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

**24. Learn About Different Filesystem Types (e.g., ext4, NTFS)**

* **Filesystem:** A method and data structure that an OS uses to manage files on storage devices.

**Common Filesystem Types:**

* **ext4 (Fourth Extended Filesystem):**
  + Default filesystem for most Linux distros.
  + Supports large files and volumes (up to 1 exabyte).
  + Journaling filesystem (helps recover from crashes).
  + High performance and stability.
* **NTFS (New Technology File System):**
  + Developed by Microsoft for Windows.
  + Supports large files, encryption, and compression.
  + Linux supports NTFS mainly for reading/writing external drives.
* **xfs:**
  + High-performance journaling filesystem developed by SGI.
  + Excellent for large files and parallel I/O.
  + Common in enterprise Linux servers.
* **FAT32:**
  + Older filesystem mainly for USB drives, compatible across OSes.
  + Max file size 4GB, volume size up to 2TB.
* **Btrfs:**
  + Newer Linux filesystem with features like snapshots, checksums, and pooling.

**25. Manage Disk Partitions and Filesystems Using Tools Like fdisk, mkfs, and mount**

* **fdisk:**
  + Command-line utility to create, delete, and manage partitions on MBR disks.
  + Example:
  + sudo fdisk /dev/sdb
  + Interactive mode to add/delete partitions.
* **mkfs (Make Filesystem):**
  + Creates a filesystem on a partition.
  + Example (ext4):
  + sudo mkfs.ext4 /dev/sdb1
* **mount:**
  + Attach filesystem to the directory tree (mount point).
  + Example:
  + sudo mount /dev/sdb1 /mnt
* To **unmount**:
* sudo umount /mnt

**26. Create a 2048MB Partition and Verify If the Partition Has Been Created**

**Step 1: Use fdisk to create partition**

sudo fdisk /dev/sdb

* Press n to create a new partition.
* Select partition number (default usually 1).
* For the first sector, press Enter (default).
* For the last sector, enter +2048M to create a 2048MB (2GB) partition.
* Press w to write changes.

**Step 2: Verify the partition**

* Use lsblk:
* lsblk /dev/sdb

You should see the new partition /dev/sdb1 with size 2G.

* Or use fdisk -l:
* sudo fdisk -l /dev/sdb

**27. Why LVM is Required?**

* **LVM (Logical Volume Manager)** allows flexible management of disk storage.

**Benefits:**

* Combine multiple physical disks into a single logical volume.
* Resize (grow or shrink) partitions easily without repartitioning.
* Create snapshots for backups.
* Manage storage dynamically as needs change.

LVM is especially useful in servers or environments where storage requirements grow or change frequently.

**28. How Can You Find Out How Much Memory Linux Is Using?**

* Use the free command:
* free -h

Shows total, used, free, shared, buffers/cache, and available memory.

* View /proc/meminfo for detailed info:
* cat /proc/meminfo
* top or htop shows real-time memory usage.

**29. What is a Typical Size for a Swap Partition Under a Linux System?**

* Traditional rule of thumb:

| **RAM Size** | **Swap Size** |
| --- | --- |
| < 2 GB | 2 times RAM size |
| 2 GB – 8 GB | Equal to RAM size |
| > 8 GB | At least 4 GB or half RAM |

* Swap is used for extending virtual memory when RAM fills.
* Modern systems with lots of RAM may require little or no swap.
* Also, swap can be a **swap file** instead of a dedicated partition.

**30. What is the Maximum File Size on the ext4 File System?**

* Maximum file size on ext4 is **16 TiB** (terabytes).
* Maximum volume size is **1 EiB** (exabyte).

**31. What is the Maximum File Size on the XFS File System?**

* XFS supports very large files, with maximum file size of **8 EiB** (exabytes).
* Maximum volume size is also **8 EiB**.