

Students who attend this course will be able to:

- Run diagnostic analysis test on networks using the Wireshark Network Analyser
- Find design faults in small switched and routed networks
- Identify Security zones within a small-medium sized network
- Diagnose security weaknesses in small networks using security tools such as NMAP and ZENMAP
- Design a small network for maximum security

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Course Contents

- Troubleshooting Methodology
- Challenge Task
- Problem solving model
- Problem solving worksheet
- Identifying Layer 1, 2 & 3 problems
- L1/L2/L3 Exercise
- Layer 1 Tests
- Layer 2 Tests
- Layer 3 Tests
- Using Wireshark as a troubleshooting tool
- Capturing
- Display Filters
- Capture Filters
- Problem diagnosis
- What makes Ethernet... Ethernet?
- CSMA/CD
- Media Standards
- Layer 2 vs Layer 3
- MAC addresses
- IP addresses
- Broadcast domains
- Hubs, switches & routers
- Where do VLANs fit in?
- VLAN security
- Frame tagging
- Trunk/access ports
- Traffic between VLANs
- Layer 3 switching
- VLAN troubleshooting
- VLAN islands
- Trunk negotiation
- Understanding ARP
- ARP Request/Reply
- ARP cache
- ARP spoofing
- Switching vs routing
- MAC Address Learning
- IP Forwarding
- Routing Logic
- IP & IP Address Logic
- IP Datagram
- IP Addressing
- IP Subnets
- Troubleshooting IP
- Above IP

TCP

HTTP

IP Utilities

DHCP & DNS

use and abuse

Structure of the Name Space

DNS Request and Reply

DNS configuration

DHCP operation

DHCP control

Ping & Traceroute

Network Security zones

The Importance of Security

Using VLANs to isolate trouble

Viruses, Trojans and Worms

Managing outbreaks

Identifying network design issues

Secure Network design

Security tools

Placement of security devices

The role of Firewalls & Proxy servers

Function of a Firewall

Stateful Packet Inspection

Firewall Security Zones

The DMZ

Network Address Translation

Deep Packet Inspection

Proxy Servers

Web Filtering

Email Monitoring

Intrusion Detection/Prevention

Traffic between zones

troubleshooting ACLs

Basic firewall configuration

ACL configuration

ACL troubleshooting

Using VMWare to troubleshoot OS (Linux & Windows) problems

VMWare NIC operation

Creating a Virtual Machine

VMWare resources

Troubleshooting IP vulnerabilities

DHCP Spoofing

DNS Hijacking

Labs

Tracing Traffic

ARP

Troubleshooting Worksheet

Using VLANs to Create Security Zones

IP Addressing

Ping and Traceroute

TCP/IP Name Resolution

DHCP

TCP Sequence Numbers

HTTP Analysis

Using VMWare

Firewall Operation

Troubleshooting ACLs