

## 18c GI/RAC 安装指南

本文包含 18c GI/RAC step-by-step 的安装步骤，同时也包含 dbca 创建数据库的过程。

注意：这篇文章只是展示 18c GI/RAC 的安装过程，以测试为目的。如果您希望以该文作为您生产系统安装文档，请进行充分的测试并根据您的需求进行更改。

### 1. 关闭 SELINUX, 防火墙

```
vi /etc/selinux/config
```

```
SELINUX=disabled
```

```
chkconfig sendmail off
```

```
chkconfig smartd off
```

```
chkconfig iptables off
```

```
chkconfig ip6tables off
```

```
service iptables stop
```

```
service ip6tables stop
```

修改 /etc/pam.d/login 文件

```
session required pam_limits.so
```

### 2. 创建 GI/RAC 需要的 OS 组 and 用户

```
userdel -r oracle
```

```
userdel -r grid
```

```
groupdel oinstall
```

```
groupdel dba
```

```
groupdel asmadmin
```

```
groupdel asmdba
```

```
groupdel asmoper
```

```
groupadd -g 501 oinstall
```

```
groupadd -g 502 dba
```

```
groupadd -g 503 asmadmin
```

```
groupadd -g 504 asmdba
```

```
groupadd -g 505 asmoper
```

```
/usr/sbin/useradd -g oinstall -G asmadmin,asmdba,asmoper grid
```

```
/usr/sbin/useradd -g oinstall -G dba,asmdba oracle
```

```
passwd oracle
```

```
passwd grid
```

### 3. 配置 VIP 和 SCAN-IP

```
vim /etc/hosts
```

```
# Public
10.10.2.11 node1
10.10.2.12 node2
# VIPs
10.10.2.21 node1-v
10.10.2.22 node2-v
# Private
192.168.2.11 node1-i private1
192.168.2.12 node2-i private2
# Cluster name - 'testclu'
# SCAN
10.10.2.50 testclu-scan
```

#### 4. 设置 NTP

```
service ntpd stop
chkconfig ntpd off
rm /var/run/ntpd.pid
mv /etc/ntp.conf /etc/ntp.conf.org
```

#### 5. 5. 本次采用 NFS 方式提供共享存储功能

5.1 关于 NFS 的搭建，在这里不进行详细描述，非常简单，可以参考系统文档  
可以单独安装 NFS Server 或者将集群中一个节点作为 NFS Server 进行提供 NFS 服务。

#### 5.2 使用 dd 命令，创建 ASM 设备

例如：

```
dd if=/dev/zero of=/oracleasm/oracleasm/disks/asm1 bs=8192k count=1280
dd if=/dev/zero of=/oracleasm/oracleasm/disks/asm2 bs=8192k count=1280
dd if=/dev/zero of=/oracleasm/oracleasm/disks/asm3 bs=8192k count=1280
dd if=/dev/zero of=/oracleasm/oracleasm/disks/asm4 bs=8192k count=1280
dd if=/dev/zero of=/oracleasm/oracleasm/disks/asm5 bs=8192k count=1280
```

#### 5.3 设置 NFS 文件正确的权限：

```
chown grid:asmadmin /u02/oracleasm/disks/asm1
chown grid:asmadmin /u02/oracleasm/disks/asm2
chown grid:asmadmin /u02/oracleasm/disks/asm3
chown grid:asmadmin /u02/oracleasm/disks/asm4
chown grid:asmadmin /u02/oracleasm/disks/asm5
chmod 660 /u02/oracleasm/disks/asm1
chmod 660 /u02/oracleasm/disks/asm2
chmod 660 /u02/oracleasm/disks/asm3
chmod 660 /u02/oracleasm/disks/asm4
```

```
chmod 660 /u02/oracleasm/disks/asm5
```

6.

创建 Inventory 目录

```
mkdir -p /u01/app/oraInventory  
chown -R grid:oinstall /u01/app/oraInventory  
chmod -R 775 /u01/app/oraInventory
```

创建 Grid Base 目录

```
mkdir -p /u01/app/grid  
chown -R grid:oinstall /u01/app/grid
```

创建 Grid Home 目录

```
mkdir -p /u01/app/18.3.0/grid  
chown -R grid:oinstall /u01/app/18.3.0/grid  
chmod -R 775 /u01/app/18.3.0/grid
```

创建 Oracle Base 目录

```
mkdir -p /u01/app/oracle  
mkdir -p /u01/app/oracle/cfgtoollogs  
chown -R oracle:oinstall /u01/app/oracle  
chmod -R 775 /u01/app/oracle
```

创建 Oracle Home 目录

```
mkdir -p /u01/app/oracle/product/18.3.0/dbhome_1  
chown -R oracle:oinstall /u01/app/oracle/product/18.3.0/dbhome_1  
chmod -R 775 /u01/app/oracle/product/18.3.0/dbhome_1
```

7. 修改 .bash\_profile 文件，设置环境变量

```
~grid~
```

```
export ORACLE_SID=+ASM1(+ASM2)  
export ORACLE_BASE=/u01/app/grid  
export ORACLE_HOME=/u01/18.3.0/grid  
export PATH=$ORACLE_HOME/bin:$PATH  
export LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib  
export CLASSPATH=$ORACLE_HOME/JRE:$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib  
export ORACLE_SRVM_REMOTESHELL=/usr/local/bin/ssh  
export ORACLE_SRVM_REMOTECOPY=/usr/local/bin/scp
```

```
~oracle~
```

```
export ORACLE_SID=orcl1(orcl2)  
export ORACLE_BASE=/u01/app/oracle
```

```
export ORACLE_HOME=/u01/app/oracle/product/18.3.0/db_1
export PATH=$ORACLE_HOME/bin:$PATH
export LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib
export CLASSPATH=$ORACLE_HOME/JRE:$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib
```

#### 8. 修改 /etc/sysctl.conf 文件中的内核参数

```
fs.aio-max-nr = 1048576
fs.file-max = 6815744
kernel.shmni = 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 = 1048576
```

#### 9. 修改 /etc/security/limits.conf 文件中的资源限制

```
grid soft nproc 2047
grid hard nproc 16384
grid soft nofile 1024
grid hard nofile 65536
grid soft stack 10240
oracle soft nproc 2047
oracle hard nproc 16384
oracle soft nofile 1024
oracle hard nofile 65536
oracle soft stack 10240

oracle soft memlock 3145728
oracle hard memlock 3145728
```

#### 10. 安装 RPM 包

```
# yum install oracle-database-preinstall-18c
```

#### 11. 下载介质

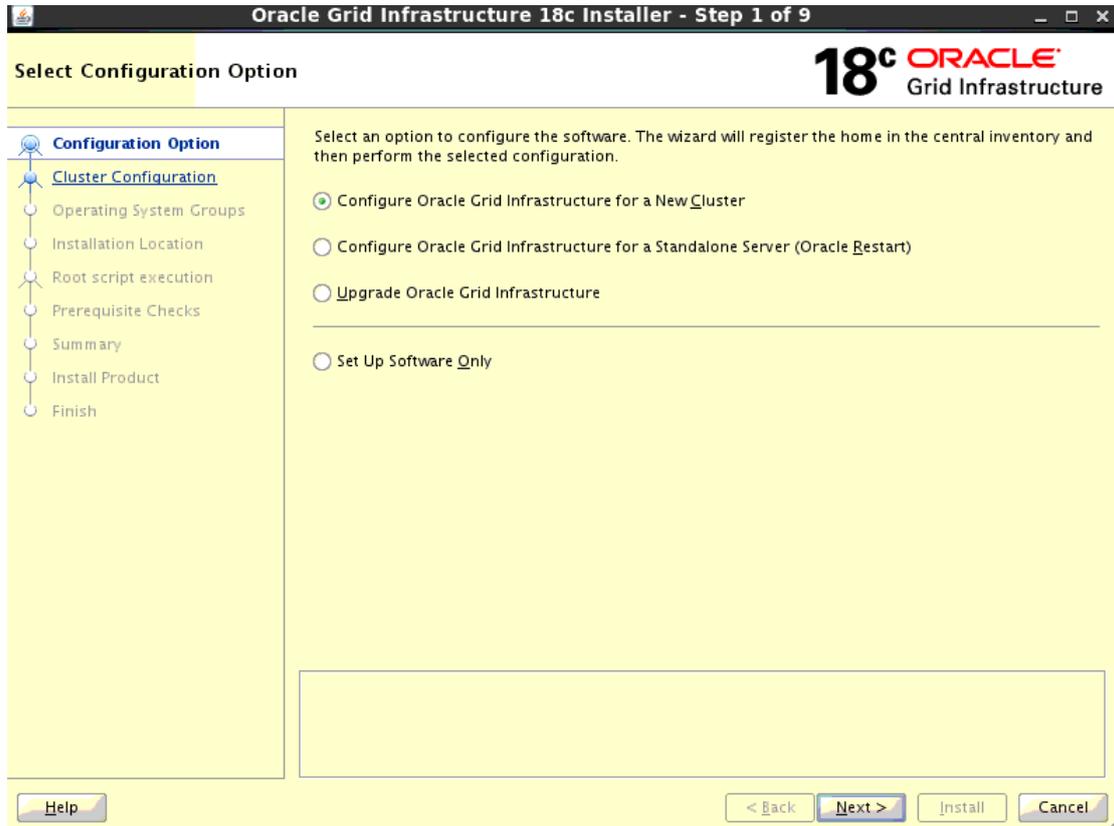
```
LINUX.X64_180000_grid_home.zip
LINUX.X64_180000_db_home.zip
```

将 LINUX.X64\_180000\_grid\_home.zip 以 grid 用户解压在 GRID\_HOME 下  
将 LINUX.X64\_180000\_db\_home.zip 以 oracle 用户解压在 GRID\_HOME 下

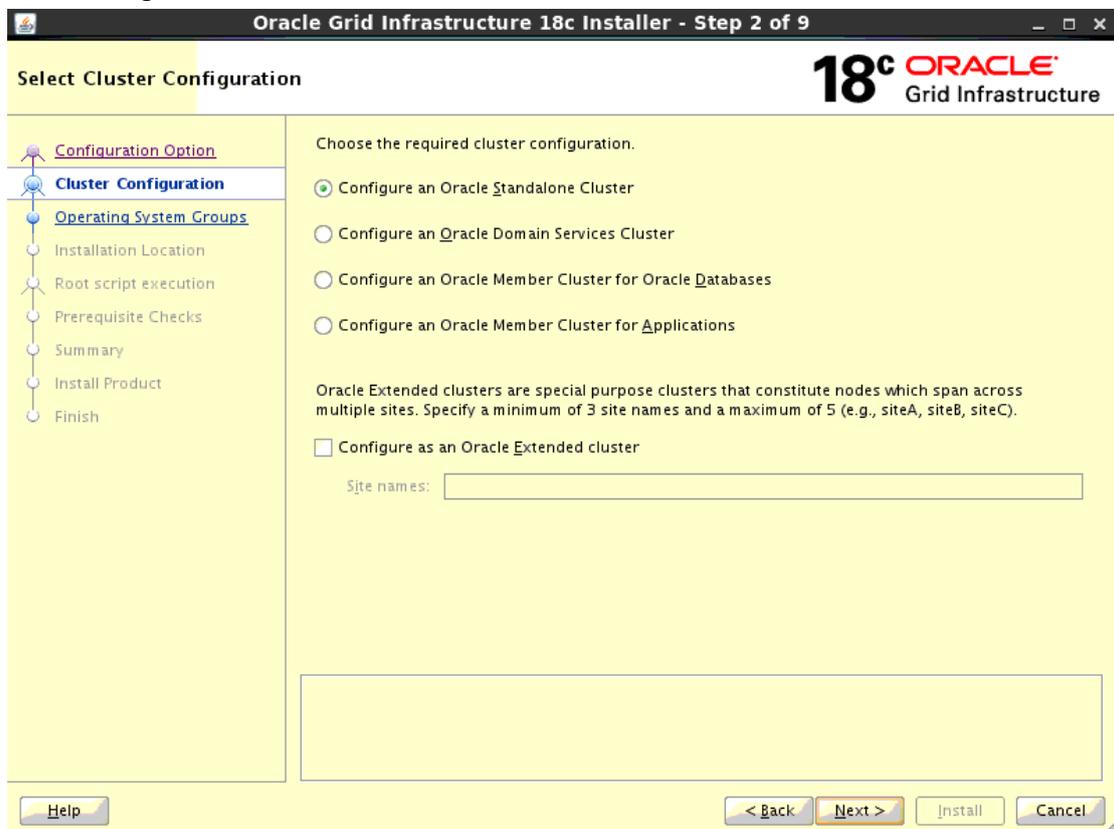
## 安装 GI

以 grid 用户在 \$ORACLE\_HOME 下执行 ./gridSetup.sh

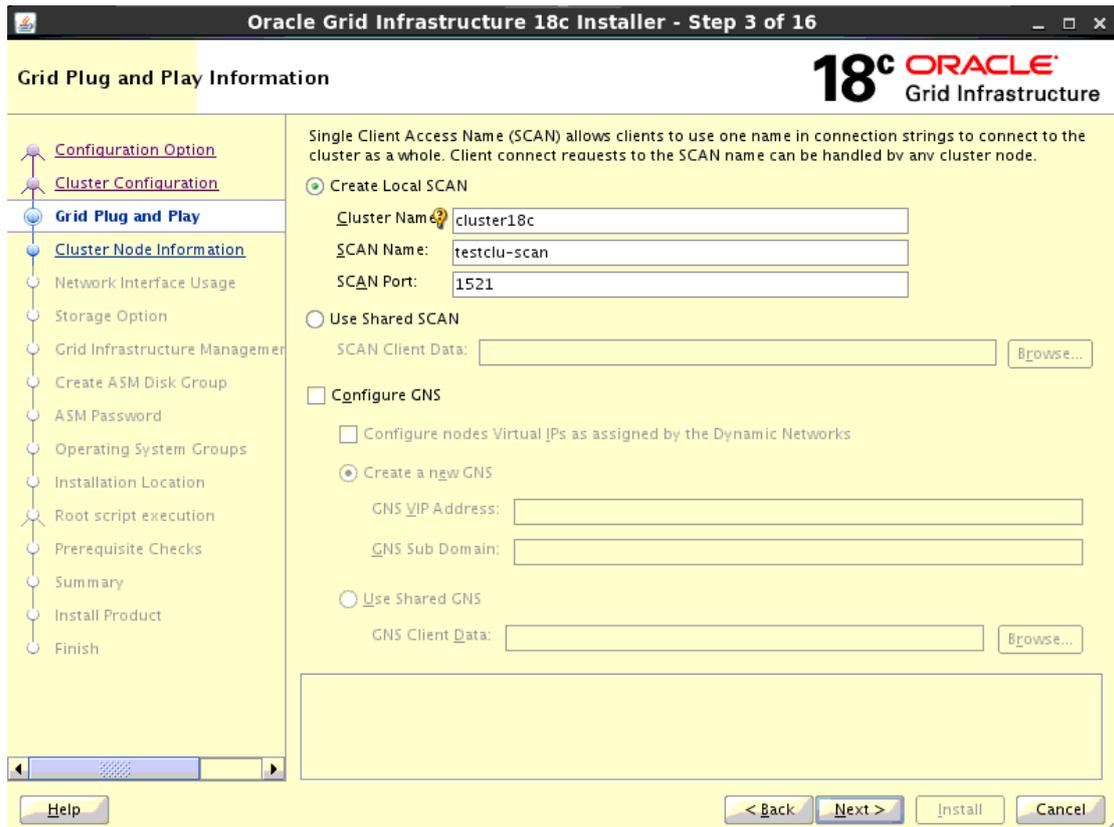
选择“Configure Oracle Grid Infrastructure for a New Cluster”, 点击 Next



选择“Configure an Oracle Standalone Cluster”, 点击Next。



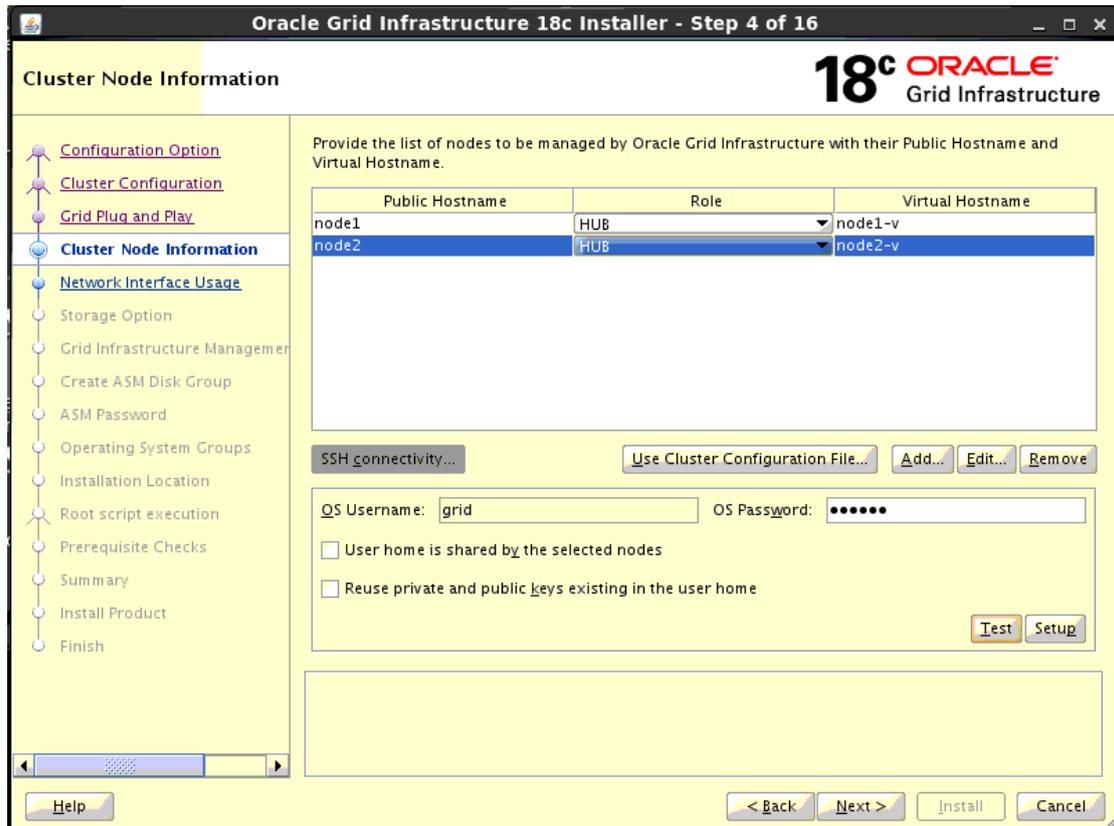
更改 Cluster Name 和 SCAN Name, 本测试不使用 GNS, 点击 Next



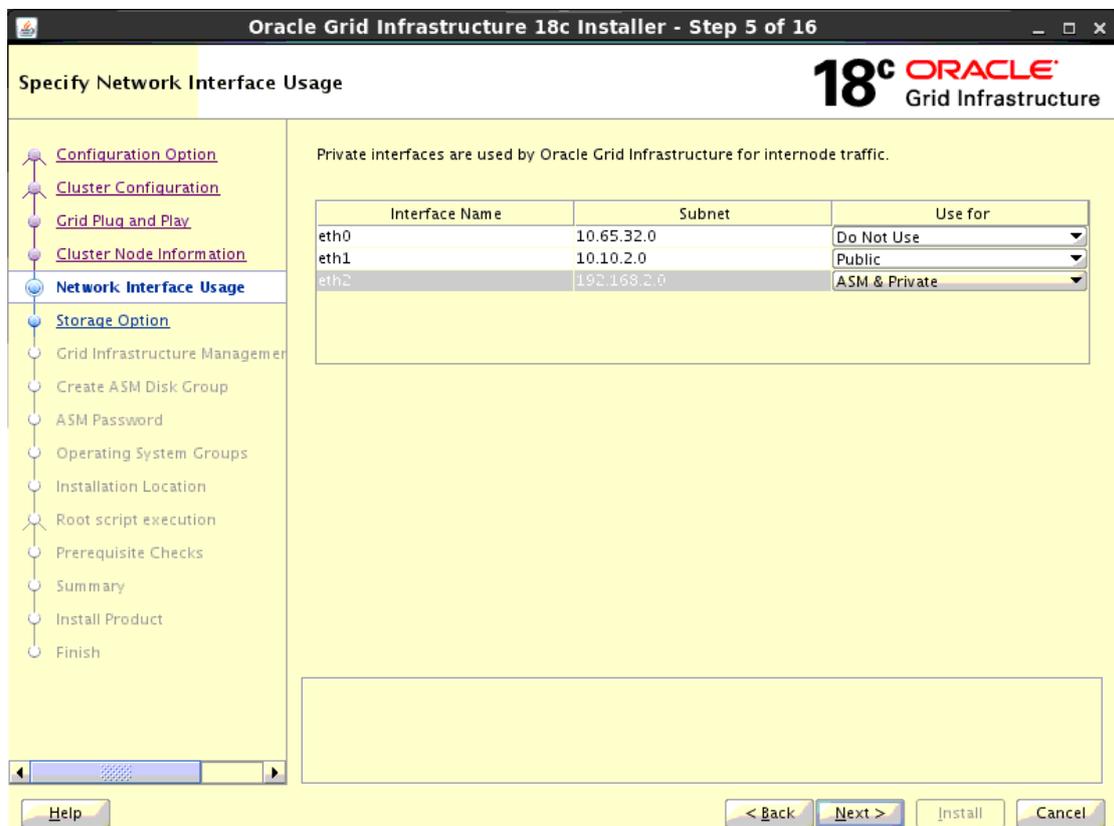
点击 Add, 添加 node2



点击 SSH connectivity, 配置用户等效性, 输入 grid 用户的密码, 点击 Setup, 配置成功后, 点击 Test 测试成功后, 点击 Next



选择配置私有网卡和公有网卡, 点击 Next



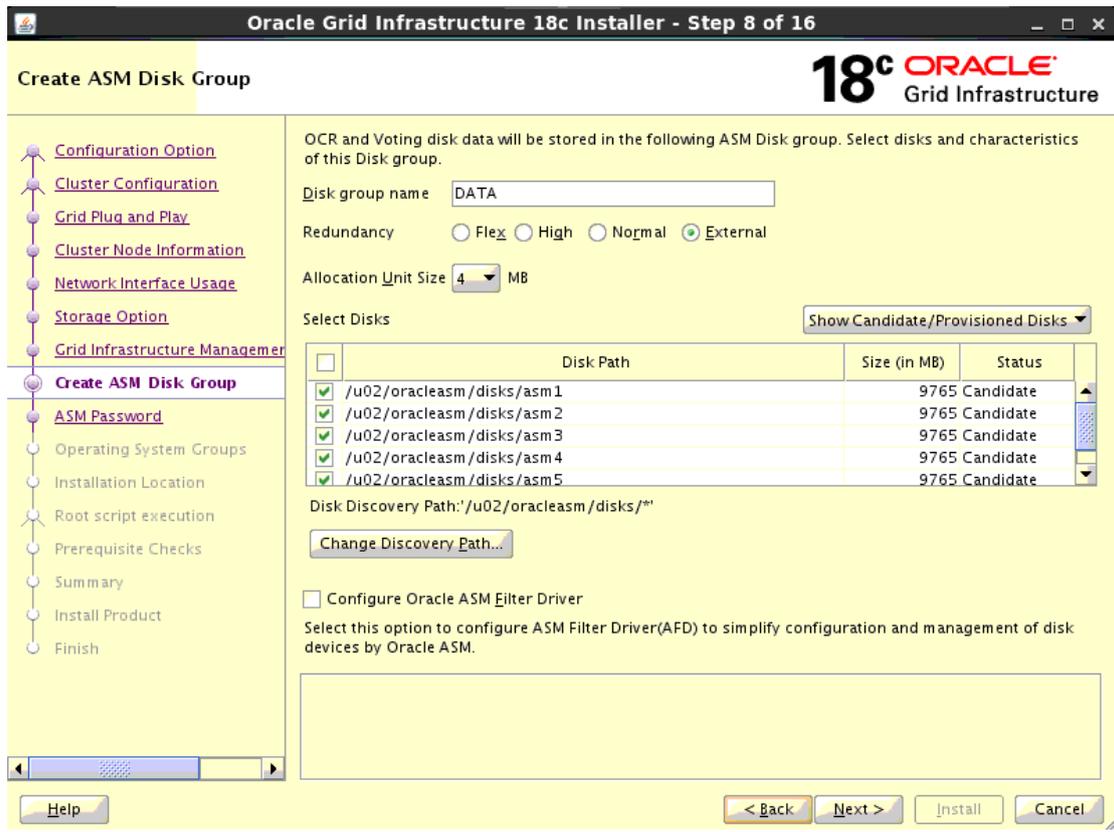
选择“Configure ASM using block devices”,点击 Next



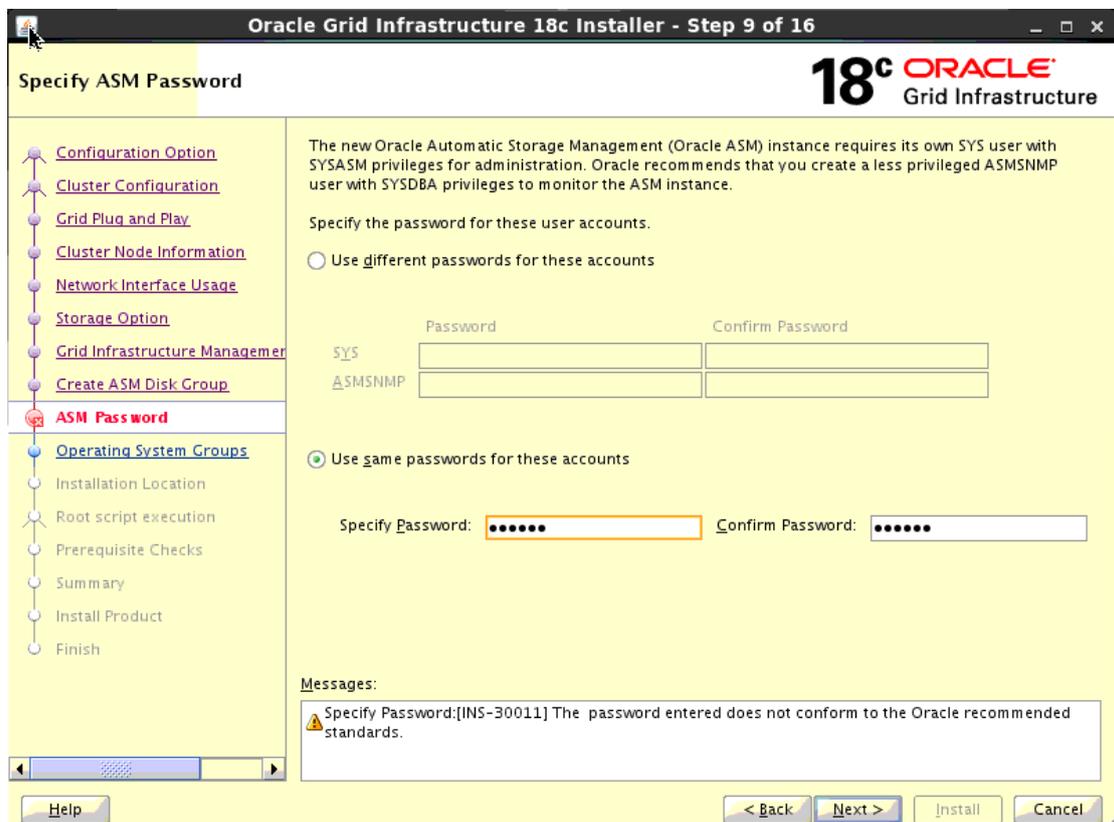
本测试把 GIMR 和 Voting disk, OCR 放置在同一个 DG, 因此选择 NO, 点击 Next



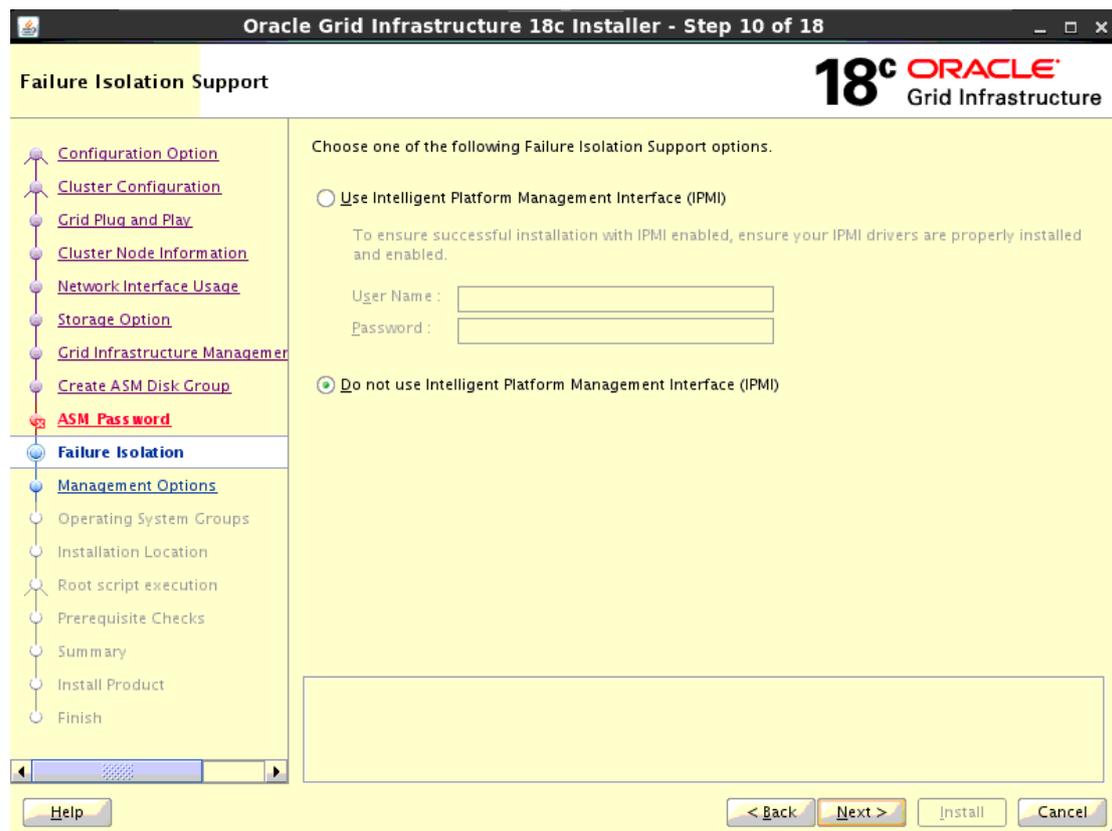
输入Disk Group Name: DATA, 本次测试Redundancy 选择External , 选择磁盘, 如果列表中没有显示出可用磁盘, 点击Change Discovery Path, 输入“/dev/asm\*”。点击Next



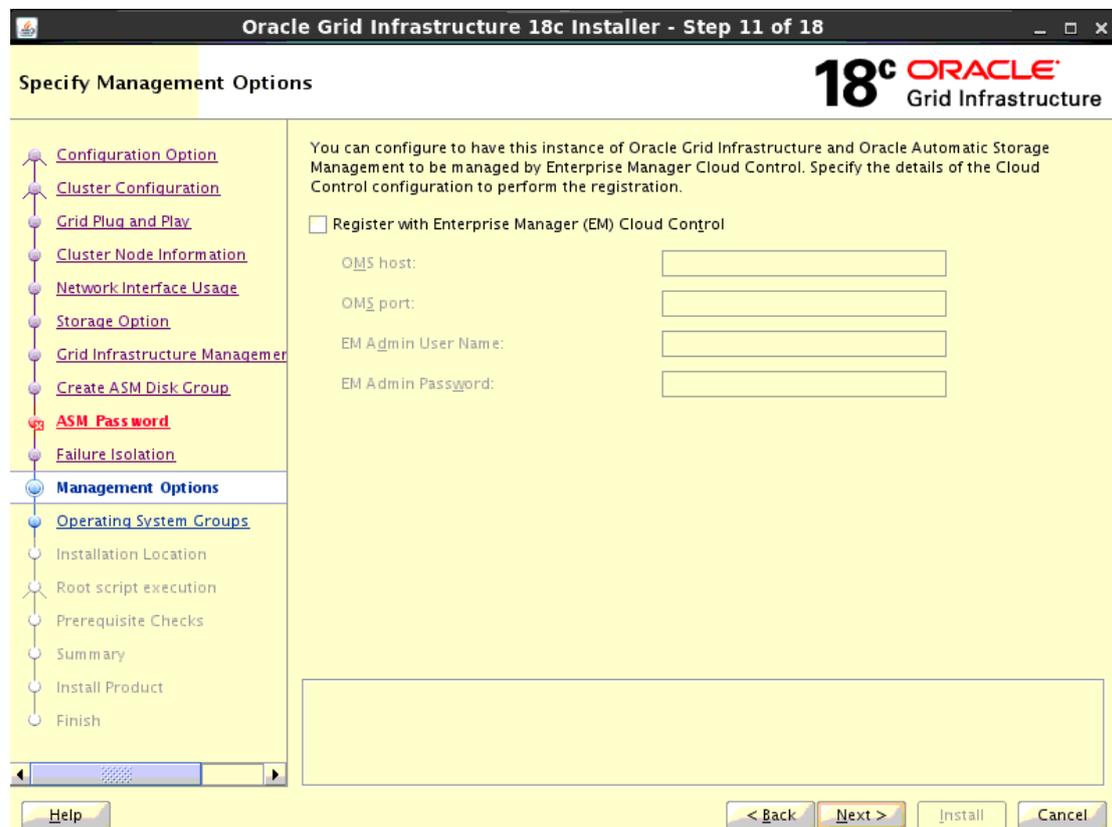
输入ASM实例相关密码, 点击Next



选择“Do not use Intelligent Platform Management Interface(IPMI)”,点击 Next



配置是否注册到 EM cloud Control, 点击 Next



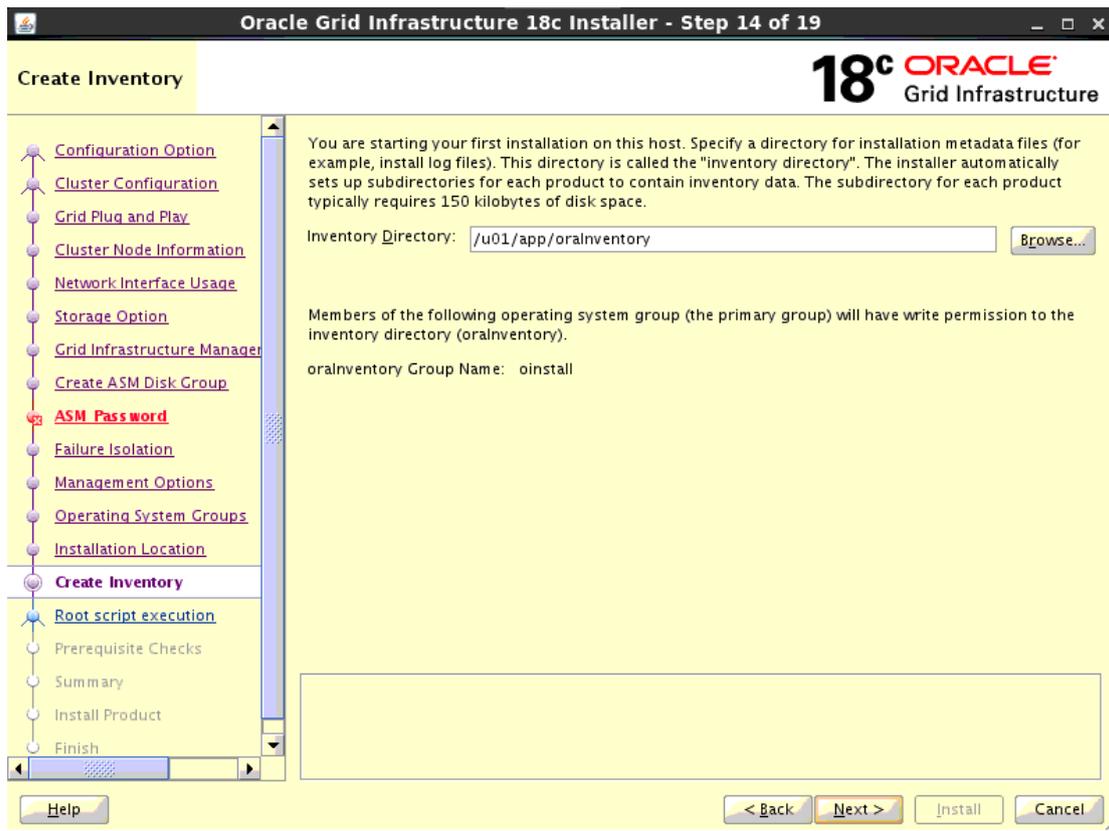
配置管理组， 点击 Next



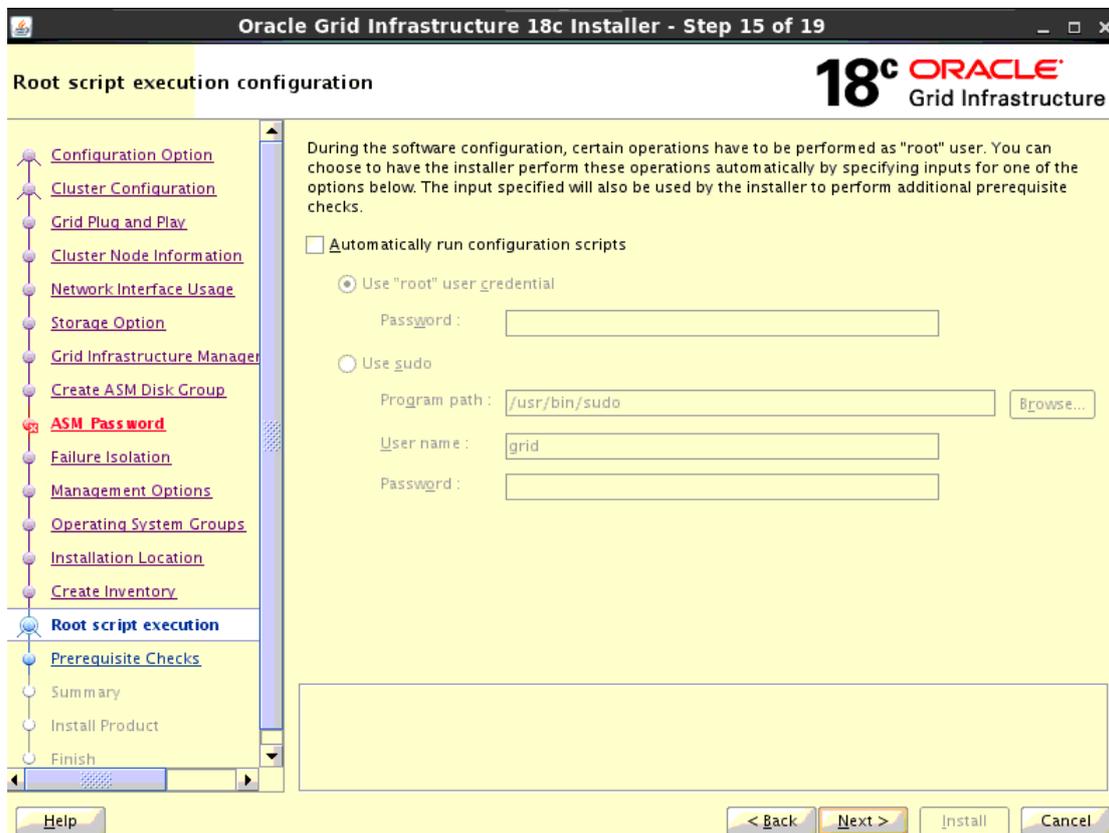
设置 GRID Base 目录， 点击 Next



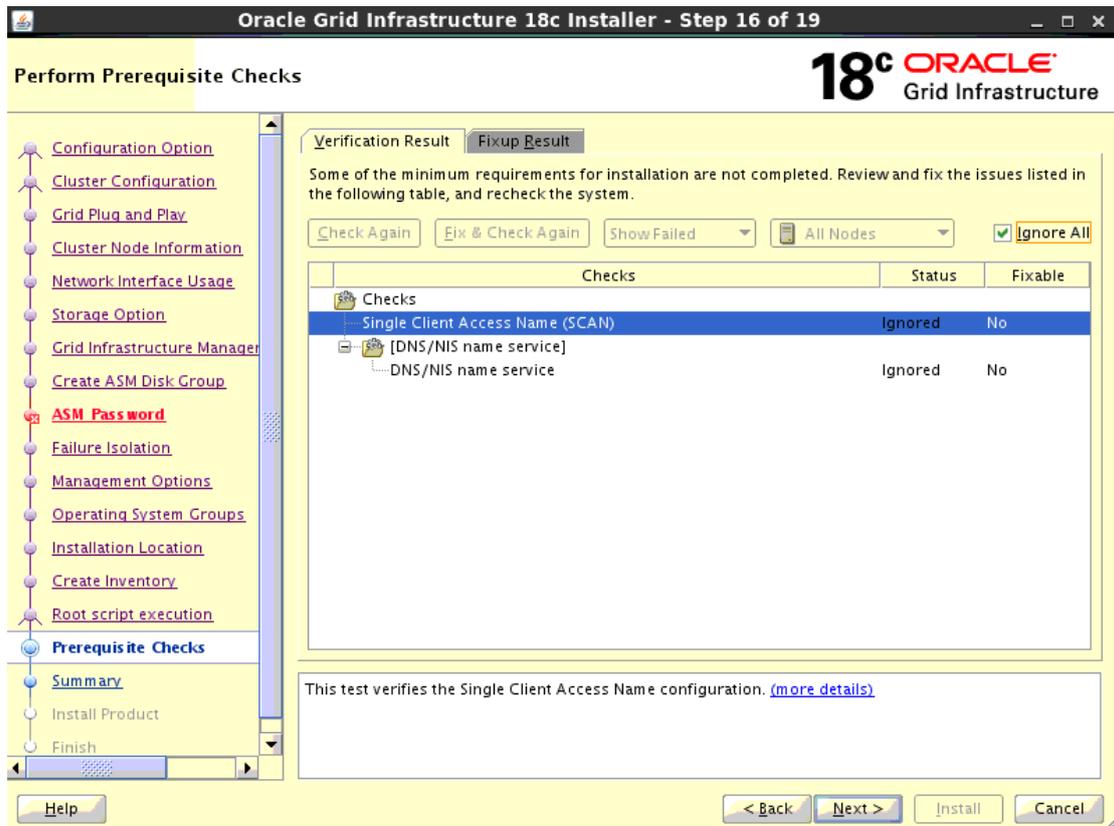
设置Inventory 目录， 点击Next



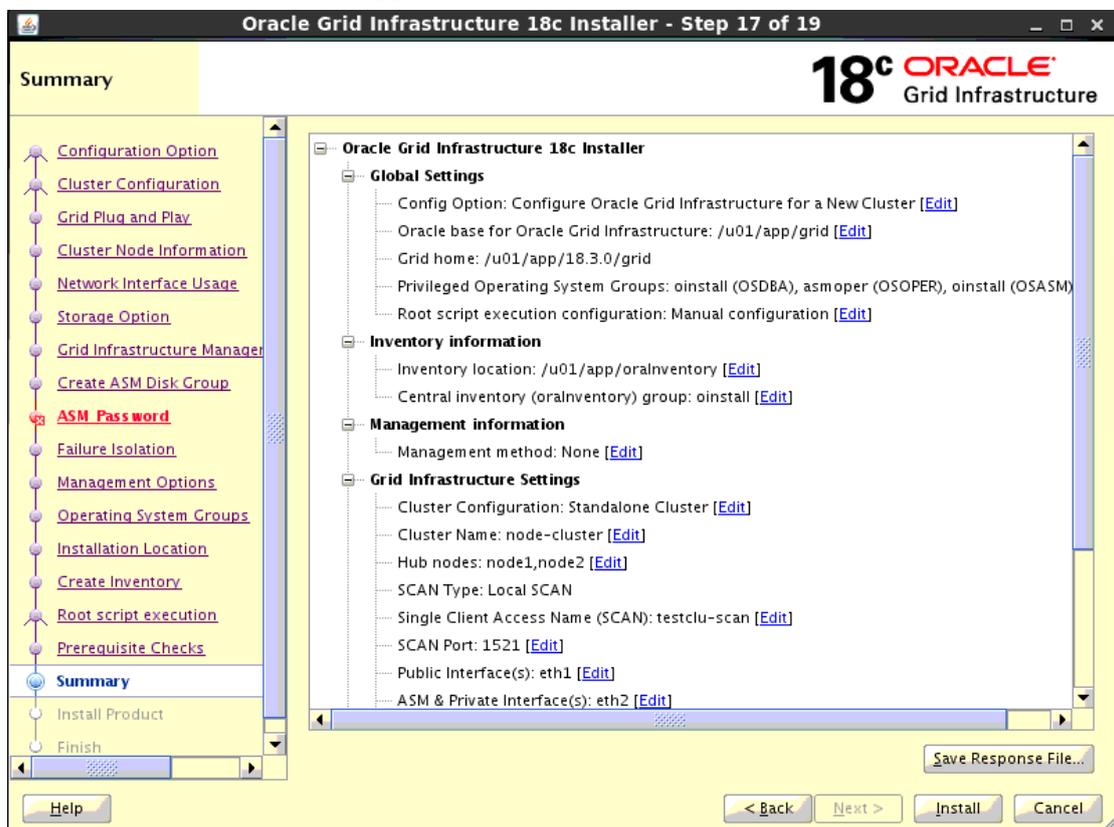
18c 中，安装可以自动执行 root.sh，本次测试选择手动运行。



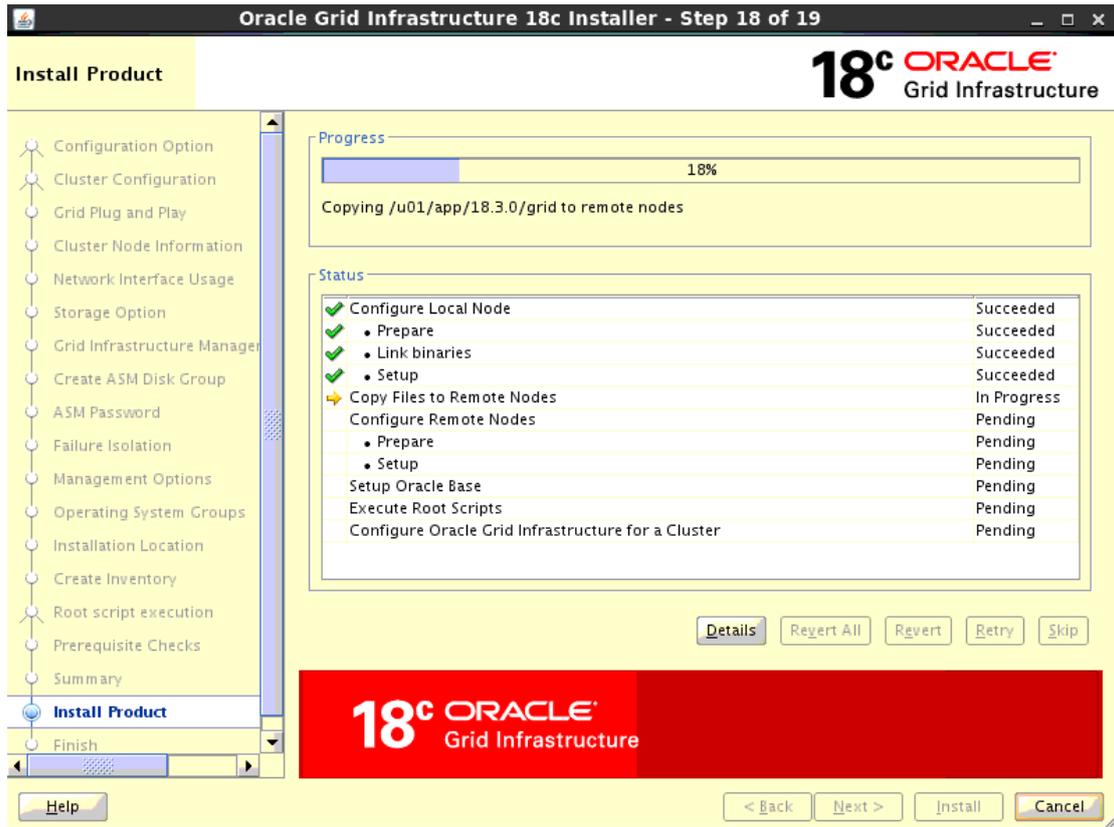
进行 Prerequisite Checks, 对于结果中 Fixable 的问题, 点击 Fix&Check Again, 按照提示进行修复, 对于可以忽略的错误, 选择 “Ignore All”, 本测试没有配置 DNS, 因此选择忽略, 点击 Next。



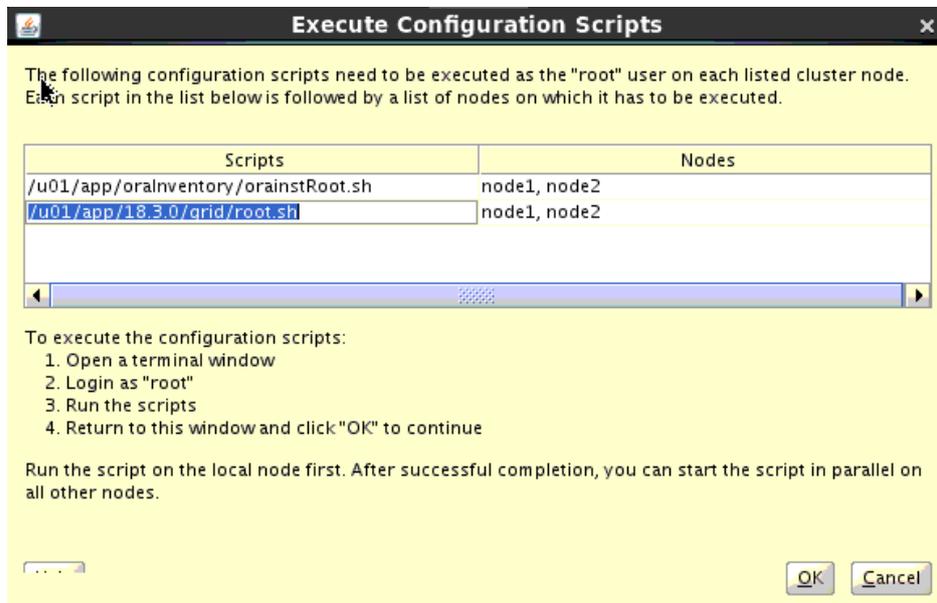
列出之前安装配置的信息, 检查正确无误后, 点击 Next



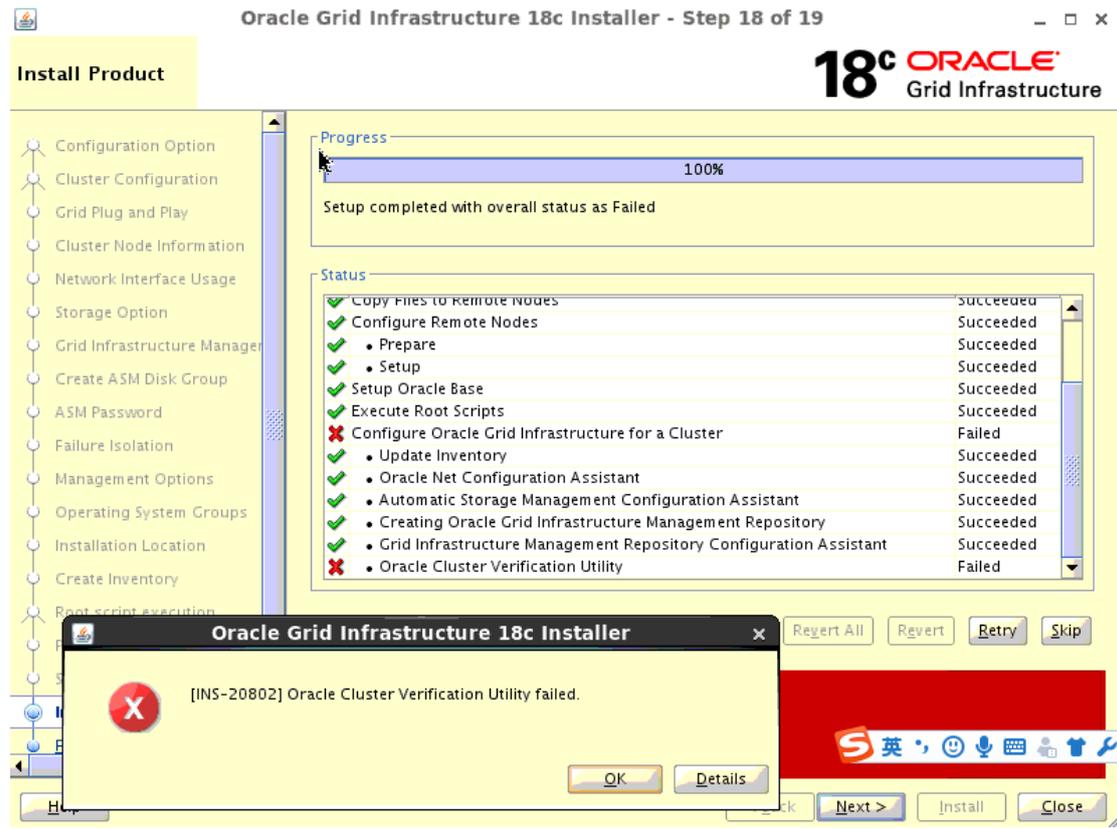
## 开始安装



以 root 用户分别先在 node1 执行脚本，然后在 node2 执行脚本。



安装完成

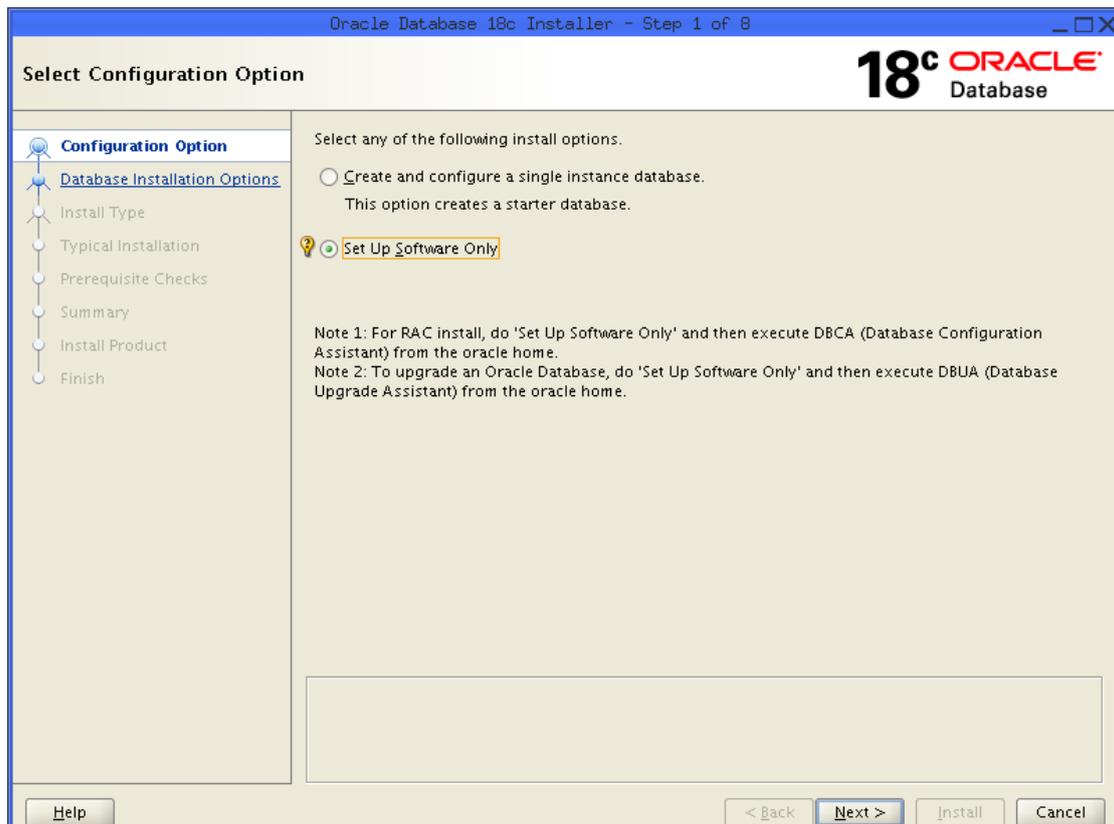


由于本测试仅在 hosts 文件中设置了一个 SCAN IP，因此 Cluster Verification 的错误可以忽略。

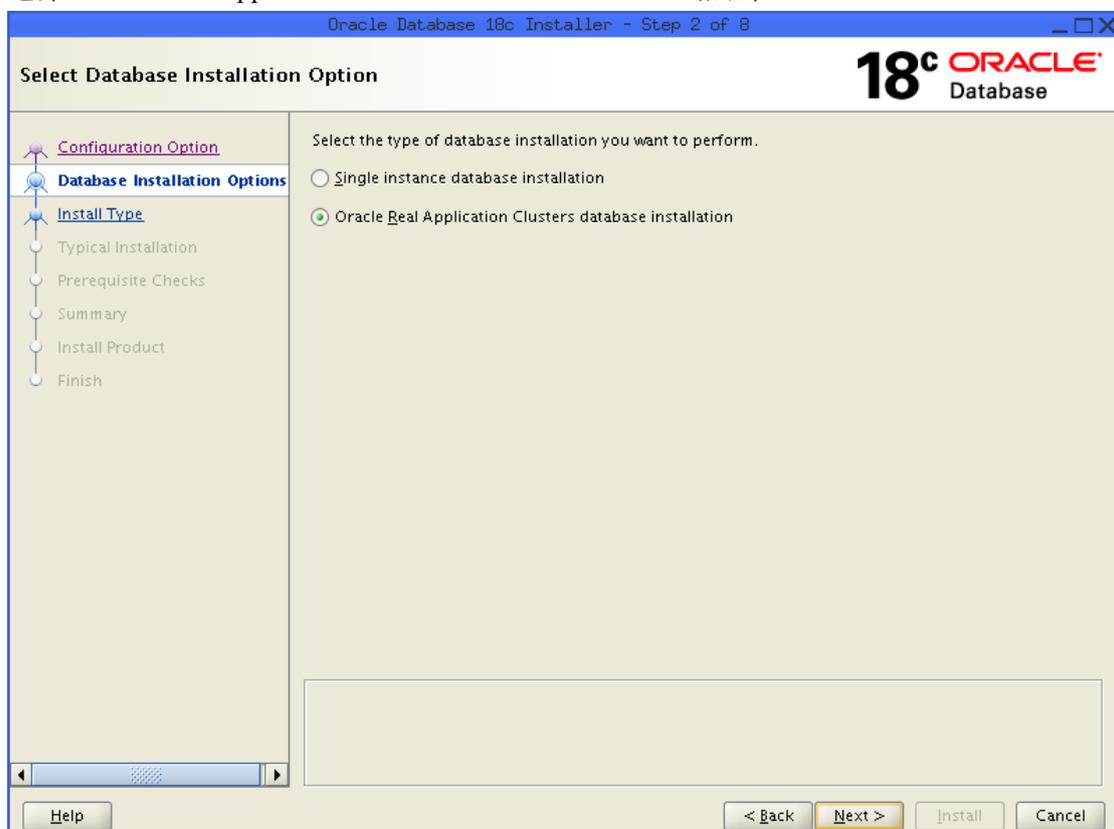
GRID 安装完成。

## 安装 DB 软件

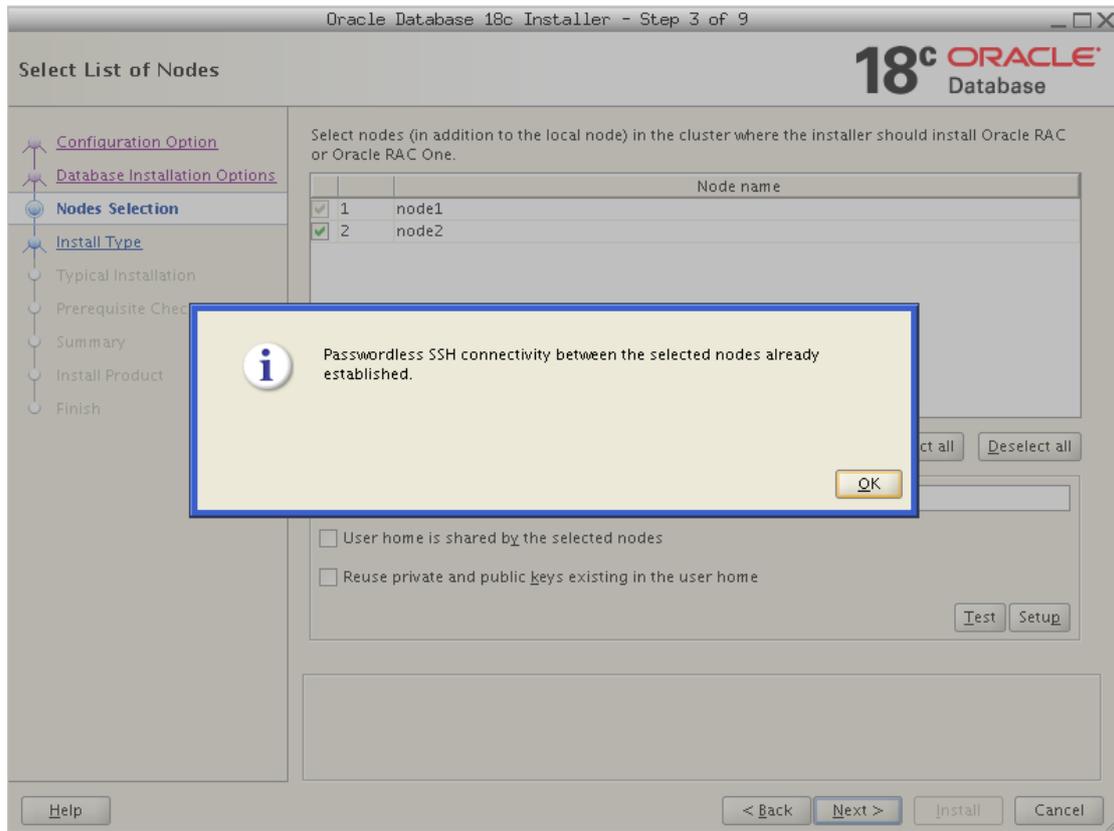
以 oracle 用户在 \$ORACLE\_HOME 下执行 `./runInstaller` , 选择 Set Up Software Only, 点击 Next。



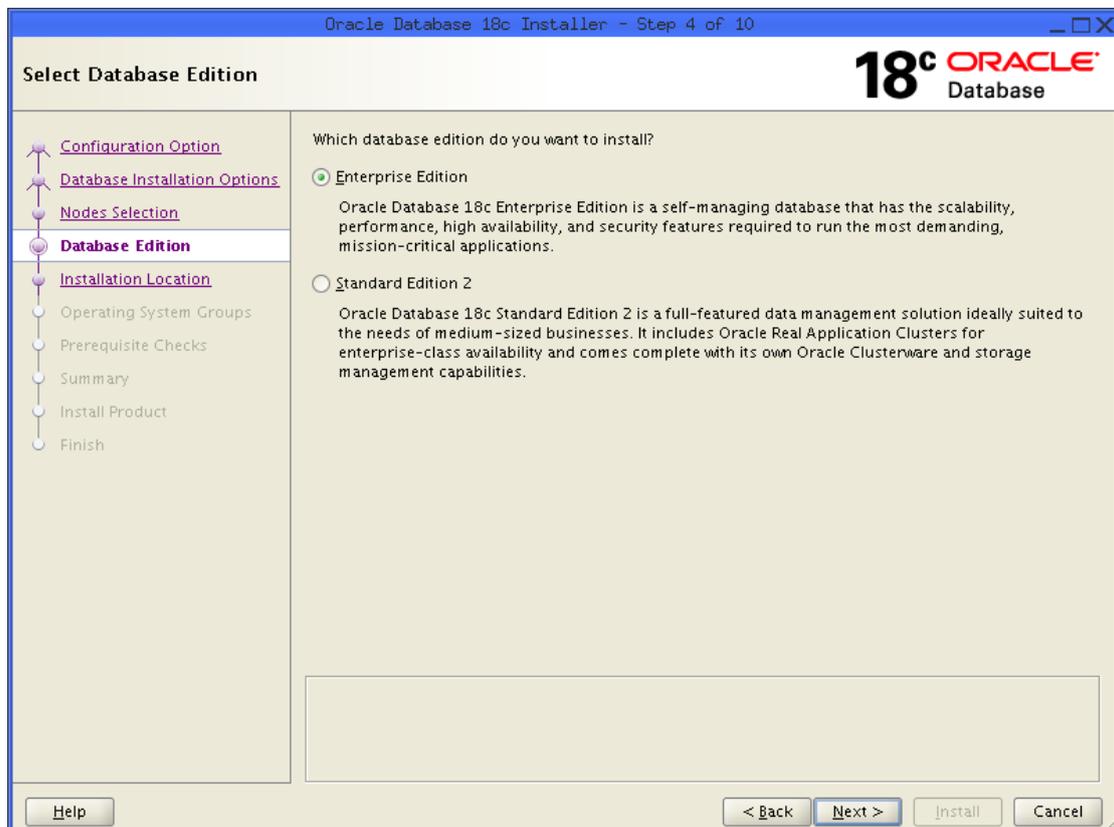
选择“Oracle Real Application Clusters database installation”, 点击 Next。



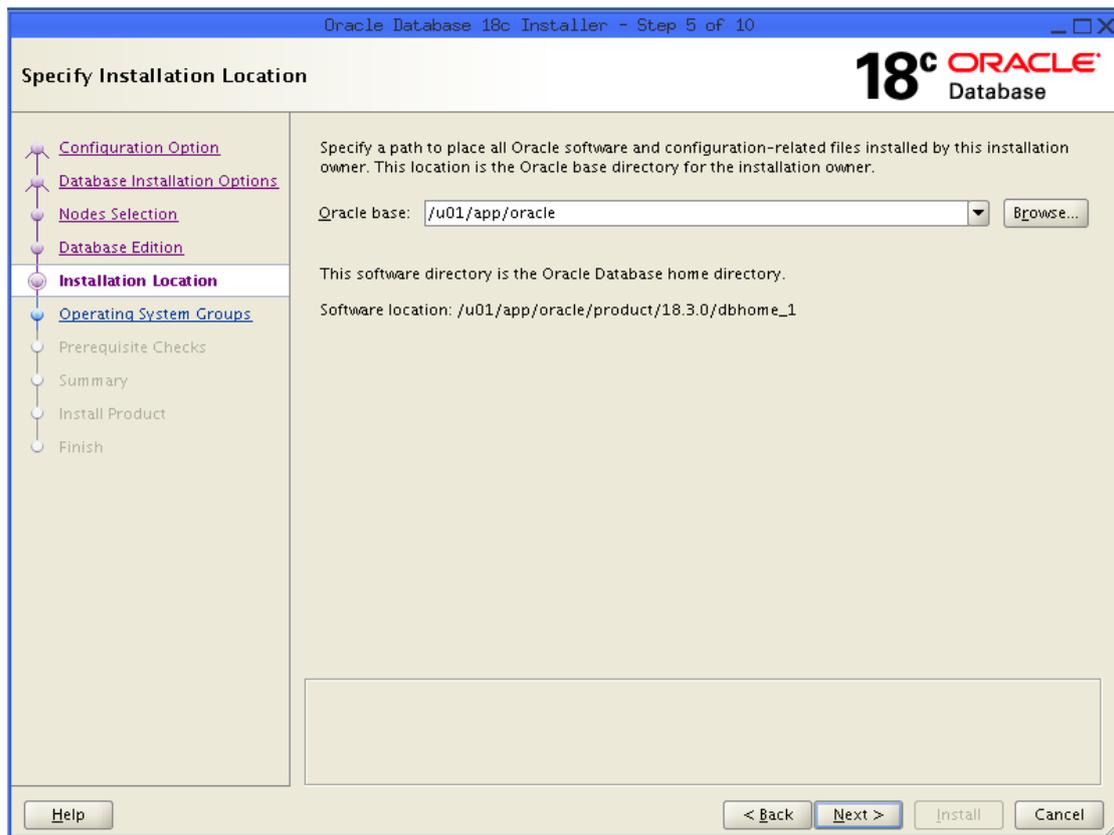
点击Select all，选择所有节点，点击SSH Connectivity，配置用户等效性，配置成功后，点击Next。



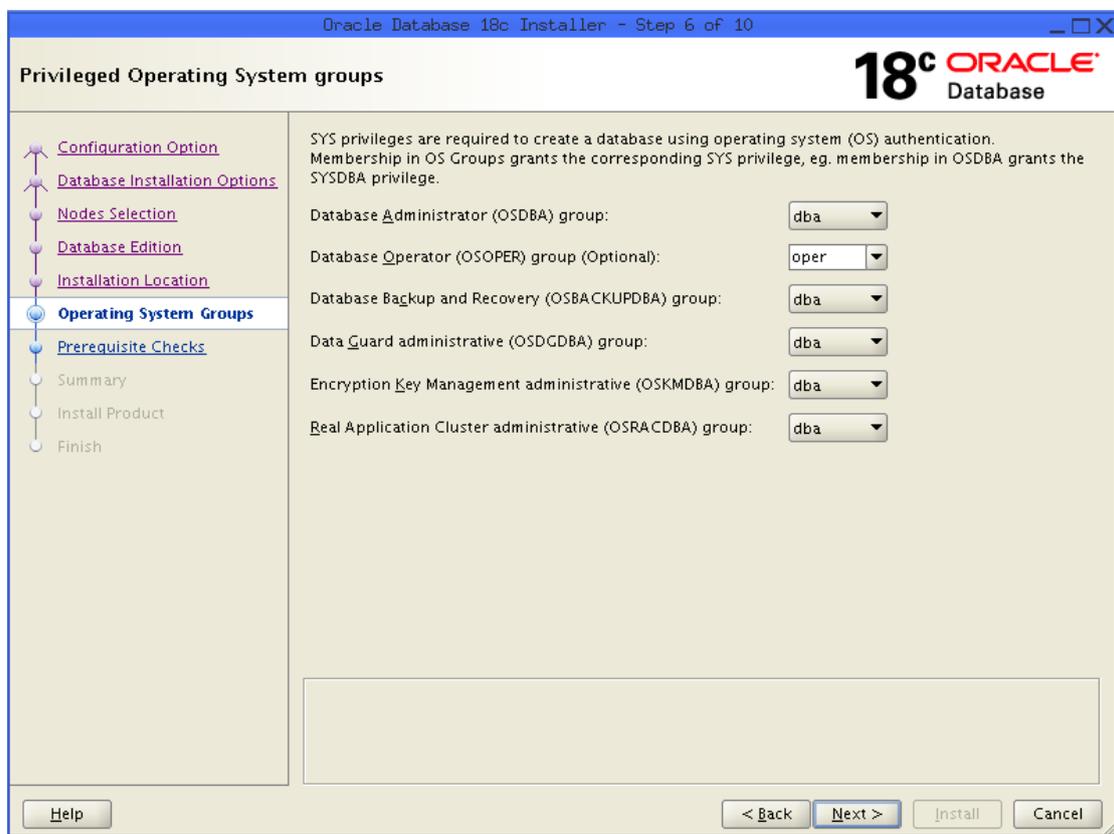
选择“Enterprise Edition”，点击Next。



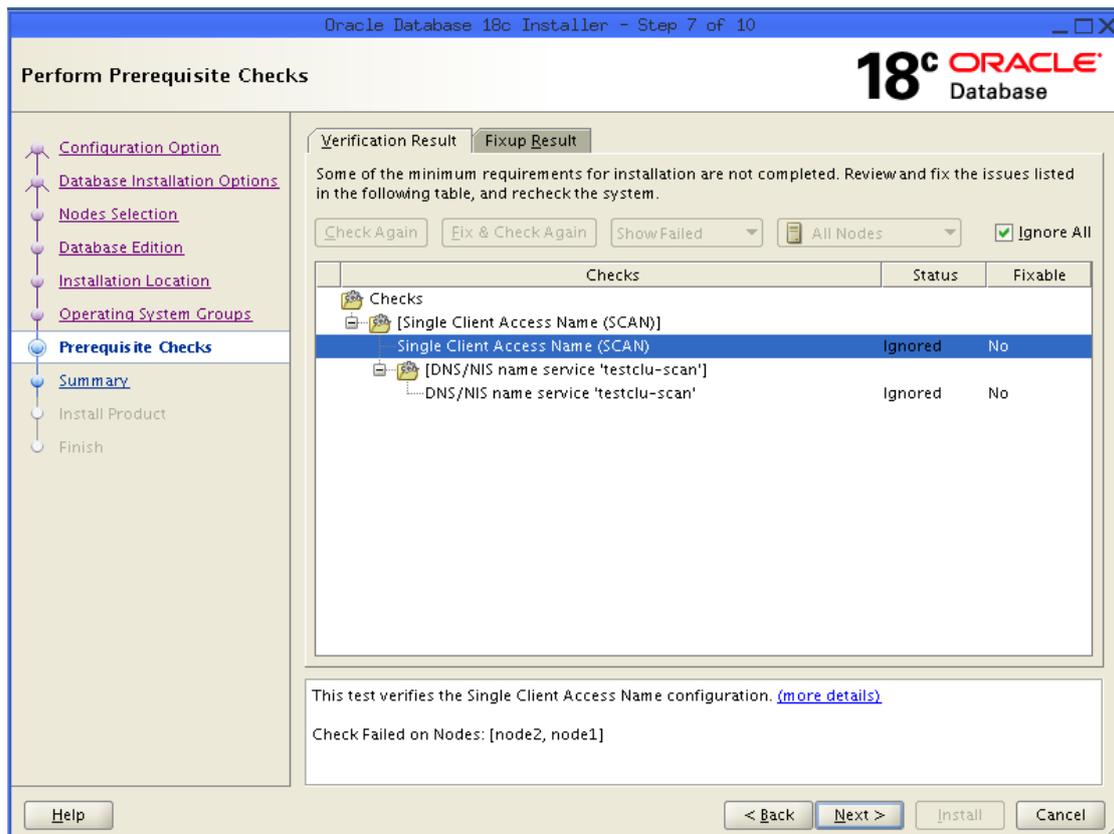
设置 Oracle base 和 Oracle home, 点击 Next



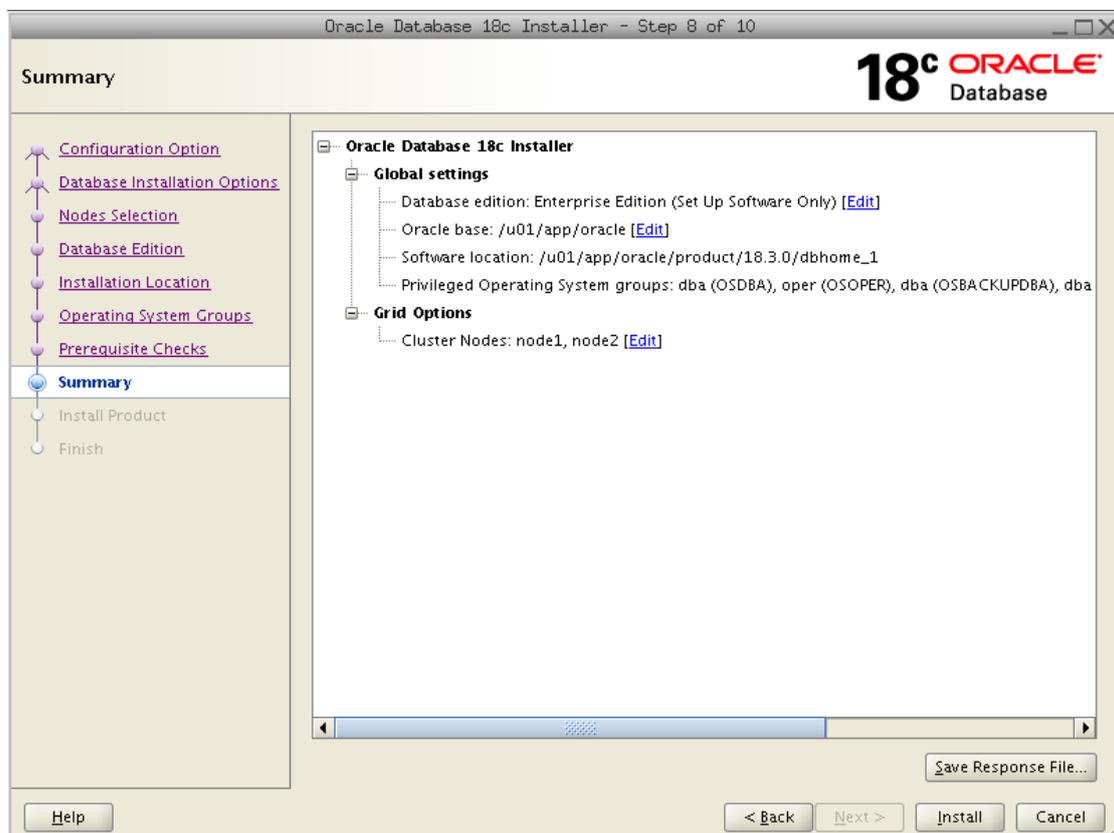
设置管理组, 点击 Next。



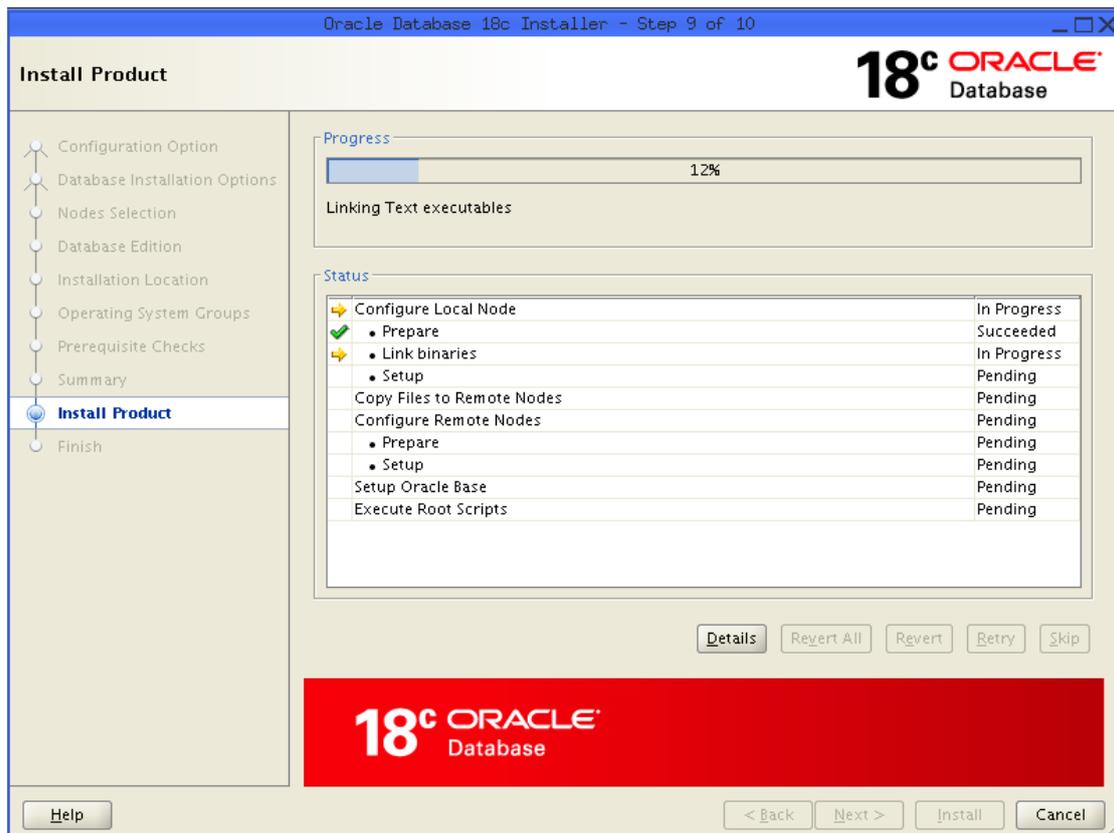
进行 Prerequisite Checks 检查，根据结果，修复不符合要求的配置，对于可以忽略的错误，选择“Ignore All”，点击 Next。



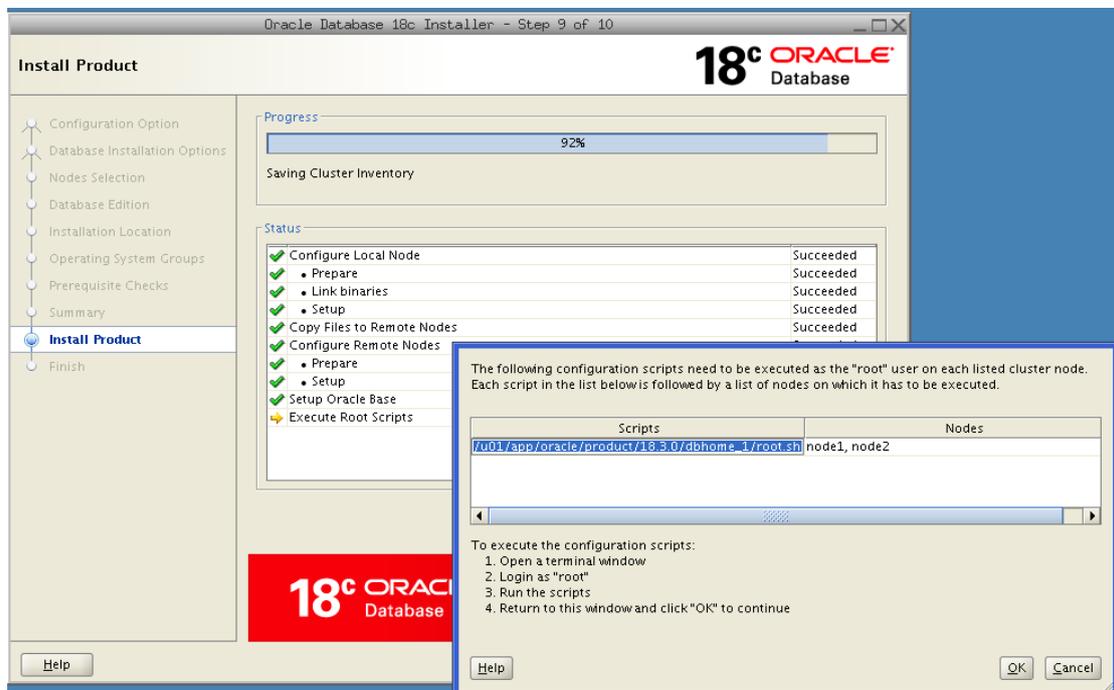
检查之前的配置信息，如果错误，点击 Install 开始安装。



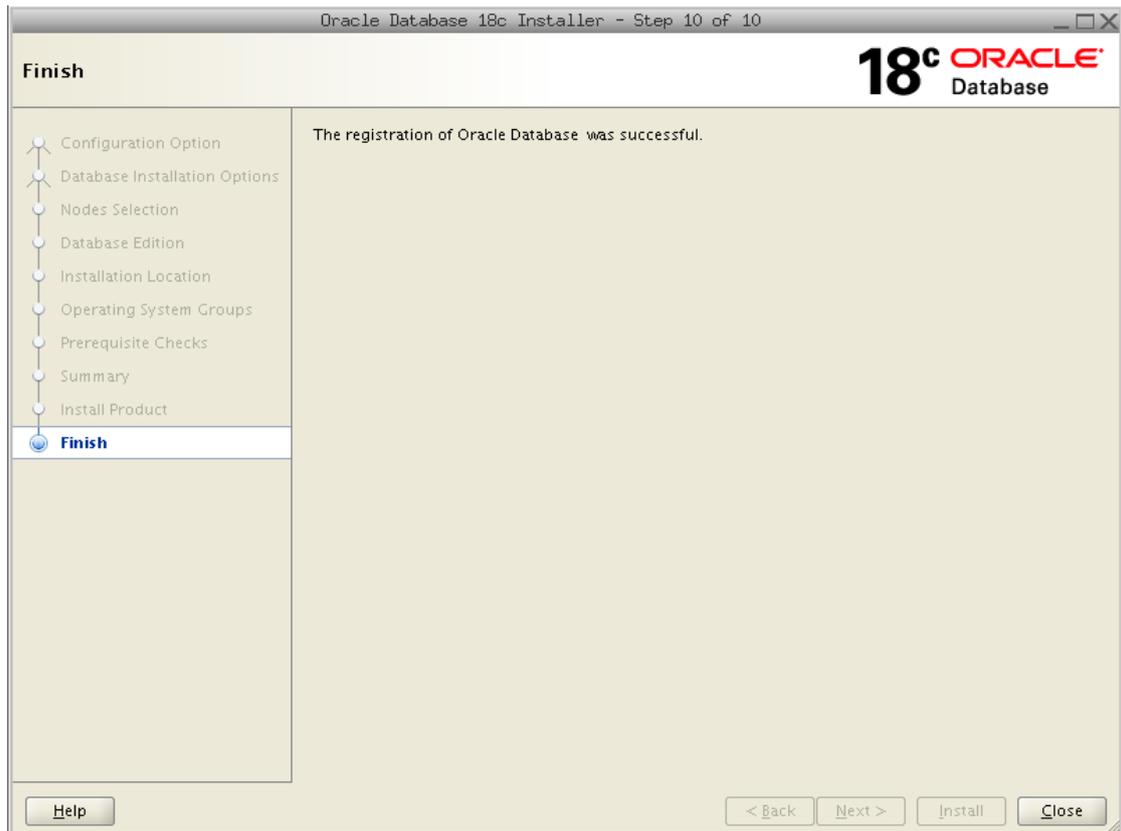
## 开始安装



在所有节点执行按顺序执行 root.sh，执行完毕后，点击 OK,继续安装

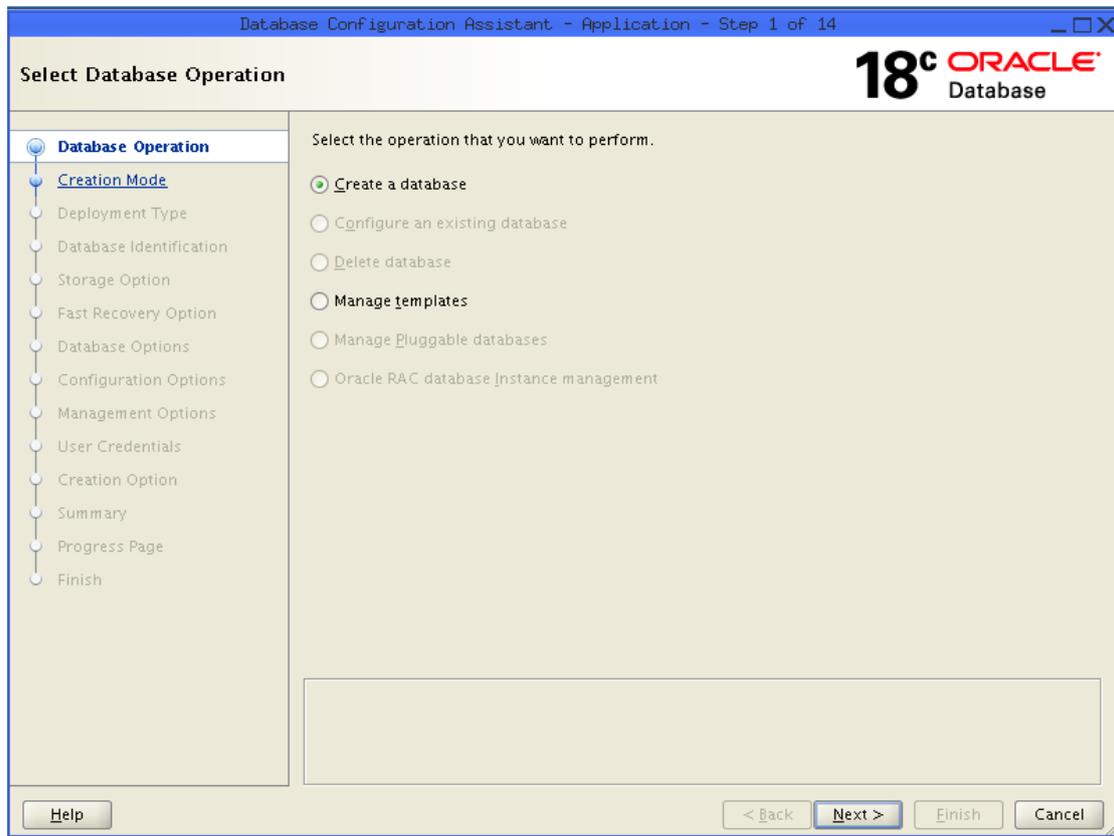


安装完成。

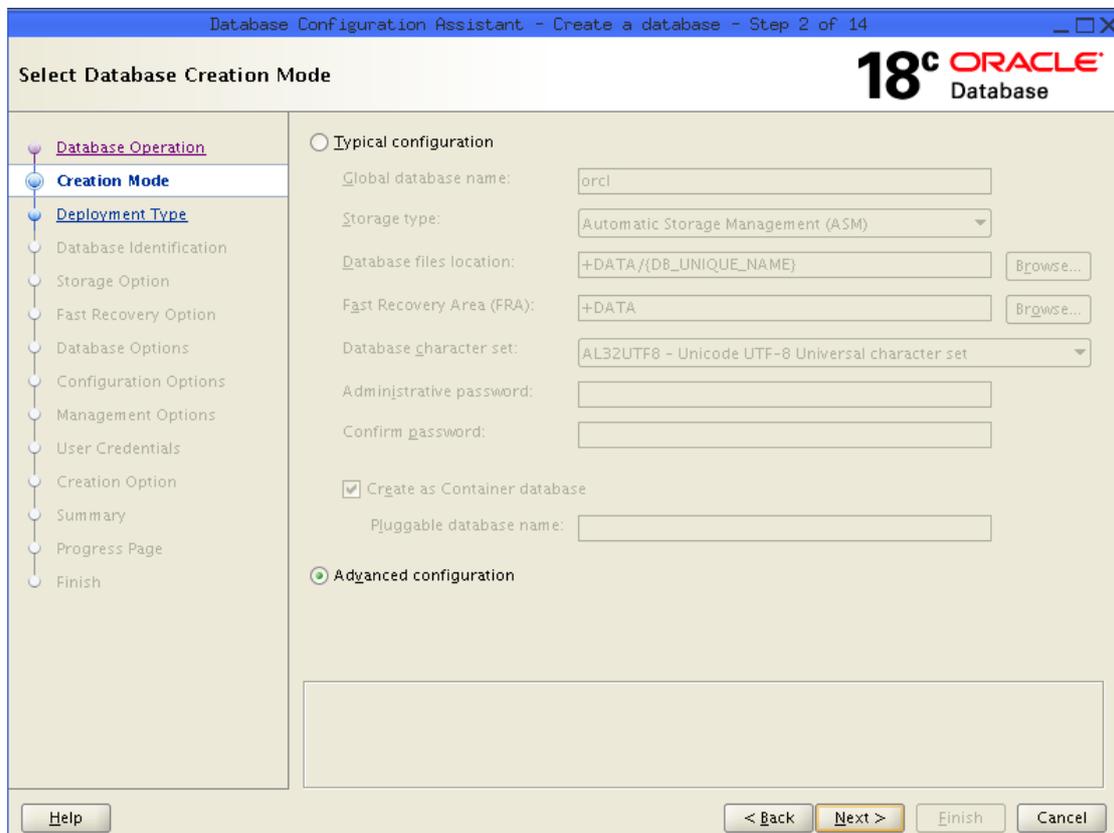


## dbca 创建数据库

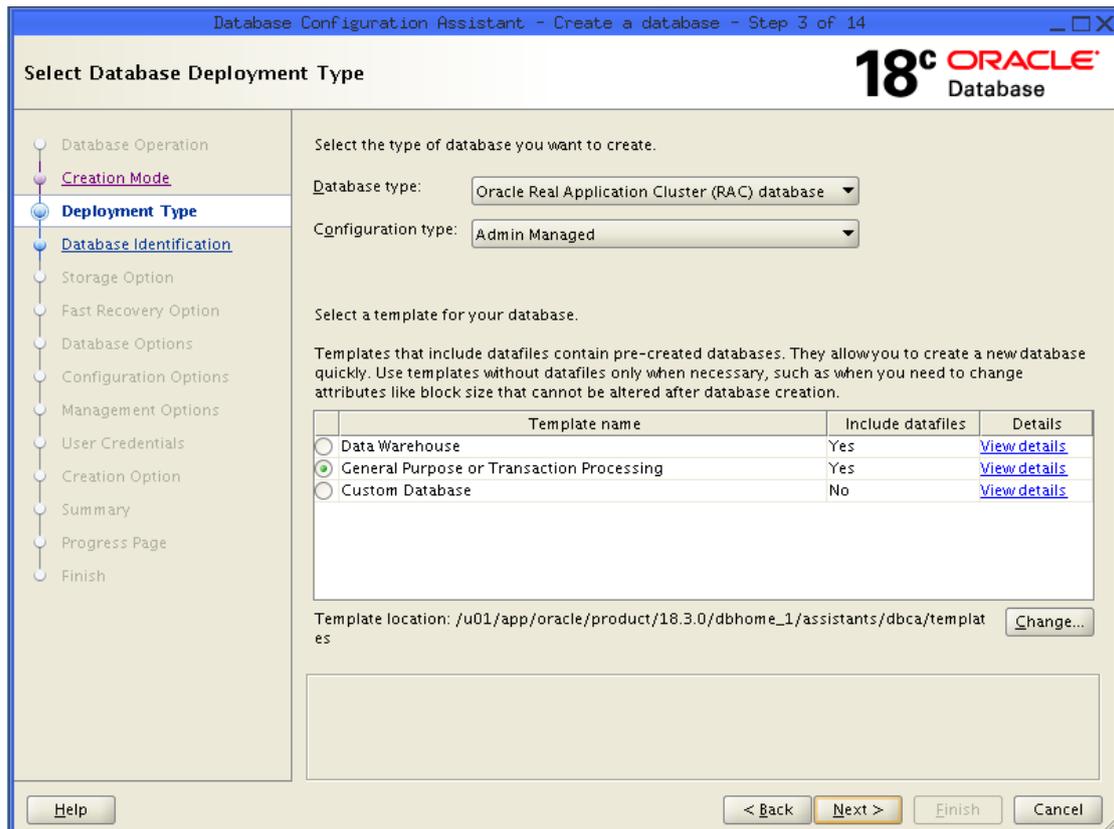
以 oracle 用户执行 dbca 命令，选择“Create a database”，点击 Next。



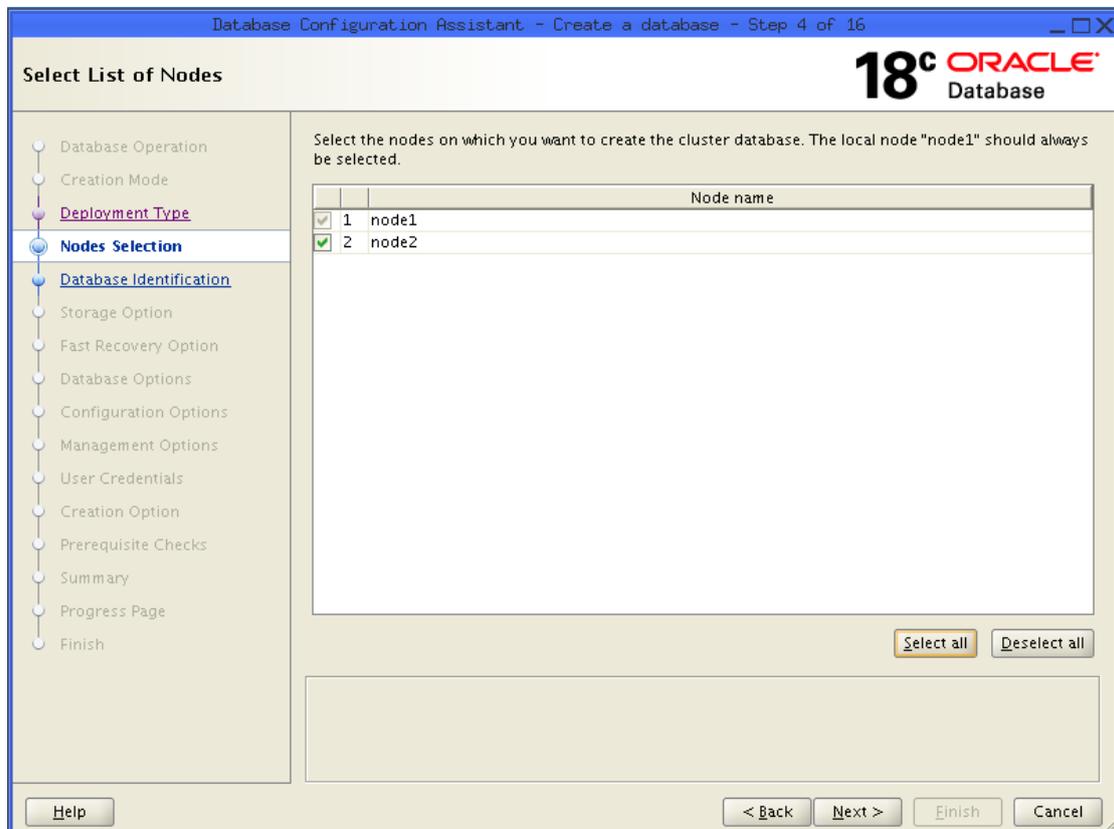
选择 Advanced configuration, 点击 Next。



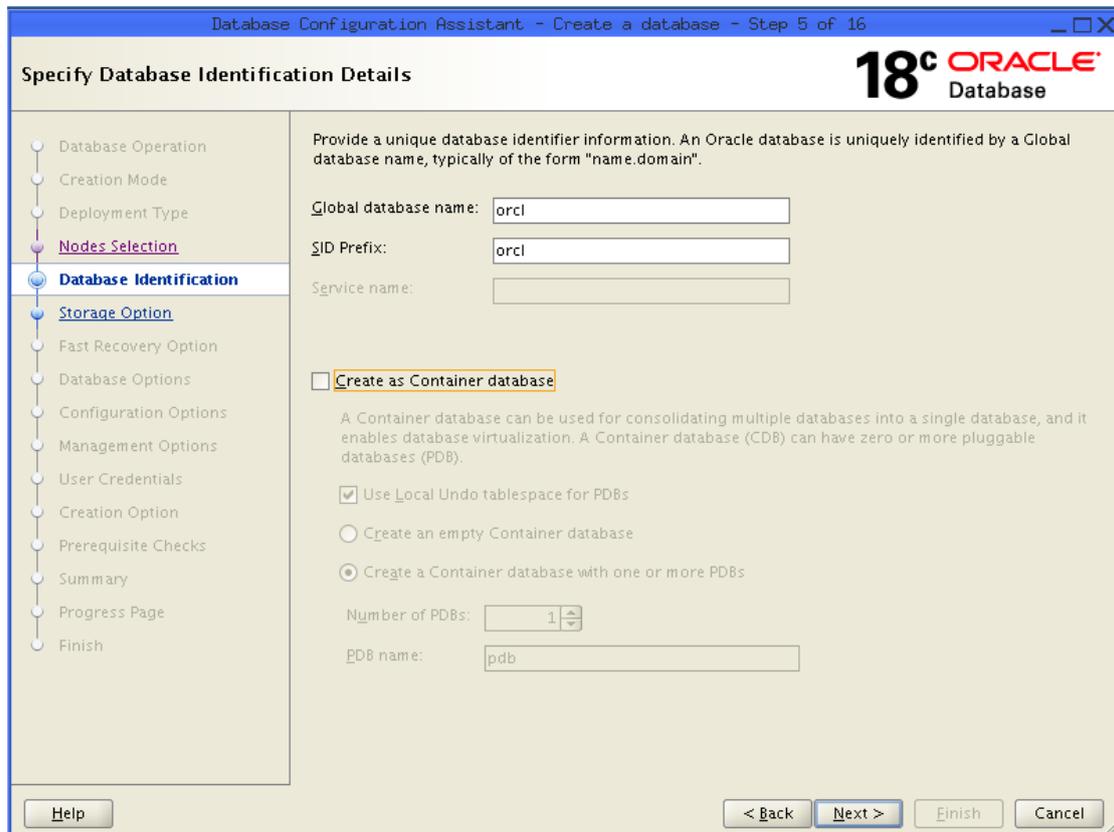
本次测试选择 General Purpose or Transaction Processing，点击 Next。



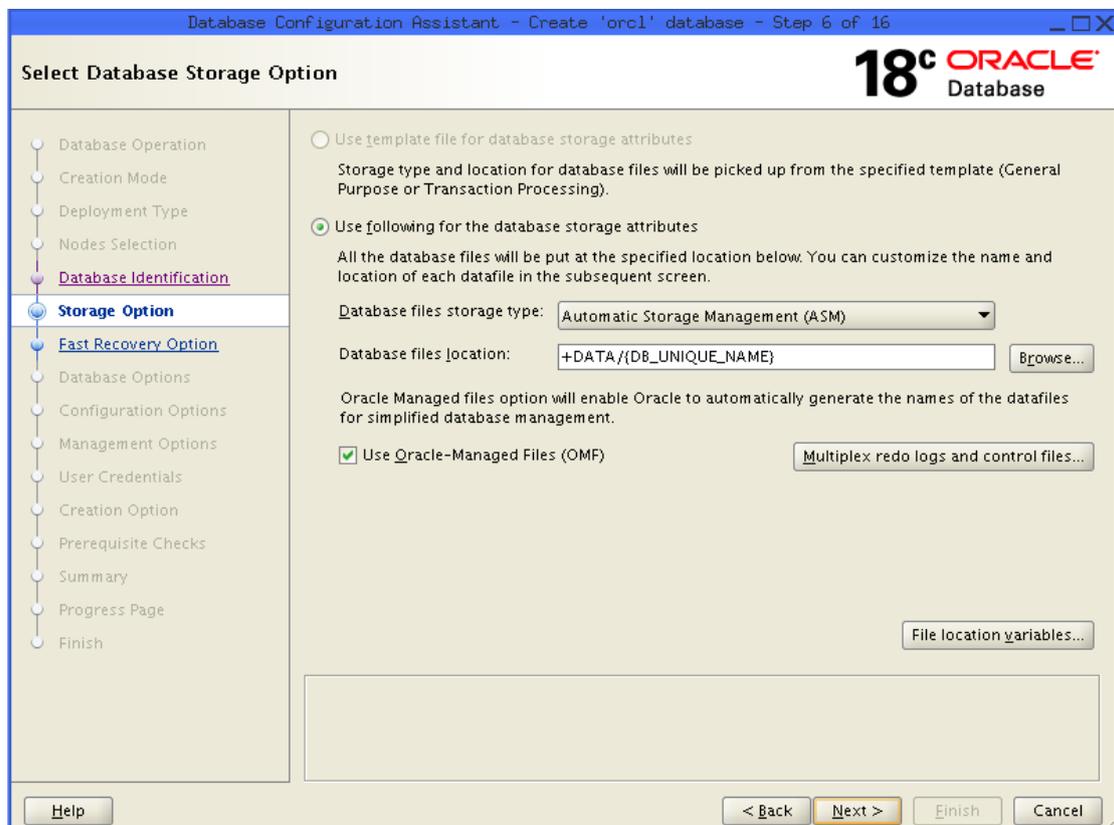
选择所有节点，点击 Next



输入Global Database Name 和SID Prefix, Prefix, 可以选择“Create as Contrainer Database”,创建CDB和PDB, 输入PDB 名称。本测试创建的Non-CDB 环境, 点击Next。



选择 DATA 磁盘组, 点击 Next。



本次测试没有选择 FRA diskgroup 和 Enable Archiving, 点击 Next。

Database Configuration Assistant - Create 'orcl' database - Step 7 of 16

### Select Fast Recovery Option

18<sup>c</sup> ORACLE Database

Choose the recovery options for the database.

- Specify Fast Recovery Area**
  - Recovery files storage type: Automatic Storage Management (ASM)
  - Fast Recovery Area: +DATA
  - Fast Recovery Area size: 8106 MB
- Enable archiving**

Navigation: < Back, Next >, Finish, Cancel

本次测试没有选择配置 Database Vault。点击 Next。

Database Configuration Assistant - Create 'orcl' database - Step 8 of 16

### Select Oracle Data Vault Config Option

18<sup>c</sup> ORACLE Database

- Configure Oracle Database Vault**
  - Database Vault owner:
  - Password:  Confirm password:
- Create a separate account manager**
  - Account manager:
  - Password:  Confirm password:
- Configure Oracle Label Security**
  - Configure Oracle Label Security with OJD

Navigation: < Back, Next >, Finish, Cancel

配置 SGA，如果需要选择非默认字符集，点击 Character sets，设置字符集，点击 Next

Database Configuration Assistant - Create 'orcl' database - Step 9 of 16

### Specify Configuration Options

18<sup>c</sup> ORACLE Database

- Database Operation
- Creation Mode
- Deployment Type
- Nodes Selection
- Database Identification
- Storage Option
- Fast Recovery Option
- Data Vault Option
- Configuration Options**
- Management Options
- User Credentials
- Creation Option
- Prerequisite Checks
- Summary
- Progress Page
- Finish

**Memory** | Sizing | Character sets | Connection mode | Sample schemas

Use Automatic Shared Memory Management

SGA size: 2394 MB

PGA Size: 798 MB

Total memory for database 3192 MB

Use Manual Shared Memory Management

Shared pool size: 0 MB

Buffer cache size: 0 MB

Java pool size: 0 MB

Large pool size: 0 MB

PGA size: 0 MB

Total memory for database 0 MB

Use Automatic Memory Management

Memory target: 3192 MB

490 3192 7980

490 3192 7980 40%

Help < Back Next > Finish Cancel

Database Configuration Assistant - Create 'orcl' database - Step 9 of 16

### Specify Configuration Options

18<sup>c</sup> ORACLE Database

- Database Operation
- Creation Mode
- Deployment Type
- Nodes Selection
- Database Identification
- Storage Option
- Fast Recovery Option
- Data Vault Option
- Configuration Options**
- Management Options
- User Credentials
- Creation Option
- Prerequisite Checks
- Summary
- Progress Page
- Finish

**Memory** | Sizing | Character sets | Connection mode | Sample schemas

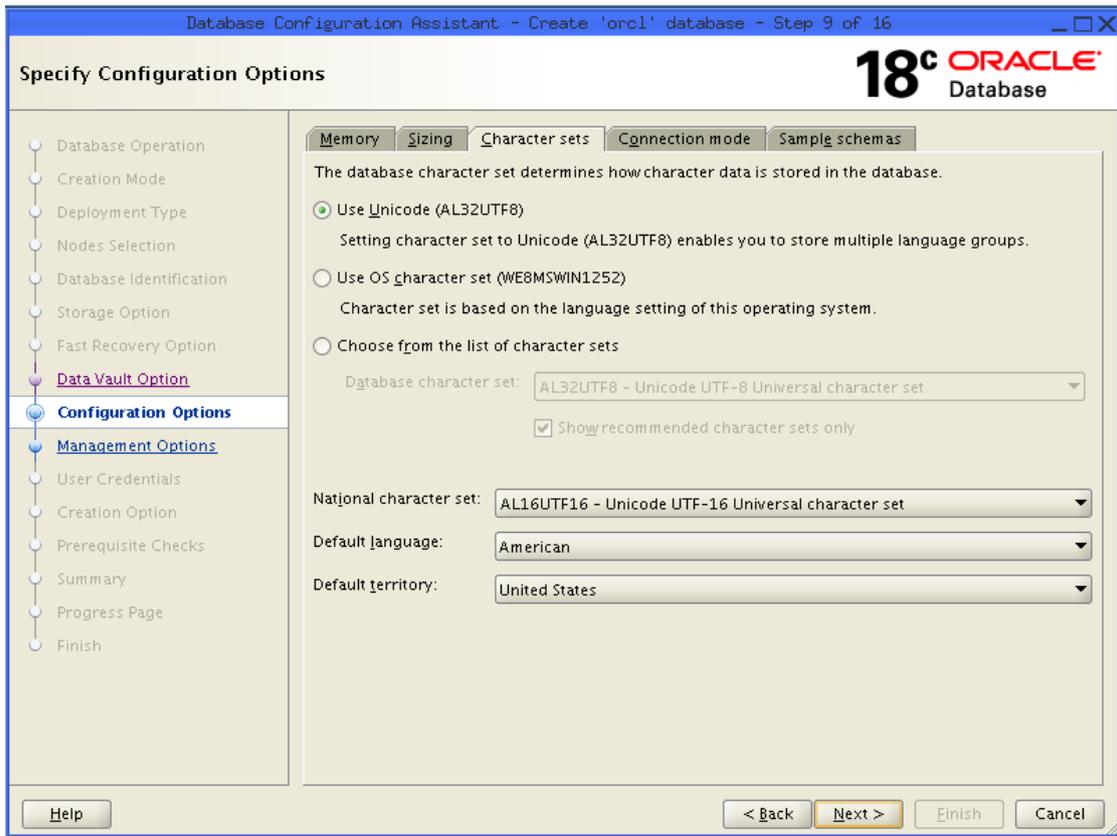
A block is the smallest unit of storage for allocation and for I/O. It cannot be changed once the database is created.

Block size: 8192 BYTES

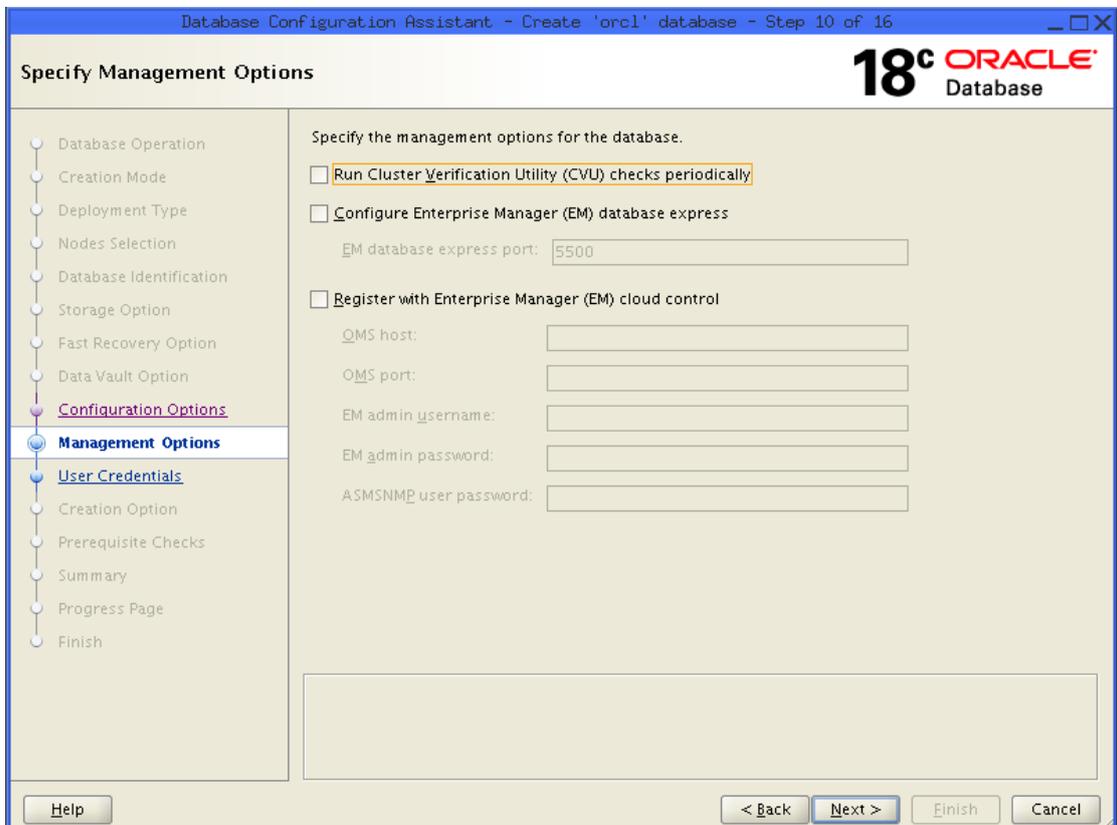
Specify the maximum number of operating system user processes that can be simultaneously connected to this database. The value of this parameter includes the user processes and the Oracle background processes.

Processes: 300

Help < Back Next > Finish Cancel



本次测试没有选择配置 EM Database express, 点击 Next。



设置数据库实例相关密码，点击 Next

Database Configuration Assistant - Create 'orcl' database - Step 11 of 16

### Specify Database User Credentials

18<sup>c</sup> ORACLE Database

You must specify passwords for the following user accounts in the new database for security reasons.

Use different administrative passwords

    SYS      Password: [ ]      Confirm password: [ ]

    SYSTEM      Password: [ ]      Confirm password: [ ]

Use the same administrative password for all accounts

    Password: [ ]      Confirm password: [ ]

Messages:

⚠ Password: [DBT-06208] The 'ADMIN' password entered does not conform to the Oracle recommended standards.

Help      < Back      Next >      Finish      Cancel

创建数据库，如果要更改默认的数据文件配置，点击 Customize Storage Locations

Database Configuration Assistant - Create 'orcl' database - Step 12 of 16

### Select Database Creation Option

18<sup>c</sup> ORACLE Database

Select the database creation options.

Create database

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

    Post DB creation scripts: [ ]      Browse...

Save as a database template

    Template name: [ dbca\_template\_2018-08-31\_01-41-0 ]

    Template location: [ /u01/app/oracle/product/18.3.0/dbhome\_1/assistants/dbca/te ]      Browse...

    Description: [ ]

Generate database creation scripts

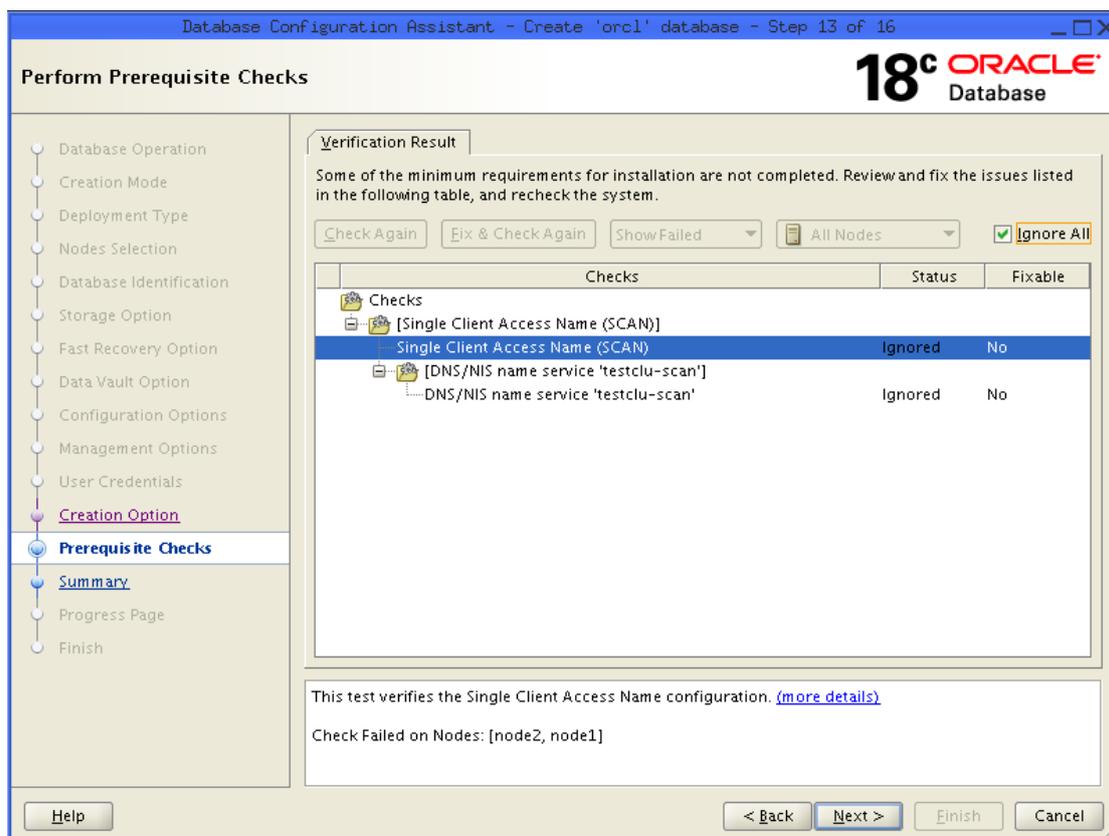
    Destination directory: [ {ORACLE\_BASE}/admin/{DB\_UNIQUE\_NAME}/scripts ]      Browse...

Following advanced configuration options can be used to configure initialization parameters and customize database storage locations.

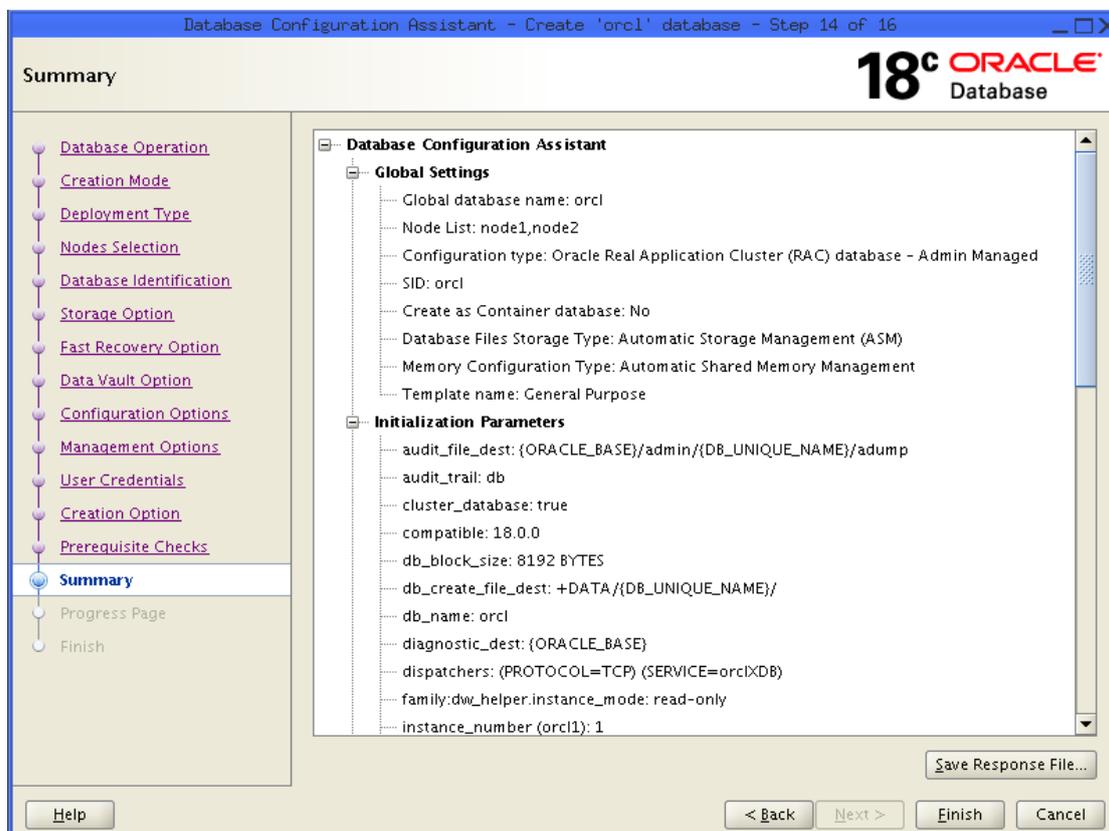
    All Initialization Parameters...      Customize Storage Locations...

Help      < Back      Next >      Finish      Cancel

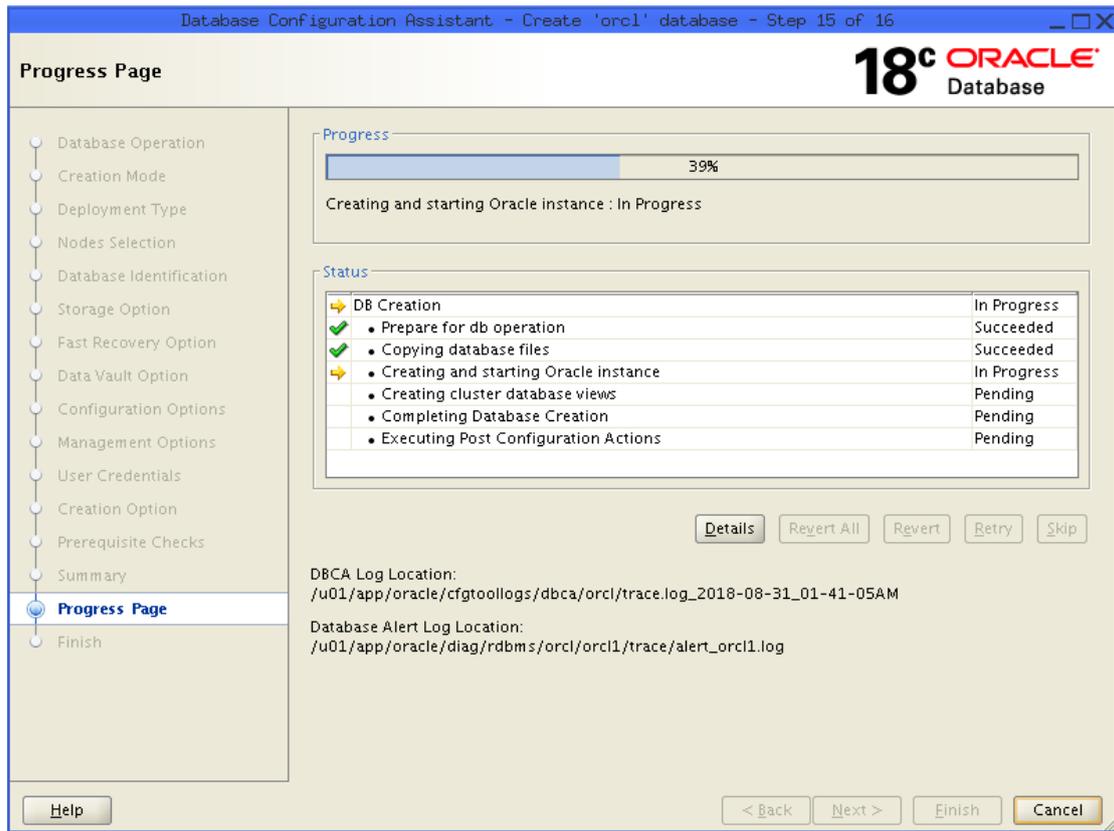
进行prerequisite checks, 根据检查结果, 修复不符合要求的配置, 对于可以忽略的, 选择 Ignore All, 点击 Next。



出之前的配置信息, 如果无误, 点击 Finish。



开始创建数据库。



数据库创建成功。

