

## IP Troubleshooting - 3 days

### CONTENTS:

This course contains the repetition required, and the practical and theoretical exercises needed, to provide the students with the skills for becoming a troubleshooter of generic IP networks.

Firstly, the course contains theory chapters to ensure that the students understand how the data link layer work together with the TCP/IP protocol suite, and the common used features that can cause problems in your network. This includes issues such as auto-sensing, VLANs, subnetting, as well as redundancy logic on both layer 2(spanning tree) and layer 3(routing).

The course will attempt to help students to learn a method for how to perform structured troubleshooting in any generic IP network, including higher layer functions such as TCP/UDP, DHCP and DNS.

### TARGET AUDIENCE:

This course is suitable for anyone who works with hosts and/or network equipment and that needs to be able to troubleshoot network problems quickly and efficiently, with a good understanding of the bigger picture of IP networks and their functions.

### PREREQUISITES:

The students need basic knowledge of TCP/IP and generic data communication, but repetition of these subjects will be included in the course.

### EXERCISES:

This is a theoretical training with practical exercises.

NOTE: This course is not delivered with the FoldOut methodology.

#### Ethernet, Switching and VLAN

- HUBs, Bridges and Switches
- VLAN and 802.1Q
- Layer 2 redundancy

#### Learning to use Wireshark

- Basic traffic analysis
- Understanding display filtering
- Customizing Wireshark
- Viewing Flows

#### Practical Exercises

- Using Wireshark

#### Basic troubleshooting methodology

- How to troubleshoot
- Baselines and documentation
- Reference models
- Isolating the error

#### IP Fundamentals

- Addressing and Subnetting
- Error handling; ICMP, Ping, Traceroute
- Network address translation
- Basics IPv6

#### IP Routing and Forwarding

- Using the routing table
- Static and default routing
- Dynamic routing protocols; RIP and OSPF

#### Theoretical Exercises

- Subnetting
- IP Routing

#### Practical Exercise

- Switching and VLAN problems

#### Higher layers

- TCP and UDP
- Basics of Firewalls
- Domain name resolution (DNS)
- DHCP/BOOTP
- SNMP
- Overview of VoIP and QoS

#### Practical Exercises

- Lab 2 – Addressing, Static IP Routing. Using ping and traceroute
- Lab 3 – Routing, ACLs, Higher layers