

Practical

TCP/IP^{*}, TROUBLESHOOTING & PROBLEM SOLVING

(incl. VPNs & VLANs) for Industry

* Transmission Control Protocol/ Internet Protocol - The fundamental suite of protocols on which the Internet is based



YOU WILL LEARN:

- The fundamentals of TCP/IP
- The basic skills to effectively set up TCP/IP networks
- How to understand and construct a secure, robust Local Area Network
- How to diagnose and fix problems with TCP/IP utilities
- How to plan and design improved networks
- How to analyze and construct a typical Firewall
- How to understand how to optimise your company's connectivity with LANs/Intranets and the Internet
- How to troubleshoot TCP/IP Networks
- The essentials of Network Management
- To use a Protocol Analyzer to diagnose real TCP/IP problems
- How to construct Virtual Private Networks (VPNs)
- How to construct Virtual LANs (VLANs)

WHO SHOULD ATTEND:

- Network Technicians
- Data Communications Managers
- Communications Specialists
- IT Support Managers and Personnel
- Network Planners
- Programmers
- Design Engineers
- Electrical Engineers
- System Integrators
- System Analysts
- Designers
- Network Administrators
- Network Engineers
- IT and MIS Managers
- Network Support Staff
- Systems Engineers



Technology Training that Works

THE WORKSHOP

Practical TCP/IP, Troubleshooting and Problem Solving for Industry is a practical 'hands-on' 3-day workshop. The Internet has made a substantial impact on the way you do business and now is impacting on your business. One of the great protocols that has been inherited from the Internet is TCP/IP and this is being used as the standard today for all network and communication systems.

The reasons for this popularity are not hard to find. TCP/IP and Ethernet are truly open standards available to competing manufacturers and providing the user with a common standard. In addition, the cost of TCP/IP and Ethernet is low.

The workshop has been structured to cover the main areas of TCP/IP and Ethernet in detail, while going through the practical implementation of TCP/IP in computer and industrial areas and practical use of the Internet and Intranets. Troubleshooting and maintenance of TCP/IP networks and communication systems in an office and industrial environment are also covered. You will also cover the important issues of Virtual LANs (VLANs) and Virtual Private Networks (VPNs).

You will then be able to apply the knowledge you have gained in a day of practical fault finding. This workshop takes all the theory and practice learnt on the first two days of the Practical TCP/IP and Ethernet Networking workshop and with 15 practical mini-sessions, exposes you to typical problems that could occur with TCP/IP networks and shows you how to fix them. Most of this day comprises practical sessions with a modicum of discussion to explain the key points. There will be one person to a PC so that the practical component will be emphasized.

A great way to round off the workshop...with hard hitting practical sessions so that you can walk away with a well rounded understanding, both practical and theoretical, of TCP/IP and Ethernet networks.

WORKSHOP OBJECTIVES

Practical TCP/IP, Troubleshooting and Problem Solving for Industry is designed to give you a superb fundamental grounding in TCP/IP and the Internet as applied to your business. The objective is to give you a useful and practical toolbox of skills that you can apply immediately to your plant or facility, and to provide a solid grounding in the principles of troubleshooting TCP/IP networks.

When attending this workshop you will:

- gain a practical understanding of the application of TCP/IP
- learn how to construct a robust Local Area Network (LAN)
- learn the basic skills to effectively troubleshoot TCP/IP and LANs
- be able to improve the performance of your network
- install a typical firewall
- understand how to set up an Intranet
- understand how to connect your LAN or Intranet to the Internet
- troubleshoot at the Ethernet level, IP Level, TCP Level and Application level
- understand VPNs and VLANs
- gain a grounding in fundamentals of network security

THE PROGRAM

DAY ONE

INTRODUCTION

- Terms and definitions
- LANs, WANs, VLANs and VPNs
- Open Systems Interconnection, OSI and ARPA models

ETHERNET

- Fundamentals
- 10Mbps Ethernet systems
- Fast and Gigabit Ethernet
- Collisions and performance
- Full duplex, deterministic and dual redundant Ethernet

(Practical Session)

INTERNET LAYER PROTOCOLS

- IPv4
 - addressing
 - subnetting
 - supernetting and CIDR
 - fragmentation
 - header structure
 - ARP
 - ICMP
 - routing protocols
- IPv6

- addressing modes
- header structure
- extension headers

(Practical Session)

HOST-TO-HOST LAYER PROTOCOLS

- TCP
 - ports and sockets
 - sequence and acknowledgement numbers
 - establishing and closing connections
 - sliding windows
- UDP

(Practical Session)

DAY TWO

PROCESS/APPLICATION LAYER PROTOCOLS

- BOOTP, DHCP, TELNET, FTP, TFTP, NFS, SMTP, POP3, HTTP, SNMP, DNS

(Practical Session)

TCP/IP UTILITIES

- Ping, arp, tracer, netstat, ipconfig, winipcfg, etc

(Practical Session)

CONNECTION DEVICES

- Repeaters, hubs, bridges, switches, routers, gateways

THE INTERNET & COMMUNICATIONS

- Creating an Intranet
- Connecting to the internet
- VoIP

(Practical Session)

SECURITY CONSIDERATIONS

- Authentication
- Routers
- Encryption
- Firewalls

DAY TWO continued

CONFIGURING & TROUBLESHOOTING ETHERNET & TCP/IP

To be covered during the practical sessions:

- Configuration
 - Use of TCP/IP and third party utilities
 - Use of protocol analyzers
- (Practical Session)

SATELLITE COMMUNICATIONS

- Essentials of satellites
- Challenges with TCP/IP

TYING IT ALL TOGETHER

- Current and future trends
- Critical areas of focus

DAY THREE

VIRTUAL LANS (VLANs)

- Introduction to VLANs
- VLAN Identification
- IEEE 802.1p/Q
- Configuring a Trunk Line
- VLAN Trunk Protocol (VTP)
- VTP Pruning
- Managing Redundant Links
- Inter VLAN Routing

SECURITY

- Fundamentals
- Authentication
- Encryption
- Layer 2 Tunneling Protocol Concept
- IPSec Protocol
- Key Management for IPSecs
- Designing VPN Solutions
- Remote Access VPNs
- Management of VPNs

VIRTUAL PRIVATE NETWORKS (VPNS)

- Introduction to VPNs
- Intro to cryptography and PKI
- VPN Technologies

FIREWALLS

- Fundamentals
- Effective Design
- Tips and Tricks

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*Very knowledgeable –
presented workshop well.*

M Torrance

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