```
MAX_SIZE=-1
MIN_SIZE=0
SERVER_CATEGORY=
SERVER_NAMES=
SERVERPOOL
  NAME=bigpool
  IMPORTANCE=0
  MAX_SIZE=0
  MIN_SIZE=0
  SERVER_CATEGORY=big
  SERVER_NAMES=
SERVERPOOL
  NAME=ora.orcldb
  IMPORTANCE=10
  MAX_SIZE=3
  MIN_SIZE=1
  SERVER_CATEGORY=ora.hub.category
  SERVER_NAMES=
POLICY
NAME=night
DESCRIPTION=The night policy
SERVERPOOL
  NAME=Free
  IMPORTANCE=0
  MAX_SIZE=-1
  MIN_SIZE=0
  SERVER_CATEGORY=
  SERVER_NAMES=
SERVERPOOL
  NAME=bigpool
  IMPORTANCE=5
  MAX_SIZE=1
  MIN_SIZE=1
  SERVER_CATEGORY=big
  SERVER_NAMES=
SERVERPOOL
  NAME=ora.orcldb
  IMPORTANCE=10
  MAX_SIZE=3
  MIN_SIZE=1
  SERVER_CATEGORY=ora.hub.category
  SERVER_NAMES=
[grid@host01 ~] $
```

14. Activate the day policy.

```
[grid@host01 ~]$ crsctl modify policyset -attr
"LAST_ACTIVATED_POLICY='day'"
[grid@host01 ~]$
```

15. Reexamine the policy set. Confirm that LAST_ACTIVATED_POLICY=day and that the Current policy settings reflect the day policy.

```
[grid@host01 ~]$ crsctl status policyset
ACL=owner:grid:rwx,pgrp:oinstall:rwx,other::r--
LAST_ACTIVATED_POLICY=day
SERVER_POOL_NAMES=Free bigpool ora.orcldb
POLICY
  NAME=Current
  DESCRIPTION=This policy is built-in and managed automatically to
reflect current configuration
  SERVERPOOL
    NAME=Free
    IMPORTANCE=0
    MAX_SIZE=-1
    MIN_SIZE=0
    SERVER_CATEGORY=
    SERVER_NAMES=
  SERVERPOOL
    NAME=Generic
    IMPORTANCE=0
    MAX_SIZE=-1
    MIN_SIZE=0
    SERVER_CATEGORY=
    SERVER_NAMES=
  SERVERPOOL
    NAME=bigpool
    IMPORTANCE=0
    MAX_SIZE=0
    MIN_SIZE=0
    SERVER_CATEGORY=big
    SERVER_NAMES=
  SERVERPOOL
    NAME=ora.orcldb
    IMPORTANCE=10
    MAX_SIZE=3
    MIN_SIZE=1
    SERVER_CATEGORY=ora.hub.category
    SERVER_NAMES=
POLICY
```

```
NAME=day
DESCRIPTION=The day policy
SERVERPOOL
  NAME=Free
  IMPORTANCE=0
  MAX_SIZE=-1
  MIN_SIZE=0
  SERVER_CATEGORY=
  SERVER_NAMES=
SERVERPOOL
  NAME=bigpool
  IMPORTANCE=0
  MAX_SIZE=0
  MIN_SIZE=0
  SERVER_CATEGORY=big
  SERVER_NAMES=
SERVERPOOL
  NAME=ora.orcldb
  IMPORTANCE=10
  MAX_SIZE=3
  MIN_SIZE=1
  SERVER_CATEGORY=ora.hub.category
  SERVER_NAMES=
POLICY
  NAME=night
  DESCRIPTION=The night policy
  SERVERPOOL
    NAME=Free
    IMPORTANCE=0
    MAX_SIZE=-1
    MIN_SIZE=0
    SERVER_CATEGORY=
    SERVER_NAMES=
  SERVERPOOL
    NAME=bigpool
    IMPORTANCE=5
    MAX_SIZE=1
    MIN_SIZE=1
    SERVER_CATEGORY=big
    SERVER_NAMES=
  SERVERPOOL
    NAME=ora.orcldb
    IMPORTANCE=10
    MAX_SIZE=3
    MIN_SIZE=1
    SERVER_CATEGORY=ora.hub.category
```

```
SERVER_NAMES=  
[grid@host01 ~] $
```

16. Examine the server pool allocations. Confirm the Hub Nodes are still allocated to the `orcldb` server pool in line with the day policy.

```
[grid@host01 ~] $ crsctl status serverpool  
NAME=Free  
ACTIVE_SERVERS=host04 host05  
  
NAME=Generic  
ACTIVE_SERVERS=  
  
NAME=bigpool  
ACTIVE_SERVERS=  
  
NAME=ora.orcldb  
ACTIVE_SERVERS=host01 host02 host03  
[grid@host01 ~] $
```

17. Use reasoned what-if command evaluation using `-explain` argument to analyze the effect of activating the `night` policy. Notice that **E** in the **Required** column explains the criteria used to arrive at each of the potential actions.

```
[grid@host01 ~] $ crsctl eval activate policy night -explain  
  
Stage Group 1:  
-----  
-----  
Stage Required Action  
-----  
-----  
  
1 E Starting to evaluate activation of policy 'night'  
with  
server pools (MIN_SIZE, MAX_SIZE)  
'Free(0,-1),bigpool(1,1),ora.orcldb(1,3)'.  
E Looking at other server pools to see whether  
MIN_SIZE  
value 1 of server pool 'ora.orcldb' can be met.  
E Scanning server pools with more than MIN_SIZE  
servers in  
ascending order of IMPORTANCE.
```

```

E Considering server pools (IMPORTANCE): Free(0) for
suitable servers.

E Server pool 'ora.orcldb' cannot contain server
'host04'

because the server is not in server category
'ora.hub.category' which is based on attribute
(ACTIVE_CSS_ROLE).

E Server pool 'ora.orcldb' cannot contain server
'host05'

Because the server is not in server category
'ora.hub.category' which is based on attribute
(ACTIVE_CSS_ROLE).

E Scanning server pools with MIN_SIZE or fewer servers
in
ascending order of IMPORTANCE.

E Considering server pools (IMPORTANCE): bigpool(5)
for
suitable servers.

E Considering server pool 'bigpool' because its
MIN_SIZE is
1 and it has 0 servers above MIN_SIZE.

E Relocating server 'host01' to server pool
'ora.orcldb'.

E Scanning server pools with more than MIN_SIZE
servers in
ascending order of IMPORTANCE.

E Considering server pools (IMPORTANCE): Free(0) for
suitable servers.

E Server pool 'ora.orcldb' cannot contain server
'host04'

Because the server is not in server category
'ora.hub.category' which is based on attribute
(ACTIVE_CSS_ROLE).

E Server pool 'ora.orcldb' cannot contain server
'host05'

Because the server is not in server category
'ora.hub.category' which is based on attribute
(ACTIVE_CSS_ROLE).

E Scanning server pools with MIN_SIZE or fewer servers
in
ascending order of IMPORTANCE.

E Looking at other server pools to see whether
MIN_SIZE
value 1 of server pool 'bigpool' can be met.

```

```

E      Scanning server pools with more than MIN_SIZE
servers in
          ascending order of IMPORTANCE.
E      Considering server pools (IMPORTANCE):
          Free(0),ora.orcldb(10) for suitable servers.
E      Considering server pool 'ora.orcldb' because its
MIN_SIZE
          is 1 and it has 2 servers above MIN_SIZE.
E      Server pool 'bigpool' cannot contain server 'host04'
          because the server is not in server category 'big'
which
          is based on attribute (ACTIVE_CSS_ROLE).
E      Server pool 'bigpool' cannot contain server 'host05'
          because the server is not in server category 'big'
which
          is based on attribute (ACTIVE_CSS_ROLE).
E      Relocating server 'host01' to server pool 'bigpool'.
E      Scanning server pools with more than MIN_SIZE
servers in
          ascending order of IMPORTANCE.
E      Considering server pools (IMPORTANCE): Free(0) for
          Suitable servers.
E      Server pool 'bigpool' cannot contain server 'host04'
          because the server is not in server category 'big'
which
          is based on attribute (ACTIVE_CSS_ROLE).
E      Server pool 'bigpool' cannot contain server 'host05'
          because the server is not in server category 'big'
which
          is based on attribute (ACTIVE_CSS_ROLE).

2      Y      Server 'host01' will be moved from pool 'ora.orcldb
          bigpool' to pool 'ora.orcldb bigpool'.

-----
-----
```

[grid@host01 ~]\$

18. Activate the night policy.

```
[grid@host01 ~]$ crsctl modify policyset -attr
"LAST_ACTIVATED_POLICY='night'"
```

```
[grid@host01 ~] $
```

19. Examine the server pool allocations. Confirm that the servers allocated to each pool are consistent with the night policy.

```
[grid@host01 ~] $ crsctl status serverpool
NAME=Free
ACTIVE_SERVERS=host04 host05

NAME=Generic
ACTIVE_SERVERS=

NAME=bigpool
ACTIVE_SERVERS=host01

NAME=ora.orcldb
ACTIVE_SERVERS=host02 host03

[grid@host01 ~] $
```

20. One of the side-effects of activating the night policy is that the RAC database (`orcl`) that previously ran on both `host01`, `host02`, and `host03` now only runs on two nodes. Confirm that only two instances of the `orcl` database are running. This demonstrates how Oracle Clusterware automatically starts and stops required resources when a policy change is made.

```
[grid@host01 ~] $ srvctl status database -db orcl
Instance orcl_1 is running on node host03
Instance orcl_2 is running on node host02

[grid@host01 ~] $
```

21. To illustrate the dynamic nature of policy-based cluster management, modify the `big` category so that no servers can be associated with it. Notice that the category change immediately causes a server re-allocation, which in turn causes an instance of the `orcl` database to start up.

```
[grid@host01 ~] $ crsctl modify category big -attr
"EXPRESSION='(MEMORY_SIZE > 256000)'"
CRS-2672: Attempting to start 'ora.orcl.db' on 'host01'
CRS-2676: Start of 'ora.orcl.db' on 'host01' succeeded

[grid@host01 ~] $
```

22. Reexamine the server pool allocations. Notice that no servers are associated with the `bigpool` server pool because of the change to the big category, which in turn results in three servers being allocated to the `orcldb` server pool. Confirm that `ora.orcl.db` is now placed on three servers.

```
[grid@host01 ~]$ crsctl status serverpool
NAME=Free
ACTIVE_SERVERS=host04 host05

NAME=Generic
ACTIVE_SERVERS=

NAME=bigpool
ACTIVE_SERVERS=

NAME=ora.orcldb
ACTIVE_SERVERS=host01 host02 host03

[grid@host01 ~]$ srvctl status database -db orcl
Instance orcl_1 is running on node host03
Instance orcl_2 is running on node host02
Instance orcl_3 is running on node host01
[grid@host01 ~]$
```

23. Close all terminal windows opened for this practice.

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Practices for Lesson 9: Upgrading and Patching Grid Infrastructure

Practices for Lesson 9

There are no practices for this lesson.

Practices for Lesson 10: Monitoring and Troubleshooting Oracle Clusterware

Practice 10-1: Working with CLUVFY

Overview

In this practice, you will work with CLUVFY to verify the state of various cluster components.

1. Connect to the first node of your cluster as the `grid` user. You can use the `oraenv` script to set your environment correctly.

```
[oracle@dns ~]# ssh grid@host01
grid@host01's password:

[grid@host01 ~] $ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01~] $
```

2. Determine the location of the `cluvfy` utility and its configuration file.

```
[grid@host01 ~]$ which cluvfy
/u01/app/12.2.0/grid/bin/cluvfy

[grid@host01 ~]$ cd $ORACLE_HOME/cv/admin

[grid@host01 admin]$ cat cvu_config
# Configuration file for Cluster Verification Utility(CVU)
# Version: 011405
#
# NOTE:
# 1._ Any line without a '=' will be ignored
# 2._ Since the fallback option will look into the environment
variables,
#      please have a component prefix(CV_) for each property to
define a
#      namespace.
#

#Nodes for the cluster. If CRS home is not installed, this list will
be
#picked up when -n all is mentioned in the commandline argument.
#CV_NODE_ALL=

#if enabled, cvuqdisk rpm is required on all nodes
CV_RAW_CHECK_ENABLED=TRUE

# Fallback to this distribution id
#CV_ASSUME_DISTID=OEL5
```

```
#Complete file system path of sudo binary file, default is
/usr/local/bin/sudo
CV_SUDO_BINARY_LOCATION=/usr/local/bin/sudo

#Complete file system path of pbrun binary file, default is
/usr/local/bin/pbrun
CV_PBRUN_BINARY_LOCATION=/usr/local/bin/pbrun

# Whether X-Windows check should be performed for user equivalence
with SSH
#CV_XCHK_FOR_SSH_ENABLED=TRUE

# To override SSH location
#ORACLE_SRVM_REMOTESHELL=/usr/bin/ssh

# To override SCP location
#ORACLE_SRVM_REMOTECOPY=/usr/bin/scp

# To override version used by command line parser
CV_ASSUME_CL_VERSION=12.1

# Location of the browser to be used to display HTML report
#CV_DEFAULT_BROWSER_LOCATION=/usr/bin/mozilla

# Maximum number of retries for discover DHCP server
#CV_MAX_RETRIES_DHCP_DISCOVERY=5

# Maximum CVU trace files size (in multiples of 100 MB)
#CV_TRACE_SIZE_MULTIPLIER=1

[grid@host01 admin]$
```

3. Display the stage options and stage names that can be used with the `cluvfy` utility.

```
[grid@host01 admin]$ cluvfy stage -list

USAGE:
cluvfy stage {-pre|-post} <stage-name> <stage-specific options> [-verbose]

Valid Stages are:
  -pre cfs          : pre-check for CFS setup
  -pre crsinst      : pre-check for CRS installation
  -pre acfscfg      : pre-check for ACFS Configuration.
  -pre dbinst        : pre-check for database installation
  -pre dbcfg         : pre-check for database configuration
  -pre hacfg         : pre-check for HA configuration
  -pre nodeadd       : pre-check for node addition.
  -pre appcluster    : pre-check for Oracle Clusterware
Application Cluster Installation
  -post hwos        : post-check for hardware and operating
system
```

```

-post cfs          : post-check for CFS setup
-post crsinst     : post-check for CRS installation
-post acfscfg      : post-check for ACFS Configuration.
-post hacfg        : post-check for HA configuration
-post nodeadd       : post-check for node addition.
-post nodedel       : post-check for node deletion.
-post appcluster    : post-check for Oracle Clusterware
Application Cluster Installation

```

[grid@host01 admin]\$

4. Perform a post-check for the ACFS configuration on all nodes. You may observe the I/O scheduler related warning due to the environment setup. You can safely ignore it.

```

[grid@host01 admin]$ cluvfy stage -post acfscfg -n all

Verifying ASM Integrity ...
  Verifying Node Connectivity ...
    Verifying Hosts File ...PASSED
    Verifying Check that maximum (MTU) size packet goes through
subnet ...PASSED
      Verifying subnet mask consistency for subnet "192.168.2.0"
...PASSED
      Verifying subnet mask consistency for subnet "192.168.1.0"
...PASSED
      Verifying subnet mask consistency for subnet "192.0.2.0"
...PASSED
      Verifying subnet mask consistency for subnet "192.0.3.0"
...PASSED
    Verifying Node Connectivity ...PASSED
Verifying ASM Integrity ...PASSED
Verifying ACFS Integrity ...PASSED
Verifying I/O scheduler ...
  Verifying Package: cvuqdisk-1.0.10-1 ...PASSED
Verifying I/O scheduler ...PASSED

Post-check for ACFS Configuration was successful.

CVU operation performed:           stage -post acfscfg
Date:                            Nov 15, 2017 12:28:58 PM
CVU home:                         /u01/app/12.2.0/grid/
User:                            grid

[grid@host01 admin]$

```

5. Display a list of the component names that can be checked with the `cluvfy` utility.

```
[grid@host01 admin]$ cluvfy comp -list

USAGE:
cluvfy comp <component-name> <component-specific options> [-verbose]

Valid Components are:
nodereach          : checks reachability between nodes
nodecon            : checks node connectivity
ssa                : checks shared storage accessibility
space              : checks space availability
sys                : checks minimum system requirements
clu                : checks cluster integrity
clumgr             : checks cluster manager integrity
ocr                : checks OCR integrity
olr                : checks OLR integrity
ha                 : checks HA integrity
freespace          : checks free space in CRS Home
crs                : checks CRS integrity
nodeapp            : checks node applications existence
admprv             : checks administrative privileges
peer               : compares properties with peers
software           : checks software distribution
acfs               : checks ACFS integrity
asm                : checks ASM integrity
gpnp               : checks GPnP integrity
gns                : checks GNS integrity
scan               : checks SCAN configuration
ohasd              : checks OHASD integrity
clocksync          : checks Clock Synchronization
vdisk              : checks Voting Disk configuration and UDEV
settings
  healthcheck       : checks mandatory requirements and/or best
practice recommendations
  dhcp               : checks DHCP configuration
  dns                : checks DNS configuration
  baseline           : collect and compare baselines

[grid@host01 admin]$
```

6. Display the syntax usage help for the space component check of the cluvfy utility.

```
[grid@host01 admin]$ cluvfy comp space -help

USAGE:
cluvfy comp space [-n <node_list>] -l <storage_location> -z
<disk_space>{B|K|M|G} [-verbose]

<node_list> is the comma-separated list of non-domain qualified node
names on which the test should be conducted. If "all" is specified,
then all the nodes in the cluster will be used for verification.
<storage_location> is the storage path.
<disk_space> is the required disk space, in units of
bytes(B),kilobytes(K),megabytes(M) or gigabytes(G).

DESCRIPTION:
Checks for free disk space at the location provided by '-l' option
on all the nodes in the nodelist. If no '-n' option is given, local
node is used for this check.

[grid@host01 admin]$
```

7. Verify that on each node of the cluster the /tmp directory has at least 1 GB of free space in it using the cluvfy utility. Use verbose output.

```
[grid@host01 admin]$ cluvfy comp space -n host01,host02,host03,host04,host05 -l /tmp -z 1G -verbose

Verifying Available File System Space ...
-----  

Node Name      Available          Required          Status  

-----  

host05         5.7461GB (6025216.0KB)    1GB (1048576.0KB)  passed  

host04         5.2383GB (5492736.0KB)    1GB (1048576.0KB)  passed  

host03         6.582GB (6901760.0KB)     1GB (1048576.0KB)  passed  

host02         6.7109GB (7036928.0KB)    1GB (1048576.0KB)  passed  

host01         96.9609GB (1.01670912E8KB) 1GB (1048576.0KB)  passed

Verifying Available File System Space ...PASSED

Verification of space availability was successful.

CVU operation performed:           space availability
Date:                            Nov 15, 2017 12:34:33 PM
CVU home:                         /u01/app/12.2.0/grid/
User:                            grid

[grid@host01 admin]$
```

8. Check the status of the Cluster Verify Utility (CVU) resource.

```
[grid@host01 admin]$ crsctl stat res ora.cvu -t
-----
Name          Target   State        Server           State
details
-----
Cluster Resources
-----
ora.cvu
    1      ONLINE   ONLINE     host01          STABLE
-----
[grid@host01 admin]$
```

9. Check the current interval setting of CVU resource. (21600 sec, every 6 hours)

```
[grid@host01 admin]$ crsctl stat res ora.cvu -p |grep RUN_INTERVAL
RUN_INTERVAL=21600
[grid@host01 admin]$
```

10. Attempt to modify the current interval setting of CVU resource using the `crsctl` utility

```
[grid@host01 admin]$ crsctl modify resource ora.cvu -attr
"RUN_INTERVAL=86400"
CRS-4995: The command 'Modify resource' is invalid in crsctl. Use
srvctl for this command.
[grid@host01 admin]$
```

11. Modify the current interval setting of CVU resource using the `srvctl` utility and verify the new configuration.

```
[grid@host01 admin]$ srvctl modify cvu -help
Modifies the check interval for the CVU resource.

Usage: srvctl modify cvu [-checkinterval
<check_interval_in_minutes>] [-destloc <path>]
      -checkinterval <check_interval_in_minutes> Interval in minutes
      between checks
      -destloc <path>                         Directory for copying and
      executing CVU files
      -help                                     Print usage

[grid@host01 admin]$ srvctl modify cvu -checkinterval 1440

[grid@host01 admin]$ srvctl config cvu
CVU is configured to run once every 1440 minutes
CVU is enabled.
CVU is individually enabled on nodes:
CVU is individually disabled on nodes:
```

```
[grid@host01 admin]$
```

12. Display the CVU health check report files in

/u01/app/grid/crsdata/@global/cvu/baseline/cvures. Notice that *.zip file includes the report in the xml format.

```
[grid@host01 admin]$ cd
/u01/app/grid/crsdata/@global/cvu/baseline/cvures

[grid@host01 cvures]$ ls -lrt
total 4628
-rw-r--r--. 1 grid oinstall 378755 Nov 12 23:01 cvuchekreport_11122017225622.zip
-rw-r--r--. 1 grid oinstall 377733 Nov 13 05:01 cvuchekreport_11132017045622.zip
-rw-r--r--. 1 grid oinstall 378097 Nov 13 11:01 cvuchekreport_11132017105622.zip
-rw-r--r--. 1 grid oinstall 384235 Nov 13 17:01 cvuchekreport_11132017165622.zip
-rw-r--r--. 1 grid oinstall 381945 Nov 13 23:01 cvuchekreport_11132017225622.zip
-rw-r--r--. 1 grid oinstall 381942 Nov 14 05:01 cvuchekreport_11142017045654.zip
-rw-r--r--. 1 grid oinstall 108384 Nov 14 05:01 cvuchekreport_11142017045654.txt
-rw-r--r--. 1 grid oinstall 381953 Nov 14 07:45 cvuchekreport_11142017074022.zip
-rw-r--r--. 1 grid oinstall 108384 Nov 14 07:45 cvuchekreport_11142017074022.txt
-rw-r--r--. 1 grid oinstall 391623 Nov 14 12:35 cvuchekreport_11142017122902.zip
-rw-r--r--. 1 grid oinstall 223762 Nov 14 12:35 cvuchekreport_11142017122902.txt
-rw-r--r--. 1 grid oinstall 392718 Nov 14 14:25 cvuchekreport_11142017141940.zip
-rw-r--r--. 1 grid oinstall 264055 Nov 14 14:25 cvuchekreport_11142017141940.txt
-rw-r--r--. 1 grid oinstall 381302 Nov 14 15:49 cvuchekreport_11142017154334.zip
-rw-r--r--. 1 grid oinstall 108805 Nov 14 15:49 cvuchekreport_11142017154334.txt
```

```
[grid@host01 cvures]$
```

13. Review the most current CVU health check report. (Use your report file name)

```
[grid@host01 cvures]$ more cvuchekreport_11142017154334.txt
*****
***** Summary of environment *****
*****

Date (mm/dd/yyyy)      : 11/14/2017
Time (hh:mm:ss)         : 15:43:34
Cluster name            : cluster01
Clusterware version     : 12.2.0.1.0
Grid home               : /u01/app/12.2.0/grid
Grid User               : grid
Operating system        : Linux4.1.12-94.3.6.el6uek.x86_64
Database1              : Database name      - orcl
                           Database version   - 12.2.0.1.0
                           Database home     -
                           /u01/app/oracle/product/12.
                           2.0/dbhome_1

*****
***** System requirements *****
*****
```

Verification Check	:	ASM Integrity
--------------------	---	---------------

Verification Description	:	This test checks the integrity of Oracle Automatic Storage Management across the cluster nodes.	
Verification Result	:	NOT MET	
Node Value	Status	Expected Value	Actual
host03 applicable	NOT MET	not applicable	not
host02 applicable	NOT MET	not applicable	not
host01 applicable	NOT MET	not applicable	not
...			
[grid@host01 cvures]\$			

14. Close all terminal windows opened for this practice.

Practice 10-2: Working with Cluster Health Monitor

Overview

In this practice, you will work with Cluster Health Monitor.

1. Open a terminal session to host01 as the grid user. Use the oraenv script to set the Grid environment. Display Clusterware resource information for the management repository database and the associated listener.

```
[oracle@dns ~]$ ssh grid@host01
grid@host01's password:

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ crsctl stat res ora.mgntdb -t
-----
Name          Target   State        Server      State details
-----
Cluster Resources
-----
ora.mgntdb
    1           ONLINE  ONLINE     host01      Open, STABLE
-----

[grid@host01 ~]$ crsctl stat res ora.MGMTLSNR -t
-----
Name          Target   State        Server      State details
-----
Cluster Resources
-----
ora.MGMTLSNR
    1           ONLINE  ONLINE     host01      169.254.63.97
                                                192.168.1.101
                                                192.168.2.101
                                                , STABLE
-----

[grid@host01 ~]$
```

2. Determine which node in the cluster is hosting the cluster logger service. Retrieve detailed logger information.

```
[grid@host01 ~]$ oclumon manage -get master
Master = host01
[grid@host01 ~]$ oclumon manage -get allogger -details
Logger = host01
Nodes = host01,host03,host02,host04,host05
[grid@host01 ~]$
```

3. Determine where the management repository database files are stored.

```
[grid@host01 ~]$ oclumon manage -get reppath
CHM Repository Path =
+MGMT/_MGMTDB/5D8D8980308C5A4FE053650200C094F0/DATAFILE/sysmgmtdata.
277.959605907
[grid@host01 ~]$
```

4. Run the `oclumon dumpnodeview -h` command to see the available options.

```
[grid@host01 ~]$ oclumon dumpnodeview -h
dumpnodeview verb usage
=====
The dumpnodeview command reports monitored records in the text format.
The collection of metrics for a node at a given point in time (a
timestamp) is called a node view.

* Usage
  dumpnodeview [-allnodes | -n <node1> ...] [-last <duration> |
    -s <timestamp> -e <timestamp>] [-i <interval>] [-v]
    [-system] [-process] [-device] [filesystem] [-nic]
    [-protoerr] [-cpu] [-topconsumer] [-format <format type>]
    [-dir <directory> [-append]]
```

*Where

- n <node1> ... = Dump node views for specified nodes
- allnodes = Dump node views for all nodes
- s <timestamp> = Specify start time for range dump of node views
- e <timestamp> = Specify end time for range dump of node views
 Absolute timestamp must be in "YYYY-MM-DD
 HH24:MI:SS"
 format, for example "2007-11-12 23:05:00"
- last <duration> = Dump the latest node views for a specified duration.
 Duration must be in "HH24:MI:SS" format, for example
 "00:45:00"
- i = Dump node views separated by the specified
 interval in seconds. Must be a multiple of 5.

```

-v = Dump verbose node views containing all parts.
-system, -cpu,... = Dump each indicate node view parts.
-format <format type> = format of the output.
    <format type> can be legacy, tabular, or csv.
    The default format is tabular.
-dir <directory> = Dump node view part to file(s) in spceified dir.
    With -append, will append the files. Overwrite
    otherwise.

[grid@host01 ~]$

```

5. Use the `oclumon` command to dump node views for host01, host02 and host03 collected over the 5 minutes. Notice that a node view consists of eight views when you display verbose (-v) output.

```

[grid@host01 ~]$ oclumon dumpnodeview -n host01 host02 host03 -last
"00:05:00" -v|more

-----
Node: host01 Clock: '2017-11-15 14.41.55+0000' SerialNo:16549
-----

SYSTEM:
#pcpus: 1 #cores: 2 #vcpus: 2 cphuht: N chipname: Intel(R) Xeon(R) CPU E5-
2660 0 @ 2.20GHz cpusage: 15.13 cpusystem: 5.04 cpuuser: 10.08 cpunice:
0.00 cpu
iowait: 0.43 cpusteal: 0.32 cpufreq: 2 physmemfree: 534000 physmemtotal:
10237588 mcache: 5996616 swapfree: 10230476 swaptotal: 11010044
hugepagetotal: 0 hug
epagefree: 0 hugepagesize: 2048 ior: 153 iow: 232 ios: 52 swpin: 0 swpout:
0 pgin: 153 pgout: 232 netr: 155.521 netw: 128.127 procs: 418 procsoncpu:
2 #pr
ocs_blocked: 0 rtprocs: 14 rtprocsoncpu: N/A #fds: 28160 #sysfdlimit:
6815744 #disks: 7 #nics: 5 loadavg1: 0.58 loadavg5: 0.83 loadavg15: 0.72
nicErrors:
0

TOP CONSUMERS: → format (metric_name: 'process_name(pid) utilization')
topcpu: 'ora_vktm_orcl_3(25666) 3.40' topprivmem: 'java(3353) 287068'
topshm: 'oracle-MGMTDB(24939) 842552' topfd: 'ocssd.bin(18455) 385'
topthread: 'crsd
.bin(19764) 52'

CPU:
ID system[%] user[%] nice[%] usage[%] iowait[%] steal[%]
 0      5.89   11.35    0.00   17.24     0.43     0.43
 1      4.18    8.81    0.00   12.99     0.44     0.22
Total    5.04   10.08    0.00   15.13     0.43     0.32

PROCESS:
          name           pid      #procfdlimit      cpuusage [%]
cumulative_cpu      privatemem[KB]      sharedmem[KB]
      #fd           #threads        priority            nice
      state           class

```

	ora_vktm_orcl_3	25666	65536
3.40	460900000	3820	59000
62	1	-2	0
S	RR		
	oraagent.bin	20089	65536
2.40	1809420000	60372	56916
349	34	20	0
S	TS		
...			
DISK:			
	diskname ior[KB/S] iow[KB/S] ios[#/S] #qlen wait[MSEC]		type
	xvdg 70.398 126.599 13 0 0		DISK,ASM,SYS
c1_MGMT_dsk14	0.000 0.000 0 0 0		PARTITION,ASM
c1_MGMT_dsk13	19.199 6.399 1 0 0		PARTITION,ASM
c1_MGMT_dsk12	0.000 0.000 0 0 0		PARTITION,ASM
c1_MGMT_dsk11	35.199 12.800 2 0 0		PARTITION,ASM
...			
NIC:			
	id/name netrr[KB/S] netwr[KB/S]		
neteff[KB/S]	nicerrors[#/S] pktsin[#/S] pktsout[#/S]		
errsi			
n[#/S]	errsout[#/S] indiscarded[#/S] outdiscarded[#/S]		
iunicast[#/S]	innonunicast[#/S] type latency[MSEC]		
	lo 29.661 29.661		
59.322	0 48 48		
0	0 0 0		0
48	0 N/A	0.021	
0.052	0 0 0		0
0	0 0 0		0
0	eth0 PUBLIC 0.000 0.000 N/A		
0.000	0 0 0 0 0		
0	0 0 0 0 0		0
0	0 ASM 82.029 39.524 N/A		
121.554	0 83 56		
0	0 0 0 0 0		0
83	0 PRIVATE 43.799 58.919 N/A		
102.718	0 51 62		
0	0 0 0 0 0		0
51	0 PRIVATE N/A		
FILESYSTEM:			
	mount type total[KB]		
used[KB]	available[KB] used[%]		ifree[%]
tag	/ ext3 133527880		
25505816	101232600 20 97		
GRI			
D_HOME			
PROTOCOL ERRORS:			

```

IPHdrErr: 0 IPAaddrErr: 0 IPUnkProto: 0 IPReasFail: 0 IPFragFail: 0
TCPFailedConn: 0 TCPEstRst: 0 TCPRetraSeg: 0 UDPUnkPort: 0 UDPRecvErr: 0

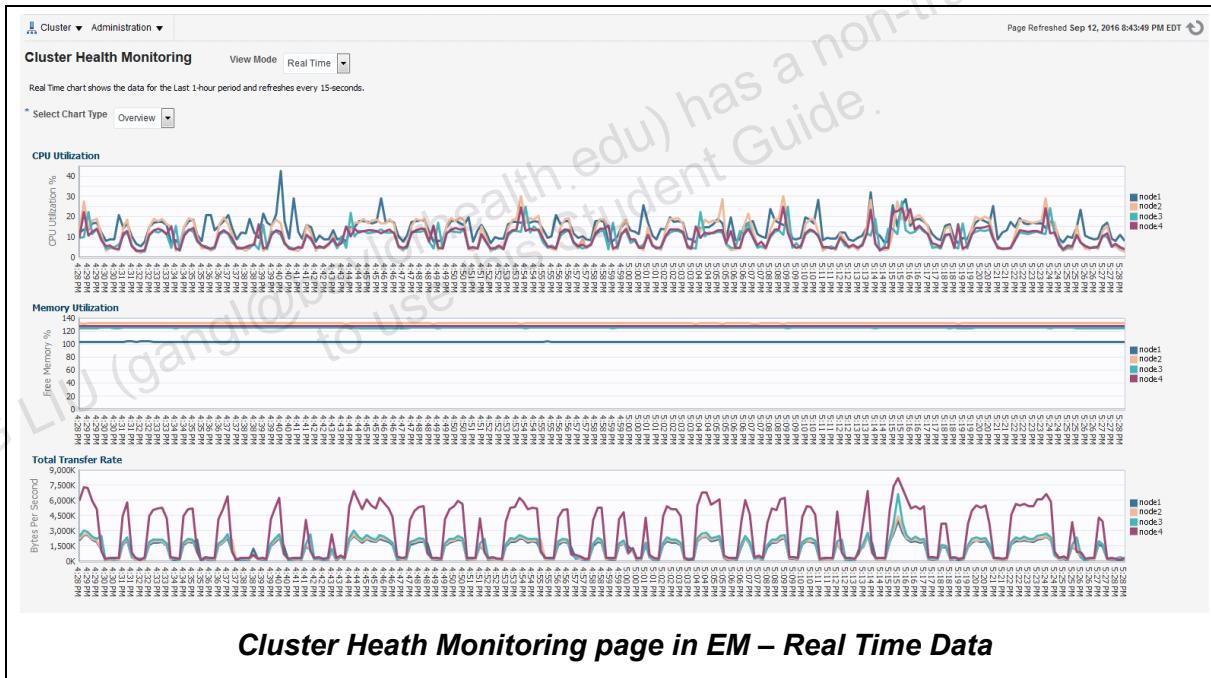
-----
Node: host01 Clock: '2017-11-15 14.42.00+0000' SerialNo:16550

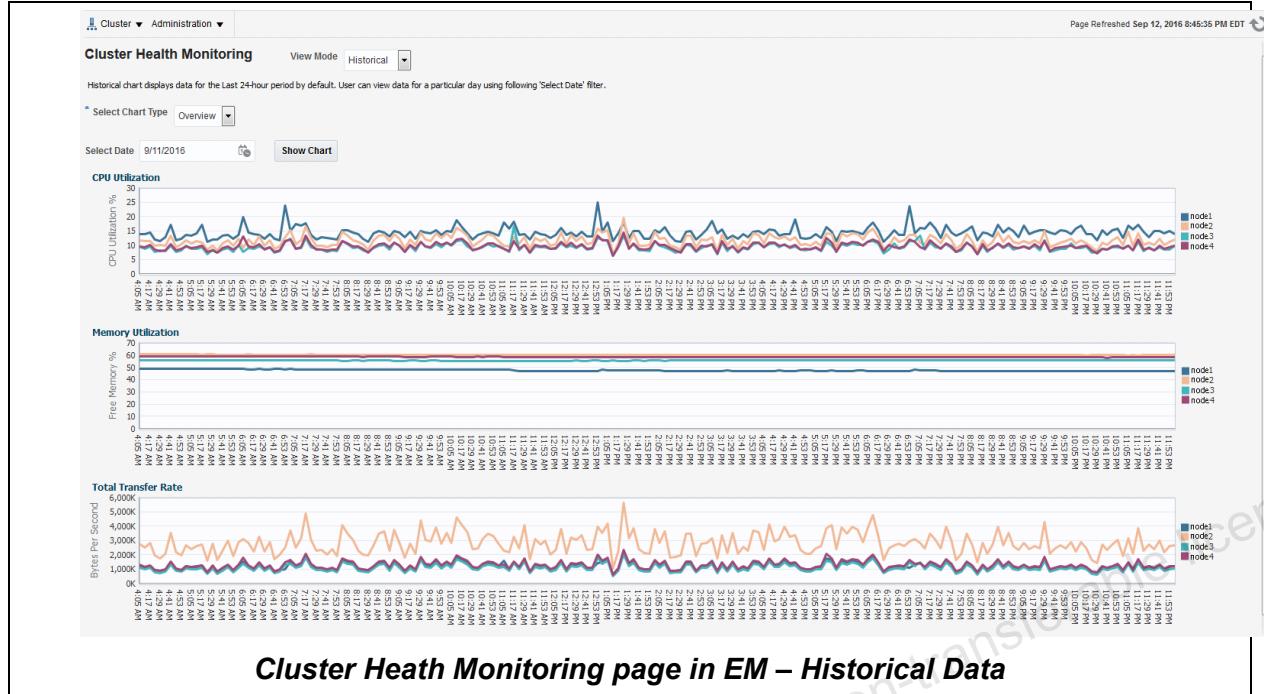
--More--

...
[grid@host01 ~] $
```

6. (**Reference Only**) In a real environment, you can also use EMCC to display the data as charts. For more information about Using Cluster Health Monitor from Enterprise Manager Cloud Control, refer to the following link.

<https://docs.oracle.com/en/database/oracle/oracle-database/12.2/atnms/chm-emcc-integration.html#GUID-DE503DBC-EFF7-4C48-A82A-0B891AE22D93>





7. Use `oclumon` to retrieve the current retention time for the management database. Set the new retention time to 61740 (increased by 2hrs, 7200 seconds). What happens?

```
[grid@host01 ~]$ oclumon manage -get repsize
```

CHM Repository Size = 54540 seconds

```
[grid@host01 ~]$ oclumon manage -repos changeretentiontime 61740
```

The Cluster Health Monitor repository is too small for the desired retention. Please first resize the repository to 2320 MB

```
[grid@host01 ~]$
```

The repository is too small to support your new retention time.

8. The repository default size is 2048 MB and is too small to support the desired retention time. Resize the repository to 2320 MB. **Note:** If you cannot resize it, try with a lower value (i.e. 2300MB)

```
[grid@host01 ~]$ oclumon manage -repos changereposize 2320
```

The Cluster Health Monitor repository was successfully resized. The new retention is 61800 seconds.

----- If the above command fails, try with a lower value. -----

```
[grid@host01 ~]$ oclumon manage -repos changereposize 2300
```

Warning: Entire data in Cluster Health Monitor repository will be deleted. Do you want to continue (Yes/No)?

Yes

The Cluster Health Monitor repository was successfully resized. The new retention is 61260 seconds.

```
[grid@host01 ~]$
```

9. Resize the repository to 1500 MB. What happens?

```
[grid@host01 ~]$ oclumon manage -repos changereposize 1500
```

Size less than default value of 2048 MB specified. Aborting resize operation.

```
[grid@host01 ~]$
```

The resize operation is not permitted for values less than the default (minimum) size.

10. Resize the repository to its original size. Again, what do you observe?

```
[grid@host01 ~]$ oclumon manage -repos changereposize 2048
```

Warning: Entire data in Cluster Health Monitor repository will be deleted. Do you want to continue(Yes/No)? **Yes**.

The Cluster Health Monitor repository was successfully resized. The new retention is 54540 seconds.

```
[grid@host01 ~]$
```

A resize operation that reduces the repository size causes all repository data to be dropped.
It takes about 4~5min to complete the resize operation.

11. Exit all terminal windows opened up for this practice.

Practice 10-3: Working with Cluster Health Advisor

Overview

In this practice, you will configure and use Cluster Health Advisor to monitor cluster nodes and your database.

1. Open a terminal window on your dns node and ssh to host01 as the grid user. Set the environment using oraenv. Check the status of the Cluster Health Advisor resource (ora.chad).

```
[oracle@dns ~]$ ssh -X grid@host01
grid@host01's password:

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ srvctl status cha
Oracle Cluster Health Analysis Service is enabled
Oracle Cluster Health Analysis Service is running on nodes: host02,
host03, host01, host04, host05

[grid@host01 ~]$ crsctl stat res ora.chad -t
-----
Name          Target  State       Server      State details
-----
Local Resources

-----
ora.chad
      ONLINE  ONLINE    host01      STABLE
      ONLINE  ONLINE    host02      STABLE
      ONLINE  ONLINE    host03      STABLE
      ONLINE  ONLINE    host04      STABLE
      ONLINE  ONLINE    host05      STABLE
-----
[grid@host01 ~]$
```

2. Check the Cluster Health Advisor resource attributes with the `crsctl stat res` command. Note the start and stop dependencies.

```
[grid@host01 ~]$ crsctl stat res ora.chad -p
NAME=ora.chad
TYPE=ora.chad.type
STATE=ONLINE
TARGET=ONLINE
ACL=owner:grid:rwx,pgrp:oinstall:r--,other::r--,group:asdba:r--
ACTIONS=action_target,user:grid
ACTION_SCRIPT=
ACTION_TIMEOUT=900
ACTION_TYPE=
AGENT_FILENAME=%CRS_HOME%/bin/oraagent%CRS_EXE_SUFFIX%
AUTO_START=restore
CHECK_INTERVAL=60
CHECK_TIMEOUT=30
CLEAN_TIMEOUT=60
CSS_CRITICAL=no
DEGREE=1
DELETE_TIMEOUT=60
DESCRIPTION=Oracle CHAD resource
ENABLED=1
ID=ora.chad
IGNORE_TARGET_ON_FAILURE=no
INSTANCE_COUNT=4
INSTANCE_FAILOVER=1
INTERMEDIATE_TIMEOUT=0
LOAD=1
LOGGING_LEVEL=1
MODEL_NAME=
MODIFY_TIMEOUT=60
MONITORED_DATABASES=orcl
NLS_LANG=
OFFLINE_CHECK_INTERVAL=0
OXR_SECTION=0
RESOURCE_GROUP=
RESTART_ATTEMPTS=5
RESTART_DELAY=0
SCRIPT_TIMEOUT=60
SERVER_CATEGORY=
START_CONCURRENCY=0
START_DEPENDENCIES=hard(global:ora.mgmtdb) pullup(global:ora.mgmtdb)
```

```

START_DEPENDENCIES_RTE_INTERNAL=
START_TIMEOUT=300
STOP_CONCURRENCY=0
STOP_DEPENDENCIES=hard(global:intermediate:ora.mgmtdb)
STOP_DEPENDENCIES_RTE_INTERNAL=
STOP_TIMEOUT=180
TARGET_DEFAULT=atleastone
TARGET_NAME=
TARGET_TYPE=
TYPE_VERSION=1.1
UPTIME_THRESHOLD=1d
USER_WORKLOAD=no
USR_ORA_ENV=
WORKLOAD_CPU=0
WORKLOAD_CPU_CAP=0
WORKLOAD_MEMORY_MAX=0
WORKLOAD_MEMORY_TARGET=0

[grid@host01 ~]$

```

3. Look at the command usage for the chactl command.

```

[grid@host01 ~]$ chactl -help

Usage:
chactl monitor cluster [-model <model_name> [-force]]
chactl monitor database -db <db_unique_name>
                           [-model <model_name> [-force]]
chactl unmonitor database -db <db_unique_name>
chactl status [cluster|database [-db <db_unique_name>]] [-verbose]
chactl config [cluster|database -db <dbname>]
chactl calibrate {cluster|database -db <db_unique_name>}
                  -model <model_name> [-force]
                  [-timeranges
'start=<time_stamp>,end=<time_stamp>,...']
                  [-kpiset 'name=<kpi_name> min=<val> max=<val>,...' ]
WHERE:
      -interval <val> : interval is in hrs
      -timeranges 'start=<time_stamp>,end=<time_stamp>,...':
                      Timestamp must be in format 'YYYY-MM-DD HH24:MI:SS'
KPI for db:
      CPUPERCENT - CPU utilization - Percent
      IOREAD - Disk read - Mbyte/sec

```

```

DBTIMEPERCALL - Database time per user call - usec/call
IOWRITE - Disk write - Mbyte/sec
IOTHROUGHPUT - Disk throughput - IO/sec
KPI for cluster:
CPUPERCENT - CPU utilization - Percent
IOREAD - Disk read - Mbyte/sec
IOWRITE - Disk write - Mbyte/sec
IOTHROUGHPUT - Disk throughput - IO/sec
chactl query diagnosis [-cluster|-db <db_uniq_name>]
[-start <time> -end <time>]
[-htmlfile <file_name>]
chactl query model [-name <model_name> [-verbose]]
chactl query repository
chactl query calibration {-cluster|-db <db_uniq_name>}
[-timeranges 'start=<time_stamp>,end=<time_stamp>,...']
[-kpiset 'name=<kpi_name> min=<val> max=<val>,...']
[-interval <val>]
WHERE:
-interval <val> : interval is in hrs
-timeranges 'start=<time_stamp>,end=<time_stamp>,...' :
Timestamp must be in format 'YYYY-MM-DD HH24:MI:SS'
KPI for db:
CPUPERCENT - CPU utilization - Percent
IOREAD - Disk read - Mbyte/sec
DBTIMEPERCALL - Database time per user call - usec/call
IOWRITE - Disk write - Mbyte/sec
IOTHROUGHPUT - Disk throughput - IO/sec
KPI for cluster:
CPUPERCENT - CPU utilization - Percent
IOREAD - Disk read - Mbyte/sec
IOWRITE - Disk write - Mbyte/sec
IOTHROUGHPUT - Disk throughput - IO/sec
chactl remove model -name <model_name>
chactl rename model -from <model_name> -to <model_name>
chactl import model -name <model_name> -file <model_file> [-force]
chactl export model -name <model_name> -file <output_file>
chactl set maxretention -time <retention_time>
chactl resize repository -entities <total # of hosts and database instances> [-force | -eval]

[grid@host01 ~]$

```

4. Review the Cluster Health Advisor status using the `chactl status` command to see what is being monitored. Check and see what model is being used to monitor the cluster and the database with the `chactl config` command. Use the `chactl query model` command to view the model details for both.

```
[grid@host01 ~]$ chactl status
monitoring nodes host01, host05, host03, host02, host04
not monitoring databases

[grid@host01 ~]$ chactl config cluster
Monitor: Enabled
Model: DEFAULT_CLUSTER

[grid@host01 ~]$ chactl config database -db orcl
Monitor: Disabled
Model: DEFAULT_DB

[grid@host01 ~]$ chactl query model -name DEFAULT_CLUSTER -verbose
Model: DEFAULT_CLUSTER
Target Type: CLUSTERWARE
Version: 12.2.0.1_0
OS Calibrated on:
Calibration Target Name:
Calibration Date:
Calibration Time Ranges:
Calibration KPIs:
Used in Target: cluster01

[grid@host01 ~]$ chactl query model -name DEFAULT_DB
Model: DEFAULT_DB
Target Type: DATABASE
Version: 12.2.0.1_0
OS Calibrated on:
Calibration Target Name:
Calibration Date:
Calibration Time Ranges:
Calibration KPIs:

[grid@host01 ~]$
```

5. The default maximum retention time for data collected by CHA is 72 hours. Verify this with the **chactl query repository** command. Change it to 84 hours.

```
[grid@host01 ~]$ chactl query repository
specified max retention time(hrs): 72
available retention time(hrs)      : 1236
available number of entities       : 17
allocated number of entities       : 2
total repository size(gb)         : 15.00
allocated repository size(gb)      : 0.08

[grid@host01 ~]$ chactl set maxretention -time 84
max retention successfully set to 84 hours

[grid@host01 ~]$ chactl query repository
specified max retention time(hrs): 84
available retention time(hrs)      : 1236
available number of entities       : 12
allocated number of entities       : 2
total repository size(gb)         : 15.00
allocated repository size(gb)      : 0.08

[grid@host01 ~]$
```

6. Calibrate a new clusterware model called **MY_CW_MODEL**. Use a time interval of just a quarter hour. What do you see?

```
[grid@host01 ~]$ date
Thu Nov 16 08:44:10 UTC 2017

[grid@host01 ~]$ chactl calibrate cluster -model MY_CW_MODEL -
timeranges 'start=2017-11-16 08:30:00,end=2017-11-16 08:44:00'

CLSCH-3729 : The number of data samples 181 is below the required
number of data samples 720.

[grid@host01 ~]$
```

The short time interval specified does not provide enough data samples (greater than 719) to calibrate the specified model.

7. You can check calibration information like number of samples available using the `chactl query calibration -cluster` command. Check available samples for both the cluster and database.

```
[grid@host01 ~]$ chactl query calibration -cluster
```

Cluster name : cluster01
 Start time : 2017-11-09 15:15:35
 End time : 2017-11-09 19:15:35
 Total Samples : 8643
 Percentage of filtered data : 100%

Disk read (ASM) (Mbyte/sec)

MEAN	MEDIAN	STDDEV	MIN	MAX
0.01	0.00	0.09	0.00	3.64
<25	<50	<75	<100	>=100
100.00%	0.00%	0.00%	0.00%	0.00%

2) Disk write (ASM) (Mbyte/sec)

MEAN	MEDIAN	STDDEV	MIN	MAX
0.01	0.00	0.17	0.00	6.46
<50	<100	<150	<200	>=200
100.00%	0.00%	0.00%	0.00%	0.00%

3) Disk throughput (ASM) (IO/sec)

MEAN	MEDIAN	STDDEV	MIN	MAX
1.10	0.00	16.59	0.00	1000.00
<5000	<10000	<15000	<20000	>=20000
100.00%	0.00%	0.00%	0.00%	0.00%

4) CPU utilization (total) (%)

MEAN	MEDIAN	STDDEV	MIN	MAX
------	--------	--------	-----	-----

```

12.73      9.20      11.30      4.00      96.70

<20        <40        <60        <80        >=80
91.65%    2.33%    4.74%    1.19%    0.09%

...
***** CTRL + C to stop *****

[grid@host01 ~]$^C

[grid@host01 ~]$ chactl query calibration -db orcl
CLSCH-3655 : Database orcl does not exist.

[grid@host01 ~]$

```

In this example the cluster has 8643 samples and the database sample doesn't exist because the database monitoring was not enabled.

8. Attempt to calibrate the DEFAULT_CLUSTER model.

```
[grid@host01 ~]$ chactl calibrate cluster -model DEFAULT_CLUSTER
CLSCH-3660 : The model "DEFAULT_CLUSTER" already exists.
```

9. Create and calibrate the MY_CW_MODEL model filtering on the key performance indicators IOREAD, IOWRITE, and IOTHROUGHPUT. Use a time interval of just an hour to save time.

Note: In a real environment, use the minimum 6 hour period, which includes all normal workload phases for the model.

```

[grid@host01 ~]$ date
Thu Nov 16 10:35:40 UTC 2017

[grid@host01 ~]$ chactl calibrate cluster -model MY_CW_MODEL -kpiset
'name=IOREAD min=0 max=60,name=IOWRITE min=0 max=80,name=IOTHROUGHPUT
min=0 max=1200' -timeranges 'start=2017-11-16 09:30:00','end=2017-11-
16 10:30:00'

[grid@host01 ~]$

```

10. Query model details using the `chactl query model` command. Which database model is active?

```
[grid@host01 ~]$ chactl query model

Models: DEFAULT_CLUSTER, DEFAULT_DB, MY_CW_MODEL

[grid@host01 ~]$ chactl query model -name DEFAULT_CLUSTER -verbose
Model: DEFAULT_CLUSTER
Target Type: CLUSTERWARE
Version: 12.2.0.1_0
OS Calibrated on: Linux amd64
Calibration Target Name: cluster02
Calibration Date: 2017-06-15 16:10:20
Calibration Time Ranges: not specified
Calibration KPIs: name=IOREAD min=0 max=60, name=IOWRITE min=0 max=80, name=IOTHROUGHPUT min=0 max=1200
Used in Target: cluster01

[grid@host01 ~]$ chactl query model -name DEFAULT_DB -verbose
Model: DEFAULT_DB
Target Type: DATABASE
Version: 12.2.0.1_0
OS Calibrated on:
Calibration Target Name:
Calibration Date:
Calibration Time Ranges:
Calibration KPIs:
Used in Target: orcl

[grid@host01 ~]$
```

11. Make `DEFAULT_DB` the active model using the `chactl monitor database` command.
Confirm the active model.

```
[grid@host01 ~]$ chactl monitor database -db orcl -model DEFAULT_DB

[grid@host01 ~]$ chactl config database -db orcl
Monitor: Enabled
Model: DEFAULT_DB

[grid@host01 ~]$
```

12. Use the `chactl query diagnosis` command and see if CHACTL has identified any issues with the cluster and database. **Note:** If the `chareport*` file already exists, delete it first.

```
[grid@host01 ~]$ ls -l chareport*
ls: cannot access chareport*: No such file or directory

[grid@host01 ~]$ chactl query diagnosis -cluster -htmlfile
chareport01.html

[grid@host01 ~]$ chactl query diagnosis -db orcl -htmlfile
chareport02.html

[grid@host01 ~]$ ls -l chareport*
-rw-r--r--. 1 grid oinstall 1611 Nov 16 10:56 chareport01.html
-rw-r--r--. 1 grid oinstall 423 Nov 16 11:06 chareport02.html

[grid@host01 ~]$ firefox chareport01.html &
[2] 11292
[1] Done
firefox chareport01.html
```

Timestamp	Target Information	Event Name	Detected/Cleared
2017-11-14 15:46:45.0	Host host02	Host Memory Consumption	detected
2017-11-14 15:47:40.0	Host host03	Host Memory Consumption	detected
2017-11-15 08:47:05.0	Host host01	Host Memory Consumption	detected

Problem	Description	Cause	Action
Host Memory Consumption	CHA detected that more memory than expected is consumed on this server. The memory is not allocated by sessions of this database.	The Cluster Health Advisor (CHA) detected an increase in memory consumption by other databases or by applications not connected to a database on this node.	Identify the top memory consumers by using the Cluster Health Monitor (CHM).

No abnormal incidents were found.

Timestamp	Target Information	Event Name	Detected/Cleared
-----------	--------------------	------------	------------------

In the cluster diagnosis example, memory consumption issues on three nodes were detected. The database diagnosis for `orcl` has reported no incidents. Note that your output may likely vary from the example above.

13. Close all terminal windows opened for this practice.

Practice 10-4: Working with Trace File Analyzer

Overview

In this practice, you will explore the enhancements to Trace File Analyzer.

1. Open a terminal window on your dns node and ssh to host01 as the grid user. Set the environment using oraenv.

```
[oracle@dns ~]$ ssh grid@host01
grid@host01's password:

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$
```

2. Check and see how much space can be freed on host01 and host01 if you were to purge logs older than two days without actually deleting anything. Use the tfactl managelogs -purge ... -dryrun command.

```
[grid@host01 ~]$ tfactl managelogs -purge -older 2d -dryrun

Output from host : host01
-----
2017-12-17 20:16:04: INFO Estimating files older than 2 days
2017-12-17 20:16:04: INFO Estimating purge for diagnostic destination
"diag/asm/+asm/+ASM1" for files ~ 394 files deleted , 11.56 MB freed ]
2017-12-17 20:16:04: INFO Estimating purge for diagnostic destination
"diag/clients/user_oracle/host_969082260_107" for files ~ 62 files
deleted , 37.61 KB freed ]
2017-12-17 20:16:04: INFO Estimating purge for diagnostic destination
"diag/clients/user_root/host_969082260_107" for files ~ 0 files
deleted , 0 bytes freed ]
2017-12-17 20:16:04: INFO Estimating purge for diagnostic destination
"diag/clients/user_grid/host_969082260_107" for files ~ 178 files
deleted , 193.04 KB freed ]
2017-12-17 20:16:04: INFO Estimating purge for diagnostic destination
"diag/crs/host01/crs" for files ~ 900 files deleted , 59.27 MB freed ]
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination
"diag/rdbms/_mgmtdb/-MGMTDB" for files ~ 718 files deleted , 9.06 MB
freed ]
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination
"diag/tnslsnr/host01/listener_scan3" for files ~ 0 files deleted , 0
bytes freed ]
```

```
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host01/listener_scan2" for files ~ 0 files deleted , 0  
bytes freed ]  
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host01/listener" for files ~ 0 files deleted , 0 bytes  
freed ]  
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host01/listener_scan1" for files ~ 0 files deleted , 0  
bytes freed ]  
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host01/asmnet1lsnr_asm" for files ~ 1 files deleted ,  
10.00 MB freed ]  
2017-12-17 20:16:05: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host01/mgmtlsnr" for files ~ 0 files deleted , 0 bytes  
freed ]  
2017-12-17 20:16:05: MESSAGE Estimation for Grid Infrastructure  
[ Files to delete : ~ 2253 files | Space to be freed : ~ 90.11 MB ]
```

Output from host : host02

```
-----  
2017-12-17 20:16:11: INFO Estimating files older than 2 days  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/rdbms/_mgmtdb/-MGMTDB" for files ~ 62 files deleted , 232.68 KB  
freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/asm/+asm/+ASM2" for files ~ 74 files deleted , 129.06 KB freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host02/listener" for files ~ 0 files deleted , 0 bytes  
freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host02/listener_scan1" for files ~ 0 files deleted , 0  
bytes freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host02/mgmtlsnr" for files ~ 0 files deleted , 0 bytes  
freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host02/asmnet1lsnr_asm" for files ~ 1 files deleted ,  
10.00 MB freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host02/listener_scan3" for files ~ 0 files deleted , 0  
bytes freed ]  
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination  
"diag/tnslnsr/host02/listener_scan2" for files ~ 0 files deleted , 0  
bytes freed ]  
2017-12-17 20:16:12: INFO Estimating purge for diagnostic destination  
"diag/crs/host02/crs" for files ~ 608 files deleted , 57.78 MB freed ]
```

```

2017-12-17 20:16:12: INFO Estimating purge for diagnostic destination
"diag/clients/user_oracle/host_3334511044_107" for files ~ 8 files
deleted , 4.20 KB freed ]
2017-12-17 20:16:12: INFO Estimating purge for diagnostic destination
"diag/clients/user_grid/host_3334511044_107" for files ~ 36 files
deleted , 17.47 KB freed ]
2017-12-17 20:16:12: MESSAGE Estimation for Grid Infrastructure
[ Files to delete : ~ 789 files | Space to be freed : ~ 68.16 MB ]

Output from host : host04
-----
2017-12-17 20:16:11: INFO Estimating files older than 2 days
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination
"diag/clients/user_oracle/host_2460245533_107" for files ~ 8 files
deleted , 9.55 KB freed ]
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination
"diag/clients/user_grid/host_2460245533_107" for files ~ 4 files
deleted , 2.34 KB freed ]
2017-12-17 20:16:11: INFO Estimating purge for diagnostic destination
"diag/crs/host04/crs" for files ~ 602 files deleted , 568.42 KB
freed ]
2017-12-17 20:16:11: MESSAGE Estimation for Grid Infrastructure
[ Files to delete : ~ 614 files | Space to be freed : ~ 580.30 KB ]

[grid@host01 ~]$
```

If the `managelogs purge... dryrun` command returns no candidate files, try a smaller `-older` value.

3. Purge the logs older than two days using the `tfactl managelogs -purge -older 2d` command.

```
[grid@host01 ~]$ tfactl managelogs -purge -older 2d

Output from host : host01
-----
2017-12-17 20:22:36: INFO Purging files older than 2 days
2017-12-17 20:22:36: INFO Cleaning Grid Infrastructure destinations
2017-12-17 20:22:40: INFO Purging diagnostic destination
"diag/asm/+asm/+ASM1" for files - 394 files deleted , 11.56 MB freed
2017-12-17 20:22:40: INFO Purging diagnostic destination
"diag/clients/user_oracle/host_969082260_107" for files - 394 files
deleted , 11.56 MB freed
2017-12-17 20:22:40: INFO Purging diagnostic destination
"diag/clients/user_root/host_969082260_107" for files - 394 files
deleted , 11.56 MB freed
```

```

2017-12-17 20:22:42: INFO Purging diagnostic destination
"diag/clients/user_grid/host_969082260_107" for files - 571 files
deleted , 11.75 MB freed

2017-12-17 20:22:53: INFO Purging diagnostic destination
"diag/crs/host01/crs" for files - 1471 files deleted , 12.74 MB freed

2017-12-17 20:22:59: INFO Purging diagnostic destination
"diag/rdbms/_mgmtDB/-MGMTDB" for files - 2189 files deleted , 21.80 MB
freed

2017-12-17 20:22:59: INFO Purging diagnostic destination
"diag/tnslsnr/host01/listener_scan3" for files - 2189 files deleted ,
21.80 MB freed

2017-12-17 20:23:00: INFO Purging diagnostic destination
"diag/tnslsnr/host01/listener_scan2" for files - 2189 files deleted ,
21.80 MB freed

2017-12-17 20:23:00: INFO Purging diagnostic destination
"diag/tnslsnr/host01/listener" for files - 2189 files deleted , 21.80
MB freed

2017-12-17 20:23:01: INFO Purging diagnostic destination
"diag/tnslsnr/host01/listener_scan1" for files - 2189 files deleted ,
21.80 MB freed

2017-12-17 20:23:01: INFO Purging diagnostic destination
"diag/tnslsnr/host01/asmnet1lsnr_asm" for files - 2190 files deleted ,
31.80 MB freed

2017-12-17 20:23:02: INFO Purging diagnostic destination
"diag/tnslsnr/host01/mgmtlsnr" for files - 2190 files deleted , 31.80
MB freed

2017-12-17 20:23:02: MESSAGE Grid Infrastructure [ Files deleted :
18549 files | Space Freed : 231.76 MB ]

```

```

-----
|          File System Variation : /u01/app/12.2.0/grid           |
+-----+-----+-----+-----+-----+-----+
| State   | Name      | Size       | Used      | Free       | Capacity   | Mount     |
+-----+-----+-----+-----+-----+-----+
| Before  | /dev/xvda2 | 133527880 | 26904760 | 99833656 | 22%        | /          |
| After   | /dev/xvda2 | 133527880 | 26839720 | 99898696 | 22%        | /          |
'-----+-----+-----+-----+-----+-----'

```

Output from host : host02

```

-----
2017-12-17 20:22:43: INFO Purging files older than 2 days
2017-12-17 20:22:43: INFO Cleaning Grid Infrastructure destinations
2017-12-17 20:22:44: INFO Purging diagnostic destination
"diag/rdbms/_mgmtDB/-MGMTDB" for files - 62 files deleted , 232.68 KB
freed

2017-12-17 20:22:46: INFO Purging diagnostic destination
"diag/asm/+asm/+ASM2" for files - 136 files deleted , 361.74 KB freed

```

```

2017-12-17 20:22:46: INFO Purging diagnostic destination
"diag/tnslnsr/host02/listener" for files - 136 files deleted , 361.74
KB freed

2017-12-17 20:22:46: INFO Purging diagnostic destination
"diag/tnslnsr/host02/listener_scan1" for files - 136 files deleted ,
361.74 KB freed

2017-12-17 20:22:47: INFO Purging diagnostic destination
"diag/tnslnsr/host02/mgmtlsnr" for files - 136 files deleted , 361.74
KB freed

2017-12-17 20:22:48: INFO Purging diagnostic destination
"diag/tnslnsr/host02/asmnet1lsnr_asm" for files - 137 files deleted ,
10.35 MB freed

2017-12-17 20:22:48: INFO Purging diagnostic destination
"diag/tnslnsr/host02/listener_scan3" for files - 137 files deleted ,
10.35 MB freed

2017-12-17 20:22:49: INFO Purging diagnostic destination
"diag/tnslnsr/host02/listener_scan2" for files - 137 files deleted ,
10.35 MB freed

2017-12-17 20:22:55: INFO Purging diagnostic destination
"diag/crs/host02/crs" for files - 743 files deleted , 10.86 MB freed

2017-12-17 20:22:55: INFO Purging diagnostic destination
"diag/clients/user_oracle/host_3334511044_107" for files - 750 files
deleted , 10.87 MB freed

2017-12-17 20:22:56: INFO Purging diagnostic destination
"diag/clients/user_grid/host_3334511044_107" for files - 785 files
deleted , 10.88 MB freed

2017-12-17 20:22:56: MESSAGE Grid Infrastructure [ Files deleted :
3295 files | Space Freed : 65.31 MB ]

```

```

-----
|          File System Variation : /u01/app/12.2.0/grid           |
+-----+-----+-----+-----+-----+-----+
| State   | Name      | Size       | Used      | Free       | Capacity   | Mount     |
+-----+-----+-----+-----+-----+-----+
| Before  | /dev/xvda2 | 30315548 | 24656472 | 4112480 | 86%        | /          |
| After   | /dev/xvda2 | 30315548 | 24615356 | 4153596 | 86%        | /          |
'-----+-----+-----+-----+-----+-----'

```

Output from host : host04

```

-----
2017-12-17 20:22:43: INFO Purging files older than 2 days
2017-12-17 20:22:43: INFO Cleaning Grid Infrastructure destinations
2017-12-17 20:22:44: INFO Purging diagnostic destination
"diag/clients/user_oracle/host_2460245533_107" for files - 7 files
deleted , 9.39 KB freed

```

```
2017-12-17 20:22:44: INFO Purging diagnostic destination  
"diag/clients/user_grid/host_2460245533_107" for files - 10 files  
deleted , 11.56 KB freed  
2017-12-17 20:22:49: INFO Purging diagnostic destination  
"diag/crs/host04/crs" for files - 616 files deleted , 582.59 KB freed  
2017-12-17 20:22:49: MESSAGE Grid Infrastructure [ Files deleted : 633  
files | Space Freed : 603.54 KB ]  
  
-----.  
| File System Variation : /u01/app/12.2.0/grid |  
+-----+-----+-----+-----+-----+-----+  
| State | Name | Size | Used | Free | Capacity | Mount |  
+-----+-----+-----+-----+-----+-----+  
| Before | /dev/xvda2 | 30315548 | 24022304 | 4746648 | 84% | / |  
| After | /dev/xvda2 | 30315548 | 24019292 | 4749660 | 84% | / |  
'-----+-----+-----+-----+-----+-----+'  
  
[grid@host01 ~] $
```

4. Close all terminals opened for this practice.

Practice 10-5: Cluster Resource Activity Log

Overview

In this practice, you will explore management and usage of the Cluster Resource Activity Log.

1. Open a new terminal window and ssh as grid to host01 and set the environment using oraenv.

```
[oracle@dns ~]$ ssh grid@host01
grid@host01's password:

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$
```

2. Check the cluster activity log maximum size using the crsctl get calog maxsize command. Change maxsize to 1536 MB.

```
[grid@host01 ~]$ crsctl get calog maxsize
CRS-6760: The maximum size of the Oracle cluster activity log is 1024
MB.

[grid@host01 ~]$ crsctl set calog maxsize 1536

[grid@host01 ~]$ crsctl get calog maxsize
CRS-6760: The maximum size of the Oracle cluster activity log is 1536
MB.

[grid@host03 ~]#
```

3. Check the cluster activity log retention time with the crsctl get calog retentiontime command. Set the retention time to 72 hours with the crsctl set calog retentiontime command. What happens? Rerun the command to set the retention time to 121 hours.

```
[grid@host01 ~]$ crsctl get calog retentiontime
CRS-6781: The retention time of the cluster activity log is 109 hours.

[grid@host01 ~]$ crsctl set calog retentiontime 72
CRS-40020: The operation will delete all entries in cluster activity
log. Rerun with '-f' option.

CRS-4000: Command Set failed, or completed with errors.
```

```
[grid@host01 ~]$ crsctl set calog retentiontime 121
[grid@host01 ~]$ crsctl get calog retentiontime
CRS-6781: The retention time of the cluster activity log is 121 hours.

[grid@host01 ~]$
```

4. Query the cluster activity log and look for entries that have occurred in the last 48 hours (2 00:00:00, 2 days). Notice that your output may vary.

```
[grid@host01 ~]$ date
Thu Nov 16 12:19:11 UTC 2017

[grid@host01 ~]$ crsctl query calog -beforetime "2017-11-16 12:19:00"
-duration "2 00:00:00"

2017-11-14 12:28:38.075000 : detected unplanned state change of
resource 'ora.asm' from state 'INTERMEDIATE' to 'ONLINE' :
15106625118966604/88/1 :

2017-11-14 12:28:38.078000 : Attempting to start 'ora.LABDG.dg' on
'host01' : 15106625118966604/88/2 :

2017-11-14 12:28:38.088000 : Starting Oracle Cluster Ready Services-
managed resources on server 'host01' : 15106625118966604/89/1 :

2017-11-14 12:28:38.093000 : Server 'host01' has been assigned to pool
'ora.orcldb'. : 15106625118966604/89/2 :

2017-11-14 12:28:38.123000 : Attempting to start 'ora.gns.vip' on
'host01' : 15106625118966604/91/1 :

2017-11-14 12:28:38.213000 : Attempting to start 'ora.ons' on
'host01' : 15106625118966604/89/3 :

2017-11-14 12:28:38.217000 : Attempting to start 'ora.cvu' on
'host01' : 15106625118966604/89/4 :

2017-11-14 12:28:38.240000 : Attempting to start 'ora.qosmserver' on
'host01' : 15106625118966604/89/5 :

2017-11-14 12:28:38.459000 : Attempting to clean 'ora.LABDG.dg' on
'host01' : 15106625118966604/88/4 :

2017-11-14 12:28:38.459000 : Start of 'ora.LABDG.dg' on 'host01'
failed : 15106625118966604/88/3 :

2017-11-14 12:28:38.476000 : Clean of 'ora.LABDG.dg' on 'host01'
succeeded : 15106625118966604/88/5 :

2017-11-14 12:28:38.969000 : Resource 'ora.cvu' has been modified. :
15106625118966604/89/6 :

2017-11-14 12:28:39.261000 : Resource 'ora.cvu' has been modified. :
15106625118966604/89/7 :

...
```

```
[grid@host01 ~]$
```

5. Query the cluster activity log and find all entries that were written to the log as the root user.

```
[grid@host01 ~]$ crsctl query calog -filter "writer_user==root"
2017-11-09 12:38:31.126000 : Starting Oracle Cluster Ready Services-
managed resources on server 'host01' : 1510231111266589/0/1 :
2017-11-09 12:38:31.127000 : Server 'host01' has been assigned to pool
'Free'. : 1510231111266589/0/2 :
2017-11-09 12:39:08.905000 : Resource 'ora.net1.network' has been
registered. : 1510231111266589/130/1 :
2017-11-09 12:39:09.806000 : Resource 'ora.ons' has been registered. :
1510231111266589/137/1 :
2017-11-09 12:39:14.318000 : Resource 'ora.gns.vip' has been
registered. : 1510231111266589/145/1 :
2017-11-09 12:39:14.879000 : Resource 'ora.gns' has been registered. :
1510231111266589/150/1 :
2017-11-09 12:39:16.031000 : Resource 'ora.gns' has been modified. :
1510231111266589/158/1 :
2017-11-09 12:39:16.246000 : Resource 'ora.gns' has been modified. :
1510231111266589/160/1 :
2017-11-09 12:39:19.533000 : Resource 'ora.scan1.vip' has been
registered. : 1510231111266589/197/1 :
2017-11-09 12:39:20.193000 : Resource 'ora.scan2.vip' has been
registered. : 1510231111266589/208/1 :
2017-11-09 12:39:20.926000 : Resource 'ora.scan3.vip' has been
registered. : 1510231111266589/223/1 :
2017-11-09 12:39:24.046000 : Resource 'ora.LISTENER_SCAN1.lsnr' has
been registered. : 1510231111266589/254/1 :
2017-11-09 12:39:24.463000 : Resource 'ora.LISTENER_SCAN2.lsnr' has
been registered. : 1510231111266589/259/1 :
2017-11-09 12:39:24.897000 : Resource 'ora.LISTENER_SCAN3.lsnr' has
been registered. : 1510231111266589/265/1 :
2017-11-09 12:39:30.989000 : Resource 'ora.qosmserver' has been
registered. : 1510231111266589/288/1 :
2017-11-09 12:39:37.308000 : Resource 'ora.LISTENER_LEAF.lsnr' has
been registered. : 1510231111266589/309/1 :
2017-11-09 12:39:40.010000 : Resource 'ora.MGMTLSNR' has been
registered. : 1510231111266589/326/1 :
2017-11-09 12:39:44.453000 : Resource 'ora.asm' has been registered. :
1510231111266589/344/1 :
2017-11-09 12:39:48.686000 : Resource 'ora.ASMNET1LSNR_ASM.lsnr' has
been registered. : 1510231111266589/377/1 :
2017-11-09 12:40:06.232000 : Start of 'ora.asm' on 'host01'
succeeded : 1510231111266589/412/11 :
...
...
```

```
[grid@host01 ~]#
```

6. Query the CALOG and find entries that were logged. Notice that your output may vary.
- For a three hour period between 1AM and 4AM and display the output in full format.
 - For a three hour period between 10AM and 1PM and display the output in full format.

```
[grid@host01 ~]$ date
Thu Nov 16 13:17:54 UTC 2017

[grid@host01 ~]$ crsctl query calog -aftertime "2017-11-16 01:00:00" -
duration "0 03:00:00" -fullfmt

CRS-40002: No activities match the query.

[grid@host01 ~]$ crsctl query calog -aftertime "2017-11-16 10:00:00" -
duration "0 03:00:00" -fullfmt

----ACTIVITY START----
timestamp : 2017-11-16 10:47:54.637000
writer_process_id : 19764
writer_process_name :
/u01/app/12.2.0/grid/bin/crsd.bin
writer_user : root
writer_group : root
writer_hostname : host01
writer_clusternode : cluster01
customer_data : MONITORED_DATABASES=orcl~
nls_product : CRS
nls_facility : CRS
nls_id : 2938
nls_field_count : 1
nls_field1 : ora.chad
nls_field1_type : 25
nls_field1_len : 0
nls_format : Resource '%s' has been modified.
nls_message : Resource 'ora.chad' has been modified.
actid : 15106741773419764/201098/1
is_planned : 1
onbehalfof_user : grid
onbehalfof_hostname : host01
entity_isoraentity : 1
entity_type : resource
entity_name : ora.chad
```

```
entity_hostname      : host01
entity_clustername   : cluster01
----ACTIVITY END----

[grid@host01 ~]$
```

7. Close all terminals opened for this practice.

Practices for Lesson 11: Making Applications Highly Available with Oracle Clusterware

Practices for Lesson 11

Overview

In this practice, you will create a series of highly available application resources running on one of the Flex Cluster Leaf Nodes.

- Establish a terminal session connected to host01 using the grid user. Configure the environment with the oraenv script.

```
[oracle@dns ~]$ ssh grid@host01
grid@host01's password:

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$
```

- Examine the cluster to identify the role for each node in the cluster.

```
[grid@host01 ~]$ crsctl get node role status -all
Node 'host01' active role is 'hub'
Node 'host02' active role is 'hub'
Node 'host03' active role is 'hub'
Node 'host04' active role is 'leaf'
Node 'host05' active role is 'leaf'

[grid@host01 ~]$
```

- Examine the cluster to identify the currently defined server pools and server allocations. Notice that currently the Hub Nodes are allocated to the orcldb server pool which contains the RAC database. Also, both Leaf Nodes are currently in the Free pool.

```
[grid@host01 ~]$ crsctl status serverpool
NAME=Free
ACTIVE_SERVERS=host04 host05

NAME=Generic
ACTIVE_SERVERS=

NAME=bigpool
ACTIVE_SERVERS=

NAME=ora.orcldb
ACTIVE_SERVERS=host01 host02 host03

[grid@host01 ~]$
```

4. Examine the cluster to identify the currently defined server categories. Note the existence of the built-in category `ora.leaf.category`. All the Leaf Nodes in the cluster are implicitly associated with this category.

```
[grid@host01 ~]$ crsctl status category

NAME=big
ACL=owner:grid:rwx,pgrp:oinstall:rwx,other::r--
ACTIVE_CSS_ROLE=hub
EXPRESSION=(MEMORY_SIZE > 256000)

NAME=ora.hub.category
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIVE_CSS_ROLE=hub
EXPRESSION=

NAME=ora.leaf.category
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIVE_CSS_ROLE=leaf
EXPRESSION=

[grid@host01 ~]$
```

5. Create a new server pool to support a series of highly available application resources on one of the Flex Cluster Leaf Nodes.

```
[grid@host01 ~]$ srvctl add serverpool -serverpool my_app_pool -min 1 -
max 1 -category "ora.leaf.category"

[grid@host01 ~]$
```

6. Reexamine the server pools. Notice that one of the leaf nodes has been allocated to the newly created server pool (`my_app_pool`).

```
[grid@host01 ~]$ crsctl status serverpool
NAME=Free
ACTIVE_SERVERS=host05

NAME=Generic
ACTIVE_SERVERS=

NAME=bigpool
ACTIVE_SERVERS=

NAME=ora.my_app_pool
ACTIVE_SERVERS=host04

NAME=ora.orcldb
ACTIVE_SERVERS=host01 host02 host03

[grid@host01 ~]$
```

7. Navigate to the directory that contains the scripts for this practice.

```
[grid@host01 ~]$ cd /stage/GRID/labs/less_11
[grid@host01 less_11]$
```

8. Examine the provided action script (`action.scr`). You will use this script to create a series of highly available application resources on a Flex Cluster Leaf Node. The application resources will all perform the following set of simple tasks.

- When the application resource is started it creates an empty file at `/tmp/<resource_name>` on the node running the application resource.
- When the application resource is stopped or cleaned the file at `/tmp/<resource_name>` is deleted.
- When the application resource is checked a test is performed to check the existence of the file at `/tmp/<resource_name>`.
- In addition, regardless of the action performed, log entries are written to the CRSD agent log file, which can be found at `/u01/app/12.2.0/grid/log/<hostname>/agent/crsd/scriptagent_grid/scriptagent_grid.log`.

```
[grid@host01 less_11]$ cat action.scr
#!/bin/sh
TOUCH=/bin/touch
RM=/bin/rm
PATH_NAME=/tmp/${_CRS_NAME}

#
# These messages go into the CRSD agent log file.
echo " ***** `date` *****"
echo "Action script '$_CRS_ACTION_SCRIPT' for resource[$_CRS_NAME] called for action $1"
#

case "$1" in
  'start')
    echo "START entry point has been called.."
    echo "Creating the file: $PATH_NAME"
    $TOUCH $PATH_NAME
    exit 0
    ;;

  'stop')
    echo "STOP entry point has been called.."
    echo "Deleting the file: $PATH_NAME"
    $RM $PATH_NAME
    exit 0
    ;;

  'check')
    echo "CHECK entry point has been called.."
    if [ -e $PATH_NAME ]; then
```

```

        echo "Check -- SUCCESS"
        exit 0
    else
        echo "Check -- FAILED"
        exit 1
    fi
    ;;

'clean')
    echo "CLEAN entry point has been called.."
    echo "Deleting the file: $PATH_NAME"
    $RM -f $PATH_NAME
    exit 0
;;

esac

[grid@host01 less_11]$

```

9. Examine the file `create_res.sh`. This file contains the commands which you will next use to create three application resources named `my_dep_res1`, `my_dep_res2`, and `my_resource`. Notice that all three resources are associated with the `my_app_pool` server pool. Notice also that `my_resource` has a mandatory (hard) dependency on `my_dep_res1`, and an optional (soft) dependency on `my_dep_res2`. Finally notice that `my_resource` also depends on the RAC database (`ora.orcl.db`). This illustrates how you can unify the management of databases and applications within a Flex Cluster.

```

[grid@host01 less_11]$ cat create_res.sh

crsctl add resource my_dep_res1 -type cluster_resource -attr
"ACTION_SCRIPT=/stage/GRID/labs/less_11/action.scr,PLACEMENT=restricted,SERVER_POOLS=ora.my_app_pool"

crsctl add resource my_dep_res2 -type cluster_resource -attr
"ACTION_SCRIPT=/stage/GRID/labs/less_11/action.scr,PLACEMENT=restricted,SERVER_POOLS=ora.my_app_pool"

crsctl add resource my_resource -type cluster_resource -attr
"ACTION_SCRIPT=/stage/GRID/labs/less_11/action.scr,PLACEMENT=restricted,SERVER_POOLS=ora.my_app_pool,START_DEPENDENCIES='hard(my_dep_res1,
global:uniform:ora.orcl.db) pullup:always(my_dep_res1,
global:ora.orcl.db)
weak(my_dep_res2)',STOP_DEPENDENCIES='hard(my_dep_res1,
global:ora.orcl.db)'"
[grid@host01 less_11]$

```

10. Execute `create_res.sh` to create the application resources.

```
[grid@host01 less_11]$ ./create_res.sh
[grid@host01 less_11]$
```

11. Examine the newly created cluster resources. Note that currently the resources exist but have not been started.

```
[grid@host01 less_11]$ crsctl status resource -t -w "NAME co my"
-----
Name          Target  State       Server      State details
-----
Cluster Resources
-----
my_dep_res1      1      OFFLINE OFFLINE           STABLE
my_dep_res2      1      OFFLINE OFFLINE           STABLE
my_resource      1      OFFLINE OFFLINE           STABLE
-----
[grid@host01 less_11]$
```

12. Establish another terminal session connected to host01 as the `oracle` user. Configure the `oracle` environment setting the `ORACLE_SID` variable to `orcl`.

```
[oracle@dns ~]$ ssh oracle@host01
oracle@host01's password:

[oracle@host01 ~]$ . oraenv
ORACLE_SID = [oracle] ? orcl
ORACLE_HOME = [/home/oracle] ?
/u01/app/oracle/product/12.2.0/dbhome_1
The Oracle base has been set to /u01/app/oracle

[oracle@host01 ~]$
```

13. Stop the `orcl` database so that you can exercise the dependency between `my_resource` and your RAC database. Confirm the database has been stopped on all nodes.

```
[oracle@host01 ~]$ srvctl stop database -db orcl

[oracle@host01 ~]$ srvctl status database -db orcl
Instance orcl_1 is not running on node host03
Instance orcl_2 is not running on node host02
Instance orcl_3 is not running on node host01

[oracle@host01 ~]$
```

14. Back in your `grid` terminal session, start the `my_resource` application resource. Notice that `my_dep_res1` and `my_dep_res2` are started automatically to fulfill the dependency definitions, and that all three resources are started on the server associated with the `my_app_pool` server pool. Note also that the `orcl` database is also started as defined in the dependency definitions for the `my_resource` application resource. This illustrates how a Flex Cluster can be used to manage a RAC database and associated application resources.

```
[grid@host01 less_11]$ crsctl start resource my_resource
CRS-2672: Attempting to start 'my_dep_res1' on 'host04'
CRS-2672: Attempting to start 'my_dep_res2' on 'host04'
CRS-2672: Attempting to start 'ora.orcl.db' on 'host03'
CRS-2672: Attempting to start 'ora.orcl.db' on 'host01'
CRS-2672: Attempting to start 'ora.orcl.db' on 'host02'
CRS-2676: Start of 'my_dep_res1' on 'host04' succeeded
CRS-2676: Start of 'my_dep_res2' on 'host04' succeeded
CRS-2676: Start of 'ora.orcl.db' on 'host03' succeeded
CRS-2676: Start of 'ora.orcl.db' on 'host01' succeeded
CRS-2676: Start of 'ora.orcl.db' on 'host02' succeeded
CRS-2672: Attempting to start 'my_resource' on 'host04'
CRS-2676: Start of 'my_resource' on 'host04' succeeded

[grid@host01 less_11]$
```

15. Re-examine the application resources to confirm their status.

```
[grid@host01 less_11]$ crsctl status resource -t -w "NAME co my"
-----
Name          Target  State       Server           State details
-----
Cluster Resources
-----
my_dep_res1      1      ONLINE   ONLINE        host04           STABLE
my_dep_res2      1      ONLINE   ONLINE        host04           STABLE
my_resource       1      ONLINE   ONLINE        host04           STABLE
-----
[grid@host01 less_11]$
```

16. Check the files under `/tmp` on the node running the application resources. You should expect to see a series of empty files, each bearing the name of one of the application resources.

```
[grid@host01 less_11]$ ssh host04 ls -la /tmp/my*
-rw-r--r-- 1 grid oinstall 0 Jun 12 06:54 /tmp/my_dep_res1
-rw-r--r-- 1 grid oinstall 0 Jun 12 06:54 /tmp/my_dep_res2
-rw-r--r-- 1 grid oinstall 0 Jun 12 06:57 /tmp/my_resource

[grid@host01 less_11]$
```

17. From the `oracle` terminal session, confirm also that your RAC database (`orcl`) started as part of starting the `my_resource` application resource.

```
[oracle@host01 ~]$ srvctl status database -db orcl
Instance orcl_1 is running on node host01
Instance orcl_2 is running on node host02
Instance orcl_3 is running on node host03

[oracle@host01 ~]$
```

18. In the `grid` terminal window, switch user (`su`) to `root` and shutdown Oracle Clusterware on the node hosting the application resources. Don't forget to set the Grid environment for `root`.

```
[grid@host01 less_11]$ su -
Password:

[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# crsctl stop cluster -n host04
CRS-2673: Attempting to stop 'ora.crsd' on 'host04'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host04'
CRS-2673: Attempting to stop 'my_resource' on 'host04'
CRS-2673: Attempting to stop 'ora.host04.vip' on 'host04'
CRS-2673: Attempting to stop 'my_dep_res2' on 'host04'
CRS-2673: Attempting to stop 'ora.chad' on 'host04'
CRS-2677: Stop of 'my_resource' on 'host04' succeeded
CRS-2673: Attempting to stop 'my_dep_res1' on 'host04'
CRS-2677: Stop of 'my_dep_res2' on 'host04' succeeded
CRS-2677: Stop of 'my_dep_res1' on 'host04' succeeded
CRS-2677: Stop of 'ora.host04.vip' on 'host04' succeeded
CRS-2677: Stop of 'ora.chad' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.host04.vip' on 'host02'
```

```

CRS-2676: Start of 'ora.host04.vip' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host04'
CRS-2677: Stop of 'ora.net1.network' on 'host04' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host04' has completed
CRS-2677: Stop of 'ora.crsd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host04'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host04'
CRS-2673: Attempting to stop 'ora.evmd' on 'host04'
CRS-2673: Attempting to stop 'ora.storage' on 'host04'
CRS-2677: Stop of 'ora.storage' on 'host04' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host04' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host04' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host04'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host04'
CRS-2677: Stop of 'ora.cssd' on 'host04' succeeded

[root@host01 ~]#

```

19. Wait a few moments, then examine the status of the server pools. You should see that the previously unallocated Leaf Node has been moved to the `my_app_pool` server pool. Exit the `root` account when finished

```

[root@host01 ~]# crsctl status serverpool
NAME=Free
ACTIVE_SERVERS=

NAME=Generic
ACTIVE_SERVERS=

NAME=bigpool
ACTIVE_SERVERS=

NAME=ora.my_app_pool
ACTIVE_SERVERS=host05

NAME=ora.orcldb
ACTIVE_SERVERS=host01 host02 host03

[root@host01 ~]# exit
Logout

[grid@host01 less_11]$

```

20. Re-examine the status of the application resources. Notice that they have been failed-over to the surviving Leaf Node.

```
[grid@host01 less_11]$ crsctl status resource -t -w "NAME co my"
-----
Name          Target  State       Server      State details
-----
Cluster Resources
-----
my_dep_res1      1      ONLINE   ONLINE     host05        STABLE
my_dep_res2      1      ONLINE   ONLINE     host05        STABLE
my_resource      1      ONLINE   ONLINE     host05        STABLE
-----
[grid@host01 less_11]$
```

21. Re-examine the contents of the /tmp directory on both Leaf Nodes. Notice that the files you saw in step 16 no longer exist and that there is newer set of files on the other Leaf Node.

```
[grid@host01 less_11]$ ssh host04 ls -la /tmp/my*
ls: cannot access /tmp/my*: No such file or directory

[grid@host01 less_11]$ ssh host05 ls -la /tmp/my*
-rw-r--r-- 1 grid oinstall 0 Jun 12 06:59 /tmp/my_dep_res1
-rw-r--r-- 1 grid oinstall 0 Jun 12 06:59 /tmp/my_dep_res2
-rw-r--r-- 1 grid oinstall 0 Jun 12 06:59 /tmp/my_resource

[grid@host01 less_11]$
```

22. Restart Oracle Clusterware as the root user on the inactive Leaf Node.

```
[grid@host01 less_11]$ su -
Password:

[root@host01 ~]# . oraenv
ORACLE_SID = [root] ? +ASM1
The Oracle base has been set to /u01/app/grid

[root@host01 ~]# crsctl start cluster -n host04
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host04'
CRS-2672: Attempting to start 'ora.evmd' on 'host04'
CRS-2676: Start of 'ora.cssdmonitor' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host04'
CRS-2672: Attempting to start 'ora.diskmon' on 'host04'
CRS-2676: Start of 'ora.diskmon' on 'host04' succeeded
CRS-2676: Start of 'ora.evmd' on 'host04' succeeded
CRS-2676: Start of 'ora.cssd' on 'host04' succeeded
```

```
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host04'
CRS-2672: Attempting to start 'ora.storage' on 'host04'
CRS-2672: Attempting to start 'ora.ctssd' on 'host04'
CRS-2676: Start of 'ora.storage' on 'host04' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host04'
CRS-2676: Start of 'ora.crsd' on 'host04' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host04'
succeeded

[root@host01 ~] #
```

23. Check server pool status. Check and see what pool the server you just started the Clusterware stack on currently belongs to.

```
[root@host01 ~]# crsctl status serverpool

NAME=Free
ACTIVE_SERVERS=host04

NAME=Generic
ACTIVE_SERVERS=

NAME=bigpool
ACTIVE_SERVERS=

NAME=ora.my_app_pool
ACTIVE_SERVERS=host05

NAME=ora.orcldb
ACTIVE_SERVERS=host01 host02 host03

[root@host01 ~] #
```

Congratulations! You have successfully configured highly available application resources on Flex Cluster Leaf Nodes

24. To finish, please exit the root account. Stop and delete the `my_resource`, `my_dep_res1`, and `my_dep_res2` resources. Delete the `ora.my_app_pool` server pool. Exit the terminal session.

```
[root@host01 ~]# exit  
logout  
[grid@host01 less_11]$ crsctl stop resource my_resource  
CRS-2673: Attempting to stop 'my_resource' on 'host05'  
CRS-2677: Stop of 'my_resource' on 'host05' succeeded  
  
[grid@host01 less_11]$ crsctl stop resource my_dep_res1  
CRS-2673: Attempting to stop 'my_dep_res1' on 'host05'  
CRS-2677: Stop of 'my_dep_res1' on 'host05' succeeded  
  
[grid@host01 less_11]$ crsctl stop resource my_dep_res2  
CRS-2673: Attempting to stop 'my_dep_res2' on 'host05'  
CRS-2677: Stop of 'my_dep_res2' on 'host05' succeeded  
  
[grid@host01 less_11]$ crsctl delete resource my_resource  
  
[grid@host01 less_11]$ crsctl delete resource my_dep_res1  
  
[grid@host01 less_11]$ crsctl delete resource my_dep_res2  
  
[grid@host01 less_11]$ crsctl delete serverpool ora.my_app_pool  
  
[grid@host01 less_11]$ exit  
logout  
Connection to host01 closed.  
  
[oracle@dns ~]$
```

Practice 11-2: Clusterware Resource Groups

Overview

In this practice, you will create a resource and a resource group. You will investigate the properties, behavior, and dependencies between the two.

1. Open a terminal window and ssh as root to host04. Manually set the environment.
Check the resource groups currently configured on cluster01.

```
[oracle@dns ~]$ ssh root@host04
root@host04's Password:

[root@host04 ~]# export ORACLE_HOME=/u01/app/12.2.0/grid

[root@host04 ~]# export PATH=$PATH:$ORACLE_HOME/bin

[root@host04 ~]# crsctl stat resourcegroup
NAME=ora.ASMNET1LSNR_ASM.lsnr
TYPE=ora.asm_listener.type
TARGET=ONLINE          , ONLINE          , ONLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03

NAME=ora.DATA.dg
TYPE=ora.diskgroup.type
TARGET=ONLINE          , ONLINE          , ONLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03

NAME=ora.FRA.dg
TYPE=ora.diskgroup.type
TARGET=ONLINE          , ONLINE          , ONLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03

NAME=ora.LISTENER.lsnr
TYPE=ora.listener.type
TARGET=ONLINE          , ONLINE          , ONLINE          , OFFLINE,
OFFLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03, OFFLINE,
OFFLINE

NAME=ora.LISTENER_LEAF.lsnr
...
[root@host04 ~]#
```

2. Create a resource called `my_apache` that controls the HTTP Apache. Check the status of the resource. Start `my_apache`.

```
[root@host04 ~]# crsctl add resource my_apache -type
generic_application -attr "START_PROGRAM='/usr/sbin/httpd -k
start',STOP_PROGRAM='/usr/sbin/httpd -k
stop',PID_FILES=/etc/httpd/run/httpd.pid"

[root@host04 ~]# crsctl stat resource my_apache
NAME=my_apache
TYPE=generic_application
TARGET=OFFLINE
STATE=OFFLINE

[root@host04 ~]# crsctl start resource my_apache
CRS-2672: Attempting to start 'my_apache' on 'host04'
CRS-2676: Start of 'my_apache' on 'host04' succeeded

[root@host04 ~]# crsctl stat resource my_apache
NAME=my_apache
TYPE=generic_application
TARGET=ONLINE
STATE=ONLINE on host04

[root@host04 ~]#
```

3. Check the characteristics of the `my_apache` resource. In Oracle Clusterware 12.2, an automatic resource group is created for any resource created without an explicit assignment to a resource group. What is the value for `RESOURCE_GROUP`?

```
[root@host04 ~]# crsctl stat resource my_apache -f
NAME=my_apache
TYPE=generic_application
STATE=ONLINE
TARGET=ONLINE
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIONS=
ACTION_SCRIPT=
ACTION_TIMEOUT=60
ACTIVE_PLACEMENT=0
AGENT_FILENAME=%CRS_HOME%/bin/appagent
AUTO_START=restore
CARDINALITY=1
CARDINALITY_ID=0
```

```
CHECK_INTERVAL=60
CHECK_PROGRAMS=
CHECK_TIMEOUT=0
CLEAN_PROGRAM=
CLEAN_TIMEOUT=60
CSS_CRITICAL=no
DEGREE=1
DELETE_TIMEOUT=60
DESCRIPTION=
ENABLED=1
ENVIRONMENT_FILE=
ENVIRONMENT_VARS=
EXECUTABLE_NAMES=
FAILOVER_DELAY=0
FAILURE_INTERVAL=0
FAILURE_THRESHOLD=0
HOSTING_MEMBERS=
ID=my_apache
IGNORE_TARGET_ON_FAILURE=no
INSTANCE_COUNT=1
INSTANCE_FAILOVER=1
INTERMEDIATE_TIMEOUT=0
LOAD=1
LOGGING_LEVEL=1
MODIFY_TIMEOUT=60
OFFLINE_CHECK_INTERVAL=0
OXR_SECTION=
PID_FILES=/etc/httpd/run/httpd.pid
PLACEMENT=balanced
RELOCATE_BY_DEPENDENCY=1
RELOCATE_KIND=offline
RESOURCE_GROUP=
RESTART_ATTEMPTS=1
RESTART_DELAY=0
SCRIPT_TIMEOUT=60
SEND_OUTPUT_ALWAYS=0
SERVER_CATEGORY=
SERVER_POOLS=
START_CONCURRENCY=0
START_DEPENDENCIES=
START_PROGRAM=/usr/sbin/httpd -k start
START_TIMEOUT=0
```

```

STOP_CONCURRENCY=0
STOP_DEPENDENCIES=
STOP_PROGRAM=/usr/sbin/httpd -k stop
STOP_TIMEOUT=0
TARGET_DEFAULT=default
TEMP_PID_LIST=
TEMP_PID_LIST@SERVERNAME (host06)=16290
UPTIME_THRESHOLD=1h
USER_WORKLOAD=no
USE_STICKINESS=0
WORKLOAD_CPU=0
WORKLOAD_CPU_CAP=0
WORKLOAD_MEMORY_MAX=0
WORKLOAD_MEMORY_TARGET=0

[root@host04 ~]#

```

Note that no resource group is specified by RESOURCE_GROUP.

4. Check the status of all resources configured. Note that a resource group called my_apache has been created and is currently running.

```

[root@host04 ~]# crsctl stat resourcegroup
NAME=my_apache
TYPE=generic_application
TARGET=ONLINE
STATE=ONLINE on host04

NAME=ora.ASMNET1LSNR_ASM.lsnr
TYPE=ora.asm_listener.type
TARGET=ONLINE , ONLINE , ONLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03
NAME=ora.DATA.dg

TYPE=ora.diskgroup.type
TARGET=ONLINE , ONLINE , ONLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03

NAME=ora.FRA.dg
TYPE=ora.diskgroup.type
TARGET=ONLINE , ONLINE , ONLINE
STATE=ONLINE on host01, ONLINE on host02, ONLINE on host03
...
[root@host04 ~]#

```

Note that a resource group called `my_apache` has been created and started.

5. Check the attributes of the `my_apache` resource group.

```
[root@host04 ~]# crsctl stat resourcegroup my_apache -f
NAME=my_apache
TYPE=generic_application
STATE=ONLINE
TARGET=ONLINE
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
AUTO_START=restore
CSS_CRITICAL=no
DESCRIPTION=
ENABLED=1
ID=RG: my_apache
IGNORE_TARGET_ON_FAILURE=no
INSTANCE_COUNT=1
LOAD=1
OXR_SECTION=0
RESTART_ATTEMPTS=1
SERVER_CATEGORY=
START_DEPENDENCIES=
STOP_DEPENDENCIES=
TARGET_DEFAULT=default
TEMP_PID_LIST@SERVERNAME (host04)=14306
UPTIME_THRESHOLD=1h
USER_WORKLOAD=no
WORKLOAD_CPU=0
WORKLOAD_CPU_CAP=0
WORKLOAD_MEMORY_MAX=0
WORKLOAD_MEMORY_TARGET=0

[root@host04 ~]#
```

6. Check the status of the `my_apache` resource and resource group. Stop the `my_apache` resource group. Recheck the resource and resource group for `my_apache`. What do you see?

```
[root@host04 ~]# crsctl stat resourcegroup my_apache
NAME=my_apache
TYPE=generic_application
TARGET=ONLINE
STATE=ONLINE on host04
```

```
[root@host04 ~]# crsctl stat resource my_apache
NAME=my_apache
TYPE=generic_application
TARGET=ONLINE
STATE=ONLINE on host04

[root@host04 ~]# crsctl stop resourcegroup my_apache
CRS-2673: Attempting to stop 'my_apache' on 'host04'
CRS-2677: Stop of 'my_apache' on 'host04' succeeded

[root@host04 ~]# crsctl stat resourcegroup my_apache
NAME=my_apache
TYPE=generic_application
TARGET=OFFLINE
STATE=OFFLINE

[root@host04 ~]# crsctl stat resource my_apache
NAME=my_apache
TYPE=generic_application
TARGET=OFFLINE
STATE=OFFLINE
```

[root@host04 ~]# Stopping the resource group will also stop dependent resources.

7. Add a cluster resource group called rg1 using the crsctl add resourcegroup command. Modify resource group rg1 by adding resource my_apache. Start the resource group rg1.

```
[root@host04 ~]# crsctl add resourcegroup rg1 -type
cluster_resourcegroup

[root@host04 ~]# crsctl modify resource my_apache -group rg1

[root@host04 ~]# crsctl start resourcegroup rg1
CRS-33672: Attempting to start resource group 'rg1' on server 'host04'
CRS-2672: Attempting to start 'my_apache' on 'host04'
CRS-2676: Start of 'my_apache' on 'host04' succeeded
CRS-33676: Start of resource group 'rg1' on server 'host04' succeeded.

[root@host04 ~]#
```

8. Check the attributes of resource group rg1 and resource my_apache.

```
[root@host05 ~]# crsctl stat resourcegroup rg1 -f
NAME=rg1
TYPE=cluster_resourcegroup
STATE=OFFLINE
TARGET=OFFLINE
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIVE_PLACEMENT=0
AUTO_START=restore
CARDINALITY=1
CARDINALITY_ID=0
CRITICAL_RESOURCES=my_apache
CSS_CRITICAL=no
DEBUG=0
DESCRIPTION=
ENABLED=1
FAILURE_INTERVAL=0
FAILURE_THRESHOLD=0
HOSTING_MEMBERS=
ID=RG: rg1
IGNORE_TARGET_ON_FAILURE=no
INSTANCE_COUNT=1
LOAD=1
OXR_SECTION=0
PLACEMENT=balanced
RELOCATE_BY_DEPENDENCY=1
RESOURCE_LIST=my_apache
RESTART_ATTEMPTS=1
SERVER_CATEGORY=
SERVER_POOLS=
START_DEPENDENCIES=
STOP_DEPENDENCIES=
TARGET_DEFAULT=default
UPTIME_THRESHOLD=1h
USER_WORKLOAD=no
WORKLOAD_CPU=0
WORKLOAD_CPU_CAP=0
WORKLOAD_MEMORY_MAX=0
WORKLOAD_MEMORY_TARGET=0

[root@host04 ~]# crsctl stat resource my_apache -f
```

```
NAME=my_apache(rg1)
TYPE=generic_application
STATE=OFFLINE
TARGET=OFFLINE
ACL=owner:root:rwx,pgrp:root:r-x,other::r--
ACTIONS=
ACTION_SCRIPT=
ACTION_TIMEOUT=60
ACTIVE_PLACEMENT=0
AGENT_FILENAME=%CRS_HOME%/bin/appagent
AUTO_START=restore
CARDINALITY=1
CARDINALITY_ID=0
CHECK_INTERVAL=60
CHECK_PROGRAMS=
CHECK_TIMEOUT=0
CLEAN_PROGRAM=
CLEAN_TIMEOUT=60
CSS_CRITICAL=no
DEGREE=1
DELETE_TIMEOUT=60
DESCRIPTION=
ENABLED=1
ENVIRONMENT_FILE=
ENVIRONMENT_VARS=
EXECUTABLE_NAMES=
FAILOVER_DELAY=0
FAILURE_INTERVAL=0
FAILURE_THRESHOLD=0
HOSTING_MEMBERS=
ID=my_apache
IGNORE_TARGET_ON_FAILURE=no
INSTANCE_COUNT=1
INSTANCE_FAILOVER=1
INTERMEDIATE_TIMEOUT=0
LOAD=1
LOGGING_LEVEL=1
MODIFY_TIMEOUT=60
OFFLINE_CHECK_INTERVAL=0
OXR_SECTION=0
PID_FILES=/etc/httpd/run/httpd.pid
PLACEMENT=balanced
```

```
RELOCATE_BY_DEPENDENCY=1
RELOCATE_KIND=offline
RESOURCE_GROUP=rg1
RESTART_ATTEMPTS=1
RESTART_DELAY=0
SCRIPT_TIMEOUT=60
SEND_OUTPUT_ALWAYS=0
SERVER_CATEGORY=
SERVER_POOLS=
START_CONCURRENCY=0
START_DEPENDENCIES=
START_PROGRAM=/usr/sbin/httpd -k start
START_TIMEOUT=0
STOP_CONCURRENCY=0
STOP_DEPENDENCIES=
STOP_PROGRAM=/usr/sbin/httpd -k stop
STOP_TIMEOUT=0
TARGET_DEFAULT=default
TEMP_PID_LIST=
TEMP_PID_LIST@SERVERNAME (host04)=16569
UPTIME_THRESHOLD=1h
USER_WORKLOAD=no
USE_STICKINESS=0
WORKLOAD_CPU=0
WORKLOAD_CPU_CAP=0
WORKLOAD_MEMORY_MAX=0
WORKLOAD_MEMORY_TARGET=0

[root@host04 ~]#
```

Note the CRITICAL_RESOURCES and RESOURCE_LIST attributes for resource group rg1 are set to my_apache.

Look at the my_apache resource attributes. The NAME is my_apache (rg1). The RESOURCE_GROUP value is rg1.

9. Stop the resource group rg1. Delete resource group rg1 and resource my_apache. What dependencies do you observe?

```
[root@host04 ~]# crsctl stop resourcegroup rg1
CRS-33673: Attempting to stop resource group 'rg1' on server 'host04'
CRS-2673: Attempting to stop 'my_apache' on 'host04'
CRS-2677: Stop of 'my_apache' on 'host04' succeeded
CRS-33677: Stop of resource group 'rg1' on server 'host04' succeeded.
```

```
[root@host04 ~]# crsctl delete resourcegroup rg1
CRS-34941: cannot delete resource group 'rg1' because it has member
resources
CRS-4000: Command Delete failed, or completed with errors.

[root@host04 ~]# crsctl delete resourcegroup rg1 -f
CRS-34941: cannot delete resource group 'rg1' because it has member
resources
CRS-4000: Command Delete failed, or completed with errors.

[root@host04 ~]# crsctl delete resource my_apache
CRS-34932: cannot delete resource 'my_apache' because it is a member
of resource group 'rg1'
CRS-4000: Command Delete failed, or completed with errors.

[root@host04 ~]# crsctl delete resource my_apache -f

[root@host04 ~]# crsctl delete resourcegroup rg1

[root@host04 ~]#
```

It is not possible to delete a resource group if it has members, even if the force option is used. Resources that belong to resource groups can be deleted if the force option is used.

10. Close all terminals opened for this practice.

Practices for Appendix A

Appendix A-1: Cleanup Script

Estimated Time: 20~25min

Assumption

- You have *NOT* configured the ASM disk groups with Oracle ASM Filter Driver (AFD). If you have configured, use `asmca` to fix the issue first working with your instructor.

1. Open a terminal window to connect to `host01` as root user. Run the `reset05.sh` script.

```
[oracle@dns ~] ssh root@host01
root@host01's Password:

[root@host01 ~]# cd /stage/GRID/solutions/less_05/catchup

[root@host01 catchup]# ./reset05.sh
#####
Task 1 of 6: Stop Clusterware on all nodes
#####
Fri Feb  2 06:58:11 UTC 2018

CRS-2673: Attempting to stop 'ora.crsd' on 'host05'
CRS-2673: Attempting to stop 'ora.crsd' on 'host04'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host05'
CRS-2673: Attempting to stop 'ora.chad' on 'host05'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host04'
CRS-2673: Attempting to stop 'ora.chad' on 'host04'
CRS-2677: Stop of 'ora.chad' on 'host05' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources
on 'host05' has completed
CRS-2677: Stop of 'ora.chad' on 'host04' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources
on 'host04' has completed
CRS-2677: Stop of 'ora.crsd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host05'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host05'
CRS-2673: Attempting to stop 'ora.evmd' on 'host05'
CRS-2673: Attempting to stop 'ora.storage' on 'host05'
CRS-2677: Stop of 'ora.crsd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host04'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host04'
```

```
CRS-2673: Attempting to stop 'ora.evmd' on 'host04'
CRS-2673: Attempting to stop 'ora.storage' on 'host04'
CRS-2677: Stop of 'ora.storage' on 'host05' succeeded
CRS-2677: Stop of 'ora.storage' on 'host04' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host05' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host05' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host04' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host04' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host05'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host04'
CRS-2677: Stop of 'ora.cssd' on 'host05' succeeded
CRS-2677: Stop of 'ora.cssd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.crsd' on 'host03'
CRS-2673: Attempting to stop 'ora.crsd' on 'host02'
CRS-2673: Attempting to stop 'ora.crsd' on 'host01'
CRS-2790: Starting shutdown of Cluster Ready Services-managed resources on server 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN1.lsnr' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host03'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.chad' on 'host03'
CRS-2677: Stop of 'ora.FRA.dg' on 'host03' succeeded
CRS-2790: Starting shutdown of Cluster Ready Services-managed resources on server 'host02'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN2.lsnr' on 'host02'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host02'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.chad' on 'host02'
CRS-2677: Stop of 'ora.DATA.dg' on 'host03' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host03'
CRS-2677: Stop of 'ora.LISTENER_SCAN1.lsnr' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.scan1.vip' on 'host03'
```

```
CRS-2677: Stop of 'ora.MGMT.dg' on 'host02' succeeded
CRS-2677: Stop of 'ora.FRA.dg' on 'host02' succeeded
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.host03.vip' on 'host03'
CRS-2677: Stop of 'ora.DATA.dg' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host02'
CRS-2677: Stop of 'ora.asm' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on
'host03'
CRS-2677: Stop of 'ora.LISTENER_SCAN2.lsnr' on 'host02'
succeeded
CRS-2673: Attempting to stop 'ora.scan2.vip' on 'host02'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host01'
CRS-2673: Attempting to stop 'ora.qosmserver' on 'host01'
CRS-2673: Attempting to stop 'ora.gns' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN3.lsnr' on
'host01'
CRS-2673: Attempting to stop 'ora.cvu' on 'host01'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.host02.vip' on 'host02'
CRS-2677: Stop of 'ora.cvu' on 'host01' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN3.lsnr' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.scan3.vip' on 'host01'
CRS-2677: Stop of 'ora.chad' on 'host02' succeeded
CRS-2677: Stop of 'ora.asm' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on
'host02'
CRS-2677: Stop of 'ora.gns' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.gns.vip' on 'host01'
CRS-2673: Attempting to stop 'ora.chad' on 'host01'
CRS-2677: Stop of 'ora.chad' on 'host03' succeeded
CRS-2677: Stop of 'ora.scan1.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.scan3.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.scan2.vip' on 'host02' succeeded
CRS-2677: Stop of 'ora.host03.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.host02.vip' on 'host02' succeeded
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
succeeded
CRS-2677: Stop of 'ora.chad' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.mgmtdb' on 'host01'
CRS-2677: Stop of 'ora.gns.vip' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host03'
```

```
CRS-2677: Stop of 'ora.ons' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host03'
CRS-2677: Stop of 'ora.net1.network' on 'host03' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources
on 'host03' has completed
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02'
succeeded
CRS-2677: Stop of 'ora.crsd' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host03'
CRS-2673: Attempting to stop 'ora.evmd' on 'host03'
CRS-2673: Attempting to stop 'ora.storage' on 'host03'
CRS-2673: Attempting to stop 'ora.ons' on 'host02'
CRS-2677: Stop of 'ora.storage' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host03'
CRS-2677: Stop of 'ora.ons' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host02'
CRS-2677: Stop of 'ora.net1.network' on 'host02' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources
on 'host02' has completed
CRS-2677: Stop of 'ora.ctssd' on 'host03' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host03' succeeded
CRS-2677: Stop of 'ora.crsd' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host02'
CRS-2673: Attempting to stop 'ora.evmd' on 'host02'
CRS-2673: Attempting to stop 'ora.storage' on 'host02'
CRS-2677: Stop of 'ora.storage' on 'host02' succeeded
CRS-2677: Stop of 'ora.qosmserver' on 'host01' succeeded
CRS-2677: Stop of 'ora_mgmtdb' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.MGMTLSNR' on 'host01'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host01'
CRS-2677: Stop of 'ora.DATA.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.FRA.dg' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2673: Attempting to stop 'ora.asm' on 'host02'
CRS-2677: Stop of 'ora.ctssd' on 'host02' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host02' succeeded
CRS-2677: Stop of 'ora.MGMTLSNR' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host01'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.host01.vip' on 'host01'
```

```
CRS-2677: Stop of 'ora.host01.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host03'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host03'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host03'
CRS-2677: Stop of 'ora.asm' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host02'
CRS-2677: Stop of 'ora.cssd' on 'host03' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host02'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host02'
CRS-2677: Stop of 'ora.cssd' on 'host02' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on
'host01'
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host01'
CRS-2677: Stop of 'ora.ons' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host01'
CRS-2677: Stop of 'ora.net1.network' on 'host01' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources
on 'host01' has completed
CRS-2677: Stop of 'ora.crsd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host01'
CRS-2673: Attempting to stop 'ora.evmd' on 'host01'
CRS-2673: Attempting to stop 'ora.storage' on 'host01'
CRS-2677: Stop of 'ora.storage' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.evmd' on 'host01' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host01'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host01'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host01'
```

```
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host01'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host01'
CRS-2673: Attempting to stop 'ora.crf' on 'host01'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host01' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host01' succeeded
CRS-2677: Stop of 'ora.crf' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host01'
CRS-2677: Stop of 'ora.mdnsd' on 'host01' succeeded
CRS-2677: Stop of 'ora.gipcd' on 'host01' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host01' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host02'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host02'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host02'
CRS-2673: Attempting to stop 'ora.crf' on 'host02'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host02'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host02' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host02' succeeded
CRS-2677: Stop of 'ora.crf' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host02'
CRS-2677: Stop of 'ora.mdnsd' on 'host02' succeeded
CRS-2677: Stop of 'ora.gipcd' on 'host02' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host02' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host03'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host03'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host03'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host03'
CRS-2673: Attempting to stop 'ora.crf' on 'host03'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host03' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host03' succeeded
CRS-2677: Stop of 'ora.mdnsd' on 'host03' succeeded
CRS-2677: Stop of 'ora.crf' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host03'
CRS-2677: Stop of 'ora.gipcd' on 'host03' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host03' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host04'
```

```

CRS-2673: Attempting to stop 'ora.crf' on 'host04'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host04'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host04'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host04'
CRS-2677: Stop of 'ora.crf' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host04'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host04' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host04' succeeded
CRS-2677: Stop of 'ora.gipcd' on 'host04' succeeded
CRS-2677: Stop of 'ora.mdnsd' on 'host04' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host04' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-2791: Starting shutdown of Oracle High Availability
Services-managed resources on 'host05'
CRS-2673: Attempting to stop 'ora.crf' on 'host05'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'host05'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host05'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'host05'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host05' succeeded
CRS-2677: Stop of 'ora.crf' on 'host05' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'host05'
CRS-2677: Stop of 'ora.mdnsd' on 'host05' succeeded
CRS-2677: Stop of 'ora.gipcd' on 'host05' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host05' has completed
CRS-4133: Oracle High Availability Services has been stopped.

#####
Task 2 of 6: Blunt force execution of ohasd
#####
Fri Feb  2 07:00:49 UTC 2018

sh: cannot set terminal process group (-1): Inappropriate ioctl
for device
sh: no job control in this shell
sh: cannot set terminal process group (-1): Inappropriate ioctl
for device
sh: no job control in this shell
sh: cannot set terminal process group (-1): Inappropriate ioctl
for device
sh: no job control in this shell

```

```
sh: cannot set terminal process group (-1): Inappropriate ioctl
for device
sh: no job control in this shell

#####
Task 3 of 6: Blast the Grid Home and asst. directories
#####
Fri Feb  2 07:00:50 UTC 2018

#####
Task 4 of 6: remove OHASD init files
#####
Fri Feb  2 07:01:22 UTC 2018

#####
Task 5 of 6: remove /etc/oratab /etc/oracle/* if they exist
#####
Fri Feb  2 07:01:23 UTC 2018

#####
Task 6 of 6: Reconfigure ASM Disks
#####
Fri Feb  2 07:01:31 UTC 2018

File is /dev/c1_DATA1_dsk1
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 17.515 s, 29.9 MB/s
File is /dev/c1_DATA1_dsk10
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 14.5236 s, 36.1 MB/s
File is /dev/c1_DATA1_dsk11
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.849 s, 33.1 MB/s
File is /dev/c1_DATA1_dsk12
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 14.9201 s, 35.1 MB/s
```

```
File is /dev/c1_DATA1_dsk13
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.412 s, 34.0 MB/s
File is /dev/c1_DATA1_dsk14
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 14.6569 s, 35.8 MB/s
File is /dev/c1_DATA1_dsk2
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.1129 s, 32.5 MB/s
File is /dev/c1_DATA1_dsk3
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.522 s, 33.8 MB/s
File is /dev/c1_DATA1_dsk4
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.8241 s, 33.1 MB/s
File is /dev/c1_DATA1_dsk5
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.9136 s, 32.9 MB/s
File is /dev/c1_DATA1_dsk6
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.836 s, 33.1 MB/s
File is /dev/c1_DATA1_dsk7
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.1377 s, 34.6 MB/s
File is /dev/c1_DATA1_dsk8
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.6603 s, 33.5 MB/s
File is /dev/c1_DATA1_dsk9
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.3633 s, 34.1 MB/s
File is /dev/c1_FRA_dsk1
500+0 records in
```

```
500+0 records out
524288000 bytes (524 MB) copied, 16.0668 s, 32.6 MB/s
File is /dev/c1_FRA_dsk10
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.0152 s, 34.9 MB/s
File is /dev/c1_FRA_dsk11
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.1954 s, 32.4 MB/s
File is /dev/c1_FRA_dsk12
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.6662 s, 33.5 MB/s
File is /dev/c1_FRA_dsk13
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.0708 s, 32.6 MB/s
File is /dev/c1_FRA_dsk14
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.3648 s, 34.1 MB/s
File is /dev/c1_FRA_dsk2
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.8046 s, 33.2 MB/s
File is /dev/c1_FRA_dsk3
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.8509 s, 33.1 MB/s
File is /dev/c1_FRA_dsk4
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.1068 s, 34.7 MB/s
File is /dev/c1_FRA_dsk5
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.2474 s, 32.3 MB/s
File is /dev/c1_FRA_dsk6
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.1595 s, 34.6 MB/s
```

```
File is /dev/c1_FRA_dsk7
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.0715 s, 32.6 MB/s
File is /dev/c1_FRA_dsk8
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.2109 s, 34.5 MB/s
File is /dev/c1_FRA_dsk9
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.8876 s, 33.0 MB/s
File is /dev/c1_SPARE_dsk1
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.6668 s, 33.5 MB/s
File is /dev/c1_SPARE_dsk10
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.924 s, 32.9 MB/s
File is /dev/c1_SPARE_dsk11
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.4294 s, 34.0 MB/s
File is /dev/c1_SPARE_dsk12
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.2076 s, 32.3 MB/s
File is /dev/c1_SPARE_dsk13
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 14.9914 s, 35.0 MB/s
File is /dev/c1_SPARE_dsk14
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.7853 s, 33.2 MB/s
File is /dev/c1_SPARE_dsk15
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.9972 s, 32.8 MB/s
File is /dev/c1_SPARE_dsk2
500+0 records in
```

```
500+0 records out
524288000 bytes (524 MB) copied, 16.051 s, 32.7 MB/s
File is /dev/c1_SPARE_dsk3
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 14.903 s, 35.2 MB/s
File is /dev/c1_SPARE_dsk5
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.6917 s, 33.4 MB/s
File is /dev/c1_SPARE_dsk6
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.2228 s, 34.4 MB/s
File is /dev/c1_SPARE_dsk7
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 16.0492 s, 32.7 MB/s
File is /dev/c1_SPARE_dsk8
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.3851 s, 34.1 MB/s
File is /dev/c1_SPARE_dsk9
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.9991 s, 32.8 MB/s
File is /dev/c1_MGMT_dsk1
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.3728 s, 34.1 MB/s
File is /dev/c1_MGMT_dsk10
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.4536 s, 33.9 MB/s
File is /dev/c1_MGMT_dsk11
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.1812 s, 34.5 MB/s
File is /dev/c1_MGMT_dsk12
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.8596 s, 33.1 MB/s
```

```
File is /dev/c1_MGMT_dsk13
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 14.9365 s, 35.1 MB/s
File is /dev/c1_MGMT_dsk14
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 121.667 s, 4.3 MB/s
File is /dev/c1_MGMT_dsk2
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.3671 s, 34.1 MB/s
File is /dev/c1_MGMT_dsk3
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.4773 s, 33.9 MB/s
File is /dev/c1_MGMT_dsk4
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.2824 s, 34.3 MB/s
File is /dev/c1_MGMT_dsk5
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.9853 s, 32.8 MB/s
File is /dev/c1_MGMT_dsk6
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.3184 s, 34.2 MB/s
File is /dev/c1_MGMT_dsk7
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.623 s, 33.6 MB/s
File is /dev/c1_MGMT_dsk8
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.1113 s, 34.7 MB/s
File is /dev/c1_MGMT_dsk9
500+0 records in
500+0 records out
524288000 bytes (524 MB) copied, 15.8357 s, 33.1 MB/s

#####
```

```
All 6 Tasks Completed
#####
Fri Feb  2 07:17:51 UTC 2018

Elapsed Real Time: 19:40.14

[root@host01 catchup]#
```

2. Optionally, delete the large files in the /var/log directory.

```
[root@host01 catchup]# ssh host01 rm -f /var/log/mess*
[root@host01 catchup]# ssh host02 rm -f /var/log/mess*
[root@host01 catchup]# ssh host03 rm -f /var/log/mess*
[root@host01 catchup]# ssh host04 rm -f /var/log/mess*
[root@host01 catchup]# ssh host05 rm -f /var/log/mess*
[root@host01 catchup]#
[root@host01 catchup]# ssh host01 rm -rf /tmp/*
[root@host01 catchup]# ssh host02 rm -rf /tmp/*
[root@host01 catchup]# ssh host03 rm -rf /tmp/*
[root@host01 catchup]# ssh host04 rm -rf /tmp/*
[root@host01 catchup]# ssh host05 rm -rf /tmp/*
[root@host01 catchup]#
```

3. Optionally, purge the deleted files that are held open to reclaim disk space.

```
[root@host01 catchup]# lsof |grep delete
java      4322      root    txt      REG            202,2
7734     745648          /u01/app/12.2.0/grid/jdk/jre/bin/java
(deleted)
...
[root@host01 catchup]# kill -9 4322
[root@host01 catchup]# lsof |grep delete
[root@host01 catchup]#
[root@host01 catchup]# ssh host02 lsof|grep delete
java      29466      root    txt      REG            202,2
7734     986836 /u01/app/12.2.0/grid/jdk/jre/bin/java (deleted)
...
[root@host01 catchup]# ssh host02 kill -9 29466
[root@host01 catchup]# ssh host02 lsof |grep delete
[root@host01 catchup]#
[root@host01 catchup]# ssh host03 lsof|grep delete
java      20160      root    txt      REG            202,2
7734     1518544 /u01/app/12.2.0/grid/jdk/jre/bin/java (deleted)
...
[root@host01 catchup]# ssh host03 kill -9 20160
[root@host01 catchup]# ssh host03 lsof|grep delete
[root@host01 catchup]#
[root@host01 catchup]# ssh host04 lsof|grep delete
nautilus  3002    oracle   19r      REG            202,2
524     1581093 /home/oracle/.local/share/gvfs-metadata/home
(deleted)
```

```

nautilus 3002 oracle 20r REG 202,2
32768 1583605 /home/oracle/.local/share/gvfs-metadata/home-
cdd03e8e.log (deleted)
java 23432 root txt REG 202,2
7734 360449 /u01/app/12.2.0/grid/jdk/jre/bin/java (deleted)
...
[root@host01 catchup]# ssh host04 kill -9 3002 23432
[root@host01 catchup]# ssh host04 lsof|grep delete
[root@host01 catchup]#
[root@host01 catchup]# ssh host05 lsof|grep delete
java 14322 root txt REG 202,2
7734 114768 /u01/app/12.2.0/grid/jdk/jre/bin/java (deleted)
...
tail 21883 grid 3r REG 202,2
5800 1430917
/u01/app/12.2.0/grid/install/root_host05.example.com_2018-01-
27_11-36-01-428452867.log (deleted)
[root@host01 catchup]# ssh host05 kill -9 14322 21883
[root@host01 catchup]# ssh host05 lsof|grep delete
[root@host01 catchup]#

```

4. Make sure the root file system (/) has enough space. The available space should be close enough to the one in the output.

```

[root@host01 catchup]# ssh host01 df -h
Filesystem Size Used Avail Use% Mounted on
/dev/xvda2 128G 7.2G 114G 6% /
tmpfs 6.0G 76K 6.0G 1% /dev/shm
/dev/xvda1 488M 133M 330M 29% /boot
/dev/xvdf1 12G 6.5G 4.7G 58% /stage

[root@host01 catchup]# ssh host02 df -h
Filesystem Size Used Avail Use% Mounted on
/dev/xvda2 29G 5.6G 22G 21% /
tmpfs 6.0G 0 6.0G 0% /dev/shm
/dev/xvda1 488M 133M 330M 29% /boot
/dev/xvdf1 12G 6.5G 4.7G 58% /stage

[root@host01 catchup]# ssh host03 df -h
Filesystem Size Used Avail Use% Mounted on
/dev/xvda2 29G 5.4G 23G 20% /
tmpfs 4.9G 0 4.9G 0% /dev/shm
/dev/xvda1 488M 107M 356M 24% /boot
/dev/xvdf1 12G 6.5G 4.7G 58% /stage

[root@host01 catchup]# ssh host04 df -h
Filesystem Size Used Avail Use% Mounted on
/dev/xvda2 29G 5.4G 23G 20% /
tmpfs 4.9G 76K 4.9G 1% /dev/shm
/dev/xvda1 488M 108M 356M 24% /boot
/dev/xvdf1 12G 6.5G 4.7G 58% /stage

[root@host01 catchup]# ssh host05 df -h

```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/xvda2	29G	5.5G	22G	20%	/
tmpfs	4.8G	76K	4.8G	1%	/dev/shm
/dev/xvda1	488M	117M	346M	26%	/boot
/dev/xvdf1	12G	6.5G	4.7G	58%	/stage

[root@host01 catchup]#

5. Now, you can run the catchup script (`less05_catchup.sh`) to install and configure the Grid Infrastructure software.
 - Refer to **Appendix A-2: Catchup for Practice 5**

Appendix A-2: Catchup Script for Practice 5

Estimated Time: 45min

1. Open a terminal window to connect to host01 as root user. Make sure the /u01/app/12.2.0/grid directory is empty.

```
[oracle@dns ~] ssh root@host01
root@host01's Password:

[root@host01 ~]# ssh host01 ls -l /u01/app/12.2.0/grid
ls: cannot access /u01/app/12.2.0/grid: No such file or directory

[root@host01 ~]# ssh host02 ls -l /u01/app/12.2.0/grid
ls: cannot access /u01/app/12.2.0/grid: No such file or directory

[root@host01 ~]# ssh host03 ls -l /u01/app/12.2.0/grid
ls: cannot access /u01/app/12.2.0/grid: No such file or directory

[root@host01 ~]# ssh host04 ls -l /u01/app/12.2.0/grid
ls: cannot access /u01/app/12.2.0/grid: No such file or directory

[root@host01 ~]# ssh host05 ls -l /u01/app/12.2.0/grid
ls: cannot access /u01/app/12.2.0/grid: No such file or directory

[root@host01 ~]#
```

2. Run the less05_catchup.sh script.

```
[root@host01 ~]# cd /stage/GRID/solutions/less_05/catchup
[root@host01 ~]# ./less05_catchup.sh

#####
Task 1 of 7: Creating software directories
#####
Fri Feb 2 20:49:27 UTC 2018

#####
Task 2 of 7: Configuring NSCD
#####
Fri Feb 2 20:49:32 UTC 2018

#####
Task 3 of 7: Configuring shell limits
#####
Fri Feb 2 20:49:36 UTC 2018

bash_profile          100%   194      0.2KB/s  00:00
bash_profile          100%   194      0.2KB/s  00:00
```

```

limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
bash_profile        100% 194       0.2KB/s  00:00
limits.conf          100% 1400      1.4KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
profile             100% 1308      1.3KB/s  00:00
#####
Task 4 of 7: Unzipping the Grid Infrastructure SW
#####
Fri Feb  2 20:49:41 UTC 2018

Archive: /stage/clusterware.zip
  creating: /u01/app/12.2.0/grid/addnode/
  inflating: /u01/app/12.2.0/grid/addnode/addnode_oraparam.ini.sbs
  inflating: /u01/app/12.2.0/grid/addnode/addnode.pl
  inflating: /u01/app/12.2.0/grid/addnode/addnode.sh
  inflating: /u01/app/12.2.0/grid/addnode/addnode_oraparam.ini
  creating: /u01/app/12.2.0/grid/assistants/
  creating: /u01/app/12.2.0/grid/assistants/jlib/
  inflating: /u01/app/12.2.0/grid/assistants/jlib/initconfig
  inflating: /u01/app/12.2.0/grid/assistants/jlib/appfwk.jar
...
/u01/app/12.2.0/grid/lib/libodm12.so -> libodmd12.so
/u01/app/12.2.0/grid/lib/libagtsh.so -> libagtsh.so.1.0
/u01/app/12.2.0/grid/lib/libclntsh.so -> libclntsh.so.12.1
/u01/app/12.2.0/grid/lib/libocci.so -> libocci.so.12.1

#####
Task 5 of 7: Installing cvuqdisk RPM
#####
Fri Feb  2 20:51:51 UTC 2018

Preparing...
#####
[100%]

```

```

package cvuqdisk-1.0.10-1.x86_64 is already installed
Preparing...
#####
package cvuqdisk-1.0.10-1.x86_64 is already installed

```

3. After a few moments, the Oracle Grid Infrastructure Setup Wizard is launched.

```

#####
Task 6 of 7: Run OUI to create the cluster
#####
Fri Feb  2 20:51:56 UTC 2018

Launching Oracle Grid Infrastructure Setup Wizard...

You can find the log of this install session at:
 /tmp/GridSetupActions2018-02-02_08-51-56PM/gridSetupActions2018-02-
02_08-51-56PM.log

```

4. Open a terminal window connected to host01 as the root user and monitor the installation progress. The following tasks are performed in this stage.

- Installing Oracle Grid Infrastructure on host01, host02, and host04
- Creating the MGMT database
- Running the CLUVFY utility

```

[oracle@dns ~]$ ssh root@host01
root@host01's password:

[root@host01 ~]# tail -f /tmp/GridSetupActions2018-02-02_08-51-
56PM/gridSetupActions2018-02-02_08-51-56PM.log

...
INFO: [Timestamp] Successfully executed the flow in SILENT mode
INFO: [Timestamp] Finding the most appropriate exit status for the
current application
INFO: [Timestamp] inventory location is/u01/app/oraInventory
INFO: [Timestamp] Finding the most appropriate exit status for the
current application
INFO: [Timestamp] Exit Status is 0

```

```
INFO: [Timestamp] Shutdown Oracle Grid Infrastructure 12c Release 2
Installer
```

5. Switch to the first terminal window to monitor the rest of tasks.

You can find the log of this install session at:

```
/tmp/GridSetupActions2018-02-02_08-51-56PM/gridSetupActions2018-02-
02_08-51-56PM.log
```

As a root user, execute the following script(s):

1. /u01/app/oraInventory/orainstRoot.sh
2. /u01/app/12.2.0/grid/root.sh

Execute /u01/app/oraInventory/orainstRoot.sh on the following nodes:

```
[host01, host02, host04]
```

Execute /u01/app/12.2.0/grid/root.sh on the following nodes:

```
[host01, host02, host04]
```

Execute the script on the local node first. After successful completion, you can execute the script in parallel on all other nodes. Oracle recommends that the script executes on all HUB nodes before executing the script on LEAF nodes.

Successfully Setup Software.

As install user, execute the following command to complete the configuration.

```
/u01/app/12.2.0/grid/gridSetup.sh -executeConfigTools -
responseFile /stage/GRID/solutions/less_05/catchup/less05_grid.rsp [-
silent]
```

Moved the install session logs to:

```
/u01/app/oraInventory/logs/GridSetupActions2018-02-02_08-51-56PM
```

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.

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.

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.

```
Check /u01/app/12.2.0/grid/install/root host01.example.com 2018-02-
```

```

02_21-00-27-864427973.log for the output of root script
Check /u01/app/12.2.0/grid/install/root_host02.example.com_2018-02-
02_21-13-56-432788347.log for the output of root script
Check /u01/app/12.2.0/grid/install/root_host04.example.com_2018-02-
02_21-19-31-733458889.log for the output of root script

#####
Task 7 of 7: Run the config tools to complete cluster config
#####
Fri Feb  2 21:23:29 UTC 2018

Setting the invPtrLoc to /u01/app/12.2.0/grid/oraInst.loc

perform - mode is starting for action: configure

perform - mode finished for action: configure

You can see the log file:
/u01/app/12.2.0/grid/cfgtoollogs/oui/configActions2018-02-02_09-23-
30-PM.log

Post configuration completed successfully

Fri Feb  2 21:25:17 UTC 2018
Elapsed Real Time: 35:49.72

[root@host01 catchup]#

```

6. Open a new terminal window connected to host01 as the grid user. Check the status of the cluster. Ensure that all the listed services are online on all cluster nodes.

```

[oracle@dns ~]$ ssh grid@host01
grid@host01's password:

[grid@host01 ~]$ olsnodes -s -a
host01  Active   Hub
host02  Active   Hub
host04  Active   Leaf

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The oracle base has been set to /u01/app/grid

[grid@host01 ~]$ crsctl check cluster -all
*****
host01:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
host02:

```

```

CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
host04:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
[grid@host01 ~]$ crsctl stat res -t

-----
Name          Target  State        Server           State
details

-----
Local Resources

-----  

ora.ASMNET1LSNR_ASM.lsnr
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
ora.DATA.dg
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
ora.LISTENER.lsnr
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
ora.LISTENER_LEAF.lsnr
    OFFLINE OFFLINE  host04      STABLE
ora.MGMT.dg
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
ora.chad
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
    ONLINE  ONLINE   host04      STABLE
ora.net1.network
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
ora.ons
    ONLINE  ONLINE   host01      STABLE
    ONLINE  ONLINE   host02      STABLE
ora.proxy_advm
    OFFLINE OFFLINE  host01      STABLE
    OFFLINE OFFLINE  host02      STABLE
-----
Cluster Resources

-----  

ora.LISTENER_SCAN1.lsnr
    1      ONLINE  ONLINE   host02      STABLE
ora.LISTENER_SCAN2.lsnr
    1      ONLINE  ONLINE   host01      STABLE
ora.LISTENER_SCAN3.lsnr

```

1	ONLINE	ONLINE	host01	STABLE
ora.MGMTLSNR				
1	ONLINE	ONLINE	host01	
169.254.127.250	1	.		
168.1.101	, STABLE			
ora.asm				
1	ONLINE	ONLINE	host01	
Started	, STABLE			
2	ONLINE	ONLINE	host02	
Started	, STABLE			
3	OFFLINE	OFFLINE		STABLE
ora.cvu				
1	ONLINE	ONLINE	host01	STABLE
ora.gns				
1	ONLINE	ONLINE	host01	STABLE
ora.gns.vip				
1	ONLINE	ONLINE	host01	STABLE
ora.host01.vip				
1	ONLINE	ONLINE	host01	STABLE
ora.host02.vip				
1	ONLINE	ONLINE	host02	STABLE
ora_mgmtdb				
1	ONLINE	ONLINE	host01	Open, STABLE
ora_qosmserver				
1	ONLINE	ONLINE	host01	STABLE
ora_scan1.vip				
1	ONLINE	ONLINE	host02	STABLE
ora_scan2.vip				
1	ONLINE	ONLINE	host01	STABLE
ora_scan3.vip				
1	ONLINE	ONLINE	host01	STABLE

[grid@host01 ~]\$

7. Now, you can run the catchup script (`less06_catchup.sh`).

- Refer to **Appendix A-3: Catchup for Practice 6**

Appendix A-3: Catchup Script for Practice 6

Estimated Time: 60min

1. Open a terminal window to connect to host01 as root user. Make sure that the root file system (/) has at least 8GB of free space.

```
[oracle@dns ~] ssh root@host01
root@host01's Password:

[root@host01 ~]# ssh host01 df -h
Filesystem      Size   Used  Avail Use% Mounted on
/dev/xvda2     128G   18G   104G  15% /
tmpfs          6.0G  641M   5.4G  11% /dev/shm
/dev/xvda1     488M  133M   330M  29% /boot
/dev/xvdf1      12G   6.5G   4.7G  58% /stage

[root@host01 ~]#
[root@host01 ~]# ssh host02 df -h
Filesystem      Size   Used  Avail Use% Mounted on
/dev/xvda2     29G   15G   14G  53% /
tmpfs          6.0G  640M   5.4G  11% /dev/shm
/dev/xvda1     488M  133M   330M  29% /boot
/dev/xvdf1      12G   6.5G   4.7G  58% /stage

[root@host01 ~]#
[root@host01 ~]# ssh host03 df -h
Filesystem      Size   Used  Avail Use% Mounted on
/dev/xvda2     29G   5.5G   23G  20% /
tmpfs          4.9G    0   4.9G   0% /dev/shm
/dev/xvda1     488M  107M   356M  24% /boot
/dev/xvdf1      12G   6.5G   4.7G  58% /stage

[root@host01 ~]#
[root@host01 ~]# ssh host04 df -h
Filesystem      Size   Used  Avail Use% Mounted on
/dev/xvda2     29G   15G   14G  52% /
tmpfs          4.9G   76K   4.9G   1% /dev/shm
/dev/xvda1     488M  108M   356M  24% /boot
/dev/xvdf1      12G   6.5G   4.7G  58% /stage

[root@host01 ~]#
[root@host01 ~]# ssh host05 df -h
Filesystem      Size   Used  Avail Use% Mounted on
/dev/xvda2     29G   5.6G   22G  21% /
tmpfs          4.8G   76K   4.8G   1% /dev/shm
/dev/xvda1     488M  117M   346M  26% /boot
/dev/xvdf1      12G   6.5G   4.7G  58% /stage

[root@host01 ~]#
```

2. Run the less06_catchup.sh script.

```
[root@host01 ~]# cd /stage/GRID/solutions/less_06/catchup
[root@host01 catchup]# ./less06_catchup.sh

#####
Task 1 of 9: Use OUI to add host03 to the cluster
#####
Sat Dec  9 06:50:52 UTC 2017

Prepare Configuration in progress.

Prepare Configuration successful.
..... 7% Done.

Copy Files to Remote Nodes in progress.
..... 12% Done.
..... 17% Done.
.....
Copy Files to Remote Nodes successful.
You can find the log of this install session at:
/u01/app/oraInventory/logs/addNodeActions2017-12-09_06-50-55-AM.log

Instantiate files in progress.

Instantiate files successful.
..... 49% Done.

Saving cluster inventory in progress.
..... 83% Done.

Saving cluster inventory successful.
The Cluster Node Addition of /u01/app/12.2.0/grid was successful.
Please check '/u01/app/12.2.0/grid/inventory/silentInstall2017-12-09_6-50-53-AM.log' for more details.

Setup Oracle Base in progress.

Setup Oracle Base successful.
..... 90% Done.

Update Inventory in progress.

Update Inventory successful.
..... 97% Done.

As a root user, execute the following script(s):
1. /u01/app/oraInventory/orainstRoot.sh
2. /u01/app/12.2.0/grid/root.sh

Execute /u01/app/oraInventory/orainstRoot.sh on the following nodes:
[host03]
```

```
Execute /u01/app/12.2.0/grid/root.sh on the following nodes:  
[host03]
```

The scripts can be executed in parallel on all the nodes.

```
..... 100% Done.  
Successfully Setup Software.
```

```
#####  
Task 2 of 9: Run root scripts  
#####  
Sat Dec  9 06:56:39 UTC 2017
```

```
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.  
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= grid  
ORACLE_HOME= /u01/app/12.2.0/grid  
Copying dbhome to /usr/local/bin ...  
Copying oraenv to /usr/local/bin ...  
Copying coraenv to /usr/local/bin ...
```

Creating /etc/oratab file...

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.

Now product-specific root actions will be performed.

Relinking oracle with rac_on option

Using configuration parameter file:

/u01/app/12.2.0/grid/crs/install/crsconfig_params

The log of current session can be found at:

/u01/app/grid/crsdata/host03/crsconfig/rootcrs_host03_2017-12-09_06-57-02AM.log

2017/12/09 06:57:09 CLSRSC-594: Executing installation step 1 of 19:
'SetupTFA'.

2017/12/09 06:57:09 CLSRSC-4001: Installing Oracle Trace File Analyzer (TFA) Collector.

2017/12/09 06:57:41 CLSRSC-4002: Successfully installed Oracle Trace File Analyzer (TFA) Collector.

2017/12/09 06:57:41 CLSRSC-594: Executing installation step 2 of 19:
'ValidateEnv'.

2017/12/09 06:57:44 CLSRSC-363: User ignored prerequisites during installation

2017/12/09 06:57:45 CLSRSC-594: Executing installation step 3 of 19:
'CheckFirstNode'.

2017/12/09 06:57:45 CLSRSC-594: Executing installation step 4 of 19:

```
'GenSiteGUIDs'.
2017/12/09 06:57:46 CLSRSC-594: Executing installation step 5 of 19:
'SaveParamFile'.
2017/12/09 06:57:50 CLSRSC-594: Executing installation step 6 of 19:
'SetupOSD'.
2017/12/09 06:57:52 CLSRSC-594: Executing installation step 7 of 19:
'CheckCRSConfig'.
2017/12/09 06:57:53 CLSRSC-594: Executing installation step 8 of 19:
'SetupLocalGPNP'.
2017/12/09 06:57:55 CLSRSC-594: Executing installation step 9 of 19:
'ConfigOLR'.
2017/12/09 06:57:58 CLSRSC-594: Executing installation step 10 of 19:
'ConfigCHMOS'.
2017/12/09 06:57:59 CLSRSC-594: Executing installation step 11 of 19:
'CreateOHASD'.
2017/12/09 06:58:00 CLSRSC-594: Executing installation step 12 of 19:
'ConfigOHASD'.
2017/12/09 06:58:16 CLSRSC-330: Adding Clusterware entries to file
'oracle-ohasd.conf'
2017/12/09 06:58:36 CLSRSC-594: Executing installation step 13 of 19:
'InstallAFD'.
2017/12/09 06:58:38 CLSRSC-594: Executing installation step 14 of 19:
'InstallACFS'.
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host03'
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host03' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Oracle High Availability Services has been started.
2017/12/09 06:59:20 CLSRSC-594: Executing installation step 15 of 19:
'InstallKA'.
2017/12/09 06:59:22 CLSRSC-594: Executing installation step 16 of 19:
'InitConfig'.
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host03'
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host03' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Oracle High Availability Services has been started.
CRS-2791: Starting shutdown of Oracle High Availability Services-
managed resources on 'host03'
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host03'
CRS-2677: Stop of 'ora.drivers.acfs' on 'host03' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host03' has completed
CRS-4133: Oracle High Availability Services has been stopped.
2017/12/09 06:59:36 CLSRSC-594: Executing installation step 17 of 19:
'StartCluster'.
CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.mdnscd' on 'host03'
CRS-2672: Attempting to start 'ora.evmd' on 'host03'
CRS-2676: Start of 'ora.mdnscd' on 'host03' succeeded
CRS-2676: Start of 'ora.evmd' on 'host03' succeeded
```

```

CRS-2672: Attempting to start 'ora.gpnpd' on 'host03'
CRS-2676: Start of 'ora.gpnpd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'host03'
CRS-2676: Start of 'ora.gipcd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host03'
CRS-2676: Start of 'ora.cssdmonitor' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host03'
CRS-2672: Attempting to start 'ora.diskmon' on 'host03'
CRS-2676: Start of 'ora.diskmon' on 'host03' succeeded
CRS-2676: Start of 'ora.cssd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host03'
CRS-2672: Attempting to start 'ora.ctssd' on 'host03'
CRS-2676: Start of 'ora.ctssd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host03'
CRS-2676: Start of 'ora.crf' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host03'
CRS-2676: Start of 'ora.crsd' on 'host03' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host03'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-6017: Processing resource auto-start for servers: host03
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN2.lsnr' on 'host01'
CRS-2672: Attempting to start 'ora.net1.network' on 'host03'
CRS-2672: Attempting to start 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
CRS-2672: Attempting to start 'ora.chad' on 'host03'
CRS-2676: Start of 'ora.net1.network' on 'host03' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN2.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.scan2.vip' on 'host01'
CRS-2672: Attempting to start 'ora.ons' on 'host03'
CRS-2677: Stop of 'ora.scan2.vip' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.scan2.vip' on 'host03'
CRS-2676: Start of 'ora.chad' on 'host03' succeeded
CRS-2676: Start of 'ora.scan2.vip' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN2.lsnr' on 'host03'
CRS-2676: Start of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.ons' on 'host03' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN2.lsnr' on 'host03' succeeded
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-6016: Resource auto-start has completed for server host03
CRS-6024: Completed start of Oracle Cluster Ready Services-managed
resources
CRS-4123: Oracle High Availability Services has been started.
2017/12/09 07:01:54 CLSRSC-343: Successfully started Oracle
Clusterware stack
2017/12/09 07:01:54 CLSRSC-594: Executing installation step 18 of 19:
'ConfigNode'.
clscfg: EXISTING configuration version 5 detected.
clscfg: version 5 is 12c Release 2.
Successfully accumulated necessary OCR keys.
Creating OCR keys for user 'root', privgrp 'root'..

```

```
Operation successful.  
2017/12/09 07:02:11 CLSRSC-594: Executing installation step 19 of 19:  
'PostConfig'.  
2017/12/09 07:02:21 CLSRSC-325: Configure Oracle Grid Infrastructure  
for a Cluster ... succeeded
```

```
#####
Task 3 of 9: Use OUI to add host05 to the cluster
#####
Sat Dec  9 07:02:21 UTC 2017
```

```
[WARNING] [INS-13014] Target environment does not meet some optional  
requirements.
```

```
CAUSE: Some of the optional prerequisites are not met. See logs for  
details. /u01/app/oraInventory/logs/addNodeActions2017-12-09_07-02-23-  
AM.log
```

```
ACTION: Identify the list of failed prerequisite checks from the  
log: /u01/app/oraInventory/logs/addNodeActions2017-12-09_07-02-23-  
AM.log. Then either from the log file or from installation manual find  
the appropriate configuration to meet the prerequisites and fix it  
manually.
```

```
Prepare Configuration in progress.
```

```
Prepare Configuration successful.
```

```
..... 7% Done.
```

```
Copy Files to Remote Nodes in progress.
```

```
..... 12% Done.
```

```
..... 17% Done.
```

```
.....
```

```
Copy Files to Remote Nodes successful.
```

```
You can find the log of this install session at:
```

```
/u01/app/oraInventory/logs/addNodeActions2017-12-09_07-02-23-AM.log
```

```
Instantiate files in progress.
```

```
Instantiate files successful.
```

```
..... 49% Done.
```

```
Saving cluster inventory in progress.
```

```
..... 83% Done.
```

```
Saving cluster inventory successful.
```

```
The Cluster Node Addition of /u01/app/12.2.0/grid was successful.
```

```
Please check '/u01/app/12.2.0/grid/inventory/silentInstall2017-12-  
09_7-02-22-AM.log' for more details.
```

```
Setup Oracle Base in progress.
```

```
Setup Oracle Base successful.
```

```
..... 90% Done.
```

```
Update Inventory in progress.

Update Inventory successful.
..... 97% Done.

As a root user, execute the following script(s):
1. /u01/app/oraInventory/orainstRoot.sh
2. /u01/app/12.2.0/grid/root.sh

Execute /u01/app/oraInventory/orainstRoot.sh on the following nodes:
[host05]
Execute /u01/app/12.2.0/grid/root.sh on the following nodes:
[host05]

The scripts can be executed in parallel on all the nodes.

..... 100% Done.

Successfully Setup Software.

#####
Task 4 of 9: Run root scripts
#####
Sat Dec  9 07:10:13 UTC 2017

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.
Performing root user operation.

The following environment variables are set as:
  ORACLE_OWNER= grid
  ORACLE_HOME= /u01/app/12.2.0/grid
Copying dbhome to /usr/local/bin ...
Copying oraenv to /usr/local/bin ...
Copying coraenv to /usr/local/bin ...

Creating /etc/oratab file...
Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Relinking oracle with rac_on option
Using configuration parameter file:
/u01/app/12.2.0/grid/crs/install/crsconfig_params
The log of current session can be found at:
/u01/app/grid/crsdata/host05/crsconfig/rootcrs_host05_2017-12-09_07-
10-50AM.log
2017/12/09 07:10:55 CLSRSC-594: Executing installation step 1 of 19:
'SetupTFA'.
```

```
2017/12/09 07:10:55 CLSRSC-4001: Installing Oracle Trace File Analyzer  
(TFA) Collector.  
2017/12/09 07:11:28 CLSRSC-4002: Successfully installed Oracle Trace  
File Analyzer (TFA) Collector.  
2017/12/09 07:11:28 CLSRSC-594: Executing installation step 2 of 19:  
'ValidateEnv'.  
2017/12/09 07:11:31 CLSRSC-363: User ignored prerequisites during  
installation  
2017/12/09 07:11:31 CLSRSC-594: Executing installation step 3 of 19:  
'CheckFirstNode'.  
2017/12/09 07:11:32 CLSRSC-594: Executing installation step 4 of 19:  
'GenSiteGUIDs'.  
2017/12/09 07:11:33 CLSRSC-594: Executing installation step 5 of 19:  
'SaveParamFile'.  
2017/12/09 07:11:37 CLSRSC-594: Executing installation step 6 of 19:  
'SetupOSD'.  
2017/12/09 07:11:39 CLSRSC-594: Executing installation step 7 of 19:  
'CheckCRSConfig'.  
2017/12/09 07:11:40 CLSRSC-594: Executing installation step 8 of 19:  
'SetupLocalGPNP'.  
2017/12/09 07:11:42 CLSRSC-594: Executing installation step 9 of 19:  
'ConfigOLR'.  
2017/12/09 07:11:46 CLSRSC-594: Executing installation step 10 of 19:  
'ConfigCHMOS'.  
2017/12/09 07:11:46 CLSRSC-594: Executing installation step 11 of 19:  
'CreateOHASD'.  
2017/12/09 07:11:48 CLSRSC-594: Executing installation step 12 of 19:  
'ConfigOHASD'.  
2017/12/09 07:12:03 CLSRSC-330: Adding Clusterware entries to file  
'oracle-ohasd.conf'  
2017/12/09 07:12:24 CLSRSC-594: Executing installation step 13 of 19:  
'InstallAFD'.  
2017/12/09 07:12:25 CLSRSC-594: Executing installation step 14 of 19:  
'InstallACFS'.  
CRS-2791: Starting shutdown of Oracle High Availability Services-  
managed resources on 'host05'  
CRS-2793: Shutdown of Oracle High Availability Services-managed  
resources on 'host05' has completed  
CRS-4133: Oracle High Availability Services has been stopped.  
CRS-4123: Oracle High Availability Services has been started.  
2017/12/09 07:13:03 CLSRSC-594: Executing installation step 15 of 19:  
'InstallKA'.  
2017/12/09 07:13:05 CLSRSC-594: Executing installation step 16 of 19:  
'InitConfig'.  
CRS-2791: Starting shutdown of Oracle High Availability Services-  
managed resources on 'host05'  
CRS-2793: Shutdown of Oracle High Availability Services-managed  
resources on 'host05' has completed  
CRS-4133: Oracle High Availability Services has been stopped.  
CRS-4123: Oracle High Availability Services has been started.  
CRS-2791: Starting shutdown of Oracle High Availability Services-  
managed resources on 'host05'  
CRS-2673: Attempting to stop 'ora.drivers.acfs' on 'host05'
```

```

CRS-2677: Stop of 'ora.drivers.acfs' on 'host05' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed
resources on 'host05' has completed
CRS-4133: Oracle High Availability Services has been stopped.
2017/12/09 07:13:19 CLSRSC-594: Executing installation step 17 of 19:
'StartCluster'.
CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.mdnscd' on 'host05'
CRS-2672: Attempting to start 'ora.evmd' on 'host05'
CRS-2676: Start of 'ora.mdnscd' on 'host05' succeeded
CRS-2676: Start of 'ora.evmd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.gpnpcd' on 'host05'
CRS-2676: Start of 'ora.gpnpcd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'host05'
CRS-2676: Start of 'ora.gipcd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host05'
CRS-2676: Start of 'ora.cssdmonitor' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host05'
CRS-2672: Attempting to start 'ora.diskmon' on 'host05'
CRS-2676: Start of 'ora.diskmon' on 'host05' succeeded
CRS-2676: Start of 'ora.cssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host05'
CRS-2672: Attempting to start 'ora.ctssd' on 'host05'
CRS-2676: Start of 'ora.ctssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host05'
CRS-2676: Start of 'ora.storage' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'host05'
CRS-2676: Start of 'ora.crf' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host05'
CRS-2676: Start of 'ora.crsd' on 'host05' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host05'
succeeded
CRS-6017: Processing resource auto-start for servers: host05
CRS-2672: Attempting to start 'ora.chad' on 'host05'
CRS-2676: Start of 'ora.chad' on 'host05' succeeded
CRS-6016: Resource auto-start has completed for server host05
CRS-6024: Completed start of Oracle Cluster Ready Services-managed
resources
CRS-4123: Oracle High Availability Services has been started.
2017/12/09 07:13:59 CLSRSC-343: Successfully started Oracle
Clusterware stack
2017/12/09 07:13:59 CLSRSC-594: Executing installation step 18 of 19:
'ConfigNode'.
Successfully accumulated necessary OCR keys.
Creating OCR keys for user 'root', privgrp 'root'..
Operation successful.
2017/12/09 07:14:06 CLSRSC-594: Executing installation step 19 of 19:
'PostConfig'.
2017/12/09 07:14:10 CLSRSC-325: Configure Oracle Grid Infrastructure
for a Cluster ... succeeded

#####

```

```
Task 5 of 9: Create and mount FRA disk group
#####
Sat Dec  9 07:14:10 UTC 2017
```

```
#####
Task 6 of 9: Change the permission on /u01/app
#####
Sat Dec  9 07:14:24 UTC 2017
```

```
#####
Task 7 of 9: Run OUI to install DB software
#####
Sat Dec  9 07:14:25 UTC 2017
```

Starting Oracle Universal Installer...

Checking Temp space: must be greater than 500 MB. Actual 106236 MB
Passed
Checking swap space: must be greater than 150 MB. Actual 10722 MB
Passed
Preparing to launch Oracle Universal Installer from
/tmp/OraInstall2017-12-09_07-14-25AM. Please wait ...You can find the
log of this install session at:
/u01/app/oraInventory/logs/installActions2017-12-09_07-14-25AM.log

Prepare in progress.

..... 7% Done.

Prepare successful.

Copy files in progress.

..... 14% Done.
..... 20% Done.
..... 25% Done.
..... 30% Done.
..... 36% Done.
..... 45% Done.
..... 50% Done.
..... 55% Done.
..... 60% Done.
..... 65% Done.

.....
Copy files successful.

Link binaries in progress.

.....

Link binaries successful.

Setup files in progress.

.....

Setup files successful.

```
Setup Inventory in progress.

Setup Inventory successful.

Finish Setup successful.
The installation of Oracle Database 12c was successful.
Please check '/u01/app/oraInventory/logs/silentInstall2017-12-09_07-
14-25AM.log' for more details.

Copy Files to Remote Nodes in progress.

Copy Files to Remote Nodes successful.
..... 85% Done.

Prepare in progress.

Prepare successful.
.....
Setup in progress.
.....
Setup successful.
The Cluster Node Addition of /u01/app/oracle/product/12.2.0/dbhome_1
was successful.
Please check '/u01/app/oraInventory/logs/silentInstall2017-12-09_07-
14-25AM.log' for more details.

Setup Oracle Base in progress.

Setup Oracle Base successful.
..... 97% Done.

As a root user, execute the following script(s):
1. /u01/app/oracle/product/12.2.0/dbhome_1/root.sh

Execute /u01/app/oracle/product/12.2.0/dbhome_1/root.sh on the
following nodes:
[host01, host03, host02, host04, host05]

..... 100% Done.

Successfully Setup Software.
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 500 MB. Actual 98467 MB
Passed
Checking swap space: must be greater than 150 MB. Actual 10706 MB
Passed
Preparing to launch Oracle Universal Installer from
/tmp/OraInstall2017-12-09_07-34-06AM. Please wait ...

#####
Task 8 of 9: Run root scripts
```

```
#####
Sat Dec  9 07:34:25 UTC 2017

Check
/u01/app/oracle/product/12.2.0/dbhome_1/install/root_host01.example.co
m_2017-12-09_07-34-25-298570163.log for the output of root script
Check
/u01/app/oracle/product/12.2.0/dbhome_1/install/root_host02.example.co
m_2017-12-09_07-34-26-219731225.log for the output of root script
Check
/u01/app/oracle/product/12.2.0/dbhome_1/install/root_host03.example.co
m_2017-12-09_07-34-26-627472944.log for the output of root script
Check
/u01/app/oracle/product/12.2.0/dbhome_1/install/root_host04.example.co
m_2017-12-09_07-34-27-028362640.log for the output of root script
Check
/u01/app/oracle/product/12.2.0/dbhome_1/install/root_host05.example.co
m_2017-12-09_07-34-27-461723064.log for the output of root script

#####
Task 9 of 9: Run DBCA to create database
#####
Sat Dec  9 07:34:27 UTC 2017

You can find the logs of this session at:
/u01/app/oraInventory/logs

[FATAL] [INS-32601] The Installer has detected that there are no
config tools to execute for the specified Oracle home.
[WARNING] [DBT-12504] For Policy Managed database, database instance
may come up on local node depending on node availability. Sample
schema on local node will be configured only when database instance
comes up on local node.
Copying database files
1% complete
2% complete
15% complete
27% complete
Creating and starting Oracle instance
29% complete
32% complete
36% complete
40% complete
43% complete
44% complete
45% complete
47% complete
Creating cluster database views
49% complete
65% complete
Completing Database Creation
66% complete
67% complete
```

```

70% complete
71% complete
73% complete
74% complete
Executing Post Configuration Actions
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/orcl/orcl.log"
for further details.

#####
Completed All 9 Tasks
#####
Sat Dec  9 07:46:27 UTC 2017

[root@host01 catchup]#

```

3. Open a terminal window connected to host01 as the grid user and check the cluster and database status and configuration details.

```

[oracle@dns ~]$ ssh grid@host01
grid@host01's password:

[grid@host01 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
The Oracle base has been set to /u01/app/grid

[grid@host01 ~]$ olsnodes -s -a
host01 Active Hub
host02 Active Hub
host03 Active Hub
host04 Active Leaf
host05 Active Leaf

[grid@host01 ~]$ srvctl status database -db orcl
Instance orcl_1 is running on node host02
Instance orcl_2 is running on node host03
Instance orcl_3 is running on node host01

[grid@host01 ~]$ srvctl config database -db orcl
Database unique name: orcl
Database name: orcl
Oracle home: /u01/app/oracle/product/12.2.0/dbhome_1
Oracle user: oracle
Spfile: +DATA/ORCL/PARAMETERFILE/spfile.297.958993403
Password file: +DATA/ORCL/PASSWORD/pwdorcl.284.958993065
Domain:
Start options: open
Stop options: immediate
Database role: PRIMARY
Management policy: AUTOMATIC
Server pools: orcldb
Disk Groups: FRA,DATA

```

```
Mount point paths:  
Services:  
Type: RAC  
Start concurrency:  
Stop concurrency:  
OSDBA group: dba  
OSOPER group: oper  
Database instances:  
Configured nodes:  
CSS critical: no  
CPU count: 0  
Memory target: 0  
Maximum memory: 0  
Default network number for database services:  
Database is policy managed  
  
[grid@host01 ~]$
```

4. Close all terminals opened for this practice.

Appendix A-4: Catchup Script for Practice 7

Estimated Time: 5min

1. Open a terminal window to connect to host01 as root user. Run the less07_catchup.sh script.

```
[oracle@dns ~] ssh root@host01
root@host01's Password:

[root@host01 ~]# cd /stage/GGRID/solutions/less_07/catchup
[root@host01 catchup]# ./less07_catchup.sh

#####
Task 1: List the current CW network configuration
#####
Sat Dec  9 08:24:31 UTC 2017

eth0  192.0.2.0  global  public
eth1  192.0.3.0  global  asm
eth2  192.168.1.0  global  cluster_interconnect

#####
Task 2: Add eth3 to create an HAIP configuration
#####
Sat Dec  9 08:24:31 UTC 2017

#####
Task 3: Restart Clusterware on all nodes of the cluster
#####
Sat Dec  9 08:24:32 UTC 2017

CRS-2673: Attempting to stop 'ora.crsd' on 'host05'
CRS-2673: Attempting to stop 'ora.crsd' on 'host04'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host05'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host04'
CRS-2673: Attempting to stop 'ora.chad' on 'host05'
CRS-2673: Attempting to stop 'ora.chad' on 'host04'
CRS-2677: Stop of 'ora.chad' on 'host04' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host04' has completed
CRS-2677: Stop of 'ora.crsd' on 'host04' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host04'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host04'
CRS-2673: Attempting to stop 'ora.evmd' on 'host04'
CRS-2673: Attempting to stop 'ora.storage' on 'host04'
CRS-2677: Stop of 'ora.storage' on 'host04' succeeded
```

```
CRS-2677: Stop of 'ora.ctssd' on 'host04' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host04' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host04'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host04'
CRS-2677: Stop of 'ora.cssd' on 'host04' succeeded
CRS-2677: Stop of 'ora.chad' on 'host05' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host05' has completed
CRS-2677: Stop of 'ora.crsd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host05'
CRS-2673: Attempting to stop 'ora.ctssd' on 'host05'
CRS-2673: Attempting to stop 'ora.evmd' on 'host05'
CRS-2673: Attempting to stop 'ora.storage' on 'host05'
CRS-2677: Stop of 'ora.storage' on 'host05' succeeded
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host05'
succeeded
CRS-2677: Stop of 'ora.ctssd' on 'host05' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host05'
CRS-2677: Stop of 'ora.cssd' on 'host05' succeeded
CRS-2673: Attempting to stop 'ora.crsd' on 'host03'
CRS-2673: Attempting to stop 'ora.crsd' on 'host02'
CRS-2673: Attempting to stop 'ora.crsd' on 'host01'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host01'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host03'
CRS-2673: Attempting to stop 'ora.chad' on 'host03'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host03'
CRS-2673: Attempting to stop 'ora.chad' on 'host01'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host01'
CRS-2673: Attempting to stop 'ora.qosmserver' on 'host01'
CRS-2673: Attempting to stop 'ora.gns' on 'host01'
CRS-2790: Starting shutdown of Cluster Ready Services-managed
resources on server 'host02'
CRS-2673: Attempting to stop 'ora.orcl.db' on 'host02'
CRS-2677: Stop of 'ora.gns' on 'host01' succeeded
CRS-2677: Stop of 'ora.orcl.db' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host03'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN2.lsnr' on 'host03'
CRS-2677: Stop of 'ora.orcl.db' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host02'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host02'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN1.lsnr' on 'host02'
CRS-2677: Stop of 'ora.DATA.dg' on 'host03' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host03' succeeded
```

```

CRS-2677: Stop of 'ora.FRA.dg' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host03'
CRS-2677: Stop of 'ora.DATA.dg' on 'host02' succeeded
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host03' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN2.lsnr' on 'host03' succeeded
CRS-2677: Stop of 'ora.MGMT.dg' on 'host02' succeeded
CRS-2677: Stop of 'ora.FRA.dg' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host02'
CRS-2673: Attempting to stop 'ora.host03.vip' on 'host03'
CRS-2673: Attempting to stop 'ora.scan2.vip' on 'host03'
CRS-2677: Stop of 'ora.asm' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.host02.vip' on 'host02'
CRS-2677: Stop of 'ora.LISTENER_SCAN1.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.scan1.vip' on 'host02'
CRS-2677: Stop of 'ora.asm' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03'
CRS-2677: Stop of 'ora.orcl.db' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'host01'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN3.lsnr' on 'host01'
CRS-2673: Attempting to stop 'ora.cvu' on 'host01'
CRS-2673: Attempting to stop 'ora.gns.vip' on 'host01'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'host01' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN3.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.scan3.vip' on 'host01'
CRS-2677: Stop of 'ora.host02.vip' on 'host02' succeeded
CRS-2677: Stop of 'ora.cvu' on 'host01' succeeded
CRS-2677: Stop of 'ora.host03.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.gns.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.qosmserver' on 'host01' succeeded
CRS-2677: Stop of 'ora.scan2.vip' on 'host03' succeeded
CRS-2677: Stop of 'ora.scan1.vip' on 'host02' succeeded
CRS-2677: Stop of 'ora.scan3.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.chad' on 'host03' succeeded
CRS-2677: Stop of 'ora.chad' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.chad' on 'host02'
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host03'
CRS-2677: Stop of 'ora.ons' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host03'
CRS-2677: Stop of 'ora.net1.network' on 'host03' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host03' has completed
CRS-2677: Stop of 'ora.crsd' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host03'
CRS-2673: Attempting to stop 'ora.evmd' on 'host03'
CRS-2673: Attempting to stop 'ora.storage' on 'host03'
CRS-2677: Stop of 'ora.storage' on 'host03' succeeded
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host03'
CRS-2677: Stop of 'ora.ctssd' on 'host03' succeeded
CRS-2677: Stop of 'ora.chad' on 'host02' succeeded

```

```

CRS-2673: Attempting to stop 'ora.mgmtdb' on 'host01'
CRS-2677: Stop of 'ora.evmd' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host02'
CRS-2677: Stop of 'ora.ons' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host02'
CRS-2677: Stop of 'ora.net1.network' on 'host02' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host02' has completed
CRS-2677: Stop of 'ora.crsd' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host02'
CRS-2673: Attempting to stop 'ora.evmd' on 'host02'
CRS-2673: Attempting to stop 'ora.storage' on 'host02'
CRS-2677: Stop of 'ora.storage' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host02'
CRS-2677: Stop of 'ora.ctssd' on 'host02' succeeded
CRS-2677: Stop of 'ora.mgmtdb' on 'host01' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.MGMTLSNR' on 'host01'
CRS-2673: Attempting to stop 'ora.MGMT.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'host01'
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'host01'
CRS-2677: Stop of 'ora.MGMT.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.FRA.dg' on 'host01' succeeded
CRS-2677: Stop of 'ora.DATA.dg' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.MGMTLSNR' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.host01.vip' on 'host01'
CRS-2677: Stop of 'ora.host01.vip' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host03' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host03'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host03'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host03'
CRS-2677: Stop of 'ora.cssd' on 'host03' succeeded
CRS-2677: Stop of 'ora.asm' on 'host02' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host02'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host02'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host02'
CRS-2677: Stop of 'ora.cssd' on 'host02' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01'
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'host01'
CRS-2677: Stop of 'ora.ons' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'host01'
CRS-2677: Stop of 'ora.net1.network' on 'host01' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on
'host01' has completed
CRS-2677: Stop of 'ora.crsd' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.ctssd' on 'host01'
```

```
CRS-2673: Attempting to stop 'ora.evmd' on 'host01'
CRS-2673: Attempting to stop 'ora.storage' on 'host01'
CRS-2677: Stop of 'ora.storage' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'host01'
CRS-2677: Stop of 'ora.ctssd' on 'host01' succeeded
CRS-2677: Stop of 'ora.evmd' on 'host01' succeeded
CRS-2677: Stop of 'ora.asm' on 'host01' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on
'host01'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'host01'
CRS-2677: Stop of 'ora.cssd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.evmd' on 'host05'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host05'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host04'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host01'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host03'
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'host02'
CRS-2672: Attempting to start 'ora.evmd' on 'host04'
CRS-2672: Attempting to start 'ora.evmd' on 'host01'
CRS-2672: Attempting to start 'ora.evmd' on 'host02'
CRS-2672: Attempting to start 'ora.evmd' on 'host03'
CRS-2676: Start of 'ora.cssdmonitor' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host05'
CRS-2676: Start of 'ora.cssdmonitor' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host04'
CRS-2672: Attempting to start 'ora.diskmon' on 'host04'
CRS-2676: Start of 'ora.cssdmonitor' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host03'
CRS-2672: Attempting to start 'ora.diskmon' on 'host05'
CRS-2676: Start of 'ora.cssdmonitor' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'host01'
CRS-2672: Attempting to start 'ora.diskmon' on 'host01'
CRS-2676: Start of 'ora.cssdmonitor' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.diskmon' on 'host03'
CRS-2672: Attempting to start 'ora.cssd' on 'host02'
CRS-2672: Attempting to start 'ora.cssd' on 'host02'
CRS-2676: Start of 'ora.diskmon' on 'host04' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host01' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host02' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host05' succeeded
CRS-2676: Start of 'ora.evmd' on 'host04' succeeded
CRS-2676: Start of 'ora.evmd' on 'host02' succeeded
CRS-2676: Start of 'ora.diskmon' on 'host03' succeeded
CRS-2676: Start of 'ora.evmd' on 'host01' succeeded
CRS-2676: Start of 'ora.evmd' on 'host05' succeeded
CRS-2676: Start of 'ora.evmd' on 'host03' succeeded
CRS-2676: Start of 'ora.cssd' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.ctssd' on 'host03'
CRS-2676: Start of 'ora.cssd' on 'host02' succeeded
CRS-2676: Start of 'ora.cssd' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
```

```
'host03'
CRS-2672: Attempting to start 'ora.ctssd' on 'host01'
CRS-2672: Attempting to start 'ora.ctssd' on 'host02'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host01'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host02'
CRS-2676: Start of 'ora.ctssd' on 'host03' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host01' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host02' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host03'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host03'
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host01'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host01'
CRS-2676: Start of 'ora.asm' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host01'
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host02'
succeeded
CRS-2672: Attempting to start 'ora.asm' on 'host02'
CRS-2676: Start of 'ora.asm' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host02'
CRS-2676: Start of 'ora.asm' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host03'
CRS-2676: Start of 'ora.storage' on 'host03' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host03'
CRS-2676: Start of 'ora.crsd' on 'host03' succeeded
CRS-2676: Start of 'ora.storage' on 'host01' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host01'
CRS-2676: Start of 'ora.storage' on 'host02' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host02'
CRS-2676: Start of 'ora.crsd' on 'host01' succeeded
CRS-2676: Start of 'ora.crsd' on 'host02' succeeded
CRS-2676: Start of 'ora.cssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host05'
CRS-2676: Start of 'ora.cssd' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'host04'
CRS-2672: Attempting to start 'ora.ctssd' on 'host04'
CRS-2672: Attempting to start 'ora.storage' on 'host05'
CRS-2672: Attempting to start 'ora.ctssd' on 'host05'
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on
'host04'
CRS-2676: Start of 'ora.storage' on 'host04' succeeded
CRS-2676: Start of 'ora.storage' on 'host05' succeeded
CRS-2676: Start of 'ora.ctssd' on 'host04' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host04'
CRS-2676: Start of 'ora.ctssd' on 'host05' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'host05'
CRS-2676: Start of 'ora.crsd' on 'host04' succeeded
CRS-2676: Start of 'ora.crsd' on 'host05' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host04'
```

```
succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'host05'
succeeded

#####
Task 4: Verify the new CW network configuration
#####
Sat Dec  9 08:27:47 UTC 2017

eth0  192.0.2.0  global  public
eth1  192.0.3.0  global  asm
eth2  192.168.1.0  global  cluster_interconnect
eth3  192.168.2.0  global  cluster_interconnect

#####
All 4 Tasks Completed
#####
Sat Dec  9 08:27:48 UTC 2017

[root@host01 catchup]#
```

2. Close the terminal window opened for this practice.

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