

Tutorial Instalación Base de Datos Oracle 12c sobre CentOS 7

El presente tutorial nos mostrará la instalación de una Base de Datos Oracle 12c sobre un Sistema Operativo CentOS 7.

Dentro del tutorial se verá una instalación de los siguientes componentes:

- Sistema Operativo CentOS 7 (instalación básica)
- Base de Datos con almacenamiento en Filesystem
- Base de Datos con almacenamiento en Automatic Storage Management

Para la elaboración de este tutorial se ha realizado una máquina virtual en Oracle VM Virtual Box con las siguientes características:

- **CPU:** 2 procesadores virtuales
- **Memoria RAM:** 4GB
- **1 Disco Duro de:** 80 GB (sistema operativo y software Oracle)
- **1 Disco Duro de:** 10 GB (Diskgroup DGDATA)
- **1 Disco Duro de:** 5 GB (Diskgroup DGFRA)
- **1 Tarjeta de red:** Adaptador Puente

Instalación Sistema Operativo CentOS 7

A continuación se indicará como realizar una instalación básica del sistema Operativo Centos 7 para contener una Base de Datos Oracle 12c.

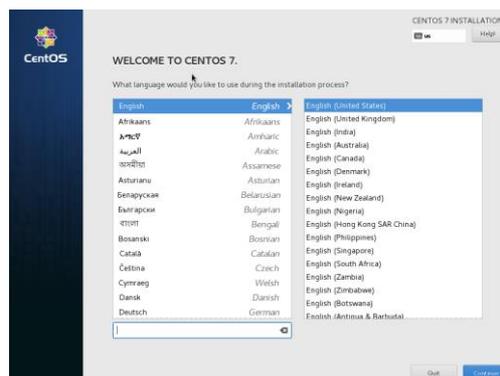
La imagen (ISO) de Centos puede ser descargada desde el siguiente sitio:

http://isoredirect.centos.org/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1708.iso

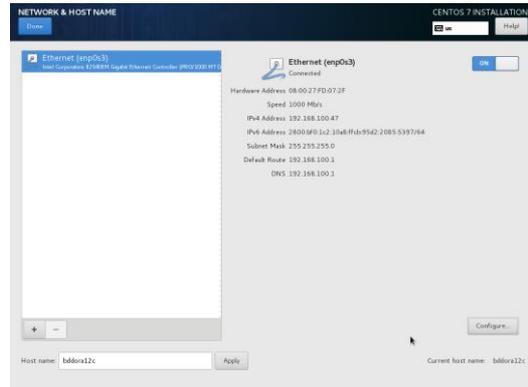
1. Una vez configurada la máquina virtual y descargado la imagen del sistema Operativo Centos 7 , la iniciamos con la opción para que que haga el booteo desde la imagen descargada y elegimos la opción **Install CentOS 7**



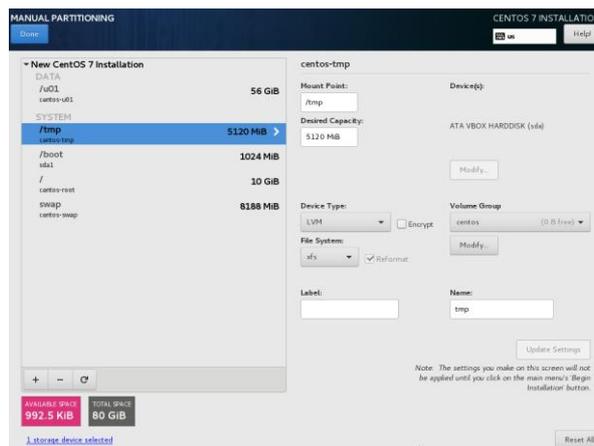
2. Luego nos aparecerá las opciones de lenguaje que deseamos que el instalador presente sus textos



3. A continuación nos mostrará la pantalla para la configuración de red y hostname. Como buena práctica se debe poner una IP fija al servidor virtual y en caso que se use un servidor DHCP, debemos reservar una IP para que siempre sea asignada al este servidor.



- Una recomendación para no tener un particionamiento de discos por defecto es tener una partición dedicada para el software Oracle (**/u01**), de preferencia que sea tipo LVM. Una buena práctica es tener esa partición de un tamaño de **100 GB**, ya que este espacio puede ser utilizados para la aplicación de parches del software Oracle.



Revisión de Prerequisitos para Instalación Software Oracle

Para garantizar la correcta instalación y funcionamiento, tanto del Grid Infrastructure como el software de Base de Datos Oracle, es necesario que se cumplan prerequisites de Hardware como de Software. A continuación se muestra los prerequisites que se debe cumplir antes de proceder con cualquier instalación.

A continuación se presenta los prerequisites para la instalación del software Oracle:

- **Partición /u01 con al menos el siguiente espacio:**

Installation Type	Disk Space for Software Files
Enterprise Edition	6.4 GB
Standard Edition	6.1 GB
Standard Edition One	6.1 GB
Standard Edition 2	6.1 GB

- **Memoria SWAP**

RAM	Swap Space
Between 1 GB and 2 GB	1.5 times the size of the RAM
Between 2 GB and 16 GB	Equal to the size of the RAM
More than 16 GB	16 GB

- **Paquetes RPM**

```
binutils-2.23.52.0.1-12.el7.x86_64
compat-libcap1-1.10-3.el7.x86_64
compat-libstdc++-33-3.2.3-71.el7.i686
compat-libstdc++-33-3.2.3-71.el7.x86_64
gcc-4.8.2-3.el7.x86_64
gcc-c++-4.8.2-3.el7.x86_64
glibc-2.17-36.el7.i686
glibc-2.17-36.el7.x86_64
glibc-devel-2.17-36.el7.i686
glibc-devel-2.17-36.el7.x86_64
ksh
libaio-0.3.109-9.el7.i686
libaio-0.3.109-9.el7.x86_64
libaio-devel-0.3.109-9.el7.i686
libaio-devel-0.3.109-9.el7.x86_64
libgcc-4.8.2-3.el7.i686
libgcc-4.8.2-3.el7.x86_64
libstdc++-4.8.2-3.el7.i686
libstdc++-4.8.2-3.el7.x86_64
libstdc++-devel-4.8.2-3.el7.i686
libstdc++-devel-4.8.2-3.el7.x86_64
libXi-1.7.2-1.el7.i686
libXi-1.7.2-1.el7.x86_64
libXtst-1.2.2-1.el7.i686
libXtst-1.2.2-1.el7.x86_64
make-3.82-19.el7.x86_64
sysstat-10.1.5-1.el7.x86_64
```

En caso de que alguno de los paquetes en el listado no se encuentren instalados, se los puede instalar mediante el comando **yum install <nombre del paquete>** o mediante el comando **rpm -ivh <nombre del paquete>**.

A continuación un ejemplo:

```
[root@bddora12c ~]# yum install compat-libstdc*e17*
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
 * base: mirror.epn.edu.ec
 * extras: mirror.epn.edu.ec
 * updates: mirror.epn.edu.ec
Resolving Dependencies
--> Running transaction check
---> Package compat-libstdc++-33.x86_64 0:3.2.3-72.e17 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package                        Arch          Version           Repository        Size
=====
Installing:
compat-libstdc++-33            x86_64        3.2.3-72.e17     base              191 k

Transaction Summary
=====
Install 1 Package

Total download size: 191 k
Installed size: 811 k
Is this ok [y/d/N]: y
Downloading packages:

warning: /var/cache/yum/x86_64/7/base/packages/compat-libstdc++-33-3.2.3-72.e17.x86_64.rpm: Header V3
RSA/SHA256 Signature, key ID f4a80eb5: NOKEY
Public key for compat-libstdc++-33-3.2.3-72.e17.x86_64.rpm is not installed
compat-libstdc++-33-3.2.3-72.e17.x86_64.rpm | 191 kB 00:00:00
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7

Importing GPG key 0xF4A80EB5:
  Userid      : "CentOS-7 Key (CentOS 7 Official Signing Key) <security@centos.org>"
  Fingerprint: 6341 ab27 53d7 8a78 a7c2 7bb1 24c6 a8a7 f4a8 0eb5
  Package     : centos-release-7-4.1708.el7.centos.x86_64 (@anaconda)
  From        : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Is this ok [y/N]: y
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Warning: RPMDB altered outside of yum.
  Installing : compat-libstdc++-33-3.2.3-72.e17.x86_64                1/1
  Verifying  : compat-libstdc++-33-3.2.3-72.e17.x86_64                1/1

Installed:
  compat-libstdc++-33.x86_64 0:3.2.3-72.e17

Complete!
```

- **Creación de usuarios oracle (dueño software base de datos) y grid (dueño software ASM)**

Para la creación de los usuarios debemos tomar en cuenta el tipo de instalación que vamos a realizar, filesystem o ASM.

NOTA: Si la instalación se va a realizar sobre filesystem, únicamente vamos a crear el usuarios **oracle**, pero si la instalación va a realizarse sobre ASM, debemos crear los usuarios **grid** y **oracle**.

➤ **Para instalación con Filesystem:**

Creamos los siguientes grupos a nivel de Sistema Operativo

```
[root@bddora12c ~]# /usr/sbin/groupadd -g 54321 oinstall
[root@bddora12c ~]# /usr/sbin/groupadd -g 54322 dba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54323 oper
[root@bddora12c ~]# /usr/sbin/groupadd -g 54324 backupdba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54325 dgdba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54326 kmdba
```

Creamos el usuario oracle asignando los grupos creados:

```
[root@bddora12c ~]# /usr/sbin/useradd -g oinstall -G dba,asmdba,backupdba,dgdba,kmdba oracle
```

Luego de crear el usuario oracle asignamos una contraseña

```
[root@bddora12c ~]# passwd oracle
Changing password for user oracle.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
```

➤ **Para instalación con ASM:**

Creamos los siguientes grupos a nivel de Sistema Operativo

```
[root@bddora12c ~]# /usr/sbin/groupadd -g 54321 oinstall
[root@bddora12c ~]# /usr/sbin/groupadd -g 54322 dba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54323 oper
[root@bddora12c ~]# /usr/sbin/groupadd -g 54324 backupdba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54325 dgdba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54326 kmdba

[root@bddora12c ~]# /usr/sbin/groupadd -g 54327 asmdba
[root@bddora12c ~]# /usr/sbin/groupadd -g 54328 asmoper
[root@bddora12c ~]# /usr/sbin/groupadd -g 54329 asmadmin
```

Creamos el usuario oracle y cambiamos su contraseña

```
[root@bddora12c ~]# /usr/sbin/useradd -g oinstall -G dba,asmdba,backupdba,dgdba,kmdba oracle
[root@bddora12c ~]# passwd oracle
Changing password for user oracle.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
```

Creamos el usuario grid y cambiamos su contraseña

```
[root@bddora12c ~]# /usr/sbin/useradd -g oinstall -G asmadmin,asmoper,asmdba grid
[root@bddora12c ~]# passwd grid
Changing password for user grid.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
```

- **Creación de directorios**

- **Para instalación con Filesystem**

```
[root@bddora12c ~]# mkdir -p /u01/app/oracle
[root@bddora12c ~]# chown -R oracle:oinstall /u01/app/
[root@bddora12c ~]# chmod -R 775 /u01/app/oracle
```

- **Para instalación con ASM**

```
[root@bddora12c ~]# mkdir -p /u01/app/oracle
[root@bddora12c ~]# chown -R oracle:oinstall /u01/app/
[root@bddora12c ~]# chmod -R 775 /u01/app/oracle

[root@bddora12c stage]# mkdir -p /u01/app/grid
[root@bddora12c stage]# chown -R grid:oinstall /u01/app/grid
[root@bddora12c stage]# chmod -R 775 /u01/app/grid
```

- **Parámetros de kernel**

Existen algunos parámetros del kernel que deben ser cambiados. Para cambiarlos editamos el archivo **/etc/sysctl.conf** y ponemos los siguientes valores:

```
fs.aio-max-nr = 1048576
fs.file-max = 6815744
kernel.shmall = 2097152
kernel.shmmax = 2147483648
kernel.shmmni = 4096
kernel.sem = 250 32000 100 128
net.ipv4.ip_local_port_range = 9000 65500
net.core.rmem_default = 262144
net.core.rmem_max = 4194304
net.core.wmem_default = 262144
net.core.wmem_max = 1048586
```

- **Límites en número de procesos y open file descriptors**

Adicionalmente a los parámetros de kernel es necesario poner límites en el número de procesos para el usuario o usuarios dependiendo el tipo de almacenamiento en el cual se va a poner la base de datos Oracle

Para cumplir con este prerrequisito debemos editar el archivo **/etc/security/limits.conf** con los siguientes valores:

- **Para instalación con Filesystem**

```
oracle hard nofile 65536
oracle hard nproc 16384
oracle soft nproc 2047
```



<http://www.polluxdata.com>
info@polluxdata.com

```
oracle soft nofile 1024
```

➤ **Para instalación con ASM**

```
grid hard nofile 65536  
grid hard nproc 16384  
grid soft nproc 2047  
grid soft nofile 1024
```

```
oracle hard nofile 65536  
oracle hard nproc 16384  
oracle soft nproc 2047  
oracle soft nofile 1024
```

Instalación Base de Datos Oracle 12c en Filesystem

Una vez que todos los prerrequisitos hayan sido cumplidos podemos realizar la instalación del Software Oracle para crear una base de datos con almacenamiento tipo filesystem.

Debemos tener en cuenta que para instalr el software de oracle vamos a trabajar con los siguientes archivos los cuales se los puede bajar de la página de Oracle:

```
p21419221_121020_Linux-x86-64_1of10.zip
p21419221_121020_Linux-x86-64_2of10.zip
```

Dentro del Sistema Operativo nos ubicamos en la carpeta que contiene los instaladores y nos aseguramos que el propietario de estos 2 archivos sea oracle con el grupo oinstall

```
[root@bddora12c stage]# ls -ltr
-rw-r--r--. 1 oracle oinstall 1673519571 May  3 21:05 p21419221_121020_Linux-x86-64_1of10.zip
-rw-r--r--. 1 oracle oinstall 1014527110 May  3 21:10 p21419221_121020_Linux-x86-64_2of10.zip
```

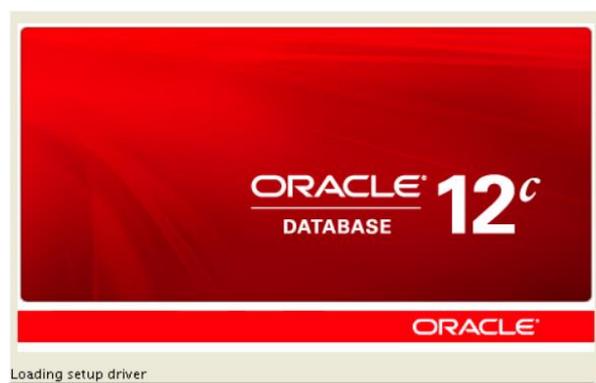
Procedemos a descomprimirlos con el **usuario oracle** archivo por archivo , no es recomendable que se lo realice en paralelo la descompresión

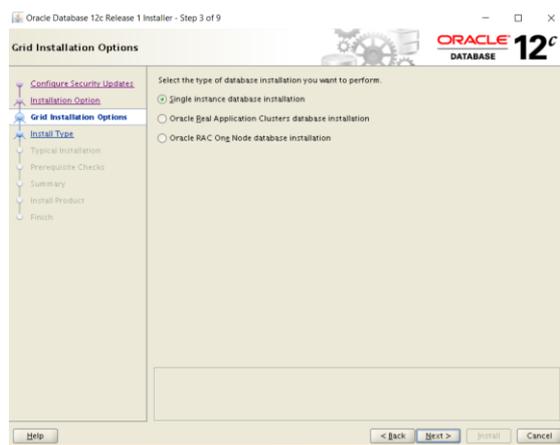
```
[root@bddora12c database]# su - oracle
[oracle@bddora12c ~]$ cd /u01/stage/
[oracle @bddora12c stage]# unzip p21419221_121020_Linux-x86-64_1of10.zip
[oracle@bddora12c stage]$ unzip p21419221_121020_Linux-x86-64_2of10.zip
```

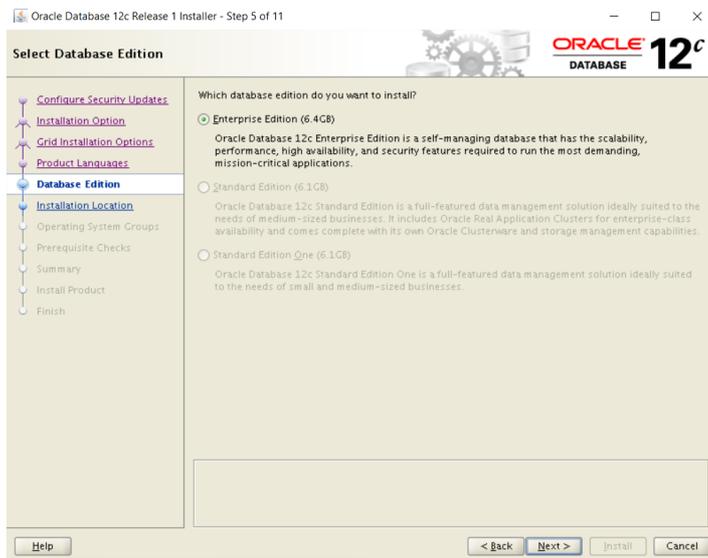
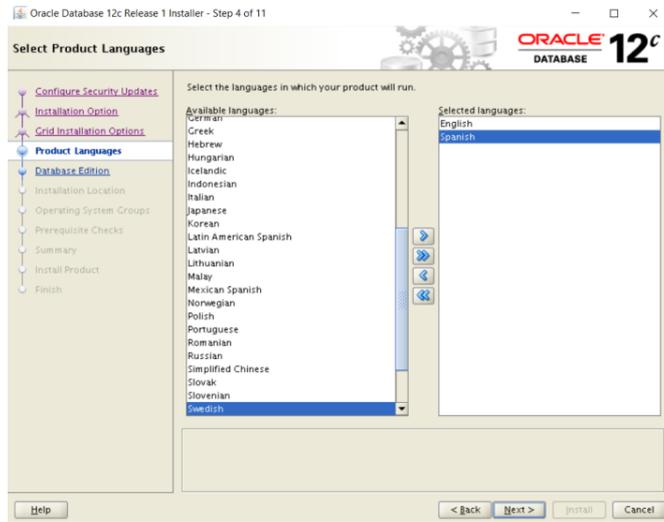
Una vez que se han descompresso los .zip mencionados nos dirigimos al directorio **database** y ejecutamos el comando **./runInstaller** y aparecerá la siguiente pantalla

```
[oracle@bddora12c database]$ ./runInstaller
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 500 MB.    Actual 5077 MB    Passed
Checking swap space: must be greater than 150 MB.    Actual 8187 MB    Passed
Checking monitor: must be configured to display at least 256 colors.    Actual 16777216
Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2018-05-04_04-15-55AM.
Please wait ...
```







Oracle Database 12c Release 1 Installer - Step 7 of 11

Privileged Operating System groups

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:

Database Operator (OSOPER) group (Optional):

Database Backup and Recovery (OSBACKUPDBA) group:

Data Guard administrative (OSDCDBA) group:

Encryption Key Management administrative (OSKMDBA) group:

Navigation: < Back Next > Install Cancel

Oracle Database 12c Release 1 Installer - Step 9 of 11

Summary

Oracle Database 12c: Release 1 Installer

Global settings

- Disk space: required 6.4 GB available 39.53 GB [\[Edit\]](#)
- Source location: /u01/stage/database/install/./stage/products.xml
- Database edition: Enterprise Edition (Install database software only) [\[Edit\]](#)
- Oracle base: /u01/app/oracle [\[Edit\]](#)
- Software location: /u01/app/oracle/product/12.1.0/dbhome_1 [\[Edit\]](#)
- Privileged Operating System groups: dba (OSDBA), oper (OSOPER), backupdba (OSBACKUPDBA)

Navigation: < Back Next > Install Cancel

Oracle Database 12c Release 1 Installer - Step 10 of 11

Install Product

Progress

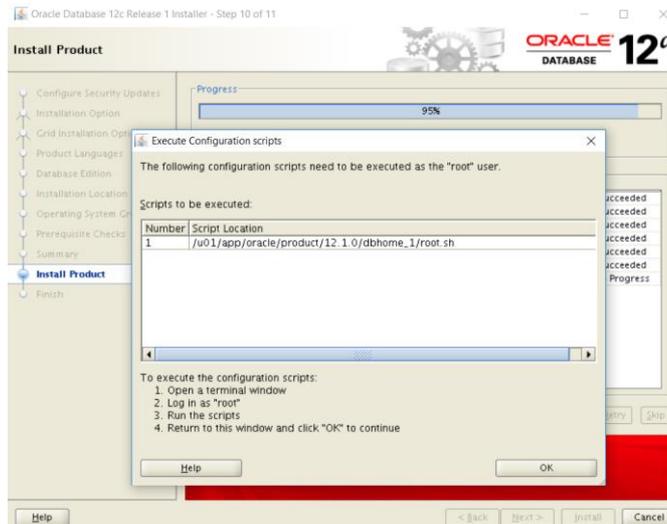
8%

Loading products. Please wait.

Status

Task	Status
Oracle Database installation	In Progress
Prepare	Succeeded
Copy files	Pending
Link binaries	Pending
Setup	Pending
Setup Oracle Base	Pending
Execute Root Scripts	Pending

Navigation: < Back Next > Install Cancel



NOTA: En este punto el instalador nos pedirá que ejecutemos un script, el mismo que debe ser ejecutado como usuario root

```
[root@bddora12c ~]# /u01/app/oracle/product/12.1.0/dbhome_1/root.sh
Performing root user operation.
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle
```

```
ORACLE_HOME= /u01/app/oracle/product/12.1.0/dbhome_1
```

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

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

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

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

Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created

Finished running generic part of root script.

Now product-specific root actions will be performed.

Luego de haber instalado el software Oracle vamos a crear una Base de Datos mediante el utilitario **dbca**.

Para ejecutar el **dbca** debemos exportar la variable ORACLE_HOME con el path en donde el software Oracle fue instalado, en este caso de la siguiente manera:

```
[oracle@bddora12c ~]$ export ORACLE_HOME=/u01/app/oracle/product/12.1.0/dbhome_1
```

```
[oracle@bddora12c bin]$ export PATH=$PATH:$ORACLE_HOME/bin
```

Luego de haber setado las variables ejecutamos dbca y nos aparecerán las siguientes pantallas:

```
[oracle@bddora12c bin]$ dbca
```



Database Configuration Assistant - Create Database - Step 4 of 14

Database Identification

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". Additionally, a database is referenced by at least one Oracle instance which is uniquely identified from any other instance on this system by an Oracle system identifier (SID).

Global Database Name:

SID:

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 (PDBs).

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 14

Management Options

Specify the management options for the database.

Configure Enterprise Manager (EM) Database Express

EM Database Express Port:

Register with Enterprise Manager (EM) Cloud Control

EM Host:

EM Port:

EM Admin Username:

EM Admin Password:

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create Database - Step 6 of 14

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	<input type="password"/>	<input type="password"/>
SYSTEM	<input type="password"/>	<input type="password"/>

Use the Same Administrative Password for All Accounts

Password:

Confirm Password:

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create Database - Step 7 of 15

Network Configuration

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

Listener Selection

Listeners from Grid Infrastructure home and Database Oracle home are listed below. To create a new listener in Database Oracle home, specify the listener name and port.

Select Listeners:

Select	Name	Port	Oracle Home	Status
<input checked="" type="checkbox"/>	LISTENER	1521	/u01/app/grid/product/12.1.0/grid	Up

Create a New Listener

Listener Name:

Listener Port:

Target Oracle Home: /u01/app/oracle/product/12.1.0/dbhome_1

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create Database - Step 8 of 15

Storage Locations

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

Database files Storage Type: File System

Use Database File Locations from Template
 Use Common Location for All Database Files

File Location: Browse...

Use Oracle-Managed Files Multiplex Redo Log and Control Files

Choose the recovery options for the database:

Recovery files Storage Type: File System

Specify Fast Recovery Area

Fast Recovery Area: Browse...

Fast Recovery Area Size: MB

Enable Archiving Sign Archive Mode Parameters

File Location Variables

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create Database - Step 9 of 15

Database Options

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

Sample Schemas: **Database Vault & Label Security**

Sample Schemas illustrate the use of a layered approach to complexity, and are used by some demonstration programs. Installing this will give you the following schemas in your database: Human Resources, Order Entry, Online Catalog, Product Media, Information Exchange, Sales History. It will also create a tablespace called EXAMPLE. The tablespace will be about 150 MB.

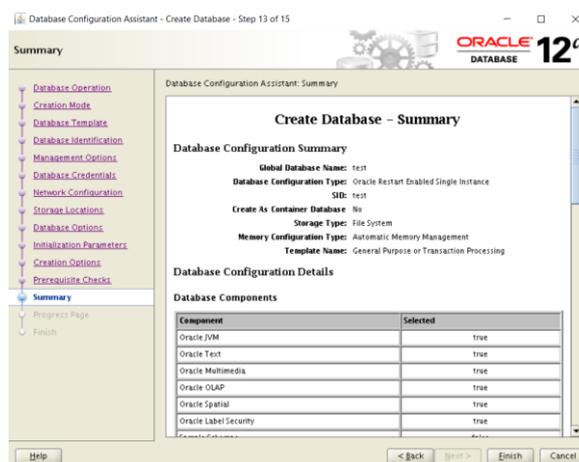
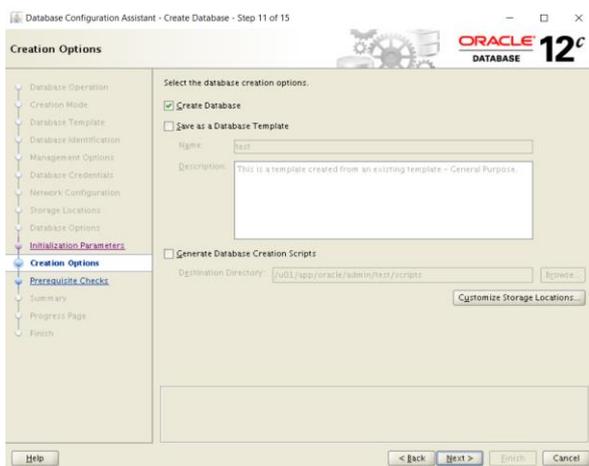
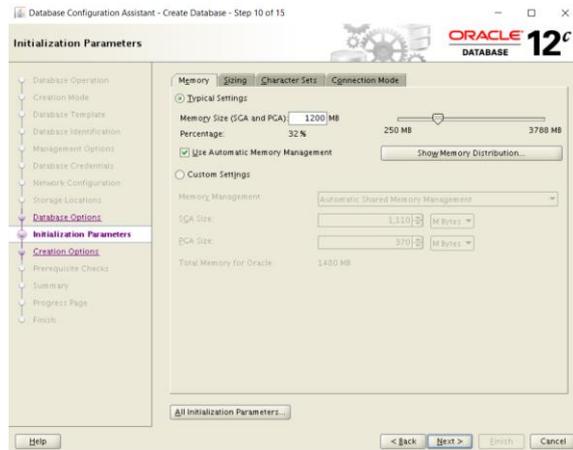
Specify whether or not to add the Sample Schemas to your database.

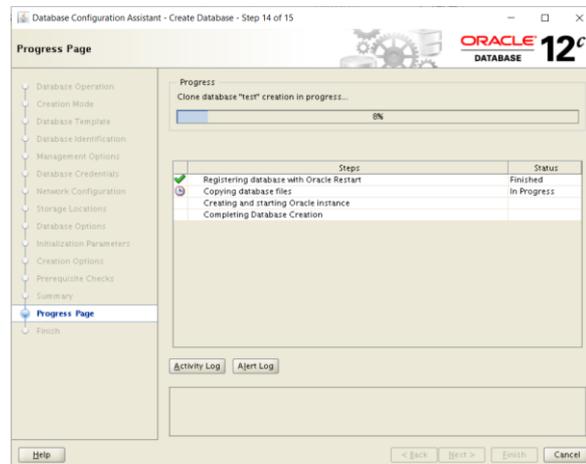
Sample Schemas

Specify the SQL scripts you want to run after the database is created. The scripts are run in the order they are listed below.

Select a script: Browse...

Help < Back Next > Finish Cancel





Instalación Base de Datos Oracle 12c en ASM

Para realizar una instalación de Base de Datos con almacenamiento en ASM se deben cumplir ciertos prerequisites adicionales para que la instalación se realice correctamente.

- **Preparación discos ASM**

Si vamos a realizar una instalación con ASM, es necesario preparar los discos para que estos sean candidatos, en este tutorial vamos a usar 1 disco de 10 GB (**/dev/sdb**) y 1 disco de 5GB (**/dev/sdc**)

```
[root@bddora12c ~]# fdisk -l

Disk /dev/sdb: 10.7 GB, 10737418240 bytes, 20971520 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 /dev/sdc: 5368 MB, 5368709120 bytes, 10485760 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
```

Para que los discos puedan ser utilizados por el utilitario oracleasm es necesario crear una partición un cada uno de ellos con **fdisk**

```
[root@bddora12c tmp]# 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 0x406affb5.

Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-20971519, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-20971519, default 20971519):
Using default value 20971519
Partition 1 of type Linux and of size 10 GiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.

[root@bddora12c tmp]# fdisk /dev/sdc
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.

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-10485759, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-10485759, default 10485759):
Using default value 10485759
Partition 1 of type Linux and of size 5 GiB is set
```

```
Command (m for help): w
The partition table has been altered!
```

```
Calling ioctl() to re-read partition table.
Syncing disks.
```

Una vez realizadas las particiones verificamos que estas se hayan creado correctamente

```
[root@bddora12c tmp]# fdisk /dev/sdb -l

Disk /dev/sdb: 10.7 GB, 10737418240 bytes, 20971520 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: 0x406affb5

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1          2048     20971519    10484736   83   Linux
[root@bddora12c tmp]# fdisk /dev/sdc -l

Disk /dev/sdc: 5368 MB, 5368709120 bytes, 10485760 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: 0xb6923d77

   Device Boot      Start         End      Blocks   Id  System
/dev/sdc1          2048     10485759     5241856   83   Linux
```

- **Paquetes RPM**

Para la configuración de los discos candidatos para formar los diskgroups van a ser necesarios los siguientes paquetes RPM, los cuales nos permiten etiquetar a los discos proporcionados para formar los diskgroups:

- kmod-oracleasm
- oracleasm-lib
- oracleasm-support



Los paquetes RPM `oracleasm-lib` y `oracleasm-support` puede ser descargados desde el siguiente link:

<http://www.oracle.com/technetwork/server-storage/linux/asmlib/rhel7-2773795.html>

Para el paquete `kmod-oracleasm` lo podemos instalar de la siguiente manera:

```
[root@bddora12c mapper]# yum install oracle*
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
 * base: mirror.epn.edu.ec
 * extras: mirror.epn.edu.ec
 * updates: mirror.epn.edu.ec
Resolving Dependencies
--> Running transaction check
---> Package kmod-oracleasm.x86_64 0:2.0.8-19.el7 will be installed
--> Finished Dependency Resolution
```

Dependencies Resolved

```
=====
Package                               Arch
Version                               Repository
Size
=====
Installing:
 kmod-oracleasm                       x86_64
2.0.8-19.el7                          base
34 k
```

Transaction Summary

```
=====
Install 1 Package

Total download size: 34 k
Installed size: 119 k
Is this ok [y/d/N]: y
Downloading packages:
kmod-oracleasm-2.0.8-19.el7.x86_64.rpm
| 34 kB 00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : kmod-oracleasm-2.0.8-19.el7.x86_64
1/1
```

- **Configuración oracleasm**

Luego de haber instalados los 3 paquetes para que oracleasm funcione correctamente procedemos a configurarlos de la siguiente manera:

```
[root@bddora12c tmp]# 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 []: grid
Default group to own the driver interface []: asmadmin
Scan for Oracle ASM disks on boot (y/n) [y]: y
Writing Oracle ASM library driver configuration: done
```

- **Creación de discos candidatos para diskgroups**

Luego de haber realizado la configuración de oracleasm procedemos a etiquetar los discos que previamente se los particionó, esto con la finalidad que el Grid Infrastructure pueda visualizarlos.

```
[root@bddora12c tmp]# /etc/init.d/oracleasm createdisk DATA01 /dev/sdb1
Marking disk "DATA01" as an ASM disk: [ OK ]
```

```
[root@bddora12c tmp]# /etc/init.d/oracleasm createdisk FRA01 /dev/sdc1
Marking disk "FRA01" as an ASM disk: [ OK ]
```

Instalación Grid Infrastructure (ASM)

Una vez que se ha cumplido con los prerequisites anteriores, nos dirigimos al directorio donde se encuentran los instaladores y los descomprimos con el usuario grid. Se debe tener en cuenta que para descomprimirlos los zip deben ser propiedad del usuario grid.

```
[root@bddora12c stage]# ls -ltr p21419221_121020_Linux-x86-64_5of10.zip p21419221_121020_Linux-x86-64_6of10.zip
-rw-r--r--. 1 grid oinstall 646969279 May 3 20:39 p21419221_121020_Linux-x86-64_6of10.zip
-rw-r--r--. 1 grid oinstall 1747021273 May 3 21:14 p21419221_121020_Linux-x86-64_5of10.zip
```

```
[grid@bddora12c stage]# unzip p21419221_121020_Linux-x86-64_5of10.zip
[grid@bddora12c stage]$ unzip p21419221_121020_Linux-x86-64_6of10.zip
```

Al momento de descomprimir los zip, se creará un directorio llamada grid, el cual contiene los instaladores

```
[grid@bddora12c stage]$ ls -ltr
total 4962944
drwxr-xr-x. 7 grid oinstall 156 Jul 11 2014 grid
```

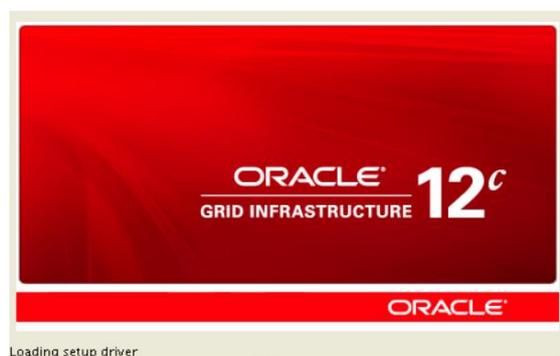
Para ejecutar el instalador nos dirigimos al directorio grid y ejecutamos el shell runInstaller de la siguiente manera:

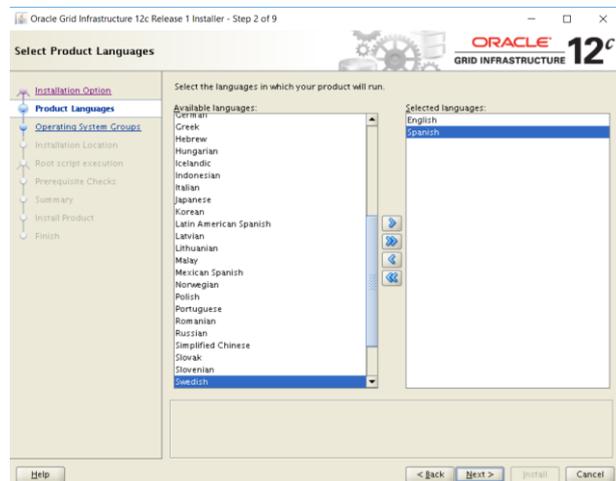
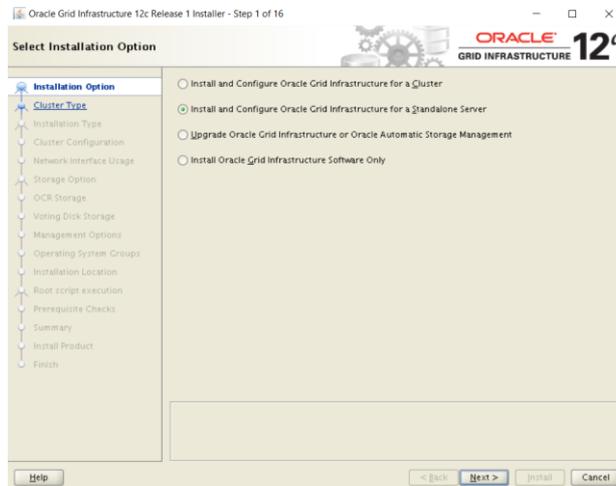
```
[grid@bddora12c stage]$ cd grid/

[grid@bddora12c grid]$ ls
install      response  runcluvfy.sh  sshsetup  welcome.html
readme.html  rpm       runInstaller  stage

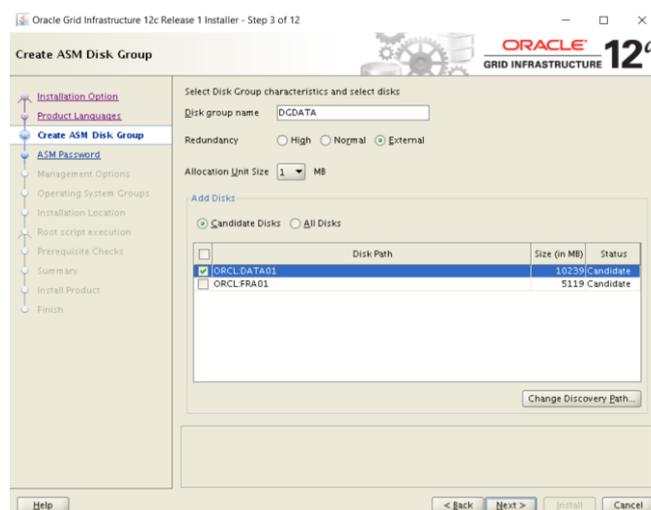
[grid@bddora12c grid]$ ./runInstaller
Starting Oracle Universal Installer...

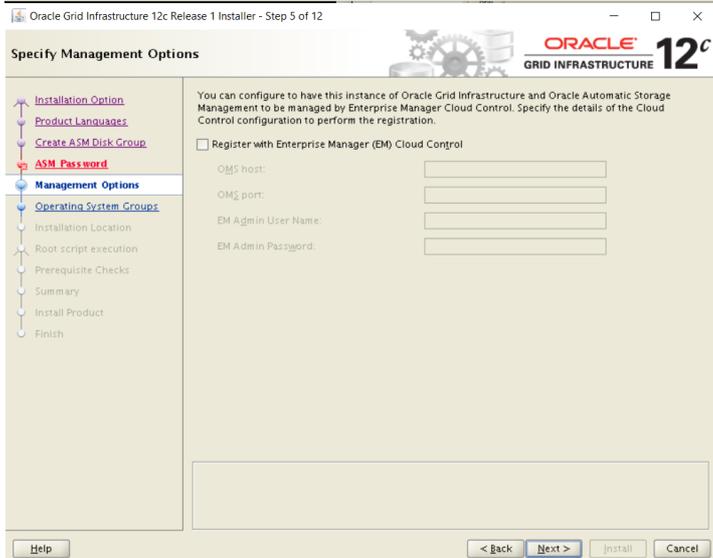
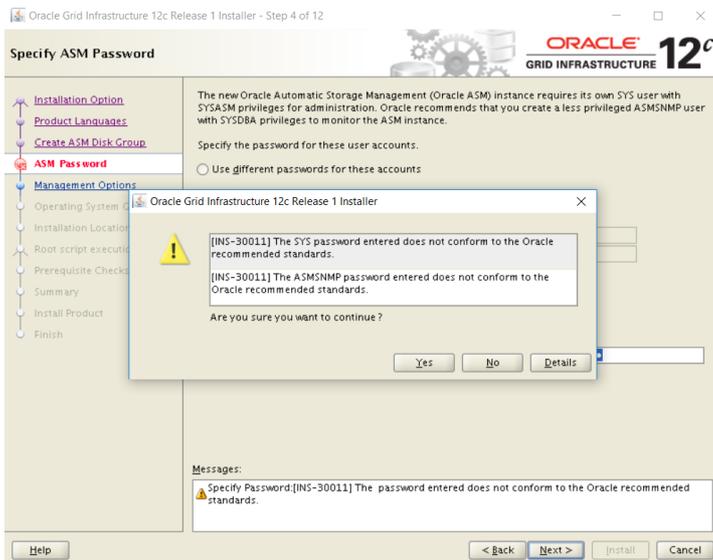
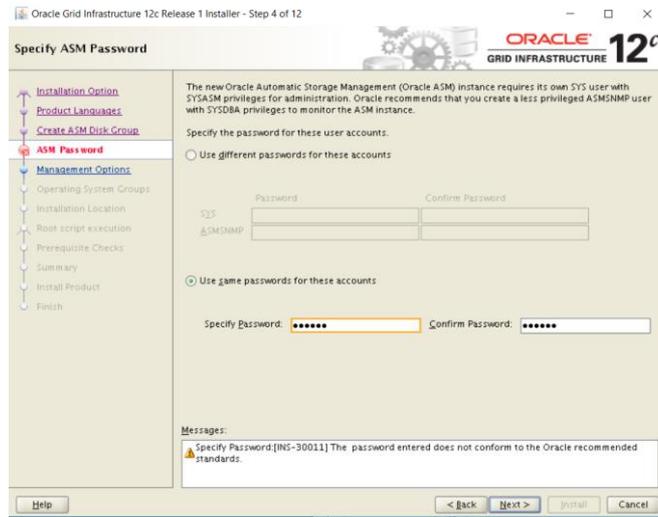
Checking Temp space: must be greater than 415 MB.   Actual 5067 MB   Passed
Checking swap space: must be greater than 150 MB.   Actual 8187 MB   Passed
Checking monitor: must be configured to display at least 256 colors.   Actual
16777216   Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall12018-05-04_09-
28-44AM. Please wait ...
```

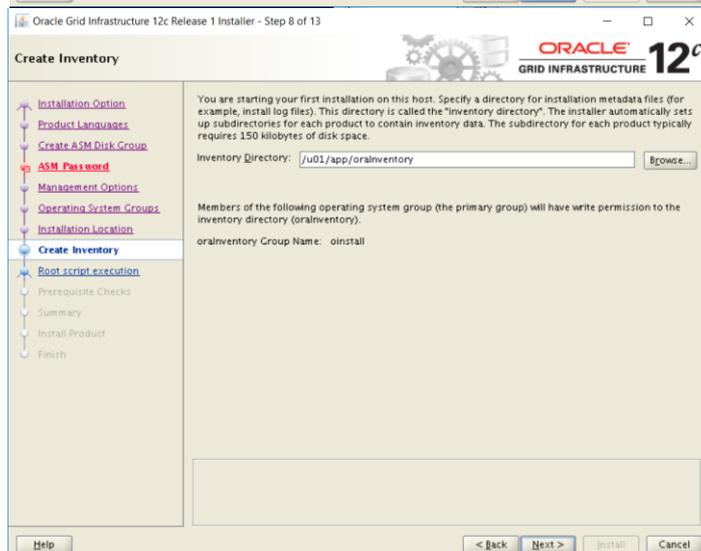
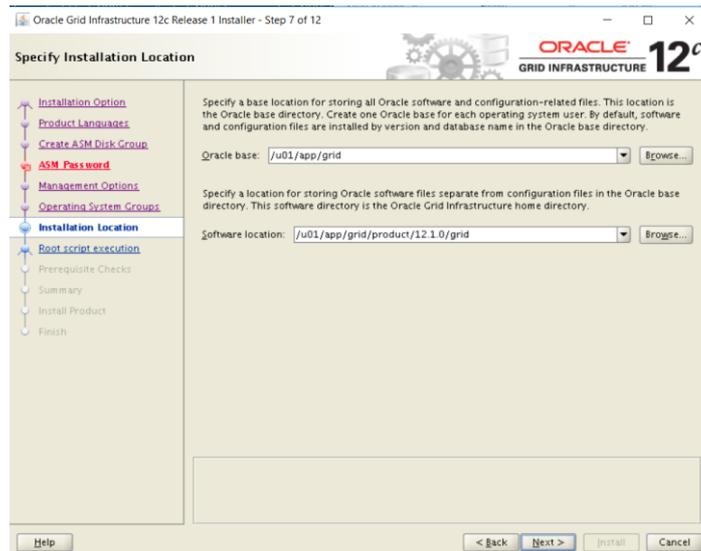
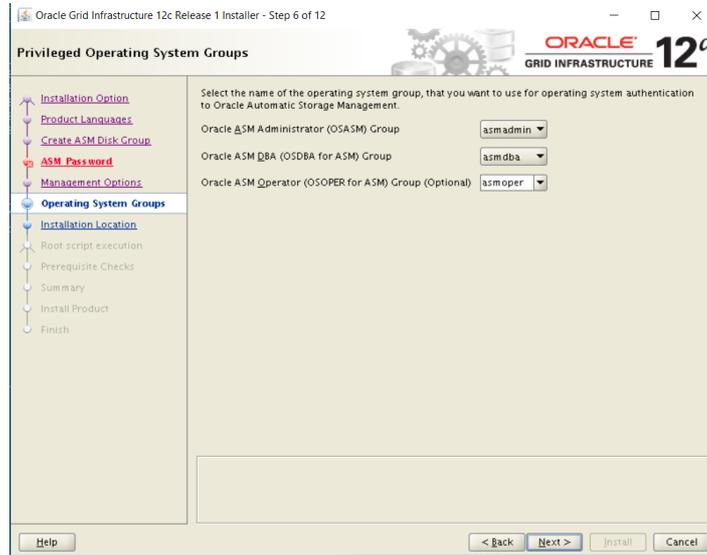


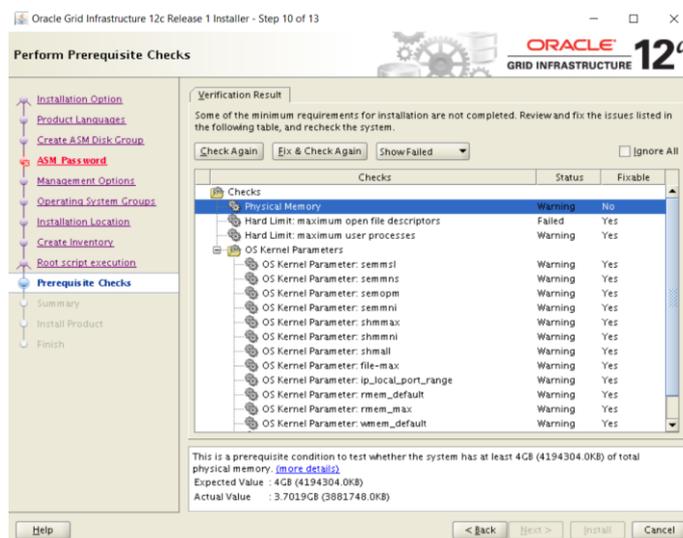
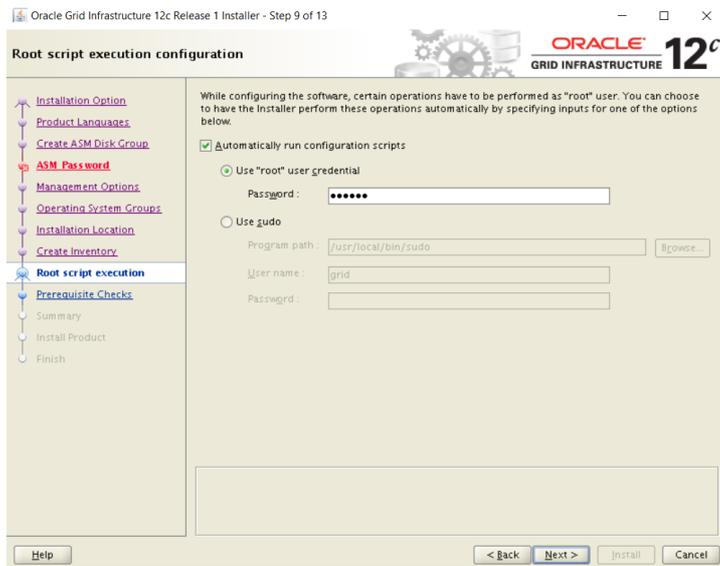


En este paso debemos dar un nombre al diskgroup donde se va almacenar la data de ASM, como se puede observar nos muestra 2 discos candidatos, los cuales son los discos que se etiquetaron anteriormente

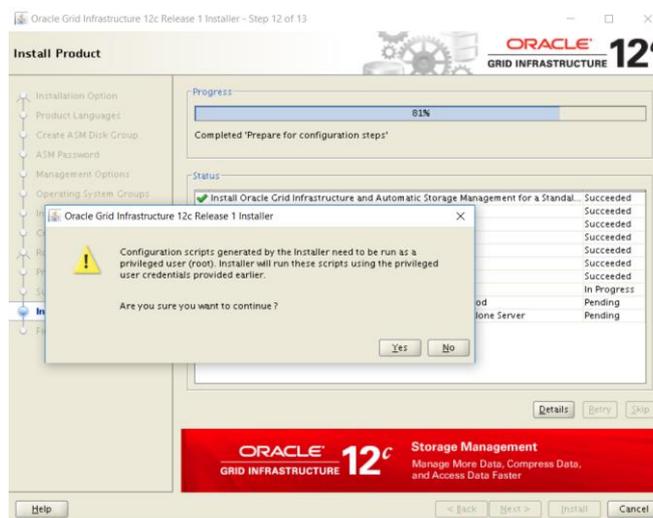
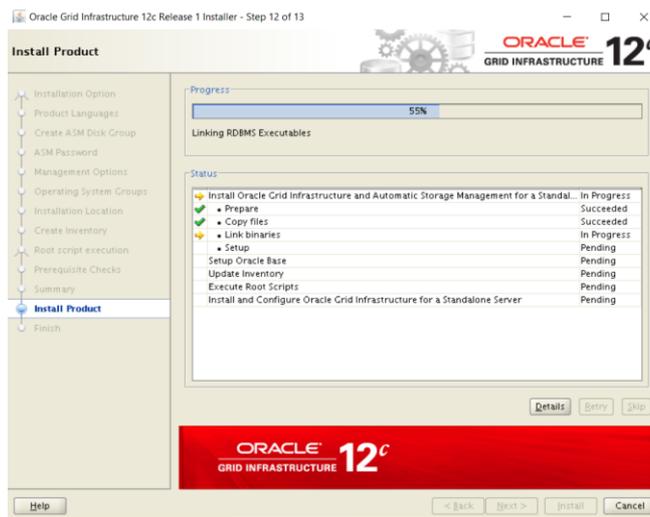
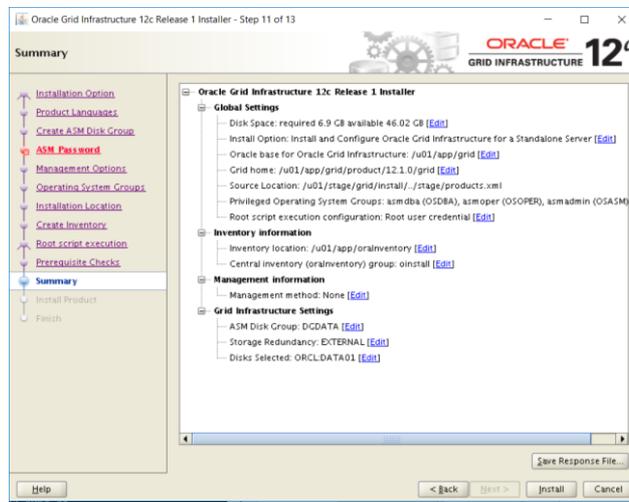


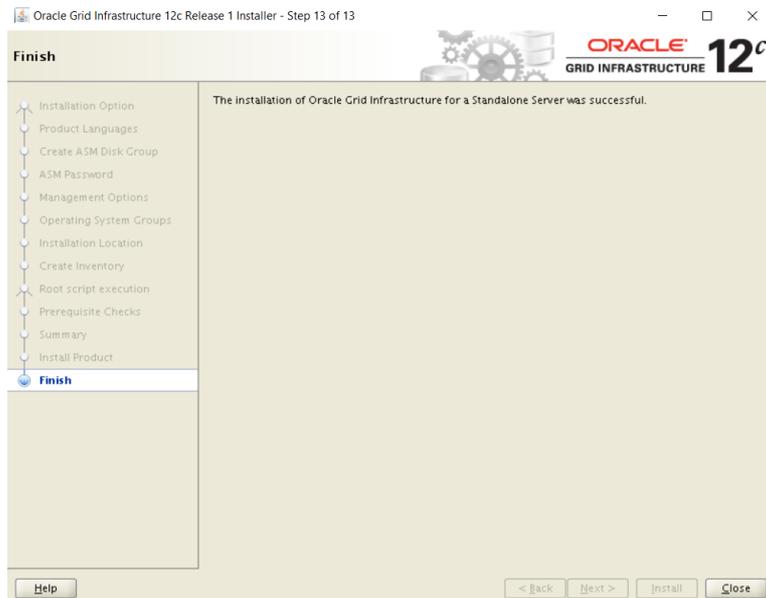






NOTA: Dentro de revision de prerequisites del instalador nos dará le mensaje si es posible solventar esos warnings, de ser así hacemos click en el botón *Fix & Check Again*, el cual nos proporcionará un script para que lo ejecutemos como root



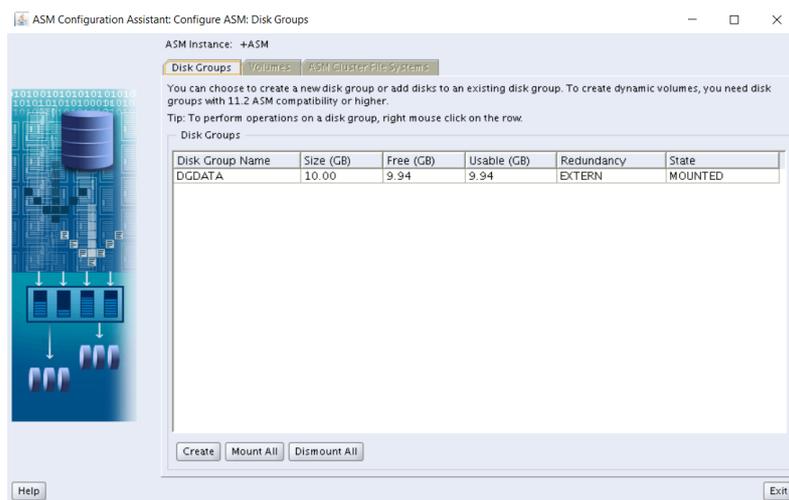


Finalmente, creamos el diskgroup DGFRA mediante el utilitario asmca, para hacer uso de asmca debemos setear las variables de ambiente de la siguiente manera:

```
[grid@bddora12c grid]$ . oraenv
ORACLE_SID = [grid] ? +ASM
The Oracle base has been set to /u01/app/grid
```

Luego de haber seteado las variables de ambiente invocamos a **asmca**, y se nos desplegará la siguiente pantalla:

```
[grid@bddora12c grid]$ asmca
```



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 checked="" type="checkbox"/>	Disk Path	Header Status	Disk Name	Size (MB)	Quorum
<input checked="" type="checkbox"/>	ORCL:FRA01	PROVISIONED		5119	<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.

ASM Configuration Assistant: Configure ASM: Disk Groups

ASM Instance: +ASM

Disk Groups Volumes | ASM Cluster File Systems

You can choose to create a new disk group or add disks to an existing disk group. To create dynamic volumes, you need disk groups with 11.2 ASM compatibility or higher.

Tip: To perform operations on a disk group, right mouse click on the row.

Disk Groups

Disk Group Name	Size (GB)	Free (GB)	Usable (GB)	Redundancy	State
DGDATA	10.00	9.94	9.94	EXTERN	MOUNTED
DGFR	5.00	4.95	4.95	EXTERN	MOUNTED

Exit

Instalación Base de Datos Oracle 12c en ASM

Luego de haber instalado y configurado correctamente Grid Infrastructure, instalaremos el motor de Base de Datos Oracle

Debemos tener en cuenta que para instalar el software de oracle vamos a trabajar con los siguientes archivos los cuales se los puede bajar de la página de Oracle:

```
p21419221_121020_Linux-x86-64_1of10.zip
p21419221_121020_Linux-x86-64_2of10.zip
```

Dentro del Sistema Operativo nos ubicamos en la carpeta que contiene los instaladores y nos aseguramos que el propietario de estos 2 archivos sea oracle con el grupo oisntall

```
[root@bddora12c stage]# ls -ltr
-rw-r--r--. 1 oracle oinstall 1673519571 May  3 21:05 p21419221_121020_Linux-x86-64_1of10.zip
-rw-r--r--. 1 oracle oinstall 1014527110 May  3 21:10 p21419221_121020_Linux-x86-64_2of10.zip
```

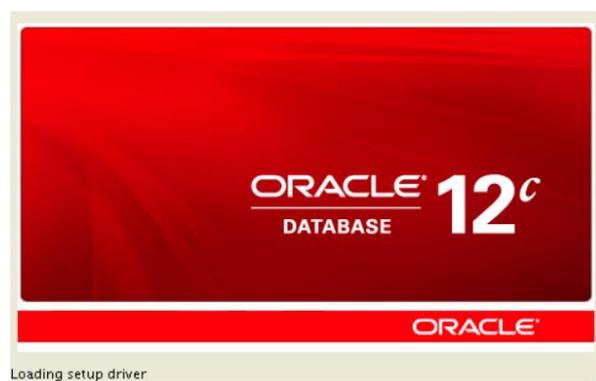
Procedemos a descomprimirlos con el **usuario oracle** archivo por archivo , no es recomendable que se lo realice en paralelo la descompresión

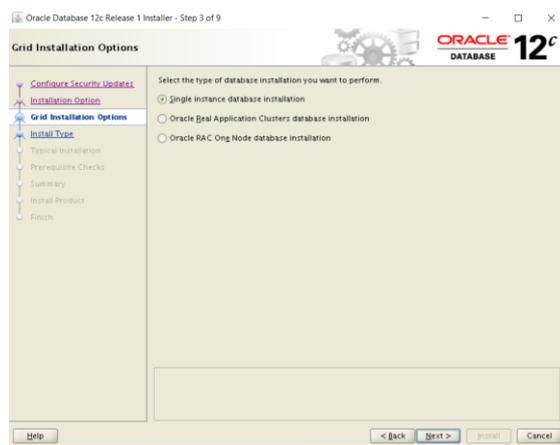
```
[root@bddora12c database]# su - oracle
[oracle@bddora12c ~]$ cd /u01/stage/
[oracle@bddora12c stage]# unzip p21419221_121020_Linux-x86-64_1of10.zip
[oracle@bddora12c stage]$ unzip p21419221_121020_Linux-x86-64_2of10.zip
```

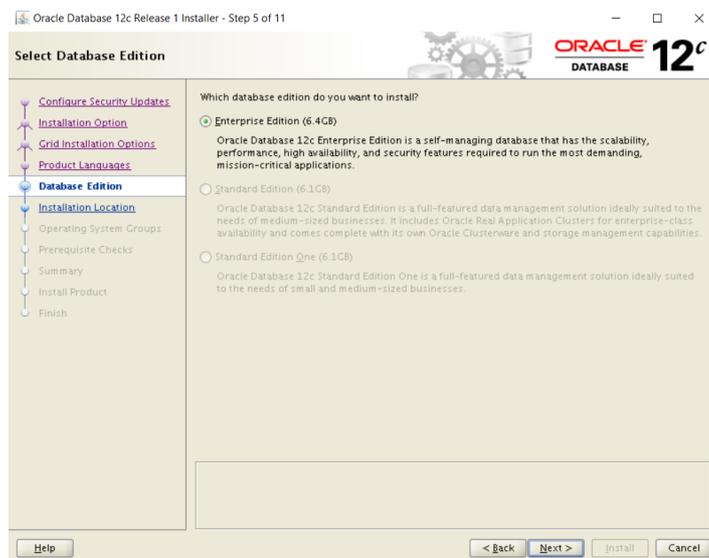
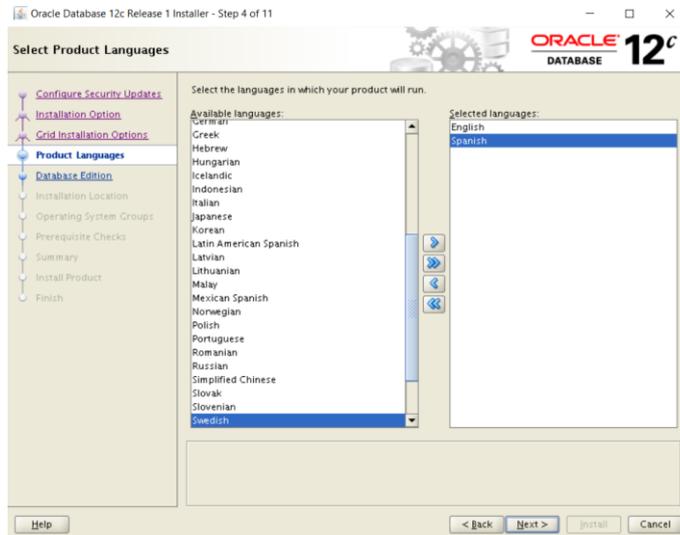
Una vez que se han descompreso los .zip mencionados nos dirigimos al directorio **database** y ejecutamos el comando **./runInstaller** y aparecerá la siguiente pantalla

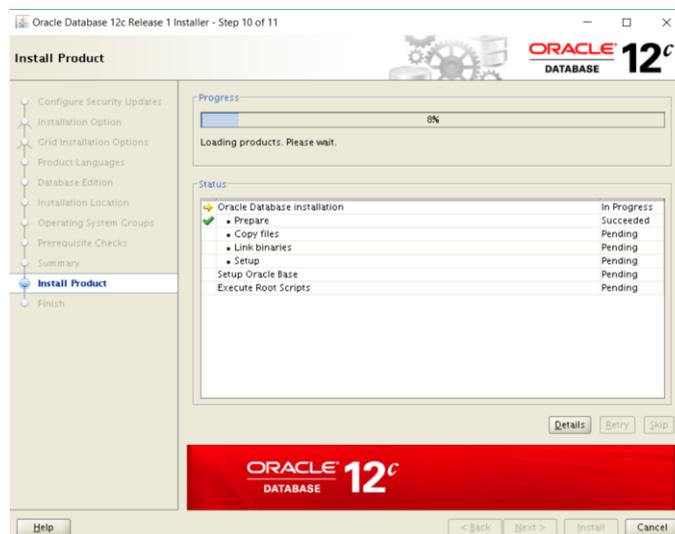
```
[oracle@bddora12c database]$ ./runInstaller
Starting Oracle Universal Installer...

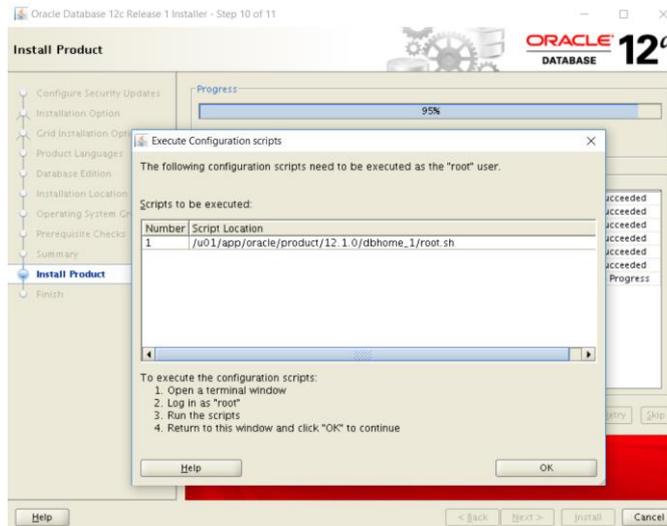
Checking Temp space: must be greater than 500 MB.    Actual 5077 MB    Passed
Checking swap space: must be greater than 150 MB.    Actual 8187 MB    Passed
Checking monitor: must be configured to display at least 256 colors.    Actual 16777216
Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall12018-05-04_04-15-55AM.
Please wait ...
```











NOTA: En este punto el instalador nos pedirá que ejecutemos un script, el mismo que debe ser ejecutado como usuario root

```
[root@bddora12c ~]# /u01/app/oracle/product/12.1.0/dbhome_1/root.sh
Performing root user operation.
The following environment variables are set as:
  ORACLE_OWNER= oracle
  ORACLE_HOME= /u01/app/oracle/product/12.1.0/dbhome_1
```

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

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

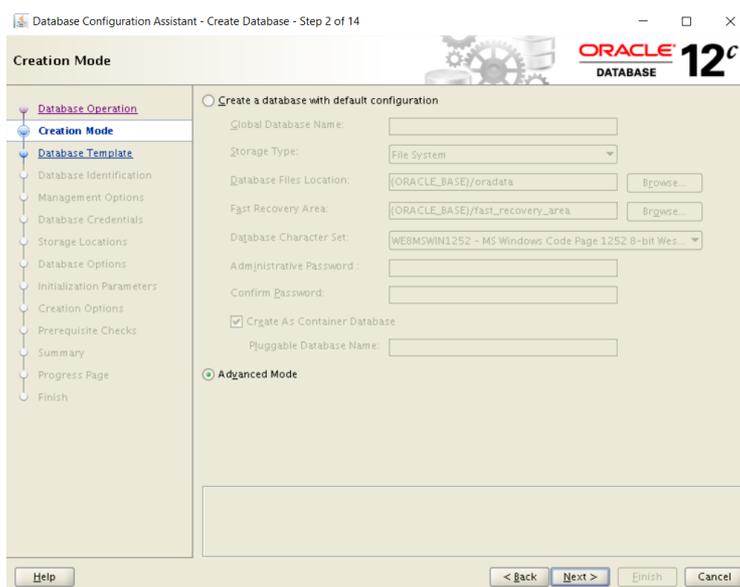
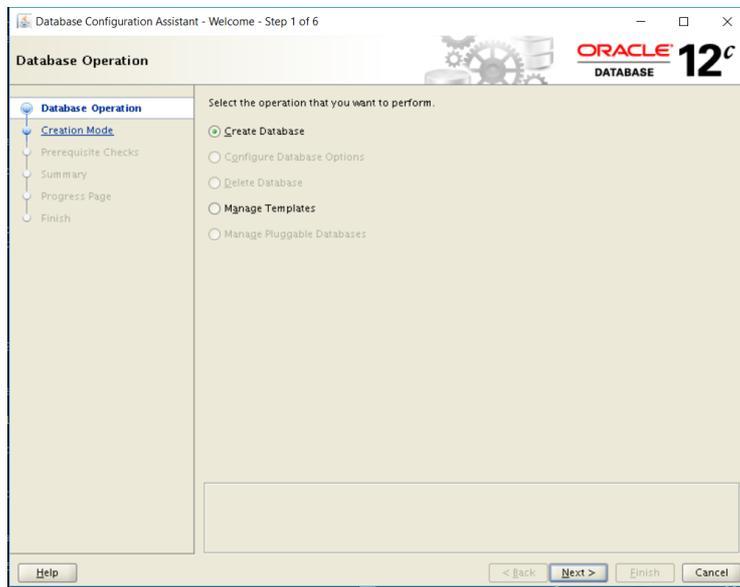
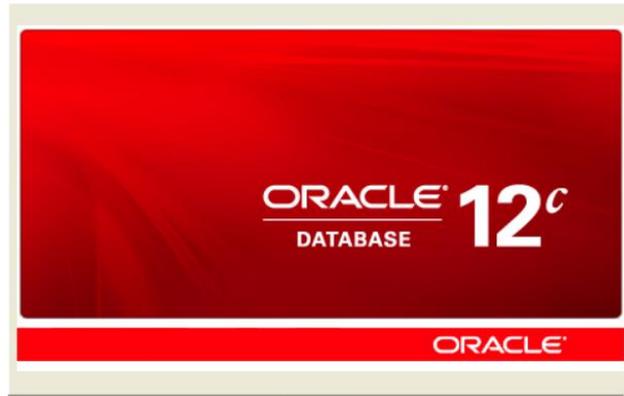
Luego de haber instalado el software Oracle vamos a crear una Base de Datos mediante el utilitario **dbca**.

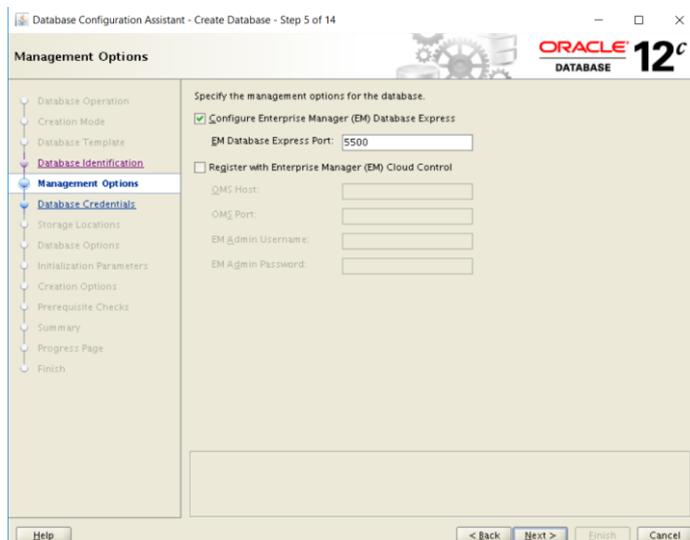
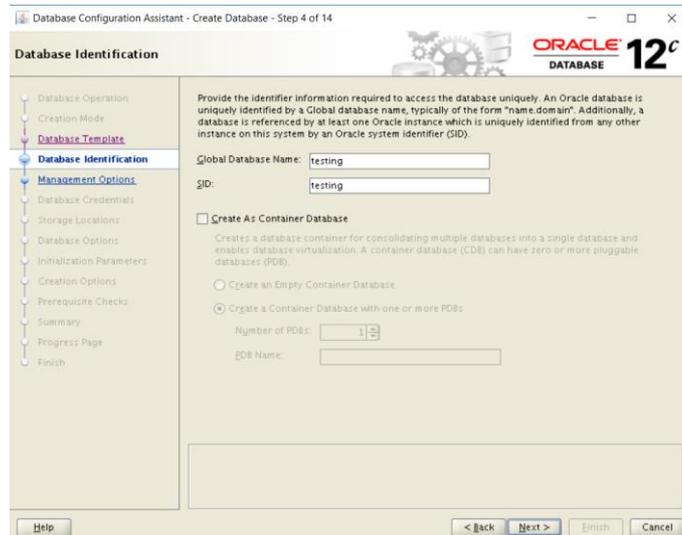
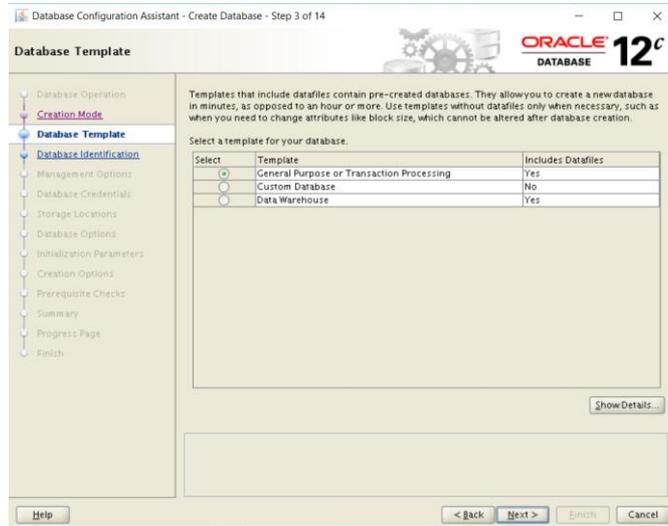
Para ejecutar el **dbca** debemos exportar la variable ORACLE_HOME con el path en donde el software Oracle fue instalado, en este caso de la siguiente manera:

```
[oracle@bddora12c ~]$ export ORACLE_HOME=/u01/app/oracle/product/12.1.0/dbhome_1
[oracle@bddora12c bin]$ export PATH=$PATH:$ORACLE_HOME/bin
```

Luego de haber setado las variables ejecutamos dbca y nos aparecerá las siguientes pantallas:

```
[oracle@bddora12c bin]$ dbca
```





Database Configuration Assistant - Create Database - Step 6 of 14

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		

Use the Same Administrative Password for All Accounts

Password:

Confirm Password:

Messages:

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.

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

Database Configuration Assistant - Create Database - Step 7 of 15

Network Configuration

Listener Selection

Listeners from Grid Infrastructure home and Database Oracle home are listed below. To create a new listener in Database Oracle home, specify the listener name and port.

Select Listeners:

Select	Name	Port	Oracle Home	Status
<input checked="" type="checkbox"/>	LISTENER	1521	/u01/app/grid/product/12.1.0/grid	Up

Create a New Listener

Listener Name:

Listener Port:

Target Oracle Home: /u01/app/oracle/product/12.1.0/dbhome_1

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

Database Configuration Assistant - Create Database - Step 8 of 15

Storage Locations

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)

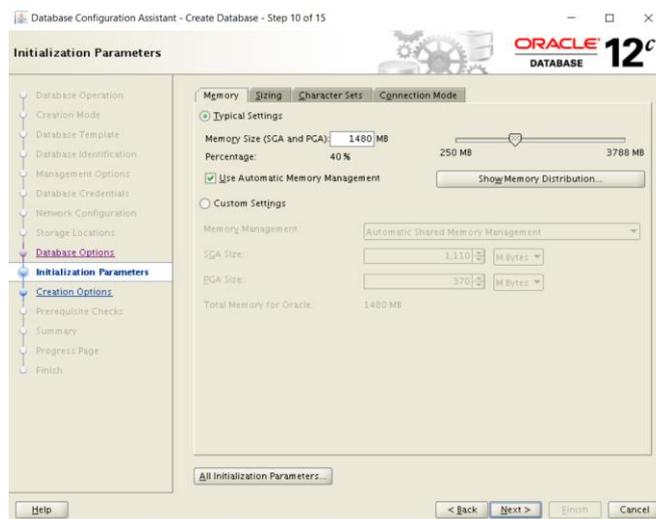
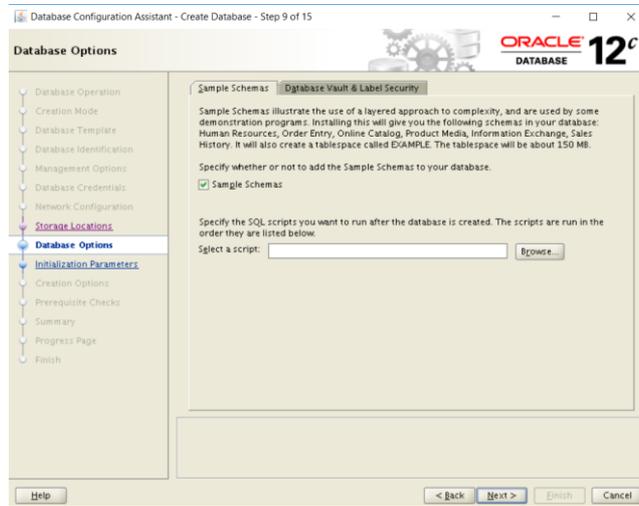
Specify Fast Recovery Area

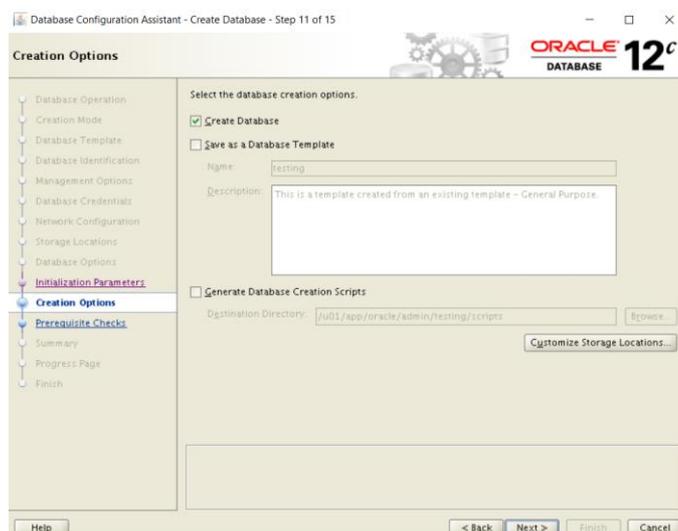
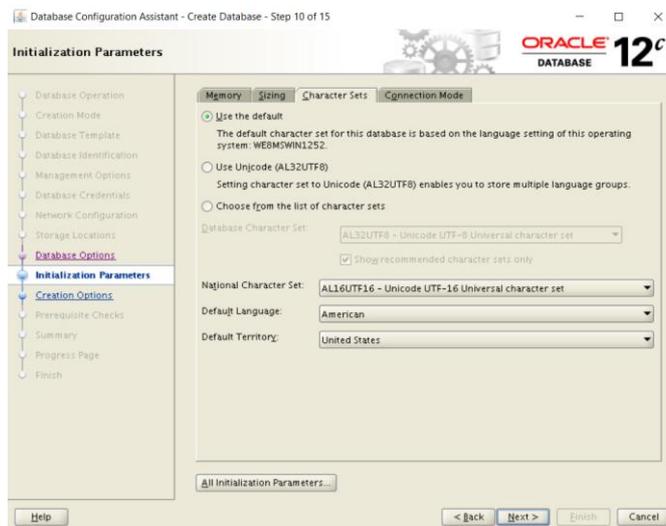
Fast Recovery Area:

Fast Recovery Area Size: MB

Enable Archiving

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





Database Configuration Assistant - Create Database - Step 13 of 15

ORACLE DATABASE 12c

Summary

Database Configuration Assistant: Summary

Create Database - Summary

Database Configuration Summary

Global Database Name: testing
 Database Configuration Type: Oracle Restart Enabled Single Instance
 SID: testing
 Create As Container Database: No
 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
Oracle Multimedia	true
Oracle OLAP	true
Oracle Spatial	true
Oracle Label Security	true

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

Database Configuration Assistant - Create Database - Step 14 of 15

ORACLE DATABASE 12c

Progress Page

Progress

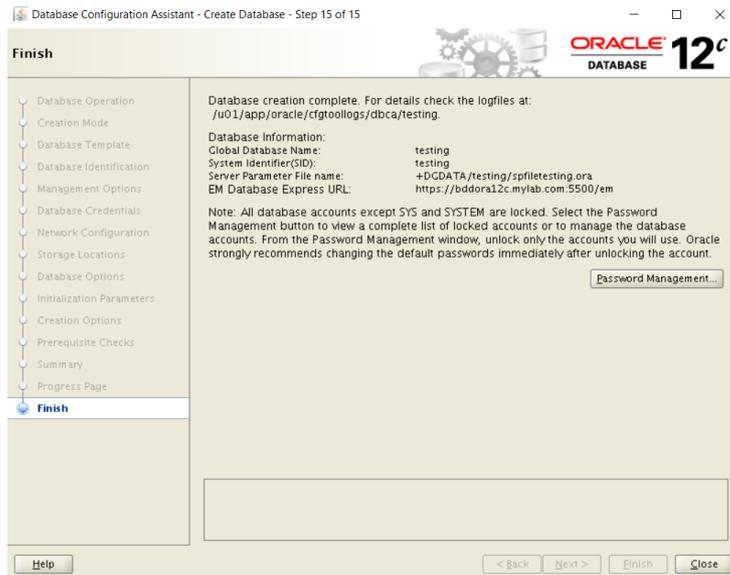
Clone database "testing" creation in progress...

16%

Steps	Status
Registering database with Oracle Restart	Finished
Copying database files	In Progress
Creating and starting Oracle instance	
Completing Database Creation	

Activity Log | Alert Log

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



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<http://www.polluxdata.com>

Muchas gracias por confiar en PolluxData.

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