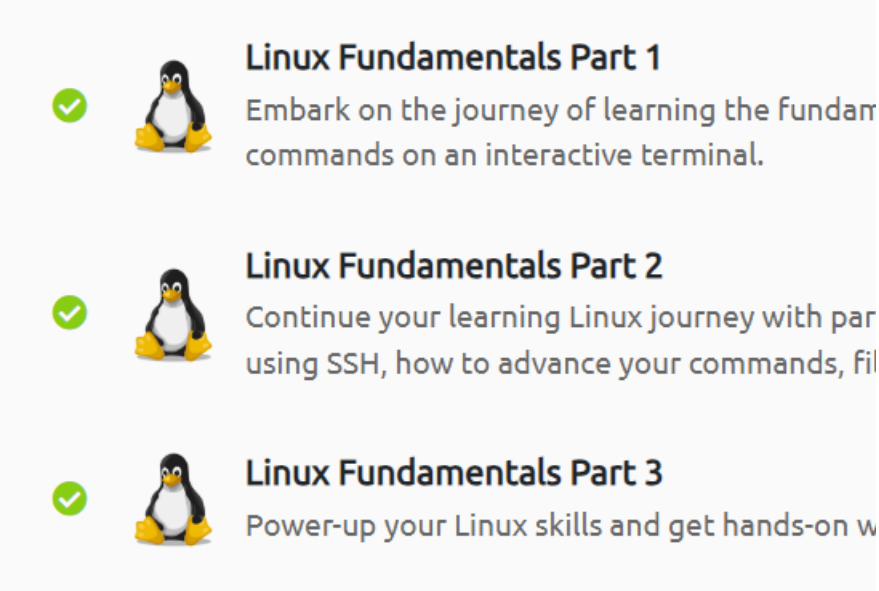
Task 1 :



Linux Fundamentals

By completing the Linux Fundamental modules (1,2,3) , I gained a solid foundation in basic Linux operations such as navigate the file system, manage files and directories, understand and modify permissions, search for files, retrieve basic system information and system processes. This foundation will help me advance in areas such as system administration, cybersecurity, or software development in upcoming future.

1. Introduction to Linux :

- **What is Linux?** : Understanding the Linux operating system, its history, and its various distributions (distros) like Ubuntu, CentOS, and Fedora.
- **File System Hierarchy** : Overview of the Linux file system structure, including essential directories like /home, /etc, /var, /bin, and /sbin.

2. Basic Commands :

- **Navigation** :
    - ls : List directory contents.
    - pwd : Print working directory.
    - cd : Change directory.
- **File Operations** :
    - touch : Create an empty file or update the timestamp of an existing file.
    - cp : Copy files or directories.
    - mv : Move or rename files or directories.
    - rm : Remove files or directories.
- **Viewing File Contents** :
    - cat : Concatenate and display file content.
    - less : View file content one screen at a time.
    - head : Display the first few lines of a file.
    - tail : Display the last few lines of a file.
- **Display File Contents :**
    - echo : Output the content in a file.
    - whoami : Display the current user logged in.

3. File Permissions :

- **Understanding Permissions** : Explanation of the read (r), write (w), and execute (x) permissions for user, group, and others.
- **Modifying Permissions** :
    - chmod : Change file permissions using symbolic (chmod u+x file) or numeric (chmod 755 file) modes.
- **File Ownership** :
    - chown: Change file owner and group.

4. Directories and File Management :

- **Managing Directories** :
    - mkdir : Create directories.
    - rmdir : Remove empty directories.
- **File Editing** :
    - nano : Basic command-line text editor for simple file editing tasks.

5. Searching and Finding Files :

- **Using find :**
    - Locate files and directories based on various criteria such as name, size, and type.
- **Using grep :**
    - Search for specific patterns within files.

6. System Information :

- **Gathering Information** :
    - uname : Print system information.
    - df : Report file system disk space usage.
    - top : Display real-time system processes and resource usage.

7. Shell operator

- & : Run commands in the background of the terminal.
- && : Combine multiple commands together in one line of the terminal.
- > : Redirect output from a command and direct it elsewhere.
- >> : same function of the > operator but appends the output rather than replacing .

8. Common directories

- / (Root Directory) : The top-level directory of the Linux file system hierarchy. All other directories are subdirectories of the root.
- /bin : Contains essential binary executables (commands) needed for booting and repairing the system, accessible by all users (e.g., ls, cp, mv).
- /sbin : Contains essential system binaries required for system administration (e.g., ifconfig, reboot).
- /etc : Contains system-wide configuration files and scripts (e.g., /etc/passwd for user account information).
- /home : Each user's personal directory where they can store their files and personal settings (e.g., /home/user1).
- /root : The home directory for the root user (system administrator).
- /var : Contains variable data like logs (/var/log), mail (/var/mail), and temporary files (/var/tmp).
- /usr : Contains user-installed software and libraries. Subdirectories include:
    - /usr/bin: Non-essential user binaries.
    - /usr/sbin: Non-essential system binaries for superuser.
    - /usr/lib: Libraries for /usr/bin and /usr/sbin.
- /lib : Contains essential shared libraries needed to boot the system and run the commands in /bin and /sbin.
- /tmp : Temporary files created by system and user processes. Files in this directory are typically cleared on reboot.
- /dev : Contains device files that represent hardware components (e.g., /dev/sda for the first hard drive).
- /mnt : Temporary mount points for mounting storage devices like USB drives.
- /opt : Optional software packages and third-party software.

- /proc : Virtual filesystem providing information about running processes and system information. It is dynamically generated by the system (e.g., /proc/cpuinfo for CPU information).
- /sys : Virtual filesystem that provides information and configuration options for the kernel.

9. Processes :

- ps : provide list of running processes.
- kill : command to terminate a processes.
    - SIGTERM (9) : Kill the process, but allow it to do some cleanup tasks beforehand.
    - SIGKILL (15) : Kill the process - doesn't do any cleanup after the fact.
    - SIGSTOP (23) : Stop/suspend a process.
- systemctl : command to control and manage services and systemd processes. There are four options to systemctl :
    - Start
    - Stop
    - Enable
    - Disable

10. Package Management :

- Installing and Managing Software :
    - apt (Debian-based systems): Use apt-get install, apt-get update, apt-get upgrade for package management.
    - yum (RHEL-based systems) : Use yum install, yum update for package management.
    - wget : download files from the web via HTTP.