

Course Outline

Network+

Duration: 5 days (30 hours)



Learning Objectives:

- Install and configure a network card
- Define the concepts of network layers
- Understand and implement the TCP/IP protocol
- Install and manage Windows NT
- Use test equipment to troubleshoot network connectivity
- Identify network topologies, cabling, connectors, and components
- Install and configure a network card and client software
- Identify network protocols and define the concepts of network layers
- Understand and implement the TCP/IP protocol
- Identify the features of network and client operating systems (Windows, NetWare, Linux, Mac OS)
- Configure remote and wireless network connections
- Configure user and security settings for an operating system
- Use test equipment to troubleshoot network connectivity

Target Audience:

This course has been created for students with the responsibility for installing, maintaining and troubleshooting local area networks, with particular emphasis on Microsoft Windows and Novell NetWare. The course has been developed to produce competent network support engineers that are capable of taking and passing CompTIA's "Network+ Certification" exam. This qualification is particularly recommended for students who wish to progress to the Microsoft Certified Systems Engineer qualification

Prerequisites:

- Taken and passed both A+ Certification exams or have equivalent knowledge and experience
- Six months to one year of post A+ Certification support experience
- Extensive experience of supporting end-users and PC-based systems

Topics Covered:

- Networking Fundamentals
 - LANs, WANs and the Internet
 - Uses and Benefits of a LAN
 - Network Components
 - Server-based Networks
 - Peer-to-Peer Networks

- Introduction to Topologies
 - Physical and Logical Topologies
 - Star
 - Bus
 - Ring
 - Other Topologies
 - Introduction to Transmission Media
 - Media Bandwidth
 - Media Types
 - Twisted-pair Cable (TP)
 - Coaxial Cable
 - Fiber Optic Cable
 - Firewire (IEEE 1394)
 - USB
 - Structured Wiring Systems
 - Crimping Cables
 - Wiring for UTP Cable
 - Wiring for a Cross-over Cable
 - Installing a NIC
 - Network Card Drivers
- The OSI Model
- Introducing the OSI model
 - Physical Layer
 - Data Link Layer
 - 802 Standards
 - Media Access
 - Contention
 - Token Passing
 - Demand Priority
 - Ethernet
 - Token Ring
 - Fiber Distributed Data Interface (FDDI)
 - AppleTalk
 - Network components (Repeaters, Hubs, MAUs, Switches, Bridges)
 - Network Layer
 - Transport Layer
 - Routers
 - Static and Dynamic Routers
 - Brouters
 - Layer 3 Switches
 - Overview of Transport Protocols
 - Characteristics of Network Protocols
 - Choosing a Protocol
 - Adding and Removing Protocols

- Session, Presentation and Application Layers
- Client/Server Protocols
- Major Network Operating Systems
 - Server Network Operating Systems
 - Workstation Software
 - Identifying a Machine on the Network
 - Connecting to Network Resources
 - Using Network Printers
 - Shared Fax Systems
 - Macintosh Clients
 - Network Applications
 - E-mail
 - Scheduling
 - GroupWare
 - Shared Network Applications
 - Novell NetWare
 - Windows NT
 - The Windows 2000 Family
 - The Windows 2003 Family
 - Combining Windows and NetWare
 - The Network File System (NFS)
 - UNIX
 - Linux
 - OS/2
 - Apple Macintosh
 - Client-Server Systems
 - Network Attached Storage
 - Configuring network services
- TCP/IP Fundamentals
 - Development of TCP/IP
 - Why is TCP/IP so Popular?
 - TCP/IP as an Open Standard
 - The TCP/IP Protocol Suite
 - Transmission Control Protocol (TCP)
 - User Datagram Protocol (UDP)
 - Internet Protocol
 - TCP/IP Services
 - E-mail (SMTP Protocol)
 - Post Office Protocol (POP)
 - Internet Message Access Protocol (IMAP)
 - The World Wide Web: HTTP
 - Other TCP/IP Services
 - TCP/IP Ports
 - TCP/IP Filtering

- IP Addresses
- Subnet Mask
- Creating Subnets
- Planning an IP Addressing Scheme
- Applying for an Internet Network Address
- Address Allocation for Private Networks
- Default Gateway
- Supernetting
- IP Version 6
- ZEROCONF Networks
- TCP/IP Configuration Parameters
- Dynamic Host Configuration Protocol
- Host Names and FQDNs
- Name Resolution using the HOSTS File
- Name Resolution using DNS
- Server (NetBIOS) Names
- UNC Names
- Name Discovery
- Using an LMHOSTS File
- WINS Servers
- TCP/IP Utilities
- ARP / RARP
- PING
- TRACERT / TRACEROUTE
- NETSTAT
- ROUTE
- NBTSTAT
- IPCONFIG
- IFCONFIG
- NSLOOKUP
- FTP
- Network Remote Access
 - Wireless Networks
 - Wireless Transmission Techniques
 - Microwave
 - Infrared
 - Radio – Single Frequency and Spread Spectrum
 - Bluetooth
 - Setting Up a Wireless Network
 - WAN Overview • Dedicated / Leased Lines
 - Digital Leased Lines
 - Switched Networks
 - Circuit Switching
 - Packet Switching

- X.25
- Frame Relay
- ISDN
- Fiber Distributed Data Interface (FDDI)
- Public Networks
- The Internet
- Protocols (SLIP / PPP)
- Tunneling / Encapsulation (PPTP / L2TP)
- Requirements for Remote Connectivity
- Remote Client and Server Configuration
- Virtual Private Networks (VPN)
- Remote Desktop Protocol (RDP)
- Intranets and Extranets
- VLANs
- Troubleshooting Remote Connectivity for Small Offices
- Network Administration and Security
 - Network Operating System Security
 - Administrative / Supervisory Account
 - Creating and Managing User Accounts
 - Groups
 - Setting Share Permissions
 - Auditing
 - Windows NTFS Security
 - Setting File and Directory Permissions
 - What Makes an Operating System Secure?
 - Types of Attack
 - Types of Defense
 - Password Principles
 - Authenticating User Logon Requests (Kerberos, RADIUS, Wireless Security)
 - Encryption and Password Hashing
 - Encryption Technology
 - Encryption Systems
 - IPSec
 - Firewalls
 - Proxy Servers
 - NAT and ICS
 - Fault Tolerance and Redundancy
 - Backup Strategies
 - Virus Prevention
 - Power Management
 - UPS
 - Disk Fault Tolerance
- Troubleshooting
 - Troubleshooting Equipment

- Terminators
- Loopback Test
- Crossover Cable
- Volt-Ohm Meters
- Tone Generators and Probe
- Cable Testers and Certifiers
- Time-Domain Reflectometer (TDR)
- Product Indicators
- Test Frame and Packet Generators
- Network Monitors
- Protocol Analyzer
- SNMP
- Overview of Troubleshooting Procedures
- Troubleshooting Networks
- Troubleshooting Cabling
- Troubleshooting Infrastructure
- Routing Issues
- Troubleshooting Name Resolution
- Establishing a Session
- Troubleshooting Services
- User Problems
- Service Packs and Driver Updates
- Performance Monitor
- Network Monitor