**Storage management – mount**

Whenever we create a file, it gets stored in a hard disk, even when we add data also those data will get stored in a hard disk.

A hard disk is storage device attached to a computer to store the data. We must know how much storage space used and how much storage space are available?

Disks are also called as volumes.

1.To know the list of hard disks connected to the machine

] # lsblk

|  |
| --- |
| A picture containing text, electronics  Description automatically generated |

i). From this command we can know how many disks have been connected to this system and their names.

ii). What is the storage space allocated for each disk and in total how much are allocated?

2. For eg : If the user study1, has created a file Studyfile1 and want to store the file in the disk xvdg. How to execute that?

A disk space 10 GB – xvdg – Raw disk

We can’t store data in the Raw disk.

The disk needs to be formatted.

What is meant by formatting?

1.Enabling the disk to store the files in a structured way. Once formatted the disk will have blocks, each block will have a unique identifier and a storage space to store data. So, it will be easy to track the files.

Diagram

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2.Once the disk is formatted then we must attach to the directory. Whenever we create a file in a directory it will get stored in that disk space.

3. Attaching the formatted disk with the directory, so the files and directories will get stored into the formatted disk in a hierarchical fashion or in a proper way is called as **File System**.

\* Hierarchical means in a Parent and child relationship.

\* Keeping the directories and files in a specific order.

\* The directory mapped or mounted to the formatted disk is called as File System.

i) **root….~]# mkdir /studydata1**

**ii) To format the disk**

**Root ~]# mkfs -t ext4 /dev/xvdg**

**iii) To mount the directory**

**root …~]# mount /dev/xvdg /studydata**

**root ~]# touch / studydata1 /studyfile1**

**root~]# touch / studydata2/studyfile2**

**iii) To see the filesystem**

**root ..~]# df -h**

**iv) to unmount the file system**

**root ..~]# umount /studydata**

**Partitioning:**

Also, we can divide the disk into partitions, combining those partitions storage capacity should be equal to the original disk capacity. But we should not use **main disk as file system**.

Why we need Partition?

To store the business data belongs different entities.

- these partitions will be formatted separately and formed as file system and will be mounted to the directory

- For Eg: 200 GB hard disk can be divided into partitions of 100GB, 50 GB, 100Gb, 100GB etc.

- If a partition name is sdc, it will be divided into sdc1, sdc2.

- sdc1 -> dir2, sdc2 ->dir1

Chart

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**Steps to do Partitioning:**

1. Login as ordinary user
2. Switch to root user
3. ]# lsblk is the command to see the disks/volumes available in a server

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1. To do the partition management, we use **fdisk** command, **- l** gives the details about the partitions in the disk mentioned, as of now there are no partitions.
2. **]# fdisk -l /dev/xvdf**
3. Text

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4. To do the partitions, same command just remove -l

Text

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1. m is the command to get help on which commands to use to create partitions.

Text

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1. Now we have to give n command to make the partitions.

Command :n

Select default) :p

Partition number (1-4, defaut 1) :1 or just enter

First sector : just enter

Last sector : +5G

Text

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1. Now save this partition by giving “w “ command

Graphical user interface, text

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1. Now we can see the list by running fdisk with -l command

Text

Description automatically generated

1. Now if we want to create another partition , repeat the same steps

Text

Description automatically generated

1. Now we can see the partition details

]# fdisk -l /dev/xvdf

Text

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1. Now these 2 partitions need to be formatted to become a file system to store data.
2. ]# mkfs -t ext4 /dev/xvdf1

Text

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1. Now mount this formatted partition to the directory
2. ]# mount /dev/xvdf1 dir1
3. Calendar

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4. After mounting the directory to the file system, we can check the file system df -h command.

**Logical Volume Management**

To increase the size of the file system or decrease the size of the **file system** as the requirement of the Business, LVM is used. LVM is pretty much used in Physical DC or on premises DC, not much on AWS.

LVM software comes along with OS. It helps to increase or decrease the size of the file systems.

If the project requires to increase or decrease the File System , then we should not create file system on the Disk or Partitions, we will make use of LVM to create File System.

Managing the file systems with LVM.

Graphical user interface

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**Steps:**

1. Take 3 disks attached to the server
2. Disc1 – 100GB, Disk 2 – 100 GB, Disk 3 – 200 GB (physical volume).
3. Create a Volume Group- Now the VG will be of the size of the total size of these 3 disks (400 GB)
4. We must create logical volumes (50GB,10GB, 20GB as per the requirement of the file system) of different sizes, out of VG.
5. LVM will automatically takes care of allocating 50 GB, 20 GB, 10 GB from anyone of the disks disk1, disk2, disk 3 or from 3 disks for each logical volume. User doesn’t know how its happening, LVM will take care of it.
6. Now we can format these logical volumes to filesystem and mount those file systems to specific directories.
7. 50 GB - /mnt, 20 GB - / var, 10 GB - /opt …total 80 GB is taken out of 400 GB LVM group.
8. Now in future if we want to increase the 50 GB to 100 GB, we can do that with commands, only thing LVM group size need to be considered. LVM works on the group level not on the individual disk level.
9. Even if the Disk partitioned, the partitions will be added into the LGV, not the disk.
10. Eg: SDC 200 GM partitioned into sdc1 150 GB, sdc2 50GB, sdc1 will be added into LVG of size 150GB.

Graphical user interface, text

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1. Create a physical volume

-Text

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1. **To see the list of PVS**
2. **]# pvs**

Text

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1. Create a Volume Group
2. ]# vgcreate datavg /dev/xvdf2

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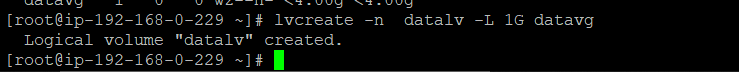
1. To see the list of LVG created
2. ]# vgs

Text

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1. Now we have to create logical volume from Volume group.

] # lvcreate -n datalv -L 1G datavg



1. Now we must format the lv to create a file system.

]# mkfs -t ext4 /dev/datavg/datalv

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1. Mount the Logical volume to directories



1. To see the list of file system

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1. Like wise we can create filesystems out of logical volumes of various sizes.
2. If a 4 GB disk is there, then create a physical volume, then create a volume group, then logical volume, then format that LV, then mount hat LV into a directory

How many types of partition?  
explain the filesystem of partition.  
What is the command for add hardisk and partition?  
how to check the hard disk?  
How to see the formatted partition  
what is the command for format the file system ?  
How to add mount permanatly?  
How to partition using UUID