Intro to Linux

Course Overview

This crash course is for students interested in the Linux operating system, particularly those interested in IT. Through this course, students will learn to install, configure, and manage Linux systems, gaining practical skills in file systems, process management, user management, system monitoring, security, and networking.

Course Objectives

- Understand the basics of the Linux operating system and its history.
- Set up and navigate a Linux environment, utilizing virtual machines and the Ubuntu desktop.
- Master Linux commands for file management, system navigation, text editing, and process control.
- Learn about user management, permissions, and basic networking in Linux.
- Configure system settings, manage software installations, and apply security measures.
- Perform system monitoring and maintenance tasks, including backups, system updates, and network configurations.
- Learn version control with Git.

Udemy Link

https://www.udemy.com/share/104wCM3@t6Gxgtmr11MbQILEZK1NGJxuHsO_6_85hr0Z9RiezZGdtNx_ejjXyFqdyQogxr80qA==/

Unit 1: Getting Started

Introduce Linux, setting up a virtual machine, navigating Ubuntu, and fundamental terminal commands.

- ☐ Why learn Linux?
    - ☐ - What is Linux? History of Linux and Linus Torvalds
    - ☐ - Linux distributions: Overview of Ubuntu, CentOS, RedHat, Debian
    - ☐ - The importance of Linux in IT and development.
- ☐ GUI vs. Command Line
- ☐ Why learn the Command Line?
- ☐ Setting Up a Virtual Machine for Linux

- ☐ - Introduction to virtual machines and installing Linux (using VirtualBox or VMware).
- ☐ - Ubuntu desktop installation walkthrough.

- ☐ Navigating the Ubuntu Desktop Environment
  - ☐ - Exploring the desktop, file explorer, and system settings.
- ☐ Basic Terminal Usage
  - ☐ - Why the terminal? Power of the command line.
  - ☐ - File systems and directory structure.
- ☐ Basic Commands
  - ☐ - File and directory commands (ls, cd, mkdir, rm, cp, mv)
  - ☐ - File content commands (cat, nano, vi)
  - ☐ - Shortcuts (tab completion, history, alias)
- ☐ Text Editing in the Command Line
  - ☐ - Editing files with nano, vi, and cat.
- ☐ Command Line Environment Customization
  - ☐ - Teach how to customize the command line environment, such as modifying the .bashrc files to set up useful aliases or color schemes.
- ☐ The Ubuntu Filesystem Hierarchy
  - ☐ - Explanation of the directory structure (/bin, /etc, /home, etc.)
- ☐ File System Comparison
  - ☐ - Provide a more in-depth explanation of the various file systems used by Linux, like ext4, Btrfs, XFS, and NTFS.
- ☐ File Management with Permissions
  - ☐ - File permissions and ownership (chmod, chown, umask)
- ☐ Version Control - Git
- ☐ Unit 1 Test

Unit 2: User Management

Managing files, processes, users, and groups in Linux, alongside basic networking commands for system administration.

- ☐ File Permissions and Ownership
  - ☐ - Deeper exploration of file permissions.
  - ☐ - Modifying permissions and understanding user groups.
- ☐ User Management
  - ☐ - Managing users (useradd, userdel, passwd, usermod)

- ☐ - Groups and permissions (groupadd, gpasswd, newgrp)
- ☐ Process Management
  - ☐ - Viewing processes (ps, top, htop)
  - ☐ - Managing processes (kill, killall, nice, renice)
  - ☐ - Monitoring system resources with df, free, iotop, du.
- ☐ Networking Basics
  - ☐ - Networking commands (ping, ip addr, ifconfig, ssh, scp)
  - ☐ - Understanding and troubleshooting network configurations.
- ☐ Networking Tools
  - ☐ - Networking is a vital aspect of IT, so tools like netstat, traceroute, and more advanced usage of ss and tcpdump could be introduced for more comprehensive network troubleshooting.
- ☐ Unit 2 Test

Unit 3: SysAdmin and Security

Key system administration tasks, security fundamentals, and software management.

- ☐ Software Installation & Package Management
  - ☐ - Package management basics with apt and dpkg (Ubuntu/Debian).
  - ☐ - Installing software and updates (apt-get install, apt upgrade, snap).
- ☐ System Updates and Upgrades
  - ☐ - Performing system updates and distribution upgrades.
  - ☐ - Package management on other distros (e.g., yum, dnf for RedHat-based systems).
- ☐ System Monitoring & Logging
  - ☐ - System monitoring tools: htop, iotop, df, free
  - ☐ - Viewing logs with journalctl, /var/log/syslog.
- ☐ Basic Security Fundamentals
  - ☐ - Introduction to firewalls (ufw), user roles, and permissions.
  - ☐ - Overview of SELinux and AppArmor for additional security.
- ☐ User Management & Security
  - ☐ - Managing user privileges, understanding the sudo command, and securing user accounts.
- ☐ Backup and Restore Procedures
  - ☐ - Backing up data with rsync, archiving with tar, and compressing with gzip.
  - ☐ - Simple backup automation with cron.

- [ ] Unit 3 Test