

**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