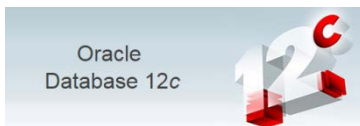


Step by Step Install Oracle RAC 12.1.0.2 On OEL7.2



Oracle RAC 12C

ohsdba

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Version	Author	Date	Content
V1.0	Robin.Han	2016/1/16	Initial version

Prerequisites

Hardware

- RAM : 8GB
- CPU: Intel (R) Core (TM) i7-4510U CPU @ 2.00GHz
- SSD: 256G
- OS: Windows 7 Ultimate, 64-bit 6.1.7601, Service Pack 1

Software

- VMware® Workstation 11.1.2 build-2780323
- Oracle Linux 7 Update 2 x86-64
- Oracle Grid Infrastructure (12.1.0.2)
- Oracle Database 12c Release 1 (12.1.0.2)

you can get ORACLE Software from <https://edelivery.oracle.com>

Note: please obey the terms of use

Install Summary

Summary			
OS			
Server name	prod1.us.oracle.com		prod2.us.oracle.com
Public IP	10.0.0.100		10.0.0.101
Gateway	10.0.0.1		
VIP	10.0.0.102		10.0.0.103
Private IP	192.168.0.100		192.168.0.101
Scan IP	10.0.0.104		
root	welcome1		
Grid Login U/P	orgrid/welcome1		
DB login U/P	oracle/welcome1		
Database			
DB Name	prod		
Instance Name	prod1		prod2
Grid_Base	/orgrid/grid_base		
Grid_Home	/orgrid/oracle/product/121		
Oracle_Base	/oradb/oracle/product		
Oracle_Home	/oradb/oracle/product/121		
+ASM,DB User/Password	sys		oracle
	system		oracle
	sysasm		oracle
	pdbadmin		oracle
Enterprise Manager			
Login URL	https://prod-scan:5500/em		
Shared Disks	ASM Diskgroup Name	Device	Size
	+SYSTEMDG(OCR,Voting Disk, MGMTDB)	/dev/sdb1	4G
	+DATA	/dev/sdb2	8G
		/dev/sdb3	8G

Oracle Certification information

Oracle Clusterware 12.1.0.2.0 (Linux x86-64 Oracle Linux 7)

Product: For general information relating to certification for the Oracle Database product, including virtualization, interoperability, binary compatibility, general release and patch set information, see Core Database Certification Information (Doc ID [1306539.1](#)).

Platform: For details about certification of all Oracle Database releases on Linux x86-64, [click here](#).

Certification: For details specific to the certification of Oracle Database Release 12.1 on Linux x86-64, [click here](#).

Oracle R Enterprise Server is supported on Linux x86-64. The following are the supported operating system versions:

- Oracle Linux 5 Update 6 or higher
- Red Hat Enterprise Linux 5 Update 6 or higher

Oracle R Enterprise Client is supported on Linux x86-64 and Windows x86-64. The following are the supported operating system versions:

- Oracle Linux 5 Update 6 or higher (64-bit)
- Red Hat 5 Update 6 or higher (64-bit)
- Microsoft Windows XP with Service Pack 3 or higher (32-bit and 64-bit)
- Microsoft Windows 7 Service Pack 1 or higher (32-bit and 64-bit)

Oracle Clusterware 12.1.0.2.0 已在 Linux x86-64 Oracle Linux 7 上通过认证

注释

Oracle Clusterware 12.1.0.2.0 (针对Linux x86-64 Oracle Linux 7)

Product: For general information relating to certification for the Oracle Database product, including virtualization, interoperability, binary compatibility, general release and patch set information, see Core Database Certification Information (Doc ID [1306539.1](#)).

Platform: For details about certification of all Oracle Database releases on Linux x86-64, [click here](#).

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- Red Hat 5 Update 6 or higher (64-bit)
- Microsoft Windows XP with Service Pack 3 or higher (32-bit and 64-bit)
- Microsoft Windows 7 Service Pack 1 or higher (32-bit and 64-bit)

以下注释适用于Oracle Clusterware的发行版 12.1.0.2.0:



ACFS: Oracle Cloud File System (ACFS) certification details are listed under the "Oracle Cloud File System" product

支持信息

产品发行版	终止日期				持续支持
	标准支持	错误更正	延长支持	持续支持	
Oracle Clusterware 12.1.0.2.0	2018-7-31	无期限	2021-7-31	无期限	在大约 -551 个月后, 将不再生成新的Oracle Clusterware 12.1.0.2.0补丁程序。

需要有关技术支持策略的说明? [了解详细信息...](#)

32/64 位兼容性

产品兼容性	32 位	64 位
Oracle Clusterware 12.1.0.2.0 64 位		
Linux x86-64 Oracle Linux 7		

OS versions and minimum levels

- Oracle Linux 7 (12.1.0.2 only) with the following kernels:
 - Unbreakable Enterprise kernel: 3.8.13-33.el7uek.x86_64 or later
 - Red Hat Compatible kernel: 3.10.0-123.el7.x86_64 or later
- Oracle Linux 6.x
 - Red Hat compatible Kernel

- Update 2 or higher - Oracle Unbreakable Enterprise Kernel (UEK R2) 2.6.39-100.5.1 or higher
 - Update 4 or higher - Oracle Unbreakable Enterprise Kernel (UEK R3) 3.8.13-16 or higher
- Oracle Linux 5 Update 6
- Red Hat Enterprise Linux 7 (12.1.0.2 only) with the following kernels:
 - Red Hat kernel 3.10.0-123.el7.x86_64 or later
 - Oracle Unbreakable Enterprise Kernel: 3.8.13-33.el7uek.x86_64 or later
- Red Hat Enterprise Linux 6
- Red Hat Enterprise Linux 5 Update 6
- SLES 11 SP2: 3.0.13-0.27 or later
- See [Oracle Database Installation Guide 12c Release 1 \(12.1\) for Linux](#), Chapter 3.7.1 for supported kernels and package information for all the above Linux versions.
- Always check the [Release Notes](#) to find out about known issues and limitations. These are often updated after the release to include new information.

Oracle 12C RAC New feature

Oracle Flex Cluster

<http://docs.oracle.com/database/121/CWADD/bigcluster.htm#CWADD92401>

Oracle Flex Clusters contain two types of nodes arranged in a hub and spoke architecture: Hub Nodes and Leaf Nodes. The number of Hub Nodes in an Oracle Flex Cluster can be as many as 64. The number of Leaf Nodes can be many more. Hub Nodes and Leaf Nodes can host different types of applications.

Hub Nodes are similar to Oracle Grid Infrastructure nodes in an Oracle Clusterware standard Cluster configuration: they are tightly connected, and have direct access to shared storage. In an Oracle Flex Cluster configuration, shared storage can be provisioned to Leaf Nodes independent of the Oracle Grid Infrastructure.

Leaf Nodes are different from standard Oracle Grid Infrastructure nodes, in that they do not require direct access to shared storage, but instead request data through Hub Nodes. Hub Nodes can run in an Oracle Flex Cluster configuration without having any Leaf Nodes as cluster member nodes, but Leaf Nodes must be members of a cluster that includes at least one Hub Node.

Hub Node

A node in an Oracle Flex Cluster that is tightly connected with other servers and has direct access to a shared disk.

Leaf Node

Servers that are loosely coupled with Hub Nodes, which may not have direct access to the shared storage

Difference between Hub Nodes and Leaf Nodes

Hub Nodes:

- Direct access to the shared storage
- They can access the Oracle Cluster Registry (OCR) and Voting Disk (VD) directly
- We can run an ASM instance on them. We can run database instance on them as well

Leaf Nodes:

- It's part of the cluster as well, but cannot direct access to the shared storage
- They connected to the cluster via the Hub Node that is linked to
- It does run Grid Infrastructure, **but cannot run as ASM/Database instances**. We can deploy Fusion Middleware ,weblogic on them

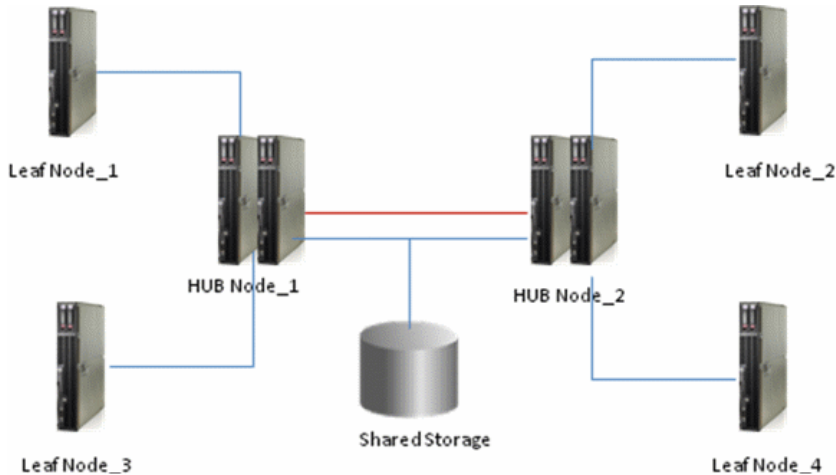
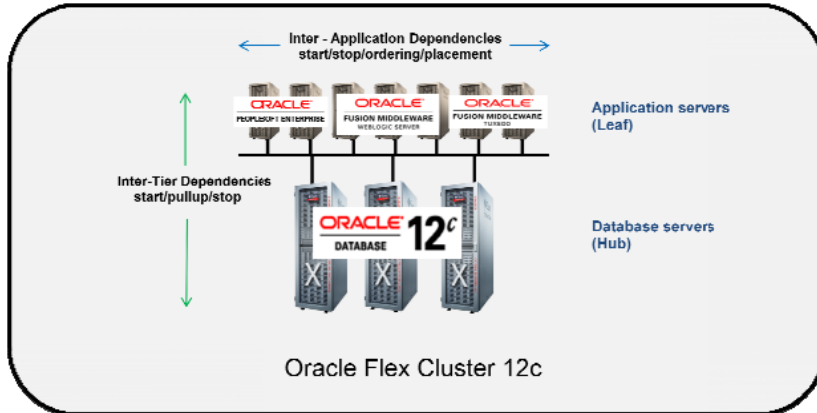


Figure 1: Oracle Flex Cluster



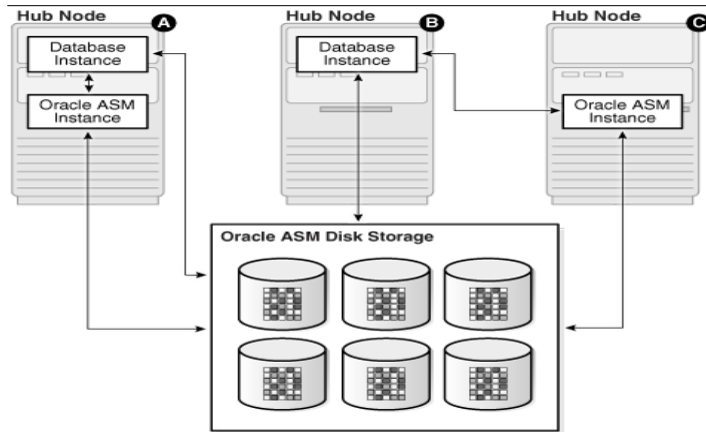
Oracle Flex ASM

Oracle Flex ASM is an ASM instance which will be running in the cluster based on cardinality defined. The default cardinality is **three**, but you can change it using `srvctl modify asm` command. It means that ASM is not required to run on each node in the cluster.

In previous release, ASM will be running on each node in the cluster and ASM clients (Database, ACFS, ADVM) can only access ASM by using an ASM on the same host.

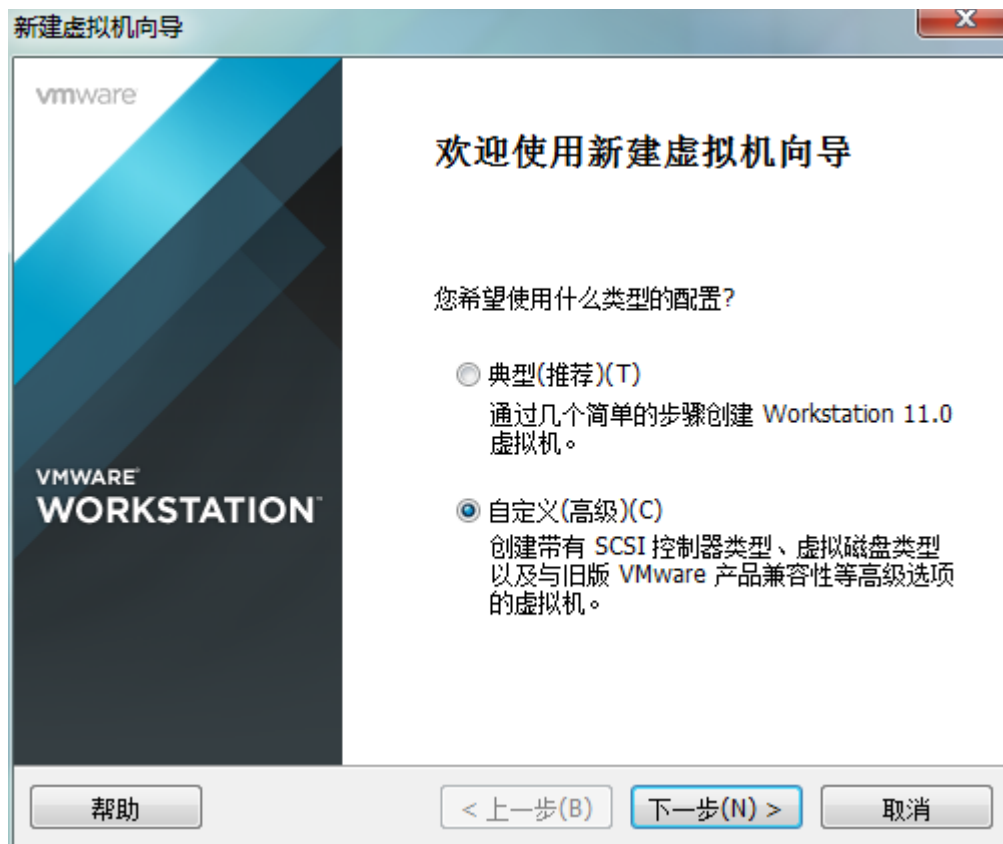
With Oracle Flex ASM, the clients can connect to remote ASM using network connection (ie ASM network). If a server running an ASM instance fails, Oracle Clusterware will start a new ASM instance on a different server to maintain the cardinality. If a 12c database instance is using a particular ASM instance, and that instance is lost because of a server crash or ASM instance failure, then the Oracle 12c database instance will reconnect to an existing ASM instance on another node. These features are collectively called Oracle Flex ASM.

Note: If you choose to install an Oracle Flex Cluster, Oracle Flex ASM is enabled by default because an Oracle Flex Cluster requires Oracle Flex ASM.

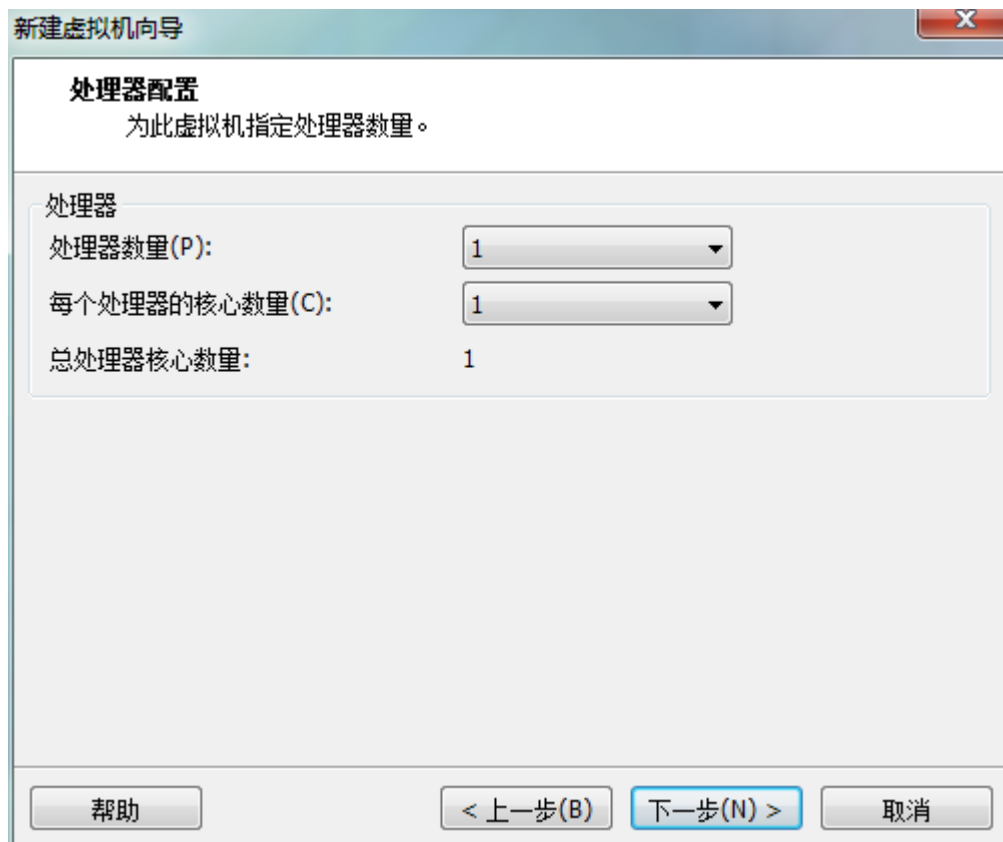
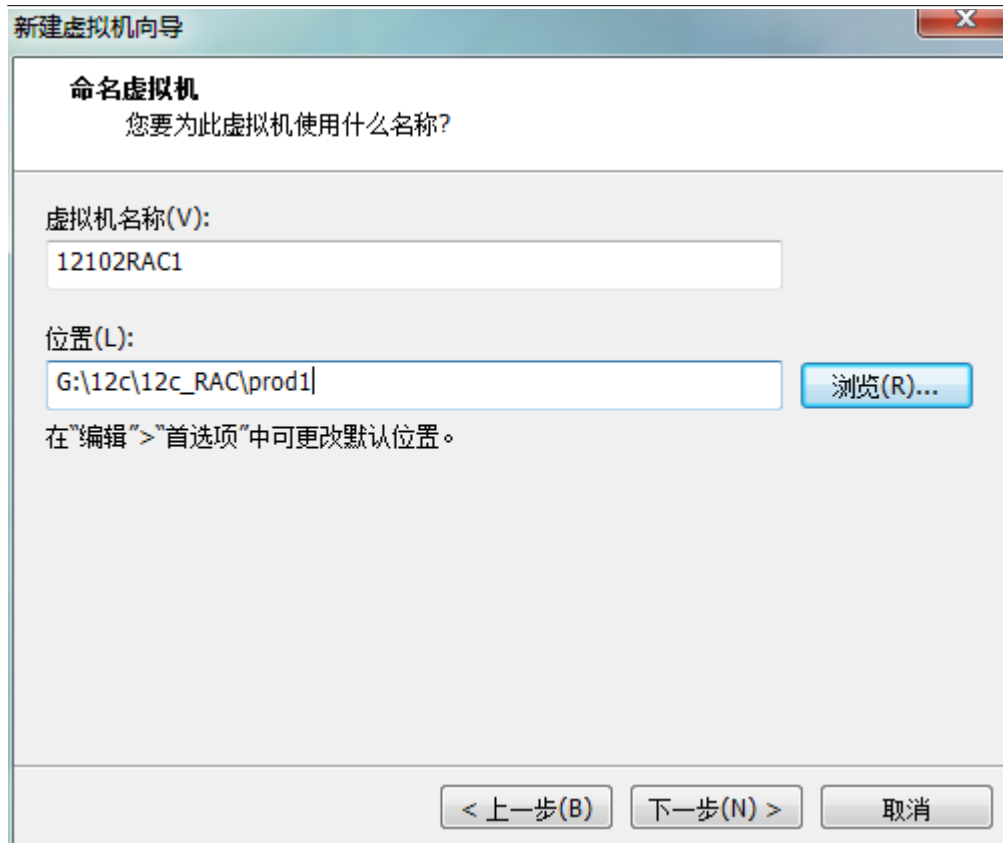


Create VMware Server and install OEL

Create vmware server

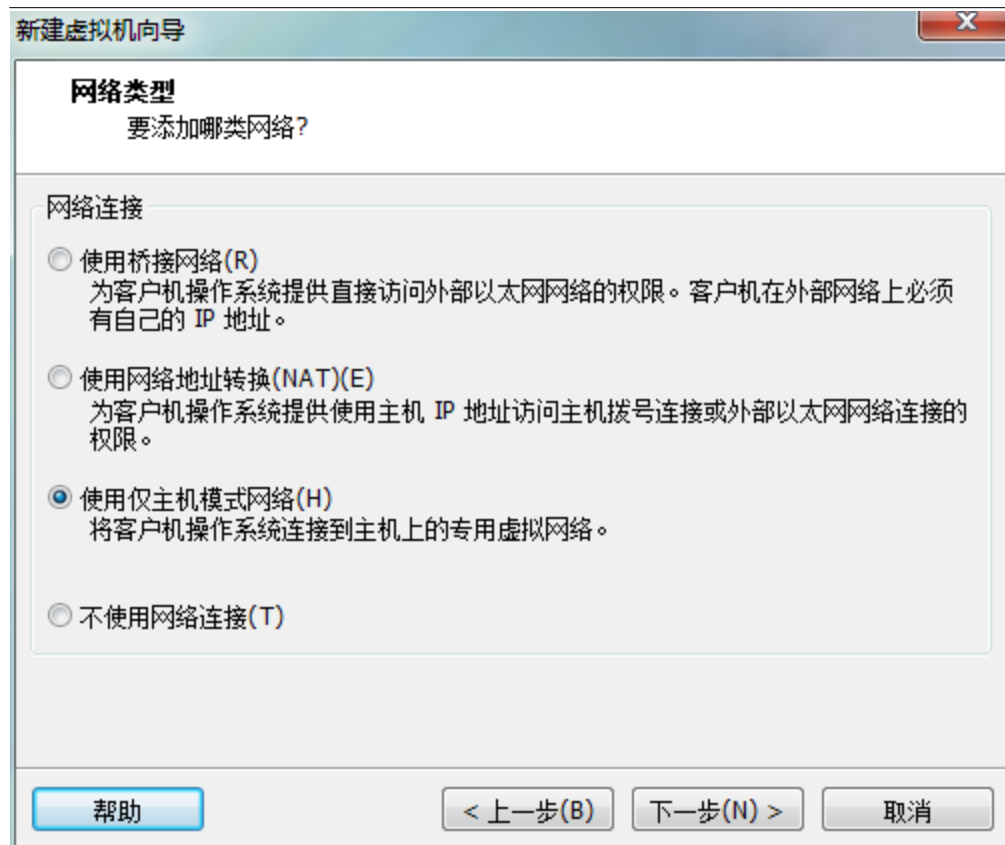


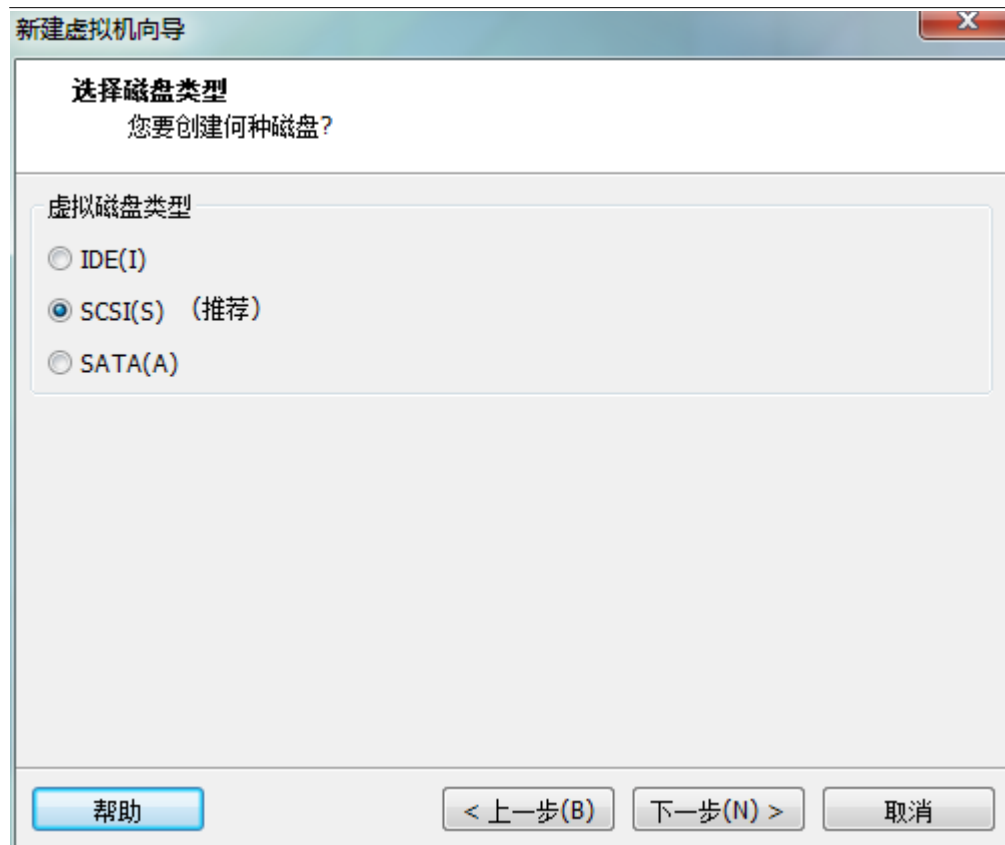


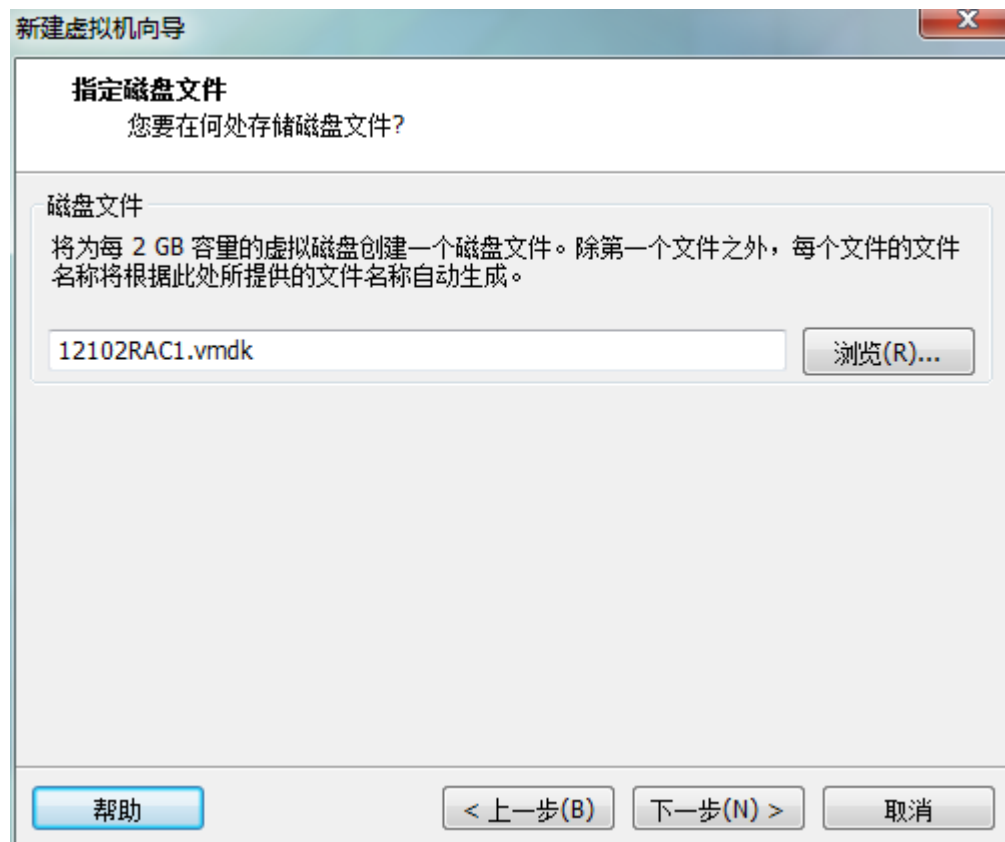
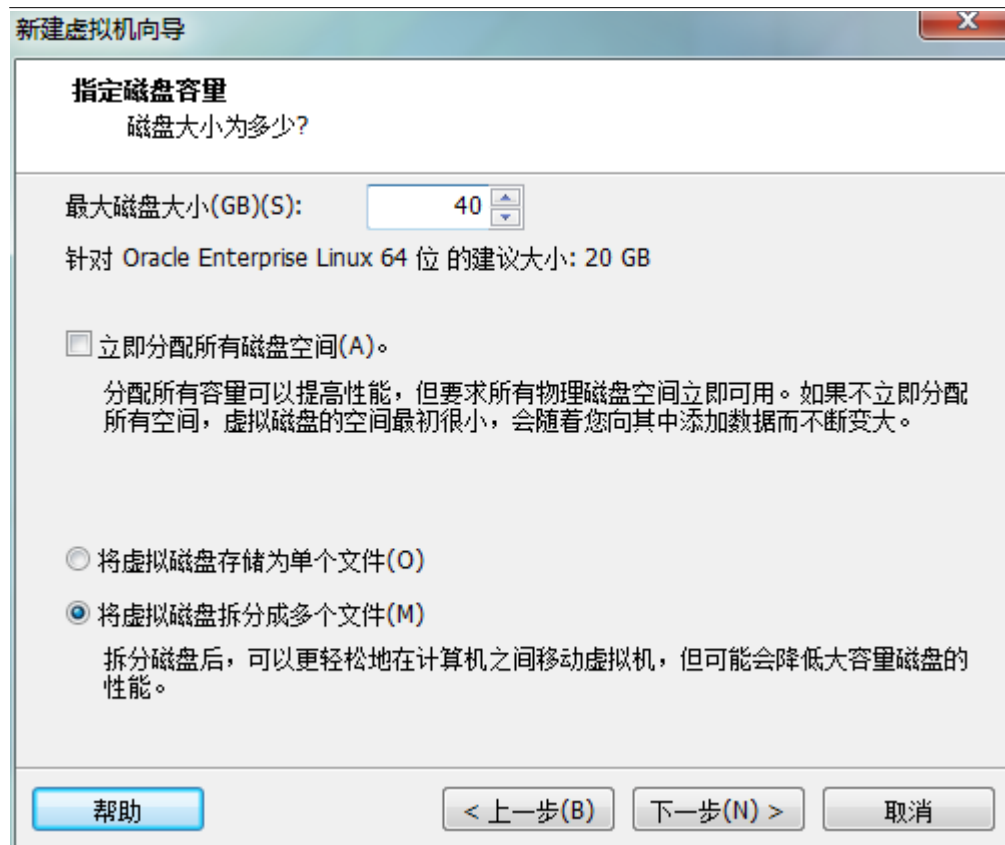


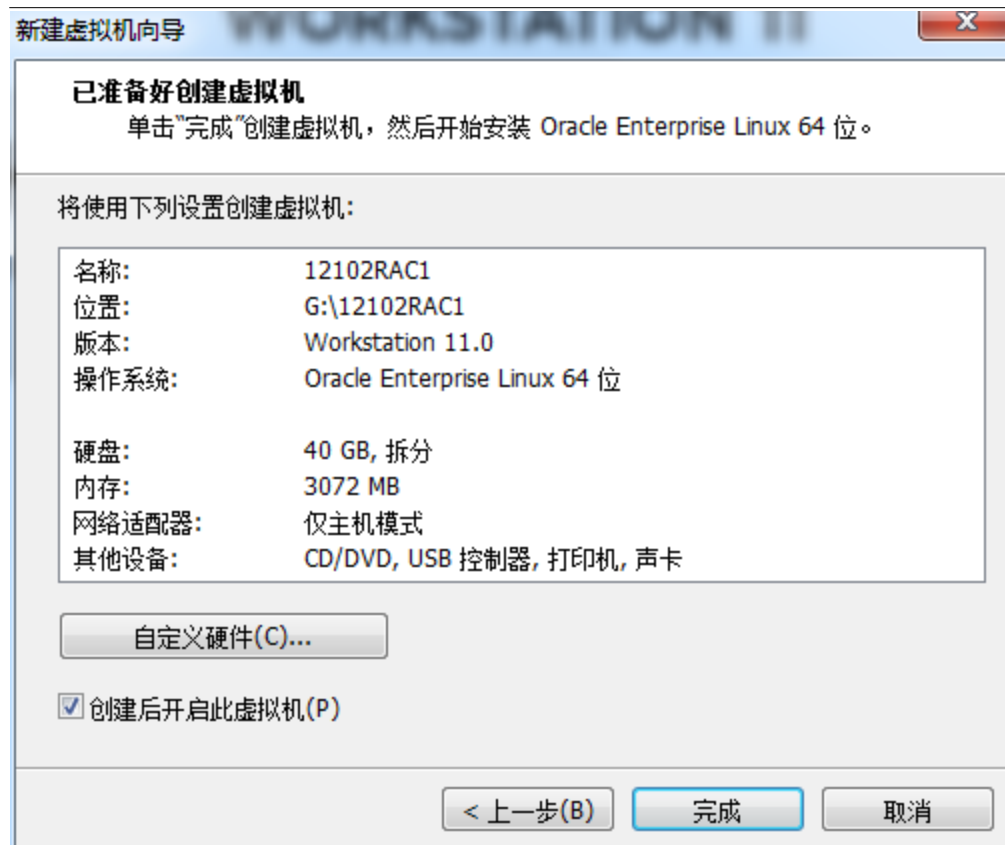


Note: At least 3G memory for each OS



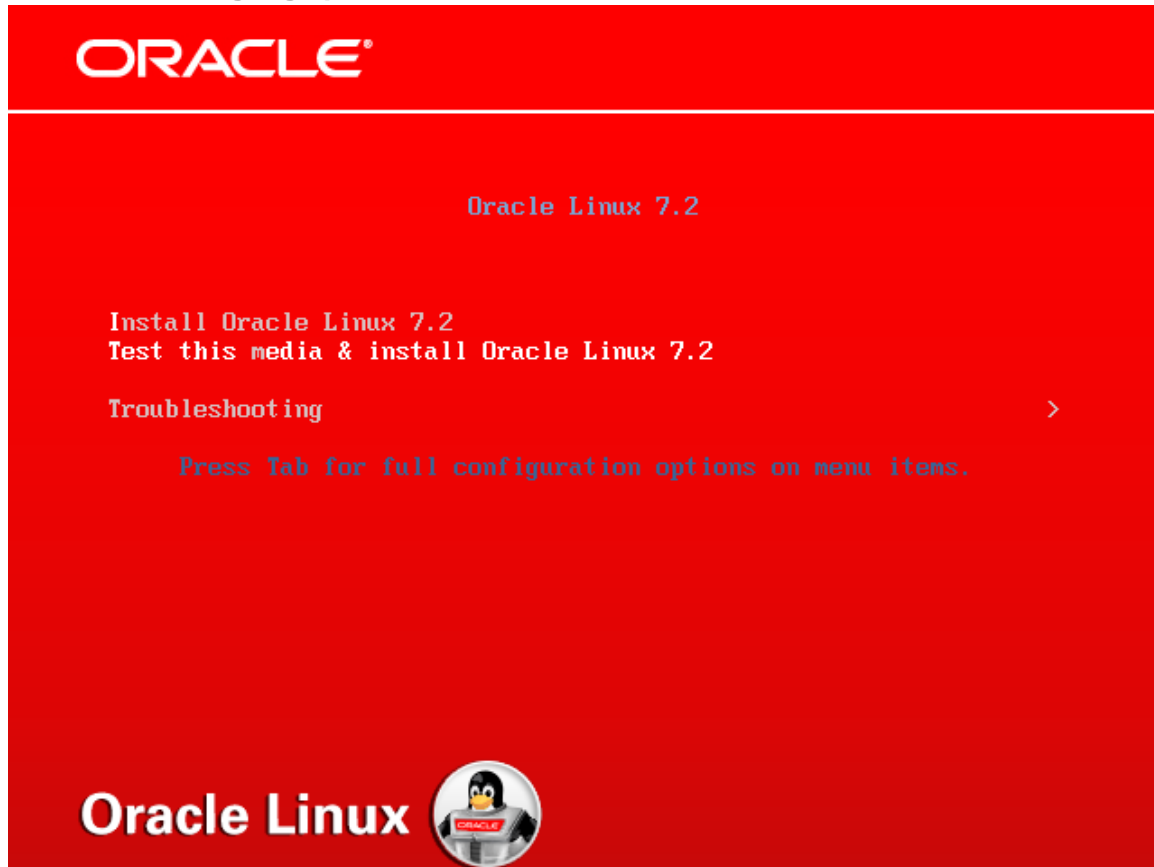






Install Oracle Linux 7.2

Set datetime,language,password



anaconda

ORACLE LINUX

INSTALLATION SUMMARY

ORACLE LINUX 7.2 INSTALLATION

us Help!

LOCALIZATION

DATE & TIME
Americas/New York timezone

KEYBOARD
English (US)

LANGUAGE SUPPORT
English (United States)

SECURITY

SECURITY POLICY
No profile selected

SOFTWARE

INSTALLATION SOURCE
Local media

SOFTWARE SELECTION
Minimal Install


Quit Begin Installation

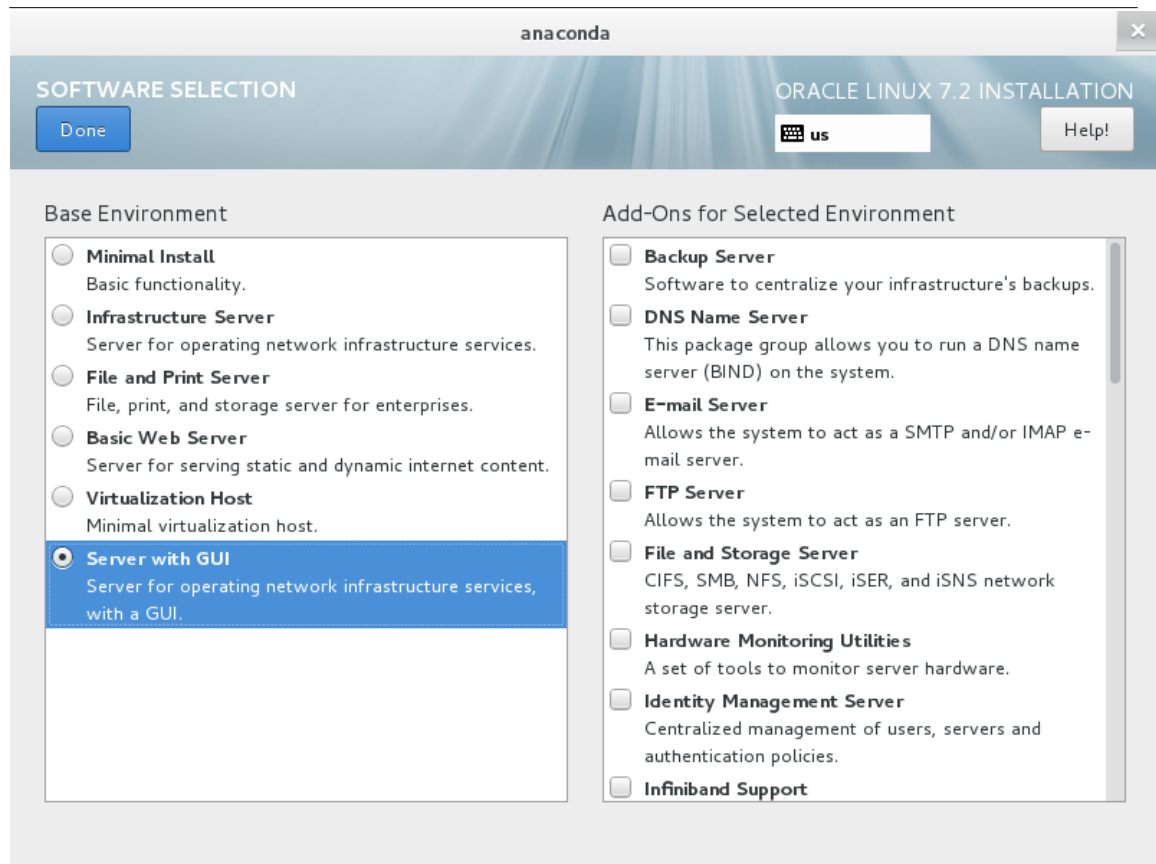
We won't touch your disks until you click 'Begin Installation'.

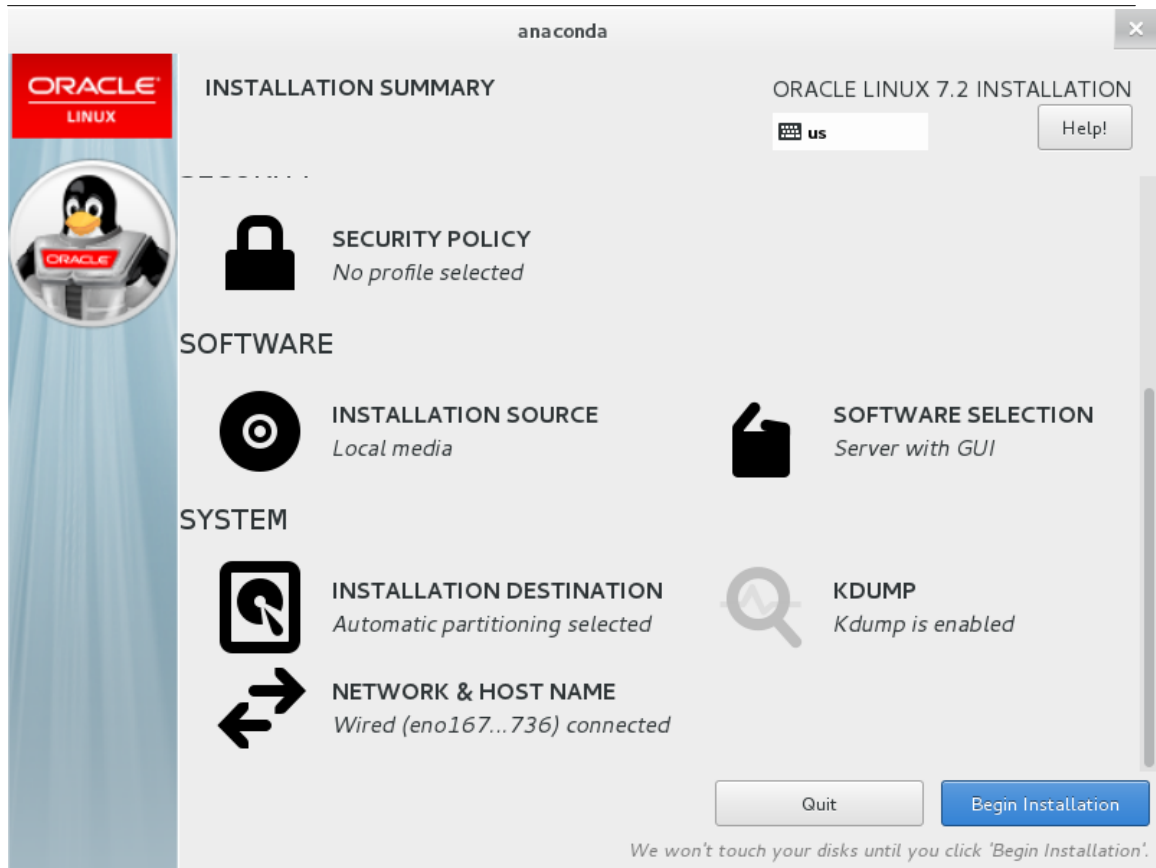
Previous Time Zone Next

Time Zone

Shanghai, Shanghai, China







anaconda

ROOT PASSWORD

ORACLE LINUX 7.2 INSTALLATION


Done Help!

The root account is used for administering the system. Enter a password for the root user.

Root Password:

Weak

Confirm:

 You have provided a weak password: The password fails the dictionary check - it is based on a dictionary word. Press Done again to use anyway.

anaconda


ORACLE
LINUX


CONFIGURATION

ORACLE LINUX 7.2 INSTALLATION


us Help!

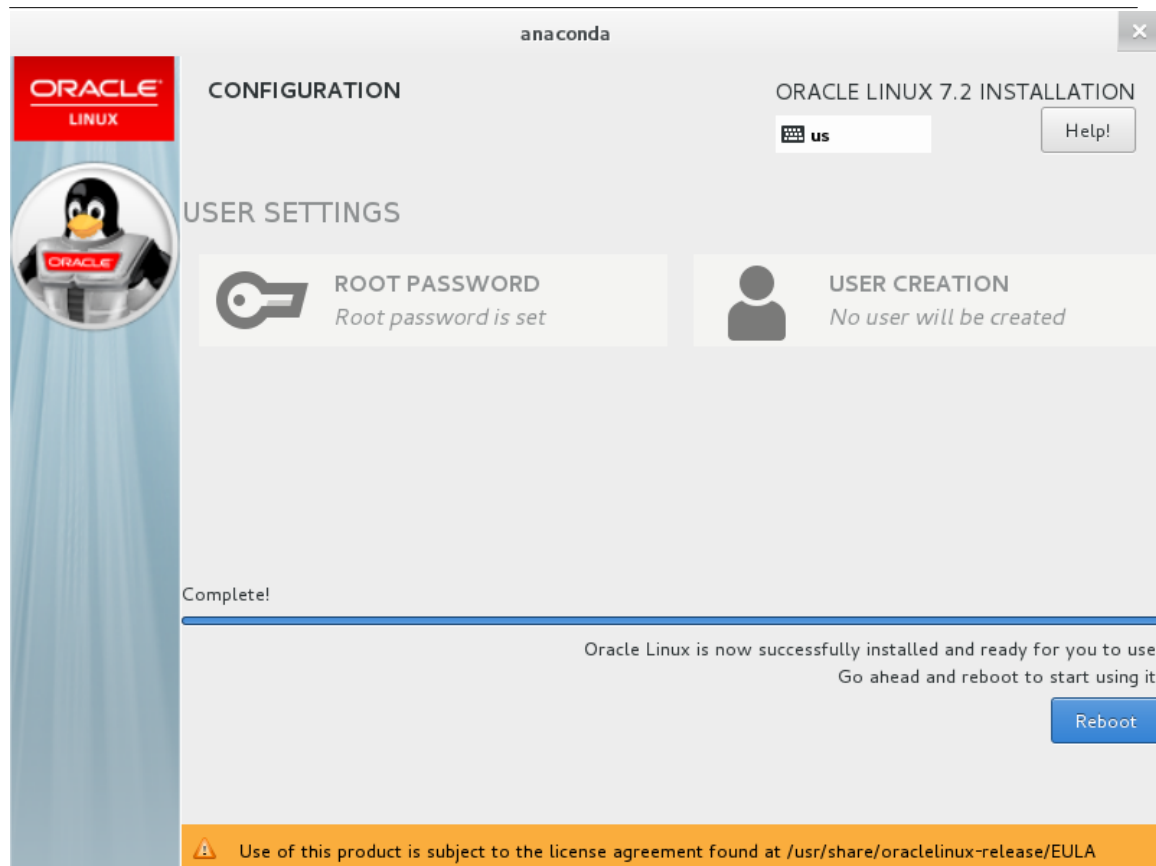
USER SETTINGS

 **ROOT PASSWORD**
Root password is set

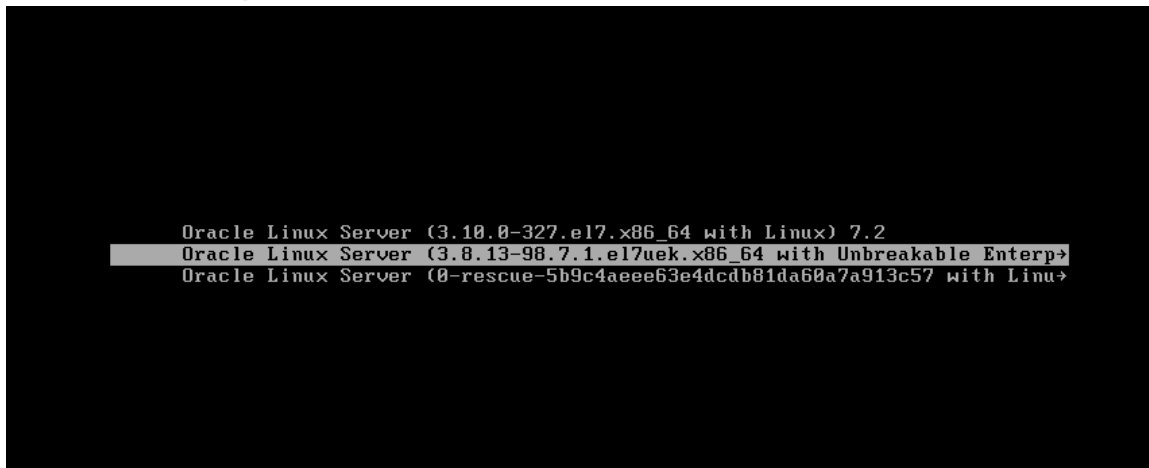
 **USER CREATION**
No user will be created

Installing libmpcdec (495/1226)

 **Oracle Linux: All errata and updates freely available across all channels at the same time, with or without a subscription.**



Reboot and Accept License



```

Please make your choice from above ['q' to quit ; 'c' to continue ;
'r' to refresh]: 1
=====
License information

1) Read the License Agreement

[ ] 2) I accept the license agreement.

Please make your choice from above ['q' to quit ; 'c' to continue ;
'r' to refresh]: 2
=====
License information

1) Read the License Agreement

[x] 2) I accept the license agreement.

Please make your choice from above ['q' to quit ; 'c' to continue ;
'r' to refresh]: _
    
```

Welcome
Next

Welcome!

Deutsch	Deutschland
English <input checked="" type="checkbox"/>	United States
Español	España
français	France
русский	Российская Федерация
العربية	مصر
日本語	日本
⋮	

Previous Next

Typing


Select your keyboard layout or an input method.

Cameroon Multilingual (Dvorak)	Preview
Cameroon Multilingual (qwerty)	Preview
English (Cameroon)	Preview
English (Canada)	Preview
English (Colemak)	Preview
English (US) ✓	Preview
⋮	

Previous Next

About You

We need a few details to complete setup.



About You

Full Name ✓

Username ✓

This will be used to name your home folder and can't be changed.

Ready to Go


You're all set!

Thank you for choosing Oracle Linux Server.
We hope that you love it.


[Start using Oracle Linux Server](#)

Getting Started
GNOME Help


Getting Started



Use windows and workspaces



Switch tasks



Respond to messages

Common Tasks

- [Browse the web](#)
- [Connect to online accounts](#)
- [Use windows and workspaces](#)
- [Change the date, time and timezone](#)
- [Respond to messages](#)
- [Get online](#)
- [Change the wallpaper](#)
- [Use the system search](#)
- [Switch tasks](#)

GNOME Help



OS pre-requirement

Setting for /dev/shm

```
tmpfs /dev/shm tmpfs defaults,size=3072M 0 0
```

make sure at least 3G or it will not succeed.

Config yum repository

```
[root@prod1 ~]# cd /etc/yum.repos.d/
[root@prod1 yum.repos.d]# pwd
/etc/yum.repos.d
[root@prod1 yum.repos.d]# ls
public-yum-ol7.repo
[root@prod1 yum.repos.d]# cp public-yum-ol7.repo public-yum-ol7.repo.bak
[root@prod1 yum.repos.d]# vi public-yum-ol7.repo
[OEL72]
name=oel72
baseurl=file:///run/media/root/OL-7.2\ Server.x86_64/
gpgcheck=0
enabled=1
~
"public-yum-ol7.repo" 5L, 94C written
[root@prod1 yum.repos.d]#
[root@prod1 yum.repos.d]#
[root@prod1 yum.repos.d]# cat public-yum-ol7.repo
[OEL72]
name=oel72
baseurl=file:///run/media/root/OL-7.2\ Server.x86_64/
gpgcheck=0
enabled=1
[root@prod1 yum.repos.d]#

[root@prod1 Packages]# ls -l | grep oracle
-rw-rw-r--. 1 root root 34744 Nov 22 02:24 kmod-oracleasm-2.0.8-15.0.1.el7.x86_64.rpm
```

```

-rw-r--r--. 1 root root 80968 Jul 10 2014 oracleasm-support-2.1.8-3.el7.x86_64.rpm
-rw-rw-r--. 1 root root 49708 Nov 26 01:24 oraclelinux-release-7.2-1.0.5.el7.x86_64.rpm
-rw-r--r--. 1 root root 4246500 Jun 26 2014 oracle-logos-70.0.3-4.0.7.el7.noarch.rpm
-rw-rw-r--. 1 root root 19356 Oct 14 14:24 oracle-rdbms-server-11gR2-preinstall-1.0-4.el7.x86_64.rpm
-rw-rw-r--. 1 root root 18168 Oct 14 14:18 oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64.rpm

```

```
[root@prod1 yum.repos.d]#
```

Install 12cR1 preinstall package

```
[root@prod1 Packages]# yum install oracle-rdbms-server-12cR1-preinstall -y
```

```

[root@prod1 Packages]# yum install oracle-rdbms-server-12cR1-preinstall -y
Loaded plugins: langpacks, ulninfo
OEL72                                     | 3.6 kB  00:00:00
(1/2): OEL72/group_gz                    | 134 kB  00:00:00
(2/2): OEL72/primary_db                  | 4.1 MB  00:00:00
Resolving Dependencies
--> Running transaction check
--> Package oracle-rdbms-server-12cR1-preinstall.x86_64 0:1.0-4.el7 will be installed
--> Processing Dependency: libstdc++-devel for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: libaio-devel for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: ksh for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: glibc-devel for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: gcc-c++ for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: gcc for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: compat-libstdc++-33 for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Processing Dependency: compat-libcap1 for package: oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64
--> Running transaction check
--> Package compat-libcap1.x86_64 0:1.10-7.el7 will be installed
--> Package compat-libstdc++-33.x86_64 0:3.2.3-72.el7 will be installed
--> Package gcc.x86_64 0:4.8.5-4.el7 will be installed
--> Processing Dependency: cpp = 4.8.5-4.el7 for package: gcc-4.8.5-4.el7.x86_64
--> Processing Dependency: libmpfr.so.4(64bit) for package: gcc-4.8.5-4.el7.x86_64
--> Processing Dependency: libmpc.so.3()(64bit) for package: gcc-4.8.5-4.el7.x86_64
--> Package gcc-c++.x86_64 0:4.8.5-4.el7 will be installed
--> Package glibc-devel.x86_64 0:2.17-105.0.1.el7 will be installed
--> Processing Dependency: glibc-headers = 2.17-105.0.1.el7 for package: glibc-devel-2.17-105.0.1.el7.x86_64
--> Processing Dependency: glibc-headers for package: glibc-devel-2.17-105.0.1.el7.x86_64
--> Package ksh.x86_64 0:20120801-22.el7_1.2 will be installed
--> Package libaio-devel.x86_64 0:0.3.109-13.el7 will be installed
--> Package libstdc++-devel.x86_64 0:4.8.5-4.el7 will be installed
--> Running transaction check
--> Package cpp.x86_64 0:4.8.5-4.el7 will be installed
--> Package glibc-headers.x86_64 0:2.17-105.0.1.el7 will be installed
--> Processing Dependency: kernel-headers >= 2.2.1 for package: glibc-headers-2.17-105.0.1.el7.x86_64
--> Processing Dependency: kernel-headers for package: glibc-headers-2.17-105.0.1.el7.x86_64
--> Package libmpc.x86_64 0:1.0.1-3.el7 will be installed
--> Package mpfr.x86_64 0:3.1.1-4.el7 will be installed
--> Running transaction check
--> Package kernel-headers.x86_64 0:3.10.0-327.el7 will be installed
--> Finished Dependency Resolution

```

Dependencies Resolved

Package	Arch	Version	Repository	Size
Installing:				
oracle-rdbms-server-12cR1-preinstall	x86_64	1.0-4.el7	OEL72	18 k
Installing for dependencies:				
compat-libcap1	x86_64	1.10-7.el7	OEL72	17 k
compat-libstdc++-33	x86_64	3.2.3-72.el7	OEL72	190 k
cpp	x86_64	4.8.5-4.el7	OEL72	5.9 M
gcc	x86_64	4.8.5-4.el7	OEL72	16 M
gcc-c++	x86_64	4.8.5-4.el7	OEL72	7.2 M
glibc-devel	x86_64	2.17-105.0.1.el7	OEL72	1.0 M
glibc-headers	x86_64	2.17-105.0.1.el7	OEL72	661 k
kernel-headers	x86_64	3.10.0-327.el7	OEL72	3.2 M
ksh	x86_64	20120801-22.el7_1.2	OEL72	880 k
libaio-devel	x86_64	0.3.109-13.el7	OEL72	12 k
libmpc	x86_64	1.0.1-3.el7	OEL72	49 k
libstdc++-devel	x86_64	4.8.5-4.el7	OEL72	1.5 M
mpfr	x86_64	3.1.1-4.el7	OEL72	198 k

Transaction Summary

Install 1 Package (+13 Dependent packages)

Total download size: 37 M

Installed size: 88 M

Downloading packages:

```

-----
Total
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Installing : mpfr-3.1.1-4.el7.x86_64                                1/14
Installing : libmpc-1.0.1-3.el7.x86_64                             2/14
Installing : libstdc++-devel-4.8.5-4.el7.x86_64                   3/14
Installing : cpp-4.8.5-4.el7.x86_64                               4/14
Installing : kernel-headers-3.10.0-327.el7.x86_64                 5/14
Installing : glibc-headers-2.17-105.0.1.el7.x86_64                6/14
Installing : glibc-devel-2.17-105.0.1.el7.x86_64                 7/14
Installing : gcc-4.8.5-4.el7.x86_64                               8/14
Installing : gcc-c++-4.8.5-4.el7.x86_64                           9/14
Installing : libaio-devel-0.3.109-13.el7.x86_64                  10/14
Installing : compat-libcap1-1.10-7.el7.x86_64                    11/14
Installing : ksh-20120801-22.el7_1.2.x86_64                      12/14
Installing : compat-libstdc++-33-3.2.3-72.el7.x86_64             13/14
Installing : oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64 14/14

```

```

verifying : glibc-headers-2.17-105.0.1.e17.x86_64 1/14
verifying : libstdc++-devel-4.8.5-4.e17.x86_64 2/14
verifying : gcc-4.8.5-4.e17.x86_64 3/14
verifying : oracle-rdbms-server-12cR1-preinstall-1.0-4.e17.x86_64 4/14
verifying : mpfr-3.1.1-4.e17.x86_64 5/14
verifying : glibc-devel-2.17-105.0.1.e17.x86_64 6/14
verifying : compat-libstdc++-33-3.2.3-72.e17.x86_64 7/14
verifying : ksh-20120801-22.e17_1.2.x86_64 8/14
verifying : cpp-4.8.5-4.e17.x86_64 9/14
verifying : compat-libcap1-1.10-7.e17.x86_64 10/14
verifying : gcc-c++-4.8.5-4.e17.x86_64 11/14
verifying : libmpc-1.0.1-3.e17.x86_64 12/14
verifying : libaio-devel-0.3.109-13.e17.x86_64 13/14
verifying : kernel-headers-3.10.0-327.e17.x86_64 14/14

Installed:
oracle-rdbms-server-12cR1-preinstall.x86_64 0:1.0-4.e17

Dependency Installed:
compat-libcap1.x86_64 0:1.10-7.e17          compat-libstdc++-33.x86_64 0:3.2.3-72.e17          cpp.x86_64 0:4.8.5-4.e17
gcc.x86_64 0:4.8.5-4.e17                  gcc-c++.x86_64 0:4.8.5-4.e17          glibc-devel.x86_64 0:2.17-105.0.1.e17
glibc-headers.x86_64 0:2.17-105.0.1.e17  kernel-headers.x86_64 0:3.10.0-327.e17          ksh.x86_64 0:20120801-22.e17_1.2
libaio-devel.x86_64 0:0.3.109-13.e17      libmpc.x86_64 0:1.0.1-3.e17          libstdc++-devel.x86_64 0:4.8.5-4.e17
mpfr.x86_64 0:3.1.1-4.e17

Complete!
[root@prod1 Packages]#

```

Run 12cR1-preinstall-verify

```

[root@prod1 Packages]# oracle-rdbms-server-12cR1-preinstall-verify
/bin/sed: -e expression #1, char 116: unknown command: `3'
/bin/sed: -e expression #1, char 116: unknown command: `3'
[root@prod1 Packages]#
[root@prod1 Packages]#

```

```

[root@prod1 oracle-rdbms-server-12cR1-preinstall]# diff oracle-rdbms-server-12cR1-preinstall-verify
oracle-rdbms-server-12cR1-preinstall-verify.bak
542c542
<  ${SED} -i /^#[[:space:]]*${COMMENT}/d ${LIMITSFILE}
---
>  ${SED} -i /"^[[:space:]]*${COMMENT}"/d ${LIMITSFILE}
570c570
<  ${SED} -i /^#[[:space:]]*${COMMENT}/d ${LIMITSFILE}
---
>  ${SED} -i /"^[[:space:]]*${COMMENT}"/d ${LIMITSFILE}
[root@prod1 oracle-rdbms-server-12cR1-preinstall]#

```

```

[root@prod1 backup]# cd ..
[root@prod1 oracle-rdbms-server-12cR1-preinstall]# pwd
/var/log/oracle-rdbms-server-12cR1-preinstall
[root@prod1 oracle-rdbms-server-12cR1-preinstall]# ls
backup results
[root@prod1 oracle-rdbms-server-12cR1-preinstall]# pwd
/var/log/oracle-rdbms-server-12cR1-preinstall
[root@prod1 oracle-rdbms-server-12cR1-preinstall]# ls
backup results
[root@prod1 oracle-rdbms-server-12cR1-preinstall]# oracle-rdbms-server-12cR1-preinstall-verify
[root@prod1 oracle-rdbms-server-12cR1-preinstall]# cd results/
[root@prod1 results]# ls -l
total 4
-rw-r--r--. 1 root root 3196 Jan  8 15:44 orakernel.log

```

Review Verify Result

```

[root@prod1 results]# cat orakernel.log
Adding group oinstall with gid 54323
groupadd: group 'oinstall' already exists
Adding group dba
groupadd: group 'dba' already exists
User oracle is already present
uid=54321(oracle) gid=54321(oinstall) groups=54321(oinstall),54322(dba)
Creating oracle user passed

```

```

Verifying kernel parameters as per Oracle recommendations...
fs.file-max is matching with preinstall config.
fs.file-max = 6815744

```

```
kernel.sem is matching with preinstall config.
kernel.sem = 250 32000 100 128
kernel.shmmni is matching with preinstall config.
kernel.shmmni = 4096
kernel.shmall is matching with preinstall config.
kernel.shmall = 1073741824
kernel.shmmax is matching with preinstall config.
kernel.shmmax = 4398046511104
kernel.panic_on_oops is matching with preinstall config.
kernel.panic_on_oops = 1
net.core.rmem_default is matching with preinstall config.
net.core.rmem_default = 262144
net.core.rmem_max is matching with preinstall config.
net.core.rmem_max = 4194304
net.core.wmem_default is matching with preinstall config.
net.core.wmem_default = 262144
net.core.wmem_max is matching with preinstall config.
net.core.wmem_max = 1048576
net.ipv4.conf.all.rp_filter is matching with preinstall config.
net.ipv4.conf.all.rp_filter = 2
net.ipv4.conf.default.rp_filter is matching with preinstall config.
net.ipv4.conf.default.rp_filter = 2
fs.aio-max-nr is matching with preinstall config.
fs.aio-max-nr = 1048576
net.ipv4.ip_local_port_range is matching with preinstall config.
net.ipv4.ip_local_port_range = 9000 65500
Setting kernel parameters as per oracle recommendations...
Altered file /etc/sysctl.conf
Original file backed up at /etc/sysctl.conf.orabackup
Verifying & setting of kernel parameters passed
```

```
Setting user limits using /etc/security/limits.d/oracle-rdbms-server-12cR1-preinstall.conf
```

```
Verifying oracle user OS limits as per Oracle recommendations...
```

```
oracle soft nfile 1024
nfile soft limit is matching with preinstall config.
oracle hard nfile 65536
nfile hard limit is matching with preinstall config.
oracle soft nproc 16384
nproc soft limit is matching with preinstall config.
oracle hard nproc 16384
nproc hard limit is matching with preinstall config.
oracle soft stack 10240
stack soft limit is matching with preinstall config.
oracle hard stack 32768
stack hard limit is matching with preinstall config.
oracle hard memlock 134217728
memlock hard limit is matching with preinstall config.
oracle soft memlock 134217728
memlock soft limit is matching with preinstall config.
Setting oracle user OS limits as per Oracle recommendations...
Altered file /etc/security/limits.d/oracle-rdbms-server-12cR1-preinstall.conf
Original file backed up at /var/log/oracle-rdbms-server-12cR1-preinstall/backup/Jan-08-2016-15-44-15
Verifying & setting of user limits passed
```

Verifying kernel boot parameters as per Oracle recommendations...
 numa=off already present

transparent_hugepage=never already present

Verifying & setting of boot parameters passed

Trying to add NOZEROCONF parameter...
 Parameter already present
 Setting /etc/sysconfig/network parameters passed

Taking a backup of old config files under /var/log/oracle-rdbms-server-12cR1-preinstall/backup/Jan-08-2016-15-44-15
 [root@prod1 results]#

Configure /etc/hosts

```
[root@prod1 ~]# cat /etc/hosts
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6
10.0.0.100 prod1 prod1.us.oracle.com
10.0.0.102 prod1-vip
10.0.0.101 prod2 prod2.us.oracle.com
10.0.0.103 prod2-vip
192.168.0.100 prod1-priv
192.168.0.101 prod1-priv
10.0.0.104 prod-scan
```

Create user

The preinstall package will create oracle user

```
groupadd -g 10000 asmadmin
groupadd -g 10001 asmdba
groupadd -g 10002 asmoper
useradd -g oinstall -G asmadmin,asmdba,asmoper orgrid
usermod -g oinstall -G dba,asmdba oracle
```

```
[root@prod1 ~]# id oracle
uid=54321(oracle) gid=54321(oinstall) groups=54321(oinstall),54322(dba)
[root@prod1 ~]# groupmod -g 20000 oinstall
[root@prod1 ~]# groupmod -g 20001 dba
[root@prod1 ~]# groupadd -g 10000 asmadmin
[root@prod1 ~]# groupadd -g 10001 asmdba
[root@prod1 ~]# groupadd -g 10002 asmoper
[root@prod1 ~]#
[root@prod1 ~]# id oracle
uid=54321(oracle) gid=20000(oinstall) groups=20000(oinstall),20001(dba)
[root@prod1 ~]# useradd -g oinstall -G asmadmin,asmdba,asmoper orgrid
[root@prod1 ~]# usermod -g oinstall -G dba,asmdba oracle
[root@prod1 ~]# passwd oracle
```

Changing password for user oracle.

New password:

BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word

Retype new password:

passwd: all authentication tokens updated successfully.

[root@prod1 ~]# passwd orgrid

Changing password for user orgrid.

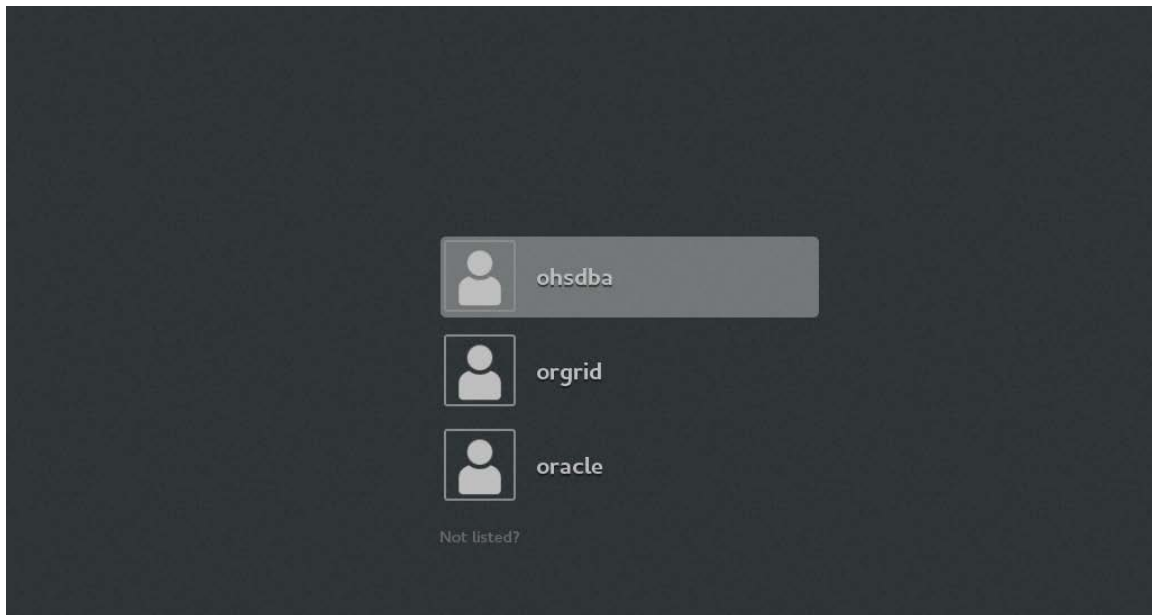
New password:

BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word

Retype new password:

passwd: all authentication tokens updated successfully.

[root@prod1 ~]#



Create directory and change permissions

```
mkdir -p /orgrid/grid_base
mkdir -p /orgrid/oracle/product/121
mkdir -p /oradb/oracle/product/121
chown -R oracle.oinstall /oradb
chown -R orgrid.oinstall /orgrid
```

Configure /etc/selinux/config

```
selinux=disabled
```

Configure /etc/security/limits.conf

```
orpemrep soft nproc 4096
orpemrep hard nproc 16384
orpemrep soft nofile 4096
orpemrep hard nofile 65536
```

Configure /etc/pam.d/login

```
session required pam_limits.so
```


Configure /etc/sysctl.conf

```
fs.file-max = 6815744
kernel.sem = 250 32000 100 128
kernel.shmmni = 4096
kernel.shmall = 1073741824
kernel.shmmax = 4398046511104
kernel.panic_on_oops = 1
net.core.rmem_default = 262144
net.core.rmem_max = 4194304
net.core.wmem_default = 262144
net.core.wmem_max = 1048576
net.ipv4.conf.all.rp_filter = 2
net.ipv4.conf.default.rp_filter = 2
fs.aio-max-nr = 1048576
net.ipv4.ip_local_port_range = 9000 65500
```

Disable firewall

```
[root@prod1 ~]# systemctl list-units|grep fire
firewalld.service                                loaded active running  firewalld - dynamic firewall daemon
[root@prod1 ~]# systemctl disable firewalld
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
Removed symlink /etc/systemd/system/basic.target.wants/firewalld.service.
[root@prod1 ~]# systemctl list-units|grep fire
firewalld.service                                loaded active running  firewalld - dynamic firewall daemon
[root@prod1 ~]# systemctl stop firewalld.service
[root@prod1 ~]# systemctl list-units|grep fire
[root@prod1 ~]#
```

```
[root@prod1 ~]# firewall-cmd --state
```

```
running
```

```
[root@prod1 ~]# systemctl disable firewalld
```

```
Removed symlink /etc/systemd/system/basic.target.wants/firewalld.service.
```

```
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
```

```
[root@prod1 ~]# systemctl stop firewalld
```

```
[root@prod1 ~]# firewall-cmd --state
```

```
not running
```

```
[root@prod1 ~]#
```

```
[root@prod1 ~]# systemctl list-unit-files |grep firewall
```

```
firewalld.service                                disabled
```

```
[root@prod1 ~]#
```

```
[root@prod1 ~]# hostnamectl
```

```
Static hostname: prod1.us.oracle.com
```

```
Icon name: computer-vm
```

```
Chassis: vm
```

```
Machine ID: 5b9c4aeec63e4dcdb81da60a7a913c57
```

```
Boot ID: bd380cc85f1d4ec684751a5d4acd934a
```

```
Virtualization: vmware
```

```
Operating System: Oracle Linux Server 7.2
```

```
CPE OS Name: cpe:/o:oracle:linux:7:2:server
```

```
Kernel: Linux 3.8.13-98.7.1.el7uek.x86_64
```

```
Architecture: x86-64
```

```
[root@prod1 ~]#
```

Install and Config ASM

```
[root@prod1 packages]# ls -l |grep oracle
-rw-r--r-- 1 root root 34744 Nov 22 02:24 kmod-oracleasm-2.0.8-15.0.1.el7.x86_64.rpm
-rw-r--r-- 1 root root 80968 Jul 10 2014 oracleasm-support-2.1.8-3.el7.x86_64.rpm
-rw-r--r-- 1 root root 49708 Nov 26 01:24 oraclelinux-release-7.2-1.0.5.el7.x86_64.rpm
-rw-r--r-- 1 root root 4246500 Jun 26 2014 oracle-logos-70.0.3-4.0.7.el7.noarch.rpm
-rw-r--r-- 1 root root 19356 Oct 14 14:24 oracle-rdbms-server-11gR2-preinstall-1.0-4.el7.x86_64.rpm
-rw-r--r-- 1 root root 18168 Oct 14 14:18 oracle-rdbms-server-12cR1-preinstall-1.0-4.el7.x86_64.rpm
[root@prod1 packages]# yum install kmod-oracleasm
Loaded plugins: langpacks, ulninfo
OEL72 | 3.6 kB 00:00:00
Resolving dependencies
--> Running transaction check
--> Package kmod-oracleasm.x86_64 0:2.0.8-15.0.1.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====================================================================================================================================
Package Arch Version Repository Size
=====================================================================================================================================
Installing:
kmod-oracleasm x86_64 2.0.8-15.0.1.el7 OEL72 34 k
Transaction Summary
-----
Install 1 Package
Total download size: 34 k
Installed size: 123 k
Is this ok [y/d/N]: y
Downloading packages:
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Installing : kmod-oracleasm-2.0.8-15.0.1.el7.x86_64 1/1
Verifying : kmod-oracleasm-2.0.8-15.0.1.el7.x86_64 1/1
Installed:
kmod-oracleasm.x86_64 0:2.0.8-15.0.1.el7
Complete!
[root@prod1 packages]# yum install oracleasm-support
Loaded plugins: langpacks, ulninfo
Resolving dependencies
--> Running transaction check
--> Package oracleasm-support.x86_64 0:2.1.8-3.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====================================================================================================================================
Package Arch Version Repository Size
=====================================================================================================================================
Installing:
oracleasm-support x86_64 2.1.8-3.el7 OEL72 79 k
Transaction Summary
-----
Install 1 Package
Total download size: 79 k
Installed size: 242 k
Is this ok [y/d/N]: y
Downloading packages:
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Installing : oracleasm-support-2.1.8-3.el7.x86_64 1/1
Note: Forwarding request to systemd enable oracleasm.service.
Created symlink from /etc/systemd/system/multi-user.target.wants/oracleasm.service to /usr/lib/systemd/system/oracleasm.service.
Verifying : oracleasm-support-2.1.8-3.el7.x86_64 1/1
Installed:
oracleasm-support.x86_64 0:2.1.8-3.el7
Complete!
[root@prod1 packages]#
```

oracleasm lib is optional. If you install it, it will list the disk automatically. If you do not install it, the disk discovery path is /dev/oracleasm/disks/*

```
[root@prod1 ~]# rpm -ivh oracleasm lib-2.0.12-1.el7.x86_64.rpm
warning: oracleasm lib-2.0.12-1.el7.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID ec551f03:
NOKEY
Preparing... ##### [100%]
Updating / installing...
 1:oracleasm lib-2.0.12-1.el7 ##### [100%]
[root@prod1 ~]#
[root@prod1 ~]#
```

```
[root@prod1 Packages]# oracleasm configure
ORACLEASM_UID=
ORACLEASM_GID=
ORACLEASM_SCANBOOT=true
ORACLEASM_SCANORDER=""
ORACLEASM_SCANEXCLUDE=""
ORACLEASM_USE_LOGICAL_BLOCK_SIZE="false"
[root@prod1 Packages]# oracleasm configure -i
Configuring the Oracle ASM library driver.
```

This will configure the on-boot properties of the Oracle ASM library driver. The following questions will determine whether the driver is loaded on boot and what permissions it will have. The current values

will be shown in brackets ([]). Hitting <ENTER> without typing an answer will keep that current value. Ctrl-C will abort.

```

Default user to own the driver interface []: orgrid
Default group to own the driver interface []: asmadmin
Scan for Oracle ASM disks on boot (y/n) [y]:
Writing Oracle ASM library driver configuration: done
[root@prod1 Packages]# oracleasm configure
ORACLEASM_UID=orgrid
ORACLEASM_GID=oinstall
ORACLEASM_SCANBOOT=true
ORACLEASM_SCANORDER=""
ORACLEASM_SCANEXCLUDE=""
ORACLEASM_USE_LOGICAL_BLOCK_SIZE="false"
[root@prod1 Packages]# /etc/init.d/oracleasm enable
Please run 'systemctl enable oracleasm.service' to enable oracleasm
[root@prod1 Packages]# systemctl enable oracleasm.service
[root@prod1 Packages]#
[root@prod1 Packages]# oracleasm configure
ORACLEASM_UID=orgrid
ORACLEASM_GID=asmadmin
ORACLEASM_SCANBOOT=true
ORACLEASM_SCANORDER=""
ORACLEASM_SCANEXCLUDE=""
ORACLEASM_USE_LOGICAL_BLOCK_SIZE="false"
[root@prod1 Packages]#

```

Install and config VMware Tools

```

[root@prod1 Packages]# yum install kernel-uek-devel
Loaded plugins: langpacks, ulninfo
Resolving Dependencies
--> Running transaction check
--> Package kernel-uek-devel.x86_64 0:3.8.13-98.7.1.el7uek will be installed
--> Processing Dependency: libdtrace-ctf for package: kernel-uek-devel-3.8.13-98.7.1.el7uek.x86_64
--> Running transaction check
--> Package libdtrace-ctf.x86_64 0:0.5.0-2.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                               Arch                               Version                               Repository                               Size
=====
Installing:
kernel-uek-devel                       x86_64                             3.8.13-98.7.1.el7uek                 OEL72                                    9.1 M
Installing for dependencies:
libdtrace-ctf                          x86_64                              0.5.0-2.el7                          OEL72                                    30 k

Transaction Summary
-----
Install 1 Package (+1 Dependent package)

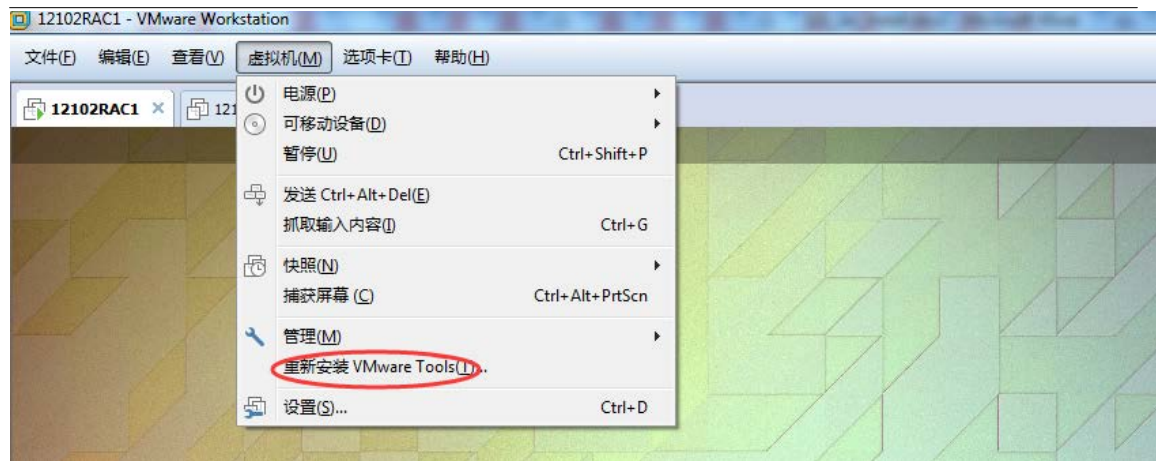
Total download size: 9.1 M
Installed size: 32 M
Is this ok [y/d/N]: y
Downloading packages:
-----
Total                                     50 MB/s | 9.1 MB  00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : libdtrace-ctf-0.5.0-2.el7.x86_64                                1/2
  Installing : kernel-uek-devel-3.8.13-98.7.1.el7uek.x86_64                    2/2
  Verifying  : kernel-uek-devel-3.8.13-98.7.1.el7uek.x86_64                    1/2
  Verifying  : libdtrace-ctf-0.5.0-2.el7.x86_64                                2/2

Installed:
kernel-uek-devel.x86_64 0:3.8.13-98.7.1.el7uek

Dependency Installed:
libdtrace-ctf.x86_64 0:0.5.0-2.el7

Complete!
[root@prod1 Packages]#

```



```
[root@prod1 ~]# cd /run/media/root/VMware\ Tools/
[root@prod1 VMware Tools]# ls
manifest.txt run_upgrader.sh VMwareTools-9.9.3-2759765.tar.gz vmware-tools-upgrader-32 vmware-tools-upgrader-64
[root@prod1 VMware Tools]#
[root@prod1 VMware Tools]# cp VMwareTools-9.9.3-2759765.tar.gz /tmp/
[root@prod1 ~]# cd /tmp/
[root@prod1 tmp]#
[root@prod1 tmp]# tar zxvf VMwareTools-9.9.3-2759765.tar.gz
vmware-tools-distrib/bin/vmware-uninstall-tools.pl
vmware-tools-distrib/INSTALL
vmware-tools-distrib/installer/
vmware-tools-distrib/installer/upstart-job.conf
vmware-tools-distrib/installer/thinprint.sh
vmware-tools-distrib/installer/thinprint.conf
vmware-tools-distrib/installer/services.sh
[root@prod1 tmp]#
[root@prod1 tmp]# cd vmware-tools-distrib/
[root@prod1 vmware-tools-distrib]# ls
bin doc etc FILES INSTALL installer lib vmware-install.pl
[root@prod1 vmware-tools-distrib]# ./vmware-install.pl
[root@prod1 vmware-tools-distrib]# vmware-config-tools.pl
```

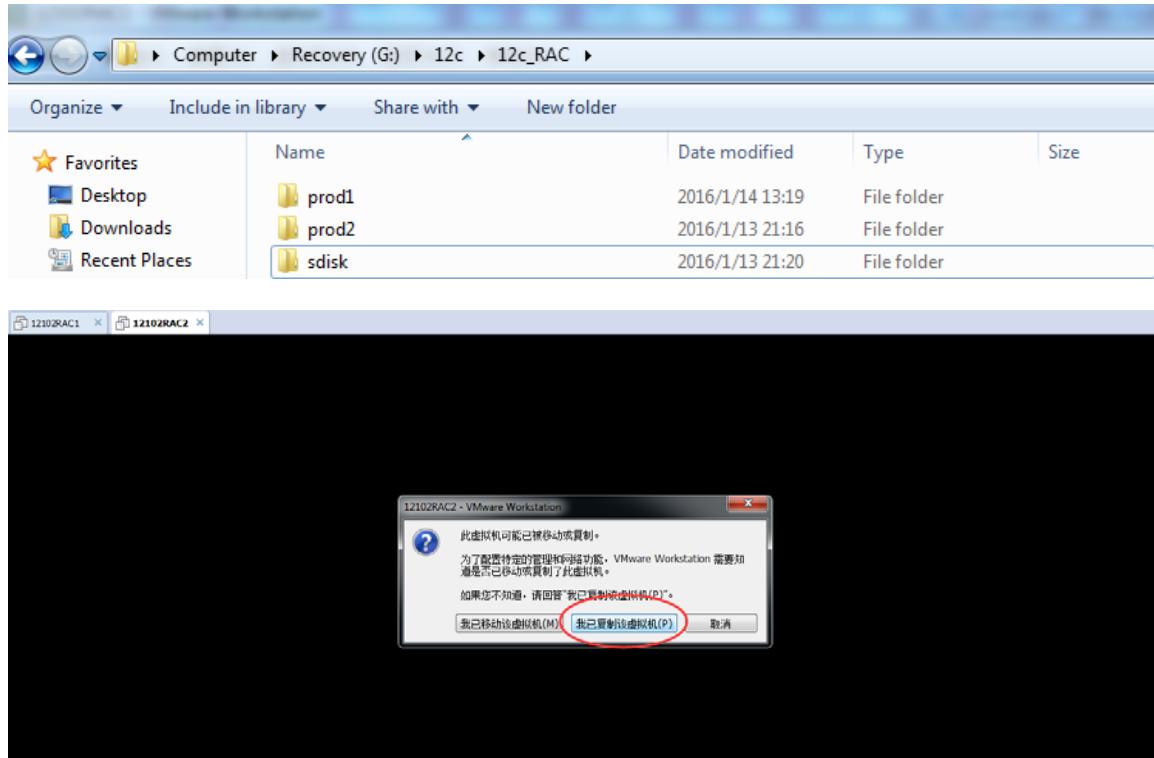
Shutdown PROD1

```
[oracle@prod1 ~]$ shutdown -h now
User root is logged in on sshd.
User root is logged in on sshd.
User root is logged in on sshd.
User root is logged in on sshd.
User root is logged in on seat0.
Please retry operation after closing inhibitors and logging out other users.
Alternatively, ignore inhibitors and users with 'systemctl poweroff -i'.
[oracle@prod1 ~]$ systemctl poweroff -i
==== AUTHENTICATING FOR org.freedesktop.login1.power-off-multiple-sessions ====
Authentication is required for powering off the system while other users are logged in.
Authenticating as: ohsdba
Password:
==== AUTHENTICATION COMPLETE ====
[oracle@prod1 ~]$
```

Of course, you can shutdown the server with below command as root
systemctl poweroff

Clone PROD1 to PROD2

Copy prod1 and rename it to prod2



Modify hostname to prod2

```
[root@prod1 Desktop]# hostnamectl
Static hostname: prod1.us.oracle.com
Icon name: computer-vm
Chassis: vm
Machine ID: 5b9c4aeec63e4dccb81da60a7a913c57
Boot ID: 41dc52a7a6af4d7abd539eb8348defbf
Virtualization: vmware
Operating System: Oracle Linux Server 7.2
CPE OS Name: cpe:/o:oracle:linux:7:2:server
Kernel: Linux 3.8.13-98.7.1.el7uek.x86_64
Architecture: x86-64
[root@prod1 Desktop]# hostnamectl set-hostname prod2.us.oracle.com --static
[root@prod1 Desktop]# hostnamectl
Static hostname: prod2.us.oracle.com
Transient hostname: prod1.us.oracle.com
Icon name: computer-vm
Chassis: vm
Machine ID: 5b9c4aeec63e4dccb81da60a7a913c57
Boot ID: 41dc52a7a6af4d7abd539eb8348defbf
Virtualization: vmware
Operating System: Oracle Linux Server 7.2
```

```

CPE OS Name: cpe:/o:oracle:linux:7:2:server
Kernel: Linux 3.8.13-98.7.1.el7uek.x86_64
Architecture: x86-64
[root@prod1 Desktop]#
[root@prod2 Desktop]# hostnamectl
Static hostname: prod2.us.oracle.com
Icon name: computer-vm
Chassis: vm
Machine ID: d2278f3d01074f8c86a072d31337d1e9
Boot ID: 1b64f5c2b5764286af7332efc219c13b
Virtualization: vmware
Operating System: Oracle Linux Server 7.2
CPE OS Name: cpe:/o:oracle:linux:7:2:server
Kernel: Linux 3.8.13-98.7.1.el7uek.x86_64
Architecture: x86-64
[root@prod2 Desktop]#

```

Change ip address on prod2

```

[root@prod2 ~]# cat /etc/hosts
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
::1 localhost localhost.localdomain localhost6 localhost6.localdomain6
10.0.0.100 prod1 prod1.us.oracle.com
10.0.0.102 prod1-vip
10.0.0.101 prod2 prod2.us.oracle.com
10.0.0.103 prod2-vip
192.168.0.100 prod1-priv
192.168.0.101 prod2-priv
10.0.0.104 prod-scan

[root@prod2 ~]#
[root@prod2 ~]# nmcli device status
DEVICE    TYPE    STATE    CONNECTION
eno16777736 ethernet connected eno16777736
eno33554984 ethernet connected Profile1
virbr0    bridge disconnected --
virbr0-nic ethernet disconnected --
lo        loopback unmanaged --
[root@prod2 ~]# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eno16777736: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
    qlen 1000
    link/ether 00:0c:29:7e:c0:28 brd ff:ff:ff:ff:ff:ff
    inet 10.0.0.101/24 brd 10.0.0.255 scope global eno16777736
    inet 10.0.0.103/24 brd 10.0.0.255 scope global secondary eno16777736:1
    inet6 fe80::20c:29ff:fe7e:c028/64 scope link
        valid_lft forever preferred_lft forever
3: eno33554984: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
    qlen 1000
    link/ether 00:0c:29:7e:c0:32 brd ff:ff:ff:ff:ff:ff

```

```

inet 192.168.0.101/24 brd 192.168.0.255 scope global eno33554984
inet 169.254.236.162/16 brd 169.254.255.255 scope global eno33554984:1
inet6 fe80::20c:29ff:fe7e:c032/64 scope link
    valid_lft forever preferred_lft forever
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN
    link/ether 52:54:00:7e:58:12 brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
5: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast master virbr0 state DOWN
    qlen 500
    link/ether 52:54:00:7e:58:12 brd ff:ff:ff:ff:ff:ff
[root@prod2 ~]#

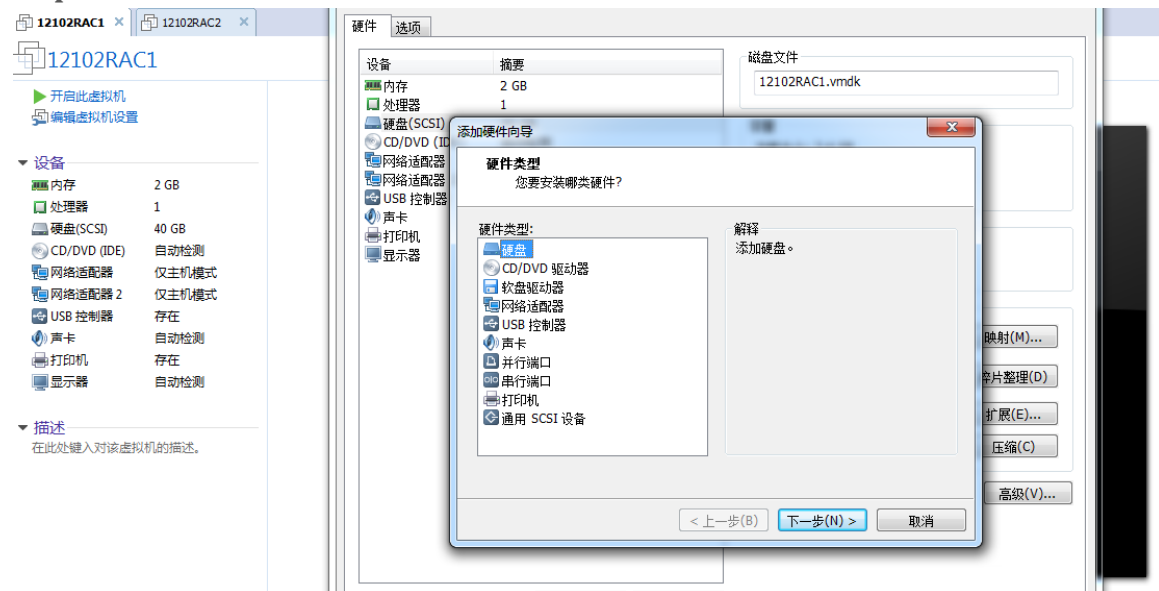
```

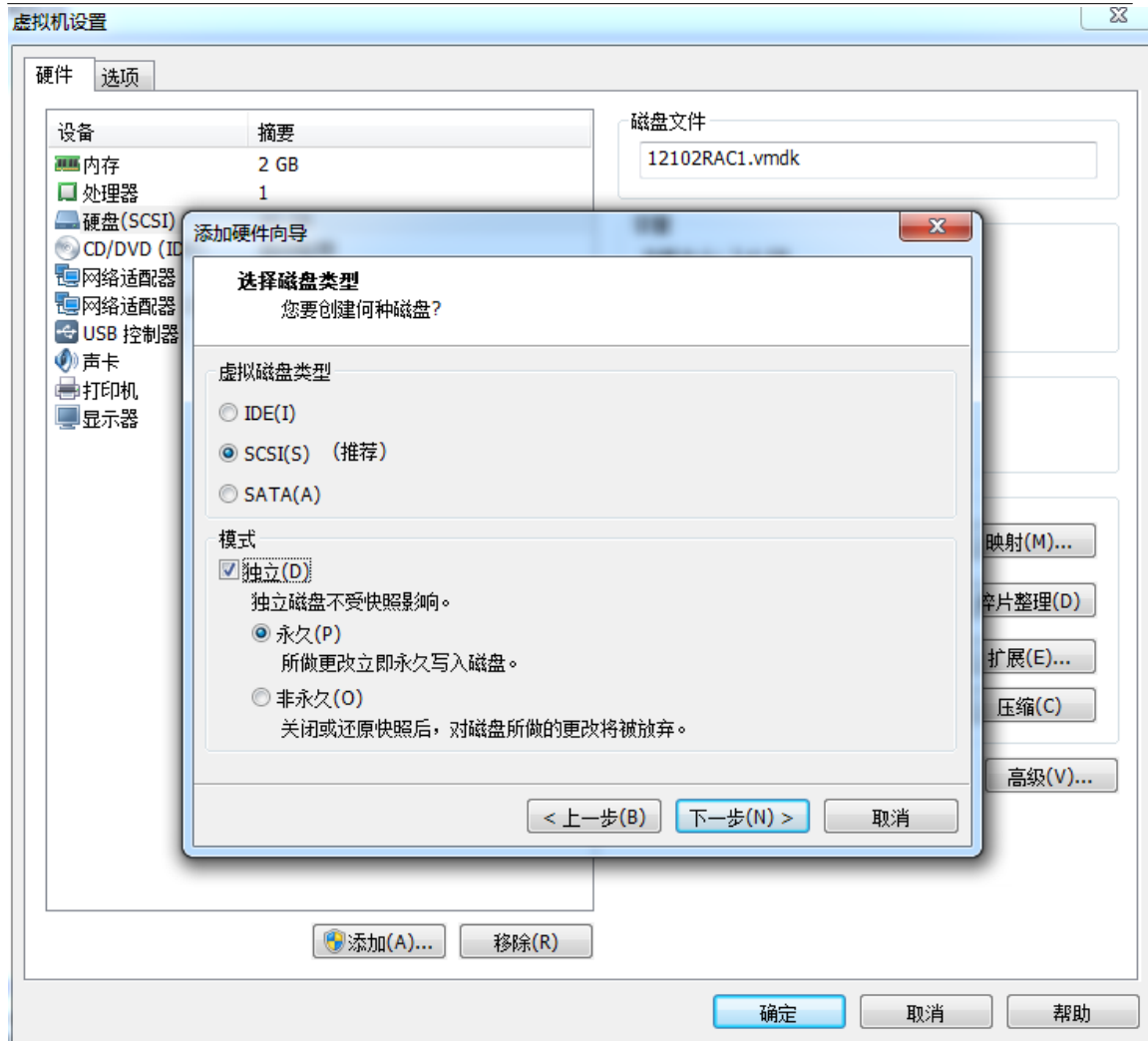
Shutdown PROD2

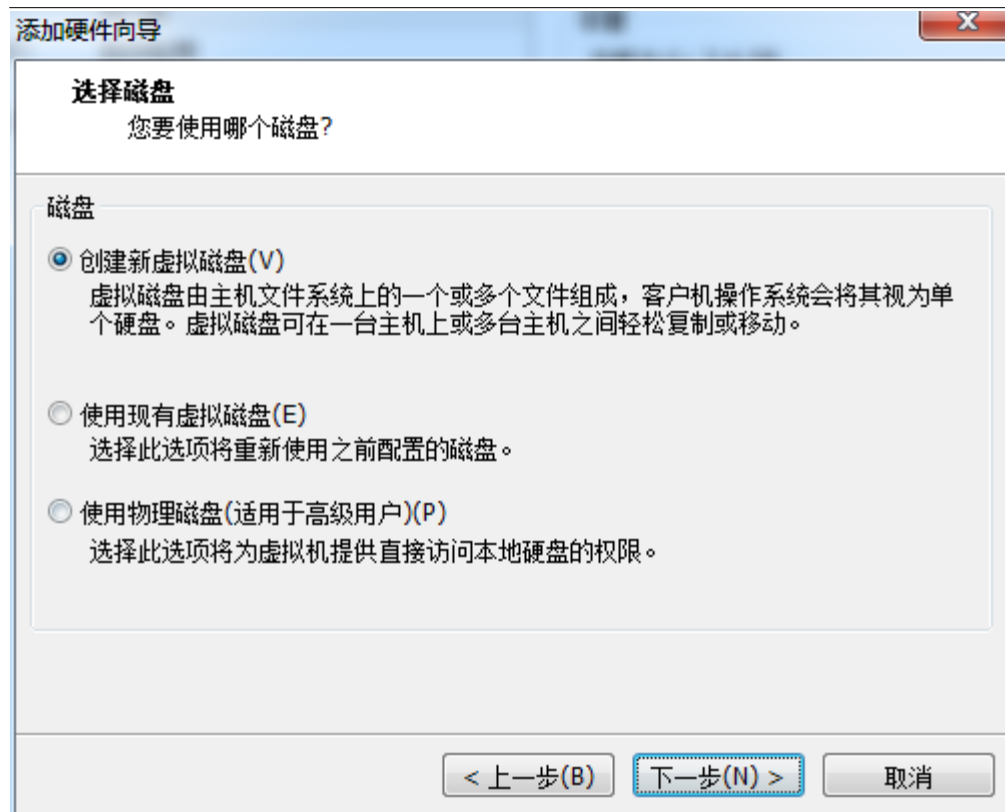
```
[root@prod2 ~]$systemctl poweroff
```

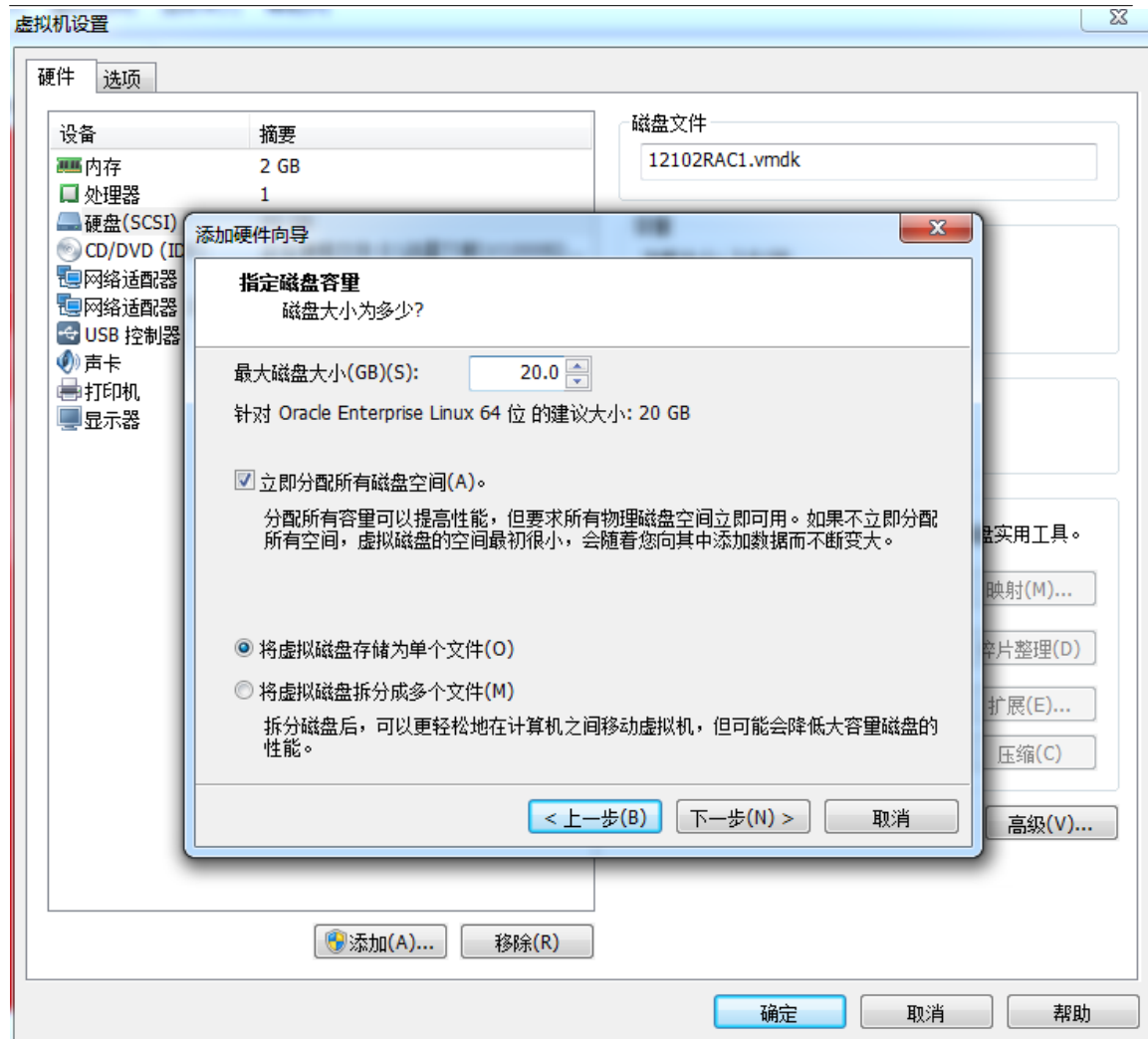
Add Shared disk

Step On PROD1

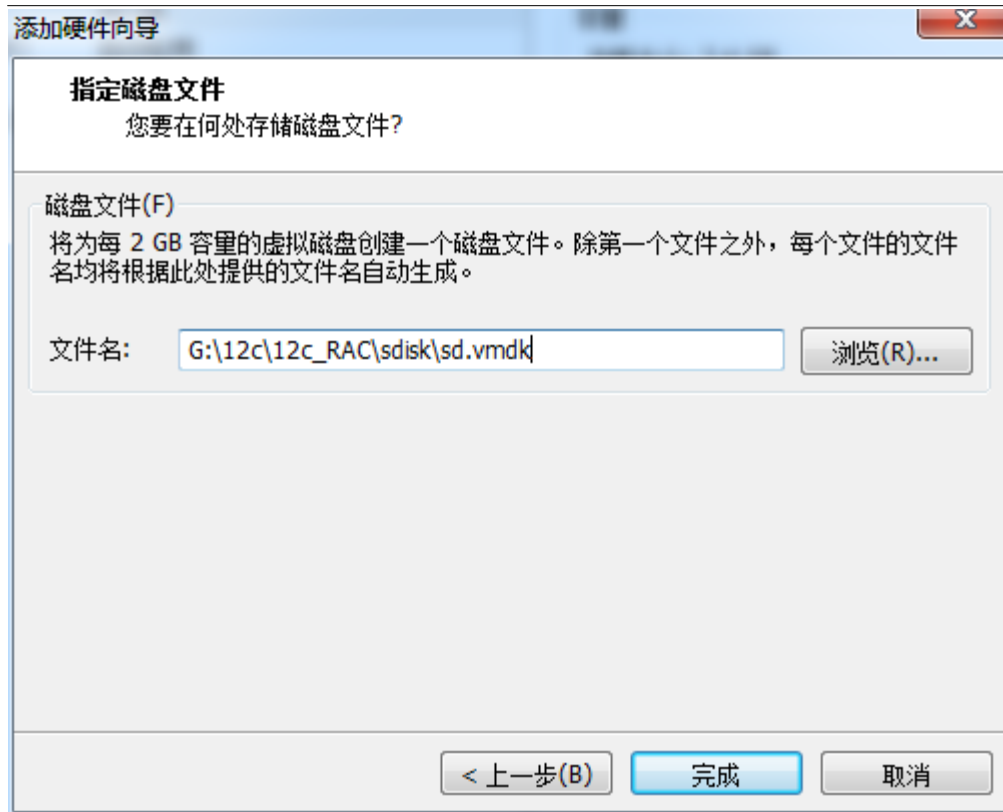


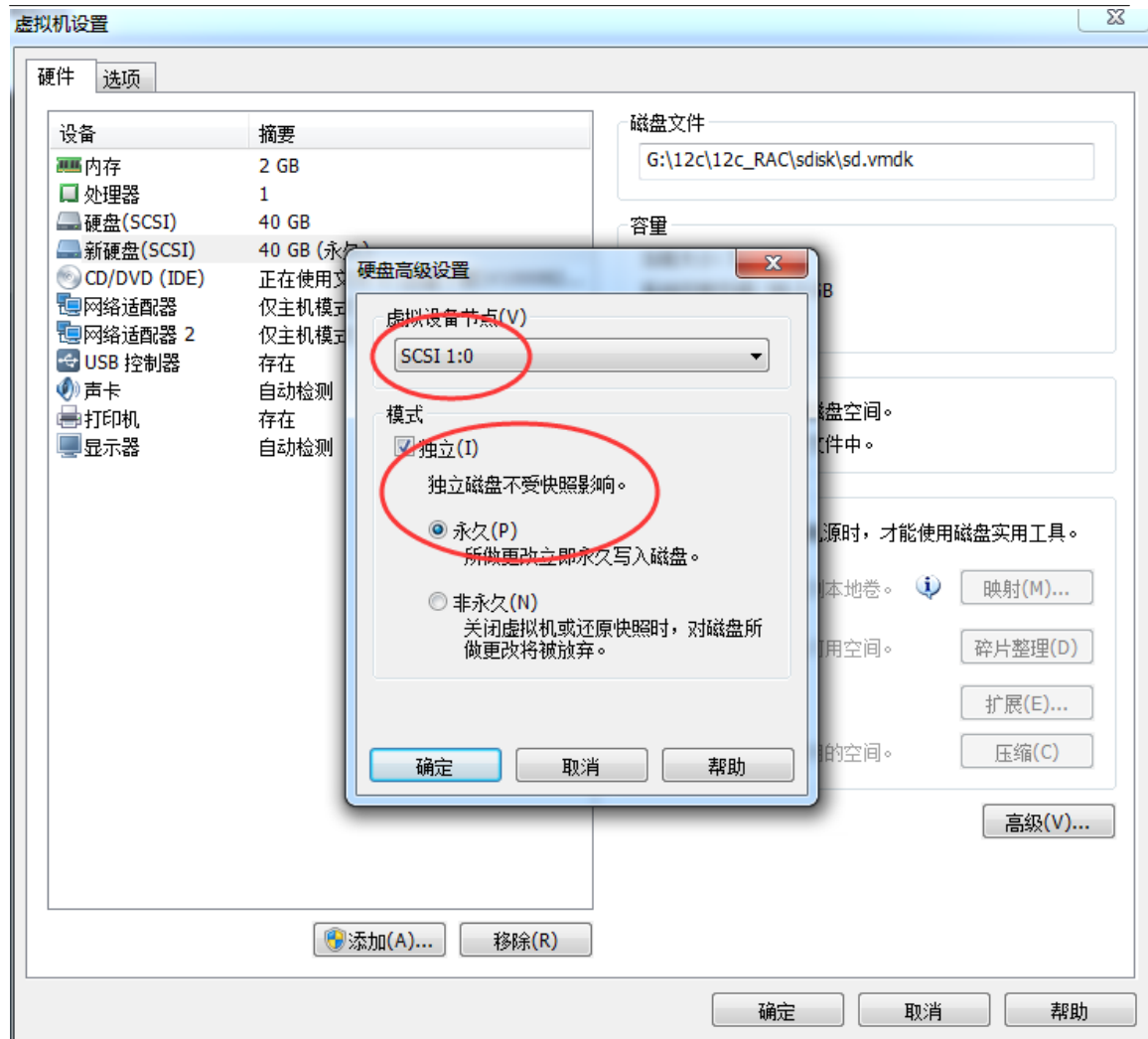






Note: you must allocate the disk space immediately





Create partitions on PROD1

```
[root@prod1 ~]#
[root@prod1 ~]# fdisk /dev/sdb
Welcome to fdisk (util-linux 2.23.2).
```

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0x25952bb8.

```
Command (m for help): n
Partition type:
  p  primary (0 primary, 0 extended, 4 free)
  e  extended
Select (default p):
Using default response p
Partition number (1-4, default 1):
First sector (2048-41943039, default 2048):
Using default value 2048
```

Last sector, +sectors or +size{K,M,G} (2048-41943039, default 41943039): +4G
 Partition 1 of type Linux and of size 4 GiB is set

Command (m for help): n

Partition type:

p primary (1 primary, 0 extended, 3 free)
 e extended

Select (default p):

Using default response p

Partition number (2-4, default 2):

First sector (8390656-41943039, default 8390656):

Using default value 8390656

Last sector, +sectors or +size{K,M,G} (8390656-41943039, default 41943039): +8G

Partition 2 of type Linux and of size 8 GiB is set

Command (m for help): n

Partition type:

p primary (2 primary, 0 extended, 2 free)
 e extended

Select (default p):

Using default response p

Partition number (3,4, default 3):

First sector (25167872-41943039, default 25167872):

Using default value 25167872

Last sector, +sectors or +size{K,M,G} (25167872-41943039, default 41943039):

Using default value 41943039

Partition 3 of type Linux and of size 8 GiB is set

Command (m for help): p

Disk /dev/sdb: 21.5 GB, 21474836480 bytes, 41943040 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Disk identifier: 0x25952bb8

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		2048	8390655	4194304	83	Linux
/dev/sdb2		8390656	25167871	8388608	83	Linux
/dev/sdb3		25167872	41943039	8387584	83	Linux

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

[root@prod1 ~]# fdisk -l |grep sdb

Disk /dev/sdb: 21.5 GB, 21474836480 bytes, 41943040 sectors

/dev/sdb1 2048 8390655 4194304 83 Linux

/dev/sdb2 8390656 25167871 8388608 83 Linux

/dev/sdb3 25167872 41943039 8387584 83 Linux

[root@prod1 ~]#

Create and Verify ASM disks

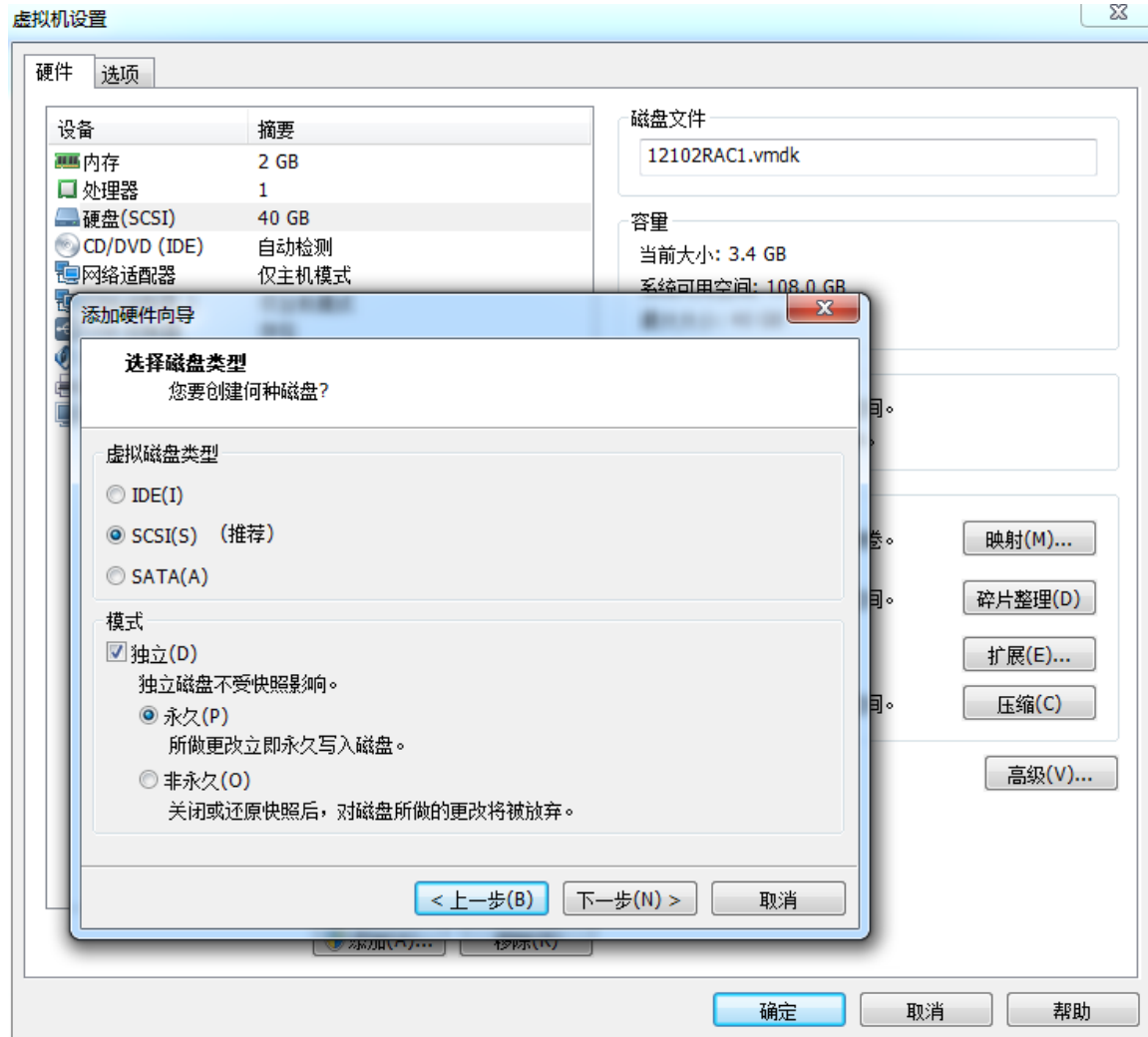
```

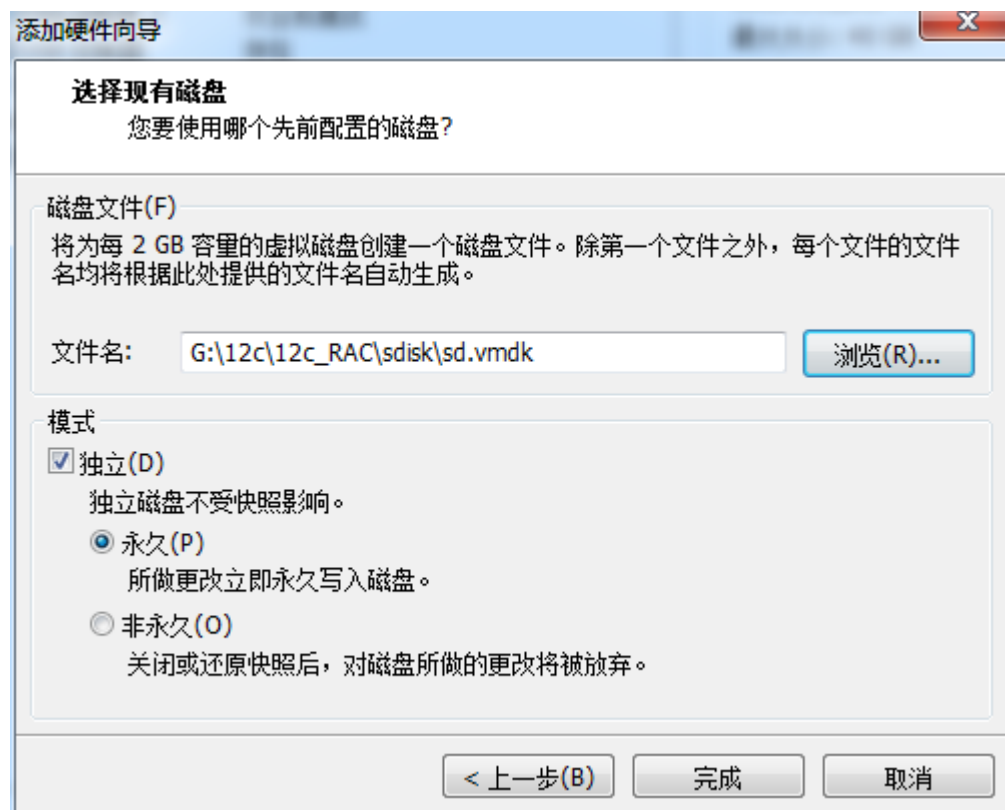
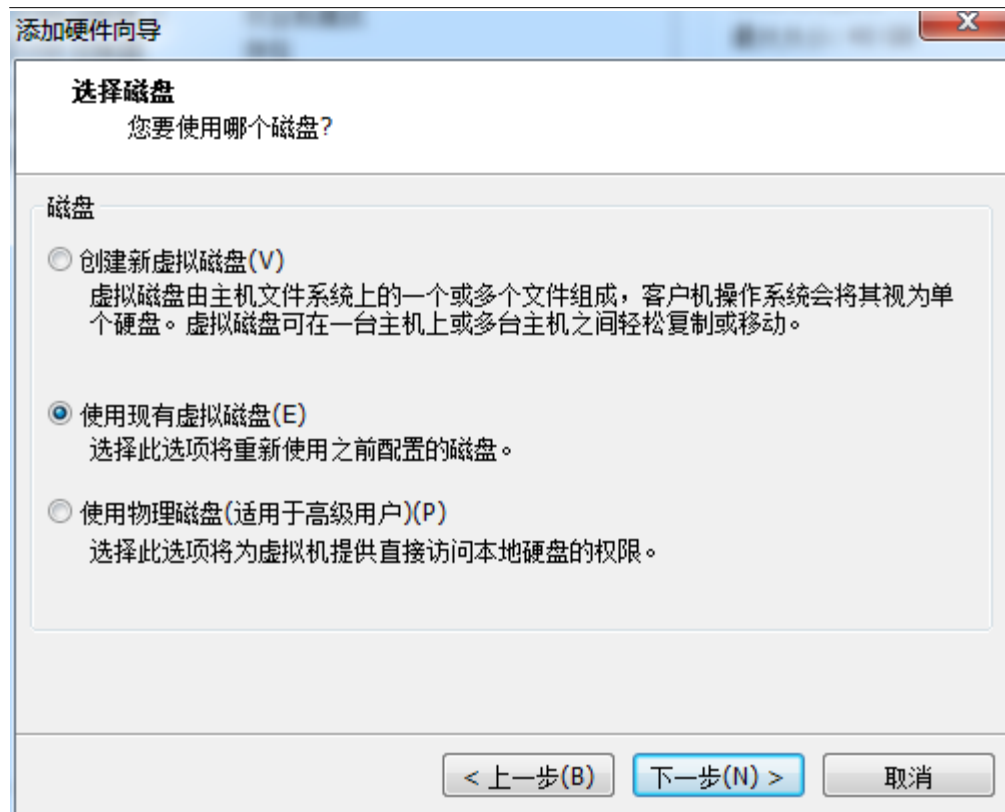
[root@prod1 ~]# oracleasm createdisk ASMDISK1 /dev/sdb1
Writing disk header: done
Instantiating disk: done
[root@prod1 ~]# oracleasm createdisk ASMDISK2 /dev/sdb2
Writing disk header: done
Instantiating disk: done
[root@prod1 ~]# oracleasm createdisk ASMDISK3 /dev/sdb3
Writing disk header: done
Instantiating disk: done
[root@prod1 ~]# oracleasm exit
Unmounting ASMLib driver filesystem: /dev/oracleasm
Unloading module "oracleasm": oracleasm
[root@prod1 ~]# oracleasm init
Loading module "oracleasm": oracleasm
Configuring "oracleasm" to use device physical block size
Mounting ASMLib driver filesystem: /dev/oracleasm
[root@prod1 ~]# oracleasm scandisks
Reloading disk partitions: done
Cleaning any stale ASM disks...
Scanning system for ASM disks...
Instantiating disk "ASMDISK1"
Instantiating disk "ASMDISK2"
Instantiating disk "ASMDISK3"
[root@prod1 ~]# oracleasm listdisks
ASMDISK1
ASMDISK2
ASMDISK3
[root@prod1 ~]# ls -l /dev/oracleasm/disks/
total 0
brw-rw---- 1 orgrid asmadmin 8, 17 Jan 10 20:26 ASMDISK1
brw-rw---- 1 orgrid asmadmin 8, 18 Jan 10 20:26 ASMDISK2
brw-rw---- 1 orgrid asmadmin 8, 19 Jan 10 20:26 ASMDISK3
[root@prod1 ~]# oracleasm configure
ORACLEASM_UID=orgrid
ORACLEASM_GID=asmadmin
ORACLEASM_SCANBOOT=true
ORACLEASM_SCANORDER=""
ORACLEASM_SCANEXCLUDE=""
ORACLEASM_USE_LOGICAL_BLOCK_SIZE="false"
[root@prod1 ~]#
Shared disk setting for prod1
scsi1.present = "TRUE"
scsi1.virtualDev = "lsilogic"
scsi1:0.present = "TRUE"
scsi1:0.fileName = "G:\12c\12c_RAC\sdisk\sd.vmdk"
scsi1:0.mode = "independent-persistent"
scsi1:0.redo = ""
disk.locking = "FALSE"
diskLib.dataCacheMaxSize="0"
diskLib.dataCacheMaxReadAheadSize="0"
diskLib.DataCacheMinReadAheadSize="0"
diskLib.dataCachePageSize="4096"
diskLib.maxUnsyncedWrites="0"

```

```
scsi1:0.deviceType = "disk"  
disk.locking = "false"
```

Step on PROD2



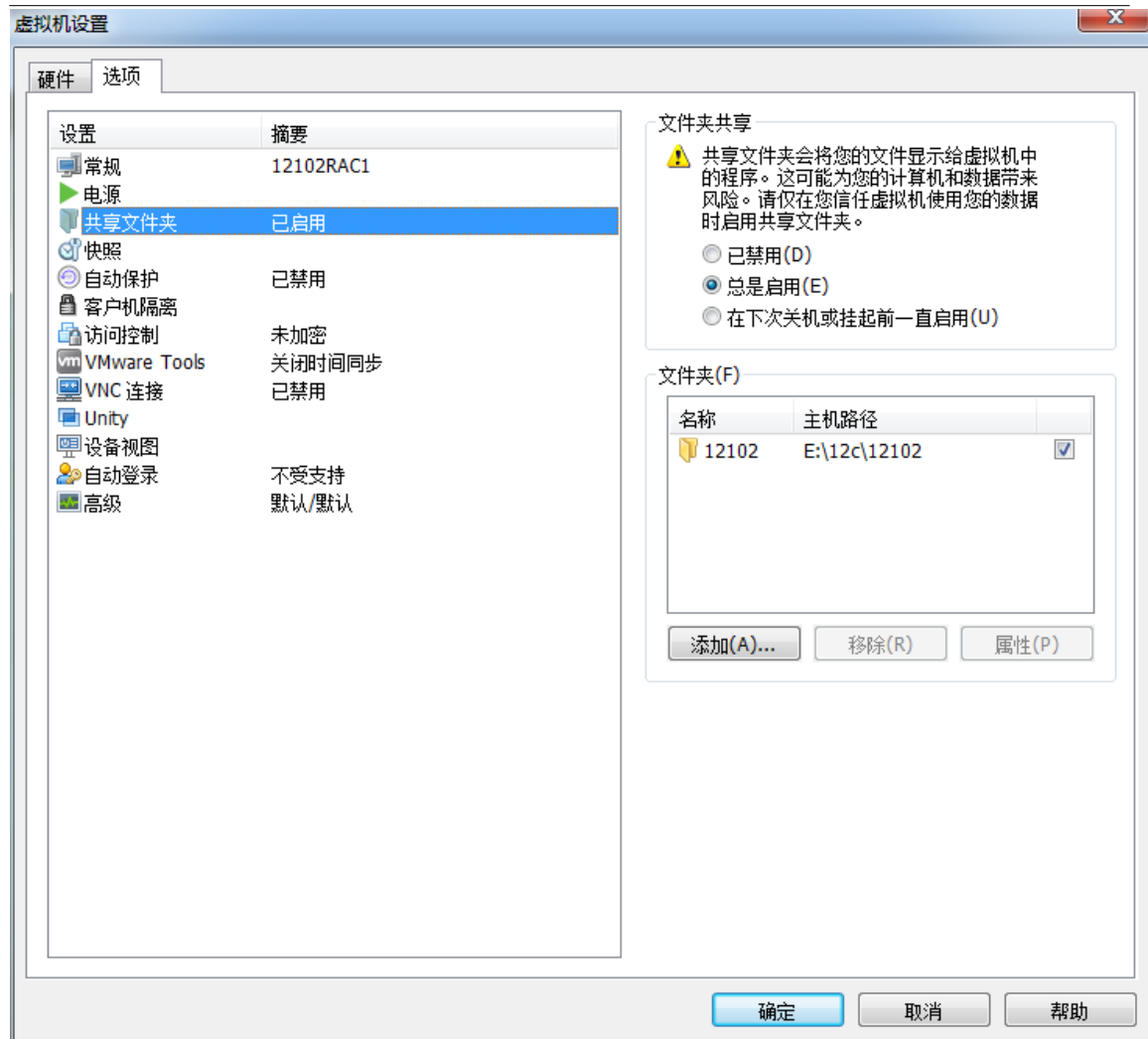


Shared disk setting for prod2

```
scsi1.present = "TRUE"
scsi1.virtualDev = "lsilogic"
scsi1:0.present = "TRUE"
scsi1:0.fileName = "G:\12c\12c_RAC\sdisk\sd.vmdk"
scsi1:0.mode = "independent-persistent"
scsi1:0.redo = ""
disk.locking = "FALSE"
diskLib.dataCacheMaxSize="0"
diskLib.dataCacheMaxReadAheadSize="0"
diskLib.DataCacheMinReadAheadSize="0"
diskLib.dataCachePageSize="4096"
diskLib.maxUnsyncedWrites="0"
scsi1:0.deviceType = "disk"
disk.locking = "false"
```

Install Grid Infrastructure

Add shared folder



```
[root@prod1 ~]# vmware-hgfsclient
12102
[root@prod1 ~]#
[root@prod1 Desktop]# xhost +
access control disabled, clients can connect from any host
[root@prod1 Desktop]# su - orgrid
Last login: Thu Jan  7 10:01:31 CST 2016 on pts/1
[orgrid@prod1 ~]$ export DISPLAY=:0.0
[orgrid@prod1 ~]$ cd /mnt/hgfs/12102/grid/
[orgrid@prod1 grid]$ ./runInstaller
Starting Oracle Universal Installer...
```

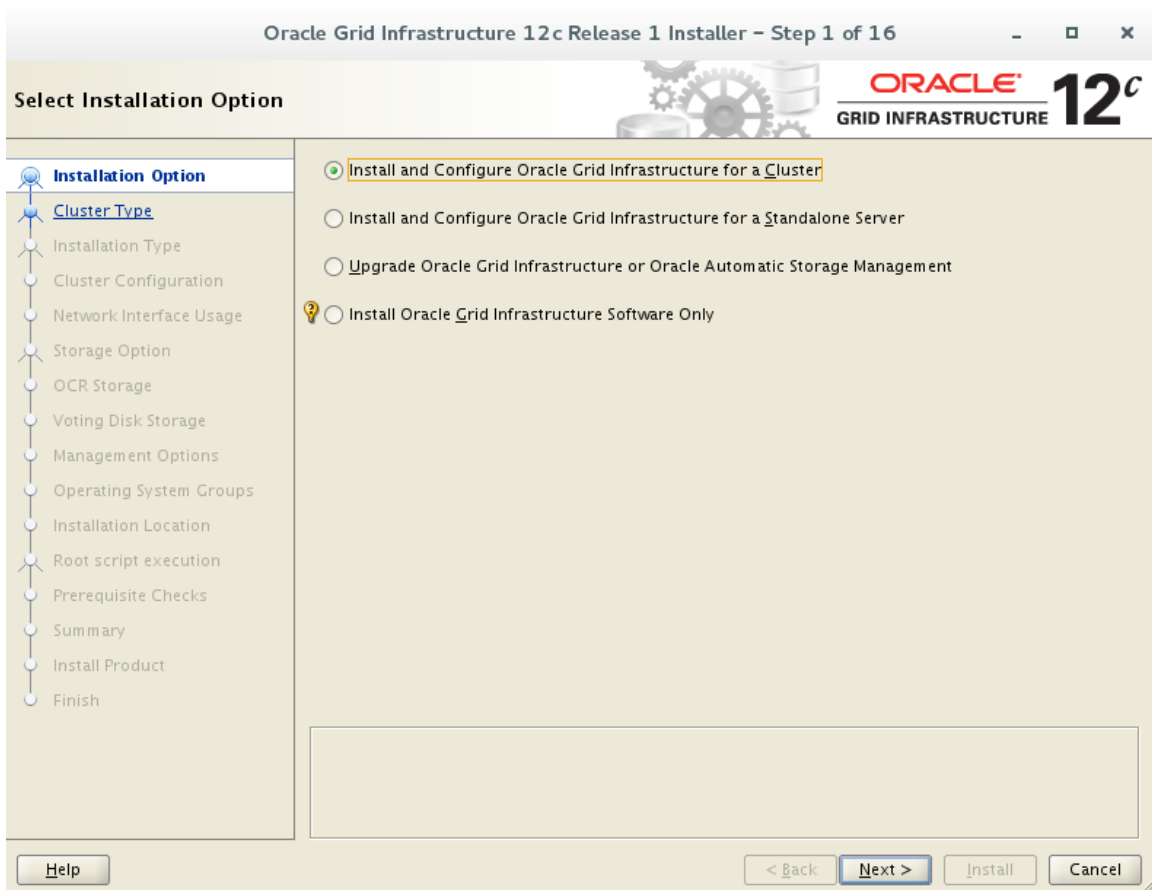
```
Checking Temp space: must be greater than 415 MB.   Actual 32753 MB   Passed
Checking swap space: must be greater than 150 MB.   Actual 2047 MB   Passed
Checking monitor: must be configured to display at least 256 colors.   Actual
16777216   Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2016-01-
07_10-05-02AM. Please wait ...[orgrid@prod1 grid]$
```

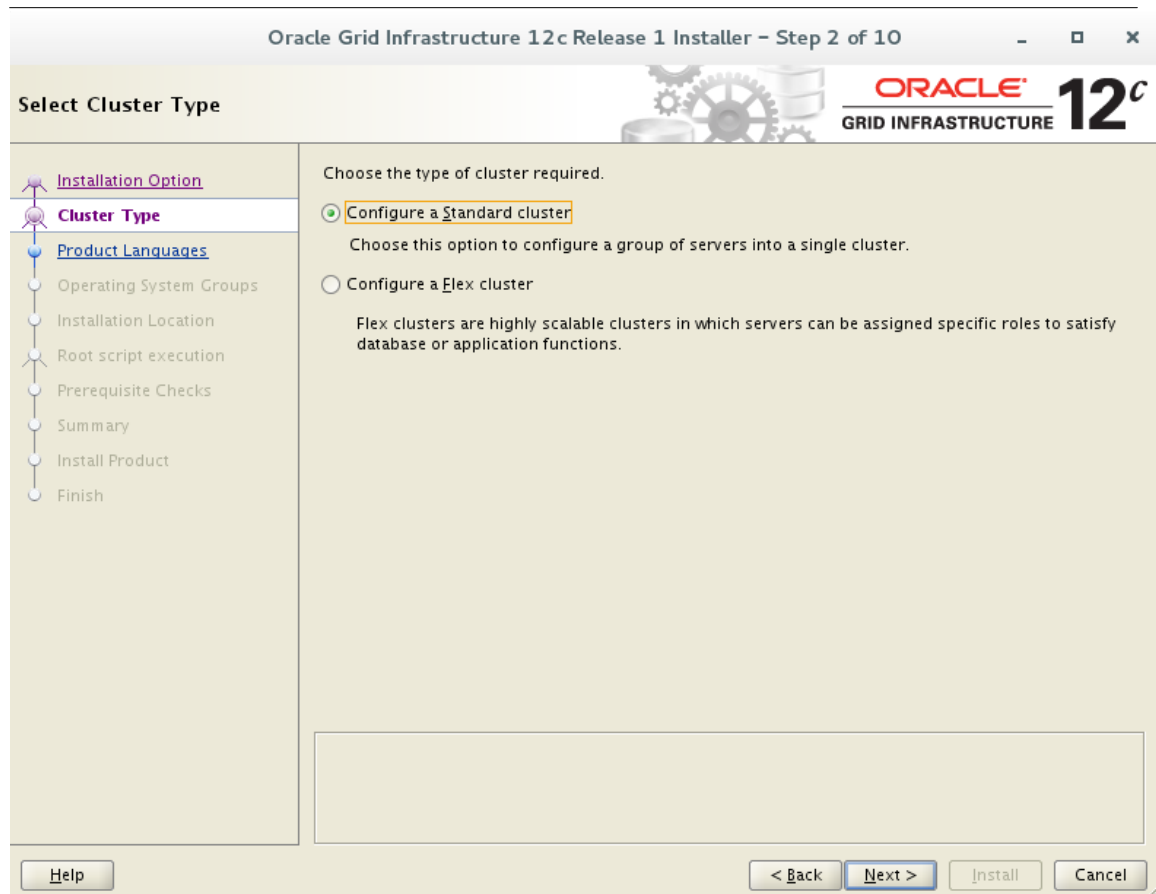
```

orgrid@prod1:/mnt/hgfs/12102/grid
File Edit View Search Terminal Help
[root@prod1 Desktop]# xhost +
access control disabled, clients can connect from any host
[root@prod1 Desktop]# su - orgrid
Last login: Thu Jan  7 10:01:31 CST 2016 on pts/1
[orgrid@prod1 ~]$ export DISPLAY=:0.0
[orgrid@prod1 ~]$ cd /mnt/hgfs/12102/grid/
[orgrid@prod1 grid]$ ./runInstaller
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 415 MB.   Actual 32753 MB   Passed
Checking swap space: must be greater than 150 MB.   Actual 2047 MB   Passed
Checking monitor: must be configured to display at least 256 colors.   Actual 16777216   Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2016-01-07_10-05-02AM. Please wait ...[orgrid@prod1 grid]$ █

```





Oracle Grid Infrastructure 12c Release 1 Installer - Step 3 of 16

Select Installation Type

ORACLE 12c
GRID INFRASTRUCTURE

- Installation Option
- Cluster Type
- Installation Type**
- Cluster Configuration
 - Network Interface Usage
 - Storage Option
 - OCR Storage
 - Voting Disk Storage
 - Management Options
 - Operating System Groups
 - Installation Location
 - Root script execution
 - Prerequisite Checks
 - Summary
 - Install Product
 - Finish


Typical Installation
Perform a full grid infrastructure installation with basic configuration.

Advanced Installation
Allows advanced configuration options such as alternative storage choices, additional networking flexibility, integration with IPMI.

Help < Back Next > Install Cancel

Oracle Grid Infrastructure 12c Release 1 Installer - Step 4 of 11

Select Product Languages



Select the languages in which your product will run.

Available languages:

- Arabic
- Bengali
- Brazilian Portuguese
- Bulgarian
- Canadian French
- Catalan
- Croatian
- Czech
- Danish
- Dutch
- Egyptian
- English (United Kingdom)
- Estonian
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Icelandic
- Indonesian

Selected languages:

- English

Navigation: < Back, Next >, Install, Cancel

Oracle Grid Infrastructure 12c Release 1 Installer - Step 5 of 18

Grid Plug and Play Information

Single Client Access Name (SCAN) allows clients to use one name in connection strings to connect to the cluster as a whole. Client connect requests to the SCAN name can be handled by any cluster node.

Cluster Name:

SCAN Name:

SCAN Port:

Configure GNS

Configure nodes Virtual IPs as assigned by the Dynamic Networks

Create a new GNS

GNS VIP Address:

GNS Sub Domain:

Use Shared GNS

GNS Client Data:

cluster name will be one pdb name for MGMTDB, you can check it in MGMTDB Status steps.

Oracle Grid Infrastructure 12c Release 1 Installer – Step 6 of 18

Cluster Node Information

Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Hostname and Virtual Hostname.

Public Hostname	Virtual Hostname
prod1	prod1-vip
prod2	prod2-vip

SSH connectivity... Use Cluster Configuration File... Add... Edit... Remove


OS Username: OS Password:

User home is shared by the selected nodes

Reuse private and public keys existing in the user home

< Back Next > Install Cancel


Oracle Grid Infrastructure 12c Release 1 Installer - Step 6 of 18

Cluster Node Information


- Installation Option
- Cluster Type
- Installation Type
- Product Languages
- Grid Plug and Play
- Cluster Node Information**
- Network Interface Usage
- Storage Option
- OCR Storage
- Voting Disk Storage
- Management Options
- Operating System Groups
- Installation Location
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Hostname and Virtual Hostname.

Public Hostname	Virtual Hostname
prod1	prod1-vip
prod2	prod2-vip


Establishing SSH connectivity between the selected nodes. This may take several minutes. Please wait...

OS Username:
OS Password:

User home is shared by the selected nodes
 Reuse private and public keys existing in the user home

Oracle Grid Infrastructure 12c Release 1 Installer - Step 6 of 18

Cluster Node Information

Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Hostname and Virtual Hostname.

Public Hostname	Virtual Hostname
prod1	prod1-vip
prod2	prod2-vip

Oracle Grid Infrastructure 12c Release 1 Installer

i Successfully established passwordless SSH connectivity between the selected nodes.

User home is shared by the selected nodes

Reuse private and public keys existing in the user home

Buttons: Help, < Back, Next >, Install, Cancel, Edit..., Remove, Test, Setup, OK

Choose ASM & Private

Oracle Grid Infrastructure 12c Release 1 Installer - Step 7 of 18

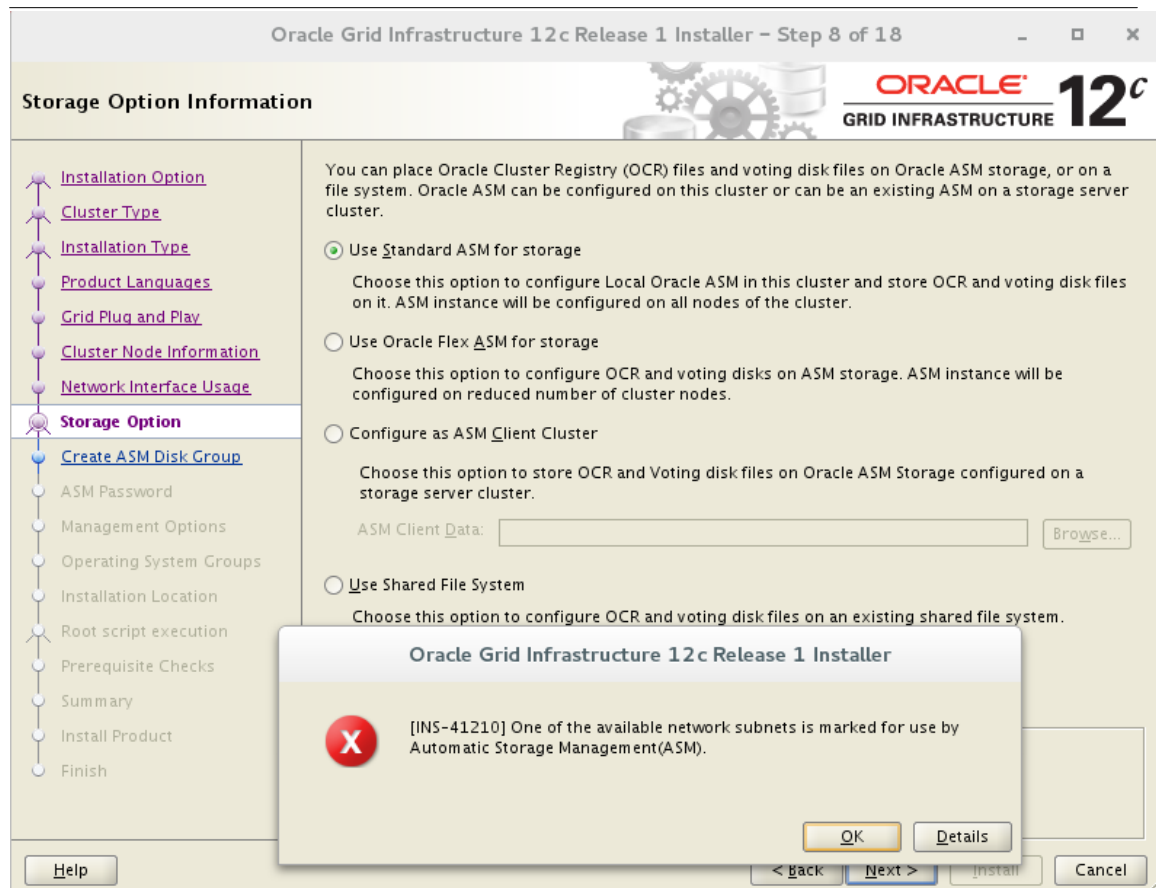
Specify Network Interface Usage

Private interfaces are used by Oracle Grid Infrastructure for internode traffic.

Interface Name	Subnet	Use for
eno16777736	10.0.0.0	Public
eno33554984	192.168.0.0	ASM & Private
virbr0	192.168.122.0	Do Not Use

Note: If you intend to store Oracle Cluster Registry (OCR) and voting disk files using Oracle Flex Automatic Storage Management (Oracle Flex ASM), then you must designate at least one of the private interface subnets either as "ASM" or as "ASM & Private".

Navigation: Help, < Back, Next >, Install, Cancel



Note: If you choose 'ASM & Private' in above step, you cannot choose the first option at this time

Choose Use Oracle Flex ASM for storage

Oracle Grid Infrastructure 12c Release 1 Installer – Step 8 of 18

Storage Option Information

ORACLE
GRID INFRASTRUCTURE 12^c

You can place Oracle Cluster Registry (OCR) files and voting disk files on Oracle ASM storage, or on a file system. Oracle ASM can be configured on this cluster or can be an existing ASM on a storage server cluster.

Use Standard ASM for storage
 Choose this option to configure Local Oracle ASM in this cluster and store OCR and voting disk files on it. ASM instance will be configured on all nodes of the cluster.

Use Oracle Flex ASM for storage
 Choose this option to configure OCR and voting disks on ASM storage. ASM instance will be configured on reduced number of cluster nodes.

Configure as ASM Client Cluster
 Choose this option to store OCR and Voting disk files on Oracle ASM Storage configured on a storage server cluster.
 ASM Client Data:

Use Shared File System
 Choose this option to configure OCR and voting disk files on an existing shared file system.

Oracle Grid Infrastructure 12c Release 1 Installer - Step 9 of 18

Create ASM Disk Group

Select Disk Group characteristics and select disks

Disk group name:

Redundancy: High Normal External


Allocation Unit Size: MB

Add Disks

Candidate Disks All Disks

<input type="checkbox"/>	Disk Path	Size (in MB)	Status
<input checked="" type="checkbox"/>	ORCL:ASMDISK1	4096	Candidate
<input checked="" type="checkbox"/>	ORCL:ASMDISK2	8192	Candidate
<input type="checkbox"/>	ORCL:ASMDISK3	8191	Candidate

Oracle Grid Infrastructure 12c Release 1 Installer

 [INS-30515] Insufficient space available in the selected disks.

Note: at least 5G disk space for OCR and Voting disk and MGMTDB

Oracle Grid Infrastructure 12c Release 1 Installer - Step 9 of 18

Create ASM Disk Group

- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- Create ASM Disk Group**
- [ASM Password](#)
- Management Options
- Operating System Groups
- Installation Location
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Select Disk Group characteristics and select disks

Disk group name:

Redundancy: High Normal External

Allocation Unit Size: MB

Add Disks

Candidate Disks All Disks

	Disk Path	Size (in MB)	Status
<input type="checkbox"/>	ORCL:ASMDISK1	4096	Candidate
<input type="checkbox"/>	ORCL:ASMDISK2	8192	Candidate
<input checked="" type="checkbox"/>	ORCL:ASMDISK3	8191	Candidate

Oracle Grid Infrastructure 12c Release 1 Installer - Step 9 of 18

Create ASM Disk Group

ORACLE 12c
GRID INFRASTRUCTURE

Select Disk Group characteristics and select disks

Disk group name: SYSTEMDG

Redundancy: High Normal External

Allocation Unit Size: 1 MB

Add Disks

Candidate Disks All Disks

	Disk Path	Size (in MB)	Status
<input type="checkbox"/>	/dev/oracleasm/disks/ASMDISK1	3072	Candidate
<input type="checkbox"/>	/dev/oracleasm/disks/ASMDISK2	3072	Candidate
<input type="checkbox"/>	/dev/oracleasm/disks/ASMDISK3	3072	Candidate
<input checked="" type="checkbox"/>	/dev/oracleasm/disks/ASMDISK4	6144	Candidate
<input type="checkbox"/>	/dev/oracleasm/disks/ASMDISK5	6144	Candidate
<input type="checkbox"/>	/dev/oracleasm/disks/ASMDISK6	6144	Candidate
<input type="checkbox"/>	/dev/oracleasm/disks/ASMDISK7	6144	Candidate

Change Discovery Path...

Help < Back Next > Install Cancel

Note: If you do not install oracleasm, the disk path is /dev/oracleasm/disks/*

Oracle Grid Infrastructure 12c Release 1 Installer – Step 10 of 18

Specify ASM Password

The new Oracle Automatic Storage Management (Oracle ASM) instance requires its own SYS user with SYSASM privileges for administration. Oracle recommends that you create a less privileged ASMSNMP user with SYSDBA privileges to monitor the ASM instance.

Specify the password for these user accounts.


Use different passwords for these accounts

	Password	Confirm Password
SYS	<input type="password"/>	<input type="password"/>
ASMSNMP	<input type="password"/>	<input type="password"/>

Use same passwords for these accounts

Specify Password: Confirm Password:


Messages:

 Specify Password:[INS-30011] The password entered does not conform to the Oracle recommended standards.

[Help](#) [< Back](#) [Next >](#) [Install](#) [Cancel](#)

Oracle Grid Infrastructure 12c Release 1 Installer - Step 11 of 19

Failure Isolation Support



Choose one of the following Failure Isolation Support options.

Use Intelligent Platform Management Interface (IPMI)

To ensure successful installation with IPMI enabled, ensure your IPMI drivers are properly installed and enabled.

User Name :

Password :

Do not use Intelligent Platform Management Interface (IPMI)

Failure Isolation Support

- Installation Option
- Cluster Type
- Installation Type
- Product Languages
- Grid Plug and Play
- Cluster Node Information
- Network Interface Usage
- Storage Option
- Create ASM Disk Group
- ASM Password
- Failure Isolation**
- Management Options
 - Operating System Groups
 - Installation Location
 - Root script execution
 - Prerequisite Checks
 - Summary
 - Install Product
 - Finish

Help < Back Next > Install Cancel

Oracle Grid Infrastructure 12c Release 1 Installer - Step 12 of 19

Specify Management Options

ORACLE 12c
GRID INFRASTRUCTURE

[Installation Option](#)
[Cluster Type](#)
[Installation Type](#)
[Product Languages](#)
[Grid Plug and Play](#)
[Cluster Node Information](#)
[Network Interface Usage](#)
[Storage Option](#)
[Create ASM Disk Group](#)
[ASM Password](#)
[Failure Isolation](#)
Management Options
[Operating System Groups](#)
Installation Location
Root script execution
Prerequisite Checks
Summary
Install Product
Finish

You can configure to have this instance of Oracle Grid Infrastructure and Oracle Automatic Storage Management to be managed by Enterprise Manager Cloud Control. Specify the details of the Cloud Control configuration to perform the registration.

Register with Enterprise Manager (EM) Cloud Control

OM\$ host:

OM\$ port:

EM Admin User Name:

EM Admin Password:

[Help](#) [< Back](#) [Next >](#) [Install](#) [Cancel](#)

Oracle Grid Infrastructure 12c Release 1 Installer – Step 13 of 19

Privileged Operating System Groups

Select the name of the operating system group, that you want to use for operating system authentication to Oracle Automatic Storage Management.

Oracle ASM Administrator (OSASM) Group


Oracle ASM DBA (OSDBA for ASM) Group

Oracle ASM Operator (OSOPER for ASM) Group (Optional)

Help **< Back** **Next >** **Install** **Cancel**

Oracle Grid Infrastructure 12c Release 1 Installer – Step 14 of 19

Specify Installation Location



Specify the Oracle Grid Infrastructure for a Cluster Oracle base. By default, Oracle Grid Infrastructure is installed in a path indicating the Oracle Grid Infrastructure release and grid infrastructure software owner.

Oracle base:

Specify a location for storing Oracle software files separate from configuration files in the Oracle base directory. This software directory is the Oracle Grid Infrastructure home directory.

Software location:

- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)**
- [Failure Isolation](#)
- [Management Options](#)
- [Operating System Groups](#)
- [Installation Location](#)**
- [Root script execution](#)
- Prerequisite Checks
- Summary
- Install Product
- Finish

Oracle Grid Infrastructure 12c Release 1 Installer - Step 15 of 20

ORACLE **12^c**
GRID INFRASTRUCTURE

Create Inventory

- Installation Option
- Cluster Type
- Installation Type
- Product Languages
- Grid Plug and Play
- Cluster Node Information
- Network Interface Usage
- Storage Option
- Create ASM Disk Group
- ASM Password**
- Failure Isolation
- Management Options
- Operating System Groups
- Installation Location
- Create Inventory**
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

You are starting your first installation on this host. Specify a directory for installation metadata files (for example, install log files). This directory is called the "inventory directory". The installer automatically sets up subdirectories for each product to contain inventory data. The subdirectory for each product typically requires 150 kilobytes of disk space.

Inventory Directory:

Members of the following operating system group (the primary group) will have write permission to the inventory directory (oralInventory).

oralInventory Group Name: oinstall

Oracle Grid Infrastructure 12c Release 1 Installer – Step 16 of 20

Root script execution configuration

While configuring the software, certain operations have to be performed as "root" user. You can choose to have the Installer perform these operations automatically by specifying inputs for one of the options below.

Automatically run configuration scripts

Use "root" user credential

Password :

Use sudo


Program path :

User name :

Password :

Oracle Grid Infrastructure 12c Release 1 Installer - Step 17 of 20

Perform Prerequisite Checks



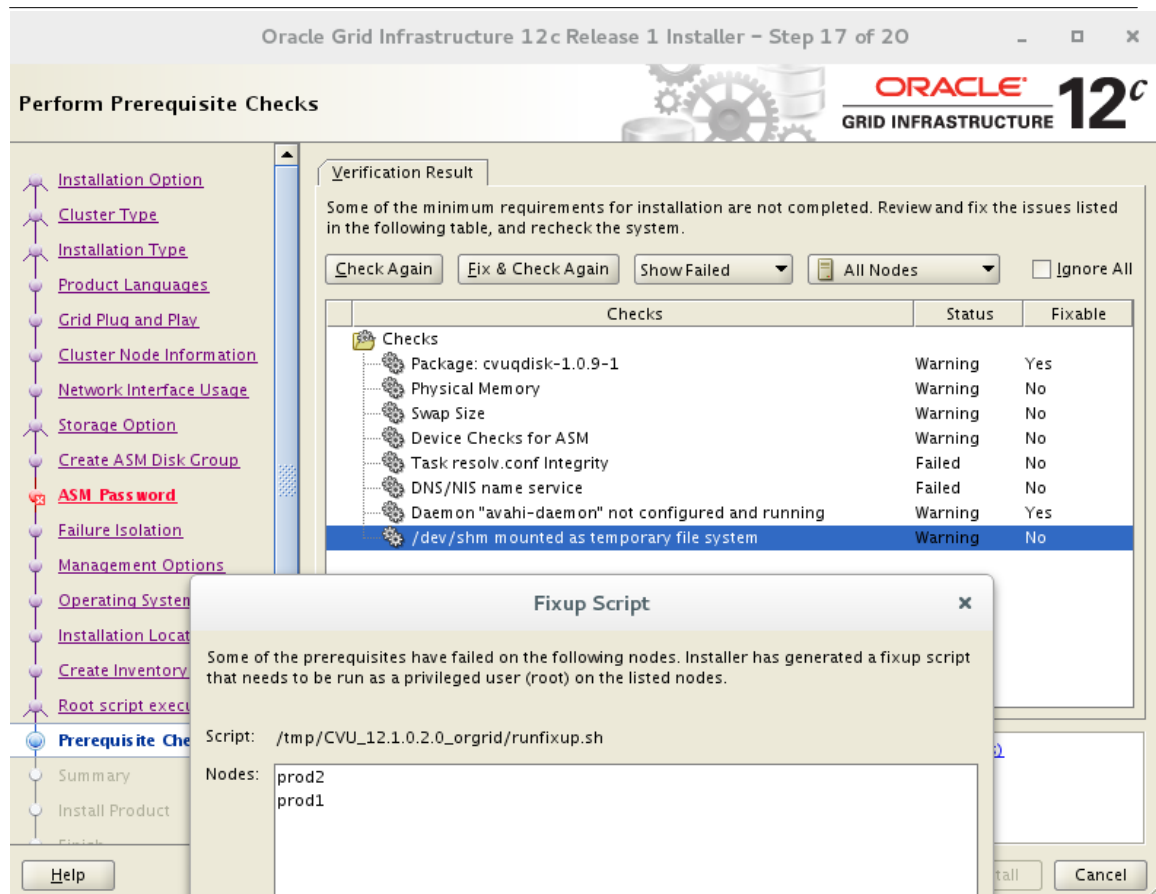
Verifying that the target environment meets minimum installation and configuration requirements for products you have selected. This can take time. Please wait.

79%

Checking Task resolv.conf Integrity ...

- Installation Option
- Cluster Type
- Installation Type
- Product Languages
- Grid Plug and Play
- Cluster Node Information
- Network Interface Usage
- Storage Option
- Create ASM Disk Group
- ASM Password
- Failure Isolation
- Management Options
- Operating System Groups
- Installation Location
- Create Inventory
- Root script execution
- Prerequisite Checks**
- Summary
- Install Product


Help < Back Next > Install Cancel



Execute fixup script for both nodes

```
[root@prod1 ~]# cd /tmp/CVU_12.1.0.2.0_orgrid/
[root@prod1 CVU_12.1.0.2.0_orgrid]# ./runfixup.sh
All Fix-up operations were completed successfully.
[root@prod1 CVU_12.1.0.2.0_orgrid]# pwd
/tmp/CVU_12.1.0.2.0_orgrid
[root@prod1 CVU_12.1.0.2.0_orgrid]# ssh prod2 /tmp/CVU_12.1.0.2.0_orgrid/runfixup.sh
The authenticity of host 'prod2 (10.0.0.101)' can't be established.
ECDSA key fingerprint is 21:2d:08:df:72:65:3e:57:e5:02:7a:c0:19:3c:29:bc.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'prod2,10.0.0.101' (ECDSA) to the list of known hosts.
root@prod2's password:
All Fix-up operations were completed successfully.
[root@prod1 CVU_12.1.0.2.0_orgrid]#
```

Oracle Grid Infrastructure 12c Release 1 Installer – Step 17 of 20


ORACLE
 GRID INFRASTRUCTURE **12^c**

Perform Prerequisite Checks

- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Failure Isolation](#)
- [Management Options](#)
- [Operating System Groups](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Root script execution](#)
- Prerequisite Checks**
- [Summary](#)
- [Install Product](#)

Verification Result

Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Ignore All

Checks	Status	Fixable
Physical Memory	Warning	No
Swap Size	Warning	No
Task resolv.conf Integrity	Failed	No
DNS/NIS name service	Failed	No
Daemon "avahi-daemon" not configured and running	Warning	Yes
/dev/shm mounted as temporary file system	Warning	No

This is a prerequisite condition to test whether the system has at least 4GB (4194304.0KB) of total physical memory. [more details](#)

Check Failed on Nodes: [prod2, prod1]

Oracle Grid Infrastructure 12c Release 1 Installer - Step 17 of 20

Perform Prerequisite Checks

- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Failure Isolation](#)
- [Management Options](#)
- [Operating System Groups](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Root script execution](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Install Product](#)

Verification Result

Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Ignore All

Checks	Status	Fixable
<ul style="list-style-type: none"> Physical Memory Swap Size Task resolv.conf Integrity DNS/NIS name service Daemon "avahi-daemon" not configured and running /dev/shm mounted as temporary file system 		
	Ignored	No
	Ignored	No
	Ignored	No
	Ignored	No
	Ignored	No

This is a prerequisite condition to test whether the system has at least 4GB (4194304.0KB) of total physical memory. [more details](#)

Check Failed on Nodes: [prod2, prod1]

Oracle Grid Infrastructure 12c Release 1 Installer – Step 18 of 20

Summary

- [Installation Option](#)
- [Cluster Type](#)
- [Installation Type](#)
- [Product Languages](#)
- [Grid Plug and Play](#)
- [Cluster Node Information](#)
- [Network Interface Usage](#)
- [Storage Option](#)
- [Create ASM Disk Group](#)
- [ASM Password](#)
- [Failure Isolation](#)
- [Management Options](#)
- [Operating System Groups](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Root script execution](#)
- [Prerequisite Checks](#)
- Summary**
- [Install Product](#)

Source Location: /mnt/hgfs/12102/grid/install/./stage/products.xml

Privileged Operating System Groups: asmdba (OSDBA), asmoper (OSOPER), asmadmin (OS)

Root script execution configuration: Manual configuration [\[Edit\]](#)

Inventory information

- Inventory location: /orgrid/orainventory [\[Edit\]](#)
- Central inventory (orainventory) group: oinstall [\[Edit\]](#)

Management information

- Management method: None [\[Edit\]](#)

Grid Infrastructure Settings

- Cluster Type: Standard [\[Edit\]](#)
- Cluster Name: cluster [\[Edit\]](#)
- Nodes: [prod1, prod2] [\[Edit\]](#)
- Single Client Access Name (SCAN): prod-scan [\[Edit\]](#)
- SCAN Port: 10010 [\[Edit\]](#)
- Public Interface(s): eno16777736 [\[Edit\]](#)
- ASM & Private Interface(s): eno33554984 [\[Edit\]](#)

Storage Information

- Storage Type: Oracle ASM [\[Edit\]](#)
- ASM Disk Group: SYSTEMDG [\[Edit\]](#)
- Storage Redundancy: EXTERNAL [\[Edit\]](#)
- Disks Selected: ORCL:ASMDISK3 [\[Edit\]](#)

[Save Response File...](#)

[Help](#)
[< Back](#)
[Next >](#)
Install
[Cancel](#)

Details

```

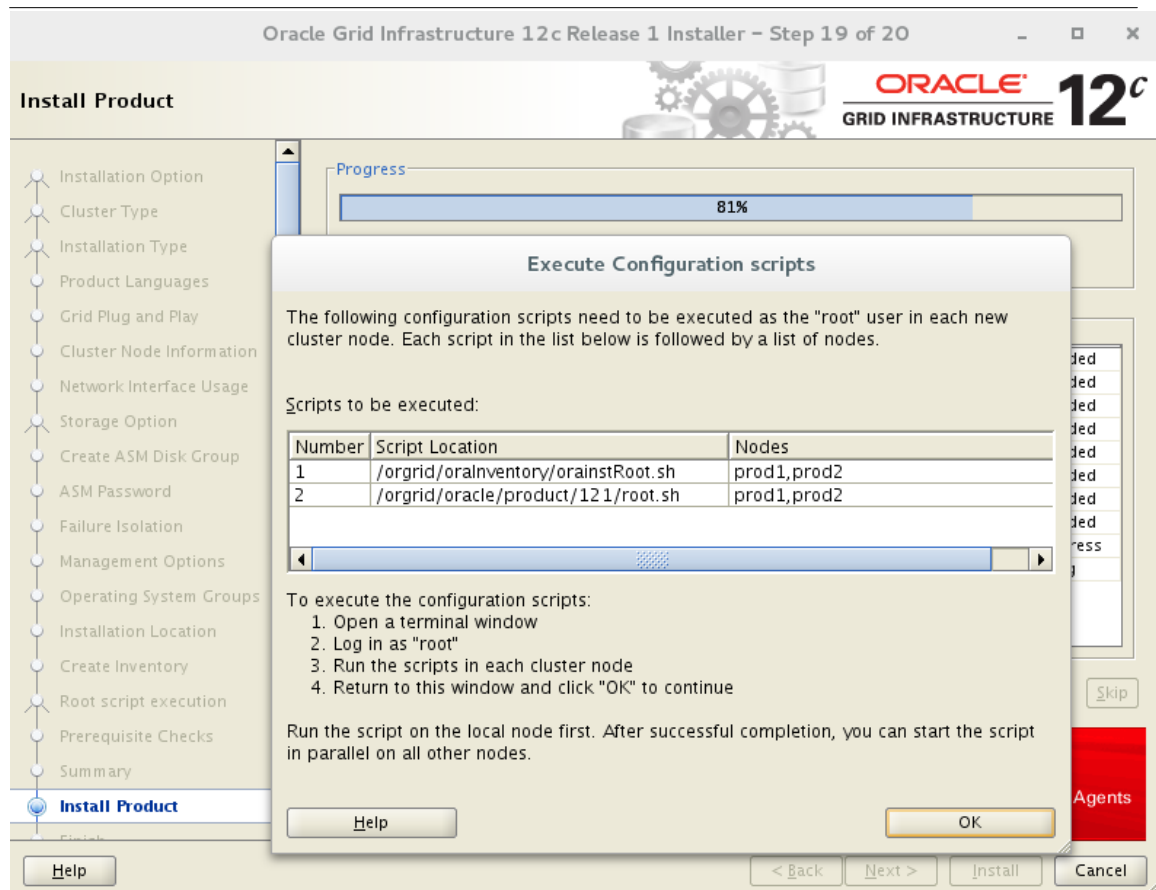
Processing Oracle RAC Deconfiguration 12.1.0.2.0
Processing Oracle Configuration Manager Deconfiguration 10.3.1.0.0
Processing Oracle USM Deconfiguration 12.1.0.2.0
Processing Oracle Grid Management Database 12.1.0.2.0
Processing Oracle Ball Share 11.1.1.6.0
Processing Oracle Grid Infrastructure Bundled Agents 12.1.0.2.0
Processing Oracle Universal Installer 12.1.0.2.0
Processing Oracle One-Off Patch Installer 12.1.0.1.2
Processing Installer SDK Component 12.1.0.2.0
Processing oracle.swd.oui.core.min 12.1.0.2.0
Processing Java Development Kit 1.6.0.75.0
Synchronizing inventory. Please wait...

Updating Libraries
Starting Installations
Synchronizing inventory. Please wait...

Installation in progress
Extracting files to /orgrid/oracle/product/121'.

Log File: /orgrid/orainventory/logs/installActions2016-01-10_08-53-16PM.log
    
```

[Close](#)



Execute orainstRoot.sh on both nodes

```
[root@prod1 ~]# /orgrid/orainventory/orainstRoot.sh
```

Changing permissions of /orgrid/orainventory.
 Adding read,write permissions for group.
 Removing read,write,execute permissions for world.

Changing groupname of /orgrid/orainventory to oinstall.
 The execution of the script is complete.

```
[root@prod1 ~]# ssh prod2 /orgrid/orainventory/orainstRoot.sh
```

root@prod2's password:
 Changing permissions of /orgrid/orainventory.
 Adding read,write permissions for group.
 Removing read,write,execute permissions for world.

Changing groupname of /orgrid/orainventory to oinstall.
 The execution of the script is complete.

```
[root@prod1 ~]#
```

Execute root.sh on PROD1

```
[root@prod1 ~]#
```

```
[root@prod1 ~]# cd /orgrid/oracle/product/121/
```

```
[root@prod1 121]# ./root.sh
```

Performing root user operation.

The following environment variables are set as:

```
ORACLE_OWNER= orgrid
ORACLE_HOME= /orgrid/oracle/product/121
```

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

```
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.

Using configuration parameter file: /orgrid/oracle/product/121/crs/install/crsconfig_params
2016/01/11 11:08:58 CLSRSC-4001: Installing Oracle Trace File Analyzer (TFA) Collector.

2016/01/11 11:09:25 CLSRSC-4002: Successfully installed Oracle Trace File Analyzer (TFA) Collector.

2016/01/11 11:09:26 CLSRSC-363: User ignored prerequisites during installation

OLR initialization - successful

```
root wallet
root wallet cert
root cert export
peer wallet
profile reader wallet
pa wallet
peer wallet keys
pa wallet keys
peer cert request
pa cert request
peer cert
pa cert
peer root cert TP
profile reader root cert TP
pa root cert TP
peer pa cert TP
pa peer cert TP
profile reader pa cert TP
profile reader peer cert TP
peer user cert
pa user cert
```

2016/01/11 11:10:20 CLSRSC-330: Adding Clusterware entries to file 'oracle-ohasd.service'

CRS-4133: Oracle High Availability Services has been stopped.

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

CRS-4133: Oracle High Availability Services has been stopped.

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

CRS-2672: Attempting to start 'ora.evmd' on 'prod1'

CRS-2672: Attempting to start 'ora.mdnsd' on 'prod1'

CRS-2676: Start of 'ora.evmd' on 'prod1' succeeded

CRS-2676: Start of 'ora.mdnsd' on 'prod1' succeeded

```

CRS-2672: Attempting to start 'ora.gpnpd' on 'prod1'
CRS-2676: Start of 'ora.gpnpd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'prod1'
CRS-2672: Attempting to start 'ora.gipcd' on 'prod1'
CRS-2676: Start of 'ora.cssdmonitor' on 'prod1' succeeded
CRS-2676: Start of 'ora.gipcd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'prod1'
CRS-2672: Attempting to start 'ora.diskmon' on 'prod1'
CRS-2676: Start of 'ora.diskmon' on 'prod1' succeeded
CRS-2676: Start of 'ora.cssd' on 'prod1' succeeded

```

ASM created and started successfully.

Disk Group SYSTEMDG created successfully.

```

CRS-2672: Attempting to start 'ora.crf' on 'prod1'
CRS-2672: Attempting to start 'ora.storage' on 'prod1'
CRS-2676: Start of 'ora.storage' on 'prod1' succeeded
CRS-2676: Start of 'ora.crf' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'prod1'
CRS-2676: Start of 'ora.crsd' on 'prod1' succeeded
CRS-4256: Updating the profile
Successful addition of voting disk 5b0da9e9e5af4fb7bf691418fcd22010.
Successfully replaced voting disk group with +SYSTEMDG.
CRS-4256: Updating the profile
CRS-4266: Voting file(s) successfully replaced
## STATE File Universal Id File Name Disk group
-----

```

```

1. ONLINE 5b0da9e9e5af4fb7bf691418fcd22010 (ORCL:ASMDISK3) [SYSTEMDG]

```

Located 1 voting disk(s).

```

CRS-2791: Starting shutdown of Oracle High Availability Services-managed resources on 'prod1'
CRS-2673: Attempting to stop 'ora.crsd' on 'prod1'
CRS-2677: Stop of 'ora.crsd' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.mdnsd' on 'prod1'
CRS-2673: Attempting to stop 'ora.storage' on 'prod1'
CRS-2673: Attempting to stop 'ora.gpnpd' on 'prod1'
CRS-2677: Stop of 'ora.storage' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.crf' on 'prod1'
CRS-2673: Attempting to stop 'ora.ctssd' on 'prod1'
CRS-2673: Attempting to stop 'ora.evmd' on 'prod1'
CRS-2673: Attempting to stop 'ora.asm' on 'prod1'
CRS-2677: Stop of 'ora.mdnsd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.crf' on 'prod1' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.evmd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.asm' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on 'prod1'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'prod1'
CRS-2677: Stop of 'ora.cssd' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'prod1'
CRS-2677: Stop of 'ora.gipcd' on 'prod1' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'prod1' has completed

```

CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.mdnsd' on 'prod1'
CRS-2672: Attempting to start 'ora.evmd' on 'prod1'
CRS-2676: Start of 'ora.evmd' on 'prod1' succeeded
CRS-2676: Start of 'ora.mdnsd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.gpnpd' on 'prod1'
CRS-2676: Start of 'ora.gpnpd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'prod1'
CRS-2676: Start of 'ora.gipcd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'prod1'
CRS-2676: Start of 'ora.cssdmonitor' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'prod1'
CRS-2672: Attempting to start 'ora.diskmon' on 'prod1'
CRS-2676: Start of 'ora.diskmon' on 'prod1' succeeded
CRS-2676: Start of 'ora.cssd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'prod1'
CRS-2672: Attempting to start 'ora.ctssd' on 'prod1'
CRS-2676: Start of 'ora.ctssd' on 'prod1' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'prod1'
CRS-2676: Start of 'ora.asm' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'prod1'
CRS-2676: Start of 'ora.storage' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'prod1'
CRS-2676: Start of 'ora.crf' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'prod1'
CRS-2676: Start of 'ora.crsd' on 'prod1' succeeded
CRS-6023: Starting Oracle Cluster Ready Services-managed resources
CRS-6017: Processing resource auto-start for servers: prod1
CRS-6016: Resource auto-start has completed for server prod1
CRS-6024: Completed start of Oracle Cluster Ready Services-managed resources
CRS-4123: Oracle High Availability Services has been started.
2016/01/11 11:14:43 CLSRSC-343: Successfully started Oracle Clusterware stack

CRS-2672: Attempting to start 'ora.ASMNET1LSNR_ASM.lsnr' on 'prod1'
CRS-2676: Start of 'ora.ASMNET1LSNR_ASM.lsnr' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'prod1'
CRS-2676: Start of 'ora.asm' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.SYSTEMDG.dg' on 'prod1'
CRS-2676: Start of 'ora.SYSTEMDG.dg' on 'prod1' succeeded
CRS-2791: Starting shutdown of Oracle High Availability Services-managed resources on 'prod1'
CRS-2673: Attempting to stop 'ora.crsd' on 'prod1'
CRS-2790: Starting shutdown of Cluster Ready Services-managed resources on 'prod1'
CRS-2673: Attempting to stop 'ora.SYSTEMDG.dg' on 'prod1'
CRS-2673: Attempting to stop 'ora.LISTENER_SCAN1.lsnr' on 'prod1'
CRS-2673: Attempting to stop 'ora.oc4j' on 'prod1'
CRS-2673: Attempting to stop 'ora.cvu' on 'prod1'
CRS-2673: Attempting to stop 'ora.prod1.vip' on 'prod1'
CRS-2677: Stop of 'ora.cvu' on 'prod1' succeeded
CRS-2677: Stop of 'ora.SYSTEMDG.dg' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'prod1'
CRS-2677: Stop of 'ora.asm' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.ASMNET1LSNR_ASM.lsnr' on 'prod1'

CRS-2677: Stop of 'ora.prod1.vip' on 'prod1' succeeded
CRS-2677: Stop of 'ora.ASMNET1LSNR_ASM.lsnr' on 'prod1' succeeded
CRS-2677: Stop of 'ora.LISTENER_SCAN1.lsnr' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.scan1.vip' on 'prod1'
CRS-2677: Stop of 'ora.scan1.vip' on 'prod1' succeeded
CRS-2677: Stop of 'ora.oc4j' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'prod1'
CRS-2677: Stop of 'ora.ons' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.net1.network' on 'prod1'
CRS-2677: Stop of 'ora.net1.network' on 'prod1' succeeded
CRS-2792: Shutdown of Cluster Ready Services-managed resources on 'prod1' has completed
CRS-2677: Stop of 'ora.crsd' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.gpnpd' on 'prod1'
CRS-2673: Attempting to stop 'ora.evmd' on 'prod1'
CRS-2673: Attempting to stop 'ora.storage' on 'prod1'
CRS-2673: Attempting to stop 'ora.crf' on 'prod1'
CRS-2673: Attempting to stop 'ora.ctssd' on 'prod1'
CRS-2673: Attempting to stop 'ora.mdnsd' on 'prod1'
CRS-2677: Stop of 'ora.storage' on 'prod1' succeeded
CRS-2677: Stop of 'ora.gpnpd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.ctssd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.crf' on 'prod1' succeeded
CRS-2677: Stop of 'ora.mdnsd' on 'prod1' succeeded
CRS-2677: Stop of 'ora.evmd' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.asm' on 'prod1'
CRS-2677: Stop of 'ora.asm' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.cluster_interconnect.haip' on 'prod1'
CRS-2677: Stop of 'ora.cluster_interconnect.haip' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'prod1'
CRS-2677: Stop of 'ora.cssd' on 'prod1' succeeded
CRS-2673: Attempting to stop 'ora.gipcd' on 'prod1'
CRS-2677: Stop of 'ora.gipcd' on 'prod1' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'prod1' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Starting Oracle High Availability Services-managed resources
CRS-2672: Attempting to start 'ora.mdnsd' on 'prod1'
CRS-2672: Attempting to start 'ora.evmd' on 'prod1'
CRS-2676: Start of 'ora.mdnsd' on 'prod1' succeeded
CRS-2676: Start of 'ora.evmd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.gpnpd' on 'prod1'
CRS-2676: Start of 'ora.gpnpd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.gipcd' on 'prod1'
CRS-2676: Start of 'ora.gipcd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cssdmonitor' on 'prod1'
CRS-2676: Start of 'ora.cssdmonitor' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cssd' on 'prod1'
CRS-2672: Attempting to start 'ora.diskmon' on 'prod1'
CRS-2676: Start of 'ora.diskmon' on 'prod1' succeeded
CRS-2676: Start of 'ora.cssd' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'prod1'
CRS-2672: Attempting to start 'ora.ctssd' on 'prod1'
CRS-2676: Start of 'ora.ctssd' on 'prod1' succeeded
CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.asm' on 'prod1'

```

CRS-2676: Start of 'ora.asm' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.storage' on 'prod1'
CRS-2676: Start of 'ora.storage' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.crf' on 'prod1'
CRS-2676: Start of 'ora.crf' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.crsd' on 'prod1'
CRS-2676: Start of 'ora.crsd' on 'prod1' succeeded
CRS-6023: Starting Oracle Cluster Ready Services-managed resources
CRS-2664: Resource 'ora.SYSEMDG.dg' is already running on 'prod1'
CRS-6017: Processing resource auto-start for servers: prod1
CRS-2672: Attempting to start 'ora.net1.network' on 'prod1'
CRS-2672: Attempting to start 'ora.oc4j' on 'prod1'
CRS-2676: Start of 'ora.net1.network' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.cvu' on 'prod1'
CRS-2672: Attempting to start 'ora.ons' on 'prod1'
CRS-2672: Attempting to start 'ora.prod1.vip' on 'prod1'
CRS-2672: Attempting to start 'ora.scan1.vip' on 'prod1'
CRS-2676: Start of 'ora.cvu' on 'prod1' succeeded
CRS-2676: Start of 'ora.prod1.vip' on 'prod1' succeeded
CRS-2676: Start of 'ora.scan1.vip' on 'prod1' succeeded
CRS-2672: Attempting to start 'ora.LISTENER_SCAN1.lsnr' on 'prod1'
CRS-2676: Start of 'ora.ons' on 'prod1' succeeded
CRS-2676: Start of 'ora.LISTENER_SCAN1.lsnr' on 'prod1' succeeded
CRS-2676: Start of 'ora.oc4j' on 'prod1' succeeded
CRS-6016: Resource auto-start has completed for server prod1
CRS-6024: Completed start of Oracle Cluster Ready Services-managed resources
CRS-4123: Oracle High Availability Services has been started.
2016/01/11 11:18:21 CLSRSC-325: Configure Oracle Grid Infrastructure for a Cluster ... succeeded

```

Execute root.sh on PROD2

```

[root@prod1 121]# ssh prod2
root@prod2's password:
Last login: Mon Jan 11 11:08:24 2016 from 10.0.0.1
[root@prod2 ~]# cd /orgrid/oracle/product/121/
[root@prod2 121]# ./root.sh
Performing root user operation.

```

The following environment variables are set as:

```

ORACLE_OWNER= orgrid
ORACLE_HOME= /orgrid/oracle/product/121

```

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

```

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.

Using configuration parameter file: /orgrid/oracle/product/121/crs/install/crsconfig_params

2016/01/11 11:19:08 CLSRSC-4001: Installing Oracle Trace File Analyzer (TFA) Collector.

2016/01/11 11:19:40 CLSRSC-4002: Successfully installed Oracle Trace File Analyzer (TFA) Collector.

2016/01/11 11:19:41 CLSRSC-363: User ignored prerequisites during installation

OLR initialization - successful

2016/01/11 11:20:54 CLSRSC-330: Adding Clusterware entries to file 'oracle-ohasd.service'

CRS-4133: Oracle High Availability Services has been stopped.

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

CRS-4133: Oracle High Availability Services has been stopped.

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

CRS-4133: Oracle High Availability Services has been stopped.

CRS-4123: Starting Oracle High Availability Services-managed resources

CRS-2672: Attempting to start 'ora.mdnsd' on 'prod2'

CRS-2672: Attempting to start 'ora.evmd' on 'prod2'

CRS-2676: Start of 'ora.mdnsd' on 'prod2' succeeded

CRS-2676: Start of 'ora.evmd' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.gpnpd' on 'prod2'

CRS-2676: Start of 'ora.gpnpd' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.gipcd' on 'prod2'

CRS-2676: Start of 'ora.gipcd' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.cssdmonitor' on 'prod2'

CRS-2676: Start of 'ora.cssdmonitor' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.cssd' on 'prod2'

CRS-2672: Attempting to start 'ora.diskmon' on 'prod2'

CRS-2676: Start of 'ora.diskmon' on 'prod2' succeeded

CRS-2676: Start of 'ora.cssd' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.cluster_interconnect.haip' on 'prod2'

CRS-2672: Attempting to start 'ora.ctssd' on 'prod2'

CRS-2676: Start of 'ora.ctssd' on 'prod2' succeeded

CRS-2676: Start of 'ora.cluster_interconnect.haip' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.asm' on 'prod2'

CRS-2676: Start of 'ora.asm' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.storage' on 'prod2'

CRS-2676: Start of 'ora.storage' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.crf' on 'prod2'

CRS-2676: Start of 'ora.crf' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.crsd' on 'prod2'

CRS-2676: Start of 'ora.crsd' on 'prod2' succeeded

CRS-6017: Processing resource auto-start for servers: prod2

CRS-2672: Attempting to start 'ora.net1.network' on 'prod2'

CRS-2672: Attempting to start 'ora.ASMNET1LSNR_ASM.lsnr' on 'prod2'

CRS-2676: Start of 'ora.net1.network' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.ons' on 'prod2'

CRS-2676: Start of 'ora.ons' on 'prod2' succeeded

CRS-2676: Start of 'ora.ASMNET1LSNR_ASM.lsnr' on 'prod2' succeeded

CRS-2672: Attempting to start 'ora.asm' on 'prod2'

CRS-2676: Start of 'ora.asm' on 'prod2' succeeded

CRS-6016: Resource auto-start has completed for server prod2

CRS-6024: Completed start of Oracle Cluster Ready Services-managed resources

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

2016/01/11 11:23:28 CLSRSC-343: Successfully started Oracle Clusterware stack

2016/01/11 11:23:45 CLSRSC-325: Configure Oracle Grid Infrastructure for a Cluster ... succeeded

[root@prod2 121]#

Verify Clusterware

[root@prod2 121]#

[root@prod1 ~]# /orgrid/oracle/product/121/bin/crsctl stat res -t

Name	Target	State	Server	State details

Local Resources				

ora.ASMNET1LSNR_ASM.lsnr				
	ONLINE	ONLINE	prod1	STABLE
	ONLINE	ONLINE	prod2	STABLE
ora.LISTENER.lsnr				
	ONLINE	ONLINE	prod1	STABLE
	ONLINE	ONLINE	prod2	STABLE
ora.SYSTEMDG.dg				
	ONLINE	ONLINE	prod1	STABLE
	ONLINE	ONLINE	prod2	STABLE
ora.net1.network				
	ONLINE	ONLINE	prod1	STABLE
	ONLINE	ONLINE	prod2	STABLE
ora.ons				
	ONLINE	ONLINE	prod1	STABLE
	ONLINE	ONLINE	prod2	STABLE

Cluster Resources				

ora.LISTENER_SCAN1.lsnr				
1	ONLINE	ONLINE	prod1	STABLE
ora.MGMTLSNR				
1	OFFLINE	OFFLINE		STABLE
ora.asm				
1	ONLINE	ONLINE	prod1	Started,STABLE
2	ONLINE	ONLINE	prod2	Started,STABLE
3	OFFLINE	OFFLINE		STABLE
ora.cvu				
1	ONLINE	ONLINE	prod1	STABLE
ora.oc4j				
1	ONLINE	ONLINE	prod1	STABLE
ora.prod1.vip				
1	ONLINE	ONLINE	prod1	STABLE
ora.prod2.vip				
1	ONLINE	ONLINE	prod2	STABLE
ora.scan1.vip				
1	ONLINE	ONLINE	prod1	STABLE

[root@prod1 ~]#

Oracle Grid Infrastructure 12c Release 1 Installer - Step 19 of 20

Install Product

Progress: 85%
Starting 'Update Inventory'

Status:

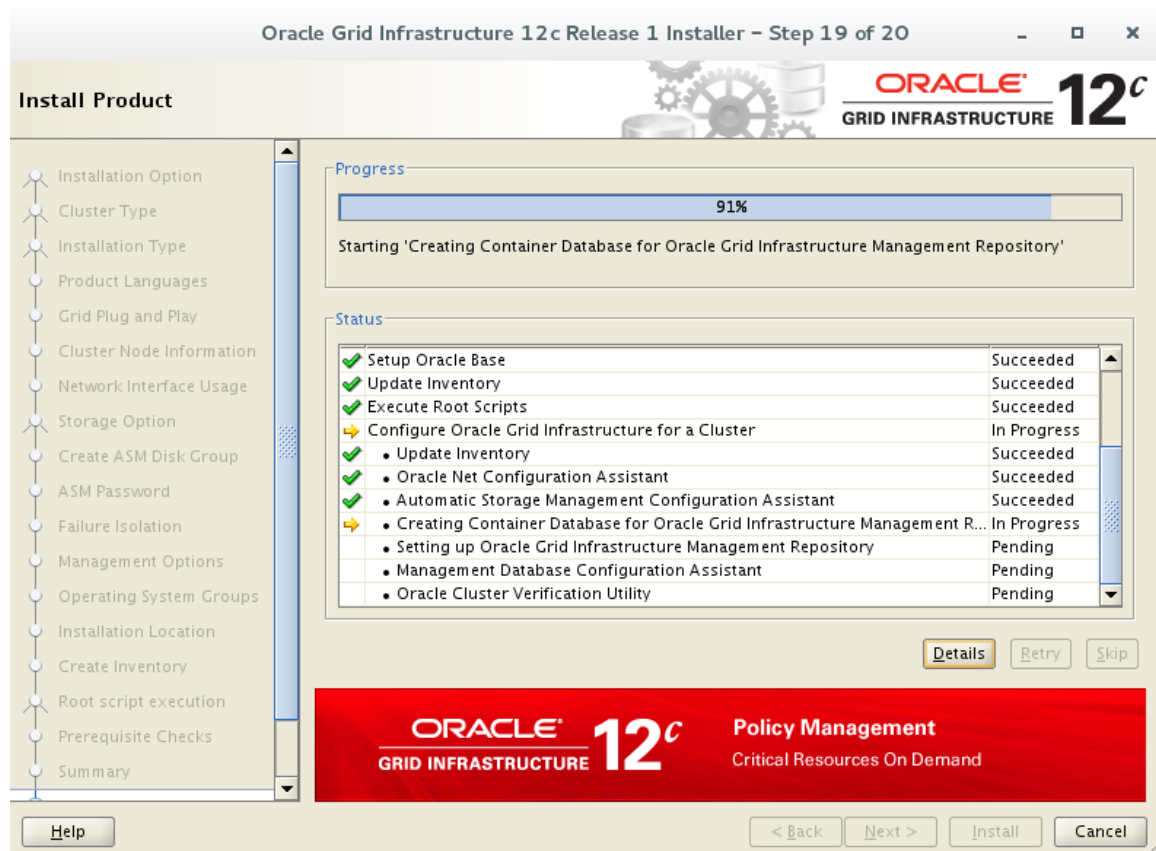
• Setup	Succeeded
• Perform remote operations	Succeeded
• Setup Oracle Base	Succeeded
• Update Inventory	Succeeded
• Execute Root Scripts	Succeeded
• Configure Oracle Grid Infrastructure for a Cluster	In Progress
• Update Inventory	In Progress
• Oracle Net Configuration Assistant	Pending
• Automatic Storage Management Configuration Assistant	Pending
• Creating Container Database for Oracle Grid Infrastructure Management R...	Pending
• Setting up Oracle Grid Infrastructure Management Repository	Pending
• Management Database Configuration Assistant	Pending
• Oracle Cluster Verification Utility	Pending

Details Retry Skip

ORACLE 12^c **Quality of Service**
GRID INFRASTRUCTURE Meeting Business Critical Performance Objectives

Help < Back Next > Install Cancel


Create MGMTDB



```
INFO: Command /orgrid/oracle/product/121/bin/dbca -silent -createPluggableDatabase -sourceDB -
MGMTDB -pdbName cluster -createPDBFrom RMANBACKUP -PDBBackupfile
/orgrid/oracle/product/121/assistants/dbca/templates/mgmtseed_pdb.dfb -PDBMetadataFile
/orgrid/oracle/product/121/assistants/dbca/templates/mgmtseed_pdb.xml -createAsClone true -
internalSkipGIHomeCheck -oui_internal
INFO: ... GenericInternalPlugIn.handleProcess() entered.
INFO: ... GenericInternalPlugIn: getting configAssistantParmas.
INFO: ... GenericInternalPlugIn: checking secretArguments.
INFO: No arguments to pass to stdin
INFO: ... GenericInternalPlugIn: starting read loop.
INFO: Read: Look at the log file "/orgrid/grid_base/cfgtoollogs/dbca/_mgmtdb.log" for further details.
WARNING: Skipping line: Look at the log file "/orgrid/grid_base/cfgtoollogs/dbca/_mgmtdb.log" for
further details.
```

Oracle Grid Infrastructure 12c Release 1 Installer - Step 19 of 20

Install Product



Progress


93%

Starting 'Setting up Oracle Grid Infrastructure Management Repository'

Status

• Setup	Succeeded
• Perform remote operations	Succeeded
Setup Oracle Base	Succeeded
Update Inventory	Succeeded
Execute Root Scripts	Succeeded
➔ Configure Oracle Grid Infrastructure for a Cluster	In Progress
• Update Inventory	Succeeded
• Oracle Net Configuration Assistant	Succeeded
• Automatic Storage Management Configuration Assistant	Succeeded
• Creating Container Database for Oracle Grid Infrastructure Management R...	Succeeded
➔ • Setting up Oracle Grid Infrastructure Management Repository	In Progress
• Management Database Configuration Assistant	Pending
• Oracle Cluster Verification Utility	Pending

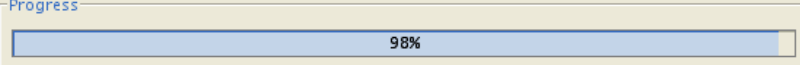
[Details](#) [Retry](#) [Skip](#)



[Help](#) [< Back](#) [Next >](#) [Install](#) [Cancel](#)

Oracle Grid Infrastructure 12c Release 1 Installer – Step 19 of 20

Install Product



Starting 'Oracle Cluster Verification Utility'

Status

✓	• Setup	Succeeded
✓	• Perform remote operations	Succeeded
✓	Setup Oracle Base	Succeeded
✓	Update Inventory	Succeeded
✓	Execute Root Scripts	Succeeded
➔	Configure Oracle Grid Infrastructure for a Cluster	In Progress
✓	• Update Inventory	Succeeded
✓	• Oracle Net Configuration Assistant	Succeeded
✓	• Automatic Storage Management Configuration Assistant	Succeeded
✓	• Creating Container Database for Oracle Grid Infrastructure Management R...	Succeeded
✓	• Setting up Oracle Grid Infrastructure Management Repository	Succeeded
✓	• Management Database Configuration Assistant	Succeeded
➔	• Oracle Cluster Verification Utility	In Progress

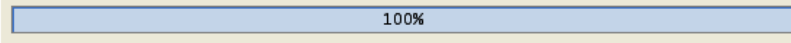
[Details](#) [Retry](#) [Skip](#)

ORACLE 12^c **GRID INFRASTRUCTURE** Flexibility, Agility, Availability
Scale-out with Flex ASM and Flex Cluster

[Help](#) [< Back](#) [Next >](#) [Install](#) [Cancel](#)

Oracle Grid Infrastructure 12c Release 1 Installer - Step 19 of 20

Install Product



Setup completed with overall status as Failed

Status

✓	Install Grid Infrastructure for a Cluster	Succeeded
✓	• Prepare	Succeeded
✓	• Copy files	Succeeded
✓	• Link binaries	Succeeded
✓	• Setup	Succeeded
✓	• Perform remote operations	Succeeded
✓	Setup Oracle Base	Succeeded
✓	Update Inventory	Succeeded
✓	Execute Root Scripts	Succeeded
✓	Configure Oracle Grid Infrastructure for a Cluster	Succeeded
✓	• Update Inventory	Succeeded
✓	• Oracle Net Configuration Assistant	Succeeded
✓	• Automatic Storage Management Configuration Assistant	Succeeded

Details Retry Skip

ORACLE 12c
GRID INFRASTRUCTURE Consolidate. Compress. Control.

Help < Back Next > Install Close

Skip Verify Step

Oracle Grid Infrastructure 12c Release 1 Installer - Step 19 of 20

Install Product

Progress: 100%

Setup completed with overall status as Failed

Oracle Grid Infrastructure 12c Release 1 Installer

[INS-32091] Software installation was successful. But some configuration assistants failed, were cancelled or skipped.

Are you sure you want to continue?

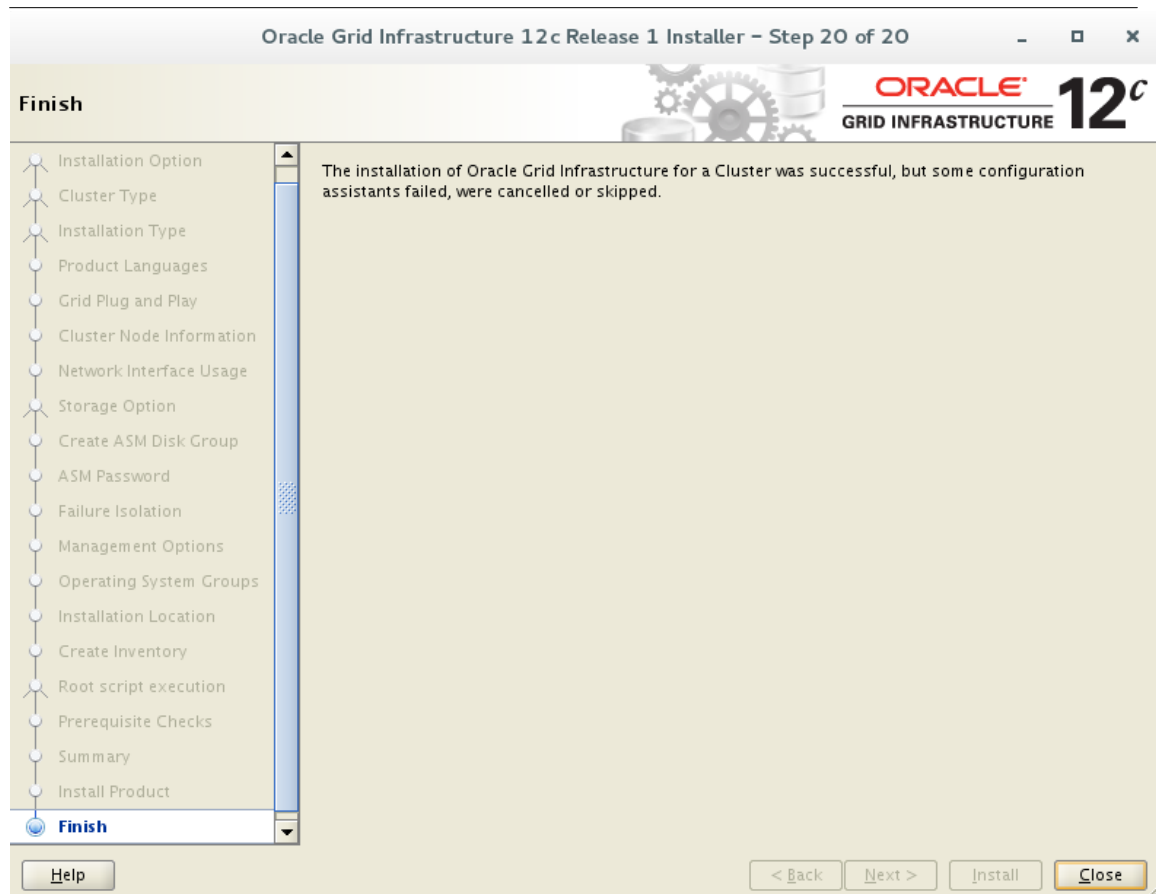
Yes No Details

- Update Inventory Succeeded
- Oracle Net Configuration Assistant Succeeded
- Automatic Storage Management Configuration Assistant Succeeded

Details Retry Skip

ORACLE 12c Maximum Availability
Eliminate Downtime and Idle Redundancy

Help < Back Next > Install Close



MGMTDB Status and Operation

MGMTDB is new database instance which is used for storing Cluster Health Monitor (CHM) data. In 11g this was being stored in berkeley database but starting Oracle database 12c it is configured as Oracle Database Instance.

```
[orgrid@prod1 ~]$ oclumon manage -get MASTER
```

Master = prod1

```
[orgrid@prod1 ~]$ srvctl status mgmtdb
```

Database is enabled

Instance -MGMTDB is running on node prod1

```
[orgrid@prod1 ~]$ srvctl config mgmtdb
```

Database unique name: _mgmtdb

Database name:

Oracle home: <CRS home>

Oracle user: orgrid

Spfile: +SYSTEMDG/_MGMTDB/PARAMETERFILE/spfile.268.900855061

Password file:

Domain:

Start options: open

Stop options: immediate

Database role: PRIMARY

Management policy: AUTOMATIC

Type: Management

```
PDB name: ohsgi
PDB service: ohsgi
Cluster name: ohsgi
Database instance: -MGMTDB
[orgrid@prod1 ~]$ oclumon manage -get reppath
```

```
CHM Repository Path =
+SYSTEMDG/_MGMTDB/FD9B43BF6A646F8CE043B6A9E80A2815/DATAFILE/sysmgmtdata.26
9.900855207
[orgrid@prod1 ~]$
```

```
[orgrid@prod1 ~]$ export ORACLE_SID=-MGMTDB
[orgrid@prod1 ~]$ sqlplus / as sysdba
```

SQL*Plus: Release 12.1.0.2.0 Production on Mon Jan 11 13:53:41 2016

Copyright (c) 1982, 2014, Oracle. All rights reserved.

```
Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Automatic Storage Management and Advanced Analytics options
```

```
SQL> select file_name from dba_data_files union select member file_name from V$logfile;
```

```
FILE_NAME
```

```
-----
+SYSTEMDG/_MGMTDB/DATAFILE/sysaux.257.900854849
+SYSTEMDG/_MGMTDB/DATAFILE/system.258.900854875
+SYSTEMDG/_MGMTDB/DATAFILE/undotbs1.259.900854901
+SYSTEMDG/_MGMTDB/ONLINELOG/group_1.261.900854945
+SYSTEMDG/_MGMTDB/ONLINELOG/group_2.262.900854945
+SYSTEMDG/_MGMTDB/ONLINELOG/group_3.263.900854945
```

6 rows selected.

```
SQL>
```

```
[orgrid@prod1 _mgmtdb]$ lsnrctl status
```

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 11-JAN-2016 14:06:06

Copyright (c) 1991, 2014, Oracle. All rights reserved.

```
Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=LISTENER)))
STATUS of the LISTENER
```

```
-----
Alias          LISTENER
Version        TNSLSNR for Linux: Version 12.1.0.2.0 - Production
Start Date     11-JAN-2016 12:26:09
Uptime         0 days 1 hr. 39 min. 57 sec
Trace Level    off
Security       ON: Local OS Authentication
SNMP           OFF
```

```

Listener Parameter File /orgrid/oracle/product/121/network/admin/listener.ora
Listener Log File      /orgrid/grid_base/diag/tnslsnr/prod1/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=LISTENER)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=10.0.0.100)(PORT=1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=10.0.0.102)(PORT=1521)))
Services Summary...
Service "+ASM" has 1 instance(s).
  Instance "+ASM1", status READY, has 1 handler(s) for this service...
Service "-MGMTDBXDB" has 1 instance(s).
  Instance "-MGMTDB", status READY, has 1 handler(s) for this service...
Service "_mgmtdb" has 1 instance(s).
  Instance "-MGMTDB", status READY, has 1 handler(s) for this service...
Service "ohsgi" has 1 instance(s).
  Instance "-MGMTDB", status READY, has 1 handler(s) for this service...
The command completed successfully
[orgrid@prod1 _mgmtdb]$
[orgrid@prod1 _mgmtdb]$
[orgrid@prod1 _mgmtdb]$ ps -ef|grep pmon
orgrid 21048 1 0 12:25 ? 00:00:00 asm_pmon_+ASM1
orgrid 46774 1 0 13:32 ? 00:00:00 mdb_pmon_-MGMTDB
orgrid 65259 59395 0 14:09 pts/1 00:00:00 grep --color=auto pmon
[orgrid@prod1 _mgmtdb]$
[orgrid@prod1 ~]$ cd /orgrid/grid_base/diag/rdbms/_mgmtdb/
[orgrid@prod1 _mgmtdb]$ ls
i_1.mif -MGMTDB
[orgrid@prod1 _mgmtdb]$ cd -MGMTDB/
-bash: cd: -M: invalid option
cd: usage: cd [-L|[-P [-e]]] [dir]
[orgrid@prod1 _mgmtdb]$ cd ./-MGMTDB/
[orgrid@prod1 -MGMTDB]$ ls
alert cdump hm incident incpkg ir lck log metadata metadata_dgif metadata_pv stage sweep trace
[orgrid@prod1 -MGMTDB]$
SQL> select name from v$database;

NAME
-----
_MGMTDB

SQL> select con_id,dbid,con_uid,name,open_mode from v$pdbs;

CON_ID  DBID  CON_UID NAME                OPEN_MODE
-----
2 809259402 809259402 PDB$SEED            READ ONLY
3 1638065911 1638065911 OHSGI                READ WRITE

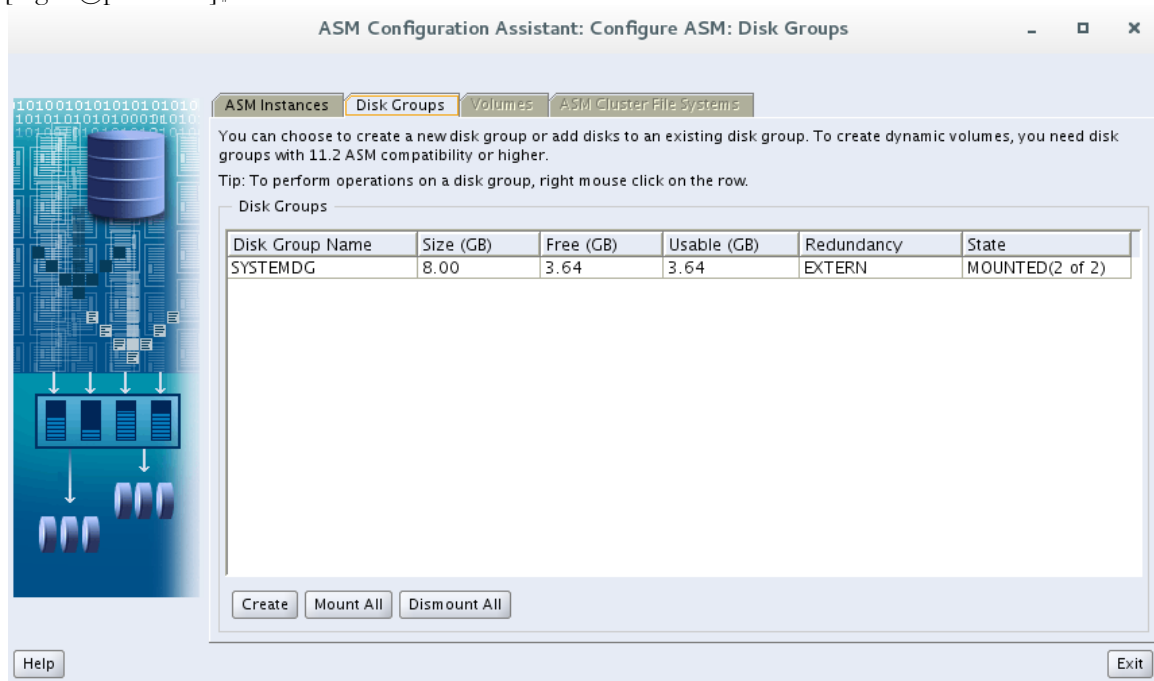
SQL>
[orgrid@prod1 ~]$ srvctl stop mgmtdb
[orgrid@prod1 ~]$
[orgrid@prod1 ~]$ srvctl status mgmtdb
Database is enabled
Database is not running.
[orgrid@prod1 ~]$ srvctl start mgmtdb
[orgrid@prod1 ~]$ srvctl status mgmtdb

```

Database is enabled
Instance -MGMTDB is running on node prod1
[orgrid@prod1 ~]\$

Create DiskGroup

```
[orgrid@prod1 ~]$ cd /orgrid/oracle/product/121/bin/  
[orgrid@prod1 bin]$ ./asmca  
[orgrid@prod1 bin]$
```



Create Disk Group

Disk Group Name

Redundancy
 Redundancy is achieved by storing multiple copies of the data on different failure groups. Normal redundancy needs disks from at least two different failure groups, and high redundancy from at least three different failure groups.

High Normal External (None)

Select Member Disks
 Show Eligible Show All

Quorum failure groups are used to store voting files in extended clusters and do not contain any user data. They require ASM compatibility of 11.2 or higher.

<input type="checkbox"/>	Disk Path	Header Status	Disk Name	Size (MB)	Quorum
<input checked="" type="checkbox"/>	ORCL:ASMDISK1	PROVISIONED		4096	<input type="checkbox"/>
<input checked="" type="checkbox"/>	ORCL:ASMDISK2	PROVISIONED		8192	<input type="checkbox"/>

Note: If you do not see the disks which you believe are available, check the Disk Discovery Path and read/write permissions on the disks. The Disk Discovery Path limits set of disks considered for discovery.

Disk Discovery Path: <default> Change Disk Discovery Path

Click on the Show Advanced Options button to change the disk group attributes. Disk Group compatibility attributes may need to be modified based on the usage of disk group for different versions of databases or ASM Cluster File Systems.

Create Disk Group

Disk Group Name

Redundancy
 Redundancy is achieved by storing multiple copies of the data on different failure groups. Normal redundancy needs disks from at least two different failure groups, and high redundancy from at least three different failure groups.

High Normal External (None)

Select Member Disks
 Show Eligible Show All

Quorum failure groups are used to store voting files in extended clusters and do not contain any user data. They require ASM compatibility of 11.2 or higher.

<input type="checkbox"/>	Disk Path	Header Status	Disk Name	Size (MB)	Quorum
<input checked="" type="checkbox"/>	ORCL:ASMDISK1	PROVISIONED		4096	<input type="checkbox"/>
<input checked="" type="checkbox"/>	ORCL:ASMDISK2	PROVISIONED		8192	<input type="checkbox"/>

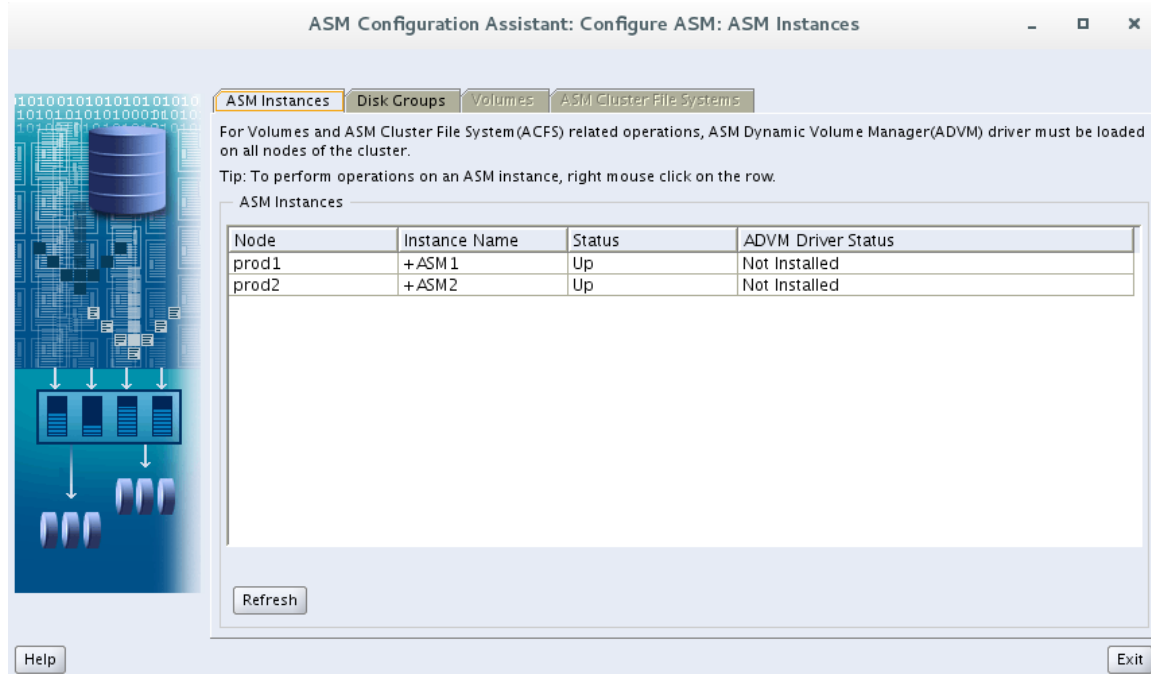
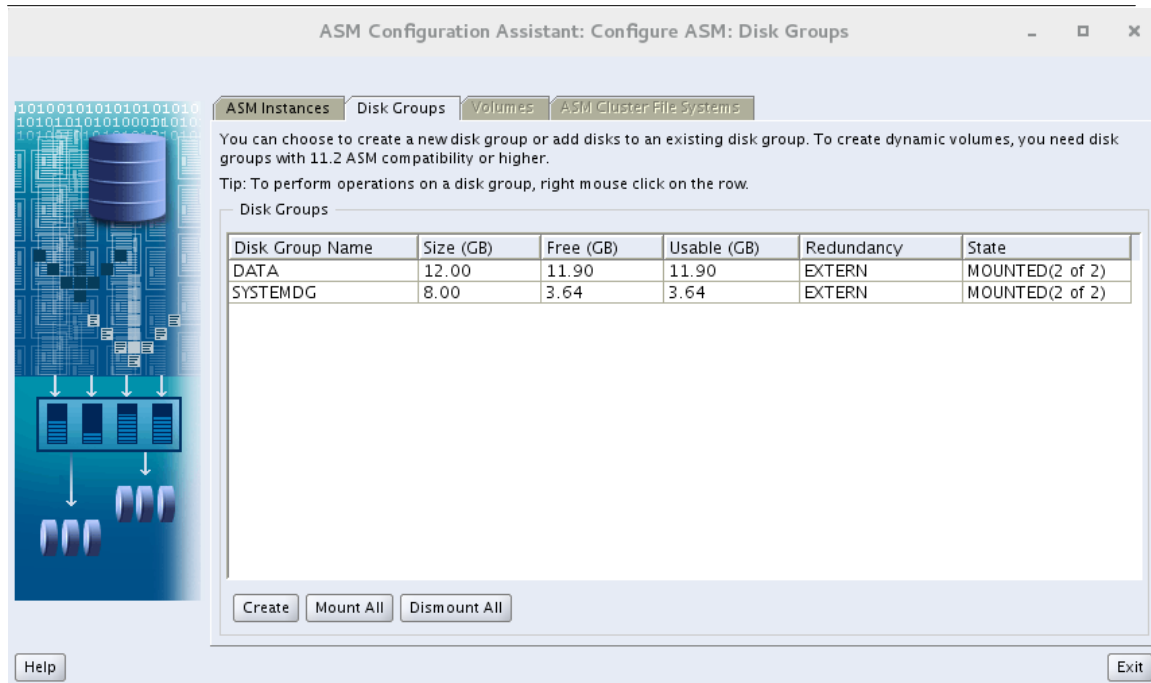
Note: If you do not see the disks which you believe are available, check the Disk Discovery Path and read/write permissions on the disks. The Disk Discovery Path limits set of disks considered for discovery.

Disk Discovery Path: <default> Change Disk Discovery Path

Click on the Show Advanced Options button to change the disk group attributes. Disk Group compatibility attributes may need to be modified based on the usage of disk group for different versions of databases or ASM Cluster File Systems.

Disk Group: Creation

Disk Group DATA created successfully.



ASM Verify and help

```
[orgrid@prod1 ~]$ asmcmd
ASMCMDS> lsdg
State Type Rebal Sector block AU Total_MB Free_MB Req_mir_free_MB usable_file_MB offline_disks voting_files Name
MOUNTED EXTERN N 512 4096 1048576 12288 6513 0 6513 0 0 N DATA/
MOUNTED EXTERN N 512 4096 1048576 8191 3724 0 3724 0 0 Y SYSTEMDG/
ASMCMDS> lsct -g DATA
Instance_ID DB_Name Status Software_Version Compatible_Version Instance_Name Disk_Group
1 +ASM1 CONNECTED 12.1.0.2.0 12.1.0.2.0 +ASM1 DATA
1 prod1 CONNECTED 12.1.0.2.0 12.1.0.2.0 prod1 DATA
ASMCMDS> lsct -g SYSTEMDG
Instance_ID DB_Name Status Software_Version Compatible_Version Instance_Name Disk_Group
1 +ASM1 CONNECTED 12.1.0.2.0 12.1.0.2.0 +ASM1 SYSTEMDG
ASMCMDS> help
```

ASMCMDS> help

asmcmd

Starts asmcmd or executes the command

Synopsis

```
asmcmd [-V] [--nocp] [-v {errors | warnings | normal | info | debug} ] [--privilege {sysasm | sysdba} ] [-p] [--inst <instance_name>] [--discover][<command>]
```

Description

The environment variables ORACLE_HOME and ORACLE_SID determine the instance to which the program connects, and ASMCMD establishes a bequeath connection to it, in the same manner as a SQLPLUS / AS SYSASM. The user must be a member of the OSASM group.

If Flex ASM is enabled, the ASMCMD connects to any one of the ASM instances running in the cluster. The connection to ASM instance does not depend on the environment variables ORACLE_HOME and ORACLE_SID. The ASMCMD alert log shows to which instance ASMCMD is connected to. If the user wants to connect to a specific ASM instance, --inst option should be used to specify the instance name.

Specifying the -V option prints the asmcmd version number and exits immediately.

Specifying the --nocp option disables connection pooling feature for ASMCMD.

Specifying the -v option prints extra information that can help advanced users diagnose problems.

Specify the --privilege option to choose the type of connection. There are only two possibilities: connecting as SYSASM or as SYSDBA.

The default value if this option is unspecified is SYSASM.

Specifying the -p option allows the current directory to be displayed in the command prompt, like so:

```
ASMCMD [+DATA/ORCL/CONTROLFILE] >
```

Specifying the --discover option uses discovery string obtained from Listener, does not use ORACLE_SID.

[command] specifies one of the following commands, along with its parameters.

Type "help [command]" to get help on a specific ASMCMD command.

commands:

md_backup, md_restore

amdu_extract

lsattr, setattr

audcleanaudittrail, audclearproperty, audcleartimestamp
 audcreatejob, auddropjob, audloaduniauditfiles, audsetdebug
 audsetjobinterval, audsetjobstatus, audsetProperty, audsettimestamp
 audsettraillocation, audshowtimestamp, lsaudcleanevents
 lsaudcleanupjobs, lsaudconfigparams

cd, cp, du, find, help, ls, lsct, lsdg, lsof, mkalias
 mkdir, pwd, rm, rmalias, showclustermode, showclusterstate
 showpatches, showversion

mapau, mapextent

chdg, chkdg, dropdg, iostat, lsdsd, lsod, mkg, mount
 offline, online, rebal, remap, umount

pwcopy, pwcreate, pwdelete, pwget, pwmove, pwset

afd_configure, afd_deconfigure, afd_dsget, afd_dsset
 afd_filter, afd_label, afd_lsdsd, afd_scan, afd_state
 afd_unlabel, dsget, dsset, lsop, mkcc, rmcc, shutdown
 spbackup, spcopy, spget, spmove, spset, startup

chtmpl, lstmpl, mktmpl, rmtmpl

chgrp, chmod, chown, groups, grpmod, lsgrp, lspwusr, lsusr
 mkg, mkusr, orapwusr, passwd, rmgrp, rmusr, rpusr

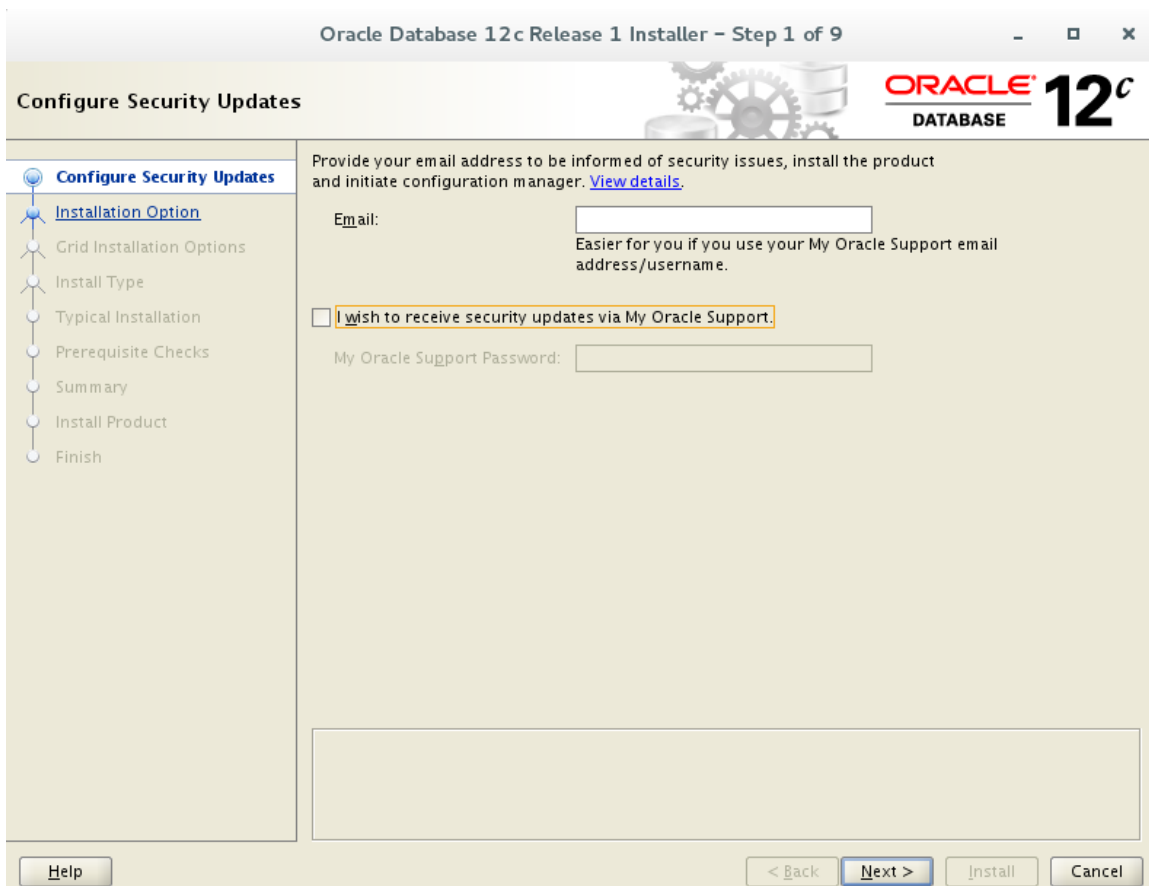
volcreate, voldelete, voldisable, volenable, volinfo
 volresize, volset, volstat

ASMCMD>

Install Database


```
[root@prod1 Desktop]# xhost +
access control disabled, clients can connect from any host
[root@prod1 Desktop]# su - oracle
Last login: Mon Jan 11 20:47:44 CST 2016 on pts/1
[oracle@prod1 ~]$ export DISPLAY=:0.0
[oracle@prod1 ~]$ cd /mnt/hgfs/12102/database/
[oracle@prod1 database]$ ./runInstaller
Starting Oracle Universal Installer...
```

```
Checking Temp space: must be greater than 500 MB.    Actual 27734 MB    Passed
Checking swap space: must be greater than 150 MB.    Actual 1861 MB    Passed
Checking monitor: must be configured to display at least 256 colors.    Actual
16777216    Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2016-01-
11_08-49-38PM. Please wait ...[oracle@prod1 database]$
```



Oracle Database 12c Release 1 Installer – Step 2 of 9

Select Installation Option




Select any of the following install options.

- Create and configure a database
- Install database software only
- Upgrade an existing database

Navigation buttons: [Help](#), [< Back](#), [Next >](#), [Install](#), [Cancel](#)

Oracle Database 12c Release 1 Installer – Step 3 of 9

Grid Installation Options



Select the type of database installation you want to perform.

- Single instance database installation
- Oracle Real Application Clusters database installation
- Oracle RAC One Node database installation


Navigation pane:

- Configure Security Updates
- Installation Option
- Grid Installation Options**
- Install Type
 - Typical Installation
 - Prerequisite Checks
 - Summary
 - Install Product
 - Finish

Buttons: Help, < Back, Next >, Install, Cancel

Oracle Database 12c Release 1 Installer - Step 4 of 10

Select List of Nodes



Select nodes (in addition to the local node) in the cluster where the installer should install Oracle RAC or Oracle RAC One.

Node name	
<input checked="" type="checkbox"/>	1 prod1
<input checked="" type="checkbox"/>	2 prod2

SSH connectivity...

Select all Deselect all

Help < Back Next > Install Cancel

Oracle Database 12 c Release 1 Installer - Step 4 of 10

Select List of Nodes

Select nodes (in addition to the local node) in the cluster where the installer should install Oracle RAC or Oracle RAC One.


	Node name
<input checked="" type="checkbox"/>	1 prod1
<input checked="" type="checkbox"/>	2 prod2

SSH connectivity... Select all Deselect all

OS Username: OS Password:

Test Setup

Oracle Database 12 c Release 1 Installer


 Successfully established passwordless SSH connectivity between the selected nodes.

OK

Help < Back Next > Install Cancel

Oracle Database 12 c Release 1 Installer – Step 5 of 12

Select Product Languages



Select the languages in which your product will run.

Available languages:

- Arabic
- Bengali
- Brazilian Portuguese
- Bulgarian
- Canadian French
- Catalan
- Croatian
- Czech
- Danish
- Dutch
- Egyptian
- English (United Kingdom)
- Estonian
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Icelandic
- Indonesian

Selected languages:


- English

Navigation buttons: < Back, Next >, Install, Cancel

Help

Oracle Database 12c Release 1 Installer – Step 6 of 12

Select Database Edition



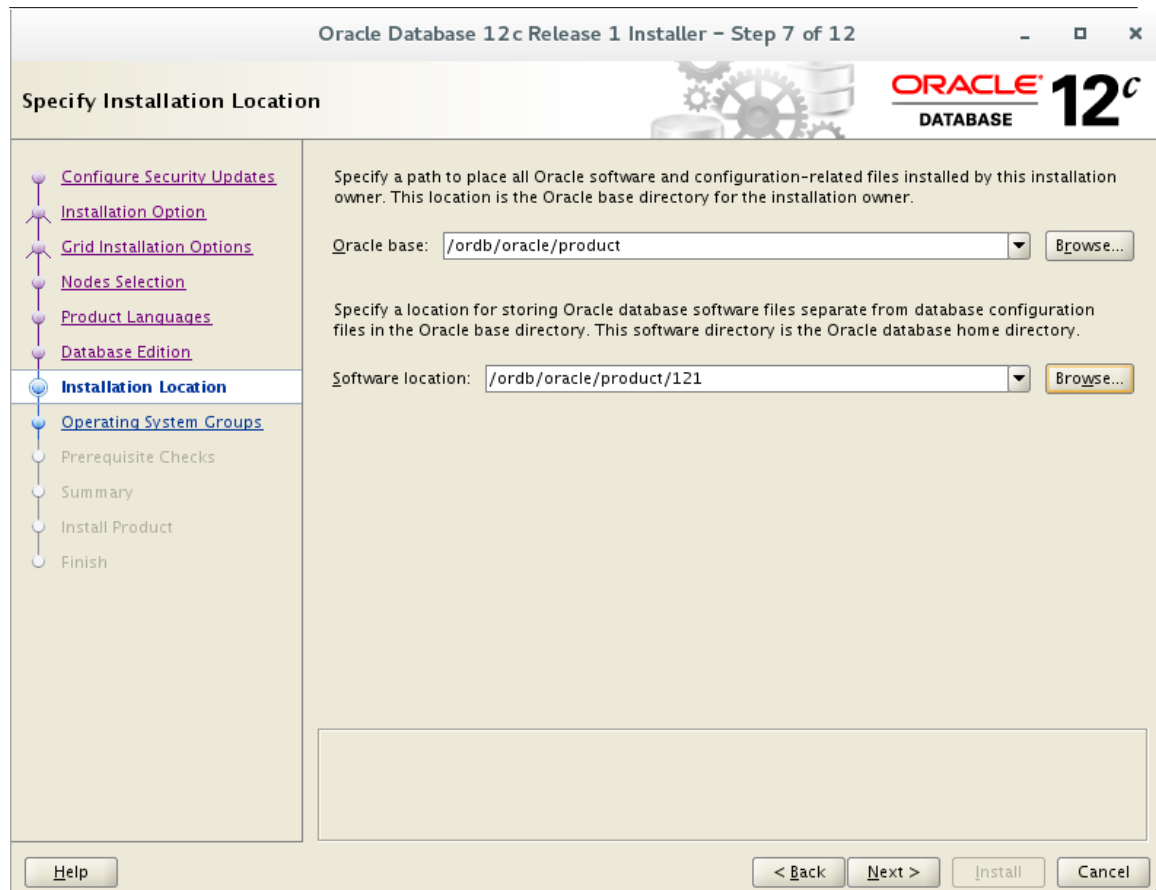
- Configure Security Updates
- Installation Option
- Grid Installation Options
- Nodes Selection
- Product Languages
- Database Edition**
- Installation Location
- Operating System Groups
- Prerequisite Checks
- Summary
- Install Product
- Finish

Which database edition do you want to install?

Enterprise Edition (6.4GB)
Oracle Database 12c Enterprise Edition is a self-managing database that has the scalability, performance, high availability, and security features required to run the most demanding, mission-critical applications.

Standard Edition (6.1GB)
Oracle Database 12c Standard Edition is a full-featured data management solution ideally suited to the needs of medium-sized businesses. It includes Oracle Real Application Clusters for enterprise-class availability and comes complete with its own Oracle Clusterware and storage management capabilities.

[Help](#) < Back Next > Install Cancel



Specify the UNIX group names for the database administrators (OSDBA) group and optionally, the database operators (OSOPER) group, then click Next.

Note: The groups that you specify must already exist. For Oracle Real Application Clusters installations, the group ID (gid) for each group must be the same on all nodes of the cluster.

These groups have the following significance:

The OSDBA group (typically, dba)

You must create this group the first time you install Oracle Database software on the system. This group identifies operating system user accounts that have database administrative privileges (the SYSDBA privilege). The name used for this group in Oracle code examples is dba.

The OSOPER group for Oracle Database (typically, oper)

This is an optional group. Create this group if you want a separate group of operating system users to have a limited set of database administrative privileges (the SYSOPER privilege). This group cannot directly connect as SYSOPER, unless explicitly granted. However, they have the privileges granted by the SYSOPER privilege. By default, members of the OSDBA group have all privileges granted by the SYSOPER privilege.

The usual name for this group is oper.

The OSBACKUPDBA group for Oracle Database (typically, backupdba)

Create this group if you want a separate group of operating system users to have a limited set of database backup and recovery related administrative privileges (the SYSBACKUP privilege). The usual name for this group is backupdba.

The OSDGDBA group for Oracle Data Guard (typically, dgdba)

Create this group if you want a separate group of operating system users to have a limited set of privileges to administer and monitor Oracle Data Guard (the SYSDBG privilege). The usual name for this group is dgdba.

The OSKMDBA group for encryption key management (typically, kmdba)

Create this group if you want a separate group of operating system users to have a limited set of privileges for encryption key management such as Oracle Wallet Manager management (the SYSKM privilege). The usual name for this group is kmdba.

Oracle Database 12c Release 1 Installer – Step 8 of 12

Privileged Operating System groups

ORACLE DATABASE 12^c

Configure Security Updates
 Installation Option
 Grid Installation Options
 Nodes Selection
 Product Languages
 Database Edition
 Installation Location
Operating System Groups
 Prerequisite Checks
 Summary
 Install Product
 Finish

SYS privileges are required to create a database using operating system (OS) authentication. Membership in OS Groups grants the corresponding SYS privilege, eg. membership in OSDBA grants the SYSDBA privilege.

Database Administrator (OSDBA) group: dba

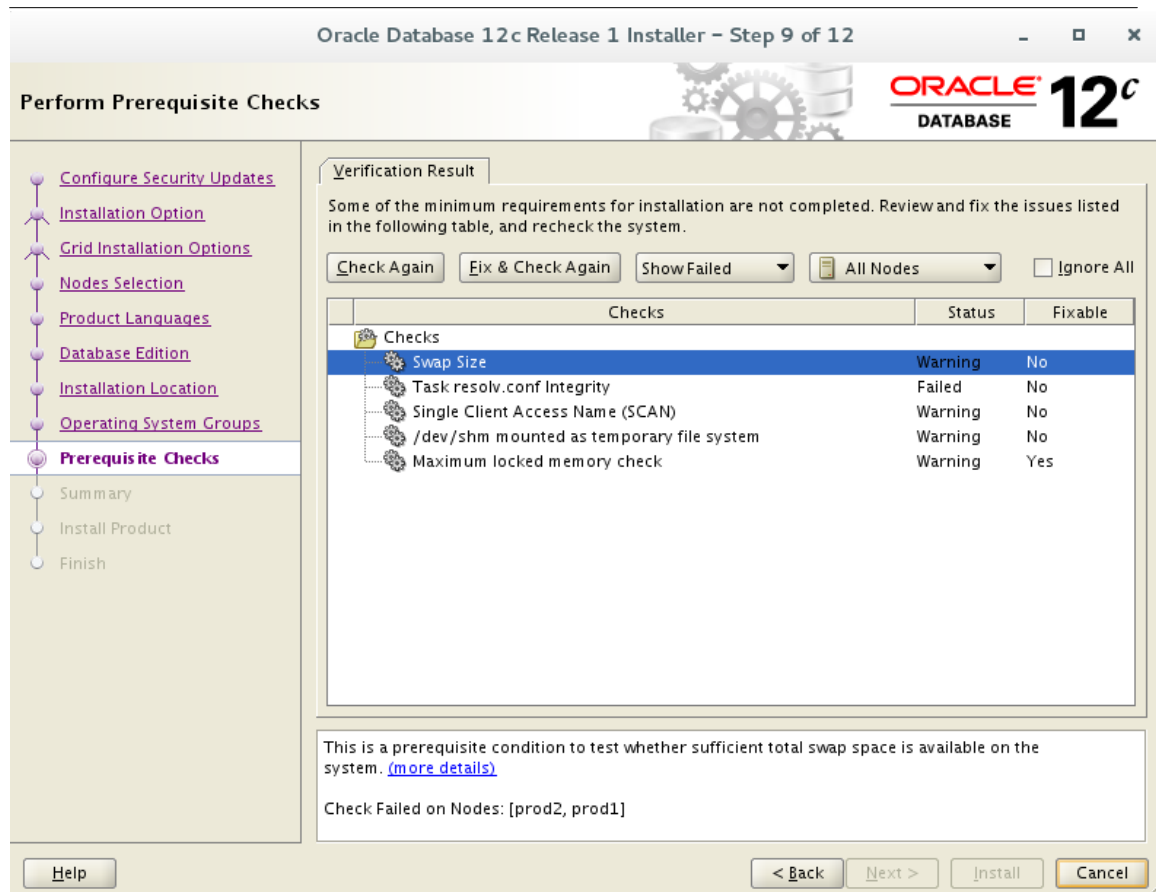
Database Operator (OSOPER) group (Optional):

Database Backup and Recovery (OSBACKUPDBA) group: dba

Data Guard administrative (OSDGDBA) group: dba

Encryption Key Management administrative (OSKMDBA) group: dba

Help < Back Next > Install Cancel



Execute fixup script for both nodes

```
[root@prod1 ~]# /tmp/CVU_12.1.0.2.0_oracle/runfixup.sh
```

All Fix-up operations were completed successfully.

```
[root@prod1 ~]# ssh prod2 /tmp/CVU_12.1.0.2.0_oracle/runfixup.sh
```


root@prod2's password:

All Fix-up operations were completed successfully.

```
[root@prod1 ~]#
```

Oracle Database 12c Release 1 Installer – Step 9 of 12

Perform Prerequisite Checks



Verification Result **Fixup Result**

Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

 Ignore All

Checks	Status	Fixable
Checks		
Swap Size	Ignored	No
Task resolv.conf Integrity	Ignored	No
Single Client Access Name (SCAN)	Ignored	No
/dev/shm mounted as temporary file system	Ignored	No

This is a prerequisite condition to test whether sufficient total swap space is available on the system. ([more details](#))

Check Failed on Nodes: [prod2, prod1]

Oracle Database 12c Release 1 Installer - Step 9 of 12

Perform Prerequisite Checks

- [Configure Security Updates](#)
- [Installation Option](#)
- [Grid Installation Options](#)
- [Nodes Selection](#)
- [Product Languages](#)
- [Database Edition](#)
- [Installation Location](#)
- [Operating System Configuration](#)
- Prerequisite Checks**
- [Summary](#)
- [Install Product](#)
- [Finish](#)

Verification Result
Fixup Result

Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Ignore All

Checks	Status	Fixable
Checks		
Swap Size	Ignored	No
Task resolv.conf Integrity	Ignored	No
Single Client Access Name (SCAN)	Ignored	No
	red	No

Oracle Database 12c Release 1 Installer

[INS-13016] You have chosen to ignore some of the prerequisites for this installation. This may impact product configuration.

Are you sure you want to continue?

This is a prerequisite condition to test whether sufficient total swap space is available on the system. [\(more details\)](#)

Check Failed on Nodes: [prod2, prod1]

Oracle Database 12c Release 1 Installer – Step 10 of 12

Summary

ORACLE 12^c DATABASE

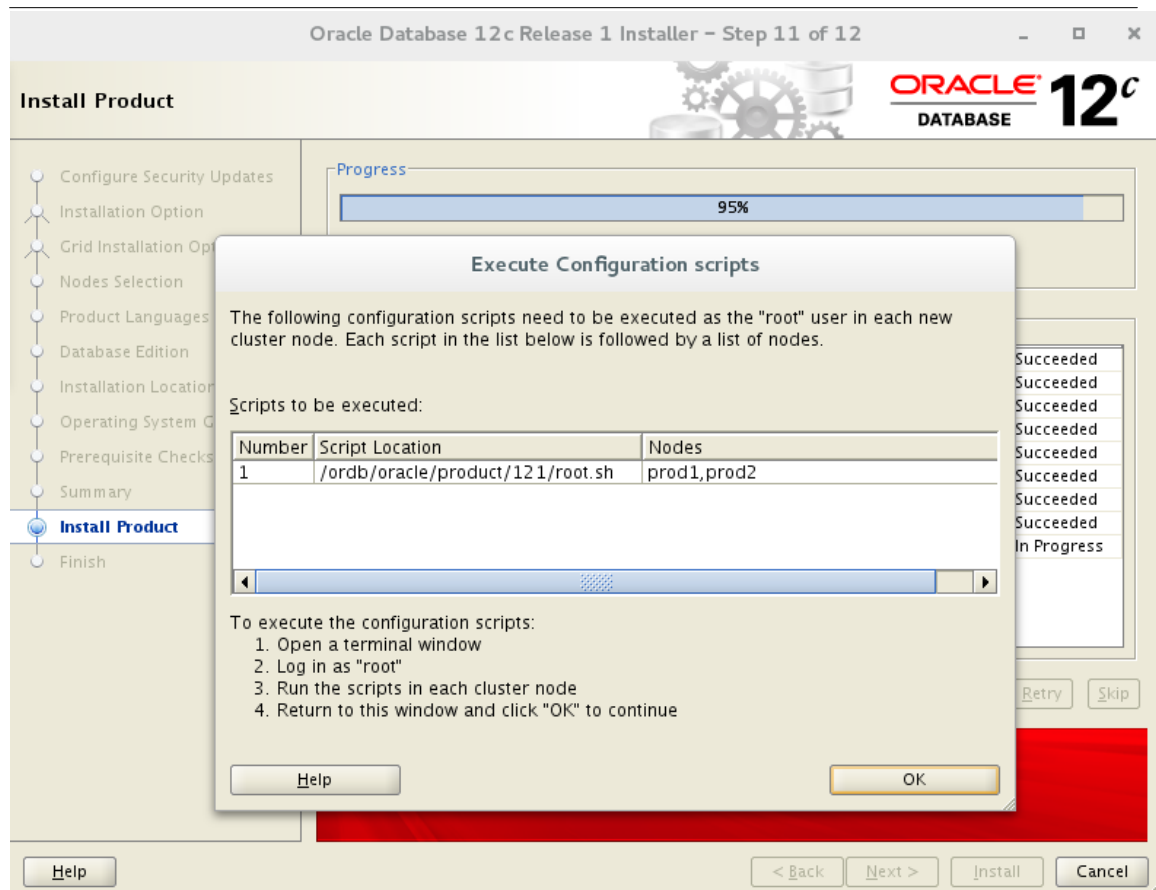
- [Configure Security Updates](#)
- [Installation Option](#)
- [Grid Installation Options](#)
- [Nodes Selection](#)
- [Product Languages](#)
- [Database Edition](#)
- [Installation Location](#)
- [Operating System Groups](#)
- [Prerequisite Checks](#)
- Summary**
- Install Product
- Finish

Oracle Database 12c Release 1 Installer

- Global settings**
 - Disk space: required 6.4 GB available 26.6 GB [\[Edit\]](#)
 - Source location: /mnt/hgfs/12102/database/install/./stage/products.xml
 - Database edition: Enterprise Edition (Install database software only) [\[Edit\]](#)
 - Oracle base: /ordb/oracle/product [\[Edit\]](#)
 - Software location: /ordb/oracle/product/121 [\[Edit\]](#)
 - Privileged Operating System groups: dba (OSDBA), dba (OSBACKUPDBA), dba (OSDGDBA), dba (OSOPER)
- Grid Options**
 - Cluster Nodes: prod1, prod2 [\[Edit\]](#)

[Save Response File...](#)

[Help](#) [< Back](#) [Next >](#) [Install](#) [Cancel](#)



Execute root.sh

```
[root@prod1 ~]# /oradb/oracle/product/121/root.sh
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle
ORACLE_HOME= /oradb/oracle/product/121
```

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.

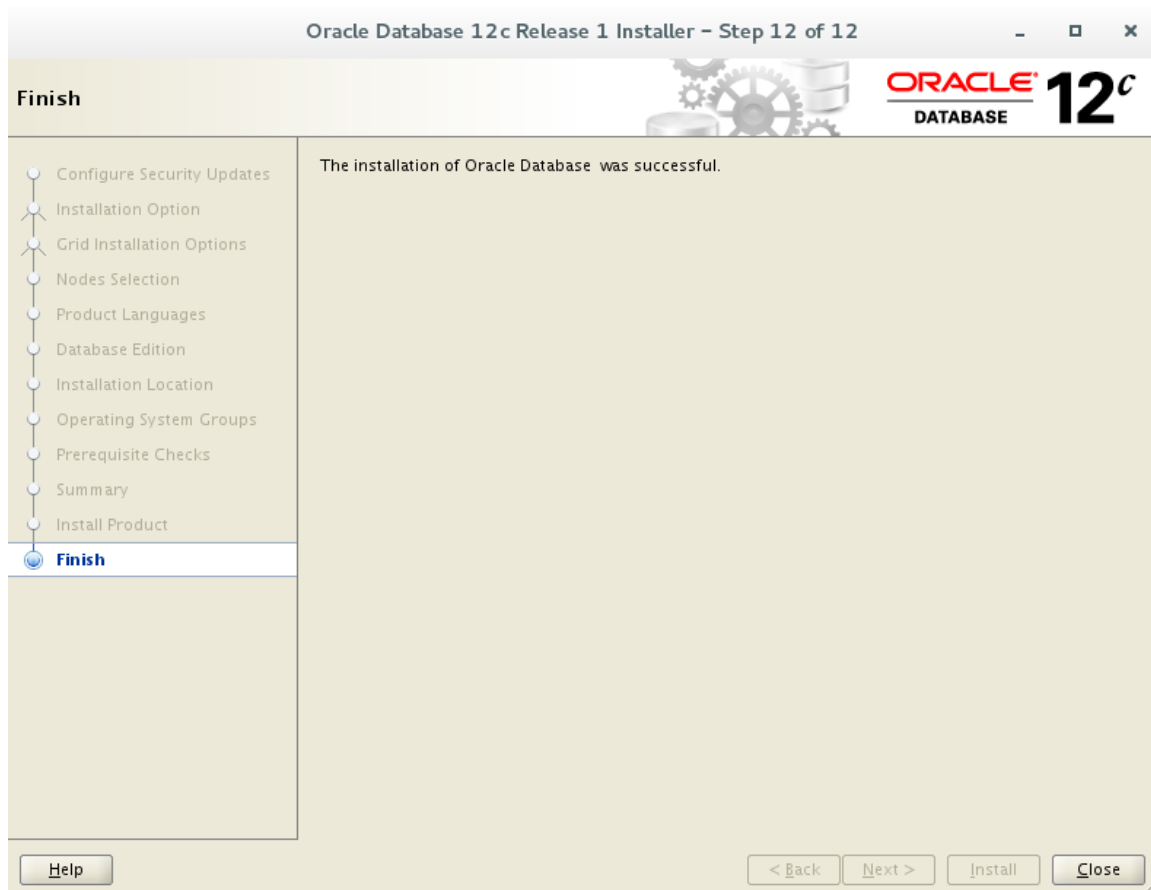
```
[root@prod1 ~]# ssh prod2 /oradb/oracle/product/121/root.sh
root@prod2's password:
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle
ORACLE_HOME= /oradb/oracle/product/121
```


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@prod1 ~]#



Create database

```
[oracle@prod1 ~]$ cd /oradb/oracle/product/121/bin/
[oracle@prod1 bin]$ ./dbca
```



Database Configuration Assistant - Welcome - Step 1 of 6

Database Operation

Database Operation

- Creation Mode**
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Select the operation that you want to perform.

- Create Database
- Configure Database Options
- Delete Database
- Manage Templates
- Manage Pluggable Databases
- Instance Management

Help < Back Next > Finish Cancel

Database Configuration Assistant – Create Database – Step 2 of 6

Creation Mode

ORACLE DATABASE 12c

- Database Operation
- Creation Mode**
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Create a database with default configuration

Global Database Name:

Storage Type:

Database Files Location:

Fast Recovery Area:

Database Character Set:

Administrative Password:



Confirm Password:

Create As Container Database

Pluggable Database Name:

Advanced Mode

Database Configuration Assistant – Create Database – Step 3 of 14

Database Template

- Database Operation
- Creation Mode
- Database Template**
- Database Identification
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Select the type of database you want to configure.

Database Type:

Configuration Type:

Templates that include datafiles contain pre-created databases. They allow you to create a new database in minutes, as opposed to an hour or more. Use templates without datafiles only when necessary, such as when you need to change attributes like block size, which cannot be altered after database creation.

Select a template for your database.

Select	Template	Includes Datafiles
<input checked="" type="radio"/>	General Purpose or Transaction Processing	Yes
<input type="radio"/>	Custom Database	No
<input type="radio"/>	Data Warehouse	Yes

[Show Details...](#)

[Help](#)
[< Back](#)
[Next >](#)
[Finish](#)
[Cancel](#)

Create container database

Database Configuration Assistant - Create Database - Step 4 of 15

Database Identification

ORACLE DATABASE 12^c

Provide the identifier information required to access the database uniquely. An Oracle database is uniquely identified by a Global Database Name, typically of the form "name.domain". A database is referenced by an Oracle instance on each cluster database node. Specify a prefix to be used to name the cluster database instances.

Database Operation
Creation Mode
Database Template
Database Identification
Database Placement
Management Options
Database Credentials
Storage Locations
Database Options
Initialization Parameters
Creation Options
Prerequisite Checks
Summary
Progress Page
Finish

Global Database Name:

SID Prefix:

Create As Container Database

Creates a database container for consolidating multiple databases into a single database and enables database virtualization. A container database (CDB) can have zero or more pluggable databases (PDB).

Create an Empty Container Database

Create a Container Database with one or more PDBs


Number of PDBs:

PDB Name:

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create Database - Step 5 of 15

Database Placement



Select Nodes
Select the nodes on which you want to create the cluster database. The local node "prod1" should always be selected.

Available:

Selected:

- prod1
- prod2

Navigation buttons: >, >>, <, <<

Buttons: Help, < Back, Next >, Finish, Cancel

Database Configuration Assistant - Create Database - Step 6 of 15

Management Options

Specify the management options for the database.

Run Cluster Verification Utility (CVU) Checks Periodically

Configure Enterprise Manager (EM) Database Express

EM Database Express Port:

Register with Enterprise Manager (EM) Cloud Control

OMS Host:

OMS Port:

EM Admin Username:

EM Admin Password:

Help < Back Next > Finish Cancel

Database Configuration Assistant – Create Database – Step 7 of 15

ORACLE **12^c**
DATABASE

Database Credentials

For security reasons, you must specify passwords for the following user accounts in the new database.

Use Different Administrative Passwords

User Name	Password	Confirm Password
SYS		
SYSTEM		
PDBADMIN		

Use the Same Administrative Password for All Accounts

Password:

Confirm Password:


Messages:

Warning: Password: The password entered does not conform to the Oracle recommended standards. A password should have minimum of 8 characters in length. In addition, the password must contain at least one upper case character, one lower case character and one digit.

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create Database - Step 8 of 15

Storage Locations



- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials**
- Storage Locations**
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Database files Storage Type: Automatic Storage Management (ASM) ▼

Use Database File Locations from Template

Use Common Location for All Database Files

File Location:

Use Oracle-Managed Files

Choose the recovery options for the database.

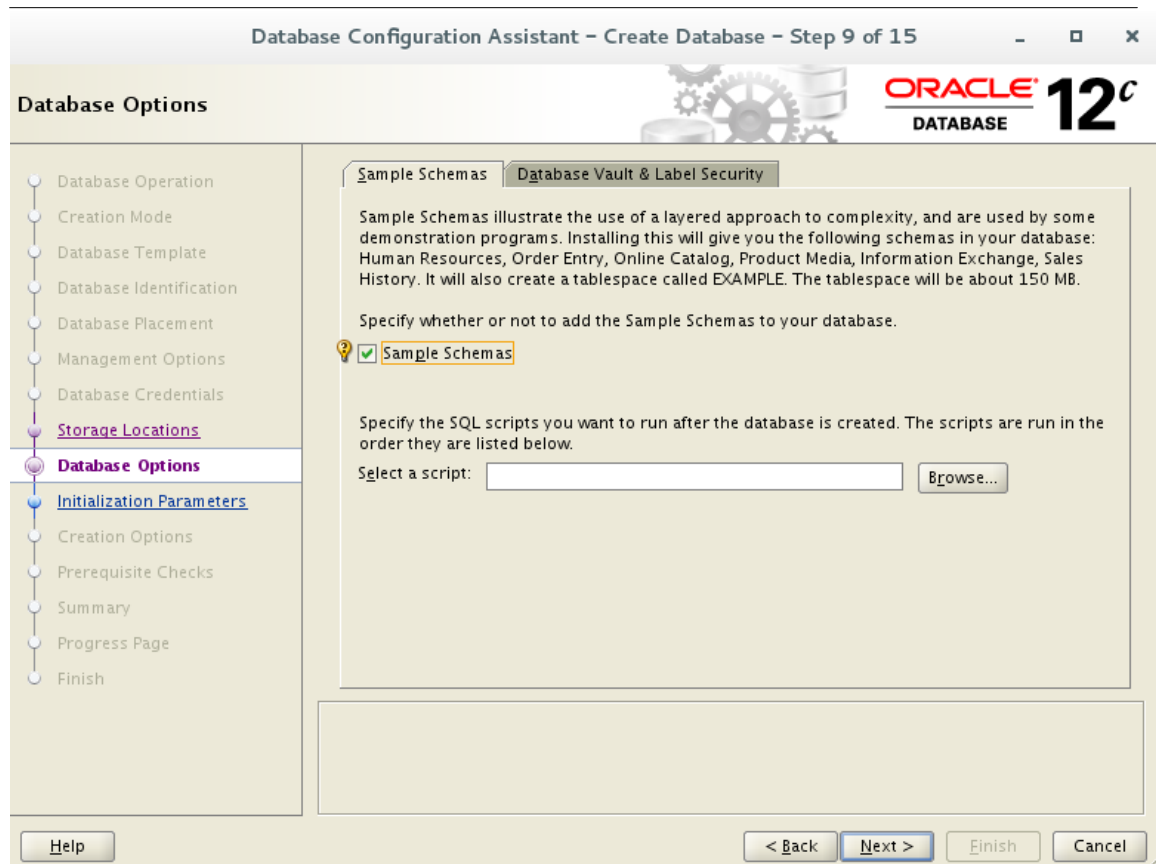
Recovery files Storage Type: Automatic Storage Management (ASM) ▼

Specify Fast Recovery Area

Fast Recovery Area:

Fast Recovery Area Size:

Enable Archiving



Database Configuration Assistant - Create Database - Step 9 of 15

Database Options

ORACLE 12c DATABASE

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options**
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Sample Schemas Database Vault & Label Security

Specify the Database Vault Owner and Password.

Configure Database Vault

Database Vault Owner:

Password: Confirm Password:

Create a Separate Account Manager

Account Manager:

Password: Confirm Password:

Select Label Security configuration options.

Configure Label Security

Configure with OID

Help < Back Next > Finish Cancel

Database Configuration Assistant – Create Database – Step 10 of 15

Initialization Parameters

ORACLE DATABASE 12c

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters**
- Creation Options
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Memory | Sizing | Character Sets | Connection Mode

Typical Settings

Memory Size (SGA and PGA): 800 MB

Percentage: 29 %

Use Automatic Memory Management

Custom Settings

Memory Management: Automatic Shared Memory Management

SGA Size: -1 M Bytes

PGA Size: -1 M Bytes

Total Memory for Oracle: 1080 MB

Show Memory Distribution...

All Initialization Parameters...

Help | < Back | Next > | Finish | Cancel

Database Configuration Assistant – Create Database – Step 10 of 15

Initialization Parameters

Memory Sizing **Character Sets** Connection Mode

Use the default
The default character set for this database is based on the language setting of this operating system: WE8MSWIN1252.

Use Unicode (AL32UTF8)
Setting character set to Unicode (AL32UTF8) enables you to store multiple language groups.

Choose from the list of character sets

Database Character Set: AL32UTF8 - Unicode UTF-8 Universal character set

Show recommended character sets only

National Character S... AL16UTF16 - Unicode UTF-16 Universal character set

Default Language: American

Default Territory: United States

All Initialization Parameters...

Help < Back Next > Finish Cancel

Database Configuration Assistant – Create Database – Step 11 of 15

ORACLE **12^c**
DATABASE

Creation Options

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options**
- Prerequisite Checks
- Summary
- Progress Page
- Finish

Select the database creation options.


Create Database

Generate Database Creation Scripts

Destination Directory:

Database Configuration Assistant - Create Database - Step 12 of 15

Prerequisite Checks



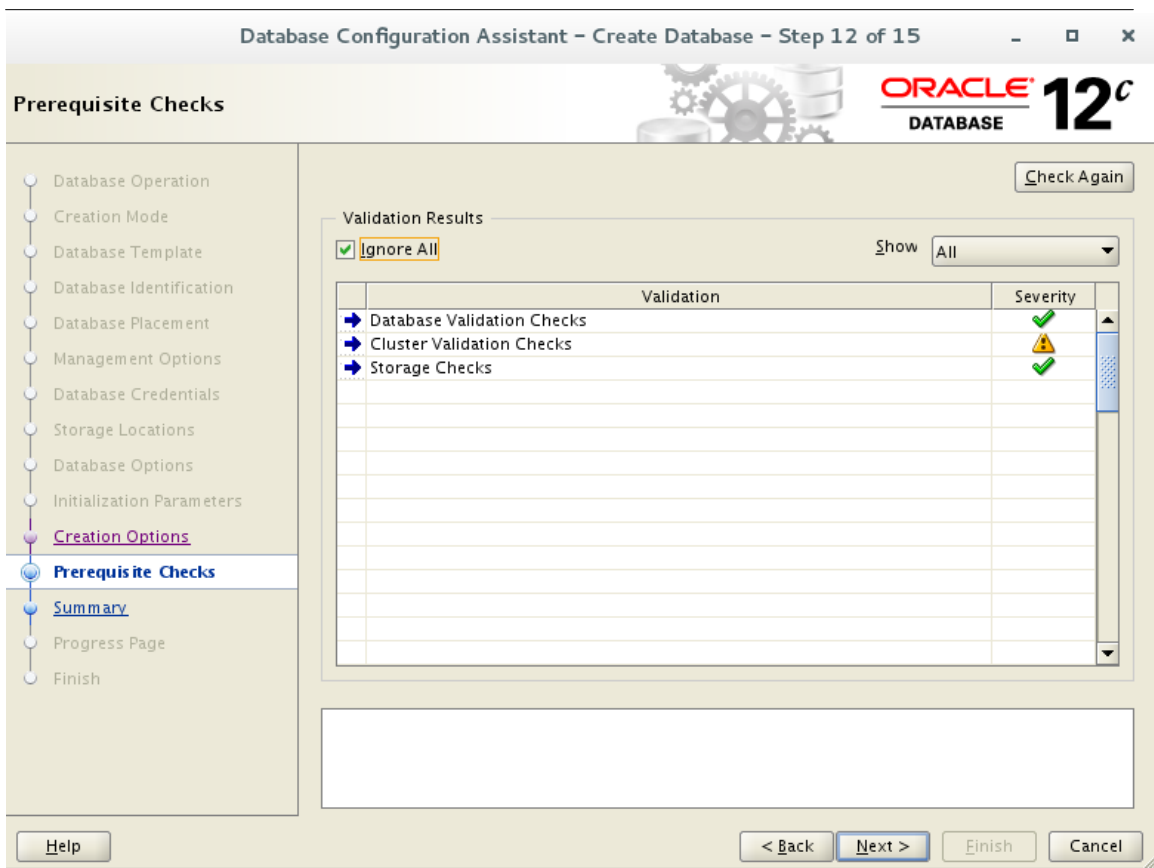
- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks**
- Summary
- Progress Page
- Finish

Prerequisite Checks

51%

Cluster Validation Checks: OS Kernel Parameters

Help < Back Next > Finish Cancel



Ignore Validation Check

Database Configuration Assistant - Create Database - Step 12 of 15

Prerequisite Checks

ORACLE DATABASE 12^C

Check Again

Validation Results

Ignore All Show All

Validation	Severity
Database Validation Checks	✓
Cluster Validation Checks	⚠
Physical Memory	✓
Available Physical Memory	✓
Swap Size	⚠
Free Space: prod2:/tmp	✓
Free Space: prod1:/tmp	✓
User Existence: oracle	✓
Run Level	✓
Hard Limit: maximum open file descriptors	✓
Soft Limit: maximum open file descriptors	✓
Hard Limit: maximum user processes	✓
Soft Limit: maximum user processes	✓
Architecture	✓
OS Kernel Version	✓



Physical Memory

Cluster Verification Check "Physical Memory" succeeded on node "prod1", expected value: 1GB (1048576.0KB) actual value: 2.676GB (2805948.0KB).

Cluster Verification Check "Physical Memory" succeeded on node "prod2", expected value: 1GB (1048576.0KB) actual value: 2.676GB (2805948.0KB).

Help < Back Next > Finish Cancel

Database Configuration Assistant – Create Database – Step 13 of 15

Summary

- [Database Operation](#)
- [Creation Mode](#)
- [Database Template](#)
- [Database Identification](#)
- [Database Placement](#)
- [Management Options](#)
- [Database Credentials](#)
- [Storage Locations](#)
- [Database Options](#)
- [Initialization Parameters](#)
- [Creation Options](#)
- [Prerequisite Checks](#)
- [Summary](#)
- [Progress Page](#)
- [Finish](#)

Database Configuration Assistant: Summary

Create Database – Summary

Database Configuration Summary

Global Database Name: prod
Database Configuration Type: Admin-Managed Cluster Database
Node List: prod1,prod2
SID List: prod1,prod2
Create As Container Database: Yes
Number of Pluggable Databases: 1
Sample Schema PDB: ohsdba
Storage Type: Automatic Storage Management (ASM)
Memory Configuration Type: Automatic Memory Management
Template Name: General Purpose or Transaction Processing

Database Configuration Details

Database Components

Component	Selected
Oracle JVM	true
Oracle Text	true

Help
< Back
Next >
Finish
Cancel

Database Configuration Assistant - Create Database - Step 14 of 15

Progress Page

ORACLE DATABASE 12^c

Progress
Database creation script generation in progress...

70%

Steps	Status
✓ Database creation script generation	Finished

Activity Log Alert Log

Help < Back Next > Finish Cancel

Database Configuration Assistant – Create Database – Step 14 of 15

Progress Page

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- **Progress Page**
- Finish

Progress

Clone database "prod" creation in progress...

29%

	Steps	Status
✔	Copying database files	Finished
⌚	Creating and starting Oracle instance	In Progress
	Creating cluster database views	
	Completing Database Creation	
	Creating Pluggable Databases	


Activity Log
Alert Log

Help
< Back
Next >
Finish
Cancel

Database Configuration Assistant – Create Database – Step 14 of 15

Progress Page

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- **Progress Page**
- Finish



Progress

Clone database "prod" creation in progress...

66%

	Steps	Status
✓	Copying database files	Finished
✓	Creating and starting Oracle instance	Finished
✓	Creating cluster database views	Finished
🕒	Completing Database Creation	In Progress
	Creating Pluggable Databases	


Activity Log
Alert Log

Help
< Back
Next >
Finish
Cancel

Database Configuration Assistant – Create Database – Step 14 of 15

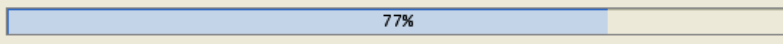
Progress Page

- Database Operation
- Creation Mode
- Database Template
- Database Identification
- Database Placement
- Management Options
- Database Credentials
- Storage Locations
- Database Options
- Initialization Parameters
- Creation Options
- Prerequisite Checks
- Summary
- **Progress Page**
- Finish



Progress

Clone database "prod" creation in progress...



77%


	Steps	Status
✓	Copying database files	Finished
✓	Creating and starting Oracle instance	Finished
✓	Creating cluster database views	Finished
✓	Completing Database Creation	Finished
⌚	Creating Pluggable Databases	In Progress

Activity Log
Alert Log

Help
< Back
Next >
Finish
Cancel

Database Configuration Assistant – Create Database – Step 15 of 15

Finish



The generation of the script "/ordb/oracle/product/admin/prod/scripts" is successful.

Database creation complete. For details check the logfiles at:
/ordb/oracle/product/cfgtoollogs/dbca/prod.

Database Information:

Global Database Name:	prod
System Identifier(SID) Prefix:	prod
Server Parameter File name:	+DATA/prod/spfileprod.ora
EM Database Express URL:	https://prod-scan:5500/em

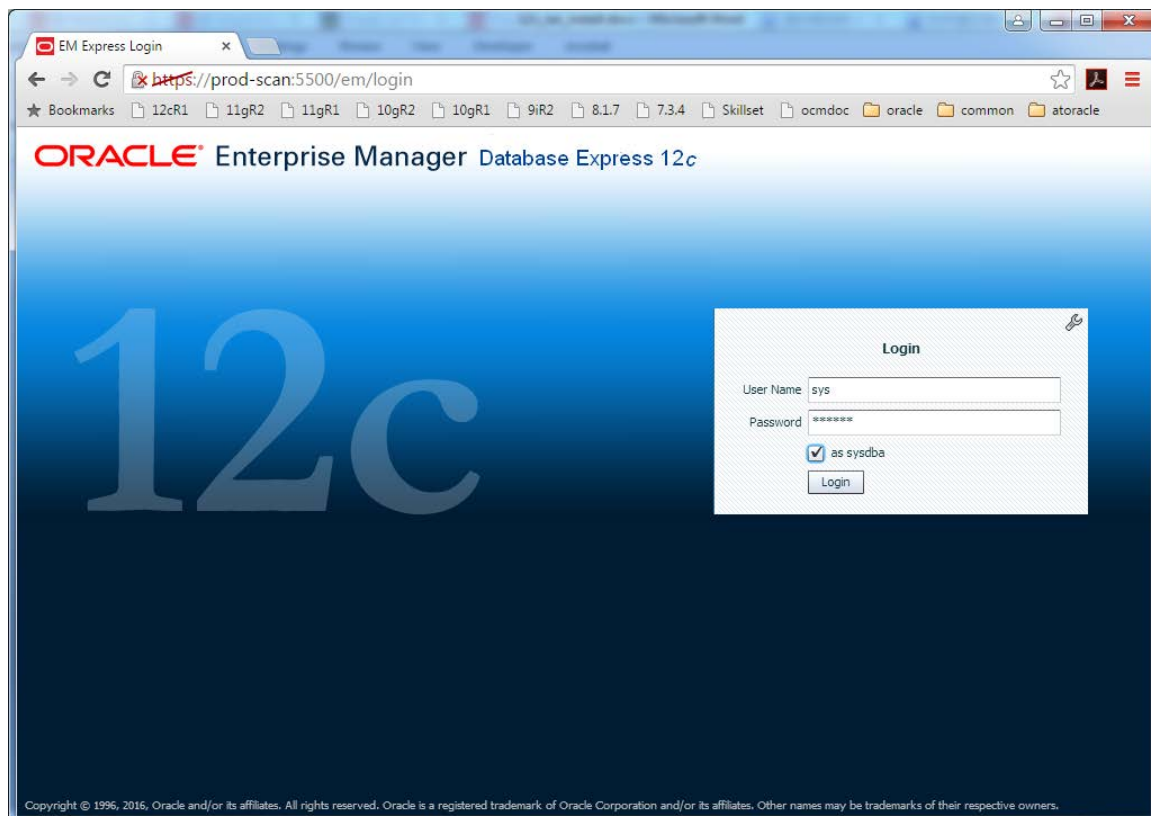
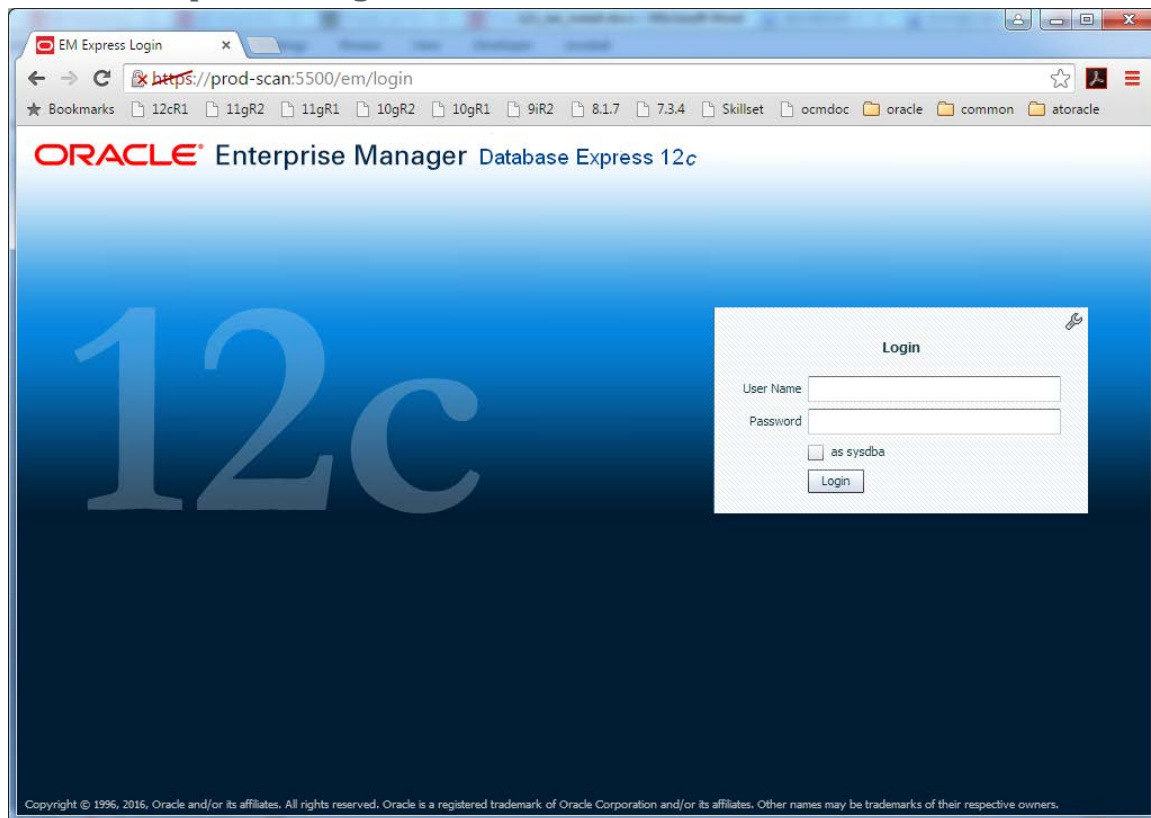
Note: All database accounts except SYS and SYSTEM are locked. Select the Password Management button to view a complete list of locked accounts or to manage the database accounts. From the Password Management window, unlock only the accounts you will use. Oracle strongly recommends changing the default passwords immediately after unlocking the account.

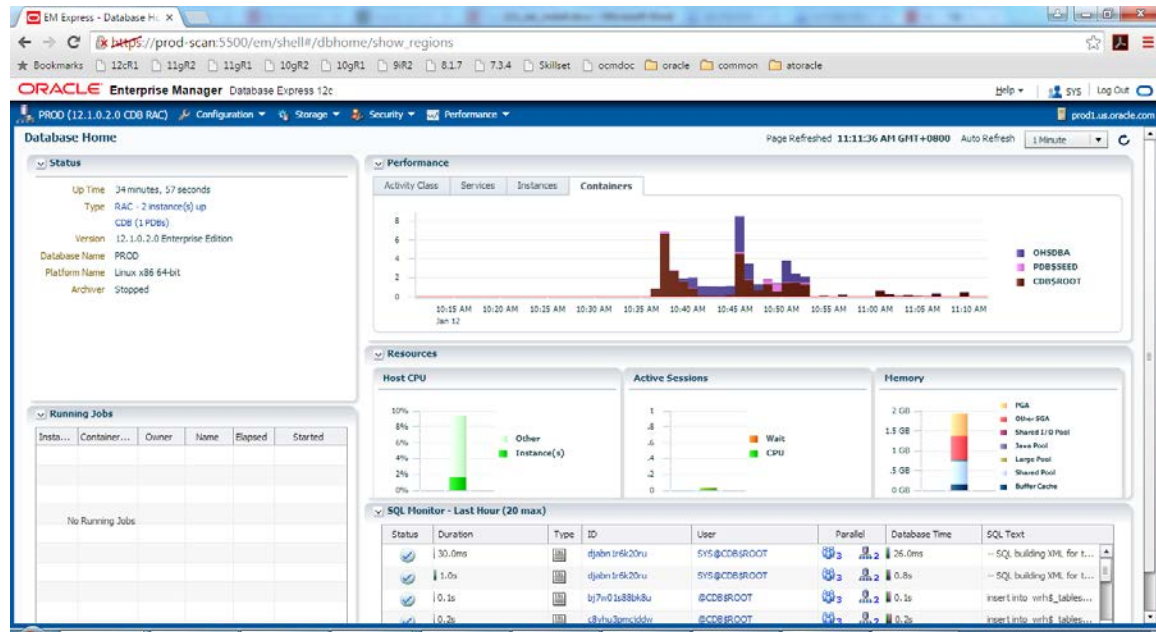
[Password Management...](#)

Finish

Help < Back Next > Finish Close

Access Enterprise Manager





Final Verify

```
[root@prod1 ~]# /orgrid/oracle/product/121/bin/crsctl stat res -t
```

Name	Target	State	Server	State details

Local Resources				

ora.ASMNET1LSNR_ASM.lsnr		ONLINE	prod1	STABLE
		ONLINE	prod2	STABLE
ora.DATA.dg		ONLINE	prod1	STABLE
		ONLINE	prod2	STABLE
ora.LISTENER.lsnr		ONLINE	prod1	STABLE
		ONLINE	prod2	STABLE
ora.SYSTEMDG.dg		ONLINE	prod1	STABLE
		ONLINE	prod2	STABLE
ora.net1.network		ONLINE	prod1	STABLE
		ONLINE	prod2	STABLE
ora.ons		ONLINE	prod1	STABLE
		ONLINE	prod2	STABLE

Cluster Resources				

ora.LISTENER_SCAN1.lsnr		ONLINE	prod1	STABLE
1		ONLINE	prod1	STABLE
ora.MGMTLSNR		ONLINE	prod1	169.254.207.20, STABLE
1		ONLINE	prod1	E
ora.asm		ONLINE	prod1	Started, STABLE
1		ONLINE	prod2	Started, STABLE
2		ONLINE	prod2	Started, STABLE
3		OFFLINE	OFFLINE	STABLE
ora.cvu		ONLINE	prod1	STABLE
1		ONLINE	prod1	STABLE
ora.mgmtdb		ONLINE	prod1	STABLE

1	ONLINE	ONLINE	prod1	Open, STABLE	
ora.oc4j	1	ONLINE	ONLINE	prod1	STABLE
ora.prod.db	1	ONLINE	ONLINE	prod1	Open, STABLE
	2	ONLINE	ONLINE	prod2	Open, STABLE
ora.prod1.vip	1	ONLINE	ONLINE	prod1	STABLE
ora.prod2.vip	1	ONLINE	ONLINE	prod2	STABLE
ora.scan1.vip	1	ONLINE	ONLINE	prod1	STABLE

```

-----
[root@prod1 ~]#
[orgrid@prod1 ~]$ ps -ef|grep pmon
oracle  42367      1  0 10:36 ?        00:00:00 ora_pmon_prod1
orgrid  87052      1  0 07:32 ?        00:00:01 mdb_pmon_-MGMTDB
orgrid  87791      1  0 07:33 ?        00:00:01 asm_pmon_+ASM1
orgrid  95242  94980  0 13:28 pts/2    00:00:00 grep --color=auto pmon
[orgrid@prod1 ~]$

```

```

[oracle@prod1 ~]$ srvctl config database -d prod
Database unique name: prod
Database name: prod
Oracle home: /oradb/oracle/product/121
Oracle user: oracle
Spfile: +DATA/PROD/PARAMETERFILE/spfile.267.900930851
Password file: +DATA/PROD/PASSWORD/pwdprod.276.900930051
Domain:
Start options: open
Stop options: immediate
Database role: PRIMARY
Management policy: AUTOMATIC
Server pools:
Disk Groups: DATA
Mount point paths:
Services:
Type: RAC
Start concurrency:
Stop concurrency:
OSDBA group: dba
OSOPEER group:
Database instances: prod1,prod2
Configured nodes: prod1,prod2
Database is administrator managed
[oracle@prod1 ~]$

```

```

[oracle@prod1 ~]$ lsnrctl status

```

```

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 12-JAN-2016 13:50:56

```

```

Copyright (c) 1991, 2014, Oracle. All rights reserved.

```

```

Connecting to (ADDRESS=(PROTOCOL=tcp)(HOST=)(PORT=1521))
STATUS of the LISTENER
-----

```

```

Alias                LISTENER
Version              TNSLSNR for Linux: Version 12.1.0.2.0 - Production
Start Date           11-JAN-2016 19:45:29
Uptime                0 days 18 hr. 5 min. 27 sec
Trace Level           off
Security              ON: Local OS Authentication
SNMP                  OFF
Listener Parameter File /orgrid/oracle/product/121/network/admin/listener.ora

```

```

Listener Log File
/orgrid/grid_base/diag/tnslsnr/prod1/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=LISTENER)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=10.0.0.100)(PORT=1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=10.0.0.102)(PORT=1521)))

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcps)(HOST=prod1)(PORT=5500))(Security=(my_wall
et_directory=/ordb/oracle/product/121/admin/prod/xdw_wallet))(Presentation=HTTP
)(Session=RAW))
Services Summary...
Service "+ASM" has 1 instance(s).
  Instance "+ASM1", status READY, has 1 handler(s) for this service...
Service "-MGMTDBXDB" has 1 instance(s).
  Instance "-MGMTDB", status READY, has 1 handler(s) for this service...
Service "_mgmtdb" has 1 instance(s).
  Instance "-MGMTDB", status READY, has 1 handler(s) for this service...
Service "ohsdba" has 1 instance(s).
  Instance "prod1", status READY, has 1 handler(s) for this service...
Service "ohsgi" has 1 instance(s).
  Instance "-MGMTDB", status READY, has 1 handler(s) for this service...
Service "prod" has 1 instance(s).
  Instance "prod1", status READY, has 1 handler(s) for this service...
Service "prodXDB" has 1 instance(s).
  Instance "prod1", status READY, has 1 handler(s) for this service...
The command completed successfully
[oracle@prod1 ~]$

```

CDB & PDB Operations

Open pdb as sysdba

```
[oracle@prod1 ~]$ sqlplus / as sysdba
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Fri Jan 15 10:19:13 2016
```

```
Copyright (c) 1982, 2014, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Real Application Clusters, Automatic Storage Management,
OLAP,
```

```
Advanced Analytics and Real Application Testing options
```

```
SQL> show pdbs;
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	OHSDBA	MOUNTED	

```
SQL> alter pluggable database ohsdba open instances=all;
```

```
Pluggable database altered.
```

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO

```

          3 OHSDBA                                READ WRITE NO
SQL> show con_name

CON_NAME
-----
CDB$ROOT
SQL> show con_id

CON_ID
-----
1
SQL> alter session set container=ohsdba;

Session altered.

SQL> show con_name

CON_NAME
-----
OHSDBA
SQL> show con_id

CON_ID
-----
3
SQL> show pdbs

   CON_ID CON_NAME                                OPEN MODE  RESTRICTED
-----
          3 OHSDBA                                READ WRITE NO
SQL> shutdown immediate
Pluggable Database closed.
SQL> show con_name

CON_NAME
-----
OHSDBA
SQL> show pdbs

   CON_ID CON_NAME                                OPEN MODE  RESTRICTED
-----
          3 OHSDBA                                MOUNTED

SQL>
SQL> exit
Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 -
64bit Production
With the Partitioning, Real Application Clusters, Automatic Storage Management,
OLAP,
Advanced Analytics and Real Application Testing options
[oracle@prod1 ~]$

[oracle@prod1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Fri Jan 15 10:26:08 2016

Copyright (c) 1982, 2014, Oracle. All rights reserved.

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Real Application Clusters, Automatic Storage Management,
OLAP,
Advanced Analytics and Real Application Testing options

```

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	OHSDBA	MOUNTED	

```
SQL> alter pluggable database all open instances=all;
```

Pluggable database altered.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	OHSDBA	READ WRITE	NO

```
SQL> alter pluggable database ohsdba close instances=all;
```

Pluggable database altered.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	OHSDBA	MOUNTED	

```
SQL>
```

Open pdb as pdb sysdba

```
[oracle@prod1 ~]$ sqlplus sys/oracle@10.0.0.100/ohsdba as sysdba
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Fri Jan 15 10:24:05 2016
```

```
Copyright (c) 1982, 2014, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Real Application Clusters, Automatic Storage Management,
OLAP,
Advanced Analytics and Real Application Testing options
```

```
SQL> show con_name
```

```
CON_NAME
-----
OHSDBA
```

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
3	OHSDBA	MOUNTED	

```
SQL> alter database open;
```

Database altered.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
--------	----------	-----------	------------

```

3 OHSDBA                                READ WRITE NO
SQL> shutdown immediate
Pluggable Database closed.
SQL> show pdbs

```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
3	OHSDBA	MOUNTED	

```

SQL>
SQL> alter database open;

```

Database altered.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
3	OHSDBA	READ WRITE	NO

```
SQL> alter session set container=cdb$root;
```

Session altered.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	OHSDBA	READ WRITE	NO

```
SQL>
```

Create user

**global user is begin with c##,you cannot create local user on cdb.
you cannot see the local user(pdb user) in cdb.**

```
SQL> show parameter common_user_prefix
```

NAME	TYPE	VALUE
common_user_prefix	string	C##

```
SQL> create user ohsdba identified by oracle;
create user ohsdba identified by oracle
*
```

```
ERROR at line 1:
ORA-65096: invalid common user or role name
```

```
SQL> create user c##ohsdba identified by oracle;
```

User created.

```
SQL> select username from dba_users where username='C##OHSDBA';
```

USERNAME
C##OHSDBA

```
SQL> alter session set container=ohsdba;
```

Session altered.

```
SQL> show pdbs
```

```

      CON_ID CON_NAME                                OPEN MODE  RESTRICTED
-----
      3 OHSDBA                                     READ WRITE NO

```

```
SQL> show con_name
```

```
CON_NAME
```

```
-----
OHSDBA
```

```
SQL> select username from dba_users where username='C##OHSDBA';
```

```
USERNAME
```

```
-----
C##OHSDBA
```

```
SQL> create user ohsdba identified by oracle;
```

```
User created.
```

```
SQL> select username from dba_users where username='OHSDBA';
```

```
USERNAME
```

```
-----
OHSDBA
```

```
SQL> alter session set container=cdb$root;
```

```
Session altered.
```

```
SQL> select username from dba_users where username='OHSDBA';
```

```
no rows selected
```

```
SQL>
```

Create tablespace

If you create tablespace in cdb, pdba will not create it.cdb and pdba can have tablespace with the same name

```
SQL> show con_name
```

```
CON_NAME
```

```
-----
CDB$ROOT
```

```
SQL> create tablespace ohs datafile '+DATA' size 100M;
```

```
Tablespace created.
```

```
SQL> select tablespace_name from dba_tablespaces;
```

```
TABLESPACE_NAME
```

```
-----
SYSTEM
```

```
SYSAUX
```

```
UNDOTBS1
```

```
TEMP
```

```
USERS
```

```
UNDOTBS2
```

```
OHS
```

```
7 rows selected.
```

```

SQL> alter session set container=ohsdba;

Session altered.

SQL> select tablespace_name from dba_tablespaces;

TABLESPACE_NAME
-----
SYSTEM
SYSAUX
TEMP
USERS
EXAMPLE

SQL>
SQL> create tablespace ohs datafile '+DATA' size 100M;

Tablespace created.

SQL> select tablespace_name from dba_tablespaces;

TABLESPACE_NAME
-----
SYSTEM
SYSAUX
TEMP
USERS
EXAMPLE
OHS

6 rows selected.

SQL> select name from v$datafile;

NAME
-----
+DATA/prod/undotbs01.dbf
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/system.258.900931113
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/sysaux.257.900931113
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/users.278.900931113
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/example.260.900931113
+DATA/PROD/291AF2A8AF2EA86AE0536400000A981F/DATAFILE/ohs.281.901192383

6 rows selected.

SQL> alter session set container=cdb$root;

Session altered.

SQL> select name from v$datafile;

NAME
-----
+DATA/prod/system01.dbf
+DATA/prod/sysaux01.dbf
+DATA/prod/undotbs01.dbf
+DATA/PROD/FD9AC20F64D244D7E043B6A9E80A2F2F/DATAFILE/system.274.900930229
+DATA/prod/users01.dbf
+DATA/PROD/FD9AC20F64D244D7E043B6A9E80A2F2F/DATAFILE/sysaux.263.900930229
+DATA/prod/undotbs02.dbf
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/system.258.900931113

```



```
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/sysaux.257.900931113
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/users.278.900931113
+DATA/PROD/FD9BD2B44413096FE043B6A9E80ABC28/DATAFILE/example.260.900931113
```

```
NAME
-----
```

```
-
```

```
+DATA/PROD/DATAFILE/ohs.280.901192285
+DATA/PROD/291AF2A8AF2EA86AE053640000A981F/DATAFILE/ohs.281.901192383
```

```
13 rows selected.
```

```
SQL>
```

Grant privileges

grant resource to c##ohsdba container=all;

if you grant privileges without container=all, you just grant them to current container.

```
SQL> show con_name
```

```
CON_NAME
-----
```

```
CDB$ROOT
```

```
SQL> grant connect,resource to c##ohsdba;
```

```
Grant succeeded.
```

```
SQL>
```

```
SQL> col grantee for a15
```

```
SQL> col granted_role for a15
```

```
SQL> select * from dba_role_privs where grantee='C##OHSDBA';
```

GRANTEE	GRANTED_ROLE	ADM	DEL	DEF	COM
C##OHSDBA	CONNECT	NO	NO	YES	NO
C##OHSDBA	RESOURCE	NO	NO	YES	NO

```
SQL> alter session set container=ohsdba;
```

```
Session altered.
```

```
SQL> show con_name
```

```
CON_NAME
-----
```

```
OHSDBA
```

```
SQL> select * from dba_role_privs where grantee='C##OHSDBA';
```

```
no rows selected
```

```
SQL>
```

Modify initiate parameters

If you change the initiate parameters in cdb, pdba will be modified as well.

If you change the initiate parameters in pdba, cdb will not change.

```
SQL> show con_name
```

```
CON_NAME
-----
```

```
CDB$ROOT
```

```
SQL> show parameter parallel_max_servers
```

NAME	TYPE	VALUE
parallel_max_servers	integer	40

```
SQL> alter session set container=ohsdba;
```

Session altered.

```
SQL> show con_name
```

CON_NAME

OHSDBA

```
SQL> show parameter parallel_max_servers
```

NAME	TYPE	VALUE
parallel_max_servers	integer	40

```
SQL> alter session set container=cdb$root;
```

Session altered.

```
SQL> alter system set parallel_max_servers=200;
```

System altered.

```
SQL> show parameter parallel_max_servers
```

NAME	TYPE	VALUE
parallel_max_servers	integer	200

```
SQL> alter session set container=ohsdba;
```

Session altered.

```
SQL> show con_name
```

CON_NAME

OHSDBA

```
SQL> show parameter parallel_max_servers
```

NAME	TYPE	VALUE
parallel_max_servers	integer	200

```
SQL>
```

```
SQL> show con_name
```

CON_NAME

OHSDBA

```
SQL> show parameter open_cursors
```

NAME	TYPE	VALUE
open_cursors	integer	300

```
SQL> alter system set open_cursors=100;
```

System altered.

```
SQL> show parameter open_cursors
```

NAME	TYPE	VALUE
open_cursors	integer	100

```
SQL> alter session set container=cdb$root;
```

```
Session altered.
```

```
SQL> show parameter open_cursors
```

NAME	TYPE	VALUE
open_cursors	integer	300

```
SQL>
```

Oracle Flex ASM Operations

Oracle Flex ASM Testing

Prior to Oracle 12c, for a database instance to use ASM it is expected that the ASM instance must be up and running on all nodes before the database instance is brought up. Failure of ASM instance to come-up means that database instance using ASM at the storage level cannot be brought up.

Shutdown +ASM1, the database on prod1 is still running. That's the biggest difference between standard ASM and flex ASM

Operations on Prod1

```
[root@prod1 ~]# ps -ef|grep pmon
orgrid      4112      1  0 00:14 ?        00:00:00 asm_pmon_+ASM1
oracle      4762      1  0 00:14 ?        00:00:00 ora_pmon_prod1
root        11348    4003  0 00:18 pts/0    00:00:00 grep --color=auto pmon
[root@prod1 ~]# su - orgrid
Last login: Fri Jan 15 21:10:14 CST 2016 on pts/1
[orgrid@prod1 ~]$ srvctl status asm
ASM is running on prod2,prod1
[orgrid@prod1 ~]$ asmcmd
ASMCMD> showclustermode
ASM cluster : Flex mode enabled
ASMCMD> showclusterstate
Normal
ASMCMD> exit
[orgrid@prod1 ~]$ srvctl status asm -detail
ASM is running on prod2,prod1
ASM is enabled.
[orgrid@prod1 ~]$ srvctl config asm -detail
ASM home: <CRS home>
Password file: +SYSTEMDG/orapwASM
ASM listener: LISTENER
ASM is enabled.
ASM is individually enabled on nodes:
ASM is individually disabled on nodes:
ASM instance count: 3
Cluster ASM listener: ASMNET1LSNR_ASM
[orgrid@prod1 ~]$ srvctl stop asm -node prod1 -stopoption abort -force
[orgrid@prod1 ~]$ ps -ef|grep pmon
oracle      4762      1  0 00:14 ?        00:00:00 ora_pmon_prod1
orgrid      14417   11764  0 00:22 pts/0    00:00:00 grep --color=auto pmon
```

```

[orgrid@prod1 ~]$ srvctl status asm
ASM is running on prod2
[orgrid@prod1 ~]$ srvctl status asm -detail
ASM is running on prod2
ASM is enabled.
[orgrid@prod1 ~]$ ps -ef|grep pmon
oracle      4762      1  0 00:14 ?          00:00:00 ora_pmon_prod1
orgrid     16574  11764  0 00:23 pts/0    00:00:00 grep --color=auto pmon
[orgrid@prod1 ~]$
[orgrid@prod1 ~]$ asmcmd
ASMCMDS>
ASMCMDS> lsct -g DATA
Instance_ID DB_Name Status Software_Version Compatible_version Instance_Name Disk_Group
           2 +ASM CONNECTED 12.1.0.2.0 12.1.0.2.0 +ASM2 DATA
           2 prod CONNECTED 12.1.0.2.0 12.1.0.2.0 prod1 DATA
           2 prod CONNECTED 12.1.0.2.0 12.1.0.2.0 prod2 DATA
ASMCMDS>
ASMCMDS> lsct -g systemdg
Instance_ID DB_Name Status Software_Version Compatible_version Instance_Name Disk_Group
           2 +ASM CONNECTED 12.1.0.2.0 12.1.0.2.0 +ASM2 SYSTEMDG
ASMCMDS>

[root@prod1 ~]# su - orgrid
Last login: Sat Jan 16 00:33:36 CST 2016 on pts/1
[orgrid@prod1 ~]$ sqlplus / as sysasm

SQL*Plus: Release 12.1.0.2.0 Production on Sat Jan 16 00:53:12 2016

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Real Application Clusters and Automatic Storage Management options

SQL>
SQL> SELECT instance_name, db_name, status FROM V$ASM_CLIENT;

no rows selected

SQL>
SQL> col instance_name for a20
SQL> SELECT instance_name, db_name, status FROM V$ASM_CLIENT;

INSTANCE_NAME          DB_NAME  STATUS
-----
prod1                  prod     CONNECTED

SQL>
[orgrid@prod1 ~]$ asmcmd lsct -g data
Instance_ID DB_Name Status Software_Version Compatible_version Instance_Name Disk_Group
           2 +ASM CONNECTED 12.1.0.2.0 12.1.0.2.0 +ASM2 DATA
           1 prod CONNECTED 12.1.0.2.0 12.1.0.2.0 prod1 DATA
           2 prod CONNECTED 12.1.0.2.0 12.1.0.2.0 prod2 DATA
[orgrid@prod1 ~]$ asmcmd lsct -g systemdg
Instance_ID DB_Name Status Software_Version Compatible_version Instance_Name Disk_Group
           2 +ASM CONNECTED 12.1.0.2.0 12.1.0.2.0 +ASM2 SYSTEMDG
[orgrid@prod1 ~]$

```

Operations on Prod2

```

[root@prod2 ~]# ps -ef|grep pmon
orgrid     6572      1  0 00:15 ?          00:00:00 asm_pmon_+ASM2
oracle    11197      1  0 00:17 ?          00:00:00 ora_pmon_prod2
root     16296  3896  0 00:21 pts/0    00:00:00 grep --color=auto pmon
[root@prod2 ~]# su - orgrid
Last login: Sat Jan 16 00:18:50 CST 2016

```

```

[orgrid@prod2 ~]$ asmcmd
ASMCMD> showclustermode
ASM cluster : Flex mode enabled
ASMCMD> showclusterstate
Normal
ASMCMD> exit
[orgrid@prod2 ~]$ srvctl config asm -detail
ASM home: <CRS home>
Password file: +SYSTEMDG/orapwASM
ASM listener: LISTENER
ASM is enabled.
ASM is individually enabled on nodes:
ASM is individually disabled on nodes:
ASM instance count: 3
Cluster ASM listener: ASMNET1LSNR_ASM
[orgrid@prod2 ~]$ ps -ef|grep pmon
orgrid      6572      1  0  00:15 ?           00:00:00 asm_pmon_+ASM2
oracle     11197      1  0  00:17 ?           00:00:00 ora_pmon_prod2
orgrid     19400    16300  0  00:23 pts/0       00:00:00 grep --color=auto pmon
[orgrid@prod2 ~]$ ps -ef|grep pmon
orgrid      6572      1  0  00:15 ?           00:00:00 asm_pmon_+ASM2
oracle     11197      1  0  00:17 ?           00:00:00 ora_pmon_prod2
orgrid     21681    16300  0  00:25 pts/0       00:00:00 grep --color=auto pmon
[orgrid@prod2 ~]$
[orgrid@prod2 ~]$ sqlplus / as sysasm
SQL> col instance_name for a20
SQL> SELECT instance_name, db_name, status FROM V$ASM_CLIENT;

INSTANCE_NAME          DB_NAME  STATUS
-----
prod1                   prod     CONNECTED
prod2                   prod     CONNECTED
+ASM2                   +ASM     CONNECTED
+ASM2                   +ASM     CONNECTED

SQL>

SQL> alter system relocate client 'prod1:prod';

System altered.

SQL> SELECT instance_name, db_name, status FROM V$ASM_CLIENT;

INSTANCE_NAME          DB_NAME  STATUS
-----
prod2                   prod     CONNECTED
+ASM2                   +ASM     CONNECTED
+ASM2                   +ASM     CONNECTED

SQL>

```

Convert standard ASM to flex ASM

You can convert an Oracle ASM configuration to an Oracle Flex ASM using ASMCA. This functionality is only available in an Oracle Grid Infrastructure 12c configuration.

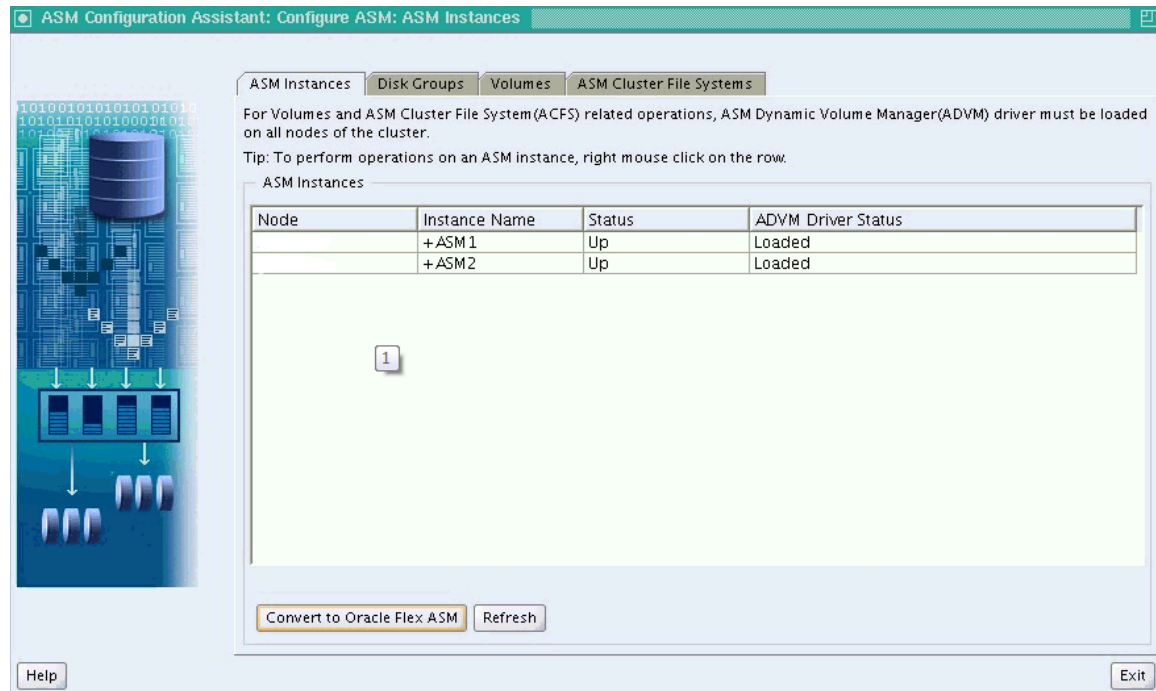
Before you convert an Oracle ASM configuration to an Oracle Flex ASM, you must ensure the following:

1. Oracle Cluster Registry (OCR) is stored in a disk group
2. The server parameter file (SPFILE) is stored in a disk group.

3.The password file (ORAPWD file) is stored in a disk group.

4.The disk group where the OCR, SPFILE, and ORAPWD files are stored has Oracle ASM compatibility (COMPATIBLE.ASM) set to 12.1 or higher.

ASMCA also informs you if any requirement, such as storing an ORAPWD file in a disk group, has not been met before starting the conversion.



Managing Oracle Flex Clusters

Changing the Cluster Mode

<http://docs.oracle.com/database/121/CWADD/bigcluster.htm#CWADD92410>

You can change the mode of an existing Oracle Clusterware standard Cluster to be an Oracle Flex Cluster. **you must enable Oracle Flex ASM in the cluster before you change the cluster mode.**

Notes:

- Changing the cluster mode requires cluster downtime.
- Oracle does not support changing an Oracle Flex Cluster to an Oracle Clusterware standard Cluster.
- Oracle Flex Cluster requires Grid Naming Service (GNS).
- Zone delegation is not required.

To change an existing Oracle Clusterware standard Cluster to an Oracle Flex Cluster:

1. Run the following command to determine the current mode of the cluster:
2. `$ crsctl get cluster mode status`

3. Run the following command to ensure that the Grid Naming Service (GNS) is configured with a fixed VIP:

```
4. $ srvctl config gns
```

This procedure cannot succeed unless GNS is configured with a fixed VIP. If there is no GNS, then, as root, create one, as follows:

```
# srvctl add gns -vip vip_name | ip_address
```

Run the following command as root to start GNS:

```
# srvctl start gns
```

5. Use the Oracle Automatic Storage Management Configuration Assistant (ASMCA) to enable Oracle Flex ASM in the cluster before you change the cluster mode.

See Also:

Oracle Automatic Storage Management Administrator's Guide for more information about enabling Oracle Flex ASM

6. Run the following command as root to change the mode of the cluster to be an Oracle Flex Cluster:

```
7. # crsctl set cluster mode flex
```

8. Stop Oracle Clusterware by running the following command as root on each node in the cluster:

```
9. # crsctl stop crs
```

10. Start Oracle Clusterware by running the following command as root on each node in the cluster:

```
11. # crsctl start crs -wait
```

Note:

Use the `-wait` option to display progress and status messages.

Changing the Node Role

<http://docs.oracle.com/database/121/CWADD/bigcluster.htm#CWADD92647>

The configured role of a node, whether it is a Hub Node or a Leaf Node, is kept locally, and is initially set at the time of installation. At startup, a node tries to come up in whatever role it was last configured.

Use CRSCTL to change the role of a node, as follows:

1. Run the following command to determine the current role of the local node:

```
2. $ crsctl get node role config
```

3. Run the following command as root to change the role of the local node:

```
4. # crsctl set node role {hub | leaf}
```

Note:

If you are changing a Leaf Node to a Hub Node, then you may have to run `srvctl add vip` to add a VIP, if a VIP does not already exist on the node. Leaf Nodes are not required to have VIPs.

If you installed the cluster with DHCP-assigned VIPs, then there is no need to manually add a VIP.

5. As root, stop Oracle High Availability Services on the node where you changed the role, as follows:

```
6. # crsctl stop crs
```

7. If you are changing a Leaf Node to a Hub Node, then configure the Oracle ASM Filter Driver as root, as follows:

```
8. # $ORACLE_HOME/bin/asmcmd afd_configure
```

See Also:

[Oracle Automatic Storage Management Administrator's Guide](#) for more information about the `asmcmd afd_configure` command

9. As root, restart Oracle High Availability Services on the node where you changed the role, as follows:

```
10. # crsctl start crs -wait
```

Note:

Use the `-wait` option to display progress and status messages.

11. Perform steps [3](#) and [5](#) on the local node.

12. Manually update the inventory.

If you convert a Hub Node to a Leaf Node, then run the following command on all remaining Hub Nodes:

```
$ Grid_home/oui/bin/runInstaller -updateNodeList ORACLE_HOME=Oracle_home
"CLUSTER_NODES={comma_separated_Hub_Node_list}" -silent -local CRS=TRUE
```

On the newly converted Leaf Node, run the following command:

```
$ Grid_home/oui/bin/runInstaller -updateNodeList ORACLE_HOME=Oracle_home
"CLUSTER_NODES={Leaf_Node_name}" -silent -local CRS=TRUE
```

If you convert a Leaf Node to a Hub Node, then run the following command on all Hub Nodes:

```
$ Grid_home/oui/bin/runInstaller -updateNodeList ORACLE_HOME=Oracle_home
"CLUSTER_NODES={comma_separated_Hub_Node_list}" -silent -local CRS=TRUE
```

Check Oracle Flex Cluster & ASM

```
[root@prod1 ~]# crsctl get cluster
```

Usage:

```
crsctl get cluster mode {config|status}
```

Get the cluster mode

```
crsctl get cluster hubsiz
```

Gets the current configured value for the maximum number of Hub nodes in the cluster


```
[root@prod1 ~]#  
[root@prod1 ~]# crsctl get cluster mode status  
Cluster is running in "standard" mode  
[root@prod1 ~]# crsctl get cluster mode config  
Cluster is configured as type "standard"  
[root@prod1 ~]# crsctl get cluster hubsize  
CRS-4950: Current hubsize parameter value is 32  
[root@prod1 ~]#
```

```
ASMCMD> showclusterstate  
Normal  
ASMCMD> showclustermode  
ASM cluster : Flex mode enabled  
ASMCMD> showpatches  
-----
```

List of Patches

```
=====
```

```
ASMCMD> showversion  
ASM version      : 12.1.0.2.0  
ASMCMD>
```

Reference

Oracle ASMLIB for OEL7

<http://www.oracle.com/technetwork/server-storage/linux/asmlib/ol7-2352094.html>

Flex ASM

<http://docs.oracle.com/database/121/OSTMG/GUID-545C311D-24C6-421A-ACBE-CA29E1FDA0A6.htm>

Flex Cluster

<http://docs.oracle.com/database/121/CWADD/toc.htm>

<http://docs.oracle.com/database/121/CWADD/bigcluster.htm#CWADD92560>

<http://docs.oracle.com/database/121/CWADD/bigcluster.htm#CWADD92401>

Glossary

<http://docs.oracle.com/database/121/CWADD/glossary.htm#CWADD91440>

An Insight into Oracle Flex ASM and Its Benefits

<http://www.oracle.com/technetwork/cn/articles/database/flexasm-flexcluster-benefits-odb12c-2177371-zhs.html>

<http://www.oracle.com/technetwork/articles/database/flexasm-flexcluster-benefits-odb12c-2177371.html>

Oracle Clusterware 12c

<http://www.oracle.com/technetwork/products/clusterware/overview/oracle-clusterware-12c-overview-1969750.pdf>

Oracle 12c new feature: Flex Clusters, what they are (and what they are not)

<http://www.oraFAQ.com/node/2857>