

# 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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Mar 31 - Apr 4, 2025 | 8:30 AM - 4:30 PM EDT

Apr 28 - May 2, 2025 | 8:30 AM - 4:30 PM EDT

May 5 - 9, 2025 | 8:30 AM - 4:30 PM EDT

Jun 23 - 27, 2025 | 8:30 AM - 4:30 PM EDT

Jul 21 - 25, 2025 | 8:30 AM - 4:30 PM EDT

Jul 28 - Aug 1, 2025 | 11:30 AM - 7:30 PM EDT

Aug 18 - 22, 2025 | 8:30 AM - 4:30 PM EDT

Sep 29 - Oct 3, 2025 | 8:30 AM - 4:30 PM EDT

Oct 6 - 10, 2025 | 8:30 AM - 4:30 PM EDT

Nov 10 - 14, 2025 | 8:30 AM - 4:30 PM EST

Nov 17 - 21, 2025 | 11:30 AM - 7:30 PM EST



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PRIVATE GROUP TRAINING

5 Day

Visit us at [www.globalknowledge.com](http://www.globalknowledge.com) or call us at 1-866-716-6688.

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