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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:

While the course serves as a comprehensive introduction to Linux machines, Red Hat distribution of the supported operating system remains the primary focus. Additionally, students will also be introduced to concepts pertaining to management and administration of the Linux operating system and Linux machines, and introduced to the best solutions for troubleshooting a variety of issues.

Course Objectives:

- Comprehensive introduction to the Linux operating system and Linux machines
- Introduction to the steps that need to be followed to manage filesystems, users, and groups
- Configuration of kernels and subsystems
- Introduction to RAID and LVM
- Seamless installation of Red Hat Linux
- Introduction to security principles, process accounting, and client networking

Audience:

This course is intended for:

- System administrators dealing with Linux servers
- Students interested in Red Hat Linux distribution and IT ops training

Prerequisites:

- Understanding of and experience working with Unix or Linux systems
- Familiarity with basic Linux concepts including process management
- Knowledge of file management and modification in Linux
- Familiarity and demonstrated experience with networking protocols
- Completion or knowledge of the concepts taught in the L-100 Introduction to the Linux Operating System course

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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