

**Linux Networking Fundamentals**

**Course Number:** LNX-144WA  
**Duration:** 3 days

**Overview**

This Linux Networking course focuses on understanding, configuring, and managing Linux networking. Participants learn foundational concepts, advanced configurations, and troubleshooting techniques to manage network operations effectively.

**Prerequisites**

Students must have taken [Linux System Administration](https://www.exitcertified.com/it-training/linux-foundation/linux-system-administration-65187-detail.html) or have equivalent experience.

**Materials**

All Linux Networking 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**

* Understand Linux networking fundamentals, including interfaces, IP addressing, and routing.
* Configure and manage networking services like DHCP, DNS, and firewalls.
* Analyze and troubleshoot networking issues using Linux tools.
* Secure Linux-based networks against common threats.
* Implement advanced networking techniques, including VLANs, bonding, bridging, and VPNs.

**Outline**

* Introduction to Networking Concepts
  + Overview of the OSI Model
  + Understanding TCP/IP and its Components
  + Networking Protocols in Linux
* Linux Networking Basics
  + Understanding Network Interfaces
  + Tools for Managing Network Interfaces
  + Configuring Static and Dynamic IPs
  + Basics of Subnetting and CIDR Notation
  + Setting Up Hostnames and Editing
* Routing and ARP
  + Default Gateways and Static Routes
  + Viewing and Managing the Routing Table (route, ip route)
  + Understanding ARP and using arp and ip neigh
* Configuring Networking Services
  + Setting Up a DHCP Server with isc-dhcp-server
  + Configuring a Local DNS Server with bind9
  + Introduction to Web Servers (Apache/Nginx Basics) for Testing
* Firewall Configuration and NAT
  + Introduction to Firewalls: iptables vs nftables
  + Creating Basic Firewall Rules (Allow/Deny Traffic)
  + Configuring Network Address Translation (NAT)
  + Port Forwarding Examples
* Networking Tools for Analysis and Monitoring
  + Packet Sniffing and Analysis with tcpdump and Wireshark
  + Monitoring Network Traffic with iftop, iptraf, and nload
  + Using netstat and ss for Active Connection Tracking
* Advanced Networking Techniques
  + Setting Up VLANs with vconfig or ip link
  + Network Bonding for Redundancy (mode 0 vs mode 1)
  + Configuring Network Bridges for Virtual Machines
  + Deploying VPNs with OpenVPN and WireGuard
* Securing Linux Networks
  + Hardening SSH
  + Protecting Against Brute-Force Attacks
  + Using tcp\_wrappers and ufw for Service-Specific Restrictions
  + DoS/DDoS Prevention (Rate Limiting with iptables)
* Troubleshooting Linux Networks
  + Diagnosing Connection Issues (ping, traceroute, mtr)
  + Debugging DNS Problems (dig, nslookup)
  + Checking Interface and Link Status (ethtool, ip link)
  + Comprehensive System Logs Analysis
* Conclusion