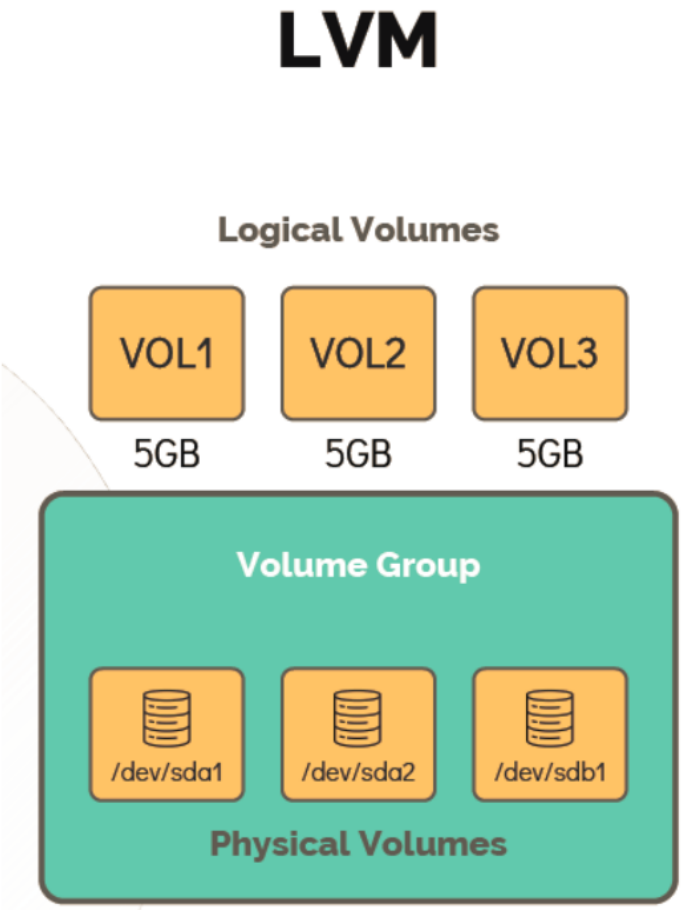
LOGICAL VOLUME MANAGER

- LVM allows grouping of multiple physical volumes, which are hard disks or partitions into a volume group.
- Volumegroups can be carve out logical volumes.



Working with LVM

- To make use of LVM, install the package `LVM` .

```
[~]$ apt-get install lvm2
```

- Use `pvcreate` command to create a Physical Volume.

```
[~]$ pvcreate /dev/sdb
Physical volume "/dev/sdb" successfully created
```

- Use `vgcreate` command to create a Volume Group.

```
[~]$ vgcreate caleston_vg /dev/sdb
Volume group "caleston_vg" successfully created
```

- Use `pvdisplay` command to list all the PVs their names, size and the Volume group it is part of.

```
[~]$ pvdisplay
--- Physical volume ---
  PV Name /dev/sdb
  VG Name caleston_vg
  PV Size 20.00 GiB / not usable 3.00 MiB
  Allocatable yes
  PE Size 4.00 MiB
  Total PE 5119
  Free PE 5119
  Allocated PE 0
  PV UUID iDCXIN-En2h-5ilJ-Yjqv-GcsR-gDfV-zaf66E
```

- Use `vgdisplay` to see more details of the VG.

```
[~]$ vgdisplay
--- Volume group ---
  VG Name caleston_vg
  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 20.00 GiB
  PE Size 4.00 MiB
  Total PE 5119
  Alloc PE / Size 0 / 0
  Free PE / Size 5119 / 20.00 GiB
  VG UUID VzmIAn-9cEl5bA-lVtm-wHKX-KQaObR
```

- To create the Logical Volumes, you can use `lvcreate` command

```
[~]$ lvcreate -L 1G -n vol1 caleston_vg
Logical volume "vol1" created.
```

- To display the Logical Volumes, you can use `lvdisplay` command

```
[~]$ lvdisplay
--- Logical volume ---
  LV Path /dev/caleston_vg/vol1
  LV Name vol1
  VG Name caleston_vg
  LV UUID LueYC3-VWpE31-UaYk-wjIR-FjAOyL
  LV Write Access read/write
  LV Creation host, time master, 2020-03-31 06:26:14
  LV Status available
  # open 0
  LV Size 1.00 GiB
  Current LE 256
  Segments 1
  Allocation inherit
  Read ahead sectors auto
  - currently set to 256
  Block device 252:0
```

- To list the volume, you can use `lvs` command

```
[~]$ lvs
 LV VG Attr LSize Pool
 vol1 caleston_vg -wi-a----- 1.00g
```

- Now to create an filesystem you can use `mkfs` command

```
[~]$ mkfs.ext4 /dev/caleston_vg/vol1
```

- To mount the filesystem use `mount` command

```
[~]$ mount -t ext4 /dev/caleston_vg/vol1 /mnt/vol1
```

- Now logical volume is now available for use. Lets resize the filesystem on vol1 while it is mounted. Check the free space available.

```
[~]$ vgs
VG #PV #LV #SN Attr VSize VFree
caleston_vg 1 1 0 wz--n- 20.00g 19.00g
```

```
[~]$ lvresize -L +1G -n /dev/caleston_vg/vol1
Logical volume vol1 successfully resized.
```

```
[~]$ df –hP /mnt/vol1
Filesystem Size Used Avail Use% Mounted on
/dev/mapper/caleston_vg-vol1 976M 1.3M 908M 1% /mnt/vol1
```

- Now to resize the file system use `resize2fs` command.

```
[~]$ resize2fs /dev/caleston_vg/vol1
resize2fs 1.42.13 (17-May-2015)
Filesystem at /dev/mapper/caleston_vg-vol1 is mounted on
/mnt/vol1; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 1
The filesystem on //dev/mapper/caleston_vg-vol1 is now 524288
(4k) blocks long.
```

- Now run `df -hp` command to verify the size of the mounted filesystem

```
[~]$ df –hP /mnt/vol1
Filesystem Size Used Avail Use% Mounted on
/dev/mapper/caleston_vg-vol1 2.0G 1.6M 1.9G 1% /mnt/vol1
```