



CompTIA Network+ Course 36 Contact Hours

Job Responsibilities

Configure and operate a variety of networking products.

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 RingMAU
- 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
- 802standards

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



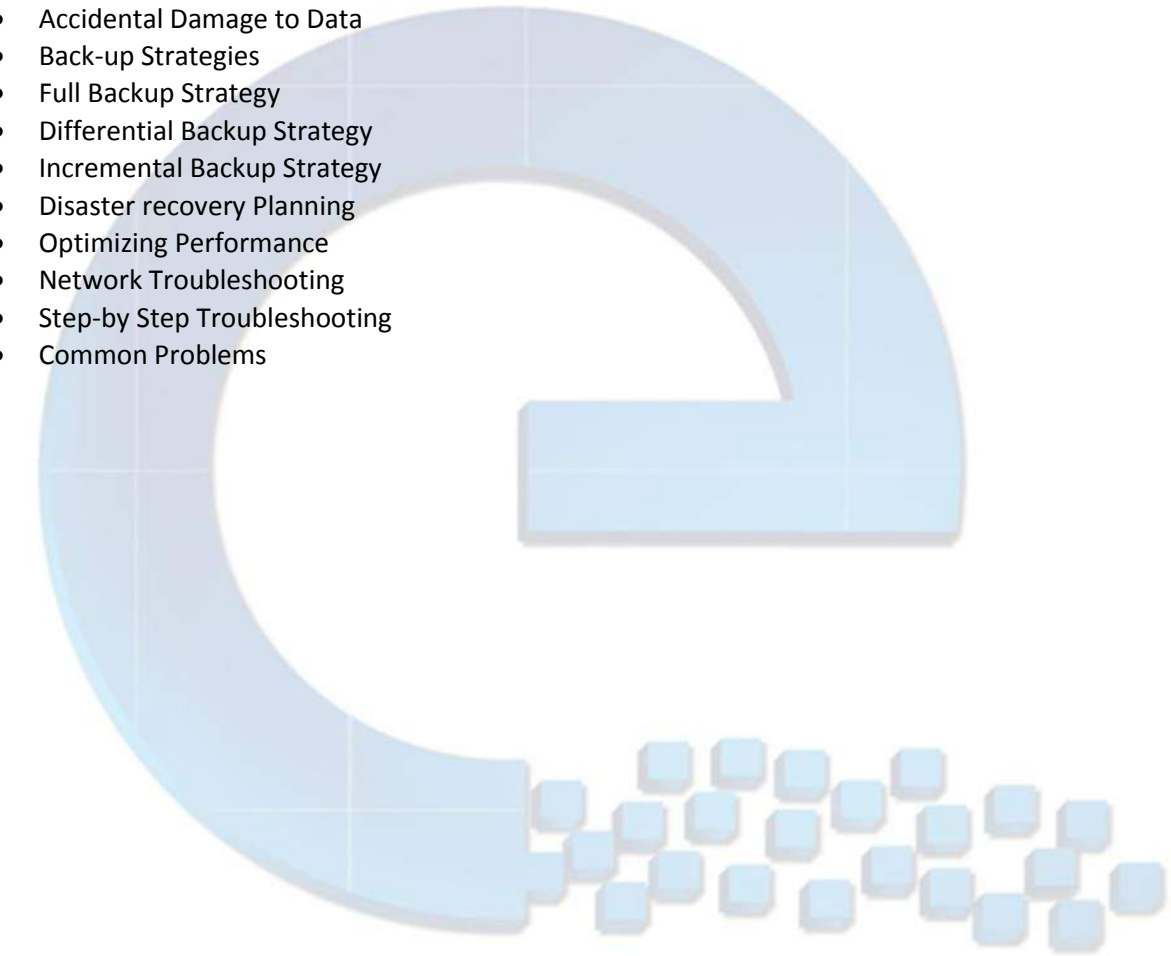
- Integrating WINS and DNS
- Internet Access
- Overview of the Internet
- The World Wide Web
- Hypertext Mark-up Language
- Browsers
- Internet Service Providers
- Firewalls
- Proxy Servers
- E-mail
- Using E-mail Simple Mail Transfer Protocol – SMTP
- Post Office Protocol Version 3 (POP3)
- Other TCP/IP 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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