

Project Title: Introduction to Linux Server Administration

Project Objective:

The objective of this project is to introduce the student to Linux, a widely-used Linux distribution, and familiarize them with basic system administration tasks. By completing this project, the student will gain hands-on experience with installing, configuring, and managing a Linux server.

Project Steps:

1. Setting Up the Virtual Environment:

- Concept of Virtualization: Explain virtualization and its importance in server administration.
- Install Virtualization Software: Install software like VMware Workstation or VirtualBox.
- Create Virtual Machine (VM): Use the following specifications:
 - Operating System: Latest Linux version.
 - RAM: 2GB or higher.
 - Hard Disk: At least 20GB.
 - Networking: Bridged or NAT for internet access.

2. Installing Linux:

- Mount ISO Image: Attach the Linux ISO to the virtual machine.
- Installation Process: Start the virtual machine and follow the installation wizard (language, time zone, disk partitioning).
- Complete Installation: Finish the installation with all required settings.

3. Initial Configuration:

- Log In: Access the Linux system after installation.
- Change Hostname: Assign a relevant server name.
- Root Password: Set a strong root password.
- Network Settings: Configure network settings (IP, subnet mask, gateway, DNS) using tools like nmtui or nmcli.

4. Disk Management using LVM, Parted, and fdisk:

- **Introduction to Disk Management:** Explain the role of disk management and the use of tools like parted, fdisk, and LVM.
- **Disk Partitioning:**
 - Use fdisk to view and manage disk partitions.
 - Partition a disk, create a new partition, and format it.
- **Logical Volume Management (LVM):**
 - Set up LVM on top of partitions.
 - Create physical volumes, volume groups, and logical volumes.
 - Extend and reduce volumes as needed.
- **Using parted:**
 - Create and resize partitions using the parted tool.
 - Manage GPT partitions for large disk sizes.

5. Installing and Configuring Services:

- **Role of Services:** Explain services in a server environment.
- **Install Services:**
 - **Web Server (Apache):** Install and configure Apache.
 - **Database Server (MySQL):** Install and configure MySQL.
- **Test Functionality:** Ensure services are properly installed and running.

6. User and Group Management:

- **User and Group Importance:** Describe why user and group management is critical.
- **User Account Management:** Create users, modify home directories, and assign login shells.
- **Group Management:** Set up and manage groups, assign users to groups.

7. File System Management:

- File System Hierarchy: Explain the Linux file system structure.
- File Permissions: Set appropriate file and directory permissions using `chmod` and `chown`.
- Disk Usage: Monitor disk usage with `df` and `du`.