Dell PowerEdge Systems

Oracle Database on

Enterprise Linux x86_64

Database Setup and Installation Guide Version 1.5

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Overview

This document applies to Oracle Database 11g R2 running on Red Hat Enterprise Linux 5.5 AS x86_64 or Oracle Enterprise Linux 5.5 AS x86_64.

Required Documentation for Deploying the Dell|Oracle 11g R2 Database

The required documents for installing the Dell|Oracle 11g R2 database are:

- *Dell PowerEdge Systems Oracle Database on Enterprise Linux x86_64-Operating System and Hardware Installation Guide*—Describes the required minimum hardware and software versions, how to install and configure the operating system, how to verify the hardware and software configurations, and how to obtain open source files.
- *Dell PowerEdge Systems Oracle Database on Enterprise Linux x86_64-Storage and Network Guide*—Describes how to install and configure the network and storage solutions.
- *Dell PowerEdge Systems Oracle Database on Enterprise Linux x86_64-Troubleshooting Guide*—Describes how to troubleshoot and resolve errors encountered during the installation procedures described in the previous modules.

NOTE: All modules provide information on how to receive technical assistance from Dell.

Terminology Used in this Document

- This document uses the terms logical unit number (LUN) and virtual disk. These terms are synonymous and can be used interchangeably. The term LUN is commonly used in a Dell/EMC Fibre Channel storage system environment and virtual disk is commonly used in a Dell PowerVault SAS and iSCSI (Dell PowerVault MD3000 and Dell PowerVault MD3000i with Dell PowerVault MD1000 expansion) storage environment.
- This document uses the term Enterprise Linux that applies to both Red Hat Enterprise Linux and Oracle Enterprise Linux unless stated specifically.

Getting Help

Dell Support

- For detailed information about using your system, see the documentation that was shipped with your system components.
- For whitepapers, Dell-supported configurations, and general information, see **dell.com/oracle**.
- For Dell technical support for your hardware and operating system software, and to download the latest updates for your system, see **support.dell.com**.
- For information on Dell enterprise training services, see **dell.com/training**.

  NOTE: The training service may not be offered in all locations.

Oracle Support

- For training information on your Oracle software and application clusterware, and for information about contacting Oracle, see **oracle.com** or see your Oracle documentation.
- Technical support, downloads, and other technical information is available at **support.oracle.com.**
- For information on installing and configuring Oracle, see the *Oracle Dell PowerEdge Systems Oracle Database on Enterprise Linux x86_64-Database Setup and Installation Guide* at **support.dell.com/manuals**.

2

Installing Oracle 11g R2 Database RAC

This section describes the steps required to install Oracle 11g R2 Real Application Clusters (RAC), which involves installing Oracle Grid Infrastructure for a cluster and the Oracle Database 11g R2 software. It is recommended that you create a seed database to verify that the cluster works correctly before you deploy it in a production environment.

Before You Begin

Setting Up the Operating System, Network, and Storage

Before you install the Oracle RAC software on your system:

- Ensure that you have already configured your operating system, network, and storage based on the steps contained in the documents listed in "Required Documentation for Deploying the Dell|Oracle 11g R2 Database" on page 5.
- Locate your Oracle media kit.

Configure the System Clock Settings for All Nodes

To prevent failures during the installation procedure, configure all the nodes with identical system clock settings. Synchronize your node system clock with the Cluster Time Synchronization Service (CTSS) which is built in Oracle 11g R2. To enable CTSS, disable the operating system network time protocol (OS NTP) service using the following commands in order:

1. `service ntpd stop`
2. `chkconfig ntpd off`
3. `mv /etc/ntp.conf /etc/ntp.conf.orig`
4. `rm /var/run/ntpd.pid`

Installing Oracle 11g R2 Grid Infrastructure for a Cluster

To install Oracle 11g R2 grid infrastructure for a cluster:

1. Log in as **root**.
2. Start the X Window System by typing:

   ```
   start x
   ```

3. Open a terminal window and type:

   ```
   xhost +
   ```

4. Mount the *Oracle Grid Infrastructure* media.
5. Log in as **Grid** user.
6. Run the `cluster verify` script in the *Oracle Grid Infrastructure* media using the following command:

   ```
   <CD_mountpoint>/runcluvfy.sh stage -pre crsinst -n
   node1,node2 -r 11gR2 -verbose
   ```

   Where *node1* and *node2* are the public host names. If your system is configured correctly, the following message is displayed:

   ```
   Pre-check for cluster services setup was
   successful on all the nodes.
   ```

   NOTE: If your system is not configured correctly and error messages are displayed, fix the issues, and then repeat the `runcluvfy.sh` command. For more information, see the *Oracle Database on Enterprise Linux x86_64 Troubleshooting Guide*.

7. Type the following command to start the **Oracle Universal Installer**:

   ```
   <CD_mountpoint>/runInstaller
   ```

8. In the **Select Installation Option** window, select **Install and Configure Grid Infrastructure for a Cluster,** and click **Next**.
9. In the **Select Installation Type** window, select **Advanced Installation** option, and click **Next**.
10. In the **Select Product Languages** window, select **English**, and click **Next**.

11 Before providing the inputs in the **Grid Plug and Play information** window, you must decide whether to use Grid Naming Service (GNS) or not.

If you are not using GNS:

NOTE: Configure the Single Client Access Name (SCAN) addresses for client access to the cluster on the domain naming service (DNS). Oracle recommends that you register the SCAN to three IP addresses in the DNS server as described in the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*.

a Provide the following inputs in the **Grid Plug and Play Information** window:

- **Cluster Name**—Enter a name for your cluster. For example, `testcluster`.
- **SCAN Name**—Enter the name registered in the DNS server which is unique for the entire cluster. For example, `scancluster`. For more information on how to configure the SCAN name, see the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*.
- **SCAN Port**—Retain the default port number, `1521`.
- **Configure GNS**—Uncheck this option.

b Click **Next**.

If you are using GNS:

NOTE: Configure the GNS virtual address and GNS sub-domain delegation as described in the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*. Configure a dynamic host control protocol (DHCP) server in the public range to lease IP address as mentioned in the *IP requirements* section of the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*.

a Provide the following data in the **Grid Plug and Play Information** window:

- **Cluster Name**—Enter a name for your cluster. For example, **testcluster**.
- **SCAN Name**—Enter a unique name with domain name as the GNS sub-domain. For example, **scancluster.clusterdomain.example.com**.

- **SCAN Port**—Retain the default port number, `1521`.
- **Configure GNS**—Check this option.
- **GNS sub-domain**—Enter the configured GNS sub domain name. For example, **clusterdomain.example.com**. See the DNS server configurations for the sub-domain delegation in the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*.
- **GNS VIP address**—Enter the GNS VIP address. For example, `192.0.2.2`. See the GNS VIP address that is pre-configured in the DNS server in the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*.

b Click **Next**.

12 In the **Cluster Node Information** window, add the nodes that must be managed by **Oracle Grid Infrastructure**:

a Click **Add**.

b Add **Public Host Name** information according to the **/etc/hosts** file entry.

c Enter the **Virtual IP Name** as per the following instructions:

If you are configuring the cluster without GNS, enter the value according to the **/etc/hosts** file entry.

If you are configuring the cluster with GNS, this value is set to **AUTO**.

d Repeat step a to step c to add all the nodes in the cluster.

e Click the **SSH connectivity** button at the bottom of the window.

f In the **OS Username** field, provide the **Oracle Grid Infrastructure Owner** name.For example, `grid`. In the **OS Password** field enter the password for the same user.

g Click **Test** at the bottom of the window to test the SSH connectivity between the selected nodes. If there are any issues with the connectivity, use the **Setup** option to provide the correct settings.

h Click **Next**.

13 In the **Specify Network Interface Usage** window, ensure that the correct interface types are selected for the interface names. To modify an interface type:

a From the **Interface Type** drop-down list, select the required interface type. The available options are **Private**, **Public**, and **Do not use**.

b Click **Next**.

14 In the **Storage Option Information** window, select **Automatic Storage Management (ASM)** to configure **OCR** and **Voting Disks** on the ASM storage, and click **Next**.

15 In the **Create ASM Disk Group** window:

a Provide a name for the ASM disk group. For example, `OCRVOTDSK`.

b Select the redundancy as per the ASM disk availability.

For example:

- Select **High redundancy** if five ASM disks are available.
- Select **Normal redundancy** if three ASM disks are available.
- Select **External redundancy** if one ASM disk is available.

c According to the redundancy level selected in step b, select the **ASM lib stamped candidate disks** that you want to use for the OCR and Voting Disk.

NOTE: If you are using the ASM library driver and the candidate disks are not listed, click **Change Disk Discover String** and type `ORCL:*`.

16 In the **Specify ASM Password** window, click **Use the same passwords for these accounts** and complete the password selections and entries. Click **Next**.

17 In the **Failure Isolation Support** window, select **Use Intelligent Platform Management Interface (IPMI)**.

a Enter the user name as configured IPMI user name. For example, `bmcuser`.

b Enter the password as configured.

c Click **Next**.

NOTE: For IPMI configuration, see the *Oracle Database on Enterprise Linux x86_64 Storage and Networking Guide*.

18 In the **Privileged Operating System Groups** window, select the following options and click **Next**:

- **ASM Database Administrator—asmdba** group.
- **ASM Instance Administration Operator—asmoper** group.
- **ASM Instance Administrator—asmadmin** group.

19 In the **Specify Installation Location** window, enter the following information and click **Next**:

- In the **Oracle Base** field, enter:

  `/opt/app/grid`

- In the **Software Location** field, enter:

  `/opt/app/11.2.0/grid`

20 Enter the following in the **Create Inventory** window→ **Inventory Directory** field, and click **Next**.

`/opt/app/oraInventory`

21 The **Perform Prerequisite Checks** window displays any minimum required prerequisite checks that have failed and must be fixed in a table. To ensure that the prerequisites are met:

a Click **Fix & Check Again**.

b The installer generates a fix-up script that must be run as a **root** user on all the nodes, to resolve the failed prerequisite checks.

Log in as **root** user and run the fix-up script on all the nodes and then click **OK**.

In the **Perform Prerequisite Checks** window, ensure that all the prerequisite checks are completed.

c Click **Next**.

22 In the **Summary** window, click **Finish**.

23 At the end of the installation process, the **Execute Configuration scripts** wizard is displayed. Complete the instructions in the wizard and click **OK**.

NOTE: Run **orainstRoot.sh** and **root.sh** sequentially on all nodes as a **root** user, starting with the primary node. For example, run **root.sh** sequentially on node 1, node 2 and so on.

24 The **Installation of Oracle Grid Infrastructure for a Cluster was Successful** window is displayed. Click **Close**.

25 On all nodes, perform the following:

a Verify the **Oracle Grid Infrastructure** installation by typing the following command:

```
olsnodes -n -v
```

This command lists the host names of all nodes in the cluster.

b Type the following command to check the status of all the grid services:

```
/opt/app/11.2.0/grid/bin/crsctl stat res -t
```

Verify that all Oracle grid services that are running are displayed. Ensure that all the services are online.

c Log in as **Grid** user and type the following command to find the list of SCAN IPs leased from DHCP Server:

```
srvctl config scan
```

d Type the following command to find the node VIP leased from DHCP Server:

```
srvctl config vip -n <nodename>
```

Configuring Shared Oracle Home for Database Binary Using ACFS

To configure shared Oracle home for database binary using ACFS:

1 Log in as **root** user and type:

```
xhost +
```

2 Log in as **Grid** user and run the **asmca** utility:

```
$<GRID HOME>/bin/asmca
```

3 In the **ASMCA** window, select **Disk Groups** tab, click **Create,** and perform the following steps:

a Enter a name of the disk group. For example, `ORAHOME`.

b Select the **external redundancy**, and then select the **ASM stamped disk** that you want to use for the shared database home.

c Click **OK**.

d Right-click the disk group you have created for the shared oracle home, and select **Create ACFS for Database Home**.

4 The **Create ACFS Hosted Database Home Volume** option is displayed. Click **Create**.

a Enter a name for the volume. For example, `ORAHOME`.

b Enter a name for the mount point for Database Home. For example, `/opt/app/oracle/acfsorahome`.

c Enter the **Database Home size**. The minimum size is 20GB.

d Enter the name of the **Database Home Owner**. For example, `oracle`.

e Enter the name of the **Database Home Owner group**. For example, `oinstall`.

f Click **OK**.

g Log in as **root** user and run the **acfs_script.sh** mentioned in the **RUN ACFS Script** window. The ACFS volume is automatically mounted to the mount point specified in step b on all nodes.

h Click **Close** to exit the **ACFS script** window.

Installing Oracle 11g R2 RAC Database Software

To install Oracle 11g R2 RAC database software:

1 Log in as **root** user and type:

```
xhost   +
```

2 Mount the *Oracle Database 11G R2* media.

3 Log out as **root** user and log in as **Oracle** user by typing:

```
su - oracle
```

4 Check the pre-requisites by typing the following cluster verification command:

```
<GRID HOME>/bin/cluvfy stage -pre dbinst -
fixup -n Node1 , Node2 -r 11gR2 -osdba dba
-verbose
```

Where *node1* and *node2* are the host names of the public IP addresses, *n* represents the list of nodes, and *r* represents the Database release. *cluvfy* is a cluster verification utility available in the **Grid Infrastructure Home**.

If your system is not configured correctly and cluster verification utility fails, see the *Oracle Database on Enterprise Linux x86_64 Troubleshooting Guide* for troubleshooting information. If your system is configured correctly, the following message is displayed:

```
Pre-check for Database installation was
successful.
```

5 Run the `runInstaller` script from your Oracle database media:

```
<CD_MOUNTPOINT> runInstaller
```

The **Oracle Universal Installer** is launched.

6 In the **Configure Security Updates** window, provide the email address and oracle support password. This step is optional. If you want to skip this step, uncheck the box, and click **Next**. If you do not provide the email address, the **Email Address Not Specified** alert window is displayed. Click **Yes** to continue.

7 In the **Select Installation Option** window, select **Install Database Software only**, and click **Next**.

8 In the **Node Selection** window, select **Real Application Cluster Database Installation,** and select all the node names. Perform the following steps:

- **a** Click **SSH Connectivity**.
- **b** In the **OS Username** field, enter the **Oracle Database Owner** user name. In the **OS Password** field, enter password.
- **c** Click **Test** to test the SSH Connectivity between the selected nodes. If any errors are reported, select **Setup** and specify the correct setup options.
- **d** Click **Next**.

9 In the **Select Product Languages** window, select the **Language Option** as **English**, and click **Next**.

10 In the **Select Database Edition** window, select **Enterprise Edition**, and click **Next**.

11 In the **Specify Installation Location** window, select one of the following options and specify path information accordingly:

- If you are planning to configure and non-shared oracle home, provide the following information and click **Next**.
  - **Oracle Base**—`/opt/app/oracle`
  - **Software Location**—`/opt/app/oracle/product/11.2.0/dbhome_1`
- If you are planning to configure a shared home using ACFS, provide the following information and click **Next**.
  - **Oracle Base**—`/opt/app/oracle`
  - **Software Location**—`/opt/app/oracle/acfsorahome/product/11.2.0/dbhome_1`

12 In the **Privileged Operating System Groups** window, select **Database Administrator Group** as **dba** and **Database Operator Group** as **dba**. Click **Next**.

13 The **Perform Prerequisites checks** window displays any minimum required prerequisite checks that have failed and must be fixed in a table:

a Click **Fix & Check Again**.

b The installer generates a fix-up script that must be run as a **root** user on all the nodes to resolve some of the failed prerequisite checks. Log in as **root**, run the fix-up script on all the nodes, and then click **OK**.

c Click **Next**.

In the **Perform Prerequisite Checks** window, ensure that all the prerequisite checks are completed.

14 In the **Summary Option** window, the Oracle Home disk space, software installation location, Database edition, and the OSDBA group are displayed. Click **Finish**.

15 In the **Install Product** window, the Database installation progress is displayed.

At the end of the installation process, the **Execute Configuration Scripts** window is displayed. Log in as **root** user and run the **root.sh** script sequentially on all nodes.

16 The **Finish Option** window displays a message stating that the installation of Oracle database was successful. Click **Close**.

Creating Server Pools for Policy-Managed Database Configuration

NOTE: Perform the procedure in this section before creating the database.

The nodes in a cluster can be organized into a server pool for better resource management. Each server pool has the following properties:

- The minimum number of nodes that must be available in the server pool.
- The maximum number of nodes that can be available in the server pool.
- The relative priority of a server pool compared to the other server pools.

To create the server pool:

1 Log in as **Grid** user.

2 Run the `srvctl` command from the grid home to see the default configuration. For example:

```
[grid@node1 bin]$ ./srvctl config srvpool
```

3 Add a server pool by running the following command:

```
[grid@node1 bin]$./srvctl add srvpool -g fournodes -
l 2 -u 4 -i 2 -n node1, node2, node3, node4
```

where *-g* is the server pool name, *-l* is the minimum number of nodes, *-u* is the maximum number of nodes, *-i* is the importance given to the server pool, *-n* is the node names which are part of the server pool. In this example, the server pool name is *fournodes*, the maximum number of nodes are *four*, the minimum number of nodes are *two*, the relative priority of the server pool is *two*, and names of nodes in the pool are *node 1*, *node 2*, *node 3*, and *node 4*.

4 Verify the server pool configuration by running the following command:

```
[grid@node1 bin]$./srvctl config srvpool
```

Creating ASM Disk Group

This section contains procedures to create the ASM disk group for the database files and Flash Recovery Area (FRA).

To create the ASM disk groups:

1. Log in as **Grid** user.
2. Start the **asmca** utility:

   ```
   $<GRID HOME>/bin/asmca
   ```

3. In the **ASM configuration Assistant** window, select the **Disk Groups** tab.
4. Click **Create**.
5. Enter the **Disk Group Name** as **databaseDG**.
6. Configure the redundancy level to **External redundancy**.
7. Select the member disks. Select **ORCL:ASM1,** where *ASM1* is the disk device that you use to store the database files.
8. Click **OK** to create and mount the disks.
9. Repeat step 4 to step 8 to create another disk group called **flashbackDG** for FRA.
10. Click **Exit** to exit the **ASM configuration assistant**.

Creating the Seed Database

To create the seed database using Oracle ASM:

1. Log in as **Oracle** user and enter:

   ```
   <GRID HOME>/bin/cluvfy stage -pre dbcfg -
   fixup -n Node1 , Node2 -d $ORACLE_HOME -
   verbose
   ```

   Where *node1* and *node2* are the public host names and *$ORACLE_HOME* is the Oracle Database Home.

   If your system is not configured correctly and the cluster verification utility fails, see the *Oracle Database on Enterprise Linux x86_64 Troubleshooting Guide* for more information.

If your system is configured correctly, the following message is displayed:

```
Pre-check for Database installation was
successful.
```

2. From Oracle home, run the **DBCA Utility**, and start the **Oracle Database configuration Assistant**.
3. In the **Welcome** window, select the **Oracle Database Real Application Cluster Database**, and click **Next**.
4. In the **Operations** window, select **Create Database**, and click **Next**.
5. In the **Database Templates** window, select **Custom Database**, and click **Next**.
6. In the **Database Identification** window, you can select the **Configuration Type** as one of the following two options:
   - Admin-Managed:
     a. Enter the **Global Database Name** and **SID Prefix** as `racdb`.
     b. In the **Node Selection** window, select **All nodes**.
     c. Click **Next**.
   - Policy-Managed:
     a. Enter the **Global Database Name** as `racdb`.
     b. Select an existing server pool that you created for this database. For example, `fournodes`.
     c. Click **Next**.
7. In the **Management Option** window, select the default values and click **Next**.
8. In the **Database Credential** window:
   a. Select the **Use the same Administrative password for all the Accounts** option.
   b. Complete the password entries and click **Next**.

9 In the **Database File Location** window, select the following options:

- **Storage Type**—Automatic Storage Management (ASM).
- **Storage Location**—Use Oracle-Managed Files.
- **Database Area**—Browse and select the disk group that you created to store the database files (databaseDG).

10 In the **Recovery Configuration** window:

a Click **Specify Flash Recovery Area**.

b Browse and select the ASM Disk Group that you created for Flash recovery (flashbackDG).

c Specify the flash recovery size.

d Select **Enable Archiving**.

e Click **Next**.

11 In the **Database Content** window, click **Next**.

12 In the **Initialization Parameters** window:

a Select **Custom**.

b In the **Memory Management** section, select **Automatic shared memory management**.

c In the **SGA size** and **PGA size** windows, specify the appropriate values.

d Click **Next**.

13 In the **Database Storage** window, click **Next**.

14 In the **Creation Option** window, click **Finish**.

15 In the **Summary** window, click **OK** to create database.

NOTE: The database creation may take an hour or more to complete.

16 When the database is created, the **Database Configuration Assistant** window is displayed.

17 If required, click **Password Management** to assign specific passwords to authorized users. Otherwise, click **Exit**.

A message is displayed indicating that the cluster database is being started on all nodes.

3

Installing Oracle 11g R2 Database (Single Node)

This section provides information about completing the initial setup or completing the reinstallation procedures as described in the *Oracle Database on Enterprise Linux x86_64 Operating System and Hardware Installation Guide*.

Configuring the Public Network

Ensure that your public network is functioning and that an IP address and host name are assigned to your system. For example: Configuring **/etc/hosts**.

Ensure that you have set a valid host name for your system.

Configuring the Database Storage

You can use the following methods to configure your database storage disks:

- Using the ext3 File System
- Using the Oracle Automatic Storage Management (ASM)

Configuring the Database Storage Using the ext3 File System

To configure database storage using the ext3 file system:

1. Log in as **root**.
2. Run the following command:

   ```
   cd /opt/oracle
   ```

3. Run the following command:

   ```
   mkdir oradata recovery
   ```

   Use the **fdisk** utility to create a partition to store your database files. For example: `sdb1` if your storage device is **sdb**

Use the **fdisk** utility to create a partition to store your recovery files. For example: `sdc1` if your storage device is **sdc**

4 Verify the new partition by running the following command:

```
cat /proc/partitions
```

If you do not detect the new partition, type:

```
sfdisk -R /dev/sdb
sfdisk -R /dev/sdc
```

5 Run the following command:

```
mke2fs -j /dev/sdb1
mke2fs -j /dev/sdc1
```

6 Edit the **/etc/fstab** file for the newly created file system by adding entries such as:

```
/dev/sdb1 /opt/oracle/oradata ext3 defaults 1 2
/dev/sdc1 /opt/oracle/recovery ext3 defaults 1 2
```

7 Run the following command:

```
chown -R oracle.dba oradata recovery
```

8 Run the following command:

```
mount /dev/sdb1 /opt/oracle/oradata
mount /dev/sdc1 /opt/oracle/recovery
```

Configuring the Database Storage Disks for ASM

To configure the database storage disks for ASM using the **ORACLEASM** library driver:

NOTE: The following example assumes that you have three storage devices (**sdb**, **sdc**, and **sdd**) available, one to create a disk group for the ASM SP file, one for the database files, and the last one for the Flash Recovery Area (FRA) respectively.

1 Log in as **root**.

2 Use either **fdisk** or **parted** to create a single whole-disk partition on the three storage devices (**sdb**, **sdc**, and **sdd**).

Configuring Disks for ASM Using the ORACLEASM Library Driver

To configure disks for ASMusing the ORACLEASM library driver:

1. Open a terminal window and log in as **root**.
2. Perform the following steps:
   a. Type the following and press <Enter>:
      `service oracleasm configure`
   b. Enter the following inputs:
      Default user to own the driver interface [ ]: `grid`
      Default group to own the driver interface [ ]: `asmadmin`
      Start Oracle ASM library driver on boot (y/n) [n]: `y`
      Fix permissions of Oracle ASM disks on boot (y/n) [y]: `y`
3. In the terminal window, run the following commands:
   `service oracleasm createdisk ASM1 /dev/sdb1`
   `service oracleasm createdisk ASM2 /dev/sdc1`
   `service oracleasm createdisk ASM3 /dev/sdd1`
4. Repeat step 3 for any additional ASM disks that you need to create.
5. Verify that the ASM disks are created and marked for ASM usage.
   In the terminal window, run the following command:
   `service oracleasm listdisks`
   The disks you created in step 3 are listed in the terminal window.
   For example: `ASM1, ASM2, ASM3`

Installing Oracle 11g R2 Standalone Database Using the ext3 File System

Installing Oracle Database 11g R2

NOTE: This section assumes that your Oracle Base is **/opt/oracle**. If not, ensure that you change the software base and location values accordingly.

To install Oracle Database 11g R2:

1. Log in as **root**.
2. Mount the *Oracle Database 11g R2* media.
3. Start the X Window System by typing:

   ```
   startx
   ```

4. Open a terminal window and type:

   ```
   xhost +
   ```

5. Log in as **Oracle** user.
6. Start the Oracle Universal Installer.

   In the terminal window, type the following and press <Enter>:

   ```
   <CD_mountpoint>/runInstaller
   ```

7. In the **Configure Security Updates** window, provide the email address and oracle support password. If you do not want to configure this information, ignore this step, and click **Next**.

   If you do not provide the email address, a pop-up window is displayed notifying that **Email Address Not Specified**. Click **Yes** to continue.

8. In the **Select Installation Method** window, select **Install Database Software only** and click **Next**.
9. In the **Grid Option** window, select the type of database installation as **Single Instance Database Installation**, and click **Next**.
10. In the **Product Languages** window, select the **Language Option** as **English**, and click **Next**.
11. In the **Select database Edition** window, click **Enterprise Edition** and click **Next**.

12 In the **Installation Location** window, enter the following information and click **Next**:

- **Oracle Base**—`/opt/app/oracle`
- **Software Location**—`/opt/app/oracle/product/11.2.0/dbhome_1`

13 In the **Specify Inventory directory and credentials** window, ensure that the full path of the inventory directory is:

`/opt/oracle/oraInventory`

In the **Specify Operating System group name** window, retain the default value, **oinstall**.

Click **Next**.

14 In the **Privileged Operating System Groups** window, use the default **dba** for the two groups and click **Next**.

15 The **Perform Prerequisites checks** window displays the minimum required prerequisites checks that have failed.

To run the **Fixup Scripts**:

a Log in as **root** user.

b **Run** the fixup script.

c Click **OK**.

16 In the **Summary** window, click **Finish**.

The Oracle Database binary installation begins.

NOTE: The database installation may take several minutes.

17 When prompted, open a terminal window and run **root.sh** as `root` user.

18 The **Finish Option** window displays a message stating that the installation of Oracle database was successful. Click **Close**.

The installation procedure completes.

Configuring the Listener

To configure the listener:

1. Log in as **root** user.
2. Start the X Window system by typing:

   ```
   startx
   ```

3. In a terminal window, type `xhost +`.
4. Log in as **Oracle** user and run the **NETCA** utility by using the below command:

   ```
   $<ORACLE_HOME>/bin/netca
   ```

5. Accept the default settings and click **Next** on all the screens to complete the listener configuration.

Creating the Seed Database Using the ext3 File System

To create a seed database with the Database Configuration Assistant (DBCA):

1. Log in as **Oracle** user.
2. Run the **DBCA** utility by typing:

   ```
   $<ORACLE_HOME>/bin/dbca
   ```

3. In the **Welcome** window, click **Next**.
4. In the **Operations** window, click **Create a Database** and click **Next**.
5. In the **Database Templates** window, click **Custom Database** and click **Next**.
6. In the **Database Identification** window, type the name of the database that you are creating in the **Global Database Name** and the **SID Prefix** fields, and click **Next**.
7. In the **Management Options** window, click **Next**.
8. In the **Database Credentials** window, click **Use the Same Password for All Accounts**, complete password entries, and click **Next**.

9 In the **Database File Locations** window, select the following information and click **Next**:

- **Storage Type**—File System
- **Storage Location**—Use **Common Location** for all Database files
- **Database Area**—Browse to the location created for database files. For example, **/opt/oracle/oradata**.

10 In the **Recovery Configuration** window select the following options and click **Next**:

a Select **Specify Flash Recovery Area**.

b **Flash Recovery Area**—Click **Browse** and select the flashback group that you created in "Configuring the Database Storage Using the ext3 File System" on page 21. For example, **/opt/oracle/recovery**.

c **Flash Recovery Area Size**—Change the value to the required size.

d Select **Enable Archiving**.

11 In the **Database Content** window, click **Next**.

12 In the **Initialization Parameters** window, click **Next**.

13 In the **Database Storage** window, click **Next**.

14 In the **Creation Options** window, click **Create Database** and click **Finish**.

15 In the **Confirmation** window, click **OK** to create the database.

NOTE: The seed database creation may take more than an hour to complete.

When the database is created, the **Database Configuration Assistant** window is displayed.

16 If required, click **Password Management** to assign specific passwords to authorized users. Otherwise, click **Exit**.

Installing Oracle 11g R2 Database Using ASM

Installing Oracle 11g R2 Grid Infrastructure

To install Oracle 11g R2 Grid Infrastructure on a stand-alone server supporting ASM disk groups with stand-alone database installation:

1. Login as **root** user.
2. Mount the *Oracle 11g R2 Grid* media.
3. Start the X Window system by typing:

   ```
   Startx
   ```

4. Open a terminal window and type `xhost +`.
5. Log in as **Grid** user.
6. Start the **Oracle Universal Installer**.

   In the terminal window, type the following and press <Enter>:

   ```
   <CD_mountpoint>/runInstaller
   ```

7. In the **Installation Option** window. select **Install and configure Grid Infrastructure for a standalone server**. Click **Next**.
8. In the **Product Languages** window. select the default language and click **Next**.
9. In the **Create ASM disk Group** window, enter the following information and click **Next**:
   - **Group Name**—Disk group name for the ASM SP file. For example, SPDATA
   - **Redundancy**—External
   - **Candidate Disk**—ORCL:ASM1 that has been stamped using ASM library for the ASM SP file.
10. In the **ASM Password** window, select **Use Same Passwords for these accounts and provide the password requirements** and click **Next**.
11. In the **Operating System Groups** window, make the following selections and click **Next**:
    - **ASM Database Administrator**—`asmdba` group.
    - **ASM Instance Administration Operator**—`asmoper` group.

- **ASM Instance Administrator**—`asmadmin` group.

12 In the **Installation Location** window, enter the following location information and click **Next**:

- In the **Oracle Base** field, type:

  `/opt/app/grid`

- In the **Software Location** field, type:

  `/opt/app/11.2.0/grid`

13 In the **Create Inventory Location** window, enter the following location:

`/opt/app/oraInventory`

14 The **Perform Prerequisite Checks** window notifies if any of the prerequisites have failed and must be fixed. Perform the following steps:

a Click **Fix & Check Again**.

b In the **Execute Fixup Scripts** window, the installer generates a fix-up script.

Log in as **root** user and run the fix-up script to resolve the failed prerequisite checks that can be fixed and then click **OK**.

c In the **Perform Prerequisite Checks** window, ensure that all prerequisite checks are passed. Click **Next**.

15 In the **Summary** window, click **Finish**.

16 At the end of the installation process, the **Execute Configuration scripts** wizard is displayed. Follow the instructions in the wizard and click **OK**.

17 The **Installation of Oracle Grid Infrastructure for a Standalone Server was Successful** window is displayed.

Click **Close**.

Oracle Grid Infrastructure for a Standalone Server is installed on your system.

Installing Oracle Database 11g R2

To install Oracle database 11g R2:

NOTE: This section assumes that your Oracle Base is **/opt/oracle**. If not, ensure that you change the software base and location values accordingly.

1. Log in as **root**.
2. Mount the *Oracle Database 11g R2* media.
3. Start the X Window System by typing:

   ```
   startx
   ```

4. Open a terminal window and type:

   ```
   xhost +
   ```

5. Log in as **oracle**.
6. Start the Oracle Universal Installer.

   In the terminal window, type the following and press <Enter>:

   ```
   <CD_mountpoint>/runInstaller
   ```

7. In the **Configure Security Updates** window, provide the email address and oracle support password. If you do not want to configure this information, ignore this step, and click **Next**.

   If you do not provide the email address, a pop-up window is displayed notifying that **Email Address Not Specified**. Click **Yes** to continue.

8. In the **Select Installation Method** window, select **Install Database Software only** and click **Next**.
9. In the **Grid Option** window, select the type of database installation as **Single Instance Database Installation**, and click **Next**.
10. In the **Product Languages** window, select the **Language Option** as **English**, and click **Next**.
11. In the **Select Database Edition** window, click **Enterprise Edition** and click **Next**.
12. In the **Installation Location** window, enter the following information and click **Next**:
    - **Oracle Base**—`/opt/app/oracle`

- **Software Location**—`/opt/app/oracle/product/11.2.0/dbhome_1`

13 In the **Privileged Operating System Groups** window, use the default **dba** for all two groups and click **Next**.

14 The **Perform Prerequisites checks** window displays the minimum required prerequisites checks that have failed.

To run the **Fixup Scripts**:

a Log in as **root** user.

b **Run** the fixup script.

c Click **OK**.

15 In the **Summary** window, click **Finish**.

The Oracle Database binary installation begins.

NOTE: The installation process may take several minutes to complete.

16 When prompted, open a terminal window and run **root.sh** as **root** user.

17 The **Finish Option** window displays a message stating that the installation of Oracle database was successful. Click **Close**.

Configuring ASM Disk Group

This section contains procedures for creating the ASM disk group for the database files and FRA.

To create the ASM disk groups:

1 Login as `Grid` user.

2 Start the **asmca** utility by typing the following command:

```
$<GRID HOME>/bin/asmca
```

3 On the **ASM Configuration Assistant** window, select the **Disk Groups** tab.

4 Click **Create**.

5 Enter the following information and click **OK** to create and mount the disks:

- **Disk Group Name**—`databaseDG`
- **Redundancy Level**—`External`

- **Member disks**—`ORCL:ASM2`, where *ASM2* is the disk device assigned for database files

6 Repeat step 4 and step 5 to create another disk group named `flashbackDG` for FRA using ORCL:ASM3.

7 Click **Exit** to exit the **ASM Configuration Assistant**.

Creating the Seed Database Using Oracle ASM

If you configured your storage using Oracle ASM, to create a seed database with the DBCA:

1 Log in as **Oracle** user, run the **DBCA** utility by typing:

```
$<ORACLE_HOME>/bin/dbca
```

2 In the **Welcome** window, click **Next**.

3 In the **Operations** window, click **Create a Database** and click **Next**.

4 In the **Database Templates** window, click **Custom Database** and click **Next**.

5 In the **Database Identification** window, type a **Global Database Name**, such as `oradb`, and click **Next**.

6 In the **Management Options** window, click **Next**.

7 In the **Database Credentials** window, click **Use the Same Password for All Accounts**, complete password entries, and click **Next**.

8 In the **Database File Locations** window select the following options and click **Next**:

   a **Storage Type**—Automatic Storage Management (ASM)

   b **Storage Location**—Use Oracle–Managed Files

   c **Database Area**—Browse and select the group created for database files. For example, **databaseDG**.

9 In the **ASM Credentials** window, enter the ASM Password, and click **OK**.

10 In the **Recovery Configuration** window, select the following options, and click **Next**:

   a Select **Specify Flash Recovery Area**.

   b **Flash Recovery Area**—Click **Browse** and select the flashback group that you created, For example, `flashbackDG`.

c **Flash Recovery Area Size**—Change the value to the required size.

d Select **Enable Archiving**.

11 In the **Database Content** window, click **Next**.

12 In the **Initialization Parameters** window, select **Typical** and click **Next**.

13 In the **Database Storage** window, click **Next**.

14 In the **Creation Options** window, select **Create Database,** and click **Finish**.

15 In the Confirmation window, click **OK** to create the database.

NOTE: Creating the seed database may take more than an hour.

When the database is created, the **Database Configuration Assistant** window is displayed.

16 If required, click **Password Management** to assign specific passwords to authorized users. Otherwise, click **Exit**.

Modifying the CSS Timeout of 11gR1 Clusterware for Proper LUN Failover of MD3000i/MD32xxi

When a Dell MD3000i or MD32xxi iSCSI storage RAID controller module fails, the total LUN failover time to the remaining RAID controller module may exceed 200 seconds. The default CSS disk timeout for Oracle 11g R1 version 11.1.0.7 is 200 seconds. To ensure that the MD3000i or MD32xxi LUN failover procedure functions correctly, increase the CSS disk timeout to 300 seconds.

To increase the CSS disk timeout:

1 Shut down the CRS on all nodes except one. For exact steps see **https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=309542.12**.

2 On the running node, log in as user root and type:

$CRS_HOME/bin/crsctl set css disktimeout 300

3 Reboot all nodes for the CSS setting to take effect.