

CompTIA Linux+ 2009

- **Exam Code:** XK0-002
- **Course Length:** 5 Days

Course Overview

This instructor-led course will prepare students for the 2009 CompTIA Linux+ certification exam. It provides a comprehensive look at common tasks performed by system administrators. This includes installation, management of Linux systems from the command line and the GUI, user administration, file permissions, customization, software configuration, management of Linux-based clients, troubleshooting, and much more. Expanded coverage of networking and security are covered, which is in step with the 2009 CompTIA exam objectives.

Prerequisites/Audience

There are no prerequisites for this course. It is intended for IT professionals who are specializing in the Linux+ platform. Oracle and Novell recognize CompTIA's Linux+ certification in certain tracks, and it is recommended for Hitachi Electronics and Fujitsu Japan employees.

Course Outline

Course Introduction

10 min

Course Introduction

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 an 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: 20h 30m