

# Linux System Administration (LX03)

**Course Number 4220 – 40 Hours**

## Overview

The purpose of this course is teach experienced Linux users the Techniques and methods and policies used in Linux System administration.

Learn to install and configure a Red Hat (RHEL5) or SUSE Linux-based server and administer that server in your day-to-day business. Learn how to recompile kernels, configure Linux Loader, manage devices and back up your system.

The course includes separate Hands-on labs and exercises for SUSE (SLES10) or Red Hat (RHEL5) environments.

This course has been approved by the Linux Professional Institute (LPI) as LPI-approved training materials.

## On Completion, Delegates will be able to

On completion of this course, students should be able to:

- Install Linux from a network install server
- Manage system startup and shutdown
- Select and use system administration tools when appropriate
- Use packaging tools to create, install and deinstall packages
- Configure and manage the X Window System
- Manage character devices, PCMCIA and USB
- Manage hard disks, partitions, RAID and LVM
- Create and manage filesystems
- Recompile the Linux kernel
- Perform memory management
- Use scheduling tools
- Create and restore backups
- Perform user administration
- Apply user-level security
- Manage logging
- Configure and manage printers
- Networking management and utilities
- Troubleshoot Linux problems

- Discuss policies and procedures
- Physically plan and manage the system and its environment

## Who Should Attend

The intended audiences for this course are experienced Linux users who want to become the administrator of one or more Linux servers.

## Prerequisites

- Linux power user course or equivalent knowledge
  - Course #4222, Essentials of Linux Administration):
    - Linux documentation; Text editors; Filesystem structure; permissions and file types, Linux documents search; processes and process monitoring; customizing user's environment; command line manipulation, redirections and text manipulation commands; shell basics
- **Must** have practical experience in running Linux as a user

## Course Contents

### Advanced Linux installation

- Perform a network installation
- Discuss network install servers
- Discuss Fedora/Red Hat Enterprise Linux (RHEL) kickstart installations
- Discuss SUSE AutoYet Another setup Tool (YaST) installations

### Startup and shutdown

- Describe the Linux startup flow
- Configure autostarting services
- Boot Linux in single-user mode
- Perform a proper shutdown of a Linux system

### System administration tools

- Discuss the main characteristics of system administration tools
- List some distribution-specific administration tools
- List some general-purpose administration tools
- Describe a print queuing system
- Configure a printer

### **Package management**

- Describe the basic principles of Red Hat Package manager (RPM)
- Install RPM packages
- Describe the RPM build process
- Create simple SPEC files
- Keep your system up to date

### **X Window System**

- Describe the basic architecture of the X Window System
- Configure XFree86 or Xorg
- Start and stop X
- Describe the function of the window manager
- Use X over a network

### **Logging**

- Describe logging concepts
- Configure the syslog daemon
- Use the logger program
- Use the logrotate program

### **Character devices, PCMCIA, and USB**

- Describe the main characteristic of a character device
- Configure serial, parallel, and PS/2 ports
- Configure a sound card
- Describe the PCMCIA subsystem
- Describe the USB subsystem

### **Block Devices, RAID, and LVM**

- Name the most important characteristic of a block device
- List various block devices
- List the device naming scheme for Integrated Development Environment (IDE) and Small Computer System Interface (SCSI) hard disks
- Partition a hard disk and list the device naming for partitions
- Use Random Access Memory (RAM) disks
- Configure and use LVM
- Configure and use RAID

### **Filesystems**

- Describe what a file is
- Describe what a filesystem is
- List the possible filesystems
- Describe the function of inodes

- Create/mount/unmount filesystems
- Create predefined mounts
- Set up user and group quota

#### **Memory management and XEN**

- Describe the principles of memory management in Linux
- Create paging space partitions
- Create paging space files
- Interpret results and reports generated by standard Linux tools
- Configure and manage Xen

#### **Scheduling**

- Use crontab files to schedule jobs on a periodic basis
- Use anacron to schedule jobs on a workstation
- Use the at command to schedule jobs or series of jobs at some time in the future
- Use the batch command to schedule jobs in a queue, to alleviate immediate system demand

#### **Backup and restore**

- Discuss backup schemes
- Discuss backup media
- List the different backup tools supported in Linux

#### **User administration**

- Add, change, and delete user accounts
- Add, change, and delete groups
- Manage user passwords
- Communicate with the user community

#### **User-level security**

- Define ways of controlling root access on the system
- Define the use of SUID, SGID, and Sticky Bit permission bits
- Identify the data files associated with users
- Describe the concepts of Pluggable Authentication Module (PAM)

#### **Networking**

- TCP/IP protocols and addressing
- TCP/IP broadcasting and multicasting
- TCP/IP subnet masking
- Configuring TCP/IP on Linux
- TCP/IP commands

- Static and dynamic routing including an introduction to the Routing Information Protocol (RIP) and Open Shortest Path First (OSPF) protocols

#### **Troubleshooting**

- Perform basic problem determination
- Use the rescue mode

#### **Kernel compilation and configuration**

- Describe why kernel compilation is sometimes desirable
- Install kernel sources from distribution CD-ROM
- Install kernel sources from Internet
- Patch the kernel
- Compile the kernel
- Install the kernel
- Configure the kernel and the kernel modules

#### **Policies and procedures**

- Discuss the need for policies and procedures
- Discuss user and administrator policies
- Discuss system management procedures

#### **Linux on IBM eServer**

- Describe how businesses are using Linux
- List the main features of the IBM eServer brands
- List the considerations involved in selecting an IBM eServer for your workload

#### **Physical planning and maintenance**

- Discuss issues to be considered when planning the physical installation of the system
- List best practices for physical maintenance