# CompTIA Network+ (N10-008)

## Course Overview

This course prepares students to take the CompTIA Network+ N10-008 exam. Topics covered include network fundamentals, communication, infrastructure, operations, security, and troubleshooting.


**Chapter 1 - Network Fundamentals** 1h 52m
Instructor Introduction
Course Introduction
Network Fundamentals
Topic A: Introduction to Networking
What is a Network?
Network Building Blocks
Types of Networks
Host Requirements
Numbering Systems
Demo - Numbering Systems
Communicaton Types
Communication Concepts
Topic B: Network Models and Topologies
Networking Models
Workgroup vs. Domain
Network Topologies
Physical Bus
Physical Star
Physical Ring
Physical Mesh
Logical Topologies
Wireless Topologies
Topic C: Network Components and Services
Network Components and Services
Network Components and Services
Topic D: Network Standards
What is a Standard?
Why Use Standards?
Standards Organizations
IEEE Networking Standards
10Base Standards
Ethernet
Ethernet Frames
MAC Addresses
Access Methods
OSI / RM
Upper Layers

Lower Layers
Chapter 1 Review

**Chapter 2 - Network Communication** 3h 6m
Network Communication
Topic A: Cabling and Connectors
Transmission Methods
Serial vs. Parallel
Baseband vs. Broadband
Data Access Methods
Communication Domains
Data Access Methods
Digital Signals
Transmission Media
Twisted Pair Cabling
Cable Media Categories
Twisted Pair Connectors
Copper Media Types
Wiring Differences
Coaxial Cabling
Demo - Media Types
Fiber Optic Cabling
Connection Options
Fiber Optic Connectors
Demo - Optical Cables and Connectors
Media Converters
Transceivers
Demarcation Point
Other LAN Components
Wiring Individual Workstations
Connecting Cables
Punchdown Blocks
Demo - LAN Wiring
Topic B: Ports and Protocols
Overview of TCP/IP
TCP/IP Layers
Core Protocols
Transport Protocols
Transmission Control Protocol
User Datagram Protocol
What is a Socket?
Internet Layer
Core Internet Layer Protocols
IP Datagrams
Application Layer
Application Layer Protocols
Well-Known Ports
Demo - Ports and Protocols
Topic C: IP Addressing
Introduction to IP Addresses

Subnet Masks
IPv4 Address Rules
Valid Masks
Default Gateway
Demo - Working with Binary IP Addresses
Demo - Configuring IP Addresses
Address Categories
Public vs. Private Addresses
Classful Addressing
Classless Addressing
Demo - CIDR Notation
Create IPv4 Subnets
Simple Subnetting
Complex Subnetting
Demo - Creating Subnets
Introduction to IPv6
IPv6 Advantages
IPv6 Addresses
IPv6 Addressing
Global Unicast
Unique Local Unicast
Link-Local Address
Special Addresses
Autoconfiguration in IPv6
Demo - IPv6 Addressing
Demo - Objective Check
Chapter 2 Review

**Chapter 3 - Network Infrastructure** 1h 55m
Network Infrastructure
Topic A: Network Devices
Common Network Devices
Device Capabilities
OSI / RM Layers and Devices
Physical Devices
Network Interface Cards
Repeaters
Repeater Types
Hubs
Data Link Filtering
Network Bridge
Switches
Topic B: Network Switching
Switch Categories
Switch Characteristics
Power over Ethernet
Virtual Capabilities
Virtual LAN (VLAN)
Initial Switch Configuration
Interface Configuration

Introduction to STP
STP Port States
RSTP Differences
Understanding Trunking
Trunking Protocols
Additional Management for Switches
Demo - Objective Check
Topic C: Network Routing
Layer 3 Functionality
Routing Tables
Demo - Routing Tables
Network Segmentation Benefits
Hardware vs. Software Routers
Static vs. Dynamic Routing
Routing Protocols
Dynamic Routing
What is a Metric?
Distance Vector vs. Link State
Path Vector
Interior Routing Protocols
Exterior Routing Protocols
Routing Problems
Topic D: Additional Network Devices
Additional Network Devices
VoIP Phones
Load Balancers
Traffic Shapers
Intrusion Prevention Systems
Firewalls
Demo - Examining Firewalls
Monitoring Devices
Internet of Things (IoT)
SCADA
Internet Connectivity
Wireless Devices
Topic E: Datacenter Architecture
Three-Tiered
Access Layer
Aggregation Layer
Additional Designs
Network Locations
Software-Defined Networking
Software-Defined Networking (cont.)
Chapter 3 Review

**Chapter 4 - Network Implementations** 2h 50m
Network Implementations
Topic A: Network Services
Introducing DHCP
DHCP Leases

Lease Renewal
DHCP Server Placement
DHCP Implementations
DHCP Servers
Demo - Configuring DHCP
What is Name Resolution?
Types of Names
Introduction to DNS
DNS Components
Resource Records
DNS Zones and Domains
Name Resolution Process
Types of Queries
Demo - Configuring DNS
Topic B: Wireless Implementations
Wireless Networking Fundamentals
Wireless Networking Fundamentals
Types of Wireless
Wireless Networking Components
Demo - WAP Configuration
Wireless Modes
Wireless Devices
Wireless Networking Standards
802.11 Standards
Enhancing Wireless Performance
Wired Equivalent Privacy
Wi-Fi Protected Access
802.1x
Demo - Configuring Security Options
Planning Wireless Networks
Choosing Antennas
Antenna Types
Wireless Channels
Site Surveys
Topic C: Remote Access
Introduction to Remote Networking
Remote Node
Remote Desktop Control
Remote Control Concepts
Demo - Configuring Remote Control
Understanding Authentication
Authentication, Authorization, and Accounting (AAA)
CHAP and MS-CHAP
EAP and Other Authentication Protocols
RADIUS
What is a VPN?
VPN Tunnel Types
What is Encapsulation?
VPN Components
Encryption Types

VPN Concentrators
VPN Protocols
Demo - Creating and Configuring VPN Connections
Topic D: Cloud and Virtualization
What is Virtualization?
Virtualization Benefits
Virtual Machine Hosts
Virtualization and Cloud Computing
Demo - Virtualization Platforms
Virtualization Components
Demo - Create and Configure Virtual Machines
Virtual Devices and Networks
What is Cloud Computing?
The Cloud Advantage
Cloud Models
Cloud Services Models
Demo - Working in the Cloud
Chapter 4 Review

**Chapter 5 - Network Operations** 59m
Network Operations
Topic A: Organizational Documents and Policies
Organizational Documents and Policies
Plans and Procedures
Hardening and Security Policies
Network Documentation
Business Agreements
Topic B: Network Monitoring
Types of Monitoring
Performance Baselines
Monitoring Tools
Network Monitoring Types
Introduction to Network Tools
Analyzing Traffic
Interface Statistics
Environmental Monitoring
Using SYSLOG
Network Device Logs
Using SNMP
SNMP Components
SNMP Packet Types
Monitoring Operating Systems
Demo - Monitoring Operating Systems
Performance Metrics and Sensors
Patch Management
Operating System Updates
Updating Windows Systems
Managing Network Devices
Topic C: High Availability and Disaster Recovery
Maintaining Business Continuity

Understanding High Availability
High Availability Options
Disaster Recovery
Hardware Redundancy
Facilities and Infrastructure
High Availability Concepts
Key Terms
Chapter 5 Review

**Chapter 6 - Network Security** 1h 31m
Network Security
Topic A: Network Security Fundamentals
Introduction to Network Security
The CIA Triad
Network Threats
Network Vulnerabilities
Understanding Risk
What is AAAA?
Cryptography
Algorithms and Keys
Digital Signatures
Best Practices for Permissions
Best Practices for Employees
Defense in Depth
Topic B: Planning for Network Security
Planning for Network Security
Types of Threats
Threat-Vulnerability Pairs
Identifying Vulnerabilities
Types of Vulnerabilities
Mitigating Risks
Risk Assessments
Topic C: Identifying Threats and Vulnerabilities
Threat Categories
Introduction to Software Attacks
Malicious Code Attacks
Types of Malicious Code
Network Threats
Port Scanning and Eavesdropping
IP Spoofing
Denial of Service (DoS)
On-path Attacks
Human Attacks
Wireless Vulnerabilities and Threats
Topic D: Protecting the Network
Protecting the Network
Implementing Physical Protection
Physical Security Options
Anti-Malware
Demo - Anti-Malware Options

Network Hardening
Securing Network Communications
Best Practices
Demo - System Hardening
Wireless Security
Authentication
Authentication Factors
Network Access Control
Chapter 6 Review

**Chapter 7 - Network Troubleshooting** 1h 6m
Network Troubleshooting
Topic A: Troubleshooting Methodology
Introduction to Troubleshooting
Identifying the Issue
Establish a Theory of Probable Cause
Create an Action Plan
Putting it All Together
Topic B: Troubleshooting Tools
Hardware Troubleshooting Tools
Network Toolkit
Software Toolkits
OS Troubleshooting Tools
Demo - TCP/IP Troubleshooting Tools
Topic C: Troubleshooting Network Issues
Introduction to Wireless Issues
Wireless Signal Issues
Troubleshooting Hardware and Configuration
Wireless Security Issues
Troubleshooting Wired Connectivity Issues
Common Cable Issues
Troubleshooting Network Service Issues
Troubleshooting Security Issues
Chapter 7 Review
Course Closure

**Total Duration:** 13h 19m