Waiting Room fun :

"Tech support says the problem is located somewhere between the keyboard and my chair."

LVM (LOGICAL VOLUME MANAGEMENT)

in Linux

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Source : Redhat, The Linux Man

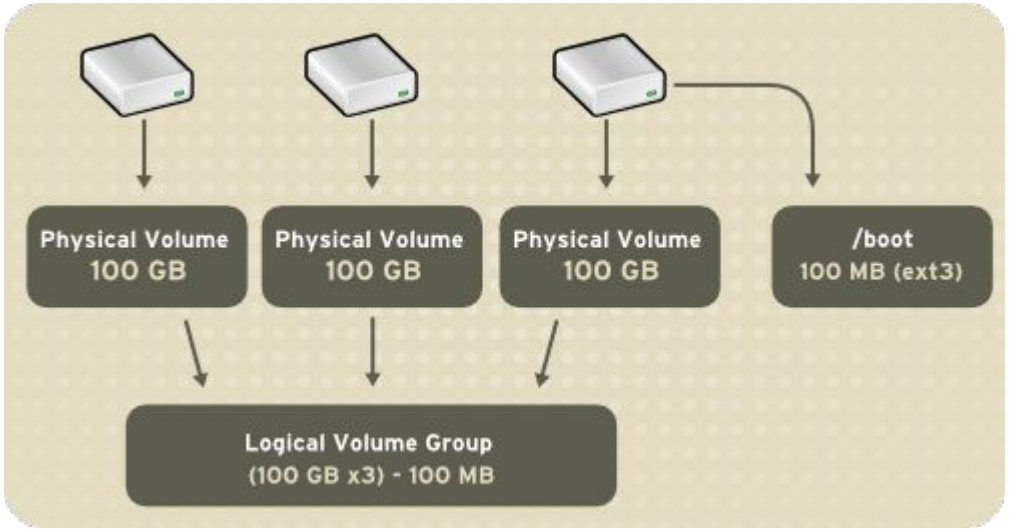
What is LVM ?

LVM is a tool for logical volume management which includes allocating disks, striping, mirroring and resizing logical volumes.

With LVM, a hard drive or set of hard drives is allocated to one or more *physical volumes*. LVM physical volumes can be placed on other block devices which might span two or more disks.

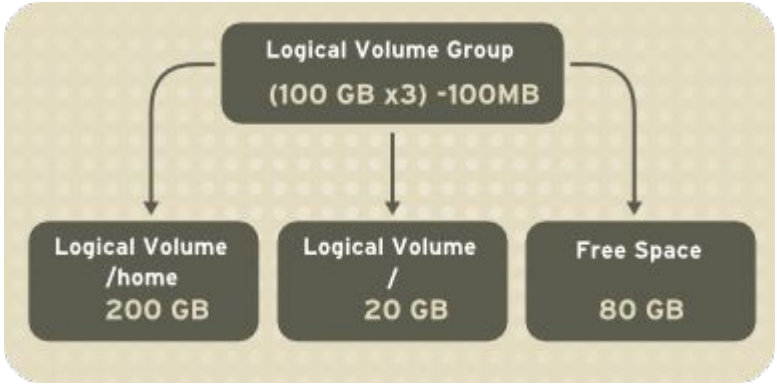
The physical volumes are combined into *logical volumes*, with the exception of the `/boot` partition. The `/boot` partition cannot be on a logical volume group because the boot loader cannot read it. If the root (`/`) partition is on a logical volume, create a separate `/boot` partition which is not a part of a volume group.

Since a physical volume cannot span over multiple drives, to span over more than one drive, create one or more physical volumes per drive.



Logical Volumes

The volume groups can be divided into *logical volumes*, which are assigned mount points, such as `/home` and `/` and file system types, such as ext2 or ext3. When "partitions" reach their full capacity, free space from the volume group can be added to the logical volume to increase the size of the partition. When a new hard drive is added to the system, it can be added to the volume group, and partitions that are logical volumes can be increased in size.



LVM CONFIGURATION

LVM can be configured during the graphical installation process, the text-based installation process, or during a kickstart installation. You can use the `system-config-lvm` utility to create your own LVM configuration post-installation. The next two sections focus on using **Disk Druid** during installation to complete this task. The third section introduces the LVM utility (`system-config-lvm`) which allows you to manage your LVM volumes in X windows or graphically.

- Creating ***physical volumes*** from the hard drives. (May be one or more drives)
- Creating *volume groups* from the physical volumes.
- Creating *logical volumes* from the volume groups and assign the logical volumes mount points.

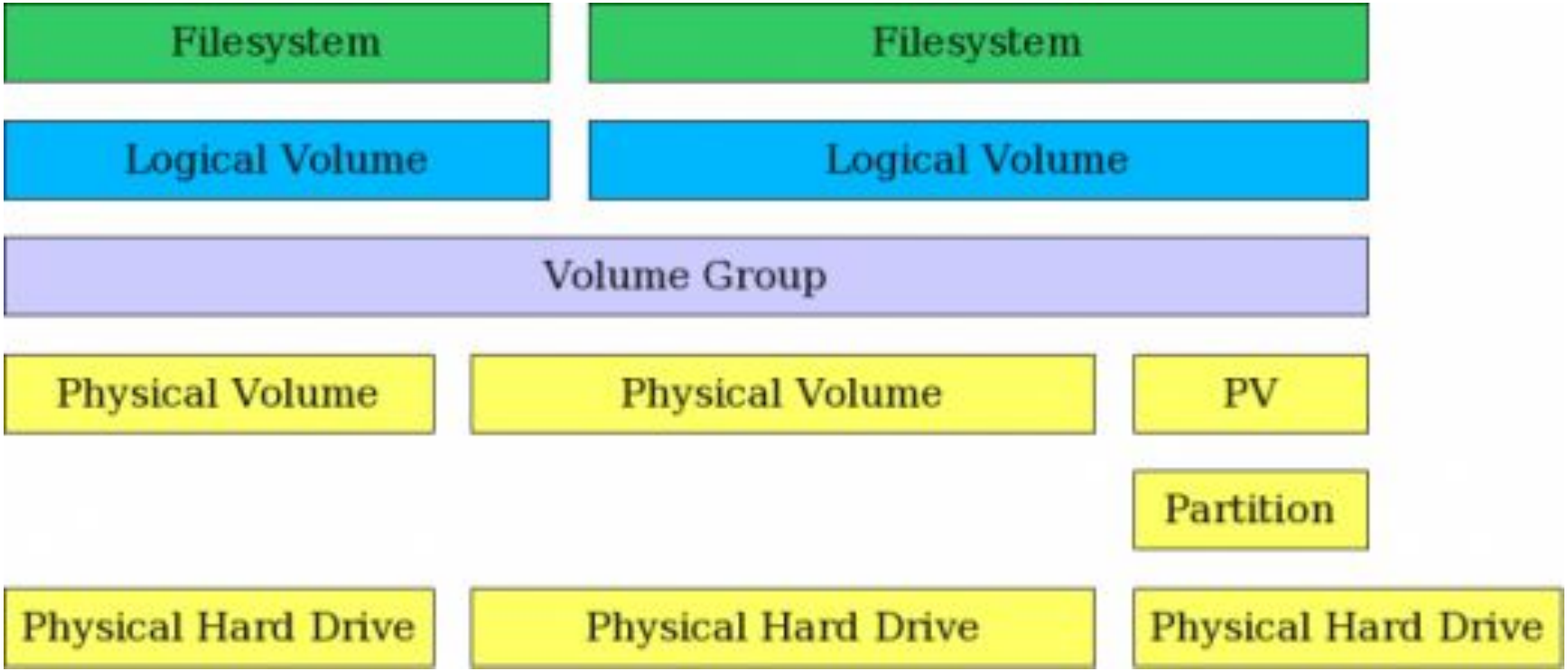
Steps to Configuration LVM

Reference Link : https://www.youtube.com/watch?v=fadQX2e_PGk

Volume Management have 3 concepts

- **Physical Volume (PV): it** is a whole disk or a partition of a disk
- **Volume Group (VG):** corresponds to one or more PV
- **Logical Volume (LV):** represents a portion of a VG. A LV can only belong to one VG. It’s on a LV that we can create a file system.

Example Layout of an LVM Group


Filesystem
Filesystem
Logical Volume
Logical Volume
Volume Group
Physical Volume
Physical Volume
PV
Partition
Physical Hard Drive
Physical Hard Drive
Physical Hard Drive

The basic steps for adding a new logical volume are as follows.

1. If necessary, install a new hard drive.
2. Optional: Create a partition on the hard drive.
3. Create a physical volume (PV) of the complete hard drive or a partition on the hard drive.
4. Assign the new physical volume to an existing volume group (VG) or create a new volume group.
5. Create a new logical volumes (LV) from the space in the volume group.
6. Create a filesystem on the new logical volume.
7. Add appropriate entries to /etc/fstab for mounting the filesystem.
8. Mount the filesystem.

Defining LVM Physical Volumes

```
[root@fs5 ~]# pvcreate /dev/sdb
  Physical volume "/dev/sdb" successfully created
[root@fs5 ~]# pvcreate /dev/sdc
  Physical volume "/dev/sdc" successfully created
[root@fs5 ~]# pvcreate /dev/sdd
  Physical volume "/dev/sdd" successfully created
```

Defining LVM Physical Volumes

```
[root@fs5 ~]# pvscan -v
    Wiping cache of LVM-capable devices
    Wiping internal VG cache
    Walking through all physical volumes
  PV /dev/sda2   VG fedora_localhost   lvm2 [19.51 GiB / 40.00 MiB free]
  PV /dev/sdd                          lvm2 [16.00 GiB]
  PV /dev/sdc                          lvm2 [16.00 GiB]
  PV /dev/sdb                          lvm2 [20.00 GiB]
  Total: 4 [71.51 GiB] / in use: 1 [19.51 GiB] / in no VG: 3 [52.00 GiB]
```

Mounting Logical Volumes

- Create a file system on the LV:
  - mkfs –t file_system /dev/volume_group/logical_volume
- Mount the LV:
  - mount –t file_system /dev/volume_group/logical_volume /mount_point