

Course Description

The Internet Protocol Suite, commonly known as TCP/IP, forms the basis for the Internet and the next generation of telecommunications services. It is now at the core of all modern mobile phone networks, is used for the distribution of television services, carries electronic mail and is at the heart of all PC networks.

Understanding how the protocols function and interact with each other is critical for engineers and technicians who will configure and troubleshoot next generation systems.

This course introduces the basic fundamentals of the Internet Protocols suite using hands-on exercises to develop practical skills. Attendees will learn the workings of the protocols and then stage by stage build a complete Internetworking system including all the necessary servers to make it function. They will use their own lap-top computers with free software supplied to construct a the service, including LANs, Routers and wireless LAN connections.

Students Will Learn

- Identify The Scope And Limitations Of Ipv4 And Infrastructures Built Upon It
- Appreciate The Standard Terms Used In Its Description
- Divide Networks Into Sub-Networks And Define Sub-Net Masks
- Describe In Detail The Features Of The IP Header
- Configure Networks To Carry IP Over Both Wired And Wireless Lans
- Compare The Major Distributed Dynamic Routing Protocols And Select The Correct One For Each Application
- Identify How Each Of The Major Applications Function
- Troubleshoot Both Client/Server And Peer To Peer Environments

Target Audience

This course is for engineers and technicians who will configure and troubleshoot next generation systems.

Course Outline

Module I: Introduction to TCP/IP Networks

Scope of TCP/IP

History of TCP and IP

Internet community

TCP/IP Applications

TCP/IP and the Internet

IANA

RFCs

Hands-on Exercise Installing a protocol analyzer and capturing protocols

Module II: TCP/IP Protocol Architecture and Foundation

TCP/IP Layering

Implementation Hierarchy

Operating System Considerations

Physical transports

LANs

WANs

Example Physical Transports

Protocol Identification

Hands-on Troubleshooting LAN Interfaces

Module III: Internet Protocol - In Detail

Where IP fits into the Internet Protocol Suite

Functions of IP

'Best Efforts' Datagram service

Uniform Logical Addressing

Fragmentation and Reassembly

Addressing: Classless and Classesful

Dotted Decimal Notation

Calculating Address Classes

Loop-back addressing

IP Header Examination Hands-on

Version field

Header Length

TOS

Datagram ID

Fragmentation

Flags

Time To Live (TTL)

Protocol field

Addresses

Options

Hands-on exercise capturing IP traffic and troubleshooting problems

Module IV: Below IP

IP over different physical networks

SNAP

IP over ATM, PPP, Frame Relay

VLANs and Quality of service using IEEE 802.1p/q

IP over wireless LANs

IEEE 802.11a/b/g

Hands-on exercise configuring Wireless LANs

Address Resolution

ARP, RARP, BOOTP

DHCP

Troubleshooting problems and tools

Hands-on Exercise allocating addresses with DHCP

Module V: Internetworking with Routers

Internet and Intranets

Concepts of an IP Network and sub-network

Unique addressing

Private Addresses

Network Addressing

Routing Tables

Routing Protocols

Concept of metrics

Distributed Dynamic Routing

Static and source routing

Hands-on exercise configuring routing addresses

Module VI: Above IP

Transport Services

Virtual Circuit Services

Datagram Services

Client Server Operation

Well known ports

Peer to peer operation

Allocation of Port Numbers to applications

TCP

UDP

Module VII: Internet Applications

Domain Names and Domain Name Service

Implementations of DNS

Hands-on Exercise configuring DNS

File transfer and FTP

FTP Servers

FTP clients

Download managers

Hands-on Exercise configuring FTP Server

World Wide Web

HTML and HTTP

Building a Web server

Building a Web page

Delivery Method

Instructor led with numerous Hands-On labs and exercises.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

2 Days