LOGICAL VOLUME MANAGER(LVM)

What is LVM?

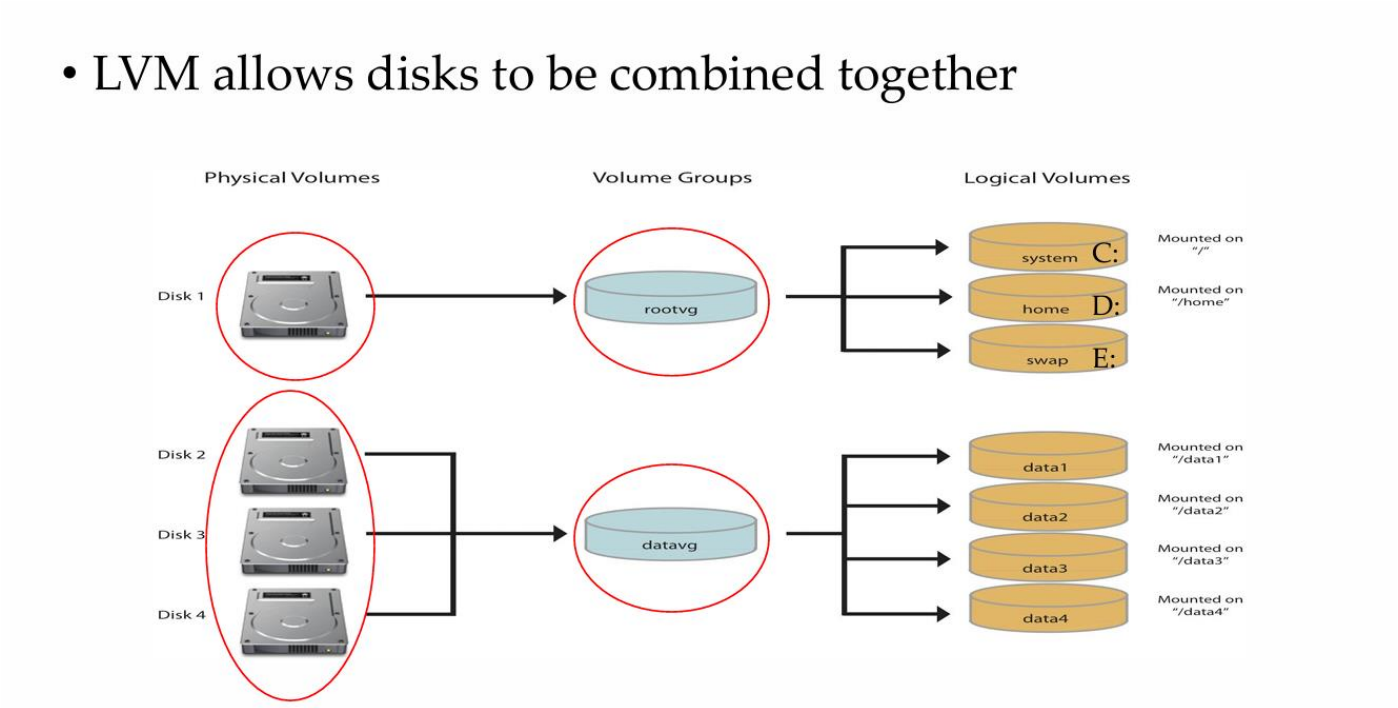
LVM stands for Logical Volume Manager , to resize file system's size online we require LVM partition in Linux. Size of LVM partition can be extended and reduced using the lvextend & lvreduce commands respectively.

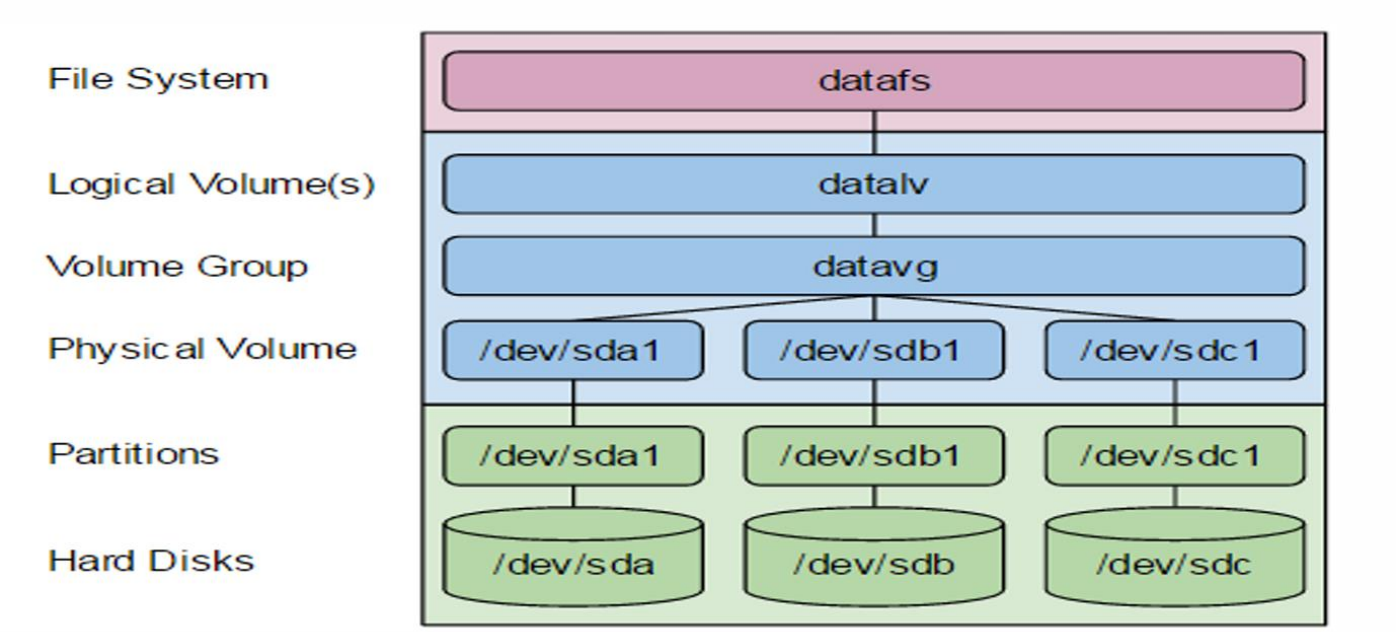
Physical Volume – It's a raw hard drive that it initialized to work with LVM, such as /dev/sdb, /dev/sdc, /dev/sdb1 etc.

Volume Group – Many PV is combined into one VG. You can create many VGs and each of them has a unique name.

Logical Volume – You can create many LVs from a VG. You can extend, reduce the LV size on the fly. The LV also has unique names.

You format the LV into ext4, zfs, btrfs etc filesystems, mount it and use it as you do other ordinary partitions.





Disk backup or disk cloning (dd command). whose primary purpose is to convert and copy files

#dd if=/dev/zero of=/prd-data/test bs=1G count=6

#dd if=<source file name> of=<target file name> [options]

#dd if=/dev/sda of=/dev/sdb

- To backup/copy the disk partition

dd if =/dev/sda1 of=/root/sda1.img

- Restoring this image file to other machine after copying the .img

dd if=/root/sda1.img of=/dev/sdb

A disk image file in Linux is a compressed file that contains a copy of a storage device's contents, including its structure and data

bs=BYTES read and write up to BYTES bytes at a time (default: 512)

count=N copy only N input blocks

Partitions based Filesystem

Hard Disks --> Partitions --> filesystem --> mount

LVM based Filesystem

Hard Disks --> Partitions --> Physical Volume --> Volume Group --> Logical Volume --> filesystem --> mount

#lvmdiskscan— List devices that may be used as physical volumes

lvmdiskscan scans all SCSI, (E)IDE disks, multiple devices and a bunch of other block devices in the system looking for LVM PVs.

#lsscsci

Create LVM

Hard Disks --> Partitions

create physical volume

#pvcreate /dev/sdb1

Create volume group

#vgcreate vg_oracle /dev/sdb1 - vgcreate <namevg> <pvname>

Create logical volume

#lvcreate -L +5G -n lv_oracle vg_oracle

#lvcreate --size +5G --name lv_oracle vg_oracle

#lvcreate -l +256 -n lv_oracle vg_oracle

#lvcreate -l +100%FREE -n lv_oracle vg_oracle

#lvcreate -l +50%FREE -n lv_oracle vg_oracle

Create filesystem

#mkfs.xfs /dev/vg_oracle/lv_oracle

#mkfs.ext4 /dev/vg_oracle/lv_oracle

#mkfs -t xfs /dev/vg_oracle/lv_oracle

#mkfs -t ext4 /dev/vg_oracle/lv_oracle

mount the filesystem

#mkdir /oracle_data

#mount /dev/vg_oracle/lv_oracle /oracle_data

command to check mounted filesystem

#df -h ,df -hT , lsblk

List pv,vg,lv details

#pvdisplay

#pvs

#vgdisplay

#vgs

#vgdisplay /dev/vg_oracle -v

#lvdisplay

#lvs

lvdisplay /dev/ vg_oracle /lv_oracle -m

#pvscan

#lvscan

#vgscan

Remove LVM

Remove fstab entry first

#umount /oracle

#lvremove /dev/vg_oracle/lv_oracle

vgremove /dev/vg_oracle

#pvremove /dev/sdb1

#lsblk

Reduce LVM partition size in RHEL (ext4) [we cant't reduce xfs filesystem]

1.Umount the file system

#umount /oracle_data

2.check the file system for Errors using e2fsck command

#e2fsck -f /dev/vg_oracle/lv_oracle

3.Reduce or Shrink the size of /home to desire size.

#resize2fs /dev/vg_oracle/lv_oracle 3G

4.Now reduce the size using lvreduce command

#lvreduce -L 3G /dev/vg_oracle/lv_oracle

5.(Optional) For the safer side, now check the reduced file system for errors

#e2fsck -f /dev/vg_oracle/lv_oracle

6.Mount the file system and verify its size

#lvs

#mount /dev/vg_oracle/lv_oracle /oracle_data

#df -h

LVM files

/etc/lvm/archive

/etc/lvm/backup

/etc/lvm/lvm.conf

#vgextend

#vgremove

Rename vg and lv

#vgrename <old_vg_name> <new_vg_name>

#lvrename

#lvrename <vg_name> <old_lv_name> <new_lv_name>

#lsblk

#lsscsci

#lvmdiskscan

Create partition using parted

#parted /dev/sdb

(parted) mklabel gpt

(parted) mkpart primary xfs 0% 100%

(parted) set 1 lvm on

(parted) print

(parted) print free

(parted) rm 1

(parted) print free

#parted /dev/sdb mkpart primary xfs 0% 100%

#parted set 1 lvm on

#parted /dev/sdb rm 1

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info :

LVM uses a concept called “extents” to manage space within a volume group. You can create a logical volume with a specific number of extents. To create a logical volume named “my_logical_volume” with 100 extents from the volume group “my_volume_group”, run the following command:

lvcreate -l 100 -n my_logical_volume my_volume_group

Instead of specifying an exact size, you can create a logical volume using a percentage of the available free space in the volume group. To create a logical volume named “my_logical_volume” that uses 50% of the free space in the volume group “my_volume_group”, use the following command:

sudo lvcreate -l 50%FREE -n my_logical_volume my_volume_group