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Learning Style: Virtual Classroom

Technology:

Difficulty: Beginner

Course Duration: 5 Days

Next Course Date: June 22, 2026

Introduction to Linux Systems Administration (TTLX220)

About This Course:

Linux System Administration is a comprehensive, hands-on course designed to provide you with essential skills to manage and maintain a Linux environment.

Whether you're new to Linux or looking to deepen your system administration knowledge, this course covers all the practical tasks needed to confidently handle daily operations. You'll begin with setting up a Linux virtual machine and learning key system administration fundamentals, such as navigating the file system, managing user accounts, controlling processes, and utilizing shell scripting for task automation.

Course Objectives:

- Install a Linux virtual machine and understand the terminal versus shell.
- Navigate the Linux file system, manage directories, and use command-line tools.
- Edit text files using both graphical editors (gedit, kate) and command-line editors (nano, vi).
- Copy, move, rename, and delete files and directories.
- Differentiate between Linux command types and effectively use command documentation.
- Create and manage both soft and hard links.
- Manage superuser access and handle root privileges with security best practices.
- Add and manage users, groups, and file permissions to control access.
- Utilize piping and I/O redirection for efficient data management.
- Automate administrative tasks using cron and shell scripts.
- Create system backups, manage disks, partitions, and file systems.
- Install and configure basic networking, and set up a LAMP stack for web hosting.

Audience:

- This course is ideal for IT professionals, system administrators, and anyone looking to gain a practical understanding of Linux system administration. It is designed for beginners, though familiarity with basic computer and command-line operations will be beneficial. No prior Linux experience is required.

Prerequisites:

- This is an introductory-level course, designed for anyone wanting to learn Linux. Attendees should be comfortable working with computers and the command line, but no other specific skills are required to attend.

Course Outline:

1. System Administration Overview

- System Administration Overview
- Installing a Linux virtual machine
- Terminal versus Shell
- A few simple commands

2. The Linux File System

- Navigating through the directory tree
- Parent and current directories
- Passing command arguments
- The touch command
- Making directories
- Combining command options

3. Linux File Editors

- Graphical editors - gedit and kate
- The nano editor
- Saving and exiting vi
- Command mode
- Heads or tails?

4. Copying, Moving, and Deleting Files

- Copying one file
- Copying multiple directories
- Moving multiple files
- Renaming files
- Removing directories

5. Linux Command Types

- The four categories of linux commands
- What does the command do?
- The info page
- Helpful apropos command
- The /usr/share/doc directory

6. Hard versus Soft Links

- Displaying file inode number
- Creating soft links
- Creating hard links

7. Superusers and the Root Login

- Accessing the root user
- The dash difference
- Setting the root password

8. Controlling the Population:

- The /etc/passwd file
- Adding users

- Modifying user attributes
- Defining the skeleton
- Changing the defaults
- Adding group members
- Primary versus secondary groups
- Changing file permissions

9. Piping and I/O Redirection
    - Linux pipes
    - Redirecting standard output
    - Redirecting standard error
    - Redirecting standard input

10. Analyzing and Manipulating Files
    - Viewing file size
    - Counting characters, words, and lines
    - Sorting files
    - Searching for patterns
    - The stream editor
    - Text processing with awk

11. Find/Locate Files
    - The locate command
    - Updating the file database
    - The find command

12. Managing and Identifying Software Packages

- How to download packages
- How to install packages
- How to remove packages
- How to show package information
- Listing all packages
- Patching your system

13. Controlling Processes:
    - What is a process?
    - Parent process versus child process
    - Foreground versus background processes
    - Sending signals to processes
    - Setting priorities for new processes
    - The /proc directory

14. The Power of Sudo
    - Examples of privileged commands
    - Granting access with sudo
    - Group privileges
    - Listing user privileges
    - visudo versus /etc/sudoers

15. Basic Networking
    - Testing network connectivity
    - The ip command
    - The nmcli command
    - Checking your IP address

- Flying with traceroute
- Breaking your DNS
- Changing your hostname

16. Shell Scripting Overview
    - The PATH variable
    - Reading user input
    - Passing arguments to scripts
    - Using the if condition
    - Using the for loop
    - Using the while loop
    - Bash script functions

17. Controlling Processes: cron and crontab
    - Our first cron job
    - Run every five minutes
    - Automating system patching
    - Running a job once

18. System Backups
    - Creating an archive
    - Extracting archive files
    - Compressing with gzip
    - Compressing with bzip2
    - Compressing with xz
    - Measuring performance

19. Creating Aliases

- Your first alias
- One alias for multiple commands
- Listing all aliases
- Creating a permanent alias
- Removing an alias

20. File and Disk Management Tools

- Where are your devices?
- Where is your hard disk?
- Adding disks to your virtual machine
- Creating new disk partitions
- Creating new filesystems
- Mounting filesystems
- Unmounting filesystems
- Corrupting and fixing filesystems
- Creating logical volumes

21. LAMP Server Basics

- Installing Apache and Updating the Firewall
- Installing MySQL
- Installing PHP
- Creating a Virtual Host for your Website
- Testing PHP Processing on your Web Server
- Testing Database Connection from PHP

BONUS TOPICS / Time Permitting

22. The Samba File Sharing Facility

- Installing Samba
- Setting Samba's Global Options
- Creating Users
- Configuring the Samba Shares
- Logging Into the Samba Server

23. Networked File Systems (NFS)

- Downloading and Installing the Components
- Creating the Share Directories on the Host
- Configuring the NFS Exports on the Host Server
- Adjusting the Firewall on the Host
- Creating Mount Points and Mounting Directories on the Client
- Testing NFS Access
- Mounting the Remote NFS Directories at Boot
- Unmounting an NFS Remote Share