

## CompTIA Network+ N10-005

- **Course Number:** Network+ N10-005
- **Length:** 7 Day(s)

### Certification Exam

This course is preparation for the CompTIA Network+™ N10-005 Certification exam

### Course Overview

The CompTIA Network+ Certification course builds on existing user-level knowledge and experience with personal computer operating systems and networks to present fundamental skills and concepts that students will use on the job in any type of networking career. If students are pursuing a CompTIA technical certification path, the CompTIA A+ certification is an excellent first step to take before preparing for the CompTIA Network+ certification.

### Prerequisites

A typical student in the CompTIA Network+ Certification course should have nine months or more of professional computer support experience as a PC technician or help desk technician. Network experience is helpful but not required; A+ certification or the equivalent skills and knowledge is helpful but not required.

An introductory course in a Windows operating system, or equivalent skills and knowledge, is required. Also, the CompTIA A+ certification, or the equivalent skills and knowledge, is helpful but not required.

### Audience

This course is intended for entry-level computer support professionals with basic knowledge of computer hardware, software, and operating systems, who wish to increase their knowledge and understanding of networking concepts and skills to prepare for a career in network support or administration, or to prepare for the CompTIA Network+ certification.

### Course Outline

#### Course Introduction

4m

Course Introduction

#### Objective 1.1 - The OSI and TCP/IP Models

38m

##### The OSI and TCP/IP Models

OSI Layer 7

OSI Layer 6

OSI Layer 5

OSI Layer 4

OSI Layer 3

OSI Layer 2

OSI Layer 1

LAN Compared with the OSI Model

TCP/IP Architecture

Demo - OSI Review

Objective 1.1 Review

**Objective 1.2 - Applications, Devices, Protocols**

**19m**

**Applications, Devices, Protocols**

Classifying Network Components

Objective 1.2 Review

**Objective 1.3 - IP Addressing**

**1h 22m**

**IP Addressing**

MAC Address

IPv4

Classful IPv4 Addresses

Subnet Masks

Network IDs

Special Addresses

CIDR

CIDR Address

APIPA

IPv6

IPv6 Address Types

IPv6 Address Scopes

Demo - Convert Binary

IPv4 Subnet Masks

IPv4 Custom Subnets

IPv6 Subnets

IPv6 Custom Subnets

Default Gateway

Routing Example

IPCONFIG and IFCONFIG

Demo - Examining IP Settings

Objective 1.3 Review

**Objective 1.4 - Routing and Switching**

**1h 21m**

**Routing and Switching**

Internetworking Devices

Ethernet Hub

Repeaters

Repeater Placement

Wireless Repeater

Repeater Operation  
Limitations of Repeaters  
Bridges  
Bridge Operation  
Bridge Types  
Bridge Routing Management  
Bridge Filtering and Intelligence  
Local and Remote Bridges  
Layer 2 Switch  
Configurations for Switched Networks  
Switched Network with Bottlenecks  
Switched Network without Bottlenecks  
Benefits of Switches  
Higher-level Switches  
Managed Layer 3 Switch  
Virtual LAN  
VLAN Filtering  
VLAN Trunking  
Trunking Example  
Demo - Intro to Routing and Switching VLANs  
Routers  
Router Operation  
About Routers  
Router Features  
Key Points  
Types of Routers  
Routing Table Contents  
Routing Metrics  
Routing Examples  
Brouters  
Bridges vs. Routers  
Objective 1.4 Review

### **Objective 1.5 - TCP and UDP Ports**

17m

#### **TCP and UDP Ports**

Transport-layer Protocols  
Port Addresses  
Service Port Numbers  
Demo - Port Numbers  
Demo - netstat  
Objective 1.5 Review

### **Objective 1.6 - Protocols**

21m

#### **Protocols**

Network Communication Protocols

TCP  
TCP Three-way Handshake  
Internet Protocol (IP)  
UDP  
Protocols  
Demo - Examining Ports and Protocols  
Objective 1.6 Review

**Objective 1.7 - The Domain Name System**

13m

**The Domain Name System**

DNS  
Top-level Domains  
DNS Namespace  
DNS Records  
Demo - Examining DNS  
Objective 1.7 Review

**Objective 1.8 - Troubleshooting Methodology**

17m

**Troubleshooting Methodology**

Troubleshooting  
Hardware Toolkit  
Additional Tools  
Software Toolkit  
Objective 1.8 Review

**Objective 1.9 - Virtual Networks**

29m

**Virtual Networks**

Virtual Computers  
Virtualization Concerns and Risks  
Demo - Viewing VM Components  
Cloud Computing  
Cloud Deployment  
Cloud Categories  
Risks and Concerns  
Objective 1.9 Review

**Objective 2.1 - Installing and Configuring Routers and Switches**

38m

**Installing and Configuring Routers and Switches**

Installing Routers and Switches  
Demo - Routing NAT  
Objective 2.1 Review

**Objective 2.2 - Installing and Configuring Wireless Networks**

33m

**Installing and Configuring Wireless Networks**

The 802.11 Standard

The 802.11 Family  
802.11 Networking  
Configuration Options  
Configuring Wireless Clients  
RADIUS  
Demo - Setting Up Wi-Fi  
Objective 2.2 Review

**Objective 2.3 – DHCP**

19m

**DHCP**

Static IP Addressing  
DHCP and DHCPv6  
IPv4 Lease Process  
IPv6 Lease Process  
IPv6 Router Flags  
M and O Flags  
Demo - DHCP  
Objective 2.3 Review

**Objective 2.4 - Troubleshooting Wireless Networks**

6m

**Troubleshooting Wireless Networks**

Troubleshooting Connections  
Common Problems  
Objective 2.4 Review

**Objective 2.5 - Troubleshooting Router and Switch Problems**

21m

**Troubleshooting Router and Switch Problems**

Common Problems  
Demo - Troubleshooting a Switch  
Demo - Troubleshooting a Router  
Objective 2.5 Review

**Objective 2.6 - Planning and Implementing a SOHO Network**

16m

**Planning and Implementing a SOHO Network**

Purposes of a Plan  
Creating a Plan  
Ongoing Planning  
Implementing a Plan  
Network Cable  
Objective 2.6 Review

**Objective 3.1 - Standard Media Types**

36m

**Standard Media Types**

Fiber Optic Cable  
Twisted-pair Cable  
Common UTP Categories

Additional TP Categories  
Stranded vs. Solid  
Straight-through, Cross-over, Rollover  
Pin Numbering of RJ-45 Connector  
T1 Crossover Cable  
Coaxial Cable  
RG Standards  
Plenums  
Media Converters  
Single-mode Fiber to UTP  
Broadband Over Power Line  
Access BPL  
BPL Modem  
Objective 3.1 Review

**Objective 3.2 - Standard Connector Types**

**30m**

**Standard Connector Types**

Fiber Optic Connectors  
Fiber Optic Connector Types  
Twisted-pair Connectors  
Pin Numbering of RJ-45 Connector  
Thinnet Connectors  
Terminating Coax with BNC  
RG-6 and RG-59 Connectors  
Serial Connectors  
Serial Cable  
Serial Console Connections  
Serial Cable Types  
Serial Data Rates  
Typical UTP Installation  
Telecommunications Room  
Termination Choices  
Punchdown Block  
Wire Placement  
Objective 3.2 Review

**Objective 3.3 - Wireless Standards**

**14m**

**Wireless Standards**

The 802.1x Standard  
The 802.11 Standard  
Access Point  
Major Wireless Protocols  
Device Compatibility

Channels  
Channel Bonding  
MIMO  
Objective 3.3 Review

**Objective 3.4 - WAN Technologies**

42m

**WAN Technologies**

Wide Area Networks  
Packet vs. Circuit Switching  
Demo - Packet Switching  
WAN Connections  
POTS/PSTN  
ISDN  
DSL  
Cable  
Satellite  
Wireless  
WiMAX  
Cellular  
T and E Lines  
X.25 and Frame Relay  
ATM  
SONET and SDH  
DWDM  
PON  
Objective 3.4 Review

**Objective 3.5 - Network Topologies**

33m

**Network Topologies**

Local Area Networks  
Network Topologies  
Logical Network Topologies  
Peer-to-peer Model  
Decentralized  
Peer-to-peer Authentication  
Client/Server Model  
A Client/Server LAN  
Client/Server Authentication  
Star Topology  
Bus Topology  
Ring Topology  
Mesh Topology  
Hybrid Topology  
Point-to-point vs. Point-to-multipoint  
MPLS

Label Edge Routers  
Demo - Topology  
Objective 3.5 Review

**Objective 3.6 - Troubleshooting Physical Connectivity**

12m

**Troubleshooting Physical Connectivity**

Troubleshooting Wired Connections  
Cable Testing Devices  
Physical Cable Tests  
Objective 3.6 Review

**Objective 3.7 - LAN Technologies**

22m

**LAN Technologies**

Ethernet  
Ethernet Media  
10-Gigabit Ethernet Standards  
Gigabit Ethernet Standards  
Fast Ethernet Standards  
10BASE-T  
Ethernet Bonding  
Data Transmission  
Data Collisions  
Channel Access Methods  
Demo - LAN Cable Types  
Objective 3.7 Review

**Objective 3.8 - Wiring Distribution Components**

20m

**Wiring Distribution Components**

Network Access Points  
Demo - Packet Tracing  
Internet Service Providers (ISPs)  
Small ISPs  
Regional ISP  
LAN Installation Components  
Cross-connects  
MDF to IDF Connections  
Standards  
Workstation Drops  
Typical UTP Installation  
Telecommunications Room  
Objective 3.8 Review

**Objective 4.1 - Network Appliances**

10m

**Network Appliances**

Networking Appliances



Demo - The Purpose of Network Devices

Objective 4.1 Review

**Objective 4.2 - Network Hardware Tools**

15m

**Network Hardware Tools**

Cable Testing Device

Physical Cable Tests

Network Function Tests

Cable Certifier

Additional Features

Testing a Basic Permanent Link

Crimpers

Coax Crimper

Twisted-pair Cable Crimper

Using a Fiber Optic Cable Crimper

Terminating Fiber Optic Cable

Butt Set

Butt Set Uses

Modapt Device

Toner Probe

Using a Toner Probe

Punchdown Tools

Using a Punchdown Tool

Network Analyzer

Loopback Plugs

TDR

OTDR

Multimeters

Measuring Resistance

Measuring Voltage

Measuring Current

Measuring Continuity

Environmental Monitor

ASHRAE 9.9 Guidelines

Objective 4.2 Review

**Objective 4.3 - Network Software Tools**

31m

**Network Software Tools**

Network Analyzer

TCP/IP Utilities

IPConfig

Ifconfig

Ping (Packet Internet Groper)

Ping Troubleshooting

NSLookup and Tracert

Demo - Software Tools	
Objective 4.3 Review	
<b><u>Objective 4.4 - Monitoring Network Traffic</u></b>	<b>27m</b>
<b>Monitoring Network Traffic</b>	
Performance Monitor	
Performance Objects	
Bottlenecks	
Demo - Performance and Monitoring	
Configuration	
Event Viewer	
Event Information	
Event Types	
Device and Application Logging	
Syslog	
Syslog Alert Levels	
SNMP	
Network Monitor	
Demo - Network Monitoring	
Objective 4.4 Review	
<b><u>Objective 4.5 - Management Documentation</u></b>	<b>7m</b>
<b>Management Documentation</b>	
Change Management	
Configuration Documentation	
Objective 4.5 Review	
<b><u>Objective 4.6 - Optimizing Network Performance</u></b>	<b>11m</b>
<b>Optimizing Network Performance</b>	
Rationales	
Methods	
Objective 4.6 Review	
<b><u>Objective 5.1 - Implementing Wireless Security</u></b>	<b>14m</b>
<b>Implementing Wireless Security</b>	
Wireless Security	
Transmission Encryption	
Demo - Wireless Security	
Objective 5.1 Review	
<b><u>Objective 5.2 - Network Access Security Methods</u></b>	<b>28m</b>
<b>Network Access Security Methods</b>	
Network Access Control	
Access Control Lists	
VPN Technologies	
VPN Security Models	

VPN Protocols  
PPTP vs. L2TP  
IPSec Protocols  
IPSec Encryption  
PPPoE  
Remote Desktop Services  
SSH  
Demo - Network Security  
Objective 5.2 Review

### **Objective 5.3 - User Authentication**

43m

#### **User Authentication**

AAA  
Authentication Factors  
One-factor Authentication  
Two-factor Authentication  
Three-factor Authentication  
Single Sign-on  
Kerberos  
Kerberos System Components  
Kerberos Data Types  
Kerberos Authentication Process  
CHAP  
EAP  
PPPoE  
Mutual Authentication  
Cryptography  
ROT13 Cipher  
Keys  
Symmetric Encryption in Action  
Public Key Cryptography  
Asymmetric Encryption in Action  
Demo - Encryption  
Public Key Cryptography  
Public Key Infrastructure  
Setup and Initialization Phase  
RADIUS  
RADIUS Authentication  
TACACS+  
TACACS+ vs. RADIUS  
802.1x  
Objective 5.3 Review

## **Objective 5.4 - Network Security Threats**

1h

### **Topic A: Attacks and Threats**

Wireless Security Threats

Vulnerabilities of Access Points

Wi-Fi Scanners

War Chalking Symbols

Denial-of-Service Attacks

Distributed DoS Attacks

DDoS Countermeasures

Man-in-the-Middle Attacks

Buffer Overflow

FTP Bounce Attacks

Smurf Attacks

Malware

Social Engineering

Attack Types

Social Engineering Countermeasures

### **Topic B: Mitigation**

Antivirus Software

Securing the Operating System

Windows Update

Updates

Patch Management

Security Policies

Acceptable Use

Due Care

Privacy

Separation of Duties

Need to Know

Password Management

Account Expiration

Service-level Agreement

Disposal and Destruction

Human Resources Policies

Incident Response Policy

Preparation

Detection

Containment

Eradication

Recovery

Follow-up

Education

Communication

User Awareness

Demo - Vulnerability

Objective 5.4 Review

**Objective 5.5 - Installing and Configuring a Firewall**

**23m**

**Installing and Configuring a Firewall**

Firewalls and Proxies

Firewall Categories

Security Zones

Intranet Zone

Perimeter Network

DMZ Options

Screened Host

Bastion Host

Three-homed Firewall

Back-to-back Firewalls

Dead Zone

Traffic Filtering

NAT and PAT

Port Address Translation

Firewall Administration

Rule Planning

Demo - Firewall Rules

Port Security

Objective 5.5 Review

**Objective 5.6 - Network Security Appliances and Methods**

**35m**

**Network Security Appliances and Methods**

Assessment Types

Vulnerability Assessments

Vulnerability Testing Tools

Demo - Scanning

Intrusion Detection

Events

NIDS

IDScenter for Snort

Example Snort Rule

HIDS

Advantages of HIDS over NIDS

Honeypots and Honeynets

Honeypot Examples

Honeypot Deployment

Objective 5.6 Review

Course Closure

**Total Duration: 18h 46m**