

# Definitive Ethernet switching for engineers

A 3 day **Hands on** training course



## Description

A hands on comprehensive look at Ethernet switches with extensive coverage of VLANs. The course focuses on the technology and not any one manufacturers product enabling delegates to configure switches from any manufacturer.



## Key outcomes

By the end of the course delegates will be able to:

- ✓ Configure and troubleshoot switches using:
  - Console port, telnet, HTTP, TFTP.
- ✓ Configure and troubleshoot switch features:
  - Duplex/speed
  - Port based MAC security
  - Spanning Tree
  - Link aggregation
  - Tagged ports
- ✓ Configure and troubleshoot VLANs.



## Training approach

This structured course uses Instructor Led Training to provide the best possible learning experience. Small class sizes ensure students benefit from our engaging and interactive style of teaching with delegates encouraged to ask questions throughout the course. Quizzes follow each major section allowing checking of learning. Hands on sessions are used throughout to allow delegates to consolidate their new skills.



## Details

### Who will benefit?

Technical staff..

### Prerequisites

Introduction to data communications & networking.

**Duration:** 3 days

**Customer rating:** ★★★★★

### Generic training



Generic training compliments product specific courses covering the complete picture of all relevant devices including the protocols "on the wire".

*"Friendly environment with expert teaching that teaches the why before the how."*  
G.C. Fasthosts

### Small class sizes



We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.

*"Excellent course. The small class size was a great benefit..."*  
M.B. IBM

### Hands On training



The majority of our courses use hands on sessions to reinforce the theory.

*"Not many courses have practice added to it. Normally just the theoretical stuff is covered."*  
J.W. Vodafone

### Our courseware



We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.

*"Comprehensive materials that made the course easy to follow and will be used as a reference point."*  
V.B. Rockwell Collins

### Customise your course



Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.

*"I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on."*  
S.R. Qinetiq

# Definitive Ethernet switching for engineers

## Course content

### What is Ethernet?

LANs, network cards and cables, CSMA/CD, Ethernet frames, Ethernet evolution, 802.3. Hands on: ping, Ethernet speeds, CSMA/CD.

### Ethernet layer 2

Layer 2 functions, NICs, MAC addresses, unicasts, multicasts and broadcasts, frame formats. Hands on: Configuring NICs, Analysing MAC addresses with Wireshark.

### IP and Ethernet

Relationship. Hands on: ARP

### What is a switch?

Switches connect multiple devices, switches versus hubs, simultaneous conversations, switches work at layer 2, the forwarding database, how the forwarding database is built, broadcast and collision domains. Hands on: Difference between hubs and switches.

### Switch configuration

Managed/unmanaged switches, configuration methods, reasons to configure switches. Console ports, HyperTerminal (and alternatives). Hands on: Using the console port to troubleshoot and configure switches.

### Switches in more detail

Latency, forwarding mechanisms, switch fabrics. Hands on: Using telnet and HTTP to switches.

### Ethernet extensions

Auto negotiation, Power over Ethernet. Hands on: Configuring and troubleshooting switch ports: Speed, duplex and security.

### Redundant links

Loops, broadcast storms, STP, BPDU format, STP convergence. Hands on: Tracking blocked ports. STP convergence.

### Backbone links

Architectures, link aggregation, LACP, load sharing, resilience. Hands on: fail over times.

### VLANs

Virtual versus physical LANs, Why have VLANs? Broadcast domains, Creating VLANs, Assigning ports to VLANs. Hands on: Analysing the effect of VLANs on traffic.

### Enterprise VLANs

VLANs are internal, multiple VLANs, Load balancing, Default VLAN, VLAN registration protocols: VTP, GVRP, MVRP. Exercise: VLANs on multiple switches.

### Tagging/Trunking

Reason for tagging, terminology, tagging process, 802.1Q, Tag format, VLAN stacking. Hands on: Configuring and troubleshooting tags.

### STP variants

RSTP, Common STP, Multiple STP, PVST, ring alternatives. Hands on: RSTP.

### Inter VLANs

Layer 3 switching, IP addressing rules, Interconnecting VLANs. Hands on: Routing between VLANs.

### Troubleshooting Ethernet

Methods, tools, locating faults, layer 1 issues, layer 2 issues. Hands on: Fixing the network.

