

UNDERSTANDING NETWORKING FUNDAMENTALS

Course Code: 3150

Exclusive - Build a foundation of networking knowledge in a real-world, multi-vendor environment.

A strong foundation of basic networking concepts is fundamental to a successful career in information technology. Networking technologies underlie all IT activities and a strong comprehension of the hardware and protocols used to create networks is essential to future success. In this training course, you will learn how to configure a workstation to connect to a network, analyze network traffic using a protocol analyzer, examine switch and router configurations, perform basic IPv4 addressing and subnetting, and research network security solutions.

What You'll Learn

- Basics of layered network protocols and compare the two primary reference models: OSI and TCP/IP
- Inspect a structured cabling system, including the proper use and installation of UTP and fiber optic cables
- Configure a workstation to connect to a network
- Ethernet operations and the use of VLANs by examining the configuration and operation of switches on a network
- Spanning Tree operation as a method of eliminating broadcast storms on a switched network
- Configure a Wi-Fi router for operation on a SOHO network, including security, SSID, and Wi-Fi channel
- Various IP addressing considerations, including binary to decimal conversion, dotted decimal notation, classful vs. classless addressing, private vs. public addresses, and the use of network masking
- Create a subnet for a small network, selecting the correct masks for various situations to accommodate the current number of hosts in each subnet and to also allow for future growth
- Operation of various TCP/IP protocols on a network, including connectionless and connection-oriented communications using UDP and TCP, translation between private and public addresses using NAT, and support protocols such as ARP, DNS, and DHCP
- Router configurations to determine the function of various routing protocols,

including RIP, IGRP, and OSPF, within and between networks

- Various WAN technologies, including circuit switched solutions such as leased lines and packet switched solutions such as Carrier Ethernet, and determine the best WAN connectivity solution for a given corporate network
- Use a protocol analyzer to capture and view network traffic, including e-mail, instant message exchanges, and web transactions
- Basic network security implementations by testing the impact a router that has been configured as a firewall has on the flow of traffic through a network
- Research the suitability of popular anti-malware suites for mitigating network security threats
- Research Mobile Device Management (MDM) solutions to support BYOD deployments

You will gain an understanding of basic network functions, standards, and protocols, to prepare you to tackle advanced networking skills.

Learn more about this topic. View the recorded webinar [BGP – What is it and why should I care?](#)

Learn more about this topic. View the recorded webinar [Networking Foundations](#).

Who Needs to Attend

New IT professionals who want to learn the basics of a structured, layered approach to networking, including the fundamentals of network hardware and components, network protocols, IP addressing and subnetting, and various tools used in network monitoring and troubleshooting. Ideal candidates include:

- Entry-level and newly hired technical professionals, including PC support, help desk, and networking professionals
- Sales and marketing professionals looking to increase their ability to communicate with technical professionals and increase sales
- Technical professionals looking to strengthen core skill before pursuing advanced topics and certifications

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CLASSROOM LIVE

\$3,395 USD

5 Day

Classroom Live Outline

1. Introduction to Networking

- What Is Network Computing?
- Building Blocks of Networks
- Network Infrastructure: Media
- Network Infrastructure: Switches and Access Points
- Network Infrastructure: Routers
- Network Services
- Network Types
- Network Topologies
- Locating Network Resources: Peer-to-Peer Networking
- Locating Network Resources: Client-Server Networking
- Virtual Computing
- Cloud Computing
- Module Review and Discussion Questions

2. Network Standards

- Introduction
- Standards Organizations
- Example Standards Development Process
- OSI Model Overview
- TCP/IP Model
- Module Review and Discussion Questions

3. Physical Network Connections

- Introduction
- UTP Cabling
- Fiber Optic Cabling

- Wireless Connections
- Module Review and Discussion Questions

4. Ethernet LANs

- Introduction
- NIC and MAC Addresses
- Ethernet Standards
- Ethernet Frame Structures
- Ethernet Equipment Types
- Ethernet Connectors
- Ethernet Performance Issues
- Module Review and Discussion Questions

5. Ethernet Switching

- Introduction
- Benefits of Switching
- Switch Installations
- Switch Operations Overview
- Switch Loop Problems
- Spanning Tree Protocol Overview
- Configuring Switches
- VLAN Overview
- Link Aggregation
- Troubleshooting
- Module Review and Discussion Questions

6. Wireless LANs

- Introduction
- WLAN Standards: IEEE & Wi-Fi Alliance
- WLAN Components
- SSID
- Wi-Fi Channels
- Wi-Fi Speeds Overview
- WLAN Security
- WLAN Performance Issues
- Module Review and Discussion Questions

7. IP Addressing

- What Are Logical Addresses?
- Binary Numbering
- Dotted Decimal Notation
- Three Types of IP Addresses
- Classful Addressing
- Assigning IP Addresses
- Reserved Addresses
- Private Addresses
- Network Masking

- Classless Addressing
- Introduction to IPv6
- Module Review and Discussion Questions

8. IPv4 Subnetting

- Purpose of Subnetting
- Subnet Communications
- Subnet Mask Rules
- The Art of Subnetting
- The Science of Subnetting
- Calculating Subnets
- Four Key Addresses
- Implementing the Plan
- Subnetting Case Study
- Variable-Length Subnet Masking
- Module Review and Discussion Questions

9. TCP and UDP

- Introduction
- TCP and UDP Headers
- Connection-Oriented vs. Connectionless Communications
- Transmission Control Protocol
- User Datagram Protocol
- TCP and UDP Port Numbers
- Network Address Translation
- Module Review and Discussion Questions

10. Support and Management Protocols

- Introduction
- Address Resolution Protocol
- Dynamic Host Configuration Protocol
- Domain Name System
- Internet Control Message Protocol (ICMP)
- Internet Group Management Protocol (IGMP)
- Telnet
- Simple Network Management Protocol (SNMP)
- Legacy Protocols: NetBIOS and NetBEUI
- Module Review and Discussion Questions

11. Routing

- Routing Overview
- Logical Segmentation
- Static vs. Dynamic Routing
- Routing Decision Process
- Route Protocol Operation
- Common Routing Protocols
- Configuring Routers

- Module Review and Discussion Questions

12. Wide Area Networks

- Introduction
- Evolution of WAN Technologies
- Sources of WAN Solutions
- Circuit Switched vs. Packet Switched
- Circuit Switched WAN Solutions
- Packet Switched WAN Solutions
- Internet WANS
- Module Review and Discussion Questions

13. Communications Protocols

- Introduction
- Electronic Mail
- Instant Messaging
- Voice over IP
- Unified Communications
- Module Review and Discussion Questions

14. Web Protocols

- Introduction
- Hypertext Transfer Protocol (HTTP)
- Secure Sockets Layer (SSL)
- Transport Layer Security (TLS)
- Remote Desktop Protocols
- File Transfer Protocol (FTP)
- Module Review and Discussion Questions

15. Network Security

- Introduction
- Security Threats
- Threat Mitigation
- Developing a Security Plan
- Module Review and Discussion Questions

16. Emerging Networking Technologies

- Introduction
- Improved Wireless Technologies
- Enterprise Mobility
- Internet of Things
- Software Defined Networks
- Keeping Up with New Technology
- Module Review and Discussion Questions

Classroom Live Labs

Lab 1: Connect and Configure a Workstation
Lab 2: Protocol Analysis with Wireshark
Lab 3: Examine Current Switch Configurations
Lab:4 Examine Spanning Tree
Lab 5: Configure a Wi-Fi Router
Lab 6: IPv4 Addressing Considerations
Lab 7: Create a Subnet Plan for a Small Network
Lab 8: Examine Support Protocols
Lab 9: Examine Router Configurations
Lab 10: Recognize Application of Different WAN Technologies
Lab 11: Examine an E-Mail Message with Wireshark
Lab 12: Examine an Instant Message Exchange with Wireshark
Lab 13: Examine a Web Transaction with Wireshark
Lab 14: Test Firewall
Lab 15: Research Anti-Malware
Lab 16: Research MDM Software

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Feb 23 - 27, 2026 | 8:30 AM - 4:30 PM EST

Mar 9 - 13, 2026 | 11:30 AM - 7:30 PM EDT

Mar 16 - 20, 2026 | 8:30 AM - 4:30 PM EDT

Apr 13 - 17, 2026 | 8:30 AM - 4:30 PM EDT

May 4 - 8, 2026 | 8:30 AM - 4:30 PM EDT

Jun 8 - 12, 2026 | 11:30 AM - 7:30 PM EDT

Jun 22 - 26, 2026 | 8:30 AM - 4:30 PM EDT

Jul 13 - 17, 2026 | 8:30 AM - 4:30 PM EDT

Aug 3 - 7, 2026 | 8:30 AM - 4:30 PM EDT

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PRIVATE GROUP TRAINING

5 Day

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