

CompTIA Linux+ 2009

Course Introduction

10m

Unit 01 - Installation

52m

Topic A: Linux Introduction

Ubuntu with OpenOffice / Firefox

Linux Platforms

Popular Distros

Software Licensing

Non-licensing Terminology

Demo - Exploring Linux and Licensing

Topic B: Pre-installation Tasks

Pre-installation Tasks

Installation Types

Installation Files

ISO Burning Applications

Topic C: Linux Installation

File Systems

Partitioning

Minimum Partitions

Demo - Installing Linux

Logging On

Demo - Logging into Debian

Unit 01 Review

Unit 02 - Using Linux

2h 24m

Topic A: Graphical User Interfaces

User Interface Architecture

Demo - Exploring User Interfaces

Desktop Environments

GNOME

GNOME Environment

KDE

Xfce

Linux Applications

Demo - Exploring End-user Applications and OpenOffice Writer

Topic B: Command Line Linux

Command Line Interface

BASH (Bourne Shell)

Common Commands

Demo - Entering Commands at the BASH Prompt

BASH Proficiency

Command History

Shell Variables

Shell Metacharacters

Tab Completion

Demo - Exploring the BASH Command Line Interface

Piping and Redirecting

Standard I/O

Demo - Exploring Piping and Redirection

Named Pipes

Demo - Exploring Named Pipes

Getting Help

Man Page

Man Page Sections
Info Pages
Demo - Getting Help
Additional Help Options
Demo - Exploring Further Help Options
Unit 02 Review

Unit 03 - File and Directory Management

1h 54m

Topic A: Directory Organization

Filesystem Hierarchy Standard
Directory Navigation
pushd and popd
Demo - Exploring the FHS Directories
Managing Directories
Demo - Managing Directories

Topic B: File Management

Files
Wildcards
Demo - Managing Files
The vi Editor
vi Commands
Demo - Editing a File with vi
Links
Demo - Creating and Using File Links
File Information Commands
File Info with ls -lF
More File Information Commands
Demo - Examining File Types
Finding Files
Demo - Finding Files

Topic C: Removable Storage

Mounting Volumes
File System Types
Device Files
Mount Points
Mount Options
Example Commands
Mounting
Privilege Escalation
Demo - Mounting and Unmounting a CD and USB Drive
Unit 03 Review

Unit 04 - System Administration

2h 40m

Topic A: Users and Groups

User Security - /etc/passwd
Password File Fields
User Security - /etc/shadow
Shadow File Fields
Privilege Escalation
Demo - Exploring User Accounts
Demo - Adding Your Account to the sudoers File
User Accounts
The /etc/login.defs File
The /etc/default/useradd File
The /etc/skel Directory

The adduser Command
The /etc/adduser.conf File
Demo - Creating User Accounts at the Command Line
GUI Admin Tools
Demo - Creating User Accounts via the GUI
Modifying Users
The chfn Command
The finger Command
Demo - Modifying a User Account
Creating Groups
Adding Users to Groups
Demo - Creating Groups and Adding Members
Deleting Accounts
Demo - Deleting Users and Groups

Topic B: File and Directory Permissions

File Ownership
Demo - Managing File Ownership
File and Directory Permissions
The Mode
Mode Explained
Demo - Viewing File Permissions
Changing Permissions
Numeric Syntax
Demo - Changing File Permissions
Default Permissions
Umask
Demo - Viewing and Changing the Umask
Special Permissions
Special Permissions in the Mode
Setting Special Permissions
Demo - Viewing and Changing Special Permissions
File System Specific Attributes
Demo - Viewing and Changing ext3 File Attributes

Topic C: User Environment Configuration

Variables
Viewing Variables, Custom Variables
PATH
Changing the Prompt
Demo - Working with Shell and Environment Variables
Command Aliases
Demo - Viewing and Creating Command Aliases
Environment Files
Demo - Saving a Command Alias in an Environment File

Topic D: GUI Configuration

Video Configuration
Screen Resolution
xvidtune
Screensaver
Appearance Preferences
Demo - Configuring Video Settings
Mouse Preferences
Keyboard Preferences
Demo - Configuring the Mouse and Keyboard
Stop and Start X Windows
Demo - Stopping and Starting X Windows
Unit 04 Review

Unit 05 - Application Management

52m

Topic A: Packages and Package Managers

Software Distribution

Packages

Package Managers

Synaptic Package Manager

Demo - Installing a Package via the GUI

Command Line Package Managers

Demo - Installing a Package via the Command Line

Installed Software

Demo - Gathering Information about Installed Software

Removing Software

Demo - Removing Software

Repositories

Synaptic - Software Sources

Demo - Managing Repositories

Topic B: Source Code Software

Installing from Source Code

Extracting

Compiling and Linking

Installing and Cleaning Up

Demo - Installing the GNU C Compiler

Demo - Downloading and Installing a Source Code Application

Unit 05 Review

Unit 06 - System Configuration

1h 31m

Topic A: Disk Management

Disk Drives

Drive Components

Drive Geometry

Partitioning

fdisk

fdisk - Drive and Partition List

parted - Partition Editor

GParted

Demo - Exploring Partitions with fdisk

Demo - Exploring Partitions via the GUI

Formatting

Demo - Formatting a Partition with mkfs

The /etc/fstab File

The fstab with New Drives

Demo - Editing the fstab File

Virtual File Systems

Demo - Mounting a Loop Device

Topic B: File System Management

Quotas

Quotas Enabled in fstab

Enabling Quotas

Editing Quotas with edquota

Enabling Quotas (cont.)

Swap Space

Swap Space Options

Creating Swap Space

Filling New Swap Space

Managing Swap

Demo - Managing Swap Space

Disk Arrays
RAID Level 0
RAID Level 1
RAID Level 3
RAID Level 5
Logical Volume Manager
Implementing LVM
Topic C: Device Management
Devices
Sample Devices
Demo - Exploring the /dev Directory
Viewing USB Devices
Demo - Viewing Devices on the USB Bus
Viewing PCI Devices
Unit 06 Review

Unit 07 - Process and Module Management

1h 14m

Topic A: Process Management

Processes
Process IDs
Demo - Exploring Processes
The ps Command
Common ps Command Forms
Output of ps aux
The top Command
Demo - Viewing Processes and Devices
Killing Processes
Other kill Commands
Demo - Managing Processes

Topic B: Process Priority and Execution

Process Forking
Foreground and Background
Demo - Comparing Foreground and Background Processes
Process Priority
Viewing Priorities
Setting Priorities
Renice
Demo - Managing Process Priorities

Topic C: Kernel Modules

Kernel
Kernel Tuning
Common sysctl Settings
Demo - Viewing Kernel Information
Kernel Modules
The lsmod Command
The modprobe Command
Module Related Files
Demo - Exploring Kernel Modules
Unit 07 Review

Unit 08 - System Maintenance

1h 59m

Topic A: Backup and Restore

Compression
Algorithms
Compressed File Types
Compression Utilities

GNU zip = gzip

bzip2

Compression via the GUI

Demo - Compressing and Extracting Data

Tape Archives

Demo - Creating Archiving with tar

cpio and find

Demo - Backing Up with cpio

Backup with dd

Demo - Backing Up with dd

Topic B: Scheduling Tasks

Scheduling Commands

The at Command

Demo - Scheduling Commands with at

The cron Command

Sample crontab

crontab run-parts Format

Managing cron

Demo - Scheduling a Job with cron

Topic C: Performance Monitoring

Monitoring Tools

Demo - Installing the sysstat Package

mpstat

iostat

Demo - Monitoring with mpstat and iostat

System Activity Reporter

Output of sar

Demo - Monitoring System Activity with sar

The uptime Command

The free Command

The top Command

The vmstat Command

Demo - Using the Memory Statistics Utilities

Load Average

Demo - Viewing the Load Average for Your Computer

Topic D: Logging

Log Files

Demo - Viewing Logs

System Logging Daemon

Sample rsyslog.conf

Logging Facilities

Priorities

Priority Notation

Demo - Examining the syslog.conf File

Log Rotation

Sample logrotate.conf

Demo - Examining Log Rotation

Text Manipulation Commands

grep

head and tail

sed

Demo - Searching and Displaying Text Files

awk

Demo - Searching and Replacing with awk

Unit 08 Review

Unit 09 - Networking

2h 6m

Topic A: Networking Basics

- Networks
- Protocols
- OSI Reference Model
- Internet Protocol Suite
- Additional Protocols
- Addressing
- Addresses
- Internet Protocol Version 4
- IPv4 Classes
- Internet Protocol Version 6
- Assigning Addresses
- Demo - Examining Addresses
- Character Based Names
- Name Utilities
- Demo - Identifying Addresses and Names
- Ports
- Demo - Viewing and Using Ports
- Authentication
- Authentication Factors
- One-factor Authentication
- Two-factor Authentication
- Three-factor Authentication

Topic B: Network Services

- NIC Configuration
- Network Commands
- Demo - Configuring Your Network Interface
- DHCP Services
- Demo - Managing DHCP Client Services
- DHCP Server Services
- Demo - Installing and Configuring DHCP Server Services
- Network Time Services
- Date and Time Commands
- Demo - Installing NTP and Configuring Time Synchronization
- Internet Super Daemon
- Demo - Viewing Daemon Startup Options

Topic C: Domain Name Services

- DNS
- Name Resolution Process
- Demo - Resolving Names
- BIND
- Resource Records
- Demo - Installing BIND and Examining its Configuration Files
- Managing BIND
- Demo - Managing BIND
- Local Name Resolution
- Default /etc/hosts File
- The nsswitch.conf File
- Demo - Examining Local Name Resolution
- Unit 09 Review

Unit 10 - File Sharing and Printing

43m

Topic A: Network File Resources

NFS

Demo - Enabling Local Name Resolution and Installing NFS

NFS Server Configuration

The exports File

Computer Entries

Options

Demo - Configuring and Starting the NFS Server

Mounting

Demo - Mounting an NFS File System

Managing NFS

Demo - Managing Exports

Topic B: Printing

Printing

LPD/LPR

Application Specific

CUPS

CUPS Configuration

GUI Tools

More on Printing

Demo - Creating a Printer in CUPS

Printing Management

Demo - Managing Printers

Unit 10 Review

Unit 11 - Interoperability

28m

Topic A: Network Interoperability

Samba

Demo - Installing Samba

Samba Configuration

The smb.conf File

SWAT

GUI Tools

Browsing for Linux Resources

Demo - Configuring Samba Shares

Components

Topic B: Remote Desktop Access

rdesktop

rdesktop Command

GUI Clients

VNC

Debian's VNC Server

TightVNC on Windows XP

A Linux Desktop on Windows

A Windows Desktop on Linux

Unit 11 Review

Unit 12 - Security

57m

Topic A: System Security

NIS

NIS Roles

PAM

LDAP

RADIUS

RADIUS Benefits
SELinux - Security Enhanced
Changing Modes
Demo - Examining SELinux
User Tools
Demo - Exploring User Management Commands
Topic B: Network Security
Routing and Firewalls
Basic Routing Table
Routing
Large Network
Modifying Routing Tables
Demo - Examining Routing
Traffic Filtering
Configuring Chains and Rules
iptables Command Parameters
iptables Examples
Demo - Configuring iptables
Network Security Tools
Nessus
Intrusion Detection Systems
Snort IDS
HIDS
Unit 12 Review

Unit 13 - Web Environment

59m

Topic A: Web Services

Web Technologies
Sample PHP Program
MySQL Client
Apache
Demo - Installing Apache
Apache Configuration
Site Definition Files
The .htaccess File
Demo - Configuring Apache
Apache Modules
Apache Daemon
Demo - Installing the PHP Module
Demo - Configuring Apache's Default Document

Topic B: MySQL Services

MySQL
Demo - Installing MySQL and Associated Tools
MySQL Configuration
Demo - Examining the MySQL Configuration Files
phpMyAdmin
Demo - Testing Your MySQL Server
Starting and Stopping MySQL
Demo - Starting and Stopping MySQL
Unit 13 Review

Unit 14 - FTP and Email Services

44m

Topic A: FTP Services

FTP

Demo - Installing an FTP Server

Configuration

Demo - Configuring the FTP Server

Security

FTP Clients

Active Mode

Passive Mode

Transfer Types

Demo - Transferring Files with FTP

Secure FTP

SSH Daemon Configuration

Key Generation

Public Key Encryption

Demo - Installing and Configuring the SSH Daemon

Demo - Connecting via SSH

Synchronizing Directories

Topic B: Mail Services

Electronic Mail

Mail Clients

Email Addresses

Unit 14 Review

Unit 15 - Troubleshooting and Maintenance

57m

Topic A: Booting Linux

Booting

Boot Loaders

GRUB Boot Loader Screen

GRUB Configuration

Demo - Investigating GRUB

Runlevels

Runlevel Initialization

Demo - Changing Runlevels

Root Password Recovery

Demo - Recovering the Root Password

Kernel Options and Recovery

Demo - Troubleshooting Boot Problems

Topic B: Network Troubleshooting

Troubleshooting

Network Utilities

Obtaining Files

File Verification

Topic C: Scripting Basics

Scripting

A Script

Commands

Demo - Writing and Testing a Shell Script

Unit 15 Review

Course Closure

Total Duration: 20hrs 30min