



# CompTIA Network+ Course

Duration: 5 Days

Language: English

Course Delivery: Classroom

## Target Audience

Comprehensive approach to both preparing a student for CompTIA's Network+ exam and developing proficiency in networking fundamentals and advanced networking topics.

## Prerequisites

Exam targeted for technicians with 18-24 months experience in IT industry. Typical student would have A+ certification or equivalent knowledge, but A+ certification is not required.

## Course Outline:

### 1 Networking fundamentals

- Why do we need Network?
- A brief Survey of Networking
- Mainframes
- The PC Revolution
- The development of local Area networks (LANs)
- The development of wide area Networks (WANs)
- Other Networks
- Intranets
- Segments and Backbones
- The Internet
- Extranets
- Network Topologies
- Point-to-Point topologies
- Broadcast Topologies - 1
- Broadcast Topologies - 2
- Broadcast Topologies - 3
- Co-operative Networking
- Peer-to Peer Networking
- Client/server Networking
- Master/slave Networking
- Features and benefits of Networks

### 2 Network Protocols

- What is a network protocol?
- The need for Standards
- OSI 7-Layer Reference Model - Basics
- OSI 7-Layer Reference Model - Layer
- OSI 7-Layer Reference Model - Protocols
- Protocol Data Unit (PDU)
- Data flow
- Data Link Sublayers
- Addressing
- Service Access point (SAP)
- MAC Addresses
- Network Addresses



## Network Devices and the 7-layer Model The Need for Network Devices

### Main Types of Network Devices

Repeaters

Hubs

Multistation Access Units-token Ring MAU

Bridges

Transporting Bridging

Problems with transporting Bridging -loops

Spanning tree Algorithm

Switched Hubs

The Network Layer and Packet Routing

Routers

Gateways

Major network Protocols

Transmission control protocol-TCP/IP

Novell Netware Protocols

Apple talk Protocols

NetBIOS Extended User Interface

(NetBEUI)

other Network Protocol

802 standards

### 3 Physical links & interfaces

Basic Physical Network Components

Network Adapter cards

Network card configuration

Coaxial cabling

types of coaxial cabling: thinnet (10base2)

cabling

Thinnet Connectors & Terminators

thicknet (10Base5) Cabling

Coaxial Cabling Considerations

Cabling: Twisted pair

Twisted pair connectors

Using a crimping tool

Cable Categories

Fiber Optic Cabling

Structured Cabling

Remote Connectivity Modems

Direct Connections - Leased Lines

Dial-up Networking - POTS

Operation

UART

RS-232

DB-9 Connectors

Null Modem Connection

Modem Speeds

Modem Standards

Modem Installation

Modem Troubleshooting

Modem Diagnostics

Integrated Services Digital Network - ISDN

Integrated Services Digital Network (ISDN)



Terminal Adaptors  
Comparison of ISDN and PSTN  
Other Connectors

#### **4 LAN Technologies**

Overview of LAN Technologies  
Ethernet Operation  
Early Ethernet Implementations  
Ethernet Frame Formats  
Ethernet Limitations  
Faster Ethernet Standards  
Token Ring  
IBM Token Ring: Physical Specification  
Token Ring Frame Format  
FDDI  
FDDI Specifications and Standards  
FDDI Physical Connections  
FDDI Fault Tolerance  
FDDI Frame Format  
Other LAN Technologies

#### **5 WAN Technologies**

Features of WAN Technologies  
Remote Connection Types  
Direct Connections - Leased Lines  
High-level Data Link Control - HDLC  
Circuit-switched Networks  
Serial Line Internet Protocol - SLIP  
Dial-up Networking via the internet  
Point-to-Point Tunneling Protocol (PPTP)  
Packet-switched Networks  
X.25  
X.25 and the OSI Reference Model  
Frame Relay  
Frame Relay Operation  
Frame Format  
Asynchronous Transfer mode (ATM)

#### **6 Network Operating Systems and Applications**

Overview of Network Operating Systems  
Resource Sharing  
Principal Networking Operating Systems  
Microsoft Windows NT/2000  
Novell Netware  
UNIX  
Network Operating System Interoperability  
Client Based Interoperability  
Gateway Based Interoperability  
Choosing a Network Operating System  
Network Applications  
E-Mail and X.400  
Directory Services and X.500  
Distributed Applications



## 7 Fundamentals of TCP/IP History

Standards

TCP/IP Protocols and Architecture

Comparison with OSI Architecture

Network Interface Layer

Internet Layer - Internet Protocol (IP)

IP Packet Structure

Address Resolution Protocol (ICMP)

Internet Group Management Protocol (IGMP)

Transport Layer

Transmission Control Protocol (TCP)

TCP Segment Structure

UDP Datagram Structure IP Addressing

Network ID and Host ID

Classes of IP Address

IP Address Restrictions

Private IP Addresses

Subnet Masks and Routing

Static vs Dynamic Routing

Static Routing

Dynamic Routing

Dynamic Routing Protocols

Classless Inter-Domain Routing (CIDR)

Ipv6 - IP version 6

TCP/IP Utilities

Remote Execution Utilities

Printing Utilities

Diagnostic Utilities

## 8 TCP/IP Applications

Ports and Sockets

Automatic TCP/IP Configuration - DHCP

DHCP Mechanisms

DHCP Implementation

Name Resolution

Hostname Resolution using the HOSTS File

FQDN Resolution using DNS (Domain

Name System)

Domain Name System (DNS)

DNS Name Space

Zones of Authority

Name Server Roles

Name Resolution

Domain Registration

NetBIOS Name Resolution using the

LMHOSTS File

Name Resolution by NetBIOS Name

Server - NBNS

Advantages of NBNS

Integrating WINS and DNS

Internet Access

Overview of the Internet



The World Wide Web  
Hypertext Mark-up Language  
Browsers  
Internet Service Providers  
Firewalls  
Proxy Servers  
E-mail  
Using E-mail Simple Mail Transfer Protocol - SMTP  
Post Office Protocol Version 3 (POP3)  
Other TCP/IP Utilities  
File Transfer Protocol - FTP  
Trivial File Transfer Protocol - TFTP  
Terminal Emulation - TELNET  
Simple Network Management Protocol - SNMP  
Management Information Base - MIB  
SNMP Communities and Security

## **9 Network Administration**

Overview of Network Administration  
Managing Hardware and Software  
Making Network Resources Available  
User Accounts  
User Privileges  
User Profiles  
Assigning Permissions to Shared resources  
Choosing a File System  
Network Security  
Threats - Internal and External  
Password Policies  
Data Encryption  
Viruses  
Internet Issues  
Preserving Data  
Physical Failures  
Media Failures - Disk Crashes  
Disk Mirroring  
Disk Duplexing  
Disk Striping With Parity  
System Failures  
Mirrored Servers  
Network Failures  
Power Supply Problems  
Software Bugs  
Accidental Damage to Data  
Back-up Strategies  
Full Backup Strategy  
Differential Backup Strategy  
Incremental Backup Strategy  
Disaster recovery Planning  
Optimizing Performance  
Network Troubleshooting  
Step-by Step Troubleshooting  
Common Problems



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