**Module: 1 - Linux server - Understand and use essential tools**

**Minimum Number of Partitions for Linux Installation:**

The minimum number of partitions required for a basic Linux installation typically includes:

Root Partition (/): This partition holds the core system files and directories.

Swap Partition: Used for virtual memory (optional but recommended).

Boot Partition (if using BIOS): Required for booting (optional if using UEFI/GPT).

Home Partition (recommended): Stores user data and settings separately from the root partition.

**Chmod Command Explanation**:

The chmod command in Linux is used to modify file permissions. It allows you to specify who can access files, search directories, and run scripts. You can use it to set permissions for the owner, group, and others. For example:

chmod +x myfile.sh # Adds execute permission to myfile.sh

**Checking Linux Memory Utilization:**

The free command provides information on total, used, free, shared, buffer/cache, and available RAM and swap space.

To see memory usage in mebibytes (MiB), run:

free -m

**Using Grep to Search for Patterns in Files:**

The grep command searches for text patterns in files. For example, to find lines containing the word “GNU” in a file:

grep "GNU" filename.txt

**Connecting to a Linux Server via SSH:**

Open a terminal (command prompt) and use the following command:

ssh username@server\_ip\_or\_hostname

Replace username with your remote server username and server\_ip\_or\_hostname with the server’s IP address or hostname.

**Creating and Compressing Files**

**To create 5 files in the /tmp directory:**

touch /tmp/file1 /tmp/file2 /tmp/file3 /tmp/file4 /tmp/file5

To bundle and compress these files using tar and gzip:

tar czvf myfiles.tar.gz /tmp/file\*

This creates a compressed archive named myfiles.tar.gz.

**Root Account:**

The root account in Linux is the superuser account with administrative privileges. It has unrestricted access to all files, directories, and system settings.

Root can perform critical tasks such as installing software, modifying system files, and managing users.

However, it’s essential to use root sparingly to avoid accidental damage to the system.

**Shell:**

A shell is a command-line interface (CLI) that allows users to interact with the operating system.

It interprets commands and executes them. Popular shells include Bash, Zsh, and Fish.

Shells provide features like scripting, environment variables, and job control.

**Linux:**

Linux is an open-source operating system kernel developed by Linus Torvalds.

It powers various distributions (distros) such as Ubuntu, Fedora, and Debian.

Linux is known for stability, security, and flexibility.

**Bash:**

Bash (Bourne Again Shell) is a widely used shell in Linux.

It’s the default shell for many distros.

Bash supports scripting, command history, and tab completion.

**Setting Up a New Hard Drive for Linux:**

The first step is to partition the drive. Use tools like fdisk or parted to create partitions (e.g., root, swap, home).

Next, format the partitions using filesystems like ext4 or XFS.

Finally, mount the partitions to appropriate directories (e.g., /, /home, /swap).

**Show Current Working Directory (CWD):**

To display the current working directory, use the pwd command:

pwd

**Get Help with Various Options:**

For help on commands, use the man command followed by the command you want to learn about. For example:

man ls

**Display Users’ Activities:**

To see what users are currently doing, use the w command:

w

**Get OS Information:**

To get information about the operating system, use the uname command:

uname -a

**Create a Hard Link of a File:**

To create a hard link, use the ln command with the -s option:

ln file1 file2

**Create Soft Links (Symbolic Links):**

To create a soft link (symbolic link) for a file:

ln -s source\_file link\_name

**To create a soft link for a directory:**

ln -s source\_directory link\_name

**To search for a specific pattern in a file using grep, you can use the following command:**

grep "pattern" filename

Replace "pattern" with the text you’re searching for and filename with the name of the file you want to search within1.

**Basic regular expressions (regex) in grep allow you to find text patterns. Here are some examples:**

To search for the word “and” in a file named redswitches\_regex.txt:

grep "and" redswitches\_regex.txt

To search for a pattern at the beginning of a line (using the ^ anchor):

grep "^linux" filename