

Course Code – TCP11002

TCP/IP & LAN Technologies

This course has been designed to provide delegates with a basic theoretical knowledge of Internetworking and focuses on the use of the TCP/IP protocol suite. Included in the course is a breakdown of the Internet Protocol version 4 address structure and how a network is logically subdivided through the use of subnetting. There are a number of practical demonstrations during the course to backup the theoretical learning. This course can form part of the prerequisites for further advanced data networking and Internet Protocol courses.

Prerequisites

None, although a basic understanding of Datacomms would be beneficial.

Learning Objectives

At the end of this class, participants will be able to:

- Understand the basic history of the Internet.
- Understand the terms WAN, LAN, MAN, Internet and Intranet.
- Determine the functions of the Open Systems Interconnect 7 Layer Model.
- Determine the functions of the Internet Protocol 4 Layer Model.
- Differentiate between different standard Network Topologies.
- Understand the basic functions of a Hub, Switch and Router.
- Comprehend the difference between Distance Vector and Link State Routing Protocols.
- Determine the function of TCP/IP Protocols and at what layer of the Protocol stack they operate.
- Determine the Class of a given IP address.
- Perform subnetting of a given network address with the purpose of building an Internetwork.

Who Should Attend

Network technicians, Technical Managers and Support Staff who need an overview of networking technologies relating to the TCP/IP protocol suite.

Course Profile:

- Introduction to TCP/IP
- Where it all began
- Arpanet
- RFCs
- Internet Architecture Board
- Internet Development (1960s and 70s)
- Internet Development (1980s)
- Internet Development (1990s)
- Internet Development (2000s)
- OSI and TCP/IP Models
- Headers and Layers

Local Area Networks and Standards

Network Systems Training (UK) Ltd Tel: 0845 519 7752 Overseas: +44 1670 712585

Email: enquiries@nstuk.com Web: <http://www.nstuk.com>

Registered Address: 83 Beech Avenue, Cramlington, Northumberland NE23 6XS

Course Code – TCP11002

- Why build Local Area Networks?
- What do we need to communicate?
- Factors to consider?
- Peer to Peer Networking
- Client Server Networking
- What is Ethernet
- Ethernet Standards
- Ethernet Physical Attributes
- Ethernet Framing
- Ethernet Hubs

Layer 2 Devices

- Bridges
- Local and Remote Bridges
- Encapsulating Bridge
- Flow Control in a Bridge
- Address Learning
- Switched Networks
- Full and Half Duplex Operation
- Basic Switch Functions
- Switching Modes
 - Store and Forward
 - Cut Through
 - Fragment Free
- Address Learning and Filtering
- Broadcast and Multicast Flooding
- Redundancy
- Broadcast Storms
- Duplicate Non-Broadcast Frames
- Database Instability
- Spanning Tree Protocol

Virtual Local Area Networks

- Traditional Routed Networks
- Switched Networks
- Understanding VLANs
- VLAN Membership
- VLAN Tags
- IEEE 802.1q
- VTP

Layer 3 Devices

- Routers
 - The Routing Process
 - Local vs Remote Routing
 - Dynamic vs Static Routing
 - Static Routes

Course Code – TCP11002

- Default Routes
- Routing Protocols
- Distance Vector vs Link State Routing Protocols
- Interior Gateway Routing Protocols
- RIP
- OSPF

Layer 3 Protocols

- ICMP
- ARP
- IPv4
- NAT
- DHCP

Internet Protocol Version 6

- IPv6 Header
- IPv6 Address Structure

Layer 4 Protocols

- TCP – Transmission Control Protocol
 - Port Numbers
 - Sockets
- TCP Header
- Windowing
- TCP 3 Way Handshake
- UDP – User Datagram Protocol
- UDP Header

Applications and Services

- Telnet
- FTP – File Transfer Protocol
- The FTP Model
- TFTP – Trivial File Transfer Protocol
- DNS – Domain Name Service
- SNMP – Simple Network Management Protocol
- SNMP Operation
- SMTP – Simple Mail Transfer Protocol
- POP – Post Office Protocol
- IMAP – Internet Mail Application Protocol
- MIME – Multimedia Internet Mail Extensions

IP Addressing and Subnetting

- IP Address Classes
- Binary Fundamentals
- The Logical AND Function
- Subnetting
-

Course Code – TCP11002

Network Systems Training (UK) Ltd Tel: 0845 519 7752 Overseas: +44 1670 712585
Email: enquiries@nstuk.com Web: <http://www.nstuk.com>
Registered Address: 83 Beech Avenue, Cramlington, Northumberland NE23 6XS