ORACLE

Exadata 运维经验交流

Lunar
www.lunar2013.com
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Exadata的主要工作

架构简介

安装和升级

刷机

换盘

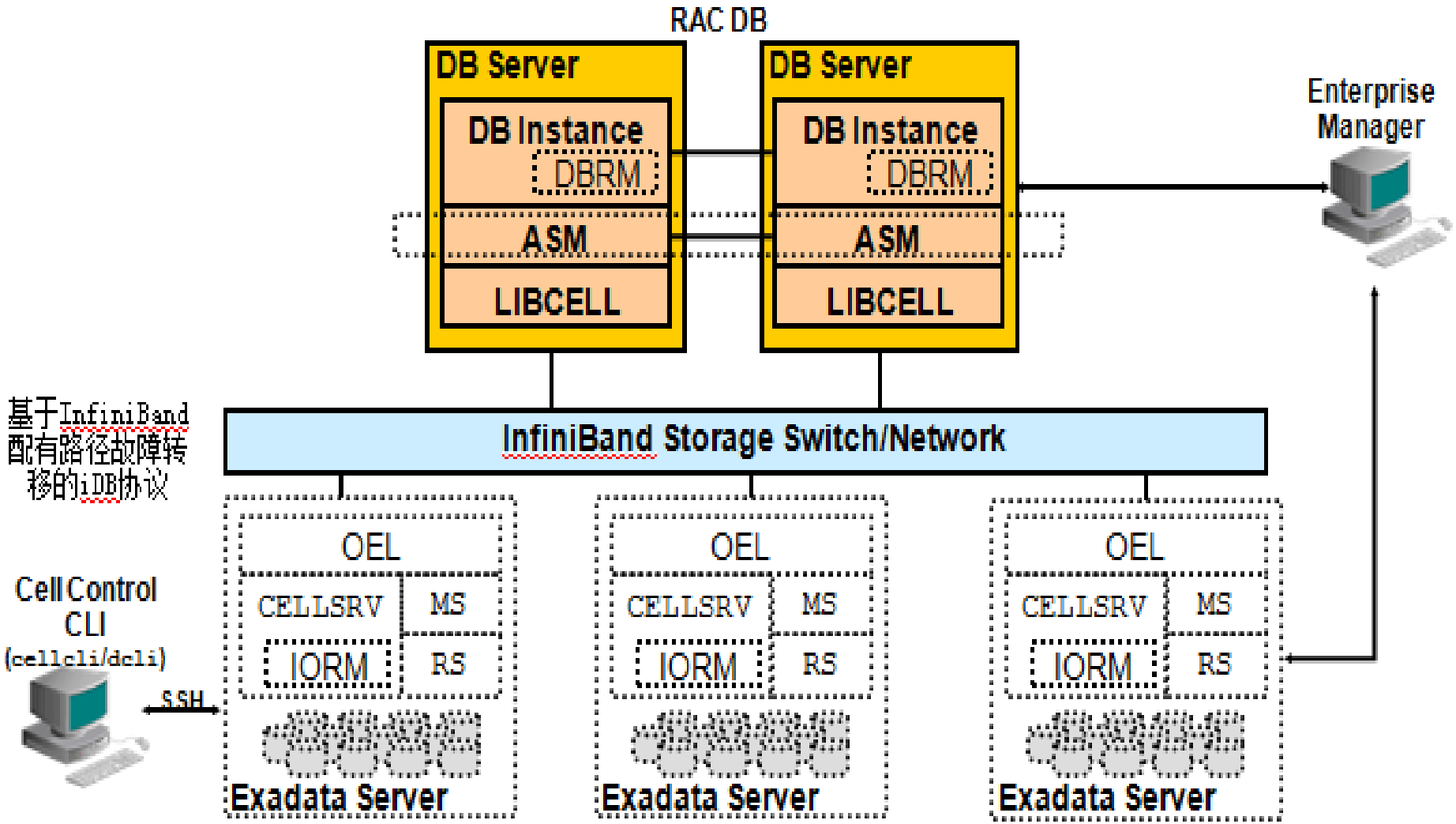
监控

故障诊断

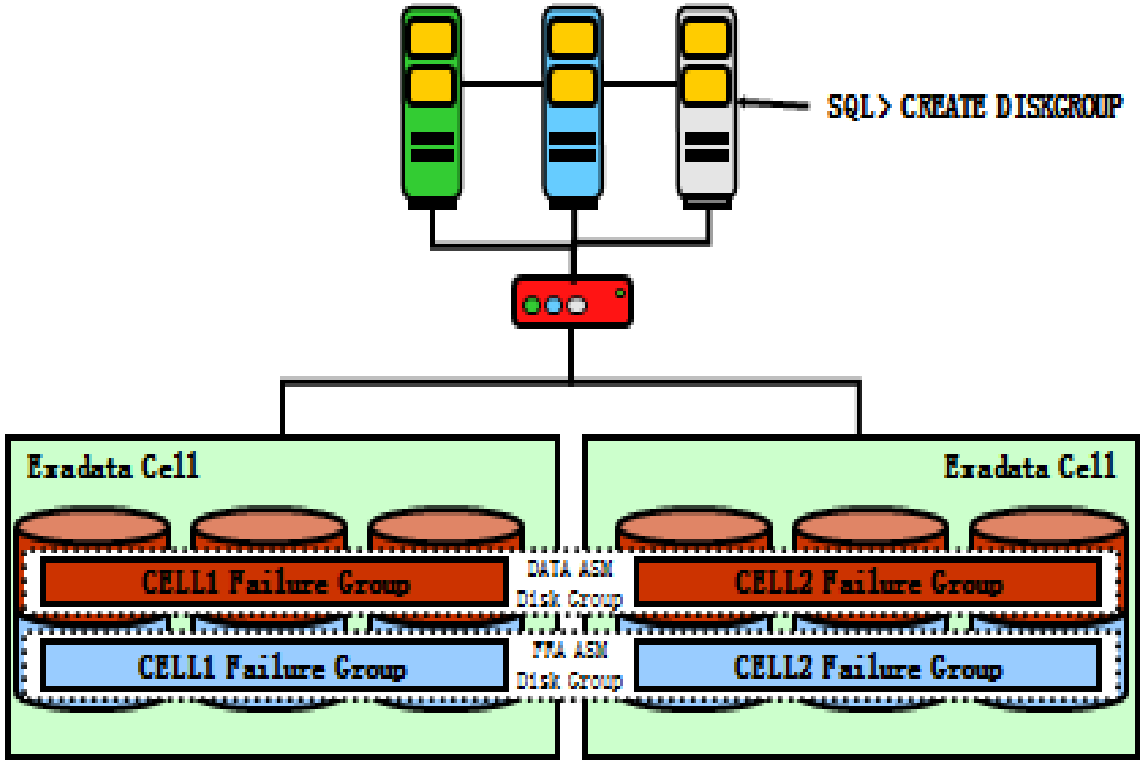
健康检查

本次交流的内容主要参考 www.lunar2013.com

Exadata 软件体系架构概览

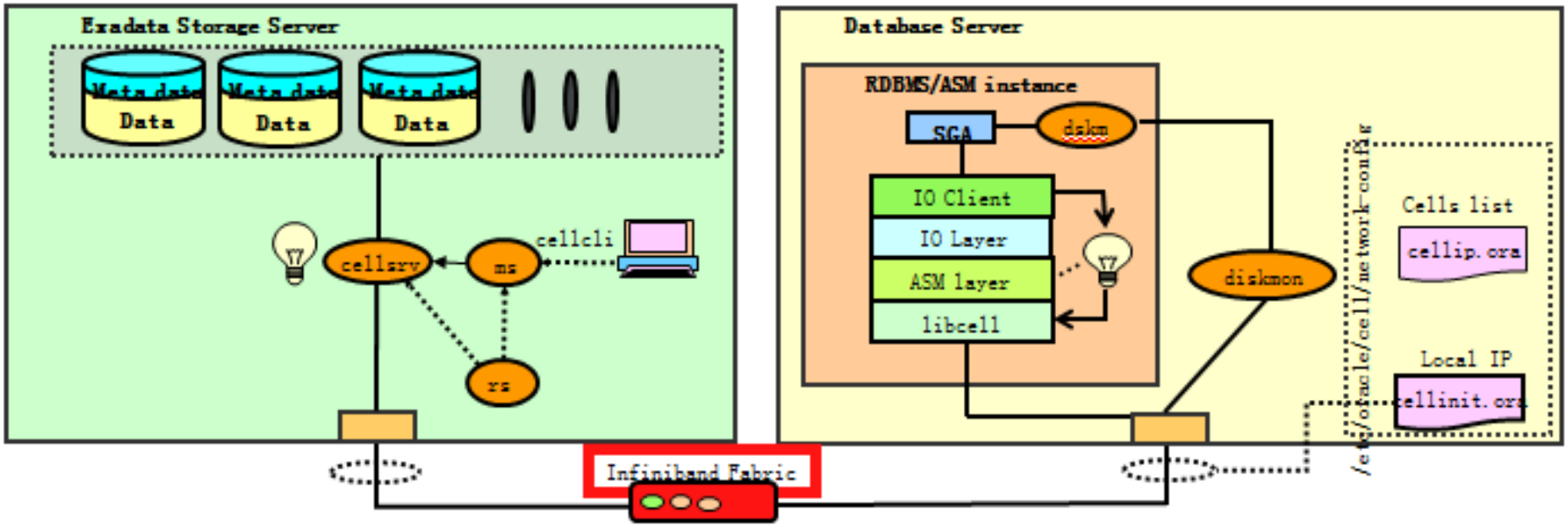


磁盘组配置



- 采用Normal保护方式，任何一份数据会同时分布到两个不同的Failure Group中
- 任何两个不同的Failure Group一定不来自同一个Storage Cell
- 如果需要增加数据保护，可以增加Failure Group数量实现数据更多重的保护

Exadata Storage Server端的进程

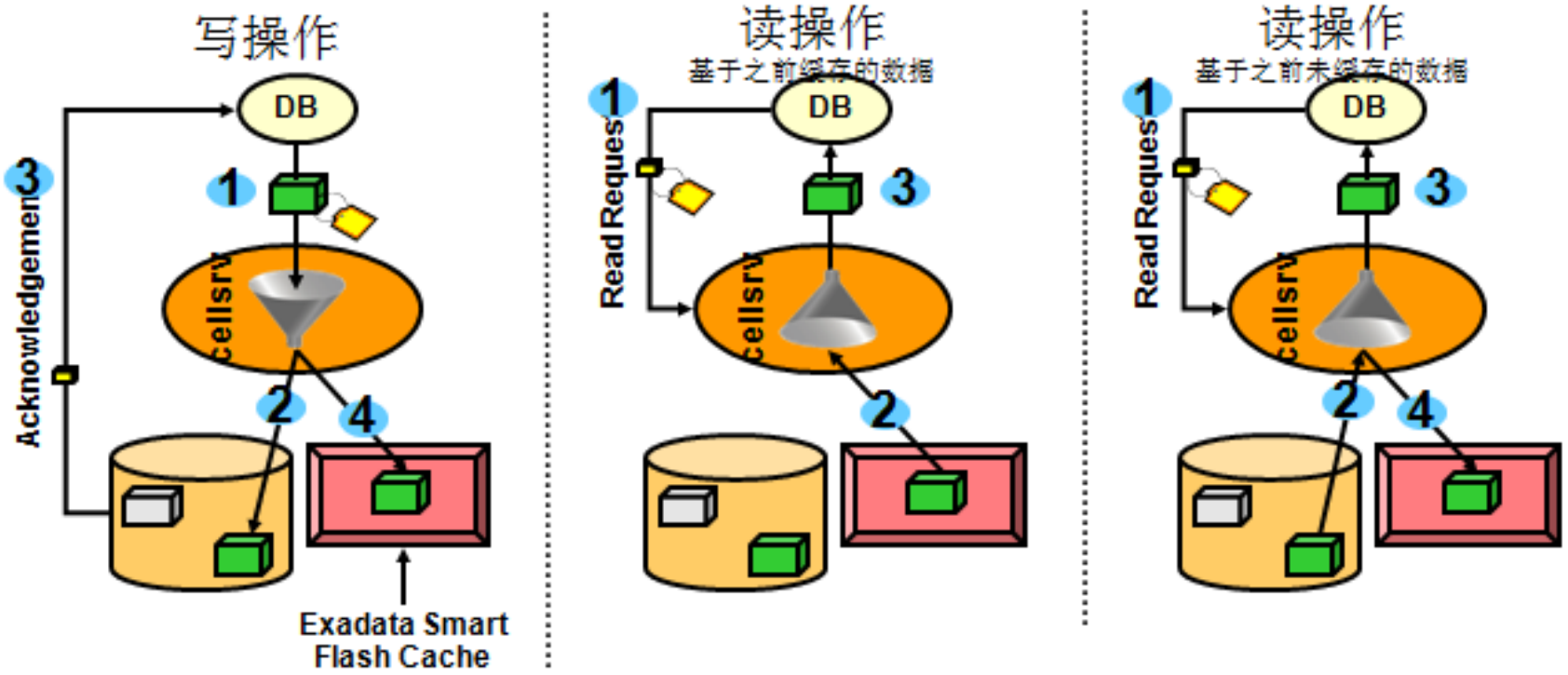


- Cellcli 管理命令
- Management Server (MS): grid disk的创建、H/W改变、SNMP陷阱警报、email通知、阈值控制及服务器管理
- Restart Server (RS) : CELLSRV和MS的监控，重启。

/etc/oracle/cell/network-config/cellip.ora

/etc/oracle/cell/network-config/cellinit.ora

Exadata Smart Flash Cache的使用方法



Exadata一体机开机顺序

1. 打开机柜背后的PDU，SWITCH自动会加电，通电几分钟后再继续

2. 确认所有的Cell Server开启，状态正常后再继续

 # dcli -g cell_group -l root hostname

 # dcli -g cell_group -l root "su - celladmin -c \"cellcli -e list cell detail \""

3. 确认所有DB Server开启，并检查cluster的状态

 # /u01/app/11.2.0/grid/bin/crsctl status resource –t

Grid是自动启动的，如果没有启动，可在一台数据库服务器上执行下面的命令

 # /u01/app/11.2.0/grid/bin/crsctl start crs

 # dcli -g dbs_group -l root /u01/app/11.2.0/grid/bin/crsctl enable crs

Exadata一体机关机顺序

停止数据库节点：

1. **确认无业务访问，以root 用户登录第1 个数据库服务器节点**
2. **停止Cluster**
3. **停除本机以外的数据库节点**

```
# dcli -l root -c dm01db02 shutdown -h -y now1
```

停存储服务器：

1. **# dcli -l root -g cell_group shutdown -h -y now**
2. **停本机**
3. **# shutdown -h -y now**

此时可通过ILOM 远程关机

安装和升级

安装：Notes 888828.1

升级（ patchmgr ）：

一、升级image前的准备工作

1，升级CELL节点需要使用patchmgr工具，首先要为patchmgr配置合适的SSH数据加密算法

2、检查各个cell节点之间root用户安全的信任关系（ssh User Equivalency）

3、检测磁盘组属性disk_repair_time配置

4、检查操作系统内核版本

5、检查操作系统版本

6、检查image版本

7、检查ofa版本

8、检测硬件设备类型

10、检查cell节点日志信息

11、检测是否存在offline状态的grid盘

。。。

安装和升级

升级CELL节点的image：

两种方式：滚动和非滚动

./patchmgr -cells cell_group -cleanup

./patchmgr -cells cell_group -patch_check_prereq

./patchmgr -cells cell_group -patch_check_prereq -rolling

安装和升级

下面的是以前的执行过程中的记录信息：

```
[root@dm01db01 patch_11.2.3.2.1.130109]# ./patchmgr -cells cell_group -patch
Linux dm01db01.scq.com 2.6.32-400.1.1.el5uek #1 SMP Mon Jun 25 20:25:08 EDT 2012 x86_64 x86_64 x86_64 GNU/Linux
NOTE Cells will reboot during the patch or rollback process.
NOTE For non-rolling patch or rollback, ensure all ASM instances using
NOTE the cells are shut down for the duration of the patch or rollback.
NOTE For rolling patch or rollback, ensure all ASM instances using
. . . . . .
```

下面的是以前的升级过程中的信息：

```
[root@dm01db01 patch_11.2.3.2.1.130109]# less -rf patchmgr.stdout

================PatchMgr run started Tue Apr  2 12:42:39 CST 2013 ===========
2013-04-02 12:42:40 <img src="http://www.lunar2013.com/wp-includes/images/smilies/icon_biggrin.gif" alt=":D" class="wp-smile
================PatchMgr run ended Tue Apr  2 12:42:40 CST 2013 ===========


================PatchMgr run started Tue Apr  2 12:42:51 CST 2013 ===========
2013-04-02 12:42:52 <img src="http://www.lunar2013.com/wp-includes/images/smilies/icon_biggrin.gif" alt=":D" class="wp-smile
================PatchMgr run ended Tue Apr  2 12:42:52 CST 2013 ===========


================PatchMgr run started Tue Apr  2 12:43:01 CST 2013 ===========
2013-04-02 12:43:01        :Working: DO: Check cells have ssh equivalence for root user. Up to 10 seconds per cell ...
2013-04-02 12:43:01 ++++++++++++++++++ Logs so far follow ++++++++++
2013-04-02 12:43:02        :SUCCESS: DONE: Check cells have ssh equivalence for root user.
2013-04-02 12:43:02        :Working: DO: Check space and state of Cell services on target cells. Up to 1 minute ...
2013-04-02 12:43:23 ++++++++++++++++++ Logs so far follow ++++++++++
```

安装和升级

升级计算节点image

1、备份每个节点的GI和DB软件

2、检查磁盘空间

3、清除yum缓存

4、解压介质

5、配置yum源

升级计算节点：

这个过程会线进行一些列检查，然后更新相关的动态库：

```
[root@dm02db01 ~]# yum --enablerepo=exadata_dbserver_11.2_x86_64_latest update
exadata_dbserver_11.2_x86_64_latest                                    | 1.9 kB     00:00
Excluding Packages in global exclude list
Finished
Setting up Update Process
Resolving Dependencies
--> Running transaction check
---> Package OpenIPMI.x86_64 0:2.0.16-13.el5_8 set to be updated
---> Package OpenIPMI-libs.x86_64 0:2.0.16-13.el5_8 set to be updated
---> Package acl.x86_64 0:2.2.39-8.el5 set to be updated
---> Package audit.x86_64 0:1.8-2.el5 set to be updated
---> Package audit-libs.x86_64 0:1.8-2.el5 set to be updated
```

Update的过程大概不足10分钟，之后，系统会自动重启N次
大概30~40分钟后，升级完成，系统最后一次启动会正常启动
（重启N次的过程中，可以通过ILOM观察到系统的N次重启活动）。

安装和升级

1，安装数据库软件的BoundPatch

2，升级后的检查

(1) 检查系统的image版本

(2) 检查 Infiniband

(3) 检查数据库的版本信息

(4) 检查opatch的信息

Exadata 的4种刷机方法——Reimage

我们有四种方式刷机：

1. 用U盘刷机，也就是 USB flash thumb drive
2. 制作ISO image，使用ILOM指定iso的方式（当然如果刻录成光盘，也可以使用DVD模式）
3. 制作一个紧急启动的iso文件（类似于紧急启动盘），然后把image放在NFS上，进行刷机
4. 使用PXE+NFS

无论哪种方式，制作Reimage的命令都是一个makeImageMedia.sh，语法如下：

```
./makeImageMedia.sh
  [-preconf &lt;prconf.csv file full pathname&gt;]
  [
      &lt;dvd iso file name&gt;
    | [-pxe [-pxeout &lt;pxe output filename&gt; ]]
    | [&lt;nfs iso filename&gt; -nfs nfs_share -dir nfs_dir [-nfs_ip &lt;ip addr for nfs server&gt;]
        [-dhcp]
        [-logpath &lt;[lognfs_ip:]/full path to writeable nfs share&gt;]
      ]
  ]
```

使用U盘启动的方式刷机

```
[root@dm01db01 dl360]# ./makeImageMedia.sh -preconf /tmp/preconf.csv
Done. Pre config verification OK
Please wait. Calculating md5 checksums for cellbits ...
Please wait. Making initrd ...
199367 blocks
Please wait. Calculating md5 checksums for boot ...

Choose listed USB devices to set up the Oracle CELL installer

sdd   Approximate capacity 15441 MB
Enter the comma separated (no spaces) list of devices or word 'ALL' for to select all: sdd
sdd will be used as the Oracle CELL installer

All data on sdd will be erased. Proceed [y/n]? y

The number of cylinders for this disk is set to 1922.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): Building a new DOS disklabel. Changes will remain in memory only,
until you decide to write them. After that, of course, the previous
content won't be recoverable.


The number of cylinders for this disk is set to 1922.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
1) software that runs at boot time (e.g., old versions of LILO)
2) booting and partitioning software from other OSs
   (e.g., DOS FDISK, OS/2 FDISK)
Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)
```

使用ISO image的方式

[root@lunar dl360]# ./makeImageMedia.sh -preconf ../preconf_db.csv -stit -notests diskgroup -nodisktests db_img112330.iso

```
Done. Pre config verification OK
Please wait. Calculating md5 checksums for cellbits ...
Calculating md5 checksum for exaos.tbz ...
Calculating md5 checksum for dbboot.tbz ...
Calculating md5 checksum for dbfw.tbz ...
Calculating md5 checksum for kernel.tbz ...
Calculating md5 checksum for ofed.tbz ...
Calculating md5 checksum for sunutils.tbz ...
Calculating md5 checksum for hputils.tbz ...
Calculating md5 checksum for c7rpms.tbz ...
Calculating md5 checksum for commonos.tbz ...
Calculating md5 checksum for debugos.tbz ...
Calculating md5 checksum for dbrpms.tbz ...
Please wait. Making initrd ...
o o o o o o
```

使用ISO image + NFS 方式

```
NFS+ISO:
--------

   nfs iso is either created on the nfs server itself where the
   nfs export path is nfs_share e.g. /exports/images and nfs_dir is the
   subdirectory of nfs_share where image bits are copied by the iso creation
   command e.g. dl180/11132.

   OR

   The iso may be created anywhere using the nfsip option to supply the
   ip address of the nfs server and then the contents of nfs_share directory
   must be copied to nfs server at the EXACT same path as nfs_share

   NOTE: nfs iso MUST either be built on the nfs server as root user
         OR
         you must supply the ip address for nfs server with -nfsip

   Example:

   nfs iso built on the nfs server:

     makeImageMedia.sh x.iso -nfs /exports/images -dir dl180/11132

     Will create x.iso and copy image bits to /exports/images/dl180/11132
     You can copy the preconf.csv file then to /exports/images/dl180/11132

     You can of course embed the preconf.csv file in the iso itself with

     makeImageMedia.sh x.iso -nfs /exports/images -dir dl180/11132 \
                             -preconf preconf.csv

   nfs iso NOT built on nfs server:

     makeImageMedia.sh x.iso -nfsip 123.123.123.123 -nfs /exports/images \
                             -dir dl180/11132
```

使用PXE+NFS的方式

（1）首先要确认TITP功能，如果没有需要安装syslinux

yum install syslinux

（2）制作image

cd dl360/

./makeImageMedia.sh -pxe

检查image文件：

```
cd /tftpboot/linux-install/dl360/PXE
ls -l
        -rw-r--r-- 1 root root 38813575 Aug 19 10:39 initrd-11.2.3.2.1-130109-DL360.img
        -rw-r--r-- 1 root root 1325076480 Aug 19 10:39 nfsimg-11.2.3.2.1-130109-DL360.tar
        -rw-r--r-- 1 root root 69 Aug 19 10:39 nfsimg-11.2.3.2.1-130109-DL360.tar.md5
        -r-xr-xr-x 1 root root 3688864 Aug 19 10:39 vmlinux-11.2.3.2.1-130109-DL360

cd /tftpboot/linux-install
ls -l
    drwxrwxr-x 7 root root 4096 Aug 19 10:39 dl360
    -rw-r--r-- 1 root root 38813575 Aug 19 10:39 initrd-11.2.3.2.1-130109-DL360.img
    drwxr-xr-x 2 root root 4096 Aug 16 2012 msgs
    -rw-r--r-- 1 root root 1325076480 Aug 19 10:39 nfsimg-11.2.3.2.1-130109-DL360.tar
    -rw-r--r-- 1 root root 69 Aug 19 10:39 nfsimg-11.2.3.2.1-130109-DL360.tar.md5
    -rw-rw-r-- 1 root root 13100 Jul 25 2011 pxelinux.0
    drwxr-xr-x 2 root root 4096 Aug 19 09:15 pxelinux.cfg
    -r-xr-xr-x 1 root root 3688864 Aug 19 10:39 vmlinux-11.2.3.2.1-130109-DL360
```

（3）配置NFS Exports，并启动nfs server

```
cat /etc/exports
service nfs restart
```

（4）安装 TFTP SERVER

```
yum install tftp-server
chkconfig --level 345 tftp on
```

（5）修改 TFTP 配置文件：

```
/tftpboot/linux-install/pxelinux.cfg/default
注意，其中的 kernel vmlinux-11.2.3.2.1-130109-DL360 就是上面我们生成的
```

使用PXE+NFS的方式

（6）配置DHCP

```
yum install dhcp
mv /etc/dhcpd.conf /etc/dhcpd.orig
chkconfig --level 345 dhcpd on
```

检查 /etc/dhcpd.conf，例如：

```
option ip-forwarding false; # No IP forwarding
option mask-supplier false; # Don't respond to ICMP Mask req

    subnet 10.187.114.0 netmask 255.255.254.0 {
        option routers 10.187.114.1;
    }

    group {
        next-server 10.187.115.250;     ######这个是PXE SERVER
        filename &quot;linux-install/pxelinux.0&quot;;
        option root-path &quot;10.187.115.250:/tftpboot/linux-install&quot;;
        host exadbmel02 {
        hardware ethernet 00:21:28:A3:27:68;  ######eth0的MAC地址
        fixed-address 10.187.115.225;   ######这个是需要做reimage的节点的eth0
    }
}
```

这里确认etho的信息，也可以通过ILOM的方式： System Information -> Components -> /SYS/MB/NETo

或者ssh到ILOM，执行： show /SYS/MB/NETo

（7）重启一下所有网络相关服务：

```
service dhcpd restart
service xinetd restart
service iptables stop
```

这样配置好了PXE，就可以使用PXE+NFS了，后面的过程类似于ISO image了。

Exadata的日常维护并不复杂

1. 搞定ILOM基本所有硬件就ok了
2. 搞定Grid Control 基本所有监控就ok了
3. 搞定Linux，基本所有OS相关都ok了
4. 搞定交换机（Cisco和IB SWITCH），基本Exadata内部的网络就ok了
5. 搞定11.2.0.3的RAC，基本所有数据库、ASM、CRS就ok了
6. 搞定DB CONTROL（本机自带的OEM功能），基本数据库日常性能的监控就ok了
7. 其余cell的相关维护等，请参考官方文档，内容非常详细，涵盖了日常维护的95%以上工作了
8. 机器所有缺省口令都是welcome1（参考本文最后附录）
9. Cisco使用telnet登陆。IB SWITCH使用ssh登陆。

硬件机房例行检查

在机房例行检查时，需要从Exadata 机箱后方查看Exadata中是否有黄灯报警，如果有，记录位置，即时登录OEM/ILOM/ 集成的第三方监控工具查明原因，定位部件，即时维护。

机房温度

Sensor Readings

Filter: Type: Temperature

Name	Type	Reading
/SYS/MB/T_OUT0	Temperature	38.000 degree C
/SYS/MB/T_OUT1	Temperature	46.000 degree C
/SYS/MB/T_OUT2	Temperature	45.000 degree C
/SYS/PS0/T_AMB	Temperature	31.500 degree C
/SYS/PS1/T_AMB	Temperature	31.500 degree C
/SYS/T_AMB	Temperature	24.690 degree C

运行温度/湿度: 5°C 到 32°C (41°F to 89.6°F)，相对湿度 10% 到 90%, 不可冷凝。

运行高度:最高 3,048 米。 在高于 900 米的地方，高度每上升 300 米温度下降 1°C。

换盘

```
[root@dm01cel02 ~]# cellcli -e list alerthistory
53 2013-09-09T16:59:32+08:00 info "This is a test trap"
54 2013-10-17T02:00:11+08:00 info "HDD disk controller battery on disk contoller at adapter 0
55_1 2013-10-29T22:52:11+08:00 critical "Hard disk failed. Status : CRITICAL Manufacturer : SE
55_2 2013-12-06T18:17:27+08:00 critical "Hard disk removed. Status : NOT PRESENT Manufacturer
55_3 2013-12-06T18:18:21+08:00 clear "Hard disk replaced. Status : NORMAL Manufacturer : SEAGA
[root@dm01cel02 ~]#
```

2013-10-29T22:52:11+08:00 critical "Hard disk failed. Status : CRITICAL Manufacturer : SEAGATE Model Number : ST360057SSUN600G Size : 600G Serial Number : E0P387 Firmware : 0805 Slot Number : 9 Cell Disk : CD_09_dm01cel02 Grid Disk : DATA_DM01_CD_09_dm01cel02, RECO_DM01_CD_09_dm01cel02, DBFS_DG_CD_09_dm01cel02"

换盘

1.在db节点上grid用户登录，这是要确认一下asm disk是不是被drop掉。

```
SQL> set linesize 132
SQL> col path format a50
SQL> select group_number,path,header_status,mount_status,mode_status,name from V$ASM_DISK where path like '%CD_09_dm01cel02';
no rows selected
SQL>
SQL> select * from gv$asm_operation where state='RUN';
no rows selected

 

SQL>
```

2. 在相应的存储节点（dm01cel02）上进行确认检查：

```
[root@dm01cel02 ~]# cellcli -e list griddisk
 DATA_DM01_CD_00_dm01cel02 active
 DATA_DM01_CD_01_dm01cel02 active
 DATA_DM01_CD_02_dm01cel02 active
 DATA_DM01_CD_03_dm01cel02 active
 DATA_DM01_CD_04_dm01cel02 active
 DATA_DM01_CD_05_dm01cel02 active
 DATA_DM01_CD_06_dm01cel02 active
 DATA_DM01_CD_07_dm01cel02 active
 DATA_DM01_CD_08_dm01cel02 active
 DATA_DM01_CD_09_dm01cel02 not present -------------标记“not present”: gridisk DATA_DM01_CD_09_dm01cel02
 DATA_DM01_CD_10_dm01cel02 active
 DATA_DM01_CD_11_dm01cel02 active
```

换盘

3, 确认物理盘状态

```
CellCLI> list griddisk where celldisk=CD_09_dm01cel02
 DATA_DM01_CD_09_dm01cel02 not present -----状态“not present”
 DBFS_DG_CD_09_dm01cel02 not present
 RECO_DM01_CD_09_dm01cel02 not present

 

CellCLI>
```

这里发现磁盘的报错信息跟alert是一致的：

```
SEAGATE Model Number : ST360057SSUN600G
Serial Number : E0P387
Slot Number : 9
Cell Disk : CD_09_dm01cel02
```

换盘

通常在添加完磁盘后，我们会检查几件事情：

1，查看机柜的磁盘LED指示灯是否变成了绿色

2，用cellcli查看celldisk和griddisk等的信息

3，查看cell的alert日志

4，查看ASM的日志

5，查看ASM磁盘组和磁盘组信息

使用 DECLI 配置Exadata上cell节点的celladmin的信任关系

```
[celladmin@dm01cel01 ~]$ mkdir ~/.ssh
[celladmin@dm01cel01 ~]$ chmod 700 ~/.ssh

[celladmin@dm01cel02 ~]$ mkdir ~/.ssh
[celladmin@dm01cel02 ~]$ chmod 700 ~/.ssh

[root@dm01cel03 ~]# su - celladmin
[celladmin@dm01cel03 ~]$ mkdir ~/.ssh
[celladmin@dm01cel03 ~]$ chmod 700 ~/.ssh
[celladmin@dm01cel03 ~]$

[celladmin@dm01cel01 ~]$ dcli -k -g cells.txt
Error: Neither RSA nor DSA keys have been generated for current user.
Run 'ssh-keygen -t rsa' to generate an ssh key pair.
[celladmin@dm01cel01 ~]$

[celladmin@dm01cel01 ~]$ ssh-keygen -t dsa


[celladmin@dm01cel01 ~]$ dcli -k -g cell.txt
```

在Exadata上修改操作系统用户口令的方法

```
[root@dm01db01 onecommand]# dcli -g cell_group -l root "echo welcome | passwd --stdin celladmin"
dm01cel01: Changing password for user celladmin.
dm01cel01: passwd: all authentication tokens updated successfully.
dm01cel02: Changing password for user celladmin.
dm01cel02: passwd: all authentication tokens updated successfully.
dm01cel03: Changing password for user celladmin.
dm01cel03: passwd: all authentication tokens updated successfully.
[root@dm01db01 onecommand]#
[root@dm01db01 onecommand]#

[root@dm01db01 onecommand]# dcli -g dbs_group -l root "echo \"welcome1\" | passwd --stdin root"
dm01db01: Changing password for user root.
dm01db01: passwd: all authentication tokens updated successfully.
dm01db02: Changing password for user root.
dm01db02: passwd: all authentication tokens updated successfully.
[root@dm01db01 onecommand]#
```

为Exadata 服务器创建共享文件系统（DBFS）

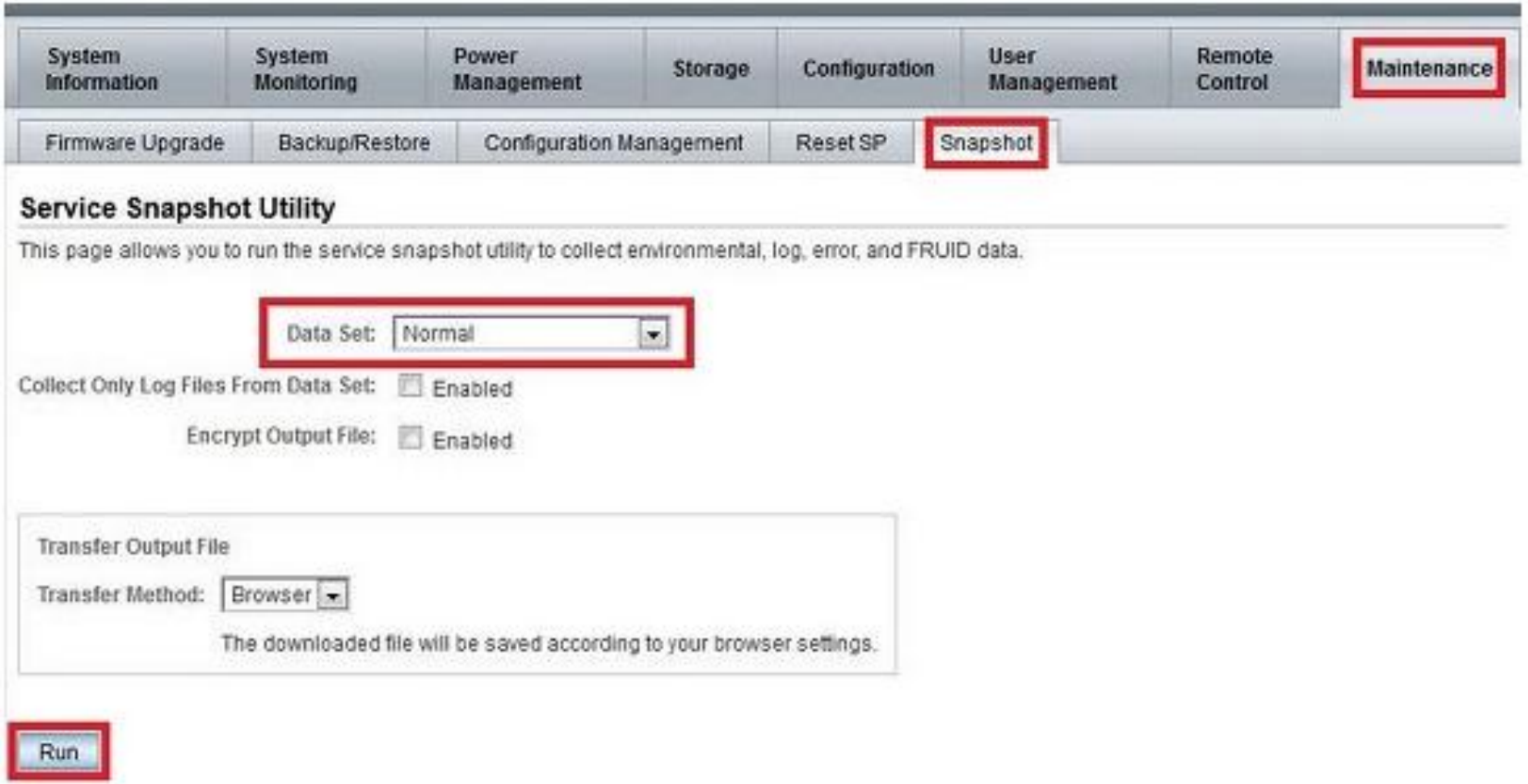
DBFS是Oracle 11.2的新特性

SecureFiles LOBs是11.1的新特性

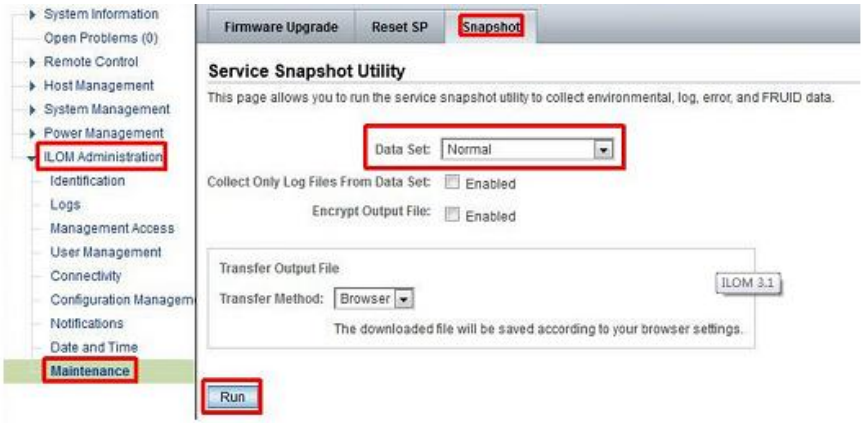
其配置过程非常简单，具体参见MOS:

Configuring a Database for DBFS on Oracle Database Machine [ID 1191144.1]
List of Critical Patches Required For Oracle 11.2 DBFS and DBFS Client [ID 1150157.1]

使用ILOM收集Exadata的硬件故障信息（snapshot）——使用WEB接口



使用ILOM收集Exadata的硬件故障信息（snapshot）——使用命令行



安装Exadata时，如果checkip有报错怎么办？

```
[root@dm01db01 onecommand]# ./checkip.sh -m pre_deploy112

Exadata Database Machine Network Verification version 1.12


Network verification mode post_applyconfig starting ...

Saving output file from previous run as dbm.out_29002

Using name server 9.9.9.3 found in dbm.dat for all DNS lookups

Processing section DOMAIN  : SUCCESS
Processing section NAME    : ERROR - see dbm.out for details   -------这里发现错误
Processing section NTP     : SUCCESS
Processing section GATEWAY : SUCCESS
Processing section SCAN    : SUCCESS
Processing section COMPUTE : SUCCESS
Processing section CELL    : SUCCESS
Processing section FACTORY : SUCCESS
Processing section ILOM    : SUCCESS
Processing section SWITCH  : ERROR - see dbm.out for details   -------这里发现错误
Processing section VIP     : SUCCESS

One or more checks report ERROR. Review dbm.out for details
[root@dm01db01 onecommand]#
```

Exadata 环境下修改NTP Server的方法

```
 : FAILED Error. Overall status of verification of Exadata configuration file: FA
 : FAILED NTP server 10.9.26.230 exists only in Exadata configuration file
 : FAILED NTP server 10.9.26.230 exists only in Exadata configuration file
  : FAILED Checking NTP server on 10.9.26.230
 : FAILED NTP server 10.9.26.230 exists only in Exadata configuration file
 : FAILED NTP server 10.9.26.230 exists only in Exadata configuration file
```

此时，在cell节点上验证会报失败“FAILED”：

```
[root@dm01cel01 ~]# /usr/local/bin/ipconf -verify -semantic
Verifying of Exadata configuration file /opt/oracle.cellos/cell.conf
Checking NTP server on 10.9.26.230                                  : FAILED
NTP server 10.9.26.230 exists only in Exadata configuration file    : FAILED
NTP server 10.9.26.62 exists only in /etc/ntp.conf                  : FAILED
Error. Overall status of verification of Exadata configuration file: FAILED
[root@dm01cel01 ~]#
```

解决方法：

直接修改/opt/oracle.cellos/cell.conf，将10.9.26.230替换成 10.9.26.62

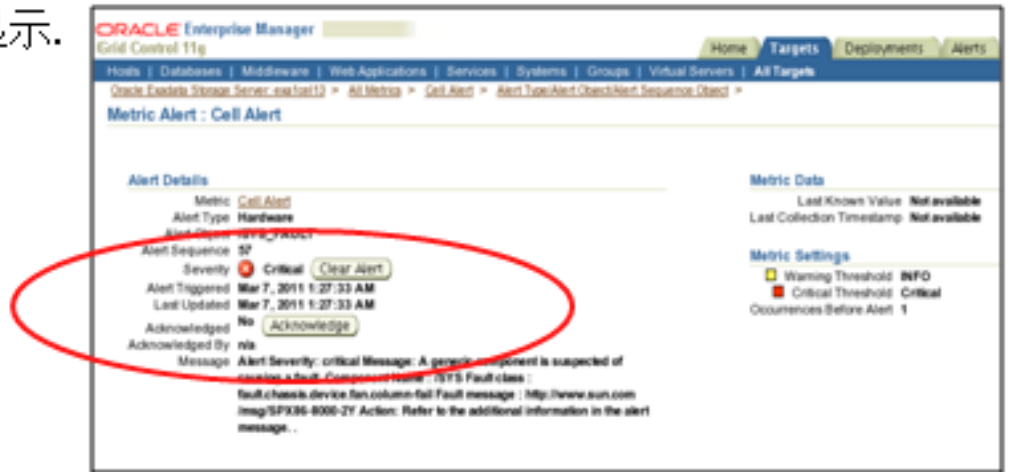
修改之后，再次使用 “ /usr/local/bin/ipconf -verify -semantic ”来验证。

```
[root@dm01cel01 ~]# /usr/local/bin/ipconf -verify -semantic
Verifying of Exadata configuration file /opt/oracle.cellos/cell.conf
Done. Configuration file /opt/oracle.cellos/cell.conf passed all verification checks
[root@dm01cel01 ~]#
1

然后重启ntp服务
#/etc/init.d/ntpd stop
#/etc/init.d/ntpd start 或者 #service ntpd restart

例如：
1
#service ntpd restart
 Shutting down ntpd: [  OK  ]
 ntpd: Synchronizing with time server: [  OK  ]
 Syncing hardware clock to system time [  OK  ]
 Starting ntpd: [  OK  ]
```

用Grid Control 监视 Exadata Storage

- 每个存储服务器都是Grid Control中的一个单独的目标
  - 存储服务器可以在系统中组合到一起

- Grid Control内的度量大多基于单元度量.
- 可以在Grid Control中设置其它阈值.
- 单元内生成的警报在Grid Control内显示.
- 可以在Grid Control内生成其它警报.



健康检查

Oracle Exadata Database Machine exachk or HealthCheck (Doc ID 1070954.1)

Oracle Exadata Assessment Report

System Health Score is 83 out of 100 (detail)

Cluster Summary

Cluster Name	dm01-cluster
OS Version	LINUX X86-64 OELRHEL 5 2.6.18-274.18.1.0.1.el5
CRS Home - Version	/u01/app/11.2.0.3/grid - 11.2.0.3.0
DB Home - Version - Names	/u01/app/oracle/product/11.2.0.3/dbhome_1 - 11.2.0.3.0 - 4
Exadata Version	11.2.3.1.1
Number of nodes	23
Database Servers	7
Storage Servers	13
IB Switches	3
exachk Version	2.2.1_20130228
Collection	exachk_dm01db01_db04_041513_161918.zip

健康检查

Database Server

Status	Type	Message	Status On	Details
FAIL	SQL Check	Table AUD$[FGA_LOG$] should use Automatic Segment Space Management for db04	All Databases	View
FAIL	Database Check	Database control files are not configured as recommended	dm01db01:db01, dm01db02:db01, dm01db04:db01	View
FAIL	Database Check	Database parameter Db_create_online_log_dest_n is not set to recommended value	All Databases	View
FAIL	Database Check	Database parameter CLUSTER_INTERCONNECTS is NOT set to the recommended value	dm01db01:db02, dm01db02:db02, dm01db04:db02, dm01db05:db03, dm01db05:db04 more	View
FAIL	SQL Parameter Check	Database parameter SQL92_SECURITY is NOT set to recommended value	db021, db022, db024, db031, db041 more	View
FAIL	SQL Parameter Check	Database parameter USE_LARGE_PAGES is NOT set to recommended value	db021, db022, db024, db041, db042 more	View
FAIL	SQL Parameter Check	Database parameter OS_AUTHENT_PREFIX is NOT set to recommended value	db021, db022, db024	View
FAIL	SQL Parameter Check	Database parameter PARALLEL_THREADS_PER_CPU is NOT set to recommended value	db021, db022, db024, db031, db041 more	View
FAIL	SQL Parameter Check	Database parameter PARALLEL_ADAPTIVE_MULTI_USER is NOT set to recommended value	db021, db022, db024, db031, db041 more	View
FAIL	SQL Parameter Check	Database parameter _file_size_increase_increment is NOT set to the recommended value	db021, db022, db024, db031, db041 more	View
FAIL	SQL Parameter Check	Database parameter GLOBAL_NAMES is NOT set to recommended value	All Instances	View
FAIL	OS Check	InfiniBand network error counters are non-zero	All Database Servers	View
FAIL	OS Check	Verify-topology returned some errors or warning.	All Database Servers	View
FAIL	SQL Check	Some data or temp files are not autoextensible	db01, db02	View

健康检查

Storage Server

Status	Type	Message	Status On	Details
FAIL	Storage Server Check	One or more storage server has stateless alerts with null "examinedby" fields.	dm01cel12, dm01cel08, dm01cel02, dm01cel01	View
FAIL	Storage Server Check	Storage Server alerts are not configured to be sent via email	dm01cel12, dm01cel08, dm01cel02, dm01cel01	View

Infiniband Switch

Status	Type	Message	Status On	Details
WARNING	Switch Check	sm_priority is not set to recommended value	dm01sw-ib1	View

Cluster Wide

Status	Type	Message	Status On	Details
FAIL	Cluster Wide Check	Master (Rack) Serial Number does not match across database servers and storage servers or not set on one or more server	Cluster Wide	View

Q & A