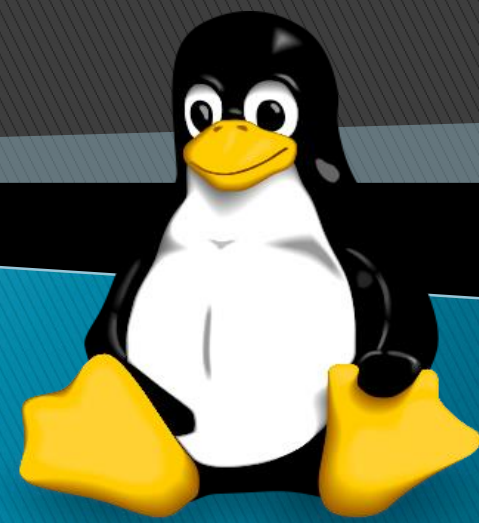
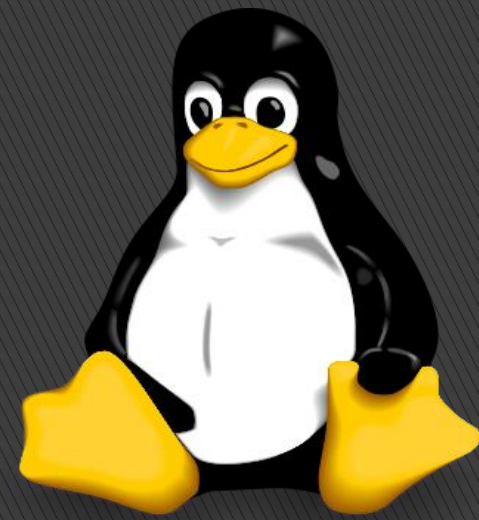
LVM

Logical Volume Manager



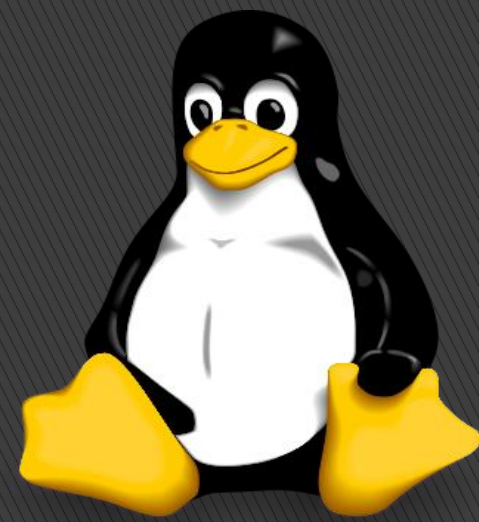
What is LVM

- Storage technology plays a important role in improving the availability, performance, and ability to manage Linux servers.
- One of the most useful and helpful technology to Linux system administrator is Linux Logical Volume Manager(LVM).
- LVM is a widely-used technique and extremely flexible disk management scheme for deploying logical rather than physical storage. With LVM, system administrator can easily resize and extend the logical drive when it is required.

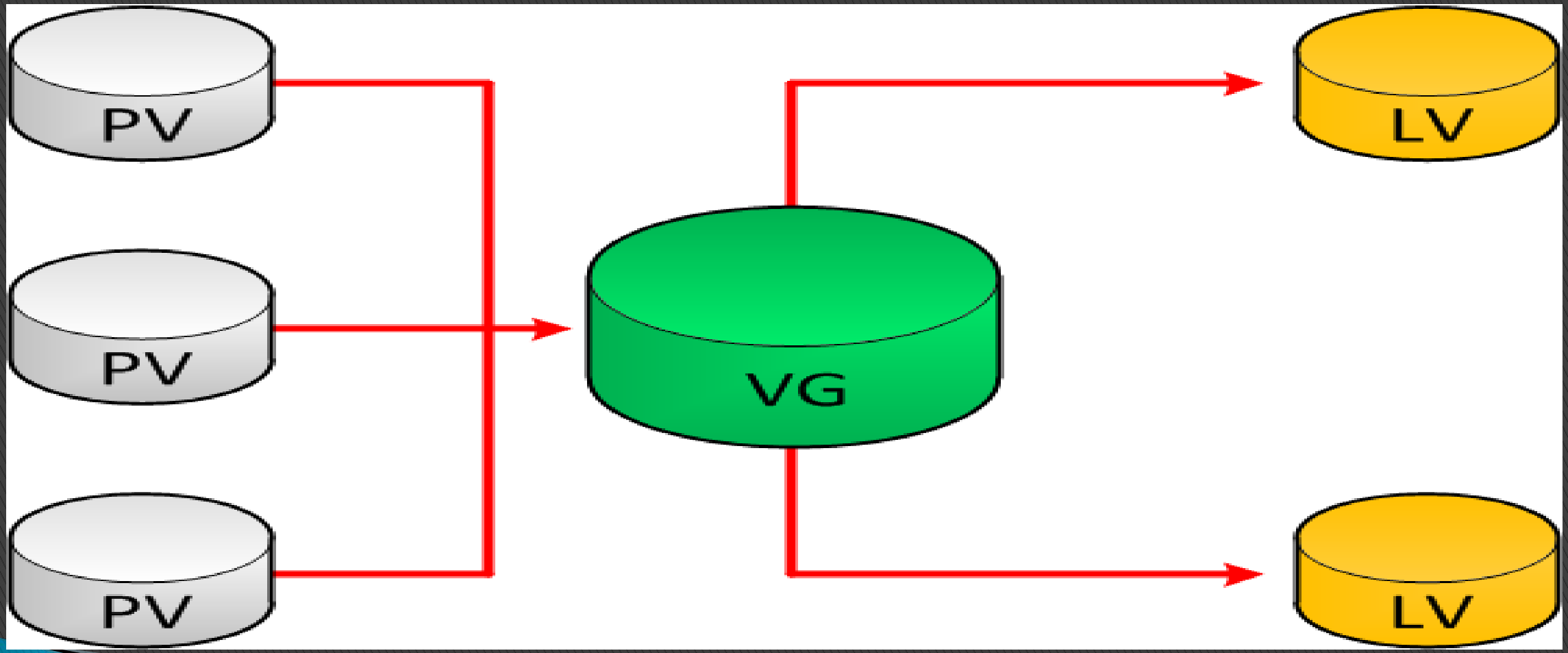


LVM Created In Three Stepes

1. Physical Volume (PV)
2. Volume Group (VG)
3. Logical Volume (LV)

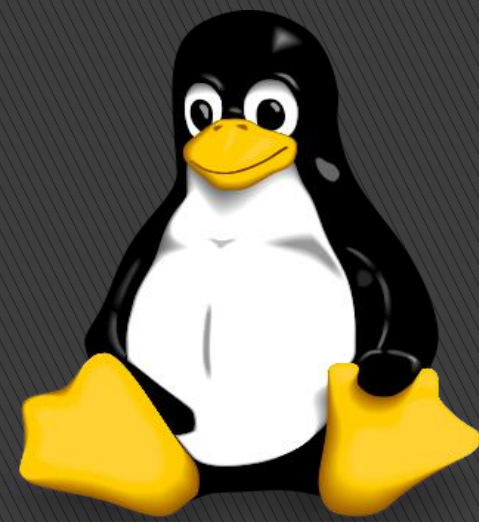


LVM Structure



Physical Volume (PV)

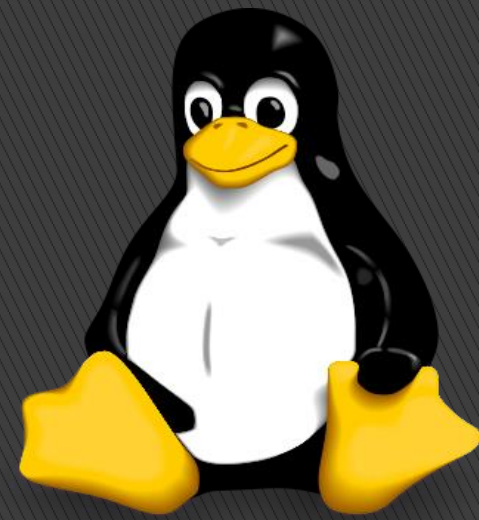
Physical Volume create from One or more entire hard disks or partitions.



Volume Group (VG)

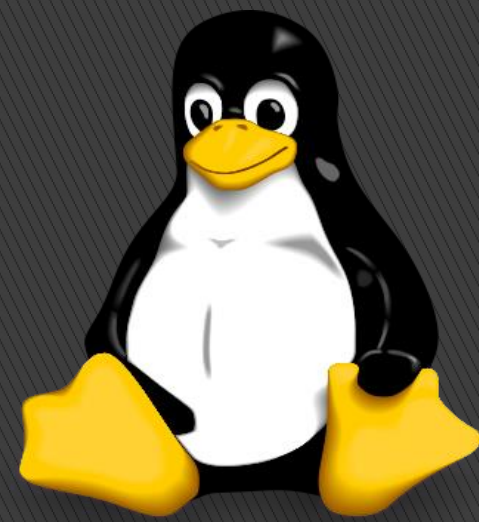
A volume group (VG) is created using one or more physical volumes. You can think of a volume group as a single storage unit.

The default size of PE is 4MB



Logical Volume (LV)

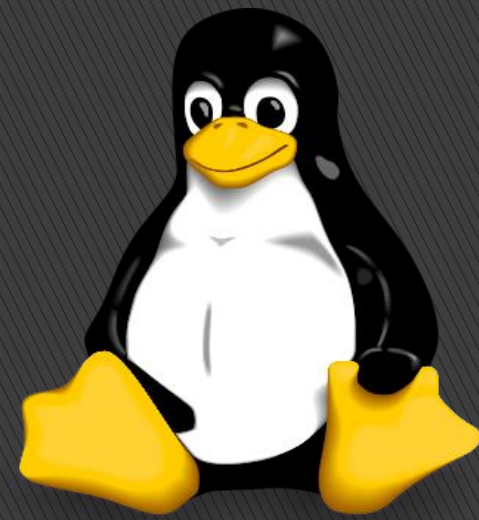
Logical volumes are block devices which are created from the volume group.
It is use to store actual data like partition after create the file system.



What are Extents?

Each volume within a volume group is segmented into small, fixed-size chunks called **extents.**

The extents on a physical volume are called **physical extents**, while the extents of a logical volume are called **logical extents**.



Steps For Manage LVM

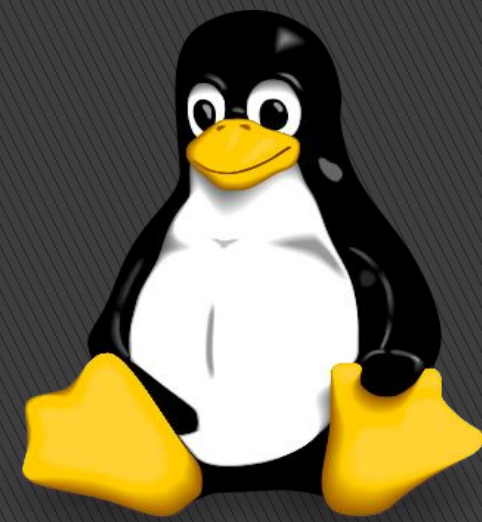
Step I : Create Physical Volume(PV)

Step1 : For create PV

```
#pvcreate          /dev/sdb1
```

Step2 : For Display PV

```
#pvdisplay         /dev/sdb1
```



Step II : Create Volume Group

Step 1: For Create Volume Group default PE size

```
#vgcreate                engineering    /dev/sdb1
```

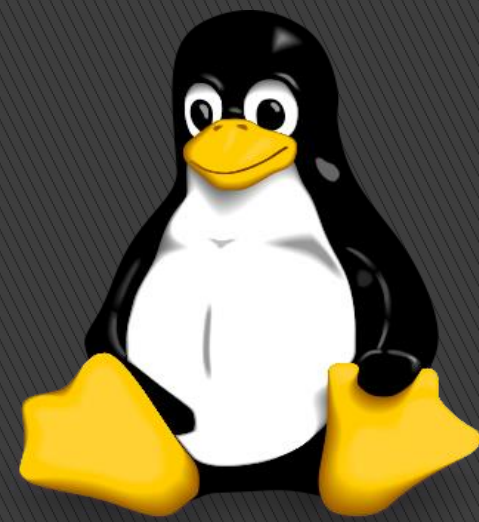
Step 2 : For display volume group

```
#vgdisplay        engineering
```

OR

For Create VG with Specific PE (physical Extends) Size

```
#vgcreate        -s    8    engineering      /dev/sdb1
```



Step III: Create Logical Volume

Step1: For Create LV with Specific PE (physical Extends) Size

```
#lvcreate       -l  100 -n /dev/engineering/comp
```

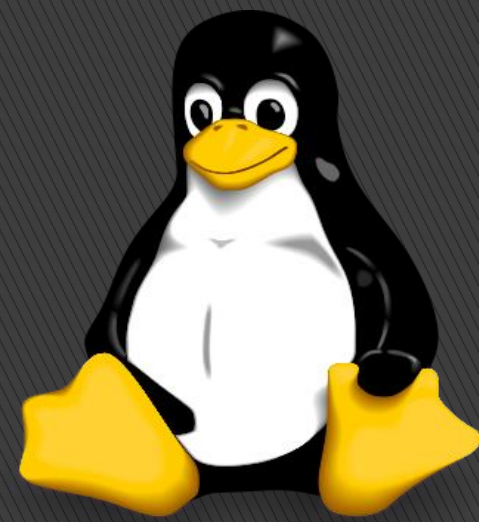
Step 2: For display LV

```
#lvdisplay                  /dev/engineering/comp
```

OR

For Create LV with Specific MB Size

```
#lvcreate       -L  100 -n /dev/engineering/comp
```



Step IV: Create Partition

Step1: For create partition on LV comp

```
#mkfs.ext4      /dev/engineering/comp
```

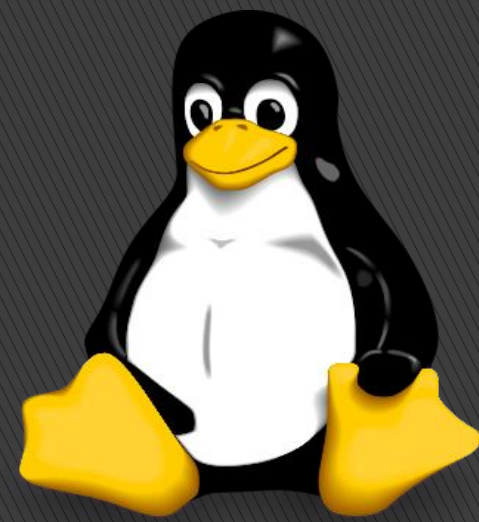
Step2: For permanent mount partition

```
#mkdir     /comp1
#vim       /etc/fstab
/dev/engineering/comp     /comp1    ext4     defaults     0 0
:wq

#mount    -a
#mount
```

OR

```
#df      -h
```



Step V : Resize VG

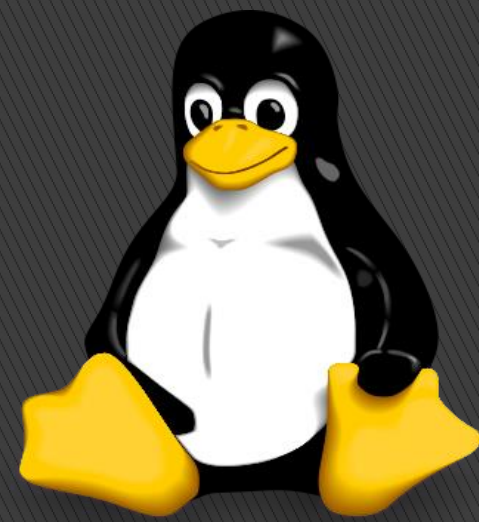
For resize VG create PV and then extend VG

Step 1: For extend VG

```
#vgextend     engineering     /dev/sdb2
```

Step 2: For reduce VG

```
#vgreduce     engineering     /dev/sdb2
```



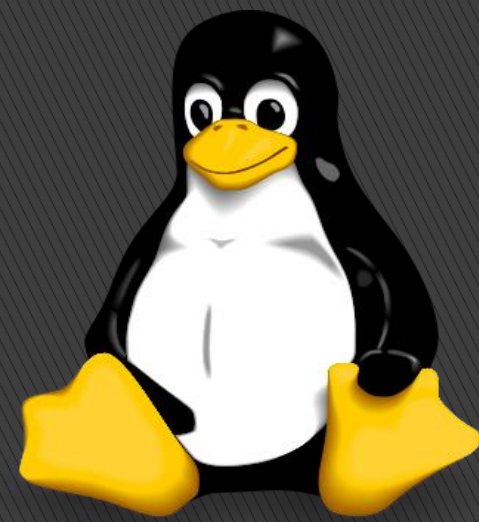
Step VI : Resize LV

Step 1: For extend LV

```
#lvextend        -L   +100   /dev/engineering/comp
```

Step 2: For reduce LV

```
#lvreduce        -L   -50    /dev/engineering/comp
```



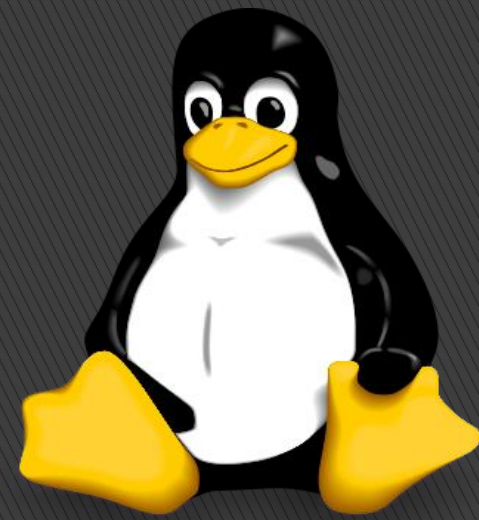
Step VII : Remove LV,VG,PV

Step 1: Remove Permanent Mounting Record
#vim /etc/fstab

Step 2: Unmount LVM
#umount /comp1

Step 3: Remove LV
#lvremove /dev/engineering/comp

Step 4: Remove VG
#vgremove engineering

Step 5: Remove PV
#pvremove /dev/sdb1

Step 6: Remove Partition
#fdisk /dev/sdb