

? RHEL5 ??????? LVM ?????? #system-config-lvm

LVM:????

?????????LVM????,?????????????.

Physical Volume (PV)

A physical volume is typically a hard disk, though it may well just be a device that 'looks' like a hard disk (eg. a software raid device).

?????????????partition(/dev/sdb1,/dev/sdc1)

volume group (VG)

The Volume Group is the highest level abstraction used within the LVM. It gathers together a collection of Logical Volumes and Physical Volumes into one administrative unit.

???????? PV(/dev/sdb1,/dev/sdc1)?????????????????(/dev/volum00,?????????/dev/sda?????????,????????? ??????????)

Logical Volume (LV)

The equivalent of a disk partition in a non-LVM system. The LV is visible as a standard block device; as such the LV can contain a file system (eg. /home).

?VG????????????? partition(/dev/volum00/LVOL1,?????????/dev/sda1?????????,?????????????????)

Physical Extent (PE)

Each physical volume is divided chunks of data, known as physical extents, these extents have the same size as the logical extents for the volume group.

PE????????????,??block???.? PE????????4M??VG????65534?PE,????????,??VG????65534*4M??256G.????
 ??????????????.??????PE?????.????4M????2????8k-16GB????????.

LVM ???????:

?????????? partition(/dev/sdb1 /dev/sdc1) ??????????(/dev/vg).?????????????????????? partition(/dev/vg/
 lv1,/dev/vg/lv2).???????? partition ???.

???????? LVM2

???????????????? LVM ???, RHEL5 ????? LVM ????.? LVM ?????,???????????? LVM2 ,??? 3 ???????.

1. ?? device-mapper ??????????????,???????? Multi-device support (RAID and LVM) ?.

```
[root@benjr ~]# cat /boot/config-kernel-version | grep -i BLK_DEV_DM
CONFIG_BLK_DEV_DM=m
```

2.device-mapper ? library (libdevmapper)

```
[root@benjr ~]# rpm -aq |grep -i device-mapper
device-mapper-version
```

3.LVM2 ???

```
[root@benjr ~]# rpm -aq |grep -i lvm  
lvm2-version
```

Physical Volume (PV) ???

PV ?????? partition ?? #system-config-lvm ????? PV ??? sdb ??? "initialize Entity.????????????? ????????????

<http://benjr.tw/?q=node/55>

Volume Group (VG) ???

?? PV ?????? VG ,? Unallocated Volumes ?????? PV,?? "Create new Volume Group" ???? VG ??????5?.

Volume Group Name:

????????? volume ????(/dev/Volume Group Name/Logical Volume Name).

Maximum Physical Volumes:

????????????????????(PV),?????? PV ??????,??256???????

Maximum Logical Volumes:

????????? LV ???,??? 256,?????????????????

Physical Extent Size:

PE ???? VG ???,???????????? PE ????.???2?????8k-1GB????????,???? 4M.

Clustered:

???? volume ??? Cluster ??????????,?????????????????????????????

Logical Volume (LV) ???

???? VG ? vg1 ? Volume Groups ????,????????? LV,?? "Create New Logical Voumes"

LV name:

????????? voulme ????(/dev/Volume Group Name/Logical Volume Name)

LV Properties:

LVM ??????????(mapping)??,1.Linear 2.Mirrored 3.Striped ??? Linear ?????????? PV(Physical Volume) ?????
 ?.???? VG(Volume Group) ??? PV(Physical Volume) ?????????? 2.Mirrored 3.Striped ??? RAID ?????,??????
 ? Soft RAID ? ?? .Mirrored ??? RAID 1 ,Striped ??? RAID 0.

1.Linear

????????????? sdb1,sdc1????? Linear LVM Disk,????????????????,? sdb1 ?????????? sdc1 ??????.

2.Mirrored

???????????? sdb1,sdc1????? Mirrored LVM Disk,???????????????? sdb1 sdc1 ??????????.????? RAID 1.?????????????????
??.

3.Striped

???????????? sdb1,sdc1????? Striped LVM Disk,????????????????sdb1 ,sdc1 ?????.????? RAID 0.????????????????????????????

?????????????.????????????????????.

Size:

????? LV(Logical Volume) ??????,?? LVM ??????????????????,?????????????.???:
1.Extents 2.Gigabytes
3.Megabytes 4.Kilobytes.?? Extents ??????????????????(G/M/K Bytes,1G=10⁹ ,1M=10⁶1K=10³) ?????????
Physical Extent Size ?????????,Extents ????????? 4MBytes.

User remaining:

???VG(volume group)????????????? LV(Logical Volume)

Filesystem:

????? LV ?????????????????????,????????? None,????????? Ext3 / Ext2 / GFS(local) / GFS(Clusterd) ,Global File System ?????????,????? Ext3 ??.

Mount point:

????????????????????? LV(Logical Volume) ??(mount)?????????"mount when rebooted" ?????????????????????
LV(Logical Vlolume) ?????????,????????? /etc/fstab ??? ????????????????????? say "yes" ?????????????????.

???? LV (Logical Volume)???????

?????? LVM(Logical Volume Manager) ?????????????????????????????????,????????????????? #system-config-lvm
?????????????.????????? LV1 ?????????? 20 GByte ??????????????????????????????????.?? 40 Gbyte.

???????? LV(Logical Volume) ??????????,??????????????,????????????????????,??????????????????.

```
[root@benjr ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1        19G  6.4G  12G  36% /
tmpfs            1005M    0 1005M   0% /dev/shm
/dev/mapper/vg1-lv1  20G  173M  19G   1% /share
#?? LV(Logical Volume) ??
[root@benjr ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1        19G  6.4G  12G  36% /
tmpfs            1005M    0 1005M   0% /dev/shm
/dev/mapper/vg1-lv1  40G  177M  38G   1% /share
```

????????????,????????????? (#umount) ,????????????,?? "resize2fs" ??????????,?
 ?????????????????????????,??? " /sbin/resize2fs:No space left on
 device while trying to resize /dev/vg1/lv1" ???????.

??? PV(Physical Volume) ?????????????????? VG(Volume Group).???? PV ??? "Unallocated Volumes".?? "Add to existing volume Group" ?????????????? vg1.

?? Volume Groups ????? Physical View ??? sdb1 + sdc1 ?????????? "Properties for Volume Group" ? "Volume Group Size" ?????,??
LV(Logical Volume) ???????.

LVM mapping modes (linear/striped/mirrored)

???? LV Properties ??? LVM ??????????(mapping)??,1.Linear 2.Mirrored 3.Striped ??? Linear ?????????????
Linear ,???????????? PV(Physical Volume) ??????.???? VG(Volume Group) ??? PV(Physical Volume) ??????????
? 2.Mirrored 3.Striped ??? RAID ?????,????????? Soft RAID ? ??Mirrored ??? RAID 1 ,Striped ??? RAID 0.

???????????????????? sdb1 , sdc1 ,sdd1 ????????????????? VG(Volume Group).???? VG ? vg1 ? Volume Groups ?????,??
?????? LV,?? "Create New Logical Voumes" Mirrored ? Striped ? LV(Logical Volume) ??????.

Mirrored(RAID 1):

????????????? Mirrored(RAID 1) ??? PV(Physical Volume) ???,????????????? PV(Physical Volume) ?? Mirrored
Log,????????????????????? Log ?????????? #lvcreate -L 15G -m1 -n mirrored vg1 ??? Log ??????????????????????
mirror ???.

Striped(RAID 0):

Striped(RAID 0) *???? 2 ? PV(Physical Volume) ?? VG(Volume Group) ?,????? PV(Physical Volume) ??????????*
?,stripesize ???(2?n??,n=2 to 9).?????? LV(Logical Volume) ???????? PV(Physical Volume) ???.

????????????? Mirrored ?????????????? PV(Physical Volume) ????? PV(Physical Volume) ?? Log.? Striped ??????????????
PV(Physical Volume) ??????????.

?????,???? striped ???????.

```
[root@benjr ~]# hdparm -t /dev/vg1/mirrored
```

```
Timing buffered disk reads: 182 MB in 3.01 seconds = 60.49 MB/sec
```

```
HDIO_DRIVE_CMD(null) (wait for flush complete) failed: Inappropriate ioctl for device
```

```
[root@benjr ~]# hdparm -t /dev/vg1/striped
```

```
/dev/vg1/striped:
```

```
Timing buffered disk reads: 702 MB in 3.01 seconds = 233.54 MB/sec
```

```
HDIO_DRIVE_CMD(null) (wait for flush complete) failed: Inappropriate ioctl for device
```

RHEL5 - LVM Snapshots

```
??? snapshot ,??? snapshot ?????????,????????????? LV(Logical Volume) ??,???? LV(Logical Volume) ????? LV(Logical Volume) ???,???
?????,snapshot ?????????????(copy on write),? LV(logical Volume) ????? snapshot ?.LV(Logical Volume) ? snapshot ?????????????,???
LV(Logical Volume) ? snapshot ?????????????,?? snapshot ?????????????.??? LV(Logical Volume) ?????????????,????????????? snapshot ,???
? LV(logical Volume) ???????????.
```

```
??? snapshot ???? dm-snapshot.
```

```
[root@benjr ~]# modprobe dm-snapshot
```


????? /database ?? /backup??????,???? /database/a.test.file ??.

```
[root@benjr ~]# rm /database/a.test.file
[root@benjr ~]# ls /backup
total 13
-rw-r--r-- 1 root  root    1 Apr 2 00:28 a.test.file
drwxr-xr-x 2 root  root  12288 Apr 2 00:28 lost+found
```

???????? a.test.file ????? /dev/vg1/snapshot ?? ??? snapshot ??????????????.

note: