

CompTIA Network+ 2009 Edition R3

Course Introduction

9m

Module 01 - Network Basics

3h 54m

Topic A: Network Concepts

Networks

Local Area Networks

Basic Network Types

Peer-to-Peer Model

Peer-to-Peer Authentication

Client/Server Model

Client/Server Authentication

Segments and Backbones

Network Wiring

Fiber Optic

Twisted Pair

Composite Cable

Coaxial

Live Demo: Cable Types

Serial

Duplex

Wireless LAN

Benefits/Drawbacks of WLANs

Network Protocols

Wireless Network Protocols

Topic B: Network Architectures

Network Architecture

Star Architecture

Bus Architecture

Ring Architecture

Mesh Architecture

Hybrid Architecture

Point-to-Point

Point-to-Multipoint

Packet vs. Circuit Switching

Ethernet

Ethernet Mediums

Ethernet Standards

Ethernet Networks

Data Collisions

Channel Access Methods

Token Ring Networks

Wireless LANs

Wide Area Networks

WAN Connections

POTS/PSTN

ISDN

DSL

Cable

Satellite

Wireless WAN

Cellular

T and E Lines
X.25 and Frame Relay
ATM
Mesh Networks

Topic C: The OSI Model

OSI Model
OSI Layer 7
OSI Layer 6
OSI Layer 5
OSI Layer 4
OSI Layer 3
OSI Layer 2
OSI Layer 1
Module 01 - Review

Module 02 - Wired Computer-to-Computer Connections

2h 29m

Topic A: Wired Network Connections

Fiber Optic Wired Connections
SONET
Fiber Optic Connectors
Fiber Optic Connector Types
Twisted Pair Connections
UTP Categories
Stranded vs. Solid
Twisted Pair Connectors
RJ Connectors
Modern Residential Wiring
RJ-45 Connector
Pin Numbering of RJ-45 Connector
Terminating CatX to RJ-45
Live Demo: Crossover Cable
Coaxial Connections
RG Standards
Thinnet Connectors
Live Demo: Thinnet Connectors
Thicknet Vampire Tap
Plenum

Topic B: Network Interface Cards and Modems

Network Adapter
Live Demo: NIC Installation
Live Demo: NIC Removal
Internal NICs
Notebook Computers
NIC Selection
Live Demo: NIC Card
Live Demo: PCM CIA
Addressing
MAC Address
IPv4
IPv6
Character-Based Names
Domain Name System (DNS)

Demo: Examining Addresses
Top-Level Domains
NetBIOS
Resolving NetBIOS by Broadcast
Resolving NetBIOS by WINS
Port Addresses
Modems
Modulation/Demodulation
Riser Cards
Softmodems
Dial-Up Connection Creation
Vista Dial-Up Connection Wizard
Vista Connect to Workplace
Dial-Up Connection Properties
Demo: Create Dial-Up
Module 02 - Review

Module 03 - Network-to-Network Connections

58m

Topic A: Network-to-Network Connection Components

Network Access Points
Internet Service Providers (ISPs)
Small ISPs
Regional ISP
LAN Installation Components
Cross-Connects
Standards
Typical UTP Installation
Telecommunications Room
Punchdown Block
Live Demo: Punchdown Block
Wire Placement

Topic B: LAN Wiring

LAN Wiring Categories
Guidelines
Backbone Installation
Workstation Runs
Calculate Workstation Run Length
Modular Office Systems
Telecommunications Room Management
Telecommunications Room Equipment
Patch Panel
Connecting Block
Punchdown Tool
Punchdown Procedure
Live Demo: Punchdown Tool

Topic C: LAN Wiring Tests

LAN Wiring Tests
Testing Equipment
Module 03 - Review

Topic A: Basic Internetworking Devices

Common Internetworking Devices

Repeaters

Repeater Placement

Repeater Operation

Repeater Issues

Bridges

Bridge Operation

Bridge Types

Bridge Routing Management

Bridge Filtering and Intelligence

Local and Remote Bridges

Layer 2 Switch

Bridges vs. Switches

Live Demo: Switch

Trunking Example

Routers

Router Operation

About Routers

Router Features

Key Points

Types of Routers

Routing Table Contents

Routing Examples

Brouters

Bridges vs. Routers

Ethernet Hub

Hub Types

Token Ring MSAU

Token Ring Distances

MSAU Functions

Media Converters

Firewalls

Firewall Functions

Hardware Firewall

Software Firewall

Proxy Server

Port and Packet Filtering

Topic B: Specialized Internetworking Devices

Higher-Level Switches

Content Switches

IDS and IPS

IDS

Malicious Traffic Detected by IDS

IPS

Traffic Shapers

Multiprotocol Label Switching (MPLS)

Multifunction Network Devices

Module 04 - Review

Topic A: The TCP/IP Protocol Suite

Network Communication Protocols
TCP/IP Architecture
Network Interface Layer Protocols
Address Resolution Protocol (ARP)
MAC Address Filter
Data Packet Addresses
ARP Request Packet Structure
ARP Reply Packet Structure
Router Forwarding
IPConfig
Demo: ARP Connectivity
Internet Layer Protocols
Internet Protocol (IP)
RIP/RIPv2 and OSPF
ICMP/ICMPv6
IGMP
SSH
Transport Layer Protocols
Service Port Numbers
Demo: Port Numbers
TCP
TCP Three-Way Handshake
Microsoft Network Monitor
UDP
Demo: Packet Capture
Application Layer Protocols
HTTP
FTP
Telnet
Demo: Using Telnet
NTP
Email Messaging Protocols

Topic B: TCP/IP

IPv4
Classful IPv4 Addresses
Subnet Masks
Network IDs
Special Addresses
CIDR
CIDR Address
Demo: Binary Conversion
Demo: Subnetting Theory
Demo: Subnetting Practical
NAT
APIPA
IPv6
IPv6 Address Types
IPv6 Address Scopes
Subnet Mask Communication
IPv4 Custom Subnets
IPv6 Subnets
IPv6 Custom Subnets

- Default Gateway
- Address Translation
- DNS
- DNS Namespace
- WINS
- Static TCP/IP Configuration
- DHCP and DHCPv6
- IPv4 Lease Process
- IPv6 Lease Process
- IPv6 Router Flags
- M and O Flags

Topic C: DHCP Servers

- Installing a DHCP Server
- Demo: DHCPv4
- IPv6 Scopes
- Demo: DHCPv6
- Module 05 - Review

Module 06 - Wireless Networking

1h 41m

Topic A: Wireless Network Devices

- Wireless
- Wireless Connections
- Infrared
- Radio
- Bluetooth
- Wireless Communications
- Indoor Point-to-Multipoint LANs
- Live Demo: Wireless Router
- Outdoor Point-to-Point Links
- Outdoor Point-to-Multipoint Links
- Wireless Connection Components
- Wireless NICs
- Live Demo: Wireless Network Adapters
- Live Demo: USB Wireless
- Wireless Access Points
- Wireless Speeds
- WAP Placement

Topic B: Wireless Networking Standards

- Standards
- 802.1x Standard
- 802.11 Standard
- Access Point
- 802.11 WLAN Standards
- Wireless Protocols
- LAN Technologies
- Wi-Fi
- Bluetooth
- 802.11a/802.11g
- WiMAX

Topic C: Wireless Configuration

WLAN Security Risks
Additional Risks
WLAN Security Components
Transmission Encryption
802.1x Authentication
Wireless Access Point Configuration
Securing Your AP
Demo: WAP
Wireless Clients
Wireless Auto Configuration
Windows CE Wireless Clients
Module 06 - Review

Module 07 - Security Threats and Mitigation

1h 54m

Topic A: Security Threats

Security Threat Categories
Technology Weaknesses
Configuration Weaknesses
Human Error and Malice
Viruses, Worms, Trojan Horses
Social Engineering
Dumpster Diving
Online Attacks
Countermeasures
Phishing
Denial of Service Attacks
SYN Flood Attack
SYN Flood Defense
Smurf Attacks
Ping of Death
Distributed DoS Attacks
DDoS Countermeasures
Demo: DDoS
Man-in-the-Middle
Spoofing
IP Address Spoofing
Demo: Port Scanner

Topic B: Threat Mitigation

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 Policy
Incident Response Policy
Preparation
Detection

Containment
Eradication
Recovery
Follow-Up
Change Management
Configuration Management Documentation
Education
Communication
User Awareness
Types of Training
Module 07 - Review

Module 08 - Security Practices

2h 9m

Topic A: Operating Systems

Antivirus Software
Demo: Antivirus
Spyware
Windows Defender
Demo: Spyware
Securing the Operating System
Windows Update
Update Categories
Patch Management
Demo: Windows Updates
Other Updates
System Information
Windows Firewall
Demo: BIOS
Demo: Firewall

Topic B: Devices

Firewalls and Proxy Servers
Security Zones
Intranet
Perimeter Network
DMZ
Screened Host
Bastion Host
Three-Homed Firewall
Back-to-Back Firewall
Dead Zone
Traffic Filtering
Network Access Control
Virtual Private Network
IPSec Encryption
Demo: IPSec
Security Issues
Built-In Management Interfaces
Secure and Insecure Methods
Physical Attack Susceptibility
Overcoming Device Weaknesses
Intrusion Detection and Prevention
NIDS
HIDS

HIDS Advantages
Physical Access Control
Surveillance
Module 08 - Review

Module 09 - Network Access Control

2h 16m

Topic A: Authentication

AAA
Usernames and Passwords
Password Protection
Strong Passwords
Multiple Passwords
Authentication Factors
One-Factor Authentication
Two-Factor Authentication
Three-Factor Authentication
Live Demo: Thumb Scanner
Authentication Protocols
Preventing Impersonation
Identify Proofing
Single Sign-On
Kerberos
Kerberos System Composition
Kerberos Data Types
Kerberos Authentication Process
Kerberos Security Weaknesses
CHAP
EAP
Mutual Authentication

Topic B: Public Key Cryptography

Cryptography
ROT13 Cipher
Keys
Symmetric Encryption in Action
Public Key Cryptography
Asymmetric Encryption in Action
Public Key Cryptography Characteristics
Public Key Infrastructure
Demo: Public Key Infrastructure
Setup and Initialization Phase
Administration Phase
Cancellation and History Phase

Topic C: Remote Access

AAA
RADIUS
RADIUS Authentication
Realms
RADIUS Security
RADIUS Benefits
Diameter
Diameter Improvements
LDAP and Remote Access

- LDAP Security
- LDAP Authentication/Authorization
- TACACS+
- TACACS+ vs. RADIUS
- 802.1x
- Virtual Private Networks
- VPN Technologies
- VPN Security Models
- VPN Protocols
- PPTP vs. L2TP
- IPSec Protocols
- Encryption Modes
- Secure Shell (SSH)
- VPN Solutions
- Service Provider Tunneling

Topic D: Wireless Security

- 802.11 Standard
- Wireless Security
- Wireless Vulnerabilities
- Wi-Fi Scanners
- Warchalking Symbols
- Module 09 - Review

Module 10 – Monitoring

59m

Topic A: Monitoring Resources

- Resource Overview
- Performance Monitor
- Performance Objects
- Demo: Performance Monitor
- Bottlenecks
- Configuration
- Data Collector Sets
- Data Collector Set Reports
- Demo: Data Collector Sets
- Reliability Monitor
- Remote Desktop
- Remote Desktop Options
- Remote Desktop Connection
- Demo: Remote Desktop

Topic B: Event Viewer

- Event Viewer
- Event Information
- Event Types
- Remote Logs
- Event Forwarding
- Demo: Event Forwarding
- Source Computers
- Collecting Computers
- Subscriptions
- Device and Application Logging
- Module 10 - Review

Module 11 – Troubleshooting

1h 32m

Topic A: Troubleshooting Basics

Troubleshooting
Information Gathering
Identify the Affected Area
Determine If Anything Has Changed
Establish Probable Cause
Determine If Escalation Is Necessary
Create an Action Plan
Implement and Test a Solution
Identify Results and Effects
Document Problem and Solution
Problem and Resolution Tracking
Hardware Toolkit
Live Demo: Multimeter
Additional Tools
Software Toolkit

Topic B: Troubleshooting The Network

Troubleshooting Wired Connections
Cable Testing Devices
Physical Cable Tests
Live Demo: Troubleshooting
Network Function Tests
Network Analyzer
Troubleshooting Wireless
TCP/IP Utilities
IPConfig
Unix IFConfig
Ping
Ping Troubleshooting
NSLookup and Tracert
Windows Network Diagnostics
Demo: Troubleshooting Connections
Demo: Network Diagnostic

Topic C: Troubleshooting Scenarios

Remote Desktop Components
Module 11 - Review
Course Closure

Total Duration: 25 hrs 53 min