

## 节点 OS 重装后加回集群的步骤（10g RAC）

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前面写过 11gR2 RAC 中节点 OS 重装后加回集群的步骤，但目前仍有客户在使用 10g RAC，而 10g RAC 还不支持 `crsctl delete node` 这样的命令来“一键”删除重做节点的 OCR 和 thread 等信息，操作起来比较繁琐。

而 My Oracle Support 和 OTN 上面与此有关的文档：

Removing a Node from a 10gR1 RAC Cluster (Doc ID 269320.1)

Adding New Nodes to Your Oracle RAC 10g Cluster on Linux

<http://www.oracle.com/technetwork/articles/vallath-nodes-095339.html>

Doc ID 269320.1 的操作是在重装 OS 之前把节点从集群删除的步骤，对于直接重装 OS 的客户来说往往难以分清哪些步骤该做哪些步骤该跳过。故在此将这些步骤测试并记录下来供参考。

### 一、环境配置

VirtualBox 虚拟机运行的两节点 10.2.0.5 RAC，操作系统为 OEL5.8。

`#cat /etc/hosts`

`# Do not remove the following line, or various programs`

`# that require network functionality will fail.`

`127.0.0.1                localhost.localdomain localhost`

`::1                localhost6.localdomain6 localhost6`

`192.168.56.8      rac10g1.fsm.com rac10g1`

`192.168.56.9      rac10g2.fsm.com rac10g2`

`192.168.59.8      rac10g1-priv.fsm.com      rac10g1-priv`

`192.168.59.9      rac10g2-priv.fsm.com      rac10g2-priv`

`192.168.56.18     rac10g1-vip.fsm.com      rac10g1-vip`

`192.168.56.19     rac10g2-vip.fsm.com      rac10g2-vip`

```
[oracle@rac10g1 ~]$ crs_stat -t
```

Name	Type	Target	State	Host
ora.db10g.db	application	ONLINE	ONLINE	rac10g1
ora....g1.inst	application	ONLINE	ONLINE	rac10g1
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....SM1.asm	application	ONLINE	ONLINE	rac10g1
ora....G1.lsnr	application	ONLINE	ONLINE	rac10g1
ora....0g1.gsd	application	ONLINE	ONLINE	rac10g1
ora....0g1.ons	application	ONLINE	ONLINE	rac10g1
ora....0g1.vip	application	ONLINE	ONLINE	rac10g1
ora....SM2.asm	application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr	application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd	application	ONLINE	ONLINE	rac10g2
ora....0g2.ons	application	ONLINE	ONLINE	rac10g2
ora....0g2.vip	application	ONLINE	ONLINE	rac10g2

通过在虚拟机层面删除节点 1 的硬盘、重装节点 1 OS 并将其加回集群来模拟实际场景。

## 二、节点 1 重装后的初始化步骤

- 1、关闭节点 1 后，从虚拟机层面删除节点 1 的硬盘文件，重新添加一块本地盘，启动虚拟机重装操作系统，在安装操作系统选择 rpm 包时注意选上如下几个包，以免去重新配置 os 内核参数、创建 os 用户和组、以及重新下载 asmlib 的 rpm 包的步骤：



2、安装 OS 后，从节点 2 将 udev rule 和 rawdevices、hosts 文件拷回节点 1:

```
[root@rac10g2 ~]# scp /etc/sysconfig/rawdevices rac10g1:/etc/sysconfig/rawdevices
```

[illegible]

IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!

Someone could be eavesdropping on you right now (man-in-the-middle attack)!

It is also possible that the RSA host key has just been changed.

The fingerprint for the RSA key sent by the remote host is

17:72:25:07:f1:ed:58:99:2d:5a:de:40:27:4b:f3:f3.

Please contact your system administrator.

Add correct host key in /root/.ssh/known\_hosts to get rid of this message.

Offending key in /root/.ssh/known\_hosts:1

RSA host key for rac10g1 has changed and you have requested strict checking.

Host key verification failed.

lost connection

这里报错是由于节点 1 重装的 ssh host key 已经变了，与后节点 2 中之前的 know\_hosts 记录不同，所以删掉 know\_hosts 即可。

[root@rac10g2 ~]# [rm -rf /root/.ssh/known\\_hosts](#)

[root@rac10g2 ~]# [scp /etc/sysconfig/rawdevices rac10g1:/etc/sysconfig/rawdevices](#)

The authenticity of host 'rac10g1 (192.168.56.8)' can't be established.

RSA key fingerprint is 17:72:25:07:f1:ed:58:99:2d:5a:de:40:27:4b:f3:f3.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added 'rac10g1,192.168.56.8' (RSA) to the list of known hosts.

root@rac10g1's password:

rawdevices 100% 249

0.2KB/s 00:00

[root@rac10g2 ~]# [scp /etc/hosts rac10g1:/etc/hosts](#)

root@rac10g1's password:

hosts 100% 447

0.4KB/s 00:00

[root@rac10g2 ~]# [scp /etc/udev/rules.d/50-udev.rules rac10g1:/etc/udev/rules.d/50-udev.rules](#)

root@rac10g1's password:

50-udev.rules

100% 16KB

16.4KB/s 00:00

### 3、配置 oracle 用户的 SSH 无密码验证

1) 生成节点 1 的 ssh public key, 并合成 key1 文件传到节点 2

[root@rac10g1 ~]# su - oracle

[oracle@rac10g1 ~]\$ ssh-keygen -t dsa

Generating public/private dsa key pair.

Enter file in which to save the key (/home/oracle/.ssh/id\_dsa):

Created directory '/home/oracle/.ssh'.

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:

c6:76:19:12:37:48:9d:ce:bc:9a:8e:48:13:00:a3:69 oracle@rac10g1.fsm.com

[oracle@rac10g1 ~]\$ 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:

6c:0e:e2:18:36:ee:1c:29:ed:22:b6:cb:bd:ab:ca:da oracle@rac10g1.fsm.com

[oracle@rac10g1 ~]\$ ll

total 0

```
[oracle@rac10g1 ~]$ cd .ssh
```

```
[oracle@rac10g1 .ssh]$ ls
```

```
id_dsa  id_dsa.pub  id_rsa  id_rsa.pub
```

```
[oracle@rac10g1 .ssh]$ cat id_dsa.pub id_rsa.pub >key1
```

```
[oracle@rac10g1 .ssh]$ scp key1 rac10g2:/home/oracle/.ssh/key1
```

The authenticity of host 'rac10g2 (192.168.56.9)' can't be established.

RSA key fingerprint is 23:92:19:05:36:3b:39:8a:1f:8e:f9:0e:b1:10:38:57.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added 'rac10g2,192.168.56.9' (RSA) to the list of known hosts.

oracle@rac10g2's password:

```
key1                                100% 1016    1.0KB/s   00:00
```

2) 在节点 2 上 key1 与原来的 key2 文件合成 authorized\_keys 文件并传回节点 1

```
[oracle@rac10g2 .ssh]$ cat key1 key2 >authorized_keys
```

```
[oracle@rac10g2 .ssh]$ scp authorized_keys rac10g1:/home/oracle/.ssh/authorized_keys
```

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
```

```
@  WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!  @
```

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
```

IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!

Someone could be eavesdropping on you right now (man-in-the-middle attack)!

It is also possible that the RSA host key has just been changed.

The fingerprint for the RSA key sent by the remote host is

17:72:25:07:f1:ed:58:99:2d:5a:de:40:27:4b:f3:f3.

Please contact your system administrator.

Add correct host key in /home/oracle/.ssh/known\_hosts to get rid of this message.

Offending key in /home/oracle/.ssh/known\_hosts:1

RSA host key for rac10g1 has changed and you have requested strict checking.

Host key verification failed.

lost connection

```
[oracle@rac10g2 .ssh]$ rm -rf known_hosts
```

```
[oracle@rac10g2 .ssh]$ scp authorized_keys rac10g1:/home/oracle/.ssh/authorized_keys
```

The authenticity of host 'rac10g1 (192.168.56.8)' can't be established.

RSA key fingerprint is 17:72:25:07:f1:ed:58:99:2d:5a:de:40:27:4b:f3:f3.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added 'rac10g1,192.168.56.8' (RSA) to the list of known hosts.

oracle@rac10g1's password:

```
authorized_keys          100% 2032    2.0KB/s   00:00
```

```
[oracle@rac10g2 .ssh]$ ssh rac10g1  ←对各个地址互相 ssh 登陆测试，以将其加入 known_hosts
```

```
[oracle@rac10g1 ~]$ ssh rac10g2
```

Last login: Sat Oct 31 02:36:44 2015 from rac10g1-priv.fsm.com

4、在节点 1 启动 rawdevice 服务并配置 asmlib

```
[root@rac10g1 ~]# fdisk -l
```

1) 检查磁盘并启动 rawdevices 服务

Disk /dev/sda: 33.6 GB, 33693843456 bytes

255 heads, 63 sectors/track, 4096 cylinders

Units = cylinders of 16065 \* 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	13	104391	83	Linux
/dev/sda2		14	4096	32796697+	8e	Linux LVM

Disk /dev/sdb: 1098 MB, 1098907648 bytes

255 heads, 63 sectors/track, 133 cylinders

Units = cylinders of 16065 \* 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1	*	1	67	538146	83	Linux
/dev/sdb2		68	133	530145	83	Linux

Disk /dev/sdc: 5368 MB, 5368709120 bytes

255 heads, 63 sectors/track, 652 cylinders

Units = cylinders of 16065 \* 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sdc1	*	1	652	5237158+	83	Linux

Disk /dev/sdd: 5368 MB, 5368709120 bytes

255 heads, 63 sectors/track, 652 cylinders

Units = cylinders of 16065 \* 512 = 8225280 bytes

Device	Boot	Start	End	Blocks	Id	System
/dev/sdd1	*	1	652	5237158+	83	Linux

Disk /dev/dm-0: 29.3 GB, 29360128000 bytes

255 heads, 63 sectors/track, 3569 cylinders

Units = cylinders of 16065 \* 512 = 8225280 bytes

Disk /dev/dm-0 doesn't contain a valid partition table



Disk /dev/dm-1: 4194 MB, 4194304000 bytes

255 heads, 63 sectors/track, 509 cylinders

Units = cylinders of 16065 \* 512 = 8225280 bytes

Disk /dev/dm-1 doesn't contain a valid partition table

[root@rac10g1 ~]# [service rawdevices restart](#)

Assigning devices:

/dev/raw/raw1 --> /dev/sdb1

/dev/raw/raw1: bound to major 8, minor 17

/dev/raw/raw2 --> /dev/sdb2

/dev/raw/raw2: bound to major 8, minor 18

/dev/raw/raw3 --> /dev/sdc1

/dev/raw/raw3: bound to major 8, minor 33

/dev/raw/raw4 --> /dev/sdd1

/dev/raw/raw4: bound to major 8, minor 49

done

[root@rac10g1 ~]# raw -qa

/dev/raw/raw1: bound to major 8, minor 17

/dev/raw/raw2: bound to major 8, minor 18

/dev/raw/raw3: bound to major 8, minor 33

/dev/raw/raw4: bound to major 8, minor 49

## 2) 配置 asmlib

[root@rac10g1 ~]# [/etc/init.d/oracleasm configure](#)

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 []: oracle

Default group to own the driver interface []: dba

Start Oracle ASM library driver on boot (y/n) [n]: y

Scan for Oracle ASM disks on boot (y/n) [y]: y

Writing Oracle ASM library driver configuration: done

Initializing the Oracle ASMLib driver: [ OK ]

Scanning the system for Oracle ASMLib disks: [ OK ]

[root@rac10gl ~]# /etc/init.d/oracleasm listdisks

ASM1

ASM2

### 三、清理原节点 1 的资源（节点 2 上操作）

#### 1、在节点 2 以图形界面使用 dbca 删除实例 1

这里不建议用 `srvctl remove instance` 来做，因为 `srvctl` 仅仅是删除了 OCR 中的配置信息，但不会删除节点 1 的 thread、redo groups 以及 undo tablespace，而这些 dbca 都会自动做了。

#### 1) `srvctl remove instance`（不建议）

```
[oracle@rac10g2 ~]$ srvctl remove instance -d db10g -i db10g1
```

```
Remove instance db10g1 from the database db10g? (y/[n]) y
```

```
[oracle@rac10g2 ~]$ crs_stat -t
```

Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....SM1.asm	application	ONLINE	OFFLINE	
ora....G1.lsnr	application	ONLINE	OFFLINE	
ora....0g1.gsd	application	ONLINE	OFFLINE	
ora....0g1.ons	application	ONLINE	OFFLINE	
ora....0g1.vip	application	ONLINE	ONLINE	rac10g2
ora....SM2.asm	application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr	application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd	application	ONLINE	ONLINE	rac10g2
ora....0g2.ons	application	ONLINE	ONLINE	rac10g2
ora....0g2.vip	application	ONLINE	ONLINE	rac10g2

```
[oracle@rac10g2 ~]$ export ORACLE_SID=db10g2
```

```
[oracle@rac10g2 ~]$ sqlplus / as sysdba
```

SQL\*Plus: Release 10.2.0.5.0 - Production on Fri Jun 10 04:14:19 2016

Copyright (c) 1982, 2010, Oracle. All Rights Reserved.

Connected to:

Oracle Database 10g Enterprise Edition Release 10.2.0.5.0 - 64bit Production

With the Partitioning, Real Application Clusters, OLAP, Data Mining

and Real Application Testing options

SQL> select tablespace\_name from dba\_tablespaces order by 1;

TABLESPACE\_NAME

-----  
SYSAUX

SYSTEM

TEMP

UNDOTBS1

UNDOTBS2

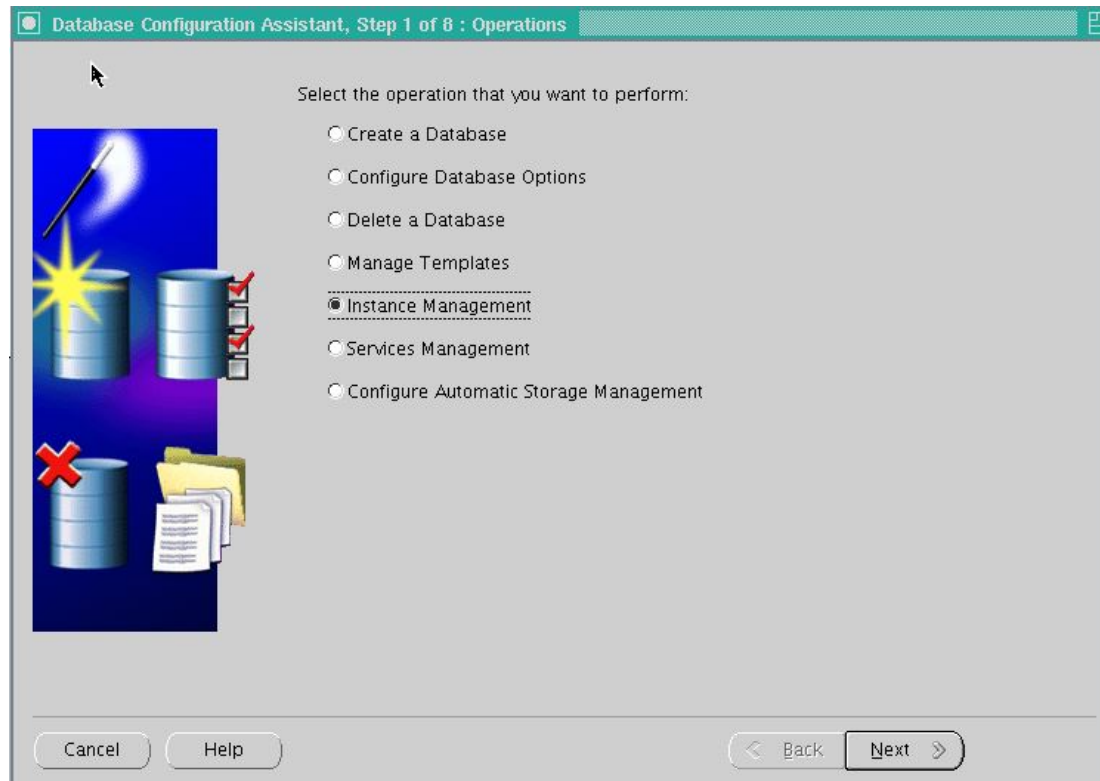
USERS

6 rows selected.

SQL> exit

显然 srvctl remove instance 删除并不彻底，因此建议用 dbca 来操作。

## 2) 使用 DBCA 在节点 2 删除实例 1（建议）




Database Configuration Assistant, Step 2 of 8 : Instance Management

Select the instance management operation that you want to perform:

☐ Add an instance

☒ Delete an instance



The illustration shows four database cylinders. The top-left cylinder is being struck by a match, with a bright yellow starburst effect. The top-right cylinder has two red checkmarks next to it. The bottom-left cylinder has a large red 'X' over it. The bottom-right cylinder is next to a stack of papers and a yellow folder icon.

Cancel Help

Back Next

Database Configuration Assistant, Step 3 of 6 : List of cluster databases

Select an active cluster database to delete an instance.

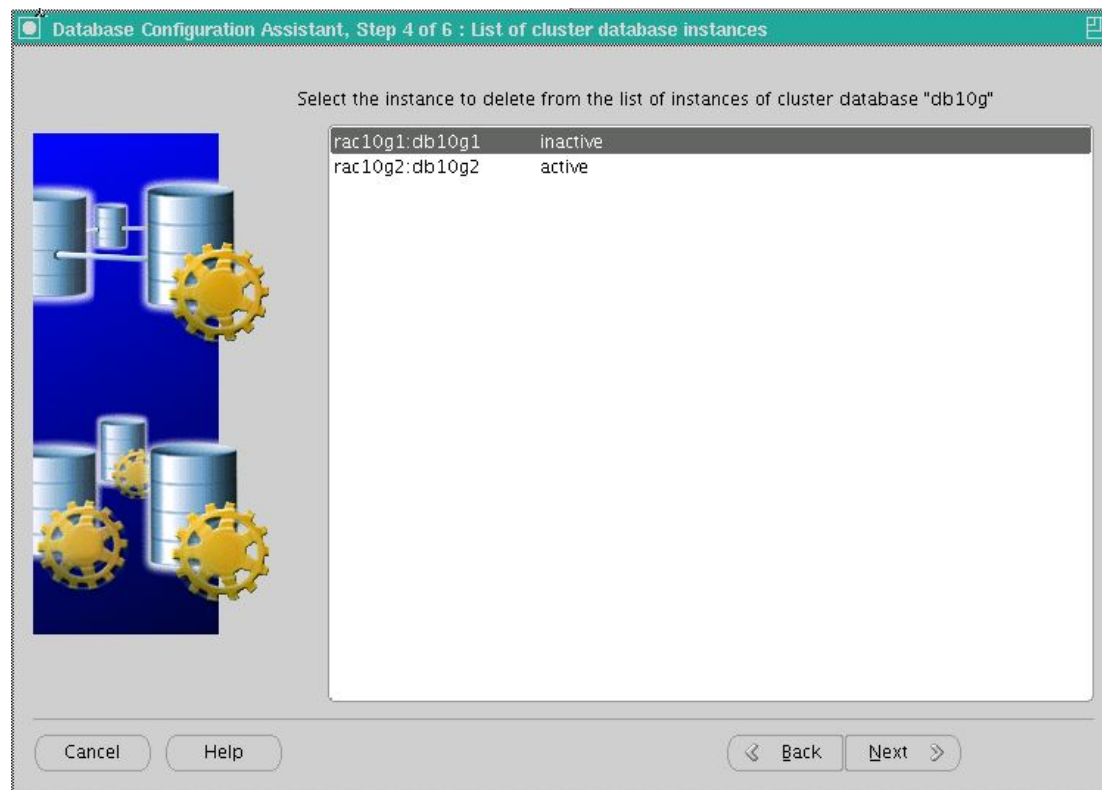
Select	Database Name	Status
<input checked="" type="radio"/>	db10g	active

Specify a user with SYSDBA system privilege

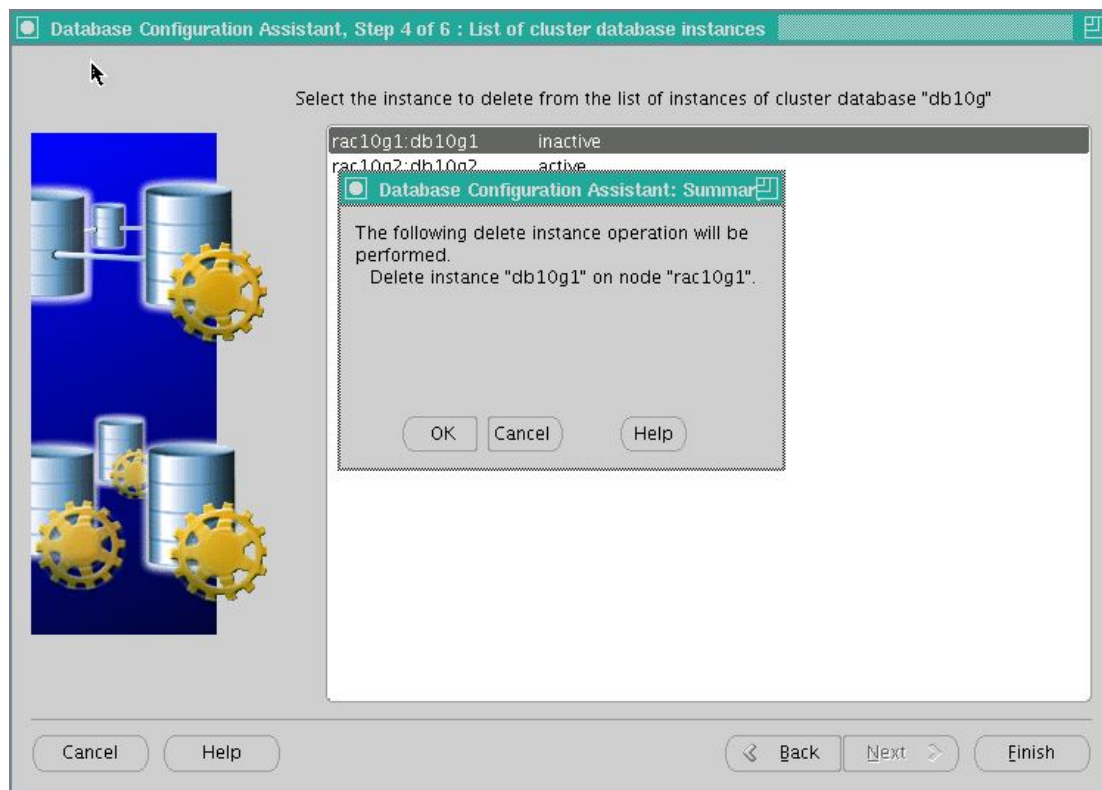
Username:

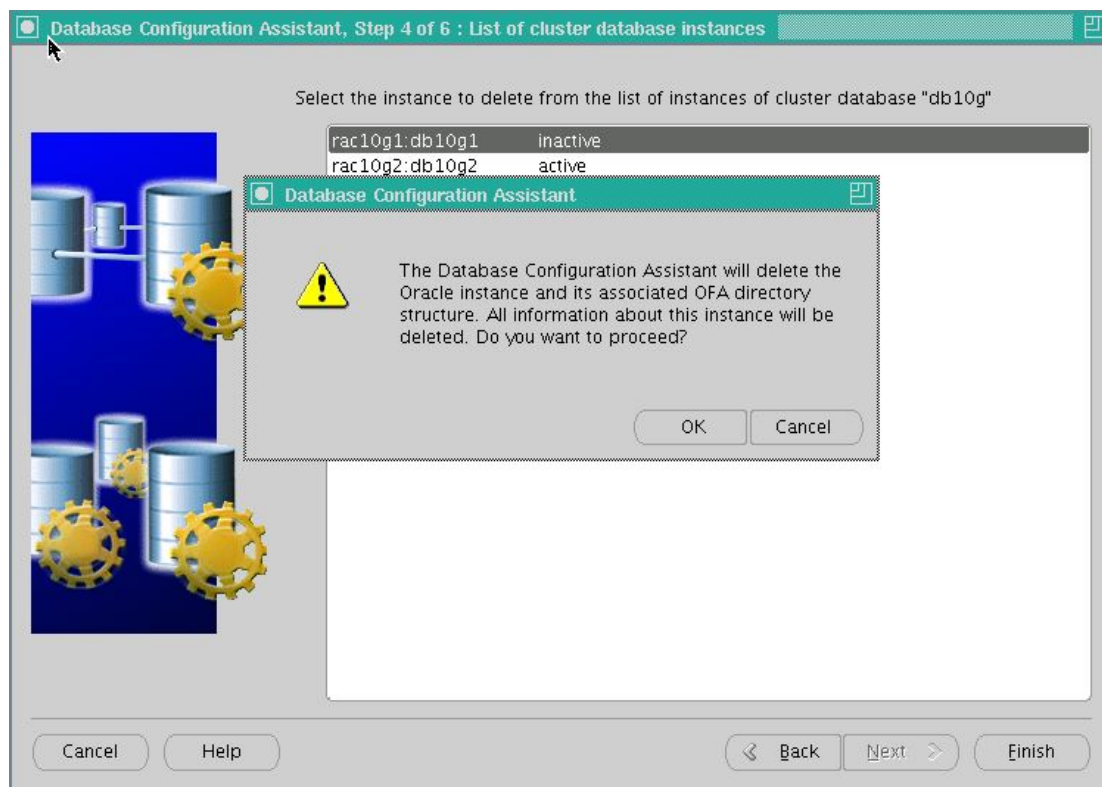
Password:

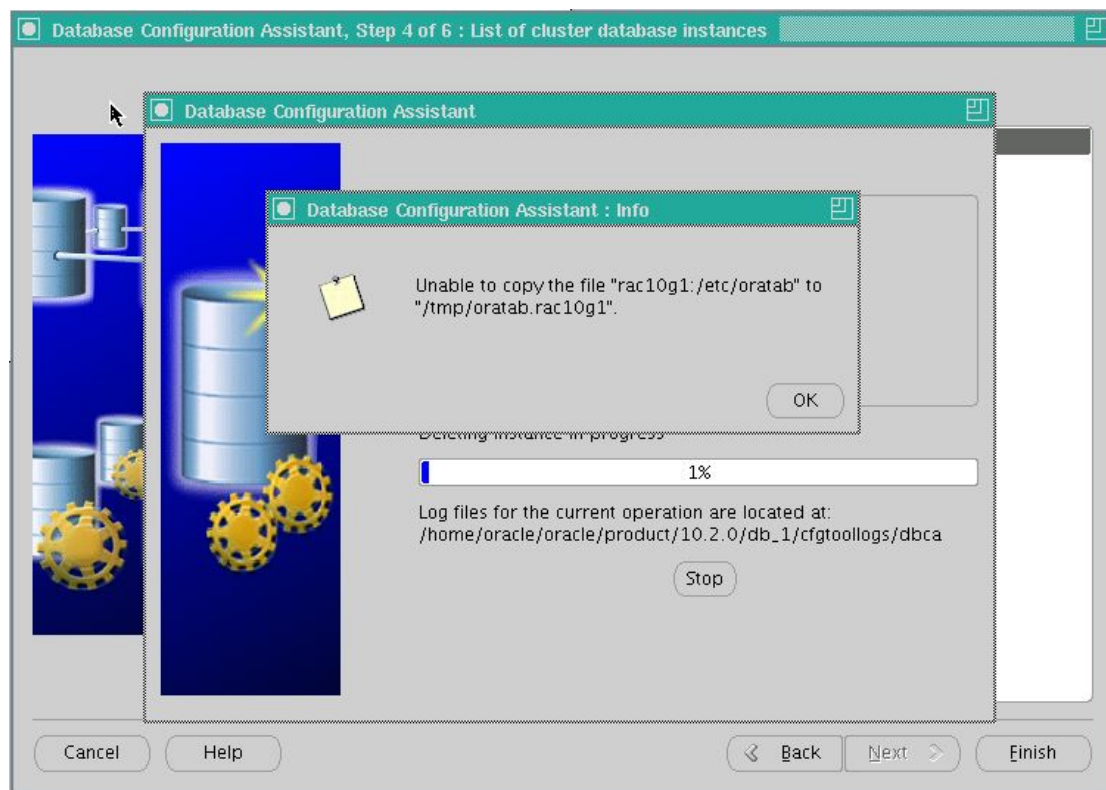
Cancel Help Back Next



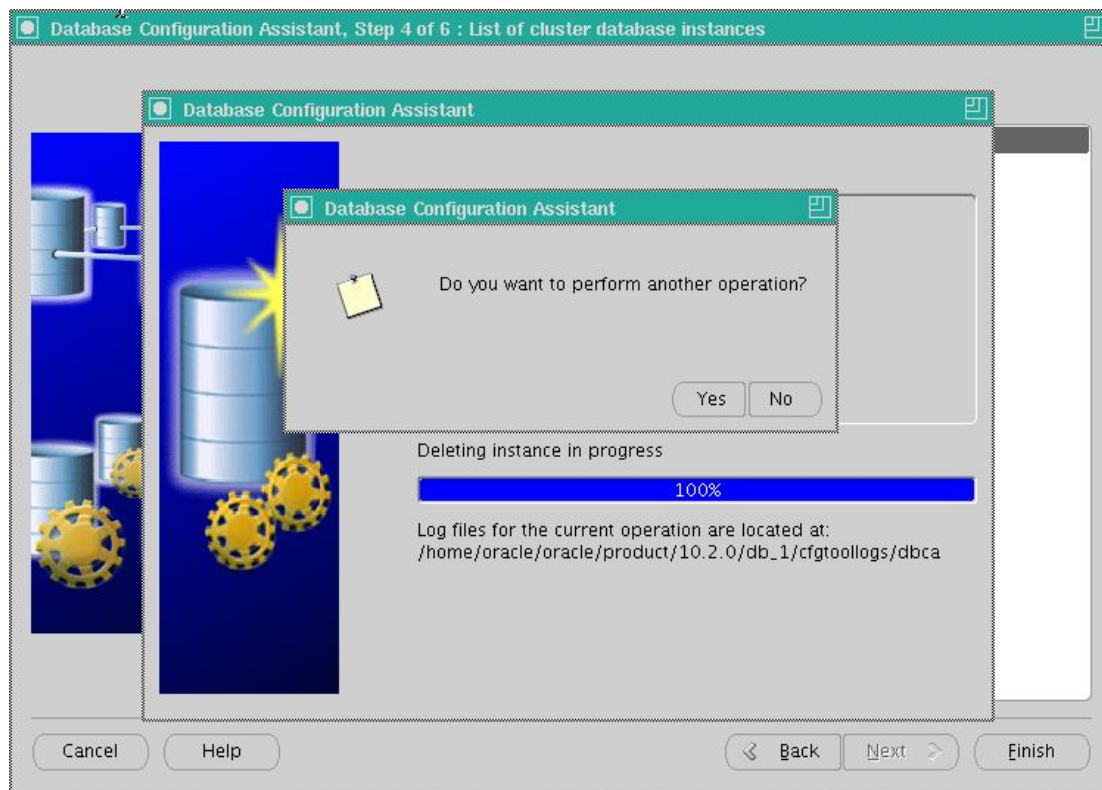








这是由于节点 1 已经重装了，在其上找不到/etc/oratab 文件，所以是正常的。点 ok 即可。



## 2、清理 ASM 实例 1

```
[oracle@rac10g2 ~]$ crs_stat -t
```

Name	Type	Target	State	Host
<hr/>				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....SM1.asm	application	ONLINE	OFFLINE	←

ora....G1.lsnr application	ONLINE	OFFLINE	
ora....0g1.gsd application	ONLINE	OFFLINE	
ora....0g1.ons application	ONLINE	OFFLINE	
ora....0g1.vip application	ONLINE	ONLINE	rac10g2
ora....SM2.asm application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd application	ONLINE	ONLINE	rac10g2
ora....0g2.ons application	ONLINE	ONLINE	rac10g2
ora....0g2.vip application	ONLINE	ONLINE	rac10g2

```
[oracle@rac10g2 ~]$ srvctl remove asm -n rac10g1
```

```
[oracle@rac10g2 ~]$ crs_stat -t
```

Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g2.inst application		ONLINE	ONLINE	rac10g2
ora....G1.lsnr application		ONLINE	OFFLINE	
ora....0g1.gsd application		ONLINE	OFFLINE	
ora....0g1.ons application		ONLINE	OFFLINE	
ora....0g1.vip application		ONLINE	ONLINE	rac10g2
ora....SM2.asm application		ONLINE	ONLINE	rac10g2
ora....G2.lsnr application		ONLINE	ONLINE	rac10g2
ora....0g2.gsd application		ONLINE	ONLINE	rac10g2
ora....0g2.ons application		ONLINE	ONLINE	rac10g2
ora....0g2.vip application		ONLINE	ONLINE	rac10g2

### 3、清理节点 1 监听资源

由于 10g rac 尚不支持通过 `srvctl delete listener`，如果节点 1 没重装的话可以通过 `netca` 来删除配置，但节点 1 已重装，只能使用 `crs_unregister` 在节点 2 注

销节点 1 监听的 ocr 资源。

```
[oracle@rac10g2 ~]$ crs_stat |grep lsnr
```

```
NAME=ora.rac10g1.LISTENER_RAC10G1.lsnr
```

```
NAME=ora.rac10g2.LISTENER_RAC10G2.lsnr
```

```
[oracle@rac10g2 ~]$ crs_unregister ora.rac10g1.LISTENER_RAC10G1.lsnr
```

```
[oracle@rac10g2 ~]$ crs_stat -t
```

Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....0g1.gsd	application	ONLINE	OFFLINE	
ora....0g1.ons	application	ONLINE	OFFLINE	
ora....0g1.vip	application	ONLINE	ONLINE	rac10g2
ora....SM2.asm	application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr	application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd	application	ONLINE	ONLINE	rac10g2
ora....0g2.ons	application	ONLINE	ONLINE	rac10g2
ora....0g2.vip	application	ONLINE	ONLINE	rac10g2

gsd 和 ons 可以使用 `srvctl remove nodeapps -n rac10g1` 来清理，但后面的 `rootdeletenode.sh` 脚本会自动清理它，所以不需要动。

4、执行 `rootdeletenode.sh` 清理节点 1

```
[oracle@rac10g2 ~]$ olsnodes -n
```

```
rac10g1 1
```

```
rac10g2 2
```

```
[root@rac10g2 ~]# cd /home/oracle/oracle/product/10.2.0/crs/install
```

```
[root@rac10g2 install]# ./rootdeletenode.sh rac10g1,1
```

```
CRS nodeapps are deleted successfully
```

clscfg: EXISTING configuration version 3 detected.

clscfg: version 3 is 10G Release 2.

Successfully deleted 14 values from OCR.

Key SYSTEM.css.interfaces.noderac10g1 marked for deletion is not there. Ignoring.

Successfully deleted 5 keys from OCR.

Node deletion operation successful.

'rac10g1,1' deleted successfully

[root@rac10g2 install]# [/home/oracle/oracle/product/10.2.0/crs/bin/olsnodes -n](#)

rac10g2 2

[root@rac10g2 install]# [/home/oracle/oracle/product/10.2.0/crs/bin/crs\\_stat -t](#)

Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....SM2.asm	application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr	application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd	application	ONLINE	ONLINE	rac10g2
ora....0g2.ons	application	ONLINE	ONLINE	rac10g2
ora....0g2.vip	application	ONLINE	ONLINE	rac10g2

确定节点 1 的 crs 资源都已被清理。

## 5、更新 CRS 的 Inventory

[oracle@rac10g2 ~]\$ cd /home/oracle/oracle/product/10.2.0/crs/oui/bin

[oracle@rac10g2 bin]\$ [./runInstaller -updateNodeList ORACLE\\_HOME=/home/oracle/oracle/product/10.2.0/crs "CLUSTER\\_NODES={rac10g2}" CRS=true](#)

Starting Oracle Universal Installer...

No pre-requisite checks found in oraparam.ini, no system pre-requisite checks will be executed.

The inventory pointer is located at /etc/oraInst.loc

The inventory is located at /home/oracle/oraInventory

'UpdateNodeList' was successful.

## 6、更新 RDBMS 的 Inventory

```
[root@rac10g2 ~]# su - oracle
```

```
[oracle@rac10g2 ~]$ $ORACLE_HOME/oui/bin/runInstaller -updateNodeList ORACLE_HOME=/home/oracle/oracle/product/10.2.0/db_1 CLUSTER_NODES=rac10g2
```

Starting Oracle Universal Installer...

No pre-requisite checks found in oraparam.ini, no system pre-requisite checks will be executed.

The inventory pointer is located at /etc/oraInst.loc

The inventory is located at /home/oracle/oraInventory

'UpdateNodeList' was successful.

至此，节点 1 的残留信息已经清理完毕。

## 四、执行 CRS 加节点步骤

### 1、运行 cvu 检查，修正发现的配置问题

建议但不是必须，这样可以预先解决可能导致加节点失败的配置问题。

```
[oracle@rac10g2 ~]$ /home/oracle/oracle/product/10.2.0/crs/bin/clusvfy stage -pre crsinst -n rac10g1,rac10g2
```

Performing pre-checks for cluster services setup

Checking node reachability...

Node reachability check passed from node "rac10g2".

Checking user equivalence...



User equivalence check passed for user "oracle".

Checking administrative privileges...

User existence check passed for "oracle".

Group existence check passed for "oinstall".

Membership check for user "oracle" in group "oinstall" [as Primary] passed.

Administrative privileges check passed.

Checking node connectivity...

Node connectivity check passed for subnet "192.168.56.0" with node(s) rac10g1,rac10g2.

Node connectivity check passed for subnet "192.168.59.0" with node(s) rac10g1,rac10g2.

Suitable interfaces for the private interconnect on subnet "192.168.56.0":

rac10g1 eth0:192.168.56.8

rac10g2 eth0:192.168.56.9 eth0:192.168.56.19

Suitable interfaces for the private interconnect on subnet "192.168.59.0":

rac10g1 eth1:192.168.59.8

rac10g2 eth1:192.168.59.9

**ERROR:**

Could not find a suitable set of interfaces for VIPs.

Node connectivity check failed.

Checking system requirements for 'crs'...

Total memory check passed.

Free disk space check passed.

Swap space check passed.

System architecture check passed.

Kernel version check passed.

Package existence check passed for "binutils-2.17.50.0.6-2.el5".

Package existence check passed for "control-center-2.16.0-14.el5".

Package existence check passed for "gcc-4.1.1-52".

Package existence check passed for "glibc-2.5-12".

Package existence check passed for "glibc-common-2.5-12".

Package existence check passed for "libstdc++-4.1.1-52.el5".

Package existence check passed for "libstdc++-devel-4.1.1-52.el5".

Package existence check passed for "make-3.81-1.1".

Package existence check passed for "sysstat-7.0.0-3.el5".

Package existence check passed for "setarch-2.0-1.1".

Kernel parameter check passed for "semmsl".

Kernel parameter check passed for "semmns".

Kernel parameter check passed for "semopm".

Kernel parameter check passed for "semmni".

Kernel parameter check passed for "shmall".

Kernel parameter check passed for "shmmni".

Kernel parameter check passed for "file-max".

Kernel parameter check passed for "rmem\_default".

Kernel parameter check passed for "rmem\_max".

Kernel parameter check passed for "wmem\_default".

Kernel parameter check passed for "wmem\_max".

Group existence check passed for "dba".

User existence check passed for "nobody".

Hard resource limit check passed for "open file descriptors".

Soft resource limit check passed for "open file descriptors".

Hard resource limit check passed for "maximum user processes".

Soft resource limit check passed for "maximum user processes".

System requirement passed for 'crs'

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

如返回信息中提示 “Could not find a suitable set of interfaces for VIPs.”，可以忽略，这是一个 bug，Metalink 中有详细说明，doc.id:338924.1。

2、

在图形界面下执行/home/oracle/oracle/product/10.2.0/crs/oui/bin 下的 addNode.sh 脚本即可打开添加节点的 OUI 界面。

```
oracle@rac10g2:~/oracle/product/10.2.0/crs/oui/bin
+ ORACLE_HOME=/home/oracle/oracle/product/10.2.0/crs
+ ./runInstaller -addNode ORACLE_HOME=/home/oracle/oracle/product/10.2.0/crs
/home/oracle/oracle/product/10.2.0/crs/oui/bin/addNode.sh: line 3: ./runInstalle
r: No such file or directory
[oracle@rac10g2 ~]$ more addNode.sh
addNode.sh: No such file or directory
[oracle@rac10g2 ~]$ ls
cvuqdisk-1.0.1-1.rpm oracle oraInventory
[oracle@rac10g2 ~]$ cd /home/oracle/oracle/product/10.2.0/crs/oui/bin/add
-bash: cd: /home/oracle/oracle/product/10.2.0/crs/oui/bin/add: No such file or d
irectory
[oracle@rac10g2 ~]$ cd /home/oracle/oracle/product/10.2.0/crs/oui/bin/
[oracle@rac10g2 bin]$ ls
addLangs.sh attachHome.sh lsnodes
addNode.sh detachHome.sh ouica.bat
[oracle@rac10g2 bin]$ ./addNode.sh
Starting Oracle Universal Installer...

No pre-requisite checks found in orapar
ll be executed.
Oracle Universal Installer, Version 10.
Copyright (C) 1999, 2010, Oracle. All r
```



Oracle Universal Installer: Specify Cluster Nodes to Add to Installation

## Specify Cluster Nodes to Add to Installation

### Existing Nodes

The following nodes are already part of the installation.

Existing Node	Private Node Name	Virtual host name
rac10g2	rac10g2-priv	rac10g2-vip.fsm.com

### Specify New Nodes

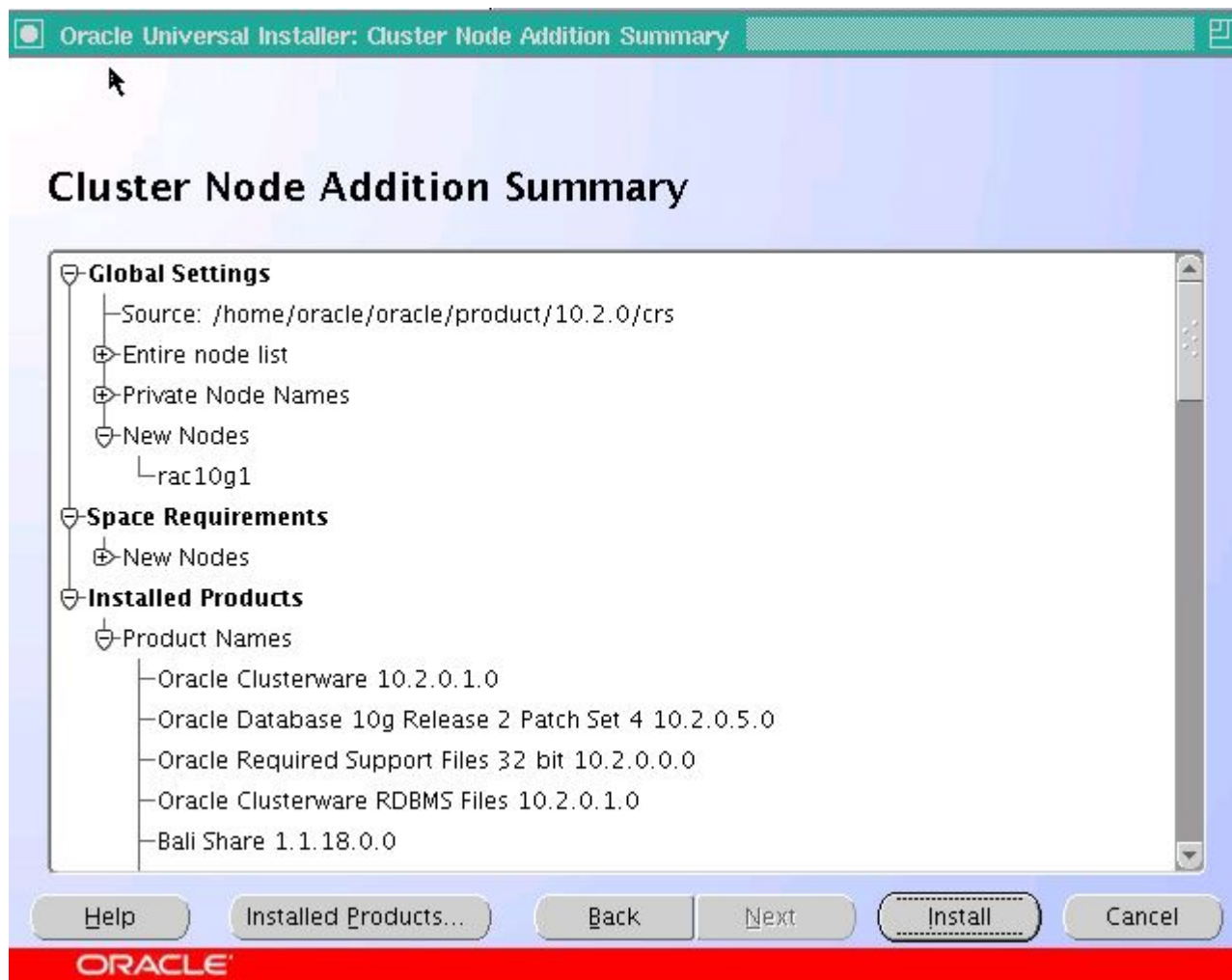
Enter the public node name and private node name for nodes that you want to add to this installation.

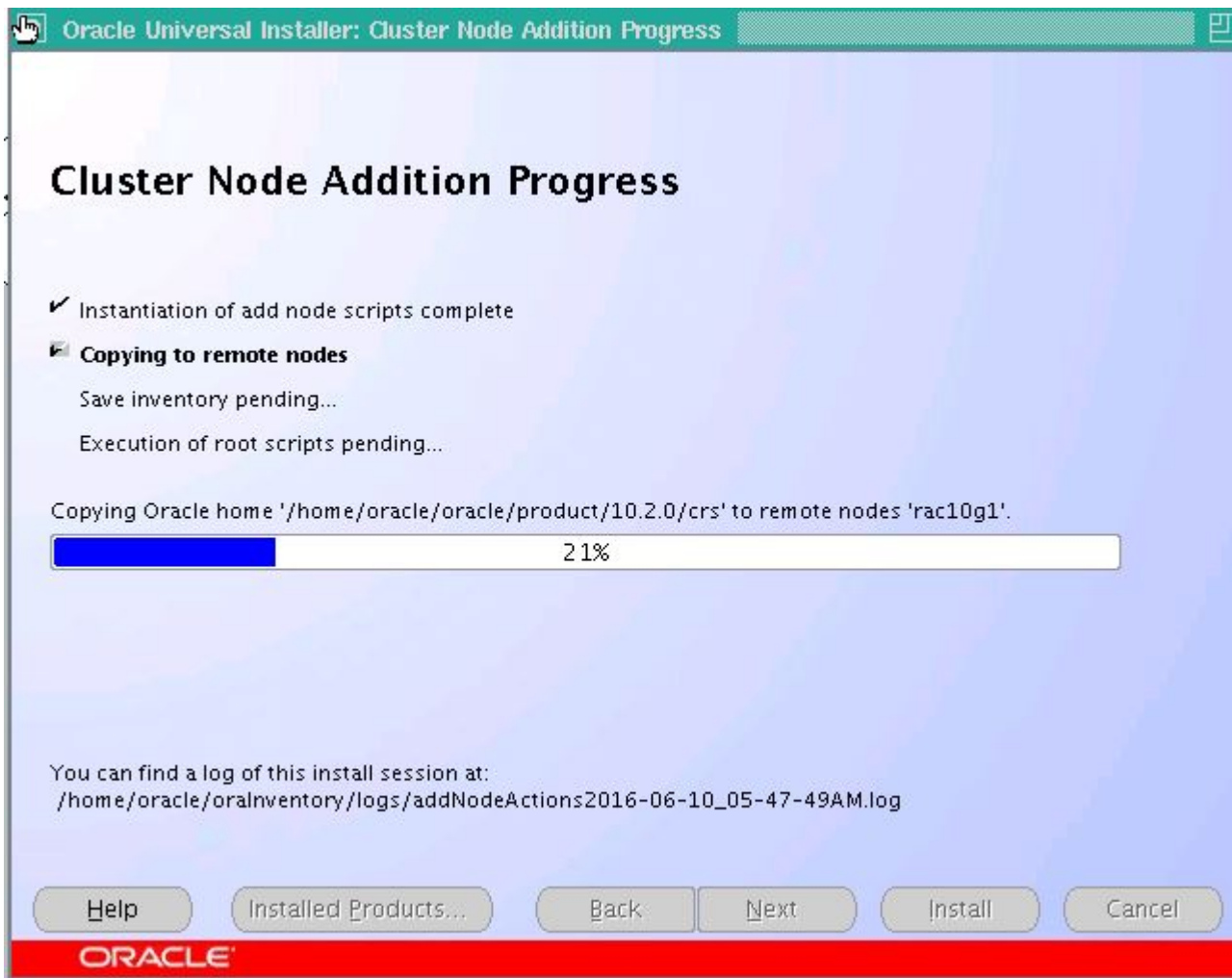
Public Node Name	Private Node Name	Virtual host name
rac10g1	rac10g1-priv	rac10g1-vip

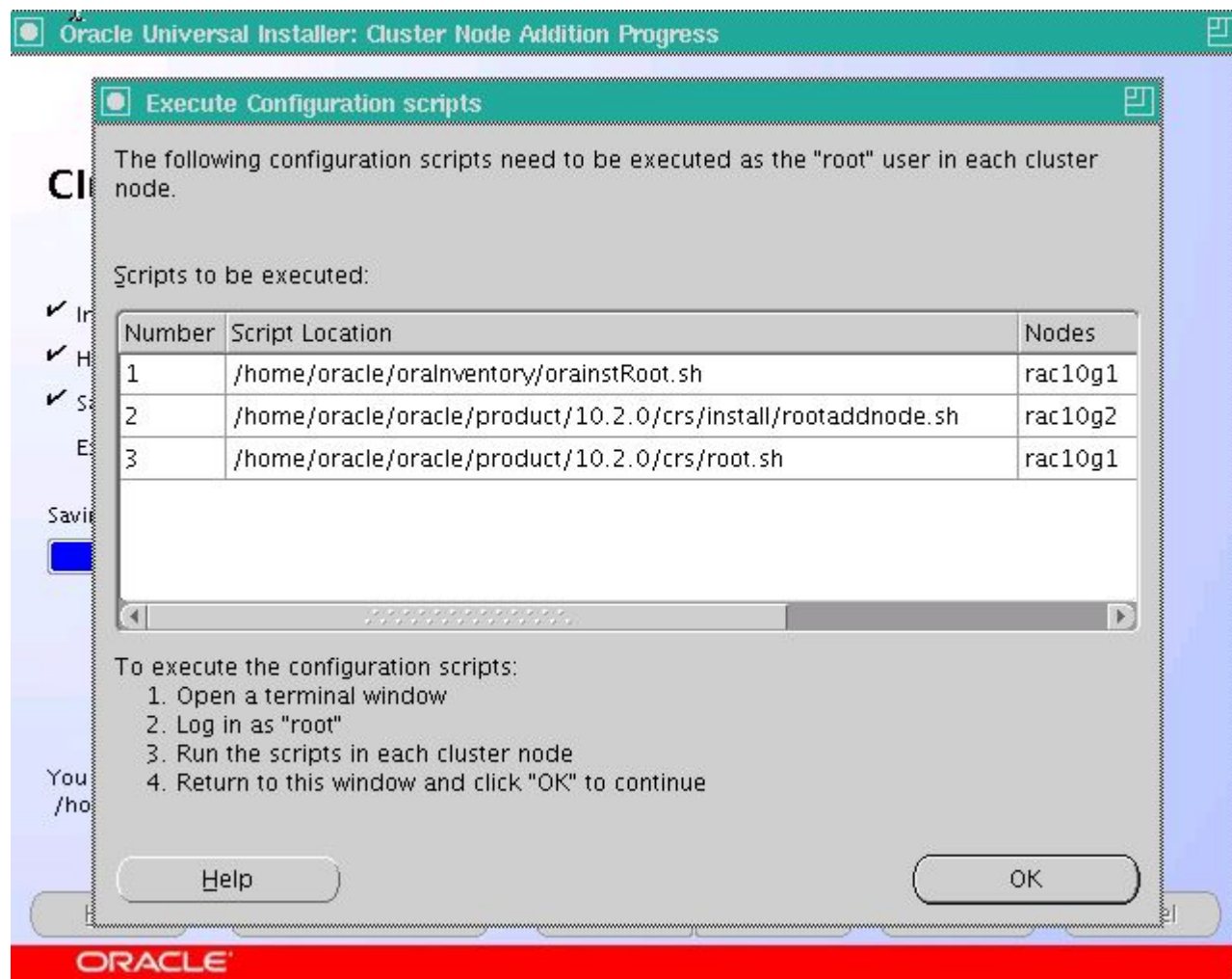
Help Installed Products... Back Next Install Cancel

ORACLE

此处在此 Specify New Nodes 处填入要增加的节点名 rac10g1 即可显示出。







依次在上述指定的节点执行指定的脚本。



节点 1:

```
[root@rac10g1 ~]# cd /home/oracle/oraInventory/
```

```
[root@rac10g1 oraInventory]# ./orainstRoot.sh
```

Creating the Oracle inventory pointer file (/etc/oraInst.loc)

Changing permissions of /home/oracle/oraInventory to 770.

Changing groupname of /home/oracle/oraInventory to oinstall.

The execution of the script is complete

节点 2:

```
[root@rac10g2 install]# /home/oracle/oracle/product/10.2.0/crs/install/rootaddnode.sh
```

clscfg: EXISTING configuration version 3 detected.

clscfg: version 3 is 10G Release 2.

Node rac10g1 is already assigned nodenum 3.

Aborting: No configuration data has been changed.

```
clscfg -add -nn nameA,numA,nameB,numB,... -pn privA,numA,privB,numB,...
```

```
[-hn hostA,numA,hostB,numB,...] [-t p1,p2,p3,p4]
```

-nn specifies nodenames in the same fashion as -nn in -install mode

-pn specifies private interconnect names as -pn in -install mode

-hn specifies hostnames in the same fashion as -hn in -install mode

-t specifies port numbers to be used by CRS daemons on the new node(s)

default ports: 49895,49896,49897,49898

WARNING: Using this tool may corrupt your cluster configuration. Do not

use unless you positively know what you are doing.

```
/home/oracle/oracle/product/10.2.0/crs/bin/srvctl add nodeapps -n rac10g1 -A rac10g1-vip/255.255.255.0/eth0 -o /home/oracle/oracle/product/10.2.0/crs
```

节点 1:

```
[root@rac10g1 ~]# /home/oracle/oracle/product/10.2.0/crs/root.sh
```

WARNING: directory '/home/oracle/oracle/product/10.2.0' is not owned by root

WARNING: directory '/home/oracle/oracle/product' is not owned by root

WARNING: directory '/home/oracle/oracle' is not owned by root

WARNING: directory '/home/oracle' is not owned by root

No value set for the CRS parameter CRS\_OCR\_LOCATIONS. Using Values in paramfile.crs

Checking to see if Oracle CRS stack is already configured

/etc/oracle does not exist. Creating it now.

OCR LOCATIONS = /dev/raw/raw1

OCR backup directory '/home/oracle/oracle/product/10.2.0/crs/cdata/crs' does not exist. Creating now

Setting the permissions on OCR backup directory

Setting up NS directories

Oracle Cluster Registry configuration upgraded successfully

WARNING: directory '/home/oracle/oracle/product/10.2.0' is not owned by root

WARNING: directory '/home/oracle/oracle/product' is not owned by root

WARNING: directory '/home/oracle/oracle' is not owned by root

WARNING: directory '/home/oracle' is not owned by root

clscfg: EXISTING configuration version 3 detected.

clscfg: version 3 is 10G Release 2.

Successfully accumulated necessary OCR keys.

Using ports: CSS=49895 CRS=49896 EVMC=49898 and EVMR=49897.

node <nodenumber>: <nodename> <private interconnect name> <hostname>

node 1: rac10g1 rac10g1-priv rac10g1

node 2: rac10g2 rac10g2-priv rac10g2

clscfg: Arguments check out successfully.

NO KEYS WERE WRITTEN. Supply -force parameter to override.

-force is destructive and will destroy any previous cluster

configuration.

Oracle Cluster Registry for cluster has already been initialized

Startup will be queued to init within 30 seconds.

Adding daemons to inittab

Expecting the CRS daemons to be up within 600 seconds.

CSS is active on these nodes.

rac10g2

rac10g1

CSS is active on all nodes.

Waiting for the Oracle CRSD and EVMD to start

Oracle CRS stack installed and running under init(1M)

至此，可以看到相节点 1 的几个 crs 资源以及加入：

[root@rac10g2 install]# su - oracle

[oracle@rac10g2 ~]\$ crs\_stat -t

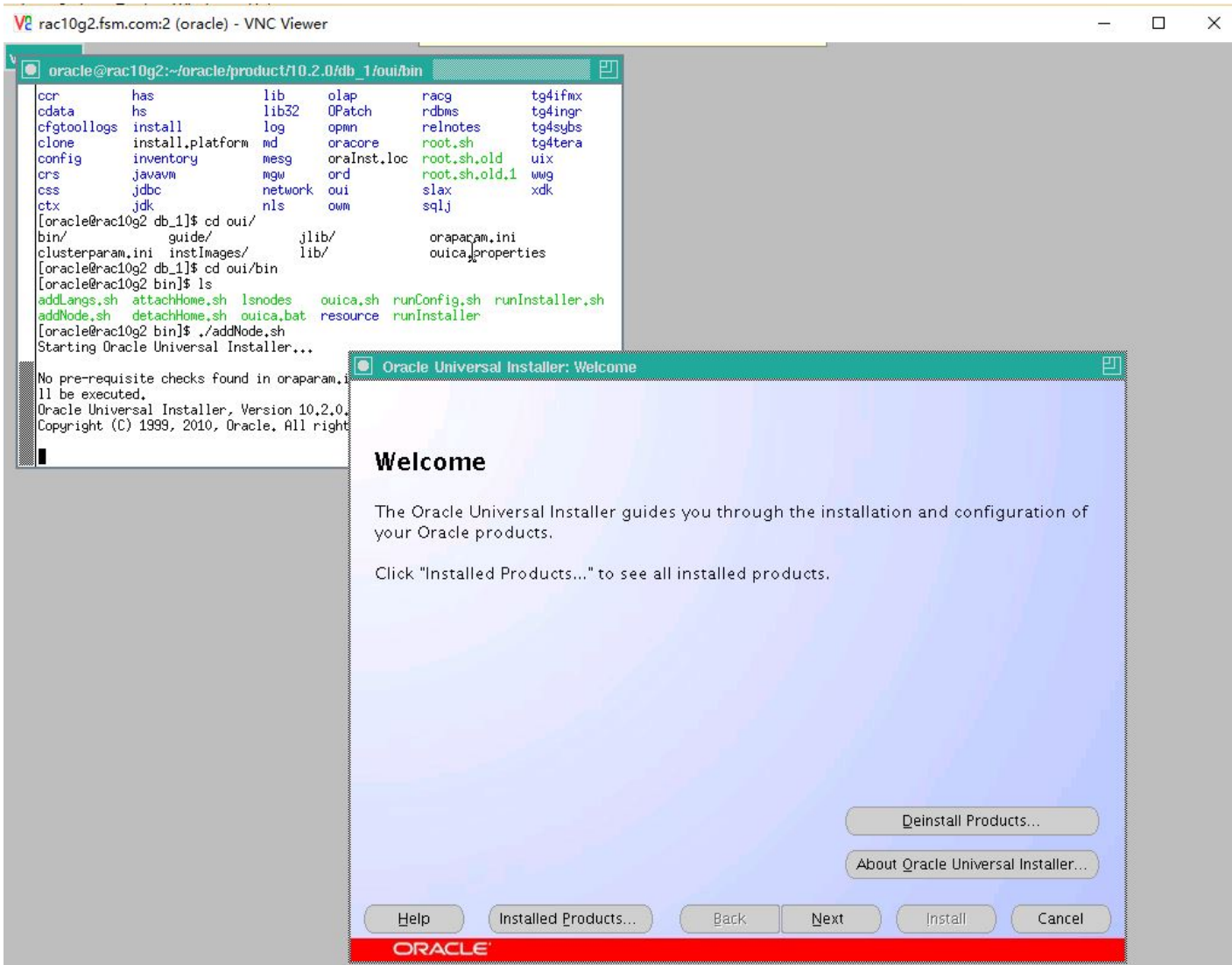
Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....0g1.gsd	application	ONLINE	ONLINE	rac10g1
ora....0g1.ons	application	ONLINE	ONLINE	rac10g1
ora....0g1.vip	application	ONLINE	ONLINE	rac10g1
ora....SM2.asm	application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr	application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd	application	ONLINE	ONLINE	rac10g2
ora....0g2.ons	application	ONLINE	ONLINE	rac10g2

```
ora....0g2.vip application    ONLINE    ONLINE    rac10g2
```

```
[oracle@rac10g2 ~]$
```

## 五、执行 RDBMS 加节点步骤

图形界面下执行/home/oracle/oracle/product/10.2.0/db\_1/oui/bin 下的 addNode.sh 脚本即可打开添加节点的 OUI 界面。





## Specify Cluster Nodes to Add to Installation

### Existing Nodes

The following nodes are already part of the installation.

Existing Node

rac10g2

### Specify New Nodes

Select nodes that you want to add to this installation.

Public Node Name

☒ rac10g1

Select All

Deselect All

Help

Installed Products...

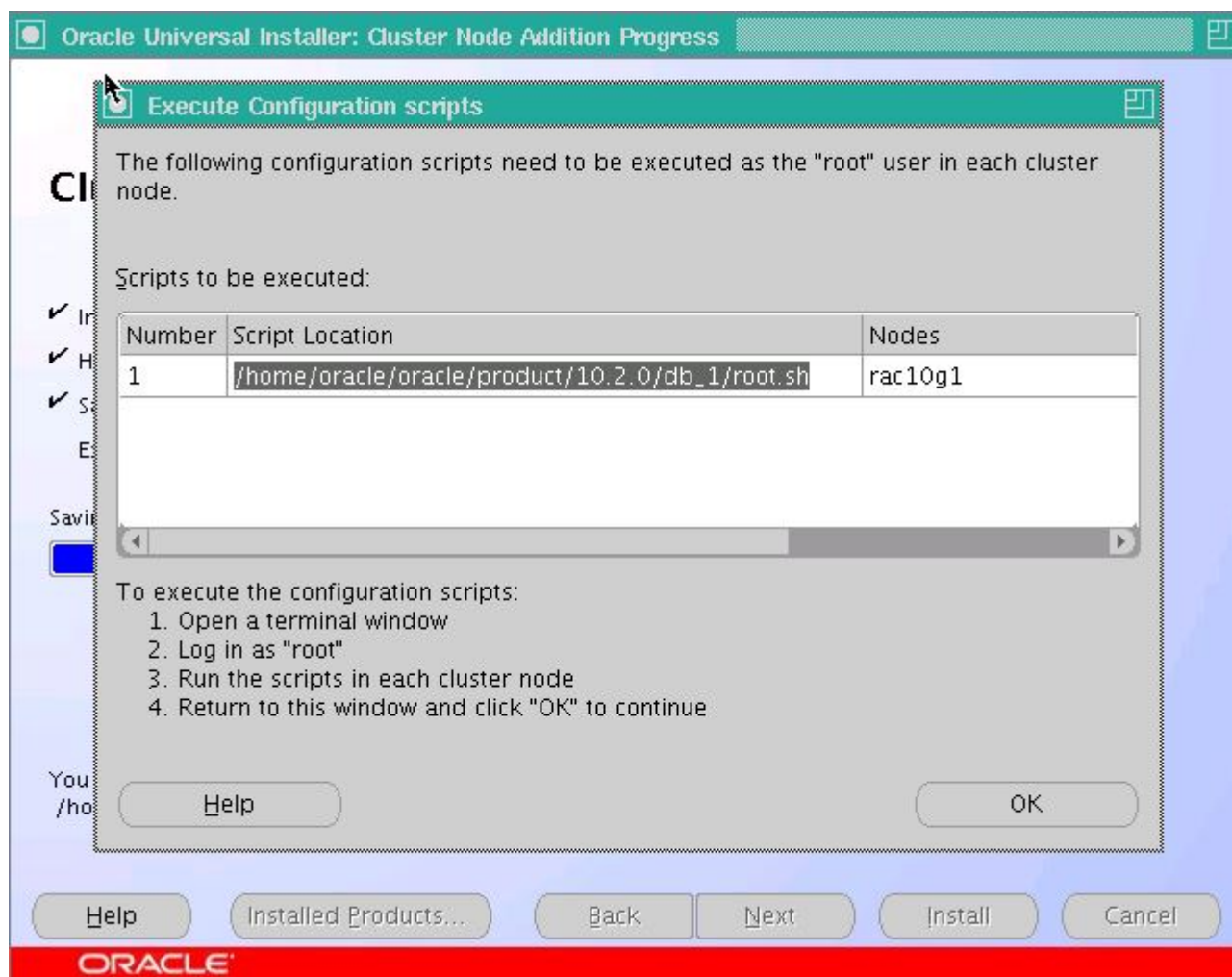
Back

Next

Install

Cancel

ORACLE



在节点 1 命令行界面下执行 root.sh 即可:

```
[root@rac10g1 ~]# /home/oracle/oracle/product/10.2.0/db_1/root.sh
```

Running Oracle 10g root.sh script...

The following environment variables are set as:

```
ORACLE_OWNER= oracle
```

```
ORACLE_HOME= /home/oracle/oracle/product/10.2.0/db_1
```

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.

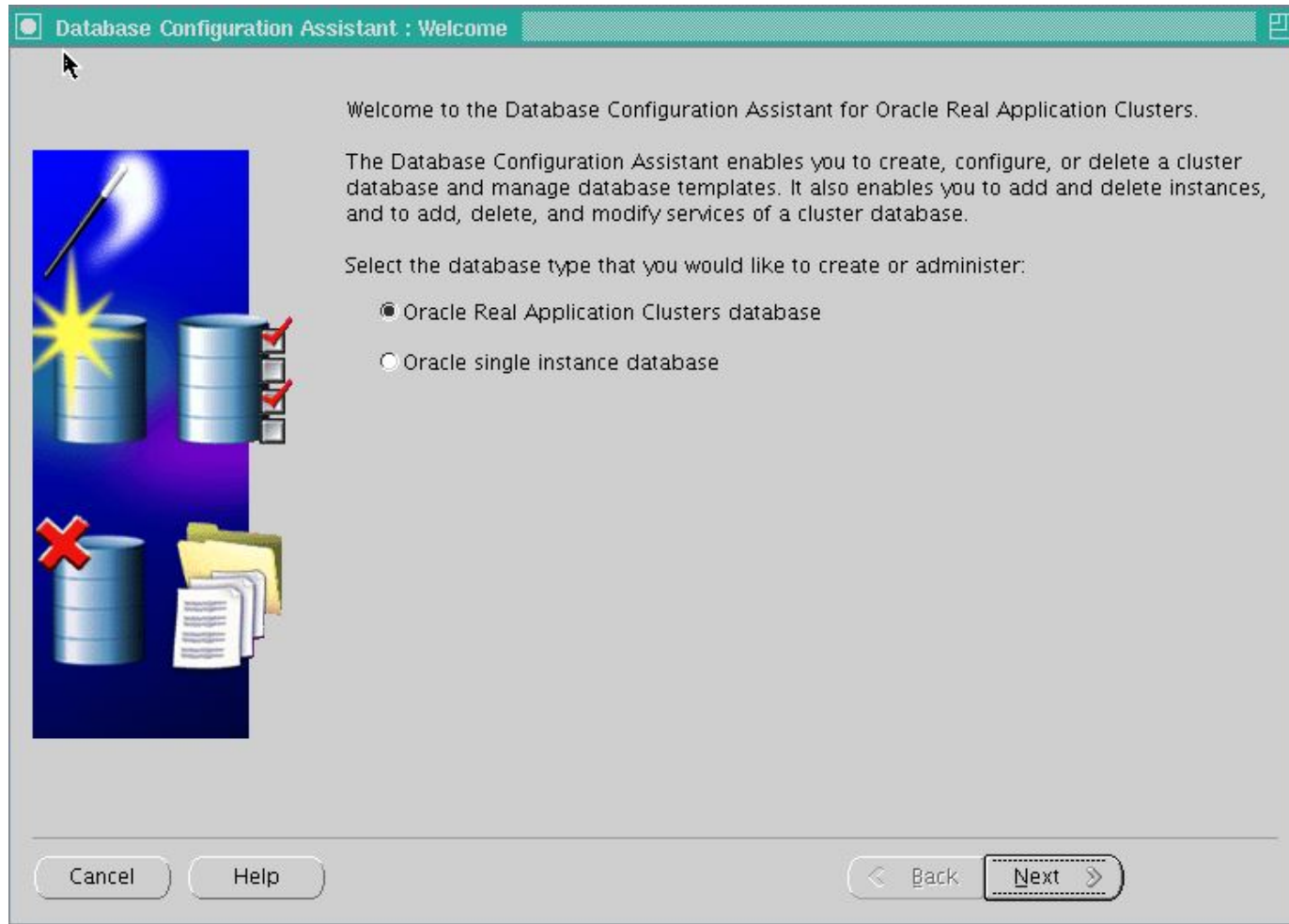
Now product-specific root actions will be performed.





六、执行 DBCA 添加实例 1 资源

DBCA 会自动扩展 ASM 和监听的配置到节点 1，这也是使用 DBCA 的自动化好处。



七、

Database Configuration Assistant, Step 1 of 8 : Operations

Select the operation that you want to perform:

- ☐ Create a Database
- ☐ Configure Database Options
- ☐ Delete a Database
- ☐ Manage Templates
- ☒ Instance Management
- ☐ Services Management
- ☐ Configure Automatic Storage Management



Cancel

Help

< Back

Next >

Select the instance management operation that you want to perform:

- ☒ Add an instance
- ☐ Delete an instance



Cancel


Help

< Back

Next >

Database Configuration Assistant, Step 3 of 8 : List of cluster databases

Select an active cluster database to add an instance



Select	Database Name	Status
<input type="radio"/>	db10g	active

Specify a user with SYSDBA system privilege

Username:

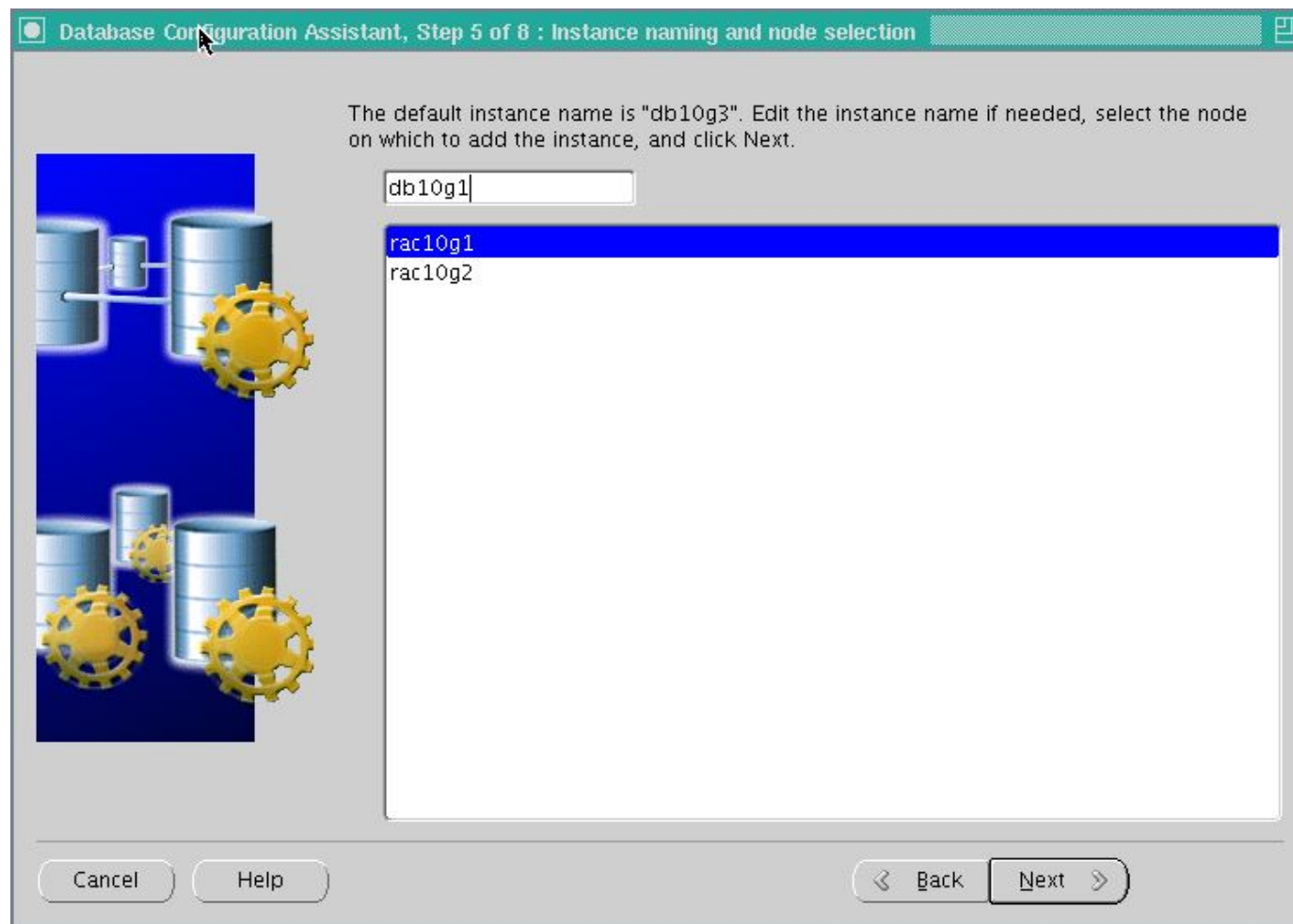
Password:

Cancel

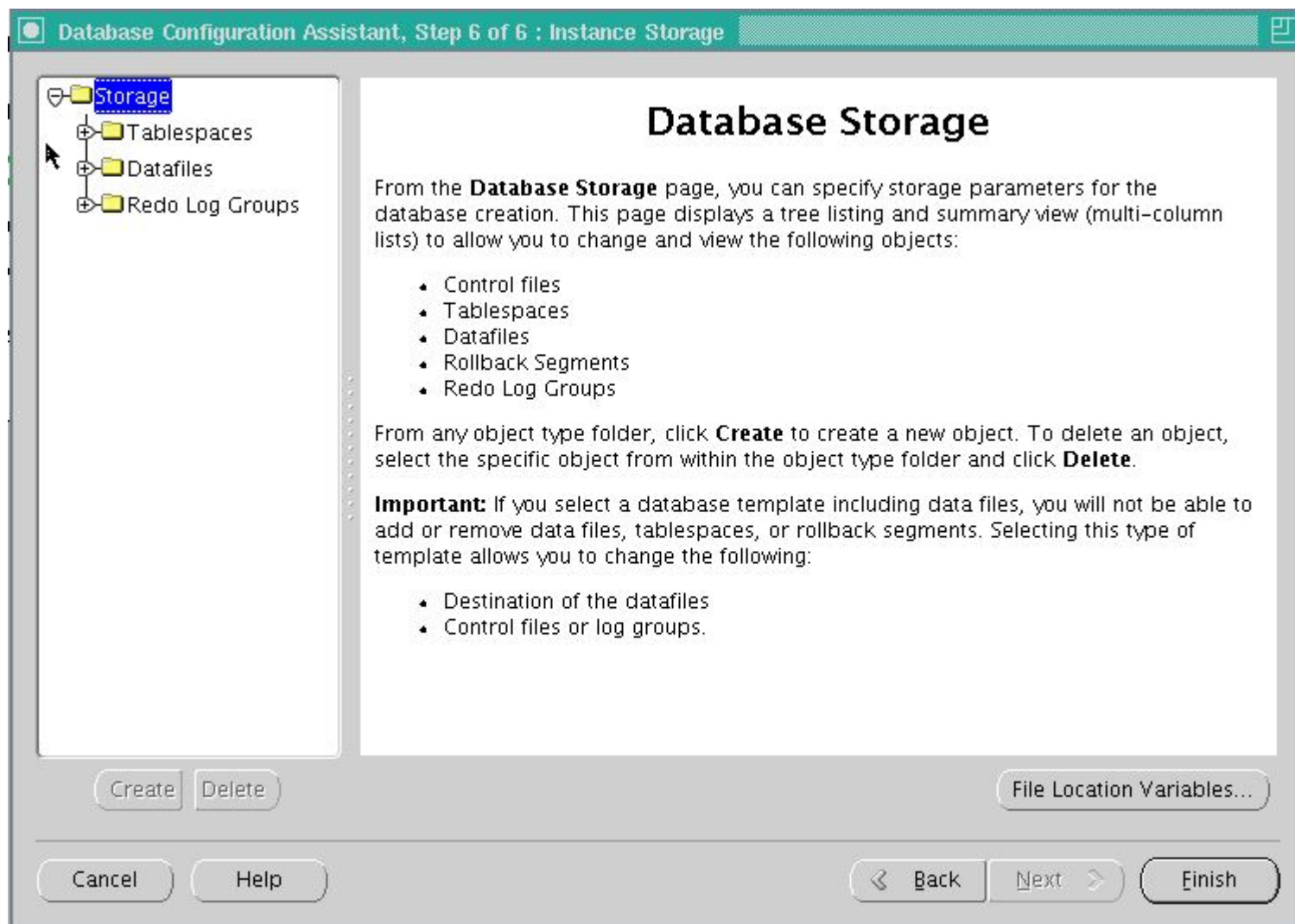
Help

< Back

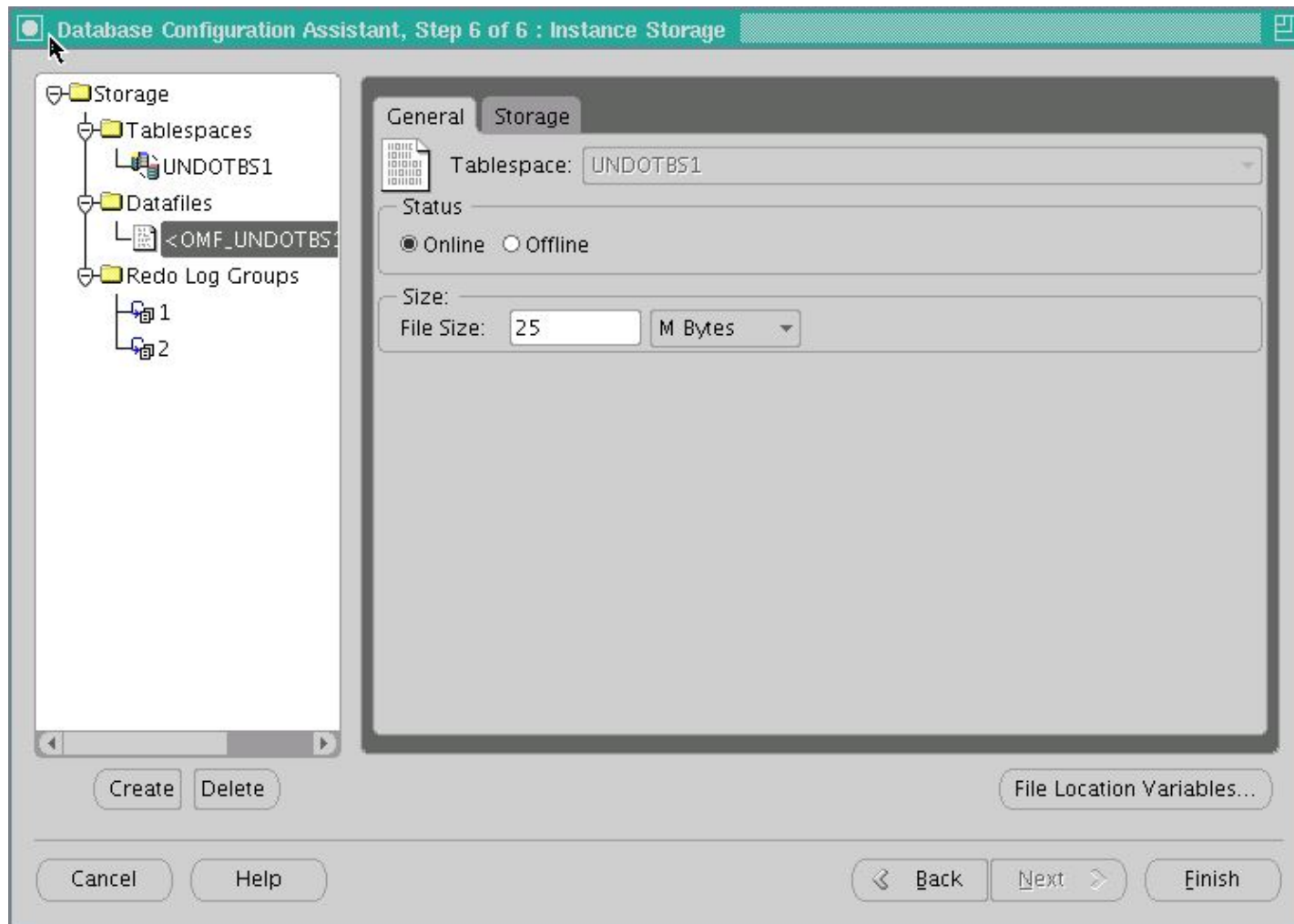
Next >



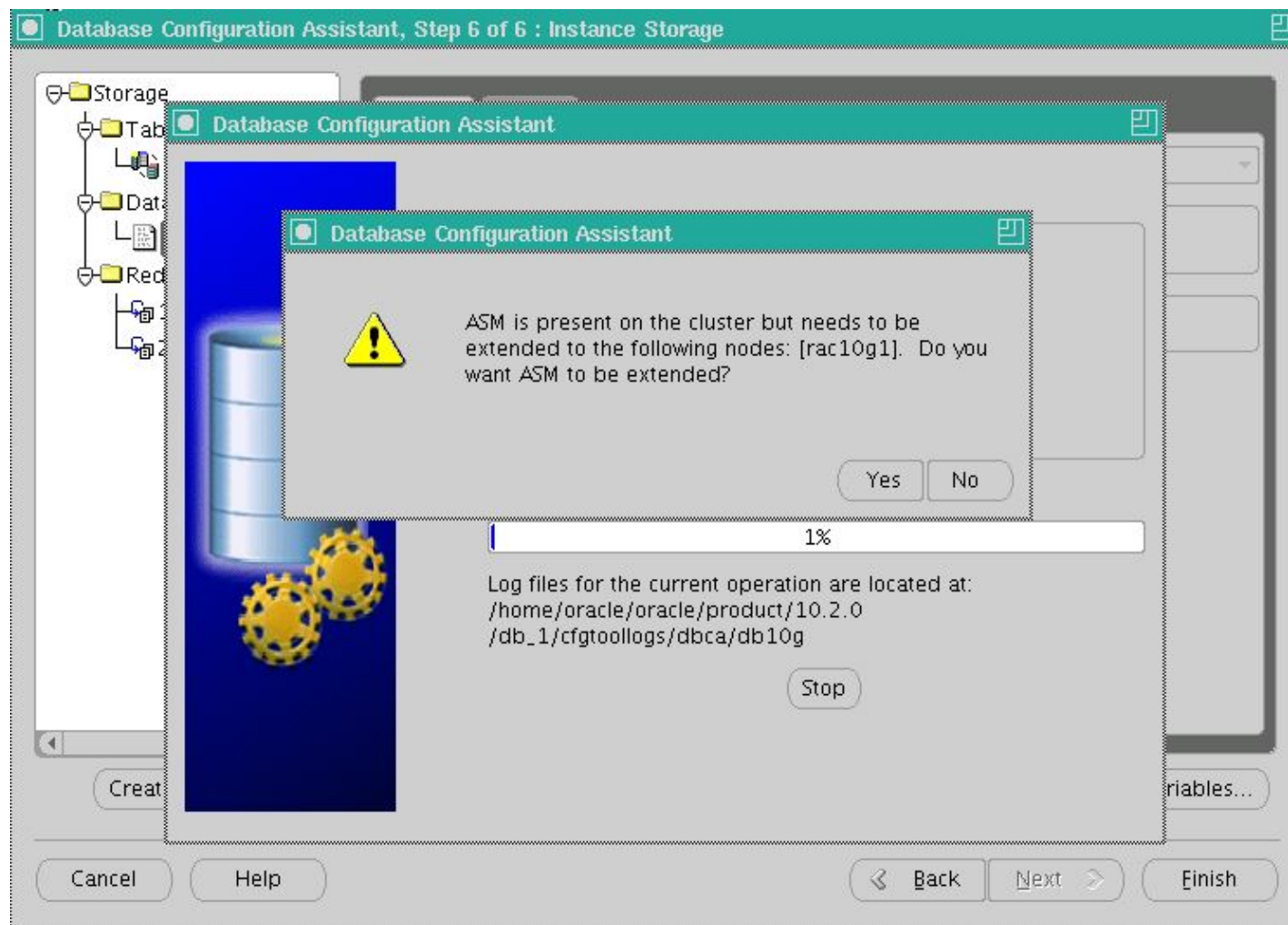
这里需要注意默认的实例名需要手工修改。



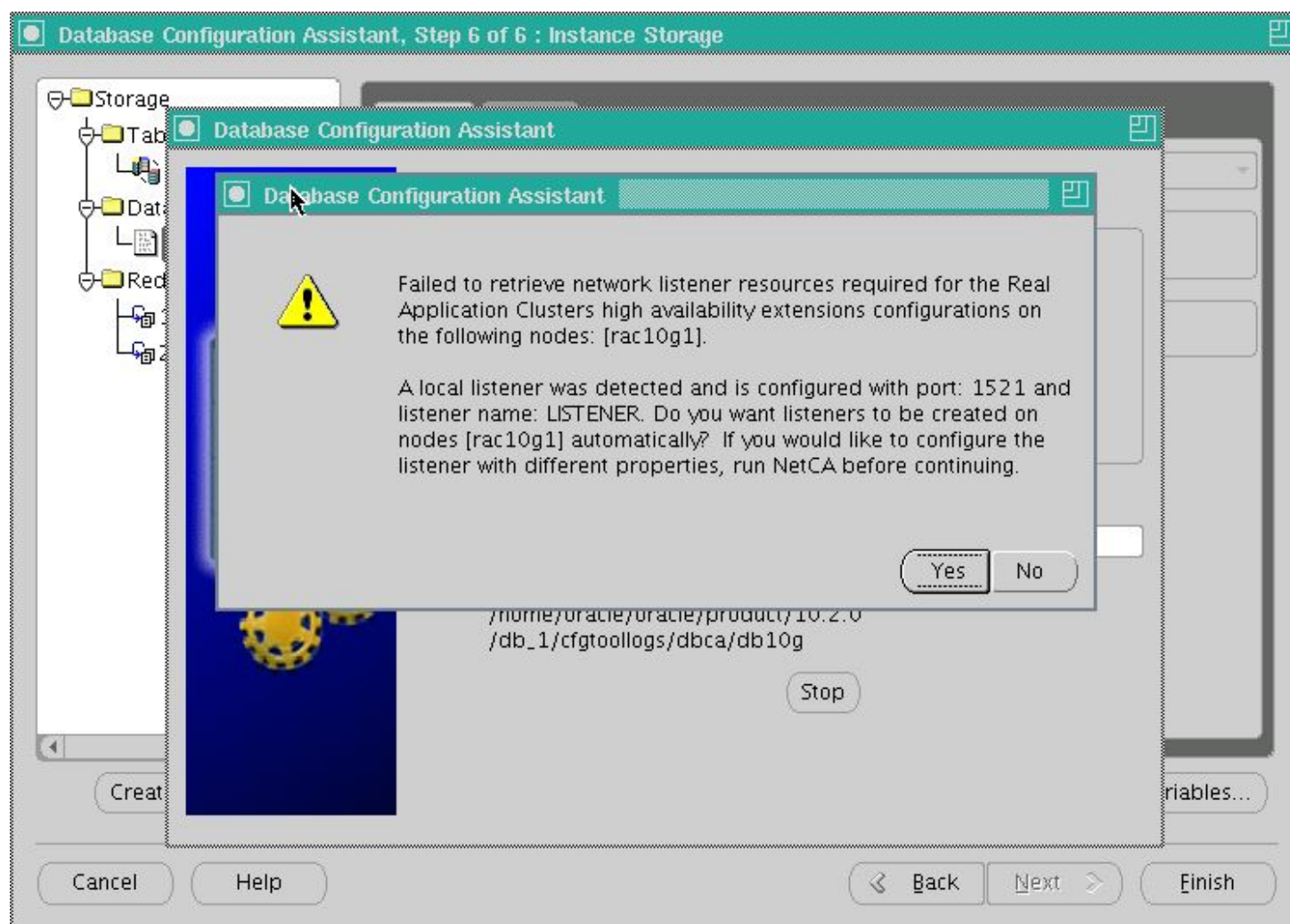
点开左边的 tablespace、datafile、redo log group 我们可以看到这里是指定给实例 1 生成的 undo 表空间、redo log group 的位置和大小:



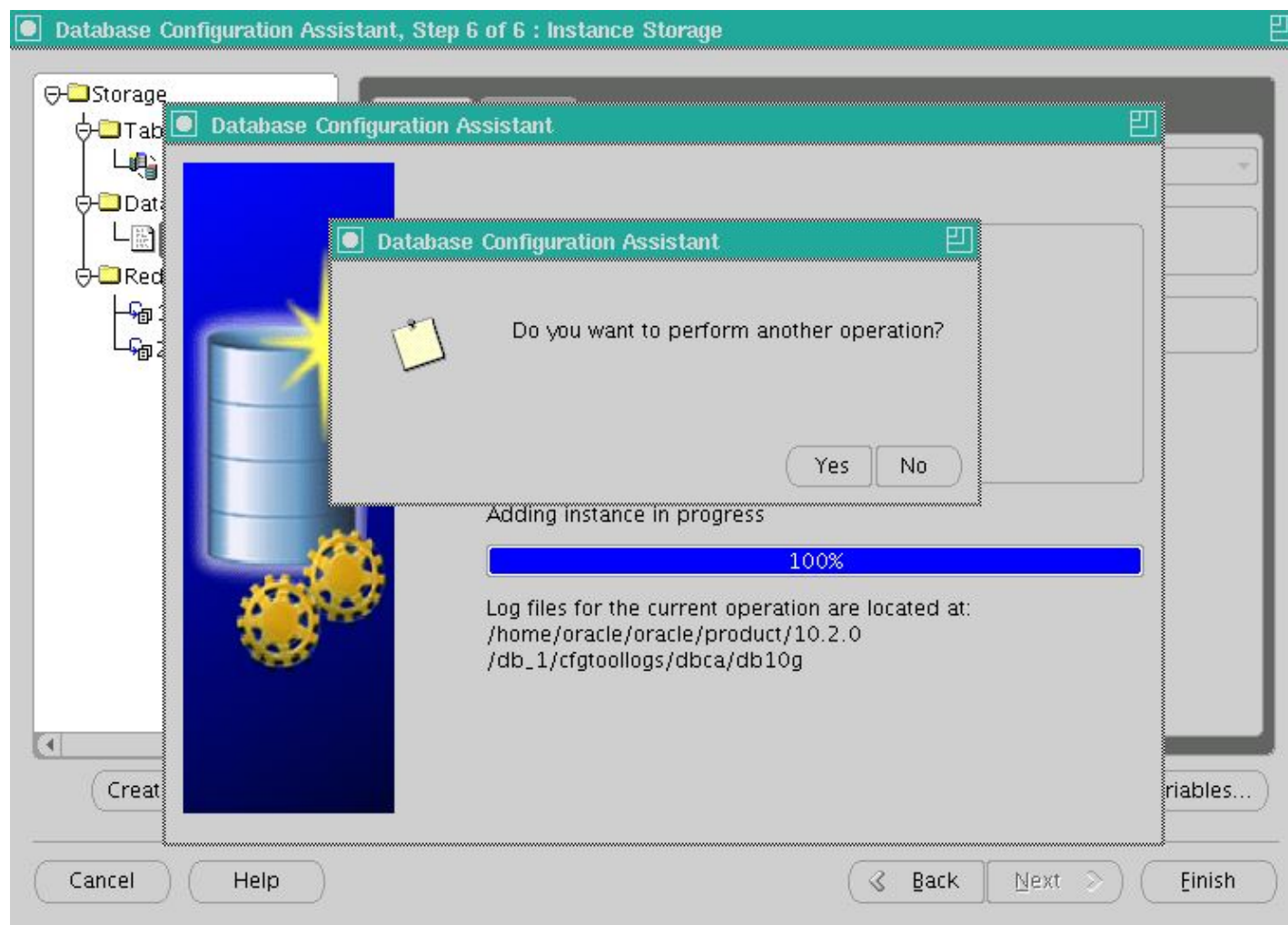




这里提示了是否将 ASM 配置扩展到节点 1（如果未使用 ASM 则不会弹出），点 yes 即可。



这里提示是否扩展监听配置到节点 1，点 yes 即可。



添加完成后，点 no 退出。

## 八、检查资源状态，确认加节点成功

```
[oracle@rac10g1 ~]$ /home/oracle/oracle/product/10.2.0/crs/bin/crs_stat -t
```

Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g1.inst	application	ONLINE	ONLINE	rac10g1
ora....g2.inst	application	ONLINE	ONLINE	rac10g2
ora....SM3.asm	application	ONLINE	ONLINE	rac10g1
ora....G1.lsnr	application	ONLINE	ONLINE	rac10g1
ora....0g1.gsd	application	ONLINE	ONLINE	rac10g1
ora....0g1.ons	application	ONLINE	ONLINE	rac10g1
ora....0g1.vip	application	ONLINE	ONLINE	rac10g1
ora....SM2.asm	application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr	application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd	application	ONLINE	ONLINE	rac10g2
ora....0g2.ons	application	ONLINE	ONLINE	rac10g2
ora....0g2.vip	application	ONLINE	ONLINE	rac10g2

```
[oracle@rac10g1 ~]$
```

```
[oracle@rac10g2 ~]$ crs_stat -t
```

Name	Type	Target	State	Host
-----				
ora.db10g.db	application	ONLINE	ONLINE	rac10g2
ora....g1.inst	application	ONLINE	ONLINE	rac10g1
ora....g2.inst	application	ONLINE	ONLINE	rac10g2

ora....SM3.asm application	ONLINE	ONLINE	rac10g1
ora....G1.lsnr application	ONLINE	ONLINE	rac10g1
ora....0g1.gsd application	ONLINE	ONLINE	rac10g1
ora....0g1.ons application	ONLINE	ONLINE	rac10g1
ora....0g1.vip application	ONLINE	ONLINE	rac10g1
ora....SM2.asm application	ONLINE	ONLINE	rac10g2
ora....G2.lsnr application	ONLINE	ONLINE	rac10g2
ora....0g2.gsd application	ONLINE	ONLINE	rac10g2
ora....0g2.ons application	ONLINE	ONLINE	rac10g2
ora....0g2.vip application	ONLINE	ONLINE	rac10g2

[oracle@rac10g2 ~]\$