

**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