

**Linux for Administrators**

**Course Number:** LNX-102  
**Duration:** 5 days

**Overview**

Accelebrate's Introduction to Linux Administration course teaches students how to install, configure, maintain, and secure Linux systems.

NOTE: This class can be taught using the Linux distribution of your choice.

**Prerequisites**

Students should be comfortable working in a Linux or UNIX environment. An understanding of network concepts and the TCP/IP protocol suite is helpful.

**Materials**

All attendees receive comprehensive courseware.

**Software Needed on Each Student PC**

Attendees will not need to install any software on their computer for this class. The class will be conducted in a remote environment that Accelebrate will provide; students will only need a local computer with a web browser and a stable Internet connection. Any recent version of Microsoft Edge, Mozilla Firefox, or Google Chrome will be fine.

**Objectives**

* Install and configure Linux
* Understand the boot process
* Master user and group administration
* Work with filesystem administration, including quotas, FACLs, RAID and LVM
* Automate tasks
* Master client networking
* Work with SELinux
* Manage software and log files
* Troubleshoot Linux

**Outline**

* Introduction
* Linux Hardware Discovery, Interaction, & Control
  + Hardware Discovery Tools
  + Configuring New Hardware with hwinfo
  + Hardware and System Clock
  + Console
  + Virtual Terminals
  + Serial Ports
  + SCSI Devices
  + USB Devices
  + USB Configuration
  + Common UNIX Printing System
  + Defining a Printer
  + Managing Optical Media
  + Tape Libraries
  + Managing Linux Device Files
  + Kernel Hardware Info - /sys/
  + /sys/ Structure
  + udev
  + Kernel Modules
  + Configuring Kernel Components and Modules
  + Handling Module Dependencies
  + Configuring the Kernel via /proc/
* Boot Process and SYSV INIT
  + Booting Linux on PCs
  + GRUB Configuration
  + Boot Parameters
  + Initial ramdisk
  + /sbin/init
  + System Init Styles
  + Linux Runlevels
  + /etc/inittab
  + /etc/rc.d/rc.sysinit
  + SUSE /etc/init.d/boot
  + Runlevel Implementation
  + System Configuration Files
  + RHEL6 Configuration Utilities
  + SLES11 Configuration Utilities
  + Typical SysV Init Script
  + The /etc/rc.local File
  + The /etc/init.d/\*.local Files
  + Managing Daemons
  + Controlling Service Startup
  + Shutdown and Reboot
* Software Maintenance [RPM and Yum coverage is specific to RHEL and CentOS; we could cover apt for Ubuntu or YaST for SUSE upon request]
  + Managing Software
  + RPM Features
  + RPM Architecture
  + RPM Package Files
  + Working with RPMs
  + Querying and Verifying with rpm
  + Updating the Kernel RPM
  + Dealing with RPM & YUM Digest Changes
  + YUM Plugins
  + YUM Repositories
  + Compiling/Installing from Source
  + Manually Installed Shared Libraries
  + Installing Source RPM Packages
* File System Administration
  + Partitioning Disks with fdisk
  + Partitioning Disks with parted
  + File system Creation
  + Mounting File system file systems
  + File system Maintenance
  + Persistent Block Devices
  + Resizing File system file systems
  + Swap
  + File system Structures
  + Determining Disk Usage With df and du
  + Configuring Disk Quotas
  + Setting Quotas
  + Viewing and Monitoring Quotas
  + File system Attributes
  + Backup Software
* LVM & RAID
  + Logical Volume Management
  + Implementing LVM
  + Creating Logical Volumes
  + Manipulating VGs & LVs
  + Advanced LVM Concepts
  + system-config-lvm
  + SLES Graphical Disk Tool
  + RAID Concepts
  + Array Creation with mdadm
  + Software RAID Monitoring
  + Software RAID Control and Display
* Remote Storage Administration
  + Remote Storage Overview
  + Remote File system file system Protocols
  + Remote Block Device Protocols
  + File Sharing via NFS
  + NFSv4
  + NFS Clients
  + NFS Server Configuration
  + Implementing NFSv4
  + AutoFS
  + AutoFS Configuration
  + Accessing Windows/Samba Shares from
  + Linux
  + SAN Multipathing
  + Multipath Configuration
  + Multipathing Best Practices
  + iSCSI Architecture
  + Open-iSCSI Initiator Implementation
  + iSCSI Initiator Discovery
  + iSCSI Initiator Node Administration
  + Mounting iSCSI Targets at Boot</li
  + iSCSI Multipathing Considerations
* User/Group Administration
  + User and Group Concepts
  + User Administration
  + Modifying Accounts
  + Group Administration
  + Password Aging
  + Default User Files
  + Controlling Logins
  + Manual DS Client Configuration
  + system-config-authentication
  + SLES Graphical DS Client
  + Configuration
  + System Security Services
  + Daemon (SSSD)
* Pluggable Authentication
  + Modules (PAM)
  + PAM Overview
  + PAM Module Types
  + PAM Order of Processing
  + PAM Control Statements
  + PAM Modules
  + pam\_unix
  + pam\_nologin.so
  + pam\_limits.so
  + pam\_wheel.so
  + pam\_xauth.so
* Security Administration
  + Security Concepts
  + Tightening Default Security
  + SuSE Security Checker
  + Security Advisories
  + File Access Control Lists
  + Manipulating FACLs
  + Viewing FACLs
  + Backing Up FACLs
  + File Creation Permissions with umask Daemon
  + User Private Group Scheme
  + Alternatives to UPG
  + AppArmor
  + SELinux Security Framework
  + SELinux Modes
  + SELinux Commands
  + Choosing an SELinux Policy
  + SELinux Booleans
  + Permissive Domains
  + SELinux Policy Tools
  + Basic Firewall Activation
* Basic Networking
  + IPv4 Fundamentals
  + TCP/UDP Fundamentals
  + Linux Network Interfaces
  + Ethernet Hardware Tools
  + Network Configuration with ip Command
  + Configuring Routing Tables
  + IP to MAC Address Mapping with ARP
  + Starting and Stopping Interfaces
  + NetworkManager
  + DNS Clients
  + DHCP Clients
  + system-config-network{tui,cmd}
  + SUSE YaST Network Configuration Tool [covered if using SUSE]
  + Network Diagnostics
  + Information from netstat and ss
  + Managing Network-Wide Time
  + Continual Time Sync with NTP
  + Configuring NTP Clients
  + Useful NTP Commands
* Advanced Networking
  + Multiple IP Addresses
  + Configuring a DHCP server
  + Enabling IPv6
  + Interface Bonding
  + Interface Bridging
  + 802.1q VLANS
  + Tuning Kernel Network Settings
* Log File Administration
  + System Logging
  + Syslog-ng
  + Rsyslog
  + /etc/rsyslog.conf
  + Log Management
  + Log Anomaly Detector
* Monitoring & Troubleshooting
  + System Status - Memory
  + System Status - I/O
  + System Status - CPU
  + Performance Trending with sar
  + Troubleshooting Basics: The Process
  + Troubleshooting Basics: The Tools
  + strace and ltrace
  + Common Problems
  + Troubleshooting Incorrect File Permissions
  + Inability to Boot
  + Typos in Configuration Files
  + CorruptFile system file systems
  + RHEL Rescue Environment [covered if using RHEL]
  + SUSE Rescue Environment [covered if using SUSE]
* Conclusion