

## Resizing LVM Volumes in Linux:

By David Maphis 4/29/2008

In this example I will change the size of my root partition without affecting any data. Since this is a VM, I can extend my vmdk with the **"vmkfstools"** command. To do this I will have to shutdown the VM to release the lock on the file then resize it. Power up when complete.

Once this is done, make a partition that uses the available space you wish to add to the LVM volume using **"parted"**. It has an interactive shell, so just enter **"parted"** in a shell:

```
parted
(parted) print
Model: VMware Virtual disk (scsi)
Disk /dev/sda: 10.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number  Start   End     Size    Type     File system  Flags
  1      32.3kB 206MB   206MB   primary  ext3         boot
  2      206MB  8587MB 8382MB   primary                lvm
```

So I have from 8588MB to 10.7GB available for a new partition. For this example I'm only using up to 9588MB. Your numbers will obviously vary.

So now let's make a partition from the new space:

```
(parted) mkpart primary 8588 9588

(parted) print
Model: VMware Virtual disk (scsi)
Disk /dev/sda: 10.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number  Start   End     Size    Type     File system  Flags
  1      32.3kB 206MB   206MB   primary  ext3         boot
  2      206MB  8587MB 8382MB   primary                lvm
  3      8587MB 9588MB 1001MB   primary
```

You can now see that we have allocated a total of 1001MB of space to partition 3 or /dev/sda3.

Next we need to create a **Physical Volume (PV)** with **"pvcreate"**. LVM also has an interactive shell, so type **"lvm"** in a shell prompt:

```
lvm
lvm> pvcreate /dev/sda3
Physical volume "/dev/sda3" successfully created

lvm> pvs
PV          VG          Fmt Attr PSize  PFree
/dev/sda2  VolGroup00 lvm2 a-   7.78G 32.00M
/dev/sda3                lvm2 --   954.44M 954.44M
```

Now there is a partition that is about 1GB of space available on **PV** /dev/sda3.

Now we need to extend the **Volume Group (VG)** to include the new **PV** with the **"vgextend"** command:

```
lvm> vgextend VolGroup00 /dev/sda3
Volume group "VolGroup00" successfully extended
lvm> pvs
PV          VG          Fmt Attr PSize  PFree
/dev/sda2  VolGroup00 lvm2 a-   7.78G 32.00M
/dev/sda3  VolGroup00 lvm2 a-  928.00M 928.00M
```

By virtue of the fact that we used the same name as the existing **VG**, we have now included this **PV** in the **VG**.

Extend the **Logical Volume (LV)** to include the new space with **"lvextend"**. To determine that size of the extents we want to add, we first need to view the **VG**:

```
lvm> vgdisplay VolGroup00
--- Volume group ---
VG Name          VolGroup00
System ID
Format           lvm2
Metadata Areas   2
Metadata Sequence No 4
VG Access        read/write
VG Status        resizable
MAX LV           0
Cur LV          2
Open LV          2
Max PV           0
Cur PV          2
Act PV           2
VG Size          8.69 GB
PE Size          32.00 MB
Total PE         278
Alloc PE / Size  248 / 7.75 GB
Free PE / Size  30 / 960.00 MB
VG UUID          L14Bg4-jIFV-lfut-z4Ae-JTfH-0Hzp-Zf9RjM
```

Looking at this we can see that the total **"Free PE"** is **30**. We will use this in the following command:

```
lvm> lvextend -l+30 /dev/VolGroup00/LogVol100
Extending logical volume LogVol100 to 8.19 GB
Logical volume LogVol100 successfully resized

lvm> lvs
LV          VG          Attr      LSize   Origin Snap%   Move Log Copy%
LogVol100  VolGroup00 -wi-ao    8.19G
LogVol101  VolGroup00 -wi-ao   512.00M
```

So there you are, you have now extended your LV. Now we have to clue the OS in what is happening.  
We need to expand the file system to make the new space visible to the OS with **resize2fs** (Fedora, CentOS) or **ext2online** (RedHat)

```
[root@labserver02 dev]# df -h /
Filesystem                Size      Used Avail Use% Mounted on
/dev/mapper/VolGroup00-LogVol100
                          7.1G     1.3G   5.4G  20% /

[root@labserver02 dev]# resize2fs
resize2fs 1.40.2 (12-Jul-2007)
Usage: resize2fs [-d debug_flags] [-f] [-F] [-p] device [new_size]

[root@labserver02 dev]# resize2fs /dev/VolGroup00/LogVol100
resize2fs 1.40.2 (12-Jul-2007)
Filesystem at /dev/VolGroup00/LogVol100 is mounted on /; on-line resizing
required
old desc_blocks = 1, new_desc_blocks = 1
Performing an on-line resize of /dev/VolGroup00/LogVol100 to 2146304 (4k)
blocks.
The filesystem on /dev/VolGroup00/LogVol100 is now 2146304 blocks long.

[root@labserver02 dev]# df -h /
Filesystem                Size      Used Avail Use% Mounted on
/dev/mapper/VolGroup00-LogVol100
                          8.0G     1.3G   6.3G  17% /
```