

**Enterprise Linux Network Services**

**Course Number:** LNX-120  
**Duration:** 5 days

**Overview**

This Enterprise Linux Network Services training course teaches attendees how to configure and secure Linux network services and a wide array of common network applications.

**Prerequisites**

Students should already be comfortable with basic Linux or Unix administration. Fundamentals such as the Linux filesystem, process management, and how to edit files will not be covered in class. A good understanding of network concepts, the TCP/IP protocol suite is also assumed. These skills are taught in Accelebrate’s [Linux Fundamentals](file:////training/linux-fundamentals) and [Enterprise Linux Systems Administration](file:////training/enterprise-linux-system-administration) courses.

**Materials**

All Linux training attendees receive comprehensive courseware.

**Software Needed on Each Student PC**

Attendees will not need to install any software on their computers 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 work well.

**Objectives**

* Security with SELinux and Netfilter
* DNS concepts and implementation with Bind
* LDAP concepts and implementation using OpenLDAP
* Web services with Apache
* FTP with vsftpd
* Caching, filtering proxies with Squid
* SMB/CIFS (Windows networking) with Samba
* E-mail concepts and implementation with Postfix combined with either Dovecot or Cyrus

**Outline**

* Introduction
* Securing Services
  + Xinetd
  + Xinetd Connection Limiting and Access Control
  + Xinetd: Resource limits, redirection, logging
  + TCP Wrappers
  + The /etc/hosts.allow & /etc/hosts.deny Files
  + /etc/hosts.{allow,deny} Shortcuts
  + Advanced TCP Wrappers
  + SUSE Basic Firewall Configuration
  + FirewallD
  + Netfilter: Stateful Packet Filter Firewall
  + Netfilter Concepts
  + Using the iptables Command
  + Netfilter Rule Syntax
  + Targets
  + Common match\_specs
  + Extended Packet Matching Modules
  + Connection Tracking
* SELinux and LSM
  + AppArmor
  + SELinux Security Framework
  + Choosing an SELinux Policy
  + SELinux Commands
  + SELinux Booleans
  + SELinux Policy Tools
* DNS Concepts
  + Naming Services
  + DNS – A Better Way
  + The Domain Name Space
  + Delegation and Zones
  + Server Roles
  + Resolving Names
  + Resolving IP Addresses
  + Basic BIND Administration
  + Configuring the Resolver
  + Testing Resolution
* Configuring Bind
  + BIND Configuration Files
  + named.conf Syntax
  + named.conf Options Block
  + Creating a Site-Wide Cache
  + rndc Key Configuration
  + Zones In named.conf
  + Zone Database File Syntax
  + SOA – Start of Authority
  + A, AAAA, & PTR – Address & Pointer Records
  + NS – Name Server
  + TXT, CNAME, & MX – Text, Alias, & Mail Host
  + SRV – SRV Service Records
  + Abbreviations and Gotchas
  + $GENERATE, $ORIGIN, and $INCLUDE
* Creating DNS Hierarchies
  + Subdomains and Delegation
  + Subdomains
  + Delegating Zones
  + in-addr.arpa. Delegation
  + Issues with in-addr.arpa.
  + RFC2317 & in-addr.arpa.
* Advanced Bind DNS Features
  + Address Match Lists & ACLs
  + Split Namespace with Views
  + Restricting Queries
  + Restricting Zone Transfers
  + Running BIND in a chroot
  + Dynamic DNS Concepts
  + Allowing Dynamic DNS Updates
  + DDNS Administration with nsupdate
  + Common Problems
  + Common Problems
  + Securing DNS With TSIG
* Using Apache
  + HTTP Operation
  + Apache Architecture
  + Dynamic Shared Objects
  + Adding Modules to Apache
  + Apache Configuration Files
  + httpd.conf – Server Settings
  + httpd.conf – Main Configuration
  + HTTP Virtual Servers
  + Virtual Hosting DNS Implications
  + httpd.conf – VirtualHost Configuration
  + Port and IP based Virtual Hosts
  + Name-based Virtual Host
  + Apache Logging
  + Log Analysis
  + The Webalizer
* Apache Security
  + Virtual Hosting Security Implications
  + Delegating Administration
  + Directory Protection
  + Directory Protection with AllowOverride
  + Common Uses for .htaccess
  + Symmetric Encryption Algorithms
  + Asymmetric Encryption Algorithms
  + Digital Certificates
  + TLS Using mod\_ssl.so
* Apache Server-Side Scripting Administration
  + Dynamic HTTP Content
  + PHP: Hypertext Preprocessor
  + Developer Tools for PHP
  + Installing PHP
  + Configuring PHP
  + Securing PHP
  + Security Related php.ini Configuration
  + Java Servlets and JSP
  + Apache's Tomcat
  + Installing Java SDK
  + Installing Tomcat Manually
  + Using Tomcat with Apache
* Implementing and FTP Server
  + The FTP Protocol
  + Active Mode FTP
  + Passive Mode FTP
  + ProFTPD
  + Pure-FTPd
  + vsftpd
  + Configuring vsftpd
  + Anonymous FTP with vsftpd
* The Squid Proxy Server
  + Squid Overview
  + Squid File Layout
  + Squid Access Control Lists
  + Applying Squid ACLs
  + Tuning Squid & Configuring Cache Hierarchies
  + Bandwidth Metering
  + Monitoring Squid
  + Proxy Client Configuration
* SQL Fundamentals and MariaDB
  + Popular SQL Databases
  + SELECT Statements
  + INSERT Statements
  + UPDATE Statements
  + DELETE Statements
  + JOIN Clauses
  + MariaDB
  + MariaDB Installation and Security
  + MariaDB User Account Management
  + MariaDB Replication
* LDAP Concepts and Clients
  + LDAP: History and Uses
  + LDAP: Data Model Basics
  + LDAP: Protocol Basics
  + LDAP: Applications
  + LDAP: Search Filters
  + LDIF: LDAP Data Interchange Format
  + OpenLDAP Client Tools
  + Alternative LDAP Tools
* OpenLDAP Servers
  + Popular LDAP Server Implementations
  + OpenLDAP: Server Architecture
  + OpenLDAP: Backends
  + OpenLDAP: Replication
  + Managing slapd
  + OpenLDAP: Configuration Options
  + OpenLDAP: Configuration Sections
  + OpenLDAP: Global Parameters
  + OpenLDAP: Database Parameters
  + OpenLDAP Server Tools
  + Native LDAP Authentication and Migration
  + Enabling LDAP-based Login
  + System Security Services Daemon (SSSD)
* SAMBA Concepts and Configuration
  + Introducing Samba
  + NetBIOS and NetBEUI
  + Samba Daemons
  + Accessing Windows/Samba Shares from Linux
  + Samba Utilities
  + Samba Configuration Files
  + The smb.conf File
  + Mapping Permissions and ACLs
  + Mapping Linux Concepts
  + Mapping Users
  + Sharing Home Directories
  + Sharing Printers
  + Share Authentication
  + Share-Level Access
  + User-Level Access
  + Samba Account Database
  + User Share Restrictions
* SMTP Theory
  + SMTP
  + SMTP Terminology
  + SMTP Architecture
  + SMTP Commands
  + SMTP Extensions
  + SMTP AUTH
  + SMTP STARTTLS
  + SMTP Session
* Postfix
  + Postfix Features
  + Postfix Architecture
  + Postfix Components
  + Postfix Configuration
  + master.cf
  + main.cf
  + Postfix Map Types
  + Postfix Pattern Matching
  + Advanced Postfix Options
  + Virtual Domains
  + Postfix Mail Filtering
  + Configuration Commands
  + Management Commands
  + Postfix Logging
  + Logfile Analysis
  + Postfix, Relaying and SMTP AUTH
  + SMTP AUTH Server and Relay Control
  + SMTP AUTH Clients
  + Postfix / TLS
  + TLS Server Configuration
  + Postfix Client Configuration for TLS
  + Other TLS Clients
  + Ensuring TLS Security
* MAIL Services and Retrieval
  + Filtering Email
  + Procmail
  + SpamAssassin
  + Bogofilter
  + amavisd-new Mail Filtering
  + Accessing Email
  + The IMAP4 Protocol
  + Dovecot POP3/IMAP Server
  + Cyrus IMAP/POP3 Server
  + Cyrus IMAP MTA Integration
  + Cyrus Mailbox Administration
  + Fetchmail
  + Roundcube Webmail
  + Mailing Lists
  + GNU Mailman
  + Mailman Configuration
* NIS
  + NIS Overview
  + NIS Limitations and Advantages
  + NIS Client Configuration
  + NIS Server Configuration
  + NIS Troubleshooting Aids
* Conclusion