Grid Infrastructure Installation Guide for Standalone Server

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Installation Steps:

**Step 1: Download Oracle Software**

Download Oracle 11gR2 software and also Grid Software


**Step 2: Vmware Client Install Tools**

I just installed Oracle Enterprise Linux 5 on Vmware workstation.

After installed OEL5 in Vmware, We need to install Vmware client Install tools...

Do like...

```bash
copy VMwareTools-8.1.4-227600.tar.gz --> tmp
[root@localhost tmp]# tar -zxvf VMwareTools-8.1.4-227600.tar.gz
[root@localhost tmp]# cd vmware-tools-distrib
[root@localhost vmware-tools-distrib]# ls
bin doc etc FILES INSTALL installer lib vmware-install.pl
[root@localhost vmware-tools-distrib]# ./vmware-install.pl
Creating a new VMware Tools installer database using the tar4 format.

Installing VMware Tools.

In which directory do you want to install the binary files?
[/usr/bin]
```

It’s asked some steps to install, you just Enter and choose your screen Resolution also.

**Reboot your machine.**

**Step 3: Memory, Swap & kernel**

```bash
[root@localhost ~]# grep MemTotal /proc/meminfo
MemTotal: 2075468 kB
Memory Min : 1.5 GB need.

[root@localhost ~]# grep SwapTotal /proc/meminfo
SwapTotal: 4128760 kB
```
[root@localhost ~]# df -h /tmp
Filesystem Size Used Avail Use% Mounted on
/dev/mapper/VolGroup00-LogVol00 21G 4.4G 15G 23% /

Kernel

[root@localhost ~]# gedit /etc/sysctl.conf
fs.aio-max-nr = 1048576
fs.file-max = 6815744
kernel.shmall = 2097152
kernel.shmmmax = 2147483648
kernel.shmni = 4096
# semaphores: semmsl, semmns, semopm, semmni
kernel.sem = 250 32000 100 128
net.ipv4.ip_local_port_range = 9000 65500
net.core.rmem_default=4194304
net.core.rmem_max=4194304
net.core.wmem_default=1048576
net.core.wmem_max=1048576

[root@localhost ~]#/sbin/sysctl -p

Security limits

[root@localhost ~]# gedit /etc/security/limits.conf
oracle soft nproc 2047
oracle hard nproc 16384
oracle soft nofile 1024
oracle hard nofile 65536

[root@localhost ~]# gedit /etc/pam.d/login
session required /lib/security/pam_limits.so
session required pam_limits.so

Selinux =Disabled

[root@localhost ~]# gedit /etc/selinux/config
SELINUX=disabled

Step 4: Install RPM Package

Following RPM package need for Oracle software installation, you can get it from OEL5 CD/DVD.

[root@localhost rpm]# ls
Installed like below all rpm packages.

[root@localhost rpm]# rpm -Uvh unixODBC-2.2.11-7.1.i386.rpm
warning: unixODBC-2.2.11-7.1.i386.rpm: Header V3 DSA signature: NOKEY, key ID 1e5e0159
Preparing...

1:unixODBC

[root@localhost rpm]# rpm -Uvh unixODBC-devel-2.2.11-7.1.i386.rpm
warning: unixODBC-devel-2.2.11-7.1.i386.rpm: Header V3 DSA signature: NOKEY, key ID 1e5e0159
Preparing...

1:unixODBC-devel

Step 5: User, Group

[root@localhost ~]# groupadd oinstall
[root@localhost ~]# groupadd oper
[root@localhost ~]# groupadd dba
[root@localhost ~]# groupadd asmadmin
[root@localhost ~]# useradd -u 500 -g oinstall -G dba,oper,asmadmin oracle

[root@localhost ~]# passwd oracle
Changing password for user oracle.
New UNIX password: BAD PASSWORD: it is based on a dictionary word
Retype new UNIX password: passwd: all authentication tokens updated successfully.

Make Directory

[root@localhost ~]# mkdir -p /u01/app/oracle/product/11.2.0/dbhome_1
[root@localhost ~]# mkdir -p /u01/app/oracle/product/11.2.0/grid
[root@localhost ~]# chown -R oracle:oinstall /u01
Step 6: `.bash_profile` - Login as Oracle user

```
[root@localhost ~]# su - oracle
[oracle@localhost ~]$ vi .bash_profile
```

# Oracle Settings
TMP=/tmp; export TMP
TEPDIR=$TMP; export TEPDIR

ORACLE_BASE=/u01/app/oracle; export ORACLE_BASE
ORACLE_HOME=$ORACLE_BASE/product/11.2.0/dbhome_1; export ORACLE_HOME
GRID_HOME=$ORACLE_BASE/product/11.2.0/grid; export GRID_HOME
PATH=/usr/sbin:$PATH; export PATH
PATH=$ORACLE_HOME/bin:$PATH; export PATH
LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib; export LD_LIBRARY_PATH
CLASSPATH=$ORACLE_HOME/JRE:$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib;
export CLASSPATH
PATH=$GRID_HOME/bin:$PATH; export PATH
LD_LIBRARY_PATH=$GRID_HOME/lib:/lib:/usr/lib; export LD_LIBRARY_PATH
CLASSPATH=$ORACLE_HOME/JRE:$GRID_HOME/jlib:$GRID_HOME/rdbms/jlib;
export CLASSPATH

if [ $USER = "oracle" ]; then
  if [ $SHELL = "/bin/ksh" ]; then
    ulimit -p 16384
    ulimit -n 65536
  else
    ulimit -u 16384 -n 65536
  fi
fi

Step 7: Create New Harddisk

Shutdown your Host Operating System, OEL.

In Vmware Page, Edit virtual machine and add Two Hard Disks, I just showed here for a newly creating Harddisk, At same like you can create another Harddisk also.
Select a Disk
Which disk do you want to use?

- Create a new virtual disk
- Use an existing virtual disk
- Use a physical disk (for advanced users)

Select a Disk Type
What kind of disk do you want to create?

- IDE
- SCSI (Recommended)

Mode:
- Independent
  Independent disks are not affected by snapshots.
- Persistent
  Changes are immediately and permanently written to the disk.
- Nonpersistent
  Changes to the disk are discarded when you power off or restore a snapshot.

Specify Disk Capacity
How large do you want this disk to be?

- Maximum disk size (GB): 10GB

Recommended size for Oracle Enterprise Linux: 20 GB

- Allocate all disk space now.
- Store virtual disk as a single file
- Split virtual disk into 2 GB files

Allocating the full capacity can enhance performance but requires enough physical disk space as you specify for the virtual disk. If you do not allocate all disk space now, the virtual disk starts small and is created quickly. It grows as you add applications, files and data.
Step 8: Format or partition your Disk using fdisk command

Step 8: Format or partition your Disk using fdisk command

[root@localhost ~]# ls /dev/sd*
/dev/sda  /dev/sda1  /dev/sda2  /dev/sdb  /dev/sdc
[root@localhost ~]# cd dev
bash: cd: dev: No such file or directory
[root@localhost ~]# cd /dev
[root@localhost dev]# fdisk sdb
Device contains neither a valid DOS partition table, nor Sun, SGI or
OSF disklabel
Building a new DOS disklabel. Changes will remain in memory only,
until you decide to write them. After that, of course, the previous
content won't be recoverable.

The number of cylinders for this disk is set to 1305.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)
Warning: invalid flag 0x0000 of partition table 4 will be corrected by
w(rite)

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
 p
Partition number (1-4): 1
First cylinder (1-1305, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-1305, default 1305):
Using default value 1305

Command (m for help): p

Disk sdb: 10.7 GB, 10737418240 bytes
255 heads, 63 sectors/track, 1305 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device Boot Start   End      Blocks   Id  System
sdb1    1   1305   10482381   83  Linux

Command (m for help): w
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.

[root@localhost dev]# fdisk sdc
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
Building a new DOS disklabel. Changes will remain in memory only, until you decide to write them. After that, of course, the previous content won't be recoverable.

The number of cylinders for this disk is set to 1305.
There is nothing wrong with that, but this is larger than 1024, and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs (e.g., DOS FDISK, OS/2 FDISK)
Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)

Command (m for help): n
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  e   extended
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p
Partition number (1-4): 1
First cylinder (1-1305, default 1):
Using default value 1
Last cylinder or +size or +sizeM or +sizeK (1-1305, default 1305):
Using default value 1305

Command (m for help): p

Disk sdc: 10.7 GB, 10737418240 bytes
255 heads, 63 sectors/track, 1305 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes

Device Boot Start End Blocks Id System
  sdc1 1 1305 10482381 83 Linux

Command (m for help): w
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.
[root@localhost dev]#

Step 9: Permission for Disks

[root@localhost dev]# ls sd*
sda  sda1  sda2  sdb  sdb1  sdc  sdc1  sdd  sdd1
[root@localhost dev]# gedit /etc/rc.local
chown -R oracle:oinstall /dev/sdb1
chown -R oracle:oinstall /dev/sdc1
chmod 600 /dev/sdb1
chmod 600 /dev/sdcl

[root@localhost dev]# gedit /etc/rc.local
[root@localhost dev]# chown -R oracle:oinstall /dev/sdb1
[root@localhost dev]# chmod 600 /dev/sdcl
[root@localhost dev]# chown -R oracle:oinstall /dev/sdcl
[root@localhost dev]# chmod 600 /dev/sdcl

[root@localhost dev]# ls -ld sd*
brw-r----- 1 root  disk 8,  0 Nov 27 12:06 sda
brw-r----- 1 root  disk 8,  1 Nov 27 12:06 sda1
brw-r----- 1 root  disk 8,  2 Nov 27 12:06 sda2
brw-r----- 1 root  disk 8, 16 Nov 27 12:34 sdb
brw------- 1 oracle oinstall 8, 17 Nov 27 12:34 sdb1
brw------- 1 root  disk 8, 32 Nov 27 12:34 sdc
brw------- 1 oracle oinstall 8, 33 Nov 27 12:34 sdc1

Step 10: Unzip Grid Software

[root@localhost ~]# mkdir /install
Copy your Grid & Database software from USB to here

[root@localhost install]# ls
linux_11gR2_database_1of2.zip  linux_11gR2_database_2of2.zip
linux_11gR2_grid.zip

[root@localhost ~]# unzip linux_11gR2_grid.zip

Step 11: Install Grid Software

[root@localhost ~]# chown -R oracle:oinstall /install
[root@localhost install]# xhost +
access control disabled, clients can connect from any host
[root@localhost install]# su oracle
[oracle@localhost install]$ ls
grid  linux_11gR2_database_1of2.zip  linux_11gR2_database_2of2.zip
linux_11gR2_grid.zip  rpm
[oracle@localhost install]$ cd grid
[oracle@localhost grid]$ ls
doc install response rpm runcluvfy.sh runInstaller sshsetup stage welcome.html
[oracle@localhost grid]$ ./runInstaller
Starting Oracle Universal Installer...
Checking Temp space: must be greater than 80 MB. Actual 12805 MB Passed
Checking swap space: must be greater than 150 MB. Actual 4031 MB Passed
Checking monitor: must be configured to display at least 256 colors. Actual 16777216 Passed

Install Grid for Standalone Server

Choose your product language
Choose Disk path, Click Change Discovery path & /dev - Enter

Select Disk & I choose External Redundancy
Put Password for ASM user.

Ignore Warning message
Specify path
Check System prerequisite

Perform Prerequisite Checks

All minimum requirements are satisfied. You may proceed with the installation.

<table>
<thead>
<tr>
<th>Checks</th>
<th>Status</th>
<th>Fixable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Physical Memory</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Swap Size</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Free Space</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>User Existence: oracle</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Group Existence: admin</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Group Membership: primary</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Run Level</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Hard Limit: maximum open file descriptors</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Soft Limit: maximum open file descriptors</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Hard Limit: maximum user processes</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Soft Limit: maximum user processes</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>OS Kernel Version</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>OS Kernel Parameters</td>
<td>Succeeded</td>
<td></td>
</tr>
<tr>
<td>OS Kernel Parameter: swap</td>
<td>Succeeded</td>
<td></td>
</tr>
</tbody>
</table>

This is a prerequisite condition to test whether the system has at least 1.5GB (1572864.0KB) of total physical memory. Expected Value: 1.5GB (1572864.0KB)  
Actual Value: 1.38GB (2075448.0KB)

Setup

Progress:

Status:

Install Oracle Grid Infrastructure and Automatic Storage Management for a Stand... In Progress
  - Prepare
  - Copy files
  - Link binaries
  - Setup files
Execute Root Scripts for Install Oracle Grid Infrastructure and Automatic Storage... Pending

Consolidate Compress Control
**Run Root.sh as a root user**

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

Changing groupname of /u01/app/oraInventory to oinstall.
The execution of the script is complete.
You have mail in /var/spool/mail/root
[root@localhost ~]# /u01/app/oracle/product/11.2.0/grid/root.sh
Running Oracle 11g root.sh script...

The following environment variables are set as:
ORACLE_OWNER= oracle
ORACLE_HOME= /u01/app/oracle/product/11.2.0/grid

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.sh script.
Now product-specific root actions will be performed.
2010-11-27 13:37:46: Checking for super user privileges
2010-11-27 13:37:46: User has super user privileges
2010-11-27 13:37:46: Parsing the host name
```
Using configuration parameter file:
/u01/app/oracle/product/11.2.0/grid/crs/install/crsconfig_params
Creating trace directory
LOCAL ADD MODE
Creating OCR keys for user 'oracle', privgrp 'oinstall'.
Operation successful.
CRS-4664: Node localhost successfully pinned.
Adding daemon to initdb
CRS-4123: Oracle High Availability Services has been started.

localhost    2010/11/27 13:38:29
/u01/app/oracle/product/11.2.0/grid/cdata/localhost/backup_20101127_13
3829.olr
Successfully configured Oracle Grid Infrastructure for a Standalone
Server
Updating inventory properties for clusterware
Starting Oracle Universal Installer...

Checking swap space: must be greater than 500 MB. Actual 4031 MB
Passed
The inventory pointer is located at /etc/oraInst.loc
The inventory is located at /u01/app/oraInventory
'UpdateNodeList' was successful.
[root@localhost ~]#

Grid Installation successfully completed.
Step 12: Install Oracle 11g R2 Software

Unzip Both

`linux_11gR2_database_1of2.zip  linux_11gR2_database_2of2.zip`

```
[root@localhost install]# unzip  linux_11gR2_database_1of2.zip
[root@localhost install]# unzip  linux_11gR2_database_2of2.zip
```

```
[root@localhost ~]# chown -R oracle:oinstall /install
[root@localhost install]# xhost +
```

access control disabled, clients can connect from any host

```
[root@localhost install]# su oracle
[oracle@localhost install]$ cd database
[oracle@localhost database]$ ls
doc install response rpm runInstaller sshsetup stage welcome.html
```

[oracle@localhost database]$ ./runInstaller
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 80 MB. Actual 7587 MB Passed
Checking swap space: must be greater than 150 MB. Actual 3937 MB Passed
Checking monitor: must be configured to display at least 256 colors. Actual 16777216 Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2010-11-27_01-52-52PM. Please wait ...

Install software only
Choose Single Instance
Running Oracle 11g root.sh script...

The following environment variables are set as:

```
ORACLE_OWNER= oracle
ORACLE_HOME= /u01/app/oracle/product/11.2.0/dbhome_1
```

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

The file "dbhome" already exists in /usr/local/bin. Overwrite it?
(y/n)

[n]:

The file "oraenv" already exists in /usr/local/bin. Overwrite it?
(y/n)

[n]:

The file "coraenv" already exists in /usr/local/bin. Overwrite it?
(y/n)

[n]:

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.sh script.

Now product-specific root actions will be performed.

Finished product-specific root actions.

[root@localhost ~]#
Step 13: Just Check ASMCA

[oracle@localhost ~]$ asmca
Step 14: Database Creation

[oracle@localhost ~]$ dbca

Database Configuration Assistant, Step 1 of 2: Operations

Select the operation that you want to perform:
- Create a Database
- Configure Database Options
- Delete a Database
- Manage Templates

ASM configuration operations must be performed using Automatic Storage Management Configuration Assistant (ASM CA) from Oracle Grid Infrastructure home.

Database Configuration Assistant, Step 2 of 2: Database Templates

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.

<table>
<thead>
<tr>
<th>Select</th>
<th>Template</th>
<th>Includes Datafiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Purpose or Transaction Processing</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Custom Database</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Data Warehouse</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Database Configuration Assistant, Step 3 of 2: Database Identification

An Oracle database is uniquely identified by a Global Database Name, typically of the form “<name-domain>.”

Global Database Name: azarc1

A database is referenced by at least one Oracle instance which is uniquely identified from any other instance on this computer by an Oracle System Identifier (SID):

SID: azarc1
Choose Automatic Storage Management
Specify storage type and locations for database files.

Storage Type: Automatic Storage Management (ASM)

Storage Locations:
- Use Database File Locations from Template
- Use Common Location for All Database Files
- Use Oracle-Managed Files

Database Area:

If you want to specify different locations for any database files, pick any of the above options except Oracle-Managed Files and use the Storage page later to customize each file location. If you use Oracle-Managed Files, Oracle automatically generates the names for database files, which cannot be changed on the Storage page.

File Location Variables...
Database Configuration Assistant, Step 7 of 12: Recovery Configuration

Choose the recovery options for the database

- Specify Flash Recovery Area
  
  This is used as the default for all disk-based backup and recovery operations, and is also required for automatic disk-based backup using Enterprise Manager. Oracle recommends that the database files and recovery files be located on physically different disks for data protection and performance.

  Flash Recovery Area: [DATA]  
  Flash Recovery Area Size: [652 M Bytes]

- Enable Archiving
  
  [Edit Archive Mode Parameters...]

File Location Variables...

Back Next

Database Configuration Assistant, Step 11 of 11: Creation Options

Select the database creation options.

- Ideal Platform for Grid Computing
- Low cost servers and storage
- Highest availability
- Best scalability

Copying database files

- Creating and starting Oracle instance
- Registering database with Oracle Restart
- Completing Database Creation

Clone database creation in progress

progress: 2%

Log files for the current operation are located at:
/u01/app/oracle/cfgoologs/dbca/22zardb

Stop

Cancel Help

Back Next Finish
Now Database also successfully created.

```
[oracle@localhost ~]$ export ORACLE_SID=azardb
[oracle@localhost ~]$ sqlplus
```

```
SQL*Plus: Release 11.2.0.1.0 Production on Sat Nov 27 15:03:38 2010
Copyright (c) 1982, 2009, Oracle.  All rights reserved.

Enter user-name: sys/Admin123 as sysdba

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production
With the Partitioning, Automatic Storage Management, OLAP, Data Mining
and Real Application Testing options

SQL> select name from v$database;

NAME
-------
AZARDB

SQL> select name from v$datafile;

NAME
-----------------------------------------------
--------
+DATA/azardb/datafile/system.256.736179685```
SQL> select group_number,name,state,type from v$asm_diskgroup;

<table>
<thead>
<tr>
<th>GROUP_NUMBER</th>
<th>NAME</th>
<th>STATE</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DATA</td>
<td>CONNECTED</td>
<td>EXTERN</td>
</tr>
</tbody>
</table>

SQL>