Networking Fundamentals

Terminus System

About the Course

This course prepares learners with the foundational knowledge and practical skills required to design, implement, manage, and troubleshoot modern network infrastructures. It covers essential networking concepts, including network architecture, protocols, addressing, and connectivity across wired and wireless environments. Participants will learn how to configure, monitor, and maintain network devices such as switches, routers, and access points while applying fundamental security practices to protect network resources. The course also introduces important operational tasks such as network documentation, performance monitoring, and the use of industry-standard troubleshooting tools and methodologies.

In addition, learners will gain an understanding of current networking technologies, including virtualization, cloud networking concepts, and common enterprise network services. They will develop the ability to analyze network traffic, identify performance or connectivity issues, and recommend appropriate solutions based on best practices. This course is designed for individuals pursuing careers in network administration, technical support, or IT infrastructure management. It also serves as preparation for the CompTIA Network+ certification, providing an objective validation of networking knowledge and practical skills relevant to today's IT environments.

Learning Objectives

1. Explain fundamental networking concepts.
2. Configure and manage IP networking.
3. Identify and compare network media and infrastructure.
4. Recognize and deploy essential network services and technologies.
5. Apply fundamental network security practices.
6. Use network management and troubleshooting tools and techniques.

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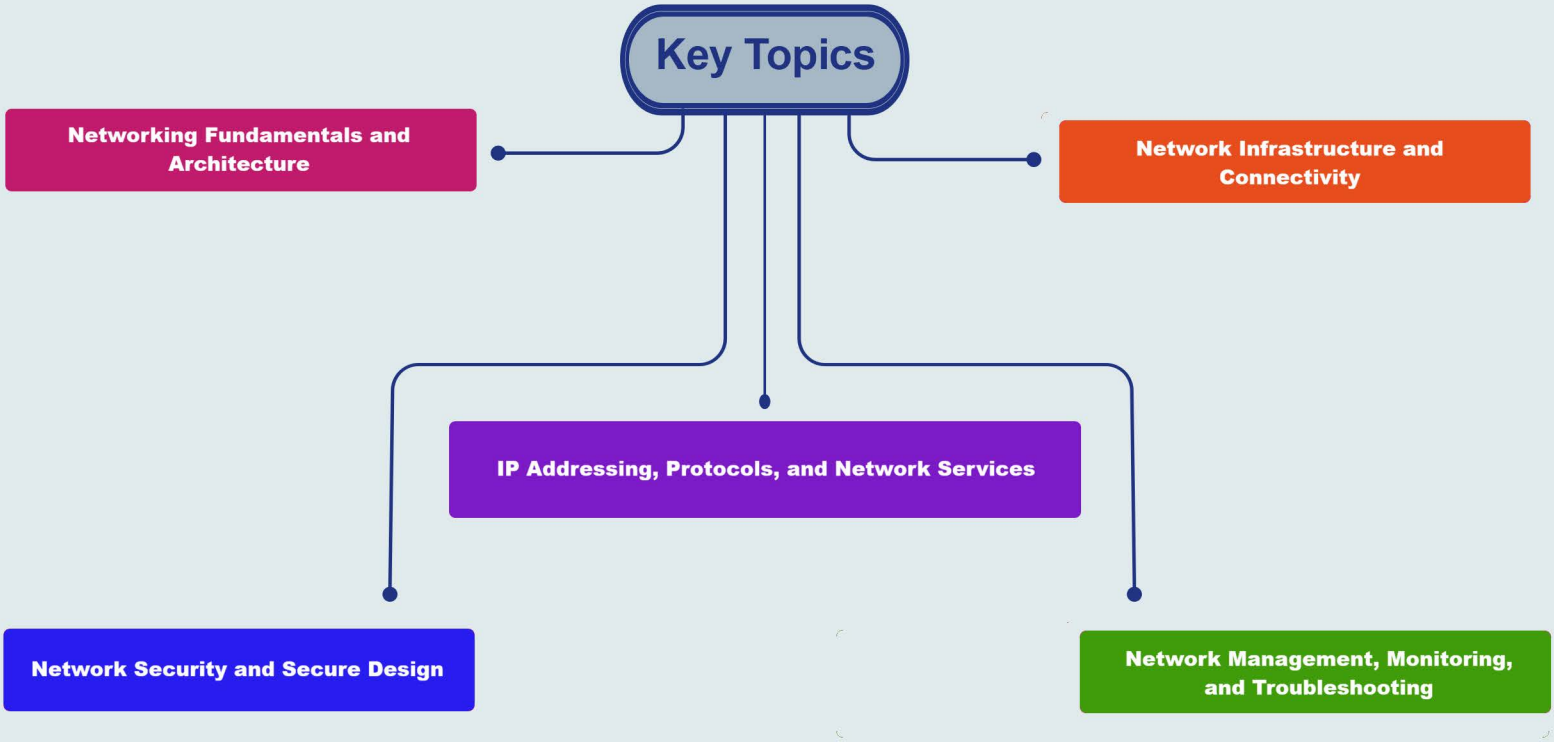
Key Topics



Pre Requisites

- **Basic Computer Literacy**
- **Fundamental Understanding of Information Technology Concepts**
- **Introductory Networking Knowledge (Recommended)**
- **Basic Command-Line and Troubleshooting Skills (Recommended)**

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What You Will Receive

Course Presentation File

Complementary Files & Toolkit

Who Should Attend

- Aspiring Network Administrators
- IT Support and Help Desk Technicians
- Junior IT Professionals
- Students pursuing careers in Information Technology
- Professionals preparing for the CompTIA Network+ certification

Syllabus

Introduction to Networking

- Peer-to-peer and client-server networks
- Types of applications and protocols used on a network
- Various networking hardware devices and the most common physical topologies
- The seven layers of the OSI model
- Best practices for safety when working with networks and computers
- The seven-step troubleshooting model for troubleshooting network problems

Infrastructure & Documentation

- Roles of various network and cabling equipment in commercial buildings and work areas
- Maintain network documentation
- Manage changes made to a network

Addressing

- MAC addresses
- TCP/IP settings
- Ports of several common network protocols
- Domain names and the name resolution process
- Troubleshoot common network problems

Protocols

- Functions of core TCP/IP protocols
- Protocol's information format
- Secure network connections using encryption protocols
- Remote access connection configuration between devices
- TCP/IP utilities for network discovery and troubleshooting

Cabling

- Basic data transmission concepts
- Physical characteristics of and official standards for coaxial cables, and their related connectors
- Benefits and limitations of various networking media
- Troubleshooting tools for common cable problems

Syllabus

Wireless Networking

- Characteristics of wireless transmissions
- IEEE 802.11 standards and innovations
- Plan a Wi-Fi network
- Secure a Wi-Fi network
- Troubleshoot a Wi-Fi network

Network Architecture

- Types of abstraction in the design of physical network architecture
- Virtualization technologies on a network
- Cloud characteristics, models, and connectivity options
- Methods to increase network availability

Segmentation

- Purposes of network segmentation
- How subnetting works
- Calculate subnets
- Configure VLANs

Wide Area Network

- Fundamental elements of WAN service options
- How routers manage internetwork communications
- WAN connectivity technologies
- Most common wireless WAN technologies
- Troubleshoot common connection problems

Network Security

- People, technology, and malware security risks to a network
- Increase network security through risk assessment and management
- Physical security to prevent and detect intrusions
- Device hardening techniques
- Security policies for secure users' activities on a network

Syllabus

Security in Network Design

- Incorporate security into the design of a network
- Functions and features of various network security devices
- Authentication, authorization, and accounting
- Compare authentication technologies

Performance and Recovery

- Appropriate tools to collect data about the network
- Methods to optimize network performance
- Best practices for incident response and disaster recovery

Hands-on Training

- **Network Discovery and Diagnostic Tools Lab**
- **Subnetting and IP Addressing Exercise**
- **Protocol and Port Identification Exercise**
- **Network Traffic Observation Lab**