

TCP/IP NETWORKING

ALS' TCP/IP Networking class is a "hands-on," student participation look at the Internet Protocol and where it fits in the five layer Internet Engineering Task Force (IETF) model. The TCP/IP Networking sessions are unique in that attendees use pre-printed 4x6 inch cards to simulate the internal steps taken by PCs, routers, and servers in a simulated end-to-end IP network connection. Attendees simulate end-to-end World Wide Web (WWW) sessions, Voice over IP (VoIP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP / email), DNS/BIND and other higher layer protocols. Lower layer transports include a combination of Point-to-Point Protocol (PPP), Frame Relay, Asynchronous Transfer Mode (ATM), T1, T3, E1, E3, Synchronous Optical Network (SONET), Wavelength Division Multiplexing (WDM) and other lower layers. The exact configuration and focus is entirely up to the class and is modified to accommodate the interests and specific focus areas of attendees.

Prerequisites:

There are no prerequisites for this course

Objectives:

At the conclusion of this course the student will be able, at minimum, to:

- Understand layered protocol models such as the 7 layer OSI model and 5 layer IETF model
- Explain what IP is, what it does and how it works
- Describe the relationship of IP to other protocols needed to provide a complete end-to-end network connection

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COURSE OUTLINE

Day 1: Theory

1. Introduction

- Packet Network Concepts
- OSI Model
- IETF Model

2. Class Model

- Student Participation
- Mechanical Processes
- Analogies
- Configuration

3. IP Networks In Depth

- LAYER 1 - THE PHYSICAL LAYER
 - Circuits (General Concepts)
 - Electrical Circuits
 - Optical Circuits
 - WDM
 - SONET/SDH
- LAYER 2 - THE DATA LINK LAYER
 - Local Area Networks
 - Network Access
- LAYER 3 - THE NETWORK LAYER
 - Internet Protocol (IP)
 - Internet Control Message Protocol (ICMP)
 - Open Shortest Path First (OSPF) Routing Protocol
 - Address Resolution Protocols (ARPs)

Day 1 Review

Day 2: Practice

4. LAYER 4- TRANSPORT LAYER

- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)
- Wireless Datagram Protocol (WDP)

5. LAYER 5 - APPLICATION LAYER

- Hypertext Markup Language (HTML)
- Hypertext Transport Protocol (HTTP)
- File Transfer Protocol (FTP)
- Remote Login (TELNET)
- Simple Mail Transport Protocol (SMTP)
- Other
- DNS / BIND
- DHCP

6. APPLICATIONS

- Browsers
- File Transfer Programs
- Remote Login / Secure Shell (SSH)
- eMail
- Other
- "Dual Stack" Operations

Day 2 Review