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**Learning Style: Virtual Classroom**

**Technology: Linux Foundation**

**Difficulty: Beginner**

**Course Duration: 5 Days**

# Enterprise Linux Systems Administration (L-250)

## About this Course:

This beginner-level 5 days training program is specifically designed for System Administrators having familiarity with the core concepts of Linux Operating Systems. This course covers the fundamental concepts more comprehensively with a major focus on Red Hat Linux. This course presents a perfect learning opportunity for candidates striving to nurture Linux System Administration skills.

This course overview every essential aspect of Linux Machines from Installation to Post-Installation Configuration and Security. Candidates will develop a conceptual understanding of the key Linux Concepts and will build familiarity with Client Networking & Task Automation Processes. This course is a complete walkthrough focusing on every minor and major Linux System Administration Features and also shed light on Linux Framework and Key Security Principles.

## Course Objectives:

The core objective of this course is to help professionals gain a better knowledge and understanding of the following key concepts:

- Linux Machines & Operating Systems Core Concepts & Functionalities
- Understanding Hardware Compatibility and Multi-OS Booting
- File System, Users, and Groups Management in Linux
- Automatic Partitioning and Boot Loader Installation
- Root Password Configuration and Package Installation
- Kernels and Subsystems Configuration
- Module Dependencies Management and New Hardware Configuration
- GUI and Authentication Configuration
- LVM and RAID Core Concepts and Fundamentals
- Post-Install System Configuration and Boot Processes
- Red Hat Linux Installation and Configuration
- Client Networking & Task Automation Essentials
- Linux Frameworks and Key Security Principles

## Audience:

- Linux System Administrators
- System Administrators
- Candidates striving to Learn Core Concepts of Red Hat Linux

## Prerequisites:

Professionals planning to enroll in the Enterprise Linux System Administration (L-250) Course must comply with the following prerequisites:

- Familiarity with Linux and Unix Systems
- Fundamental Knowledge of Linux Process Management
- Conceptual Understanding of Linux File Management & Modification
- Practical Experience of working with Networking Protocols

- Introduction to Linux Operating System (LD-100) Course Completion

## Course Outline:

### Section 1 Linux Installation Pre-Installation Considerations

- Hardware Compatibility
- Multi-OS Booting
- Partition Considerations
- Partition Planning
- Filesystem Considerations
- Journaled Filesystems
- Installation Choices
- CD-ROM Installation
- Network Installation
- Local Hard Drive Installation
- FC Personal Desktop Class
- FC Workstation Class
- FC Server Class
- FC Custom Class
- Install Program Interface
- Installation Diagnostics
- Language Selection
- Keyboard Configuration
- Fedora Install Options
- Automatic Partitioning
- Partitioning with Disk Druid
- Installing a Boot Loader
- Network Configuration
- Security Configuration
- Language Support Selection
- Root Password Configuration
- Time Zone Configuration
- Package Group Selection
- Installing Packages
- Install Finished
- First Boot
- Finalizing GUI Configuration
- Video Card Configuration
- Monitor Configuration
- Authentication Configuration
- Lab 1 - Installation
    - Perform a GUI network NFS based workstation install
    - Configure LVM and Software RAID at installation time

### Section 2 PC Hardware and Linux

- Kudzu
- PC System Hardware
- USB Devices and Configuration

- Linux Device Files
- Configuring New Hardware
- Kernel Modules
- Handling Module Dependencies
- Configuring Kernel via /proc
- Kernel Hardware Info - /sys/
- /sys/ structure
- Lab 2 - PC Hardware and Linux
    - Enable the Magic-SysReq key
    - Use system-config-proc to disable ICMP broadcast

**Section 3 Post-Install System Configuration Configuration Utilites and Files**

- Network Services
- Managing System Time and Network-Wide Time
- Continual Time Sync - NTP
- Configuring NTP Clients
- Managing Software
- RPM Features, Architecture, and Package Files
- Working With RPMs
- Querying and Verifying with RPM
- Package Dependencies
- Intro to YUM
- Using the YUM command
- Configuring YUM
- YUM Repositories and Resources
- Configuring Printers
- Common UNIX Printing System
- Defining a Printer
- Kickstart
- Creating Kickstart Files
- Using Kickstart files
- Lab 3 - Post-Install Config
    - Answer some questions about the system using RPM queries
    - Install zsh using RPM
    - Troubleshoot and repair a package using RPM verification
    - Upgrade the kernel using RPM
    - Install the XFCE desktop environment using YUM
    - Create and test a custom YUM repository
    - Crate a custom YUM repository for installing software
    - Setup CUPS print queues using: system-config-printer, lpadmin, and the CUPS web interface
    - Modify a kickstart file using a text editor
    - Create a kickstart file using ksconfig
    - Start an install using a pre made kickstart file

**Section 4 Boot Process and SysV Init Booting Linux on PCs**

- LILO Options
- GRUB Configuration

- Kernel Boot Parameters
- /sbin/init
- System init Styles
- /etc/inittab
- rc.sysinit
- /etc/init.d and /etc/rcX.d
- rc
- Typical SysV Init Script
- The rc.local file
- Managing Daemons
- Controlling Startup Services
- Shutdown and Reboot
- Lab 4 - Boot Process
    - Use GRUB to boot into single user mode
    - Modify kernel/init parameters in GRUB
    - Explore the GRUB interface
    - Attach to the /boot filesystem and display the contents of the grub/grub.conf file
    - Set a GRUB password
    - Modify the lilo.conf creating a new stanza that passes kernel parameters

**Section 5 User/Group Administration and NFS User/Group Concepts**

- User Private Group Scheme
- User Administration
- Modifying Accounts
- Group Administration
- Password Aging
- Default User Files
- Controlling Logins
- PAM, PAM Services, and PAM Control Statements
- su, Wheel, and sudo
- DS Client Configuration
- File Sharing via NFS
- NFS Server Configuration
- NFS Clients
- Automounting Filesystems
- Lab 5 - User Administration
    - Customize /etc/skel
    - Add new users and manage password aging
    - Set up wheel group behavior for su
    - Configure a project directory to take advantage of the user private group scheme
    - Configure autofs to access an NFS export
    - Configure NIS client as part of the domain
    - Configure autofs to mount home directories
    - Switch to using LDAP for authentication
    - Setup an NFS server and export directories

**Section 6 Filesystem Administration Partition Tables**

- File System Creation
- Mounting File Systems
- Filesystem Maintenance
- Persistent Block Devices
- udev
- Resizing Filesystems
- File Deletion and Undeletion
- Swap
- Disk Usage
- Configuring Disk Quotas
- Checking Disk Quotas
- Filesystem Attributes
- File Access Control Lists
- Manipulating FACLs
- Viewing FACLs
- Backing Up FACLs
- Backup Hardware, Software, and Examples
- Tape Libraries
- Lab 6 - Filesystem Admin
    - Create and activate additional swap space
    - Configure and test disk quotas on the /tmp filesystem
    - Backup files using tar and cpio over ssh
    - Backup files using rsync over ssh
    - Backup and restore files with dump and restore
    - Create and test an ISO9660 image

**Section 7 - LVM and Raid Logical Volume Management**

- Implementing LVMs
- Manipulating VGs and LVs
- Advanced LVM Concepts
- Graphical LVM Tool
- RAID Concepts, Tools, and Implementation
- RAID Monitoring/Control
- Lab 7 - RAID and LVM
    - Use command line tools to partition free space
    - Configure software RAID-5 with a hot spare
    - Fail a member device of the array, examine the automatic recovery using the hot-spare
    - Fail another member device testing RAID-5
    - Remove failed member devices, add new devices to array, examine the recovery of array
    - Partition the drive and create LVM Physical Volumes
    - Create a LVM Volume Group and Logical Volume to hold website content
    - Verify the operation of LVM snapshots
    - Extend and grow the Logical Volume and the ext3 filesytem

**Section 8 Task Automation & Process Accounting Automating Tasks**

- at / batch
- at Access Control
- cron, crontab, and crontab Format
- /etc/cron.* Directories
- anacron
- Viewing Processes
- Managing Processes
- System Logging
- /etc/syslog.conf
- Log Management
- Log Anomaly Detector
- Process Accounting
- Using Process Accounting
- Limiting System Resources
- System Status - Memory, I/O, and, CPU
- sar
- Lab 8 - Cron & Process Admin
    - Create and edit user cron jobs
    - Add a system-wide cron task to /etc/cron.hourly
    - Install and configure process accounting
    - Enable and set process limits
    - Remove cron jobs created in previous tasks

**Section 9 Client Networking Linux Network Interfaces**

- Ethernet Hardware Tools
- Runtime configuration change
- Configuring Routing Tables
- ARP
- Advanced Configuration
- Starting and Stopping Interfaces
- Virtual IP Interfaces
- Enabling IPv6
- Interface Bonding
- 802.1q VLANS
- Network Profiles and ifup
- IP Stack Configuration
- DNS Clients
- Network Services via DHCP
- DHCP Clients
- dhcpd.conf Syntax
- Red Hat Configuration Tools
- Network Diagnostics
- Point-to-Point Protocol
- PPP Configuration Files, Chat, and Secrets Files
- Lab 9 - Client Networking
    - Enable static configuration
    - Configure a virtual interface and verify connectivity through the new

interface
    - Verify Link-Local IPv6 connectivity
    - Configure and test Site-Local connectivity

**Section 10 The X Window System The X Window System**

- Xorg
- Configuring X
- X Fonts
- Using Fonts
- Display Manager Selection
- XDMCP
- Using Unix Remotely
- X Security
- Specialized X Servers
- Starting X Apps Automatically
- Lab 10 - X
    - Change your display manager to gdm
    - Enable XDMCP to support remote desktop login
    - Configure VNC to accept incoming connections
    - Launch a program by creating a script in the /etc/X11/xinit/xinitrc.d/ directory
    - Start a custom X

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