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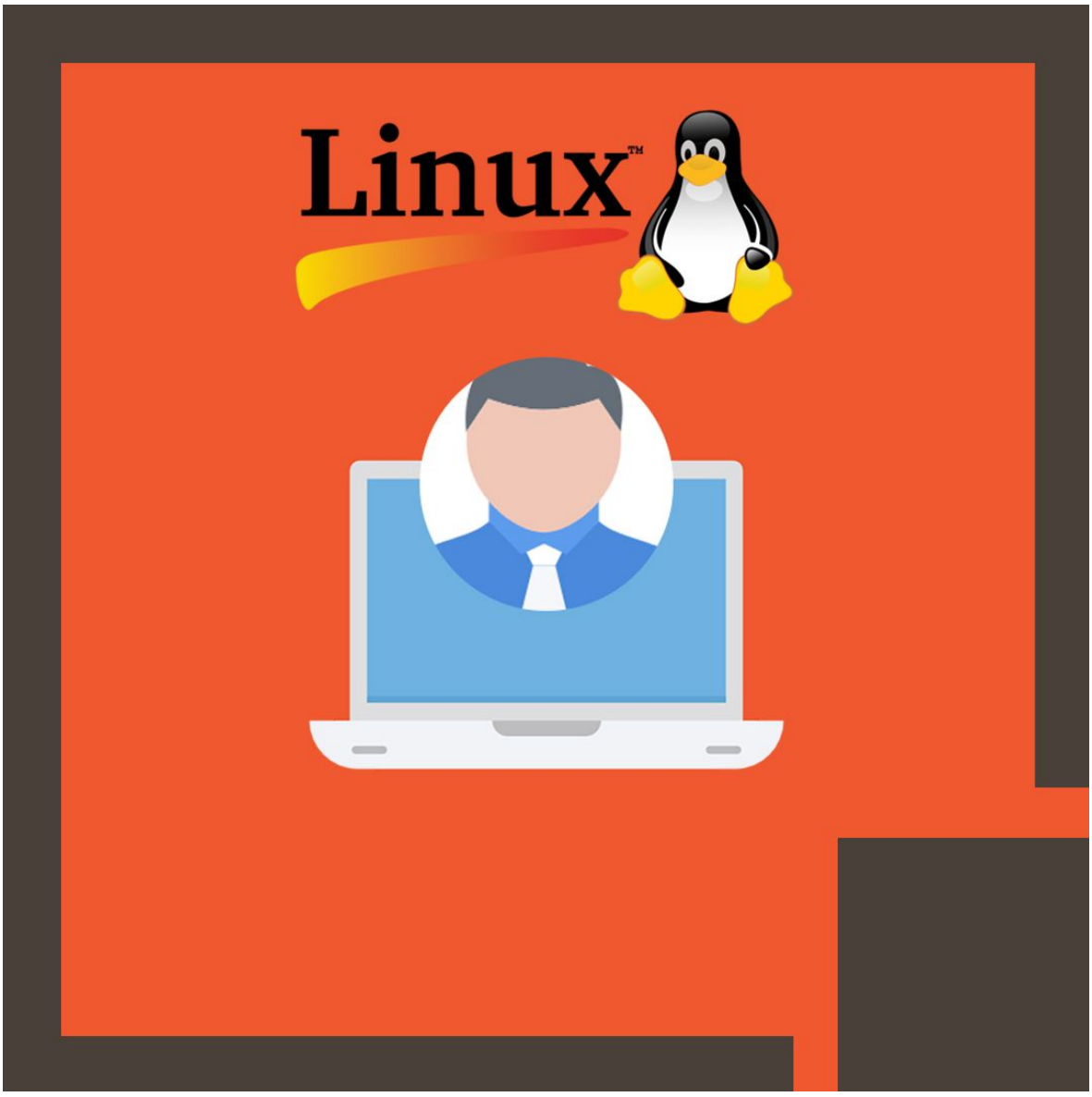
Learning Style: Virtual Classroom

Technology: Linux Foundation

Difficulty: Beginner

Course Duration: 4 Days

Linux System Administration (LFS307)



About this course:

Linux system administration is one of the most in-demand skills in IT. Whether you're looking for expert prep for the Linux Foundation Certified System Administration certification, need training to help start a new Linux IT career, transition to Linux from another platform, or you're just brushing up on your sysadmin skills, this course will teach you what you need to know.

This course is excellent preparation for the Linux Foundation Certified System Administration (LFCS) exam.

This course gives you the skills and information you need to pass the LFCS exam and work as a professional Linux system administrator.

The average salary of a Linux System Administrator is **$100,022** per year.

Course Objective:

In this course you'll learn:

- How to administer, configure and upgrade Linux systems running one of the three major Linux distribution families: Red Hat, SUSE, Debian/Ubuntu.
- How to master the tools and concepts you'll need to efficiently build and manage an enterprise Linux infrastructure.
- How to use state-of-the-art system administration techniques in real-life scenarios via practical labs.
- And more.

Audience:

- Linux System Administrators

Prerequisite:

- This course is designed to provide students with the necessary skills and abilities to work as a professional Linux system administrator. Students should have basic knowledge of Linux and its most common utilities and text editors.

Course Outline:

Introduction

- Linux Foundation
- Linux Foundation Training
- Linux Foundation Certifications
- Laboratory Exercises, Solutions and Resources
- E-Learning Course: LFS201
- Distribution Details

- Labs

Linux Filesystem Tree Layout

- One Big Filesystem
- Data Distinctions
- FHS Linux Standard Directory Tree
- root (/) directory
- /bin
- /boot
- /dev
- /etc
- /home
- /lib and /lib64
- /media
- /mnt
- /opt
- /proc
- /sys
- /root
- /sbin
- /srv
- /tmp
- /usr
- /var
- /run
- Labs

Processes

- Programs and Processes
- Process Limits
- Creating Processes
- Process States
- Execution Modes
- Daemons
- niceness
- Libraries
- Labs

Signals

- Signals
- Types of Signals
- kill
- killall and pkill
- Labs

Package Management Systems

- Software Packaging Concepts
- Why Use Packages?
- Package Types
- Available Package Management Systems
- Packaging Tool Levels and Varieties
- Package Sources
- Creating Software Packages
- Revision Control Systems
- Available Source Control Systems
- The Linux Kernel and git
- Labs

RPM

- RPM (Red Hat Package Manager
- Package File Names
- RPM Database and Helper Programs
- Queries
- Verifying Packages
- Installing and Removing Packages
- Updating, Upgrading and Freshening RPM Packages
- Upgrading the Linux Kernel
- rpm2cpio
- Labs

dpkg

- DPKG (Debian Package)
- Package File Names and Source
- DPKG Queries
- Installing/Upgrading/Uninstalling
- Labs

yum

- Package Installers
- yum
- Queries
- Verifying Packages
- Installing/Removing/Upgrading Packages
- Additional yum Commands
- dnf
- Labs

zypper

- zypper
- Queries
- Installing/Removing/Upgrading Packages
- Additional zypper Commands

- Labs

APT

- APT
- apt
- Queries
- Installing/Removing/Upgrading Packages
- Cleaning Up
- Labs

System Monitoring

- System Monitoring
- sar **
- Network Monitoring
- System Log Files
- Labs

Process Monitoring

- Process Monitoring
- ps
- pstree
- top
- Labs

Memory Monitoring and Usage

- Memory Monitoring and Tuning
- /proc/sys/vm
- vmstat
- Out of Memory Killer (OOM)
- Labs

I/O Monitoring and Tuning

- I/O Monitoring
- iostat
- iotop
- ionice
- Labs

I/O Scheduling **

- I/O Scheduling
- I/O Scheduler Choices
- Labs

Linux Filesystems and the VFS

- Filesystem Basics
- Filesystem Concepts
- Virtual Filesystem (VFS)
- Available Filesystems
- Journalling Filesystems
- Special Filesystems
- Labs

Disk Partitioning

- Common Disk Types
- Disk Geometry
- Partitioning
- Partition Tables
- Naming Disk Devices
- SCSI Device Names
- blkid and lsblk
- Sizing up partitions
- Backing Up and Restoring Partition Tables
- Partition table editors
- fdisk
- Labs

Filesystem Features: Attributes, Creating, Checking, Mounting

- Extended Attributes
- Creating and formatting filesystems
- Checking and Repairing Filesystems
- Mounting filesystems
- NFS
- Mounting at Boot and /etc/fstab
- automount
- Labs

Filesystem Features: Swap, Quotas, Usage

- Swap
- Filesystem Quotas **
- Filesystem Usage
- Disk Usage
- Labs

The Ext2/Ext3/Ext4 Filesystems

- ext4 Features
- ext4 Layout and Superblock and Block Groups
- dumpe2fs
- tune2fs
- Labs

The XFS and BTRFS Filesystems **

- XFS
- btrfs
- Labs

Encrypting Disks

- Filesystem Encryption
- LUKS
- cryptsetup
- Using an Encrypted Partition
- Mounting at Boot
- Labs

Logical Volume Management (LVM)

- Logical Volume Management (LVM)
- Volumes and Volume Groups
- Working with Logical Volumes
- Resizing Logical Volumes
- LVM Snapshots **
- Labs

RAID **

- RAID
- RAID Levels
- Software RAID Configuration
- Monitoring RAIDs
- RAID Hot Spares
- Labs

Kernel Services and Configuration

- Kernel Overview
- Kernel Configuration
- Kernel Boot Parameters
- sysctl
- Labs

Kernel Modules

- Kernel Modules
- Module Utilities
- modinfo
- Module Configuration
- Labs

Devices and udev

- udev and Device Management
- Device Nodes
- Rules
- Labs

Virtualization Overview

- Introduction to Virtualization
- Hosts and Guests
- Emulation
- Hypervisors
- libvirt
- QEMU
- KVM
- Labs

Containers Overview

- Containers
- Application Virtualization
- Containers vs Virtual Machines
- Docker
- Docker Commands
- Labs

User Account Management

- User Accounts
- Management of User Accounts
- Locked Accounts
- Passwords
- /etc/shadow
- Password Management
- Password Aging
- Restricted Shells and Accounts **
- The root Account
- SSH
- Labs

Group Management

- Groups
- Group Management
- User Private Groups
- Group Membership
- Labs

File Permissions and Ownership

- File Permissions and Ownership

- File Access Rights
- chmod, chown and chgrp
- umask
- Filesystem ACLs
- Labs

Pluggable Authentication Modules (PAM)

- PAM (Pluggable Authentication Modules)
- Authentication Process
- Configuring PAM
- LDAP Authentication **
- Labs

Network Addresses

- IP Addresses
- IPv4 Address Types
- IPv6 Address Types
- IP Address Classes
- Netmasks
- Hostnames
- Labs

Network Devices and Configuration

- Network Devices
- ip
- ifconfig
- Predictable Network Interface Device Names
- Network Configuration Files
- Network Manager
- Routing
- DNS and Name Resolution
- Network Diagnostics
- Labs

Firewalls

- Firewalls
- Interfaces
- firewalld
- Zones
- Source Management
- Service and Port Management
- Labs

System Startup and Shutdown

- Understanding the Boot Sequence

- Boot Loaders
- System Configuration Files in /etc
- Shutting Down and Rebooting
- Labs

GRUB

- The Grand Unified Boot Loader (GRUB)
- Interactive Selections with GRUB at Boot
- Installing GRUB
- Customizing the GRUB Configuration
- Labs

Init, SystemV, Upstart, systemd

- The init Process
- Startup Alternatives
- systemd
- systemctl
- SysVinit Startup **
- chkconfig and service **
- Upstart **
- Labs

Backup and Recovery Methods

- Backup Basics
- Backup vs Archive
- Backup Methods and Strategies
- tar
- Compression: gzip, bzip2 and xz and Backups
- dd
- rsync
- cpio **
- dump and restore **
- mt **
- Backup Programs **
- Labs

Linux Security Modules

- Linux Security Modules
- SELinux
- AppArmor
- Labs

Local System Security

- Local System Security
- Creating a Security Policy

- Updates and Security
- Physical Security
- BIOS
- Bootloader
- Filesystem Security
- setuid/setgid bits
- Labs

Basic Troubleshooting

- Troubleshooting Levels
- Troubleshooting Techniques
- Things to Check: Networking
- Things to Check: File Integrity
- Boot Process Failures
- Filesystem Corruption and Recovery
- Virtual Consoles
- Labs

System Rescue

- Rescue Media and Troubleshooting
- Using Rescue/Recovery Media
- System Rescue and Recovery
- Emergency Boot Media
- Using Rescue Media
- Emergency Mode
- Single User Mode
- Labs

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