

Hands-On

TCP/IP Networking for CPE Troubleshooting Technicians



Course Description

The Internet Protocol Suite, commonly known as TCP/IP, forms the basis for the Internet and the next generation of telecommunications services. Once technicians understand how they work the next key skill for them to learn is how to analyze and troubleshoot faults. Some services will be delivered and installed by a single organization. TCP/IP and Internet services by their very nature must interface to customer networks and PCs. To function correctly both network service provider equipment and customer devices and networks must be configured to interoperate correctly.

This course will teach the systematic approach to troubleshooting and locating faults. Using practical hands-on course exercises technicians will learn what the impact is of likely faults implemented on test configurations within the classroom. Using recognized test tools they will then practice locating and the faults and fixing them.

Students Will Learn

- **Identify The Key Elements Required For Successful Customer TCP/IP Interconnection**
- **Interconnect Customer And Service Provider Networks**
- **Configure And Wifi Services**
- **Identify Key Faults And Locate Them**
- **Troubleshoot Both Client/Server And Peer To Peer Environments**
- **And More...**

Prerequisites

Attendees should understand basic computer skills and be familiar with networking concepts, or have some working experience.

Course Outline

Module I: TCP/IP CPE and Network Interconnection

Layers of protocols used for Internet Services

Layer 2 functions

Layer 3 functions

Layer 4 functions

Applications

Hands-on using WireShark to observe layers

Module II: Ethernet Connection Issues

Ethernet Addresses

Using the Ether-Type to identify what runs over Ethernet

Recognizing VLANs

Hands-on using WireShark to examine Ethernet services

Module III: WiFi Service Interconnection

WiFi Access Points and Routers

SSID

Security Issues: WEP and WPA

Hands-on using WiFi

Module IV: IP Addressing

Local and Global Addressing

Dynamic Addressing

Static Addressing

Address Resolution Protocol

Hands-on Exercise Reading ARP Tables

Module V: Routing Issues

Routers and subnets

Reading and editing routing tables

Testing reachability

Hands-on reading routing tables

Module VI: Ports and Applications

TCP and UDP Ports

Well Known Ports and Protocols

Recognizing what applications are in use

Recognizing packet loss and errors

Naming issues and testing them

Hands-on recognizing packet loss and transmission errors

Hands-on recognizing Application reachability Issues

Module VII: Troubleshooting Faults and Failures

Learning to exactly describe problems

Matching descriptions to possible faults

Speculating on potential problems

Divide and conquer

Looking for most likely faults first

Selecting tests which reduce the list of potential problems

Verifying faults and fixing them

Hands on Testing and Fixing Practical CPE fault Conditions

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

3 Days