

一步一步在Linux上安装Oracle 11gR2 RAC (3)

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2.4 建用户、改口令、修改用户配置文件

配置11gR2 RAC需要安装Oracle Grid Infrastructure软件、Oracle数据库软件，其中Grid软件等同于Oracle 10g的Clusterware集群件。Oracle建议以不同的用户分别安装Grid Infrastructure软件、Oracle数据库软件，我们这里以grid用户安装Grid Infrastructure，oracle用户安装Oracle数据库软件。并且grid、oracle用户需要属于不同的用户组。在配置RAC时，还要求这两个用户在RAC的不同节点上uid、gid要一致。用户、组的对应信息见下表：

Group Name	Group ID	Group Info	Oracle User(1100)	Grid User(1101)
oinstall	1000	Inventory Group	Y	Y
dba	1300	OSDBA Group	Y	
oper	1301	OSOPER Group	Y	
asmadmin	1200	OSASM		Y
asmdba	1201	OSDBA for ASM	Y	Y
asmoper	1202	OSOPER for ASM		Y

(Figure 2.4用户、组配置信息表)

我们可以通过执行下述shell脚本的1preusers.sh来完成用户、组的创建，脚本的具体内容可见本文档附录。

```
[root@node1 shell]# pwd
/root/shell
[root@node1 shell]# ll
total 24
-rwxr--r-- 1 root root 3544 Apr 24 09:40 1preusers.sh
-rwxr--r-- 1 root root 678 Apr 24 09:40 2predir.sh
-rwxr--r-- 1 root root 858 Apr 24 09:40 3prelimits.sh
-rwxr--r-- 1 root root 465 Apr 24 09:40 4prelogin.sh
-rwxr--r-- 1 root root 651 Apr 24 09:40 5preprofile.sh
-rwxr--r-- 1 root root 1132 Apr 24 09:40 6presysctl.sh
[root@node1 shell]# ./1preusers.sh
Now create 6 groups named 'oinstall','dba','asmadmin','asmdba','asmoper','oper'
Plus 2 users named 'oracle','grid',Also setting the Environment
Changing password for user grid.
passwd: all authentication tokens updated successfully.
Changing password for user oracle.
passwd: all authentication tokens updated successfully.
The Groups and users has been created
The Environment for grid,oracle also has been set successfully
[root@node1 shell]# id grid
uid=1100(grid) gid=1000(oinstall) groups=1000(oinstall),1200(asmadmin),1201(asmdba),1202(asmoper)
[root@node1 shell]# id oracle
uid=1101(oracle) gid=1000(oinstall) groups=1000(oinstall),1201(asmdba),1300(dba),1301(oper)
[root@node1 shell]#
```

说明：在节点node2上执行该脚本时，需要将grid用户环境变量ORACLE_SID修改为+ASM2，oracle用户环境变量ORACLE_SID修改为devdb2,ORACLE_HOSTNAME环境变量修改为node2.localdomain

2.5 建路径、改权限

关于grid、oracle用户的环境变量配置信息，见下述表格。

Environment Variable	Grid User	Oracle User
ORACLE_BASE	/u01/app/grid	/u01/app/oracle
ORACLE_HOME	/u01/app/11.2.0/grid	/u01/app/oracle/product/11.2.0/db_1
ORACLE_SID [node1]	+ASM1	devdb1
ORACLE_SID [node2]	+ASM2	devdb2

(Figure 2.5环境变量配置信息表)

通过执行上述2.4节中脚本2predir.sh来完成相关路径、权限的配置。脚本的具体内容可见本文档附录。

```
[root@node1 shell]# pwd
/root/shell
[root@node1 shell]# ./2predir.sh
Now create the necessary directory for oracle,grid users and change the authention to oracle,grid users...
The necessary directory for oracle,grid users and change the authention to oracle,grid users has been finished
[root@node1 shell]# cd /u01/app/
```

```
[root@node1 app]# ll
total 12
drwxrwxr-x 3 grid  oinstall 4096 Apr 24 10:06 11.2.0
drwxrwxr-x 2 grid  oinstall 4096 Apr 24 10:06 grid
drwxrwxr-x 2 oracle oinstall 4096 Apr 24 10:06 oracle
[root@node1 app]#
```

2.6 修改/etc/security/limits.conf, 配置oracle、grid用户的shell限制

通过执行上述2.4节中脚本3prelimits.sh完成。脚本的具体内容可见本文档附录。

```
[root@node1 shell]# pwd
/root/shell
[root@node1 shell]# ./3prelimits.sh
Now modify the /etc/security/limits.conf,but backup it named /etc/security/limits.conf.bak before
Modifying the /etc/security/limits.conf has been succeed.
[root@node1 shell]#
```

2.7 修改/etc/pam.d/login配置文件

通过执行上述2.4节中脚本4prelogin.sh完成。脚本的具体内容可见本文档附录。

```
[root@node1 shell]# pwd
/root/shell
[root@node1 shell]# ./4prelogin.sh
Now modify the /etc/pam.d/login,but with a backup named /etc/pam.d/login.bak
Modifying the /etc/pam.d/login has been succeed.
[root@node1 shell]#
```

2.8 修改/etc/profile文件

通过执行上述2.4节中脚本5preprofile.sh完成。脚本的具体内容可见本文档附录。

```
[root@node1 shell]# pwd
/root/shell
[root@node1 shell]# ./5preprofile.sh
Now modify the /etc/profile,but with a backup named /etc/profile.bak
Modifying the /etc/profile has been succeed.
[root@node1 shell]#
```

2.9 修改内核配置文件

通过执行上述2.4节中脚本6presysctl.sh完成。脚本的具体内容可见本文档附录。

```
[root@node1 shell]# pwd
/root/shell
[root@node1 shell]# ./6presysctl.sh
Now modify the /etc/sysctl.conf,but with a backup named /etc/sysctl.bak
Modifying the /etc/sysctl.conf has been succeed.
Now make the changes take effect.....
net.ipv4.ip_forward = 0
net.ipv4.conf.default.rp_filter = 1
net.ipv4.conf.default.accept_source_route = 0
kernel.sysrq = 0
kernel.core_uses_pid = 1
net.ipv4.tcp_syncookies = 1
kernel.msgmnb = 65536
kernel.msgmax = 65536
kernel.shmmax = 68719476736
kernel.shmall = 4294967296
fs.aio-max-nr = 1048576
fs.file-max = 6815744
kernel.shmall = 2097152
kernel.shmmax = 536870912
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
net.ipv4.tcp_wmem = 262144 262144 262144
net.ipv4.tcp_rmem = 4194304 4194304 4194304
[root@node1 shell]#
```

2.10 停止ntp服务, 11gR2新增的检查项

```
[root@node1 ~]# service ntpd status
ntpd is stopped
[root@node1 ~]# chkconfig ntpd off
[root@node1 ~]# cat /etc/ntp
ntp/    ntp.conf
[root@node1 ~]# cp /etc/ntp.conf /etc/ntp.conf.bak
[root@node1 ~]# rm -rf /etc/ntp.conf
[root@node1 ~]#
```

2.11 节点2准备工作

我们已经在node1完成基本准备配置工作，在node2上重复上述2.2到2.10节中准备工作，以完成节点2的准备工作。

说明：2.3节配置SCAN IP已在节点2上完成，可忽略。2.4节中需要修改对应的环境变量。

2.12 配置oracle，grid用户SSH对等性

虽然在安装软件的过程中，oracle会自动配置SSH对等性，建议在安装软件之前手工配置。

配置oracle用户对等性：

node1:

```
[root@node1 ~]# su - oracle
node1-> env | grep ORA
ORACLE_UNQNAME=devdb
ORACLE_SID=devdb1
ORACLE_BASE=/u01/app/oracle
ORACLE_HOSTNAME=node1.localdomain
ORACLE_TERM=xterm
ORACLE_HOME=/u01/app/oracle/product/11.2.0/db_1
node1-> pwd
/home/oracle
node1-> mkdir ~/.ssh
node1-> chmod 700 ~/.ssh
node1-> ls -al
total 44
drwx--- 4 oracle oinstall 4096 Apr 24 10:47 .
drwxr-xr-x 4 root root 4096 Apr 24 09:41 ..
-rw--- 1 oracle oinstall 5 Apr 24 10:43 .bash_history
-rw-r--r- 1 oracle oinstall 33 Apr 24 09:41 .bash_logout
-rw-r--r- 1 oracle oinstall 823 Apr 24 09:41 .bash_profile
-rw-r--r- 1 oracle oinstall 124 Apr 24 09:41 .bashrc
-rw-r--r- 1 oracle oinstall 515 Apr 24 09:41 .emacs
drwxr-xr-x 4 oracle oinstall 4096 Apr 24 09:41 .mozilla
drwx--- 2 oracle oinstall 4096 Apr 24 10:47 .ssh
-rw-r--r- 1 oracle oinstall 658 Apr 24 09:41 .zshrc
node1-> ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/oracle/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/oracle/.ssh/id_rsa.
Your public key has been saved in /home/oracle/.ssh/id_rsa.pub.
The key fingerprint is:
4a:bd:22:4c:cc:6a:33:ae:5a:de:7d:7c:8b:77:9e:81 oracle@node1.localdomain
node1-> ssh-keygen -t dsa
Generating public/private dsa key pair.
Enter file in which to save the key (/home/oracle/.ssh/id_dsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/oracle/.ssh/id_dsa.
Your public key has been saved in /home/oracle/.ssh/id_dsa.pub.
The key fingerprint is:
8b:50:73:41:03:ad:1c:59:25:aa:40:1c:c9:5e:03:99 oracle@node1.localdomain
node1->
```

node2:

```
[root@node2 ~]# su - oracle
node2-> env|grep ORA
ORACLE_UNQNAME=devdb
ORACLE_SID=devdb2
```

```

ORACLE_BASE=/u01/app/oracle
ORACLE_HOSTNAME=node2.localdomain
ORACLE_TERM=xterm
ORACLE_HOME=/u01/app/oracle/product/11.2.0/db_1
node2-> pwd
/home/oracle
node2-> ls -al
total 40
drwx--- 3 oracle oinstall 4096 Apr 24 10:45 .
drwxr-xr-x 4 root root 4096 Apr 24 10:44 ..
-rw--- 1 oracle oinstall 10 Apr 24 10:49 .bash_history
-rw-r--r- 1 oracle oinstall 33 Apr 24 10:44 .bash_logout
-rw-r--r- 1 oracle oinstall 823 Apr 24 10:44 .bash_profile
-rw-r--r- 1 oracle oinstall 124 Apr 24 10:44 .bashrc
-rw-r--r- 1 oracle oinstall 515 Apr 24 10:44 .emacs
drwxr-xr-x 4 oracle oinstall 4096 Apr 24 10:44 .mozilla
-rw-r--r- 1 oracle oinstall 658 Apr 24 10:44 .zshrc
node2-> mkdir ~/.ssh
node2-> chmod 770 ~/.ssh/
node2-> ls -al
total 44
drwx--- 4 oracle oinstall 4096 Apr 24 10:49 .
drwxr-xr-x 4 root root 4096 Apr 24 10:44 ..
-rw--- 1 oracle oinstall 10 Apr 24 10:49 .bash_history
-rw-r--r- 1 oracle oinstall 33 Apr 24 10:44 .bash_logout
-rw-r--r- 1 oracle oinstall 823 Apr 24 10:44 .bash_profile
-rw-r--r- 1 oracle oinstall 124 Apr 24 10:44 .bashrc
-rw-r--r- 1 oracle oinstall 515 Apr 24 10:44 .emacs
drwxr-xr-x 4 oracle oinstall 4096 Apr 24 10:44 .mozilla
drwxrwx--- 2 oracle oinstall 4096 Apr 24 10:49 .ssh
-rw-r--r- 1 oracle oinstall 658 Apr 24 10:44 .zshrc
node2-> ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/oracle/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/oracle/.ssh/id_rsa.
Your public key has been saved in /home/oracle/.ssh/id_rsa.pub.
The key fingerprint is:
a0:64:81:a6:12:b2:18:4e:01:c3:bd:9d:f6:bb:55:b0 oracle@node2.localdomain
node2-> ssh-keygen -t dsa
Generating public/private dsa key pair.
Enter file in which to save the key (/home/oracle/.ssh/id_dsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/oracle/.ssh/id_dsa.
Your public key has been saved in /home/oracle/.ssh/id_dsa.pub.
The key fingerprint is:
85:56:69:73:74:a3:ef:5b:88:d7:6d:ef:90:03:b6:72 oracle@node2.localdomain
node2->

```

返回节点1:

```

node1-> id
uid=1101(oracle) gid=1000(oinstall) groups=1000(oinstall),1201(asmdba),1300(dba),1301(oper)
node1-> pwd
/home/oracle
node1-> cat ~/.ssh/id_rsa.pub >>~/.ssh/authorized_keys
node1-> cat ~/.ssh/id_dsa.pub >>~/.ssh/authorized_keys
node1-> ssh node2 cat ~/.ssh/id_rsa.pub >>~/.ssh/authorized_keys
The authenticity of host 'node2 (172.16.0.192)' can't be established.
RSA key fingerprint is a7:6b:2c:2d:fb:c3:ff:33:af:92:cd:7b:99:3b:cf:3a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node2,172.16.0.192' (RSA) to the list of known hosts.
oracle@node2's password:
node1-> ssh node2 cat ~/.ssh/id_dsa.pub >>~/.ssh/authorized_keys

```

```
oracle@node2's password:
node1-> scp ~/.ssh/authorized_keys node2:~/.ssh/authorized_keys
oracle@node2's password:
authorized_keys
100% 2040 2.0KB/s 00:00
node1->
```

验证oracle SSH对等性:

在node1, node2两个节点上分别执行下述命令, 第一次执行时需要口令验证:

```
node1-> id
uid=1101(oracle) gid=1000(oinstall) groups=1000(oinstall),1201(asmdba),1300(dba),1301(oper)
node1-> ssh node1 date
The authenticity of host 'node1 (172.16.0.191)' can't be established.
RSA key fingerprint is 16:c2:67:cd:73:dd:b7:8b:f4:07:ef:e0:fb:36:34:3e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node1,172.16.0.191' (RSA) to the list of known hosts.
Tue Apr 24 11:28:15 CST 2012
node1-> ssh node2 date
Tue Apr 24 11:28:18 CST 2012
node1-> ssh node1-priv date
The authenticity of host 'node1-priv (192.168.94.11)' can't be established.
RSA key fingerprint is 16:c2:67:cd:73:dd:b7:8b:f4:07:ef:e0:fb:36:34:3e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node1-priv,192.168.94.11' (RSA) to the list of known hosts.
Tue Apr 24 11:28:25 CST 2012
node1-> ssh node2-priv date
The authenticity of host 'node2-priv (192.168.94.12)' can't be established.
RSA key fingerprint is a7:6b:2c:2d:fb:c3:ff:33:af:92:cd:7b:99:3b:cf:3a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node2-priv,192.168.94.12' (RSA) to the list of known hosts.
Tue Apr 24 11:28:30 CST 2012
node1-> ssh node1.localdomain date
The authenticity of host 'node1.localdomain (172.16.0.191)' can't be established.
RSA key fingerprint is 16:c2:67:cd:73:dd:b7:8b:f4:07:ef:e0:fb:36:34:3e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node1.localdomain' (RSA) to the list of known hosts.
Tue Apr 24 11:28:39 CST 2012
node1-> ssh node2.localdomain date
The authenticity of host 'node2.localdomain (172.16.0.192)' can't be established.
RSA key fingerprint is a7:6b:2c:2d:fb:c3:ff:33:af:92:cd:7b:99:3b:cf:3a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node2.localdomain' (RSA) to the list of known hosts.
Tue Apr 24 11:28:46 CST 2012
node1-> ssh node2-priv.localdomain date
The authenticity of host 'node2-priv.localdomain (192.168.94.12)' can't be established.
RSA key fingerprint is a7:6b:2c:2d:fb:c3:ff:33:af:92:cd:7b:99:3b:cf:3a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node2-priv.localdomain' (RSA) to the list of known hosts.
Tue Apr 24 11:28:52 CST 2012
node1-> ssh node1-priv.localdomain date
The authenticity of host 'node1-priv.localdomain (192.168.94.11)' can't be established.
RSA key fingerprint is 16:c2:67:cd:73:dd:b7:8b:f4:07:ef:e0:fb:36:34:3e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'node1-priv.localdomain' (RSA) to the list of known hosts.
Tue Apr 24 11:28:59 CST 2012
```

第二次执行时不再提示输入口令, 并且可以成功执行命令, 则表示oracle用户SSH对等性配置成功

node1:

```
node1-> ssh node1 date
Tue Apr 24 11:29:02 CST 2012
node1-> ssh node2 date
Tue Apr 24 11:29:07 CST 2012
node1-> ssh node1-priv date
Tue Apr 24 11:29:13 CST 2012
node1-> ssh node2-priv date
```

```
Tue Apr 24 11:29:18 CST 2012
node1-> ssh node2-priv.localdomain date
Tue Apr 24 11:29:27 CST 2012
node1-> ssh node1-priv.localdomain date
Tue Apr 24 11:29:33 CST 2012
node1->
node2:
node2-> id
uid=1101(oracle) gid=1000(oinstall) groups=1000(oinstall),1201(asmdba),1300(dba),1301(oper)
node2-> pwd
/home/oracle
node2-> ssh node1 date
Tue Apr 24 11:32:06 CST 2012
node2-> ssh node2 date
Tue Apr 24 11:32:09 CST 2012
node2-> ssh node1-priv date
Tue Apr 24 11:32:14 CST 2012
node2-> ssh node2-priv date
Tue Apr 24 11:32:17 CST 2012
node2-> ssh node1.localdomain date
Tue Apr 24 11:32:26 CST 2012
node2-> ssh node2.localdomain date
Tue Apr 24 11:32:29 CST 2012
node2-> ssh node1-priv.localdomain date
Tue Apr 24 11:32:39 CST 2012
node2-> ssh node2-priv.localdomain date
Tue Apr 24 11:32:43 CST 2012
node2->
```

至此，Oracle用户SSH对等性配置完成！重复上述步骤，以grid用户配置其对等性。

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