【Linux】将 Oracle 安装目录从根目录下迁移到逻辑卷

1.1 BLOG 文档结构图

1.2 前言部分

1.2.1 导读和注意事项

各位技术爱好者，看完本文后，你可以掌握如下的技能，也可以学到一些其它你所不知道的知识，~O(∩_∩)O~：

① Linux 逻辑卷的创建和管理（重点）

Tips:

① 本文在 itpub（http://blog.itpub.net/26736162）、博客园（http://www.cnblogs.com/lhrbest）和微信公众号（xiaomaimiaolhr）上有同步更新。

② 文章中用到的所有代码、相关软件、相关资料及本文的 pdf 版本都请前往小麦苗的云盘下载，小麦苗的云盘地址见：http://blog.itpub.net/26736162/viewspace-1624453/。

③ 若网页文章代码格式有错乱，请下载 pdf 格式的文档来阅读。

④ 在本篇 BLOG 中，代码输出部分一般放在一行一列的表格中。

本文若有错误或不完善的地方请大家多多指正，您的批评指正是我写作的最大动力。

1.2.2 相关文章链接

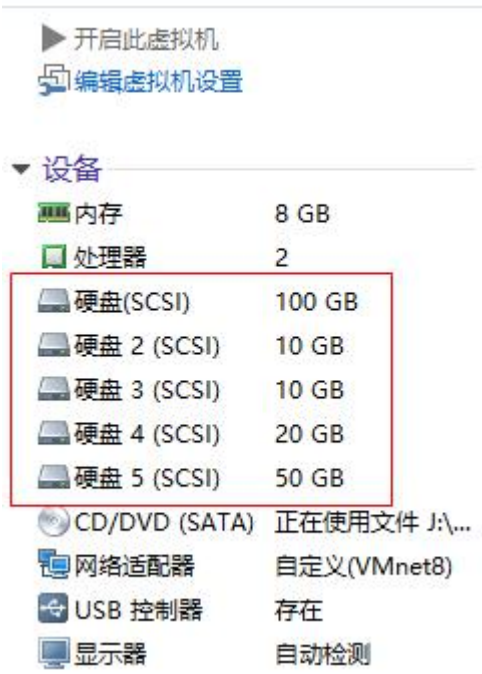
linux 逻辑卷管理：http://blog.itpub.net/26736162/viewspace-2124620/，这篇文章非常不错。

1.2.3 本文简介

由于 Oracle 版本太多，鉴于学习使用，所以，小麦苗在 RHEL6.5 上安装了 Oracle 11.2.0.3、Oracle 10.2.0.1 和 Oracle 10.2.0.4。但是由于没有采用逻辑卷的管理方式，现在根目录磁盘空间不足，而且也添加了好几块硬盘了，管理非常不方便。以后等 Oracle 12cR2 出来后还得安装在一起，想了想还是一次性将这些 Oracle 的安装目录都迁移到逻辑卷中，以后也好管理。本文记录了迁移过程，以备有同样需求的朋友使用。

1.3 迁移过程

1.3.1 磁盘现状



最后操作的结果就是把磁盘 2、3、4 和 5 去掉，只剩下 1 块或 2 块磁盘。

1.3.2 分区并创建物理卷

```
[root@rhel6 lhr ~]# df -h
Filesystem              Size  Used Avail Use% Mounted on
/dev/sda2                48G   43G  3.0G  94% /
tmpfs                   2.0G  432M  1.6G  22% /dev/shm
/dev/sda1               283M   58M  210M  22% /boot
/dev/mapper/testvg-testlv  380M  321M   40M  90% /var/lib/mysql
/dev/sdc1               9.9G  4.0G  5.5G  43% /u03
/dev/sde1                20G  7.3G   12G  39% /u04
```

```
/dev/sdf1               50G   30G   18G  63% /u05

[root@rhel6 lhr ~]# fdisk -l |grep dev
Disk /dev/sda: 107.4 GB, 107374182400 bytes
/dev/sda1   *         1         39      307200   83  Linux
/dev/sda2            39       6401    51104768   83  Linux
/dev/sda3          6401       6528     1015808   82  Linux swap / Solaris
/dev/sda4          6528      13054    52427455    5  Extended
Disk /dev/sdc: 10.7 GB, 10737418240 bytes
/dev/sdc1             1       1305    10482381   83  Linux
Disk /dev/sdd: 5368 MB, 5368709120 bytes
Disk /dev/sdf: 53.7 GB, 53687091200 bytes
/dev/sdf1             1       6527    52428096   83  Linux
Disk /dev/sdg: 21.5 GB, 21474836480 bytes
Disk /dev/sde: 21.5 GB, 21474836480 bytes
/dev/sde1             1       2610    20964793+  83  Linux
Disk /dev/mapper/testvg-testlv: 419 MB, 419430400 bytes
[root@rhel6_lhr ~]#
[root@rhel6_lhr ~]# fdisk /dev/sda

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
        switch off the mode (command 'c') and change display units to
        sectors (command 'u').

Command (m for help): p

Disk /dev/sda: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000bd0a0

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *         1         39      307200   83  Linux
Partition 1 does not end on cylinder boundary.
/dev/sda2            39       6401    51104768   83  Linux
/dev/sda3          6401       6528     1015808   82  Linux swap / Solaris

Command (m for help): m
Command action
   a   toggle a bootable flag
   b   edit bsd disklabel
   c   toggle the dos compatibility flag
   d   delete a partition
   l   list known partition types
   m   print this menu
   n   add a new partition
   o   create a new empty DOS partition table
   p   print the partition table
   q   quit without saving changes
   s   create a new empty Sun disklabel
   t   change a partition's system id
   u   change display/entry units
   v   verify the partition table
   w   write table to disk and exit
   x   extra functionality (experts only)

Command (m for help): l

 0  Empty          24  NEC DOS         81  Minix / old Lin bf  Solaris
 1  FAT12          39  Plan 9          82  Linux swap / So c1  DRDOS/sec (FAT-
 2  XENIX root     3c  PartitionMagic  83  Linux           c4  DRDOS/sec (FAT-
 3  XENIX usr      40  Venix 80286     84  OS/2 hidden C:  c6  DRDOS/sec (FAT-
```

```
 4  FAT16 <32M      41  PPC PReP Boot   85  Linux extended  c7  Syrinx
 5  Extended        42  SFS             86  NTFS volume set da  Non-FS data
 6  FAT16           4d  QNX4.x          87  NTFS volume set db  CP/M / CTOS / .
 7  HPFS/NTFS       4e  QNX4.x 2nd part 88  Linux plaintext de  Dell Utility
 8  AIX             4f  QNX4.x 3rd part 8e  Linux LVM       df  BootIt
 9  AIX bootable    50  OnTrack DM      93  Amoeba          e1  DOS access
 a  OS/2 Boot Manag 51  OnTrack DM6 Aux 94  Amoeba BBT      e3  DOS R/O
 b  W95 FAT32       52  CP/M            9f  BSD/OS          e4  SpeedStor
 c  W95 FAT32 (LBA) 53  OnTrack DM6 Aux a0  IBM Thinkpad hi eb  BeOS fs
 e  W95 FAT16 (LBA) 54  OnTrackDM6      a5  FreeBSD         ee  GPT
 f  W95 Ext'd (LBA) 55  EZ-Drive        a6  OpenBSD         ef  EFI (FAT-12/16/
10  OPUS           56  Golden Bow      a7  NeXTSTEP        f0  Linux/PA-RISC b
11  Hidden FAT12    5c  Priam Edisk     a8  Darwin UFS      f1  SpeedStor
12  Compaq diagnost 61  SpeedStor       a9  NetBSD          f4  SpeedStor
14  Hidden FAT16 <3 63  GNU HURD or Sys ab  Darwin boot     f2  DOS secondary
16  Hidden FAT16    64  Novell Netware  af  HFS / HFS+      fb  VMware VMFS
17  Hidden HPFS/NTF 65  Novell Netware  b7  BSDI fs         fc  VMware VMKCORE
18  AST SmartSleep  70  DiskSecure Mult b8  BSDI swap       fd  Linux raid auto
1b  Hidden W95 FAT3 75  PC/IX           bb  Boot Wizard hid fe  LANstep
1c  Hidden W95 FAT3 80  Old Minix       be  Solaris boot    ff  BBT
1e  Hidden W95 FAT1

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Selected partition 4
First cylinder (6528-13054, default 6528):
Using default value 6528
Last cylinder, +cylinders or +size{K,M,G} (6528-13054, default 13054):
Using default value 13054

Command (m for help): t
Partition number (1-4): 4
Hex code (type L to list codes): 8e
Changed system type of partition 4 to 8e (Linux LVM)

Command (m for help): p

Disk /dev/sda: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000bd0a0

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          39      307200   83  Linux
Partition 1 does not end on cylinder boundary.
/dev/sda2              39        6401    51104768   83  Linux
/dev/sda3            6401        6528     1015808   82  Linux swap / Solaris
/dev/sda4            6528       13054    52427455   8e  Linux LVM

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Syncing disks.
[root@rhel6_lhr ~]# partprobe
```

```
Warning: WARNING: the kernel failed to re-read the partition table on /dev/sda (Device or resource busy).
As a result, it may not reflect all of your changes until after reboot.
Warning: WARNING: the kernel failed to re-read the partition table on /dev/sdc (Device or resource busy).
As a result, it may not reflect all of your changes until after reboot.
Warning: WARNING: the kernel failed to re-read the partition table on /dev/sde (Device or resource busy).
As a result, it may not reflect all of your changes until after reboot.
Warning: WARNING: the kernel failed to re-read the partition table on /dev/sdf (Device or resource busy).
As a result, it may not reflect all of your changes until after reboot.
[root@rhel6 lhr ~]#
[root@rhel6 lhr ~]#
[root@rhel6 lhr ~]# pvcreate /dev/sda4
  dev is mpath: failed to get device for 8:4
  dev is mpath: failed to get device for 8:4
  Device /dev/sda4 not found (or ignored by filtering).
[root@rhel6_lhr ~]# fdisk -l /dev/sda

Disk /dev/sda: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000bd0a0

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          39      307200   83  Linux
Partition 1 does not end on cylinder boundary.
/dev/sda2              39        6401    51104768   83  Linux
/dev/sda3            6401        6528     1015808   82  Linux swap / Solaris
/dev/sda4            6528       13054    52427455   8e  Linux LVM
[root@rhel6_lhr ~]#

[root@rhel6_lhr ~]# pvcreate /dev/sda4
  Device /dev/sda4 not found (or ignored by filtering).
[root@rhel6_lhr ~]# l /dev/sda4
brw-rw---- 1 root disk 8, 4 Dec 26 09:51 /dev/sda4
[root@rhel6_lhr ~]# reboot

Broadcast message from root@rhel6_lhr
        (/dev/pts/1) at 10:12 ...

The system is going down for reboot NOW!
[root@rhel6_lhr ~]#
Last login: Mon Dec 26 10:06:09 2016 from 192.168.59.1
[root@rhel6_lhr ~]#
[root@rhel6_lhr ~]# df -h
Filesystem              Size  Used Avail Use% Mounted on
/dev/sda2                48G   43G  3.0G  94% /
tmpfs                   2.0G     0  2.0G   0% /dev/shm
/dev/sda1               283M   58M  210M  22% /boot
/dev/mapper/testvg-testlv  380M  321M   40M  90% /var/lib/mysql
/dev/sdc1               9.9G  4.0G  5.5G  43% /u03
/dev/sde1                20G  7.3G   12G  39% /u04
/dev/sdf1                50G   30G   18G  63% /u05
[root@rhel6_lhr ~]# fdisk -l /dev/sda

Disk /dev/sda: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000bd0a0

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          39      307200   83  Linux
```

```
Partition 1 does not end on cylinder boundary.
/dev/sda2            39       6401    51104768   83  Linux
/dev/sda3          6401       6528     1015808   82  Linux swap / Solaris
/dev/sda4          6528      13054    52427455   8e  Linux LVM
[root@rhel6 lhr ~]# pvcreate /dev/sda4
  Physical volume "/dev/sda4" successfully created
[root@rhel6 lhr ~]#
[root@rhel6 lhr ~]# pvs
  PV         VG    Fmt  Attr PSize  PFree
  /dev/sda4         lvm2 a--  50.00g 50.00g
[root@rhel6 lhr ~]# pvs
  PV         VG    Fmt  Attr PSize  PFree
  /dev/sda4         lvm2 a--  50.00g 50.00g
[root@rhel6 lhr ~]# pvdisplay
  "/dev/sda4" is a new physical volume of "50.00 GiB"
  --- NEW Physical volume ---
  PV Name               /dev/sda4
  VG Name
  PV Size               50.00 GiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               NgZ5Vl-Jbkn-9U71-9Ypp-i2nH-HhlT-cSPQ3o
```

1.3.3 创建卷组

```
[root@rhel6_lhr ~]# vgcreate vg_orasoft /dev/sda4
  Volume group "vg_orasoft" successfully created
[root@rhel6_lhr ~]# vgdisplay
  --- Volume group ---
  VG Name               vg_orasoft
  System ID
  Format                lvm2
  Metadata Areas        1
  Metadata Sequence No  1
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                0
  Open LV               0
  Max PV                0
  Cur PV                1
  Act PV                1
  VG Size               50.00 GiB
  PE Size               4.00 MiB
  Total PE              12799
  Alloc PE / Size       0 / 0
  Free  PE / Size       12799 / 50.00 GiB
  VG UUID               PyRYUt-ERDU-NU4o-NWHA-anpD-iTIA-aMGLnV

[root@rhel6_lhr ~]# vgs
  VG         #PV #LV #SN Attr   VSize  VFree
  vg_orasoft   1   0   0 wz--n- 50.00g 50.00g
[root@rhel6_lhr ~]# pvs
  PV         VG         Fmt  Attr PSize  PFree
  /dev/sda4  vg_orasoft lvm2 a--  50.00g 50.00g
[root@rhel6_lhr ~]# pvdisplay
  --- Physical volume ---
  PV Name               /dev/sda4
  VG Name               vg_orasoft
  PV Size               50.00 GiB / not usable 2.69 MiB
  Allocatable           yes
  PE Size               4.00 MiB
  Total PE              12799
  Free PE               12799
  Allocated PE          0
  PV UUID               NgZ5Vl-Jbkn-9U71-9Ypp-i2nH-HhlT-cSPQ3o
```

1.3.4 创建逻辑卷

```
[root@rhel6_lhr ~]#
[root@rhel6_lhr ~]#  lvcreate -n lv_ora_soft_u01 -L 35G vg_orasoft
  Logical volume "lv_ora_soft_u01" created
[root@rhel6_lhr ~]# lvdisplay
  --- Logical volume ---
  LV Path                /dev/vg_orasoft/lv_ora_soft_u01
  LV Name                lv_ora_soft_u01
  VG Name                vg_orasoft
  LV UUID                FYWeeZ-DMxB-MKBo-Lpeb-kVEz-yCFY-M2Ddmr
```

```
  LV Write Access        read/write
  LV Creation host, time rhel6 lhr, 2016-12-26 11:06:03 +0800
  LV Status              available
  # open                 0
  LV Size                35.00 GiB
  Current LE             8960
  Segments               1
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:1

[root@rhel6 lhr ~]# lvs
  LV            VG        Attr      LSize   Pool Origin Data%  Move Log Cpy%Sync Convert
  lv_ora_soft_u01 vg_orasoft -wi-a-----  35.00g
[root@rhel6_lhr ~]#
[root@rhel6_lhr ~]# vgs
  VG        #PV #LV #SN Attr   VSize  VFree
  vg_orasoft   1   1   0 wz--n- 50.00g 15.00g
[root@rhel6_lhr ~]# pvs
  PV        VG        Fmt  Attr PSize  PFree
  /dev/sda4  vg_orasoft lvm2 a--  50.00g 15.00g
[root@rhel6_lhr ~]# mkfs.ext4 /dev/vg_orasoft/lv_ora_soft_u01
mke2fs 1.43-WIP (20-Jun-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
2293760 inodes, 9175040 blocks
458752 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=4294967296
280 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
       32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
       4096000, 7962624

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

[root@rhel6_lhr ~]#
```

1.3.5 停止 Oracle 的所有进程

```
[root@rhel6_lhr ~]# ps -ef|grep ora
grid     3087    1  0 10:18 ?       00:00:27 /u01/app/grid/11.2.0/bin/oraagent.bin
grid     3265    1  0 10:18 ?       00:00:00 oracle+ASM (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
grid     3270    1  0 10:18 ?       00:00:00 oracle+ASM (DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
oracle   3640    1  0 10:18 ?       00:00:00 ora_pmon_orclasm
oracle   3642    1  0 10:18 ?       00:00:00 ora_psp0_orclasm
oracle   3648    1  1 10:18 ?       00:00:51 ora_vktm_orclasm
oracle   3652    1  0 10:18 ?       00:00:00 ora_gen0_orclasm
oracle   3654    1  0 10:18 ?       00:00:00 ora_diag_orclasm
oracle   3656    1  0 10:18 ?       00:00:00 ora_dbrm_orclasm
oracle   3658    1  0 10:18 ?       00:00:03 ora_dia0_orclasm
oracle   3660    1  0 10:18 ?       00:00:00 ora_mman_orclasm
oracle   3662    1  0 10:18 ?       00:00:00 ora_dbw0_orclasm
oracle   3664    1  0 10:18 ?       00:00:00 ora_lgwr_orclasm
oracle   3666    1  0 10:18 ?       00:00:01 ora_ckpt_orclasm
oracle   3668    1  0 10:18 ?       00:00:00 ora_smon_orclasm
oracle   3670    1  0 10:18 ?       00:00:00 ora_reco_orclasm
oracle   3672    1  0 10:18 ?       00:00:00 ora_rbal_orclasm
oracle   3674    1  0 10:18 ?       00:00:00 ora_asmb_orclasm
oracle   3676    1  0 10:18 ?       00:00:00 ora_mmon_orclasm
oracle   3678    1  0 10:18 ?       00:00:01 ora_mmnl_orclasm
oracle   3680    1  0 10:18 ?       00:00:00 ora_d000_orclasm
oracle   3682    1  0 10:18 ?       00:00:00 ora_s000_orclasm
oracle   3684    1  0 10:18 ?       00:00:00 oracleorclasm
(DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
grid     3686    1  0 10:18 ?       00:00:00 oracle+ASM_asmb_orclasm
(DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
oracle   3689    1  0 10:18 ?       00:00:00 ora_mark_orclasm
oracle   3703    1  0 10:18 ?       00:00:00 ora_rvwr_orclasm
oracle   3717    1  0 10:19 ?       00:00:00 ora_arc0_orclasm
oracle   3738    1  0 10:19 ?       00:00:00 ora_arc1_orclasm
oracle   3740    1  0 10:19 ?       00:00:00 ora_arc2_orclasm
oracle   3742    1  0 10:19 ?       00:00:00 ora_arc3_orclasm
oracle   3752    1  0 10:19 ?       00:00:00 ora_ctwr_orclasm
oracle   3758    1  0 10:19 ?       00:00:00 ora_fbda_orclasm
oracle   3760    1  0 10:19 ?       00:00:00 ora_qmnc_orclasm
oracle   3775    1  0 10:19 ?       00:00:00 oracleorclasm
(DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
oracle   3779    1  0 10:19 ?       00:00:00 ora_q000_orclasm
oracle   3781    1  0 10:19 ?       00:00:00 ora_q001_orclasm
oracle   3790    1  0 10:19 ?       00:00:00 oracleorclasm
(DESCRIPTION=(LOCAL=YES)(ADDRESS=(PROTOCOL=beq)))
oracle   3813    1  0 10:19 ?       00:00:00 ora_cjq0_orclasm
oracle   3820    1  0 10:19 ?       00:00:01 ora_j000_orclasm
oracle   3822    1  0 10:19 ?       00:00:08 ora_j001_orclasm
oracle   4115    1  0 10:24 ?       00:00:00 ora_smco_orclasm
oracle   6197    1  0 11:04 ?       00:00:00 ora_w000_orclasm
oracle   6283    1  0 11:05 ?       00:00:00 ora_w001_orclasm
root     6361  2323  0 11:07 pts/1    00:00:00 grep ora
[root@rhel6_lhr ~]# crsctl stop has -f
CRS-2791: Starting shutdown of Oracle High Availability Services-managed resources on 'rhel6_lhr'
CRS-2673: Attempting to stop 'ora.LISTENER.lsnr' on 'rhel6_lhr'
CRS-2673: Attempting to stop 'ora.orclasm.db' on 'rhel6_lhr'
CRS-2677: Stop of 'ora.LISTENER.lsnr' on 'rhel6_lhr' succeeded
CRS-2677: Stop of 'ora.orclasm.db' on 'rhel6_lhr' succeeded
CRS-2673: Attempting to stop 'ora.FRA.dg' on 'rhel6_lhr'
CRS-2673: Attempting to stop 'ora.DATA.dg' on 'rhel6_lhr'
CRS-2677: Stop of 'ora.FRA.dg' on 'rhel6_lhr' succeeded
CRS-2677: Stop of 'ora.DATA.dg' on 'rhel6_lhr' succeeded
```

```
CRS-2673: Attempting to stop 'ora.asm' on 'rhel6 lhr'
CRS-2677: Stop of 'ora.asm' on 'rhel6 lhr' succeeded
CRS-2673: Attempting to stop 'ora.cssd' on 'rhel6 lhr'
CRS-2677: Stop of 'ora.cssd' on 'rhel6 lhr' succeeded
CRS-2673: Attempting to stop 'ora.ons' on 'rhel6 lhr'
CRS-2673: Attempting to stop 'ora.evmd' on 'rhel6 lhr'
CRS-2677: Stop of 'ora.ons' on 'rhel6 lhr' succeeded
CRS-2677: Stop of 'ora.evmd' on 'rhel6 lhr' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'rhel6 lhr' has completed
CRS-4133: Oracle High Availability Services has been stopped.
[root@rhel6 lhr ~]# ps -ef|grep ora
root      6420  2323  0 11:07 pts/1    00:00:00 grep ora
[root@rhel6 lhr ~]# ps -ef|grep d.bin
root      6425  2323  0 11:07 pts/1    00:00:00 grep d.bin
```

1.3.6 开始迁移

注意这里的迁移技巧：

```
[root@rhel6_lhr ~]# mkdir /u11
[root@rhel6_lhr ~]# mount /dev/vg_orasoft/lv_ora_soft_u01 /u11
[root@rhel6_lhr ~]# mv /u01/*  /u11/
[root@rhel6_lhr ~]# umount /u01
[root@rhel6_lhr ~]# umount /u11
[root@rhel6_lhr ~]# mount /dev/vg_orasoft/lv_ora_soft_u01 /u01
[root@rhel6_lhr ~]# df -h
Filesystem                            Size  Used Avail Use% Mounted on
/dev/sda2                              48G   43G  3.1G  94% /
tmpfs                                 2.0G   76K  2.0G   1% /dev/shm
/dev/sda1                             283M   58M  210M  22% /boot
/dev/sdc1                             9.9G  4.0G  5.5G  43% /u03
/dev/sde1                              20G  7.3G   12G  39% /u04
/dev/sdf1                              50G   30G   18G  63% /u05
/dev/mapper/vg_orasoft-lv_ora_soft_u01    35G   28G  4.8G  86% /u01
```

依次类推，将其它的所有盘的文件都迁移至逻辑卷中，最终结果如下：

```
[root@rhel6_lhr ~]# df -h
Filesystem                            Size  Used Avail Use% Mounted on
/dev/sda2                              48G   12G   35G  25% /
tmpfs                                 2.0G   76K  2.0G   1% /dev/shm
/dev/sda1                             283M   58M  210M  22% /boot
/dev/mapper/vg_orasoft-lv_orasoft_u01     35G   28G  4.8G  86% /u01
/dev/mapper/vg_orasoft-lv_orasoft_u02    5.8G  3.6G  2.0G  65% /u02
/dev/mapper/vg_orasoft-lv_orasoft_u03    5.8G  3.8G  1.8G  69% /u03
/dev/mapper/vg_orasoft-lv_orasoft_mysql  976M  320M  605M  35% /var/lib/mysql
/dev/mapper/vg_oradata-lv_oradata_u04    9.8G  7.3G  2.1G  79% /u04
/dev/mapper/vg_oradata-lv_oradata_u05     30G   23G  5.5G  81% /u05
```

1.3.7 修改/etc/fstab

修改/etc/fstab 文件，加入如下内容：

```
/dev/vg_orasoft/lv_orasoft_u01 /u01  ext4 defaults 0 0
/dev/vg_orasoft/lv_orasoft_u02 /u02  ext4 defaults 0 0
/dev/vg_orasoft/lv_orasoft_u03 /u03  ext4 defaults 0 0
/dev/vg_oradata/lv_oradata_u04 /u04  ext4 defaults 0 0
/dev/vg_oradata/lv_oradata_u05 /u05  ext4 defaults 0 0
/dev/vg_orasoft/lv_orasoft_mysql /var/lib/mysql ext4 defaults 0 0
```

1.3.8 启动数据库验证

```
[root@rhel6_lhr ~]# crsctl start has
CRS-4123: Oracle High Availability Services has been started.
[root@rhel6_lhr ~]#
                                                    TARTING
[root@rhel6_lhr ~]# crsctl stat res -t
--------------------------------------------------------------------------------
NAME           TARGET  STATE        SERVER                   STATE_DETAILS
--------------------------------------------------------------------------------
Local Resources
--------------------------------------------------------------------------------
ora.DATA.dg
               ONLINE  ONLINE       rhel6_lhr
ora.FRA.dg
               ONLINE  ONLINE       rhel6_lhr
ora.LISTENER.lsnr
               ONLINE  ONLINE       rhel6_lhr
ora.asm
               ONLINE  ONLINE       rhel6_lhr                Started
ora.ons
               ONLINE  ONLINE       rhel6_lhr
--------------------------------------------------------------------------------
Cluster Resources
--------------------------------------------------------------------------------
ora.cssd
      1        ONLINE  ONLINE       rhel6_lhr
ora.diskmon
      1        OFFLINE OFFLINE
ora.evmd
      1        ONLINE  ONLINE       rhel6_lhr
ora.ogg2.db
      1        ONLINE  ONLINE       rhel6_lhr                Open
ora.orclasm.db
      1        ONLINE  ONLINE       rhel6_lhr                Open
```

About Me

- 本文作者：小麦苗，只专注于数据库的技术，更注重技术的运用
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