

Course Overview Linux Administration

System Administration Overview

- UNIX, Linux and Open Source
- Duties of the System Administrator
- Superusers and the Root Login
- Sharing Superuser Privileges with Others (`su` and `sudo` Commands)
- TCP/IP Networking Fundamentals
- Online Help

Installation and Configuration

- Planning: Hardware and Software Considerations
- Site Planning
- Installation Methods and Types
- Installation Classes
- Partitions
- Logical Volume Manager - LVM
- File System Overview
- Swap Partition Considerations
- Other Partition Considerations
- The Linux Boot Loader: `grub`
- Software Package Selection
- Adding and Configuring Peripherals
- Printers
- Graphics Controllers
- Basic Networking Configuration
- Booting to Recovery Mode

Booting and Shutting Down Linux

- Boot Sequence
- The `systemd` Daemon
- The `systemctl` Command
- Targets vs. Run Levels
- Modifying a Target
- Service Unit Scripts
- Changing System States
- Booting into Rescue Mode
- Shutdown Commands

Managing Software and Devices

- Identifying Software Packages
- Using `rpm` to Manage Software
- Using `yum` to Manage Software
- Installing and Removing Software
- Identifying Devices
- Displaying Device and System Information (PCI, USB)
- Plug and Play Devices
- Device Configuration Tools

Managing Users and Groups

- Setting Policies
- User File Management
- The `/etc/passwd` file
- The `/etc/shadow` file
- The `/etc/group` file
- The `/etc/gshadow` file
- Adding Users
- Modifying User Accounts
- Deleting User Accounts
- Working with Groups
- Setting User Environments
- Login Configuration Files

The Linux File System

- Filesystem Types
- Conventional Directory Structure
- Mounting a File System
- The `/etc/fstab` File
- Special Files (Device Files)
- Inodes
- Hard File Links
- Soft File Links
- Creating New File Systems with `mkfs`
- The `lost+found` Directory
- Repairing File Systems with `fsck`
- The Journaling Attribute
- File and Disk Management Tools

Linux File Security

- File Permissions
- Directory Permissions
- Octal Representation
- Changing Permissions

Controlling Processes

- Characteristics of Processes
- Parent-Child Relationship
- Examining Running Processes
- Background Processes

- Setting Default Permissions
- Access Control Lists (ACLs)
- The `getfacl` and `setfacl` commands
- SUID Bit
- SGID Bit
- The Sticky Bit

Working with the Linux Kernel

- Linux Kernel Components
- Types of Kernels
- Kernel Configuration Options
- Recompiling the Kernel

System Backups

- Backup Concepts and Strategies
- User Backups with the `tar` Command
- System Backup Options
- The `xfsdump` and `xfsrestore` Commands

Basic Networking

- Networking Services Overview
- NetworkManager Introduction
- Network Configuration Files Locations and Formats
- Enabling and Restarting Network Services with `systemctl`
- Configuring Basic Networking Manually
- Configuring Basic Networking with NetworkManager

Introduction to System Security

- Security Overview
- Maintaining System Security
- Server Access
- Physical Security
- Network Security
- Security Tools
- Port Probing with `nmap`
- Intrusion Detection and Prevention
- PAM Security Modules
- Scanning the System
- Maintaining File Integrity
- Using Firewalls
- Introduction to `firewalld`

Networked File Systems (NFS)

- Controlling Processes
- Signaling Processes
- Killing Processes
- Automating Processes
- `cron` and `crontab`
- `at` and `batch`
- System Processes (Daemons)

Shell Scripting Overview

- Shell Script Fundamentals
- Bash Shell Syntax Overview
- Shell Script Examples

Troubleshooting the System

- Common Problems and Symptoms
- Troubleshooting Steps
- Repairing General Boot Problems
- Repairing the GRUB 2 Boot Loader
- Hard Drive Problems
- Restoring Shared Libraries
- System Logs and `rsyslogd`

LAMP Server Basics

- LAMP Overview
- Configuring the Apache Web Server
- Common Directives
- Apache Virtual Hosting
- Configuring an Open Source Database
 - MySQL
 - MariaDB
- PHP Basics
- Perl CGI Scripting

The Samba File Sharing Facility

- Configure Samba for Linux to Linux/UNIX File Sharing
- Configure Samba for Linux to Windows File Sharing
- Use the `smbclient` Utility to Transfer Files
- Mount/Connect Samba Shares to Linux and Windows Clients

- Using NFS to Access Remote File Systems
- Configuring the NFS Server
- Configuring the NFS Client
- Exporting File Systems from the NFS Server to the NFS Client