Oracle 11g rac add or delete node

实验： 咸士杰

oracle：11203 rac

存储：openfiler

本文结合其他人删除和添加步骤整理，还没有测试

# 一 11g r2 RAC非正常情况下删除节点然后添加节点的步骤

## 1.1 适用场景

场景：三节点RAC，主机名是rac1、rac2、rac3，现在需要删除rac3。

以下操作步骤适用于：  
①某节点集群或库软件严重损坏，相关命令无法正常运行，如误删了/u01目录，需要重装GI和库软件。  
②某节点操作系统故障，导致不能启动或运行中报错，需要重装操作系统。  
③某节点服务器硬件故障，需要更换硬件及重装操作系统。

## 1.2 查看当前资源服务的状态

[root@rac1 ~]# crs\_stat -t  
Name           Type           Target    State     Host          
------------------------------------------------------------  
ora.DATA.dg    ora....up.type ONLINE    ONLINE    rac1       
ora.FRA.dg     ora....up.type ONLINE    ONLINE    rac1       
ora....ER.lsnr ora....er.type ONLINE    ONLINE    rac1       
ora....N1.lsnr ora....er.type ONLINE    ONLINE    rac2       
ora.OCR\_VOT.dg ora....up.type ONLINE    ONLINE    rac1       
ora.asm        ora.asm.type   ONLINE    ONLINE    rac1       
ora.orcl.db   ora....se.type ONLINE    ONLINE    rac1       
ora.crmdemo.db ora....se.type ONLINE    ONLINE    rac1       
ora.cvu        ora.cvu.type   ONLINE    ONLINE    rac2       
ora....SM1.asm application    ONLINE    ONLINE    rac1       
ora....C1.lsnr application    ONLINE    ONLINE    rac1       
ora.rac1.gsd application      OFFLINE   OFFLINE                 
ora.rac1.ons application      ONLINE    ONLINE    rac1       
ora.rac1.vip ora....t1.type   ONLINE    ONLINE    rac1       
ora....SM2.asm application    ONLINE    ONLINE    rac2       
ora....C2.lsnr application    ONLINE    ONLINE    rac2       
ora.rac2.gsd application      OFFLINE   OFFLINE                 
ora.rac2.ons application      ONLINE    ONLINE    rac2       
ora.rac2.vip ora....t1.type   ONLINE    ONLINE    rac2  
ora.rac3.vip ora....t1.type   ONLINE    ONLINE    rac1          
ora.gsd        ora.gsd.type   OFFLINE   OFFLINE                 
ora....network ora....rk.type ONLINE    ONLINE    rac1       
ora.oc4j       ora.oc4j.type  ONLINE    ONLINE    rac2       
ora.ons        ora.ons.type   ONLINE    ONLINE    rac1       
ora....ry.acfs ora....fs.type ONLINE    ONLINE    rac1       
ora.scan1.vip  ora....ip.type ONLINE    ONLINE    rac2

看到有这么一行：ora.rac3.vip ora....t1.type   ONLINE    ONLINE    rac1    
也就是rac3的vip现在在rac1上，平时我们通过vip或scan ip连接数据库，在rac3节点故障后，rac3的vip会自动转移到其他活动节点上，从而实现高可用。

## 1.3 删除RAC故障节点

1.使用dbca删掉故障节点的实例  
在任一正常的节点上执行：  
[root@rac1 ~]# su - oracle  
[oracle@rac1 ~]$ dbca  --图形界面  
或使用命令行  
[oracle@rac1 ~]$ dbca -silent -deleteInstance -nodeList rac3 -gdbName orcl -instanceName orcl2 -sysDBAUserName sys -sysDBAPassword jjlg707

查看活动的实例：  
[oracle@rac1 ~]$ sqlplus / as sysdba  
SQL> select thread#,status,instance from v$thread;

查看库的配置：  
[root@rac1 ~]# srvctl config database -d orcl

2.停止故障节点NodeApps：  
[oracle@rac1 bin]$ srvctl stop nodeapps -n rac3 -f

3.更新正常节点的集群列表（oracle用户）  
On the remaining nodes run the following to update the inventory with the remaining nodes of the cluster.  
在每个正常的节点上执行：  
[root@rac1 ~]# su - oracle  
[oracle@rac1 ~]$ $ORACLE\_HOME/oui/bin/runInstaller -updateNodeList ORACLE\_HOME=$ORACLE\_HOME "CLUSTER\_NODES={rac1,rac2}"  
[root@rac2 ~]# su - oracle  
[oracle@rac2 ~]$ $ORACLE\_HOME/oui/bin/runInstaller -updateNodeList ORACLE\_HOME=$ORACLE\_HOME "CLUSTER\_NODES={rac1,rac2}"

4.在正常的节点上删除故障节点  
su - root  
[root@rac1 ~]# crsctl delete node -n rac3    
[root@rac1 ~]# olsnodes -t -s

5.删除故障节点的vip  
[root@rac1 ~]# crsctl delete resource ora.rac3.vip -f  
验证故障节点的VIP已被删除：  
[root@rac1 ~]# crs\_stat -t

6.更新正常节点的集群列表（grid用户）  
在每个正常的节点上执行：  
[root@rac1 ~]# su - grid  
[grid@rac1 ~]$ $ORACLE\_HOME/oui/bin/runInstaller -updateNodeList ORACLE\_HOME=$ORACLE\_HOME "CLUSTER\_NODES={rac1,rac2}" CRS=true  
[root@rac2 ~]# su - grid  
[grid@rac2 ~]$ $ORACLE\_HOME/oui/bin/runInstaller -updateNodeList ORACLE\_HOME=$ORACLE\_HOME "CLUSTER\_NODES={rac1,rac2}" CRS=true

7.验证故障节点已被删除  
在任一正常的节点上：  
[grid@rac1 ~]$ cluvfy stage -post nodedel -n rac3

[grid@rac1 ~]$ crsctl status resource -t

查看活动的实例：  
[oracle@rac1 ~]$ sqlplus / as sysdba  
SQL> select thread#,status,instance from v$thread;

添加节点简单命令

1.1 安装rac的准备工作  
参考11g RAC安装文档。

1.2 配置节点间互信  
略。

1、扩展grid集群件:  
  
  
  
./runInstaller -updateNodeList ORACLE\_HOME=/u01/app/11.2.0/grid  CLUSTER\_NODES={rac1}       --此处不写rac2就是表示删除rac2的信息。  
切换至grid用户，进入/u01/app/11.2.0/grid/oui/bin执行  
$export IGNORE\_PREADDNODE\_CHECKS=Y  
$./addNode.sh -silent CLUSTER\_NEW\_NODES={rac2} CLUSTER\_NEW\_VIRTUAL\_HOSTNAMES={rac2-vip}  
油菜  15:57:01  
4.在**正常**的节点上删除故障节点  
su - root  
[root@rac1 ~]# crsctl delete node -n rac3    
[root@rac1 ~]# olsnodes -t -s

# 二 11g r2 rac添加新节点

## 2.1 新节点前期准备

针对第三个新节点做如下配置（其实和安装rac的步骤一样，就是需要手工配置ssh等效性）

**1、配置openfiler：**

(1). 在RHEL5系统中, 下载并安装iSCSI启动器软件包

# rpm -ivh iscsi-initiator-utils-6.2.0.742-0.5.el5.i386.rpm

(2.) 在RHEL5系统中, 生成并查看iSCSI启动器的名称

# echo "InitiatorName=`iscsi-iname`" >/etc/iscsi/initiatorname.iscsi

# cat /etc/iscsi/initiatorname.iscsi

InitiatorName=iqn.2005-03.com.redhat:01.b9d0dd11016

(3). 在RHEL5系统中, 配置iSCSI启动器服务

# vi /etc/iscsi/iscsid.conf(iSCSI启动器服务的配置文件)

node.session.auth.authmethod =CHAP

node.session.auth.username = iqn.2005-03.com.redhat:01.b9d0dd11016

node.session.auth.password = 01.b9d0dd11016

# chkconfig iscsi --level 35 on

(4). 在RHEL5系统中, 启动iSCSI启动器服务

# service iscsi restart

(5). 在RHEL5系统中, 使用iSCSI存储

# rm -rf /var/lib/iscsi/nodes/\*

# rm -rf /var/lib/iscsi/send\_targets/\*

# iscsiadm -m discovery -t st -p 192.168.0.197 (发现)

192.168.1.2:3260,1 iqn.2004-01.com.company:block-wb

# iscsiadm -m node -T iqn.2004-01.com.company:block-wb -p 192.168.0.197 -l (登录)

**2、安装oracle所需包**

首先配置yum源

# mkdir /mnt/cdrom

# mount -o loop /dev/cdrom /mnt/cdrom/      -------加载镜像

# mount /dev/cdrom /mnt/cdrom        ----------加载光盘

vi  /etc/yum.repos.d/dvd.repo     -------填写如下内容

[dvd]

name=install dvd

baseurl=file:///mnt/cdrom/Server

enabled=1

gpgcheck=0

#yum clean all

#yum list                   -------------------------至此yum源配置完毕

redhat 5.5 64bit + oracle 11g rac:

yum install binutils compat-libstdc++ elfutils-libelf elfutils-libelf-devel gcc gcc-c++ glibc glibc-common glibc-devel glibc-headers ksh  libaio libaio  libaio-devel  libaio-devel libgcc  libstdc++  libstdc++-devel make sysstat unixODBC unixODBC unixODBC-devel unixODBC-devel iscsi

**3、修改参数**

vi /etc/sysctl.conf

fs.aio-max-nr = 1048576

fs.file-max = 6815744

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 = 1048576

**4、修改用户限制**

vi /etc/security/limits.conf

grid                 soft    nproc   2047

grid                 hard    nproc   16384

grid                 soft    nofile  1024

grid                 hard    nofile  65536

grid                 hard    stack   10240

oracle               soft    nproc   2047

oracle               hard    nproc   16384

oracle               soft    nofile  1024

oracle               hard    nofile  65536

oracle               hard    stack   10240

**5、修改hosts文件**

# public

192.168.0.16  ocp3

192.168.0.22  ocp2

192.168.0.20  ocp1

#vip

192.168.0.17  ocp3-vip

192.168.0.23  ocp2-vip

192.168.0.21  ocp1-vip

#priv

10.10.10.16   ocp3-priv

10.10.10.22   ocp2-priv

10.10.10.20   ocp1-priv

192.168.0.18  ocp-scan

**6、禁用NTP服务**

# /sbin/service ntpd stop

# chkconfig ntpd off

# rm /etc/ntp.conf

or, mv /etc/ntp.conf   /etc/ntp.conf.org

**7、添加用户和组**

/usr/sbin/groupadd -g 1000 oinstall

/usr/sbin/groupadd -g 1100 asmadmin

/usr/sbin/groupadd -g 1200 dba

/usr/sbin/groupadd -g 1201 oper

/usr/sbin/groupadd -g 1300 asmdba

/usr/sbin/groupadd -g 1301 asmoper

useradd -u 1100 -g oinstall -G asmadmin,asmdba,asmoper grid

useradd -u 1200 -g oinstall -G dba,oper,asmdba oracle

**8、创建相应目录**

mkdir -p  /u01/app/11.2.0/grid

mkdir –p /u01/app/grid

chown grid:oinstall /u01/app/11.2.0/grid  -R

chown grid:oinstall /u01/app/grid    -R

chmod 775 /u01/ -R

mkdir -p  /u01/app/oracle/product/11.2.0/db\_1

chown oracle:oinstall /u01/app/oracle -R

chmod  775 /u01/ -R

**9、修改用户环境变量**

grid：

export LANG=C

export NLS\_LANG=AMERICAN\_AMERICA.ZHS16GBK

export ORACLE\_SID=+ASM3

export ORACLE\_BASE=/u01/app/grid

export ORACLE\_HOME=/u01/app/11.2.0/grid

export PATH=$ORACLE\_HOME/bin:$PATH

oracle：

export LANG=C

export NLS\_LANG=AMERICAN\_AMERICA.ZHS16GBK

export ORACLE\_SID=ocp3

export ORACLE\_BASE=/u01/app/oracle

export ORACLE\_HOME=$ORACLE\_BASE/product/11.2.0/db\_1

export PATH=$ORACLE\_HOME/bin:$PATH

export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib:$ORACLE\_HOME/rdbms/lib:/lib:/usr/lib

**10、安装oracleasmlib包并配置asm**

将相应的asm包安装并配置

#/etc/init.d/oracleasm configure

Default user to own the driver interface []: grid

Default group to own the driver interface []: asmadmin

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  ]

**11、创建用户等效性(grid,oracle均要按照此步骤执行一遍）**

在需要新加的第三个节点执行：

 mkdir ~/.ssh

chmod 700 ~/.ssh

ssh-keygen -t rsa

ssh-keygen -t dsa

cat ~/.ssh/id\_rsa.pub >> ~/.ssh/authorized\_keys

cat ~/.ssh/id\_dsa.pub >> ~/.ssh/authorized\_keys

在一号节点执行：

$ ssh ocp3 cat ~/.ssh/id\_rsa.pub >>   ~/.ssh/authorized\_keys

oracle@db02's password:

$ ssh ocp3 cat ~/.ssh/id\_dsa.pub >>   ~/.ssh/authorized\_keys

oracle@db02's password:

继续在一号节点执行：

scp ~/.ssh/authorized\_keys  ocp2:~/.ssh/authorized\_keys

scp ~/.ssh/authorized\_keys  ocp3:~/.ssh/authorized\_keys

在每个节点执行：

ssh ocp1 date

ssh ocp2 date

ssh ocp3 date

ssh ocp1-priv date

ssh ocp2-priv date

ssh ocp3-priv date

-------------------------------------至此三个节点的等效性配置完毕

## 2.2 添加节点

**1、扩展grid集群件:**

在正常的节点上删除故障节点  
su - root  
[root@rac1 ~]# crsctl delete node -n rac3    
[root@rac1 ~]# olsnodes -t -s

**./runInstaller -updateNodeList ORACLE\_HOME=/u01/app/11.2.0/grid  CLUSTER\_NODES={ocp3}**

切换至grid用户，进入/u01/app/11.2.0/grid/oui/bin执行

$export IGNORE\_PREADDNODE\_CHECKS=Y

$./addNode.sh -silent CLUSTER\_NEW\_NODES={rac2} CLUSTER\_NEW\_VIRTUAL\_HOSTNAMES={rac2-vip}

输出如下：

Starting Oracle Universal Installer...

Checking swap space: must be greater than 500 MB.   Actual 1749 MB    Passed

Oracle Universal Installer, Version 11.2.0.3.0 Production

Copyright (C) 1999, 2011, Oracle. All rights reserved.

Performing tests to see whether nodes ocp3,ocp2 are available

............................................................... 100% Done.

.

-----------------------------------------------------------------------------

Cluster Node Addition Summary

Global Settings

   Source: /u01/app/11.2.0/grid

   New Nodes

Space Requirements

   New Nodes

      ocp2

         /: Required 4.05GB : Available 12.82GB

Installed Products

   Product Names

      Oracle Grid Infrastructure 11.2.0.3.0

      Sun JDK 1.5.0.30.03

      Installer SDK Component 11.2.0.3.0

      Oracle One-Off Patch Installer 11.2.0.1.7

      Oracle Universal Installer 11.2.0.3.0

      Oracle USM Deconfiguration 11.2.0.3.0

      Oracle Configuration Manager Deconfiguration 10.3.1.0.0

      Enterprise Manager Common Core Files 10.2.0.4.4

      Oracle DBCA Deconfiguration 11.2.0.3.0

      Oracle RAC Deconfiguration 11.2.0.3.0

      Oracle Quality of Service Management (Server) 11.2.0.3.0

      Installation Plugin Files 11.2.0.3.0

      Universal Storage Manager Files 11.2.0.3.0

      Oracle Text Required Support Files 11.2.0.3.0

      Automatic Storage Management Assistant 11.2.0.3.0

      Oracle Database 11g Multimedia Files 11.2.0.3.0

      Oracle Multimedia Java Advanced Imaging 11.2.0.3.0

      Oracle Globalization Support 11.2.0.3.0

      Oracle Multimedia Locator RDBMS Files 11.2.0.3.0

      Oracle Core Required Support Files 11.2.0.3.0

      Bali Share 1.1.18.0.0

      Oracle Database Deconfiguration 11.2.0.3.0

      Oracle Quality of Service Management (Client) 11.2.0.3.0

      Expat libraries 2.0.1.0.1

      Oracle Containers for Java 11.2.0.3.0

      Perl Modules 5.10.0.0.1

      Secure Socket Layer 11.2.0.3.0

      Oracle JDBC/OCI Instant Client 11.2.0.3.0

      Oracle Multimedia Client Option 11.2.0.3.0

      LDAP Required Support Files 11.2.0.3.0

      Character Set Migration Utility 11.2.0.3.0

      Perl Interpreter 5.10.0.0.2

      PL/SQL Embedded Gateway 11.2.0.3.0

      OLAP SQL Scripts 11.2.0.3.0

      Database SQL Scripts 11.2.0.3.0

      Oracle Extended Windowing Toolkit 3.4.47.0.0

      SSL Required Support Files for InstantClient 11.2.0.3.0

      SQL\*Plus Files for Instant Client 11.2.0.3.0

      Oracle Net Required Support Files 11.2.0.3.0

      Oracle Database User Interface 2.2.13.0.0

      RDBMS Required Support Files for Instant Client 11.2.0.3.0

      RDBMS Required Support Files Runtime 11.2.0.3.0

      XML Parser for Java 11.2.0.3.0

      Oracle Security Developer Tools 11.2.0.3.0

      Oracle Wallet Manager 11.2.0.3.0

      Enterprise Manager plugin Common Files 11.2.0.3.0

      Platform Required Support Files 11.2.0.3.0

      Oracle JFC Extended Windowing Toolkit 4.2.36.0.0

      RDBMS Required Support Files 11.2.0.3.0

      Oracle Ice Browser 5.2.3.6.0

      Oracle Help For Java 4.2.9.0.0

      Enterprise Manager Common Files 10.2.0.4.3

      Deinstallation Tool 11.2.0.3.0

      Oracle Java Client 11.2.0.3.0

      Cluster Verification Utility Files 11.2.0.3.0

      Oracle Notification Service (eONS) 11.2.0.3.0

      Oracle LDAP administration 11.2.0.3.0

      Cluster Verification Utility Common Files 11.2.0.3.0

      Oracle Clusterware RDBMS Files 11.2.0.3.0

      Oracle Locale Builder 11.2.0.3.0

      Oracle Globalization Support 11.2.0.3.0

      Buildtools Common Files 11.2.0.3.0

      Oracle RAC Required Support Files-HAS 11.2.0.3.0

      SQL\*Plus Required Support Files 11.2.0.3.0

      XDK Required Support Files 11.2.0.3.0

      Agent Required Support Files 10.2.0.4.3

      Parser Generator Required Support Files 11.2.0.3.0

      Precompiler Required Support Files 11.2.0.3.0

      Installation Common Files 11.2.0.3.0

      Required Support Files 11.2.0.3.0

      Oracle JDBC/THIN Interfaces 11.2.0.3.0

      Oracle Multimedia Locator 11.2.0.3.0

      Oracle Multimedia 11.2.0.3.0

      HAS Common Files 11.2.0.3.0

      Assistant Common Files 11.2.0.3.0

      PL/SQL 11.2.0.3.0

      HAS Files for DB 11.2.0.3.0

      Oracle Recovery Manager 11.2.0.3.0

      Oracle Database Utilities 11.2.0.3.0

      Oracle Notification Service 11.2.0.3.0

      SQL\*Plus 11.2.0.3.0

      Oracle Netca Client 11.2.0.3.0

      Oracle Net 11.2.0.3.0

      Oracle JVM 11.2.0.3.0

      Oracle Internet Directory Client 11.2.0.3.0

      Oracle Net Listener 11.2.0.3.0

      Cluster Ready Services Files 11.2.0.3.0

      Oracle Database 11g 11.2.0.3.0

-----------------------------------------------------------------------------

Instantiating scripts for add node (Sunday, April 7, 2013 3:51:34 PM CST)

.                                                                 1% Done.

Instantiation of add node scripts complete

Copying to remote nodes (Sunday, April 7, 2013 3:51:37 PM CST)

...............................................................................................                                 96% Done.

Home copied to new nodes

Saving inventory on nodes (Sunday, April 7, 2013 3:55:44 PM CST)

.                                                               100% Done.

Save inventory complete

WARNING:A new inventory has been created on one or more nodes in this session. However, it has not yet been registered as the central inventory of this system.

To register the new inventory please run the script at '/u01/app/oraInventory/orainstRoot.sh' with root privileges on nodes 'ocp2'.

If you do not register the inventory, you may not be able to update or patch the products you installed.

The following configuration scripts need to be executed as the "root" user in each new cluster node. Each script in the list below is followed by a list of nodes.

/u01/app/oraInventory/orainstRoot.sh #On nodes ocp3

/u01/app/11.2.0/grid/root.sh #On nodes ocp3

To execute the configuration scripts:

    1. Open a terminal window

    2. Log in as "root"

    3. Run the scripts in each cluster node

The Cluster Node Addition of /u01/app/11.2.0/grid was successful.

Please check '/tmp/silentInstall.log' for more details.

按照提示在新增节点上执行orainstRoot.sh和root.sh脚本。执行完毕后grid扩展完毕。

**2、扩展database软件**

在一节点上执行：

[oracle@ocp1 bin]$ ./addNode.sh  -silent "CLUSTER\_NEW\_NODES={rac2}"

输出如下;

Performing pre-checks for node addition

Checking node reachability...

Node reachability check passed from node "ocp1"

Checking user equivalence...

User equivalence check passed for user "oracle"

WARNING:

Node "ocp2" already appears to be part of cluster

Pre-check for node addition was successful.

Starting Oracle Universal Installer...

Checking swap space: must be greater than 500 MB.   Actual 1691 MB    Passed

Oracle Universal Installer, Version 11.2.0.3.0 Production

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Performing tests to see whether nodes ocp3,ocp2 are available

............................................................... 100% Done.

.

-----------------------------------------------------------------------------

Cluster Node Addition Summary

Global Settings

   Source: /u01/app/oracle/product/11.2.0/db\_1

   New Nodes

Space Requirements

   New Nodes

      ocp2

         /: Required 4.23GB : Available 9.14GB

Installed Products

   Product Names

      Oracle Database 11g 11.2.0.3.0

      Sun JDK 1.5.0.30.03

      Installer SDK Component 11.2.0.3.0

      Oracle One-Off Patch Installer 11.2.0.1.7

      Oracle Universal Installer 11.2.0.3.0

      Oracle USM Deconfiguration 11.2.0.3.0

      Oracle Configuration Manager Deconfiguration 10.3.1.0.0

      Oracle DBCA Deconfiguration 11.2.0.3.0

      Oracle RAC Deconfiguration 11.2.0.3.0

      Oracle Database Deconfiguration 11.2.0.3.0

      Oracle Configuration Manager Client 10.3.2.1.0

      Oracle Configuration Manager 10.3.5.0.1

      Oracle ODBC Driverfor Instant Client 11.2.0.3.0

      LDAP Required Support Files 11.2.0.3.0

      SSL Required Support Files for InstantClient 11.2.0.3.0

      Bali Share 1.1.18.0.0

      Oracle Extended Windowing Toolkit 3.4.47.0.0

      Oracle JFC Extended Windowing Toolkit 4.2.36.0.0

      Oracle Real Application Testing 11.2.0.3.0

      Oracle Database Vault J2EE Application 11.2.0.3.0

      Oracle Label Security 11.2.0.3.0

      Oracle Data Mining RDBMS Files 11.2.0.3.0

      Oracle OLAP RDBMS Files 11.2.0.3.0

      Oracle OLAP API 11.2.0.3.0

      Platform Required Support Files 11.2.0.3.0

      Oracle Database Vault option 11.2.0.3.0

      Oracle RAC Required Support Files-HAS 11.2.0.3.0

      SQL\*Plus Required Support Files 11.2.0.3.0

      Oracle Display Fonts 9.0.2.0.0

      Oracle Ice Browser 5.2.3.6.0

      Oracle JDBC Server Support Package 11.2.0.3.0

      Oracle SQL Developer 11.2.0.3.0

      Oracle Application Express 11.2.0.3.0

      XDK Required Support Files 11.2.0.3.0

      RDBMS Required Support Files for Instant Client 11.2.0.3.0

      SQLJ Runtime 11.2.0.3.0

      Database Workspace Manager 11.2.0.3.0

      RDBMS Required Support Files Runtime 11.2.0.3.0

      Oracle Globalization Support 11.2.0.3.0

      Exadata Storage Server 11.2.0.1.0

      Provisioning Advisor Framework 10.2.0.4.3

      Enterprise Manager Database Plugin -- Repository Support 11.2.0.3.0

      Enterprise Manager Repository Core Files 10.2.0.4.4

      Enterprise Manager Database Plugin -- Agent Support 11.2.0.3.0

      Enterprise Manager Grid Control Core Files 10.2.0.4.4

      Enterprise Manager Common Core Files 10.2.0.4.4

      Enterprise Manager Agent Core Files 10.2.0.4.4

      RDBMS Required Support Files 11.2.0.3.0

      regexp 2.1.9.0.0

      Agent Required Support Files 10.2.0.4.3

      Oracle 11g Warehouse Builder Required Files 11.2.0.3.0

      Oracle Notification Service (eONS) 11.2.0.3.0

      Oracle Text Required Support Files 11.2.0.3.0

      Parser Generator Required Support Files 11.2.0.3.0

      Oracle Database 11g Multimedia Files 11.2.0.3.0

      Oracle Multimedia Java Advanced Imaging 11.2.0.3.0

      Oracle Multimedia Annotator 11.2.0.3.0

      Oracle JDBC/OCI Instant Client 11.2.0.3.0

      Oracle Multimedia Locator RDBMS Files 11.2.0.3.0

      Precompiler Required Support Files 11.2.0.3.0

      Oracle Core Required Support Files 11.2.0.3.0

      Sample Schema Data 11.2.0.3.0

      Oracle Starter Database 11.2.0.3.0

      Oracle Message Gateway Common Files 11.2.0.3.0

      Oracle XML Query 11.2.0.3.0

      XML Parser for Oracle JVM 11.2.0.3.0

      Oracle Help For Java 4.2.9.0.0

      Installation Plugin Files 11.2.0.3.0

      Enterprise Manager Common Files 10.2.0.4.3

      Expat libraries 2.0.1.0.1

      Deinstallation Tool 11.2.0.3.0

      Oracle Quality of Service Management (Client) 11.2.0.3.0

      Perl Modules 5.10.0.0.1

      JAccelerator (COMPANION) 11.2.0.3.0

      Oracle Containers for Java 11.2.0.3.0

      Perl Interpreter 5.10.0.0.2

      Oracle Net Required Support Files 11.2.0.3.0

      Secure Socket Layer 11.2.0.3.0

      Oracle Universal Connection Pool 11.2.0.3.0

      Oracle JDBC/THIN Interfaces 11.2.0.3.0

      Oracle Multimedia Client Option 11.2.0.3.0

      Oracle Java Client 11.2.0.3.0

      Character Set Migration Utility 11.2.0.3.0

      Oracle Code Editor 1.2.1.0.0I

      PL/SQL Embedded Gateway 11.2.0.3.0

      OLAP SQL Scripts 11.2.0.3.0

      Database SQL Scripts 11.2.0.3.0

      Oracle Locale Builder 11.2.0.3.0

      Oracle Globalization Support 11.2.0.3.0

      SQL\*Plus Files for Instant Client 11.2.0.3.0

      Required Support Files 11.2.0.3.0

      Oracle Database User Interface 2.2.13.0.0

      Oracle ODBC Driver 11.2.0.3.0

      Oracle Notification Service 11.2.0.3.0

      XML Parser for Java 11.2.0.3.0

      Oracle Security Developer Tools 11.2.0.3.0

      Oracle Wallet Manager 11.2.0.3.0

      Cluster Verification Utility Common Files 11.2.0.3.0

      Oracle Clusterware RDBMS Files 11.2.0.3.0

      Oracle UIX 2.2.24.6.0

      Enterprise Manager plugin Common Files 11.2.0.3.0

      HAS Common Files 11.2.0.3.0

      Precompiler Common Files 11.2.0.3.0

      Installation Common Files 11.2.0.3.0

      Oracle Help for the  Web 2.0.14.0.0

      Oracle LDAP administration 11.2.0.3.0

      Buildtools Common Files 11.2.0.3.0

      Assistant Common Files 11.2.0.3.0

      Oracle Recovery Manager 11.2.0.3.0

      PL/SQL 11.2.0.3.0

      Generic Connectivity Common Files 11.2.0.3.0

      Oracle Database Gateway for ODBC 11.2.0.3.0

      Oracle Programmer 11.2.0.3.0

      Oracle Database Utilities 11.2.0.3.0

      Enterprise Manager Agent 10.2.0.4.3

      SQL\*Plus 11.2.0.3.0

      Oracle Netca Client 11.2.0.3.0

      Oracle Multimedia Locator 11.2.0.3.0

      Oracle Call Interface (OCI) 11.2.0.3.0

      Oracle Multimedia 11.2.0.3.0

      Oracle Net 11.2.0.3.0

      Oracle XML Development Kit 11.2.0.3.0

      Database Configuration and Upgrade Assistants 11.2.0.3.0

      Oracle JVM 11.2.0.3.0

      Oracle Advanced Security 11.2.0.3.0

      Oracle Internet Directory Client 11.2.0.3.0

      Oracle Enterprise Manager Console DB 11.2.0.3.0

      HAS Files for DB 11.2.0.3.0

      Oracle Net Listener 11.2.0.3.0

      Oracle Text 11.2.0.3.0

      Oracle Net Services 11.2.0.3.0

      Oracle Database 11g 11.2.0.3.0

      Oracle OLAP 11.2.0.3.0

      Oracle Spatial 11.2.0.3.0

      Oracle Partitioning 11.2.0.3.0

      Enterprise Edition Options 11.2.0.3.0

-----------------------------------------------------------------------------

Instantiating scripts for add node (Sunday, April 7, 2013 4:08:50 PM CST)

.                                                                 1% Done.

Instantiation of add node scripts complete

Copying to remote nodes (Sunday, April 7, 2013 4:08:57 PM CST)

...............................................................................................                                 96% Done.

Home copied to new nodes

Saving inventory on nodes (Sunday, April 7, 2013 4:17:01 PM CST)

.                                                               100% Done.

Save inventory complete

WARNING:

The following configuration scripts need to be executed as the "root" user in each new cluster node. Each script in the list below is followed by a list of nodes.

/u01/app/oracle/product/11.2.0/db\_1/root.sh #On nodes ocp3

To execute the configuration scripts:

    1. Open a terminal window

    2. Log in as "root"

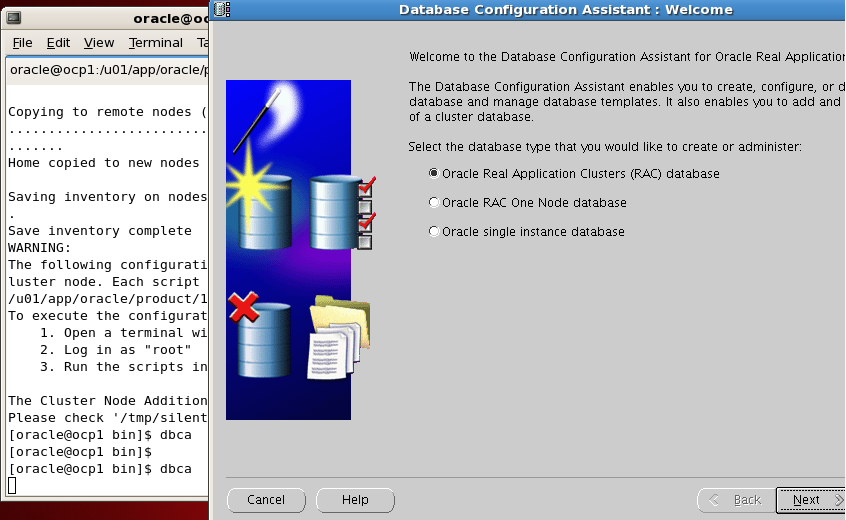
    3. Run the scripts in each cluster node

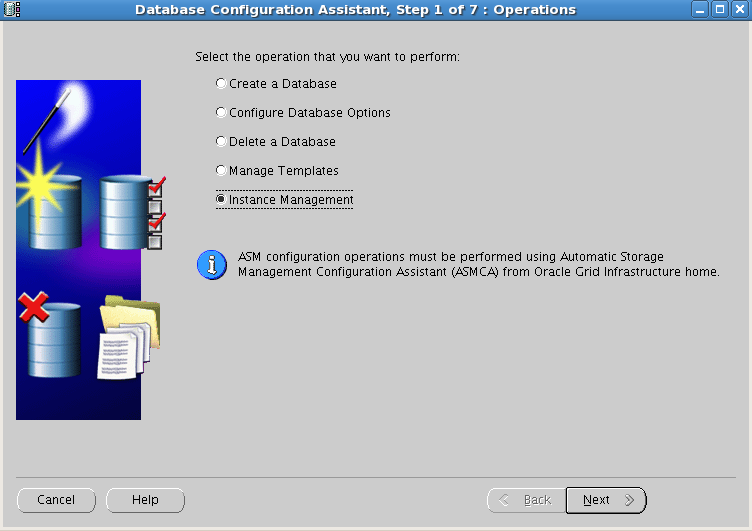
The Cluster Node Addition of /u01/app/oracle/product/11.2.0/db\_1 was successful.

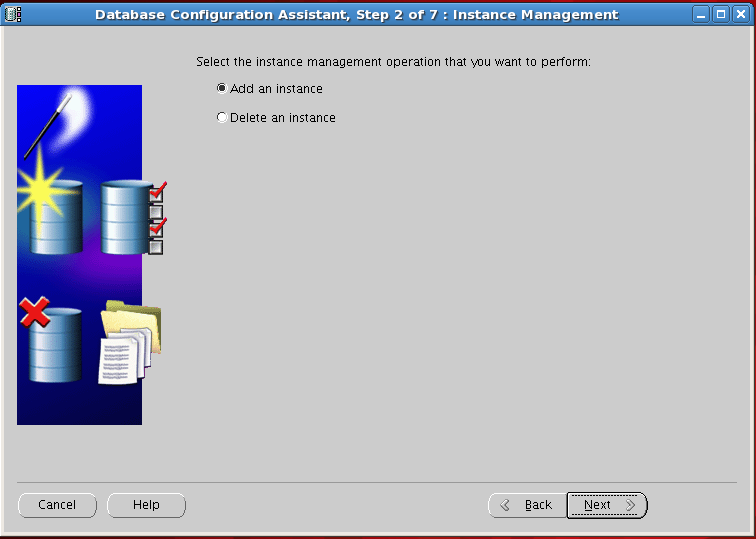
Please check '/tmp/silentInstall.log' for more details.

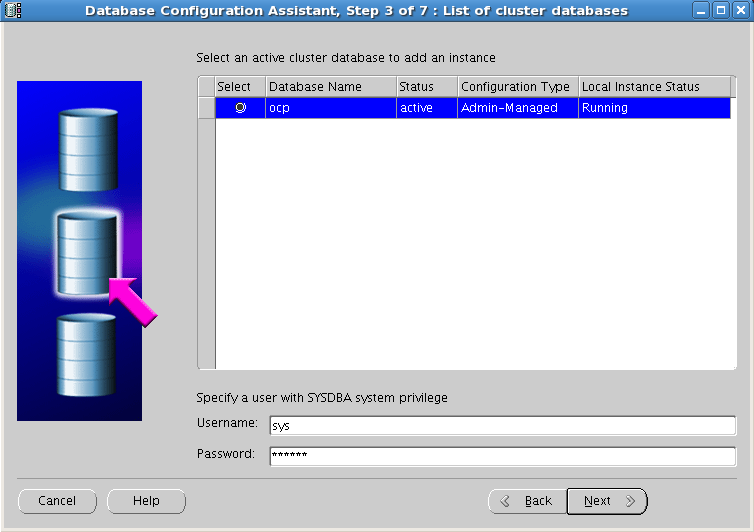
按照提示在新增节点执行root.sh脚本之后database软件扩展完毕

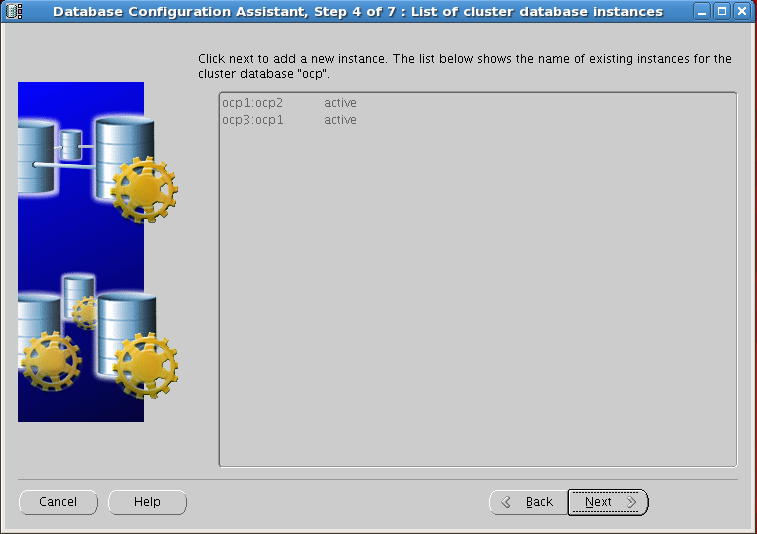
3、在一号节点执行dbca来增加第三个实例：

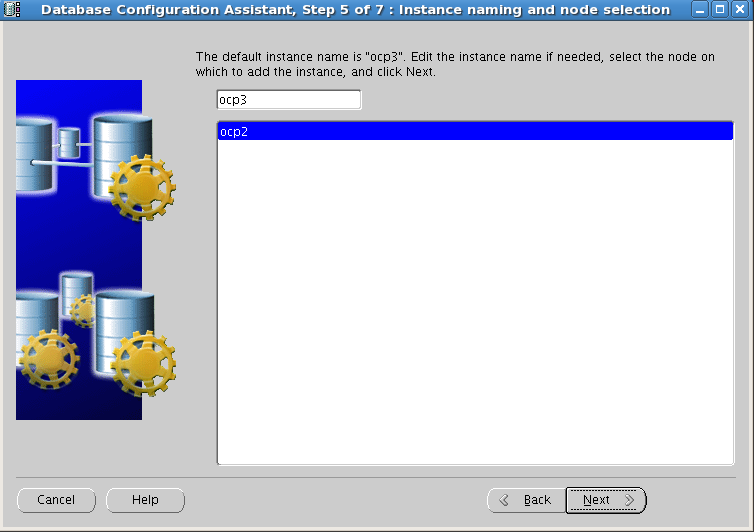


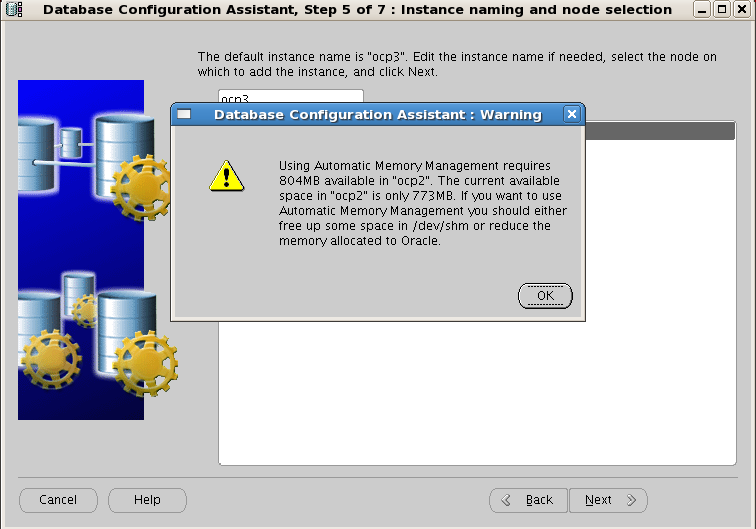












此处需要扩大/dev/shm的大小；

[grid@ocp2 app]$ df -h

Filesystem            Size  Used Avail Use% Mounted on

/dev/sda3              18G   12G  5.1G  70% /

/dev/sda1              99M   12M   82M  13% /boot

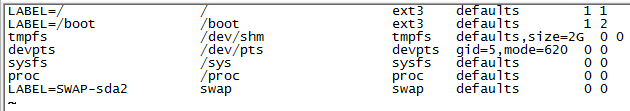
tmpfs                1005M  232M  774M  24% /dev/shm

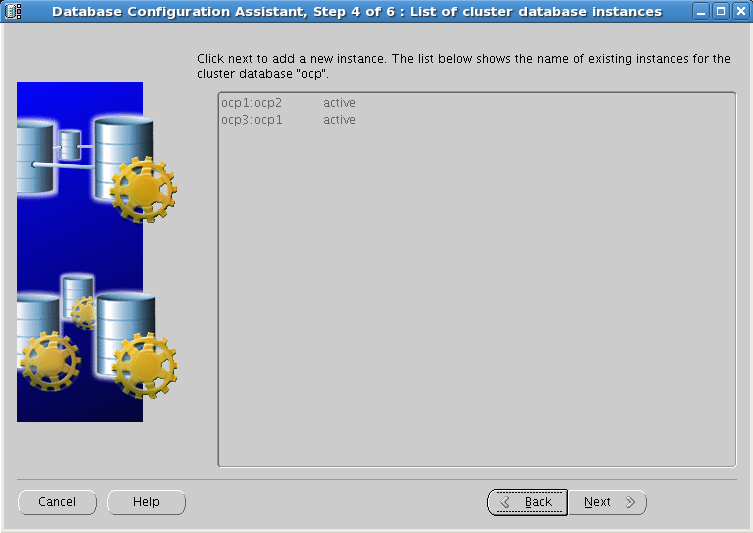
/dev/hdc              3.5G  3.5G     0 100% /media/RHEL\_5.5 x86\_64 DVD

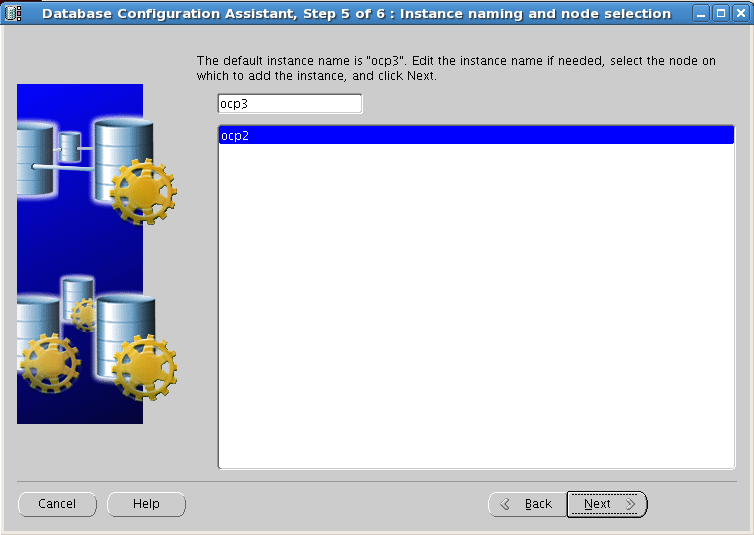
/dev/hdc              3.5G  3.5G     0 100% /mnt/cdrom

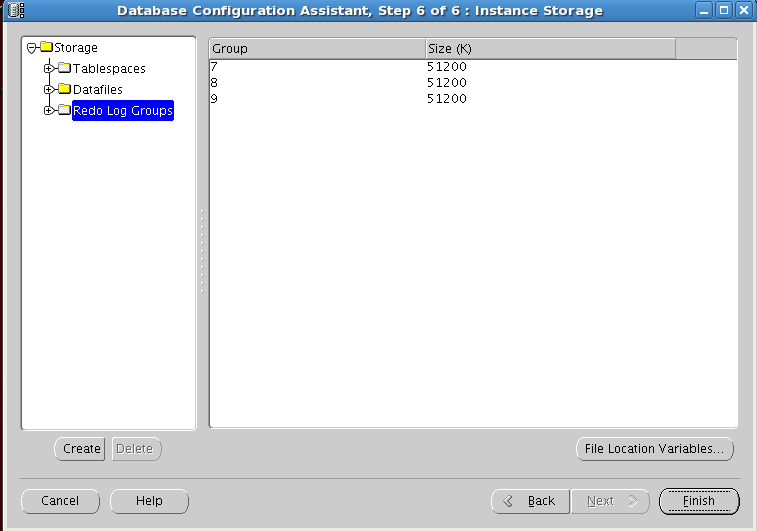
/dev/hdc              3.5G  3.5G     0 100% /mnt/cdrom

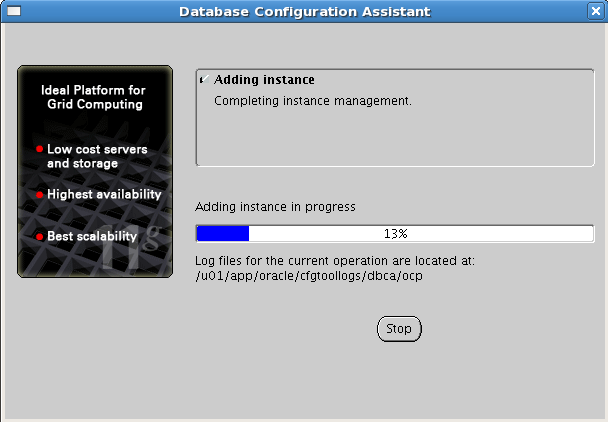
vi /etc/fstab











完成后第三个实例添加完毕，至此整个集群扩展完毕。

# 三 附录 相关错误

遇到的错误：

[grid@server1 bin]$ cat /u01/app/oraInventory/logs/oraInstall2013-04-24\_12-30-39PM.err

Exception java.lang.OutOfMemoryError: Java heap space occurred..

Exception in thread "Thread-45" java.lang.OutOfMemoryError: Java heap space

        at sun.nio.cs.UTF\_8.newDecoder(UTF\_8.java:104)

        at java.lang.StringCoding$CharsetSD.<init>(StringCoding.java:170)

        at java.lang.StringCoding$CharsetSD.<init>(StringCoding.java:161)

        at java.lang.StringCoding.decode(StringCoding.java:217)

        at java.lang.StringCoding.decode(StringCoding.java:234)

        at java.lang.String.<init>(String.java:458)

        at oracle.sysman.oii.oiix.OiixTeePrintStream.write(OiixTeePrintStream.java:369)

        at sun.nio.cs.StreamEncoder$CharsetSE.writeBytes(StreamEncoder.java:336)

        at sun.nio.cs.StreamEncoder$CharsetSE.implFlushBuffer(StreamEncoder.java:404)

        at sun.nio.cs.StreamEncoder.flushBuffer(StreamEncoder.java:115)

        at java.io.OutputStreamWriter.flushBuffer(OutputStreamWriter.java:169)

        at java.io.PrintStream.write(PrintStream.java:459)

        at java.io.PrintStream.print(PrintStream.java:602)

        at oracle.sysman.oii.oiic.OiicSilentInstallPhaseProgressListener.displayProgress(OiicSilentInstallPhaseProgressListener.java:372)

        at oracle.sysman.oii.oiic.OiicSilentInstallPhaseProgressListener.addBytes(OiicSilentInstallPhaseProgressListener.java:341)

        at oracle.sysman.oii.oiic.OiicSilentInstallPhaseProgressListener.addPercentage(OiicSilentInstallPhaseProgressListener.java:555)

        at oracle.sysman.oii.oiix.OiixProgressUpdator$OiixProgressUpdatingWorker.run(OiixProgressUpdator.java:199)

        at java.lang.Thread.run(Thread.java:595)

java.lang.OutOfMemoryError: Java heap space

        at java.io.UnixFileSystem.resolve(UnixFileSystem.java:93)

        at java.io.File.<init>(File.java:179)

        at java.io.File.listFiles(File.java:1020)

        at oracle.cluster.deployment.ractrans.DirectoryMap.processDir(DirectoryMap.java:225)

        at oracle.cluster.deployment.ractrans.DirectoryMap.processDir(DirectoryMap.java:281)

        at oracle.cluster.deployment.ractrans.DirectoryMap.processDir(DirectoryMap.java:281)

        at oracle.cluster.deployment.ractrans.DirectoryMap.<init>(DirectoryMap.java:166)

        at oracle.cluster.deployment.ractrans.DirListing.<init>(DirListing.java:283)

        at oracle.cluster.deployment.ractrans.DirListing.<init>(DirListing.java:159)

        at oracle.cluster.deployment.ractrans.RACTransferCore.createDirListing(RACTransferCore.java:209)

        at oracle.cluster.deployment.ractrans.RACTransfer.createDirListing(RACTransfer.java:1838)

        at oracle.cluster.deployment.ractrans.RACTransfer.transferDirStructureToNodes(RACTransfer.java:608)

        at oracle.cluster.deployment.ractrans.RACTransfer.transferDirToNodes(RACTransfer.java:252)

        at oracle.ops.mgmt.cluster.ClusterCmd.transferDirToNodes(ClusterCmd.java:3103)

        at oracle.ops.mgmt.cluster.ClusterCmd.transferDirToNodes(ClusterCmd.java:3022)

        at oracle.sysman.oii.oiip.oiipg.OiipgClusterOps.transferDirToNodes(OiipgClusterOps.java:947)

        at oracle.sysman.oii.oiif.oiifw.OiifwClusterCopyWCCE.doOperation(OiifwClusterCopyWCCE.java:544)

        at oracle.sysman.oii.oiif.oiifb.OiifbCondIterator.iterate(OiifbCondIterator.java:171)

        at oracle.sysman.oii.oiif.oiifw.OiifwAddNodePhaseWCDE.doOperation(OiifwAddNodePhaseWCDE.java:313)

        at oracle.sysman.oii.oiif.oiifb.OiifbCondIterator.iterate(OiifbCondIterator.java:171)

        at oracle.sysman.oii.oiic.OiicPullSession.doOperation(OiicPullSession.java:1371)

        at oracle.sysman.oii.oiic.OiicSessionWrapper.doOperation(OiicSessionWrapper.java:294)

        at oracle.sysman.oii.oiic.OiicInstaller.run(OiicInstaller.java:579)

        at oracle.sysman.oii.oiic.OiicInstaller.runInstaller(OiicInstaller.java:969)

        at oracle.sysman.oii.oiic.OiicInstaller.main(OiicInstaller.java:906)

[grid@server1 bin]$

解决办法

修改/u01/app/11.2.0/grid/oui/oraparam.ini文件，

JRE\_MEMORY\_OPTIONS=" -mx1024m"  （默认值为96M）修改为1024即可

以下前期检查步骤可以省略如果配置够好的话：

cluvfy comp peer -n ocp1 -refnode ocp3 -r 11gR2

cluvfy stage -pre nodeadd -n ocp1 -fixup -verbose

export IGNORE\_PREADDNODE\_CHECKS=Y

/u01/app/11.2.0/grid/oui/bin/addNode.sh -silent CLUSTER\_NEW\_NODES={ocp2} CLUSTER\_NEW\_VIRTUAL\_HOSTNAMES={ocp2-vip}

./runInstaller -updateNodeList  ORACLE\_HOME='/u01/app/11.2.0/grid'  "CLUSTER\_NODES={ocp3,ocp1}" CRS=TRUE

[grid@ocp3 bin]$ ./addNode.sh -silent "CLUSTER\_NEW\_NODES={ocp1}" "CLUSTER\_NEW\_VIRTUAL\_HOSTNAMES={ocp1-vip}"

Starting Oracle Universal Installer...

Checking swap space: must be greater than 500 MB.   Actual 1509 MB    Passed

Oracle Universal Installer, Version 11.2.0.3.0 Production

Copyright (C) 1999, 2011, Oracle. All rights reserved.

Performing tests to see whether nodes ocp1,ocp1 are available

............................................................... 100% Done.

Error ocurred while retrieving node numbers of the existing nodes. Please check if clusterware home is properly configured.

SEVERE:Error ocurred while retrieving node numbers of the existing nodes. Please check if clusterware home is properly configured.