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| **Assignment** | **:** |  |

### Module :3- Linux server - Configure local storage Assignment

* 1. Learn about different filesystem types (e.g., ext4, NTFS).

Ans:-

* The filesystems supported in linux are ext2,ext3,ext4,vfat and xfs.
* Ext and xfs are the widely used filesystems in linux, whereas vfat is used to maintain a common storage between linux and windows.

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| EXT2 | EXT3 | EXT4 | XFS |
| Stands for second extended file system | Stands for third extended file system | Stands for fourth extended file system | Stands for xtents filesystem |
| Introduced in 1993 | Introduced in 2001 | Introduced in 2008 | Introduced in 1993 |
| Do not have journalling feature | Supports journalling feature | Supports journalling feature | Supports journalling feature |
| Max file size can be from 16GB to 2TB | Max file size can be from 16GB to 2TB | Max file size can be from 16GB to 16TB | Max file size can be from 16TB to 8EB(Exabyte) |
| Max ext2 filesystem size can be from 2TB to 32TB | Max ext3 filesystem size can be from 2TB to 32TB | Max ext3 filesystem size is 1EB(1EB = 1024 Petabyte, 1PB = 1024TB) | Max xfs filesystem size is 16 EB |
| Cannot convert ext filesystem to ext2 | You cannot convert ext2 filesystem to ext3 filesystem directly(without backup/restore). | All previous filesystems can easily be converted into ext4 filesystem.  You can also mount an existing ext3 to ext4(without having to upgrade it.) | n/a |

* 1. Manage disk partitions and filesystems using tools like fdisk, mkfs, and mount.

Ans:-

Let us assume the name of the physical disk drive we have is /dev/sda. We will use the fdisk command to make partitions in it.

So, to enter the disk utility. The command will be

#fdisk /dev/sda

Now, we have entered the disk utility and will do the following steps.

* Use **m** to list out various options that can be used in the fdisk utility.
* Use **p** to list out the information of partitions created(we have assumed there is no partitioned created yet).
* Use **n** to create a new partition.
* Fill in the information of start and end sectors to determine the size of partition.
* Give the partition number 1.
* Type **w** to save and exit.

Now, we have created the partition /dev/sda1. We will have to format it with a

file system either ext or xfs. We will go with xfs.

The command will be.

#mkfs.xfs /dev/sda1

Now, we will make a directory and mount the partition with it.

#mkdir mountpoint

This will create a directory named mountpoint.

To mount the partition the command will be

#mount /dev/sda1 /mountpoint

Mounting is done. Note that the above command was used for temporary mounting and will be erased if the system reboots. To permanently mount the partition you have to make an entry using vim editor in the /etc/fstab file.

* 1. Create a 2048MB partition and verify if the partition has been created**.**

Ans:-

We will create a 2048MB partition in the same way as we did in question no.2, Now to view a partition the command is fdisk -l or you can use parted -l or you can use lsblk.

* 1. Why LVM is required?

Ans:-

The Linux Logical Volume Manager (LVM) is a mechanism to virtualize the disks. It can create"virtual" disk partitions out of one or more physical hard drives, allowing you to grow, shrink, or move those partitions from drive to drive as your needs change. It also allows you to create larger partitions than you could achieve with a single drive. Traditional uses of LVM have included databases and company file servers, but even home users may want large partitions for music or video collections, br for storing online backups. LVM can also be convenient ways to gain redundancy without sacrificing flexibility.

A typical example for the need of LVM can be, assuming that we are having a disk of size 2GB and we start adding the data in the form of a single file, eventually it grows to the size of 2GB.In this case the possibility is, you go for another disk which is larger than 2GB, let's say 4GB.But what if the file again grows more than 4GB? How far you will be migrating file from one disk to another so on and so forth? It requires a down time as well which is not possible in real time, so to avoid these circumstances we implement LVM and store data in LV's whose size can be easily increased whenever required without a downtime.

* 1. How can you find out how much memory Linux is using?

Ans:-

To check how much memory Linux is using, you can use several commands depending on the level of detail you need. Here are the most common ones:

1. free -h: This command provides a summary of memory usage.

The -h flag makes the output human-readable (in MB or GB). It will show total, used, free, and available memory.

* 1. What is a typical size for a swap partition under a Linux system?

Ans:-

a basic rule is applied to create the swap partitions

• if the size of the RAM is less than or equal to 2GB, then size of SWAP=2 X RAM

SIZE

• If the size of the RAM is more than 2GB, then size of SWAP= 2GB + size of the RAM

Swap space is compulsory to be created at the time of installation. But, additional swap spaces can be created and deleted at any point of time, when it is required. Sometimes we need to increase the swap space, so we create additional swap spaces which will be added to the existing swap space to increase the size.

* 1. What is the maximum file size on the ext4 file system?

Ans:-

The maximum file size in ext4 filesystem can be from 16GB to 16TB.

* 1. What is the maximum file size on the xfs file system

Ans:-

The maximum file size in ext4 filesystem can be from 16TB to 8EB.