

Enterprise Linux Networking Services

Course Summary

Description

This an expansive course that covers a wide range of network services useful to every organization. Special attention is paid to the concepts needed to implement these services securely, and to the trouble-shooting skills which will be necessary for real-world administration of these network services. The course material is designed to provide extensive hands-on experience.

Topics

- 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 either Sendmail or Postfix combined with either Dovecot or Cyrus

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, SELinux, and firewalling with iptables is also assumed.

Duration

Five days

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Course Outline

I. DNS Concepts

- A. Naming Services
- B. DNS - A Better Way
- C. The Domain Name Space
- D. Delegation and Zones
- E. Server Roles
- F. Resolving Names and IP Addresses
- G. BIND Administration
- H. rndc Key Configuration
- I. Configuring the Resolver
- J. Testing Resolution

Lab Tasks

- K. Configuring a Slave Name Server
- L. Configure rndc for Secure named Control

II. Configuring BIND

- A. BIND Configuration Files
- B. named.conf Syntax and Options Block
- C. Creating a Site-Wide Cache
- D. Zones In named.conf
- E. Zone Database File Syntax
- F. SOA - Start of Authority
- G. A & PTR - Address & Pointer Records
- H. NS - Name Server
- I. CNAME & MX - Alias & Mail Host
- J. Abbreviations and Gotchas
- K. \$ORIGIN and \$GENERATE

Lab Tasks

- L. Configuring BIND Zone Files

III. Creating DNS Hierarchies

- A. Subdomains and Delegation
- B. Delegating Zones
- C. in-addr.arpa. Delegation
- D. Issues with in-addr.arpa.
- E. RFC2317 & in-addr.arpa.

Lab Tasks

- F. Create a Subdomain in an Existing Domain
- G. Subdomain Delegation

IV. Securing BIND and DNS

- A. Split Namespaces
- B. Using Views with BIND 9
- C. Address Match Lists & ACLs

- D. Restricting Queries
- E. Restricting Zone Transfers
- F. Running BIND in a chroot jail
- G. Dynamic DNS Concepts
- H. Allowing Dynamic DNS Updates
- I. DDNS Administration with nsupdate
- J. Common Problems

Lab Tasks

- K. Configuring Dynamic DNS
- L. Securing BIND DNS

V. LDAP Concepts and Clients

- A. Centralized Authentication
- B. Directory Services
- C. LDAP
- D. What LDAP Provides
- E. LDAP Concepts and Organization
- F. Schema
- G. Entry Referencing
- H. LDIF
- I. LDAP Architecture, Security, Implementations, and Client Configuration
- J. Querying LDAP Databases

Lab Tasks

- K. Querying an Existing LDAP Directory

VI. OpenLDAP Servers

- A. OpenLDAP Components
- B. Configuring slapd
- C. /etc/openldap/ldap.conf Global Parameters
- D. Schema Definition
- E. OpenLDAP Access Control
- F. Backend Types and Configuration
- G. Database Configuration
- H. Indexes
- I. Replicas
- J. LDAP Replica Configuration
- K. OpenLDAP Configuration Syntax Check

Lab Tasks

- L. Configuring LDAP Directory Services
- M. Modifying LDAP Directory Entries

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Course Outline (cont'd)

VII. Using OpenLDAP

- A. Managing slapd
- B. Online and Offline LDAP Data Manipulation
- C. Native LDAP Authentication and Client Config

Lab Tasks

- D. Configuring LDAP for Secure TLS Access
- E. Configuring LDAP Clients and Servers for Directory Authentication

VIII. Using Apache

- A. HTTP Operation
- B. Apache History and Status
- C. Apache Architecture
- D. SSL/HTTPS and Apache
- E. Apache Configuration Files
- F. httpd.conf
- G. Dynamic Shared Objects
- H. Adding Modules to Apache
- I. Apache Logging
- J. Log Analysis
- K. The Webalizer

Lab Tasks

- L. Configure Apache
- M. Apache Content

IX. Virtual Hosting with Apache

- A. HTTP Virtual Servers
- B. DNS Implications
- C. Security Implications
- D. IP-based Virtual Host
- E. Name-based Virtual Host
- F. Port-based Virtual Host

Lab Tasks

- G. Configuring Virtual Hosts

X. Apache Security

- A. Delegating Administration
- B. Directory Protection
- C. Common Uses for .htaccess
- D. Symmetric Encryption Algorithms
- E. Asymmetric Encryption algorithms
- F. Digital Certificates

- G. SSL Using mod_ssl.so

Lab Tasks

- H. Using .htaccess Files
- I. Using SSL Certificates with Apache

XI. Apache Server-Side Programming Basics

- A. Dynamic HTTP Content
- B. PHP: Hypertext Preprocessor
- C. Developer Tools for PHP
- D. Installing PHP
- E. Configuring PHP
- F. Securing PHP
- G. Security Related php.ini Configuration
- H. Java Servlets and JSP
- I. Apache's Tomcat
- J. Installing Java SDK
- K. Installing Tomcat Manually
- L. Using Tomcat with Apache

Lab Tasks

- M. CGI Scripts in Apache
- N. Apache's Tomcat
- O. Using Tomcat with Apache
- P. Installing Applications with Apache and Tomcat

XII. Implementing an FTP Server

- A. The FTP Protocol
- B. FTP Operation
- C. Active Mode FTP
- D. Passive Mode FTP
- E. WU-FTPD
- F. vsftpd
- G. Configuring vsftpd
- H. Anonymous FTP with vsftpd

Lab Tasks

- I. Configuring vsftpd

XIII. The Squid Proxy Server

- A. Squid Overview, File Layout, and Access Control Lists
- B. Applying Squid ACLs
- C. Tuning Squid / Hierarchies
- D. Bandwidth Metering
- E. Monitoring Squid
- F. Proxy Client Configuration

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Course Outline (cont'd)

Lab Tasks

- G. Installing and Configuring Squid
- H. Squid Cache Manager CGI
- I. Proxy Auto Configuration
- J. Configure a Squid Proxy Cluster

XIV. Samba Concepts

- A. SMB Network Protocol
- B. NetBIOS and NetBEUI
- C. NetBIOS Naming
- D. Introducing Samba
- E. Samba Daemons, Clients, and Utilities
- F. Samba Configuration Files
- G. The smb.conf File

Lab Tasks

- H. Basic Samba Configuration

XV. Using Samba

- A. Unix and DOS Permissions
- B. UNIX and Windows Concepts
- C. Name and Case Mangling
- D. Sharing Home Directories
- E. Sharing Printers
- F. Restricting Access
- G. Share-Level Access
- H. User-Level Access
- I. Mapping Users
- J. SMB and Passwords
- K. The smbpasswd Database
- L. User Share Restrictions

Lab Tasks

- M. Configuring Samba
- N. Samba Share-Level Access
- O. Samba User-Level Access
- P. Samba Home Directory Shares
- Q. Samba Group Shares

XVI. SMTP Theory

- A. SMTP
- B. SMTP Terminology, Architecture, Commands, and Extensions
- C. SMTP AUTH
- D. SMTP STARTTLS
- E. SMTP Session

XVII. Sendmail

- A. Sendmail Features, Process, Architecture, Components, and Configuration
- B. Configuration Files
- C. Databases
- D. Text Files
- E. Network Access
- F. Masquerading Sendmail
- G. Controlling Access
- H. Configuring SMTP AUTH
- I. Configuring SMTP START TLS

Lab Tasks

- J. Configuring Sendmail
- K. Sendmail Network Configuration
- L. Sendmail Virtual Host Configuration
- M. Sendmail SMTP AUTH Configuration
- N. Sendmail STARTTLS Configuration

XVIII. Postfix

- A. Postfix Features, Architecture, Components, and Configuration
- B. master.cf
- C. main.cf
- D. Postfix Map Types
- E. Postfix Pattern Matching
- F. Advanced Options
- G. Virtual Domains
- H. Mail Filtering
- I. Configuration and Management Commands
- J. Postfix Logging
- K. Log file Analysis
- L. chroot'ing Postfix
- M. Postfix and SMTP AUTH
- N. SMTP AUTH Server and Clients
- O. Postfix Extensions
- P. Postfix / TLS
- Q. TLS Server Configuration
- R. Postfix Client Configuration
- S. Other TLS Clients
- T. Ensuring TLS Security

Lab Tasks

- U. Configuring Postfix
- V. Postfix Network Configuration
- W. Postfix Virtual Host Configuration

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- X. Postfix SMTP AUTH Configuration
- Y. Postfix STARTTLS Configuration

XIX. IMAP, POP, Spam Filtering & Web Mail

- A. Filtering Email
- B. procmail
- C. SpamAssassin
- D. Sendmail Mail Filter (milter)
- E. amavisd-new Mail Filtering
- F. Accessing Email
- G. The POP3 Protocol
- H. The IMAP4 Protocol
- I. Dovecot POP3/IMAP Server
- J. Cyrus IMAP/POP3 Server
- K. Cyrus IMAP MTA Integration
- L. Cyrus Mailbox Administration
- M. Fetchmail
- N. SquirrelMail

Lab Tasks

- O. Configuring Procmail & SpamAssassin
- P. Configuring Cyrus IMAP
- Q. Configuring SquirrelMail