# Linux 系统下 LV 与文件系统大小的调整

## 一【实验目标】

- 学习并掌握 Linux 系统下如何调整 LV 及其文件系统的大小

## 二【实验环境】

- 实验机环境：Centos 6.6
- 目标机环境：Centos 6.6

## 三【实验原理】

在 Linux 的 LVM 管理模式下，当我们遇到磁盘空间不够用的时候或者磁盘空间过大有点浪费的时候，就需要进行文件系统和 LV 大小调整。

## 四【实验步骤】

1 创建文件系统

命令：mkfs –t ext3 /dev/vg_test/lv_test

```
[root@localhost yangbin]# mkfs -t ext3 /dev/vg_test/lv_test
mke2fs 1.41.12 (17-May-2010)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
333248 inodes, 1332224 blocks
66611 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=1367343104
41 block groups
32768 blocks per group, 32768 fragments per group
8128 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736

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

This filesystem will be automatically checked every 20 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
```

图 1

2 挂载该文件系统

（1） 创建挂载目录

命令：mkdir /test

（2） 将文件系统挂载到该目录下

命令：mount /dev/vg_test/lv_test /test

（3） 查看此时 LV 状况

命令：df-h

```
[root@localhost yangbin]# mkdir /test
[root@localhost yangbin]# mount /dev/vg_test/lv_test /test
[root@localhost yangbin]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.5G  3.3G  5.8G  36% /
tmpfs                 491M   80K  491M   1% /dev/shm
/dev/mapper/vg_test-lv_test
                      5.1G  139M  4.7G   3% /test
```

图 2

3 将文件系统和 LV 减小到 1G

（1） 卸载/test

命令：umount /test

（2） 检查是否有被损坏的块

命令：e2fsck –f /dev/mapper/vg_test-lv_test

```
[root@localhost yangbin]# umount /test
[root@localhost yangbin]# e2fsck -f /dev/mapper/vg_test-lv_test
e2fsck 1.41.12 (17-May-2010)
Pass 1: Checking inodes, blocks, and sizes
Pass 2: Checking directory structure
Pass 3: Checking directory connectivity
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/mapper/vg_test-lv_test: 11/333248 files (0.0% non-contiguous), 56333/133222
4 blocks
```

图 3

（3） 将文件系统大小缩小到 1G（大约是 262144 个扇区，1*1024*1024/4）

命令：resize2fs /dev/mapper/vg_test-lv_test 262144

```
[root@localhost yangbin]# resize2fs /dev/mapper/vg_test-lv_test 262144
resize2fs 1.41.12 (17-May-2010)
Resizing the filesystem on /dev/mapper/vg_test-lv_test to 262144 (4k) blocks.
The filesystem on /dev/mapper/vg_test-lv_test is now 262144 blocks long.
```

图 4

（4） 改变 LV 的大小

命令：lvchange –an /dev/vg_test/lv_test

lvreduce –L1G /dev/vg_test/lv_test

lvchange –ay /dev/vg_test/lv_test

```
[root@localhost yangbin]# lvchange -an /dev/vg_test/lv_test
[root@localhost yangbin]# lvreduce -L1G /dev/vg_test/lv_test
  Size of logical volume vg_test/lv_test changed from 5.08 GiB (1301 extents) to
 1.00 GiB (256 extents).
  Logical volume lv_test successfully resized
[root@localhost yangbin]# lvchange -ay /dev/vg_test/lv_test
```

图 5

（5） 重新挂载文件系统

命令：mount /dev/vg_test/lv_test /test

```
[root@localhost yangbin]# mount /dev/vg_test/lv_test /test
[root@localhost yangbin]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.5G  3.3G  5.8G  36% /
tmpfs                 491M  228K  491M   1% /dev/shm
/dev/mapper/vg_test-lv_test
                      1009M  135M  823M  15% /test
```

图 6

如图，减小成功

4 将文件系统和 LV 增加 200M

（1） 增加 LV 大小

命令：lvextend –L +200M /dev/vg_test/lv_test

```
[root@localhost yangbin]# lvextend -L +200M /dev/vg_test/lv_test
  Size of logical volume vg_test/lv_test changed from 1.00 GiB (256 extents) to
1.20 GiB (306 extents).
  Logical volume lv_test successfully resized
```

图 7

（2） 改变文件系统大小

命令：resize2fs /dev/vg_test/lv_test

```
[root@localhost yangbin]# resize2fs /dev/vg_test/lv_test
resize2fs 1.41.12 (17-May-2010)
Filesystem at /dev/vg_test/lv_test is mounted on /test; on-line resizing require
d
old desc_blocks = 1, new_desc_blocks = 1
Performing an on-line resize of /dev/vg_test/lv_test to 313344 (4k) blocks.
The filesystem on /dev/vg_test/lv_test is now 313344 blocks long.

[root@localhost yangbin]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             9.5G  3.3G  5.8G  36% /
tmpfs                 491M  228K  491M   1% /dev/shm
/dev/mapper/vg_test-lv_test
                      1.2G  136M 1008M  12% /test
```

图 8

如图，增大成功

**五【实验思考】**

- LV 调整涉及到的操作