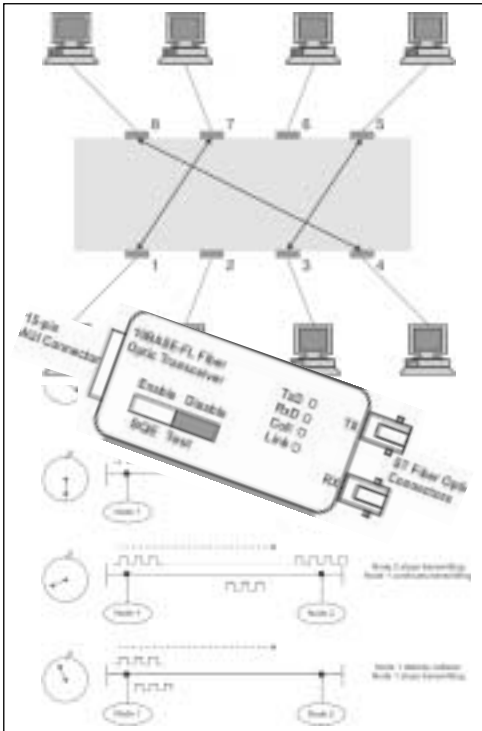


Troubleshooting

INDUSTRIAL ETHERNET & TCP/IP NETWORKS



YOU WILL LEARN HOW TO:

- Install and configure a simple Industrial Ethernet & TCP/IP network
- Troubleshoot and fix Ethernet Network problems
- Use a Protocol analyser to analyse Ethernet network activity
- Use the utilities supplied to fault find TCP/IP and Ethernet networks
- Learn how to troubleshoot TCP/IP Networks
- Identify network problems and fix them
- Fault find at the Ethernet/TCP/IP and Application Levels
- Learn the essentials of Network Management
- Learn how to track hackers and network problems

WHO SHOULD ATTEND:

This is not an advanced workshop - but a hands-on one.

Anyone who will be designing, installing and commissioning, maintaining or troubleshooting TCP/IP and Intra/Internet sites will benefit including:

- Instrumentation Engineers
- Technicians
- Design Engineers
- Network Engineers
- Engineering Managers
- Electrical Engineers
- Network System Administrators



THE WORKSHOP

This workshop is a practical workshop devoted to two days of hands-on faultfinding and troubleshooting. After an initial familiarisation session on Industrial Ethernet and TCP/IP the two days are devoted to practical hands-on exercises.

The workshop has been structured to cover key issues in troubleshooting TCP/IP and Ethernet in detail, while going through the practical implementation of TCP/IP in office and industrial networks and the 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. 15 practical mini-sessions expose you to typical problems that could occur with industrial Ethernet and TCP/IP networks and shows you how to fix them.

Most of each day comprises practical sessions with a modicum of discussion to explain the key points. There will be a minimum of two people to a PC so that the practical component will be emphasised. At the end of this workshop you will walk away with a solid knowledge on troubleshooting industrial Ethernet and TCP/IP networks. A comprehensive 400 page manual will ensure that you have an excellent reference book for referring to in your future work in this challenging and yet rewarding area of engineering.

PRE-REQUISITES

A basic working knowledge of industrial communications and applications is useful.

ON-SITE TRAINING

— contact us for a proposal today

IDC Technologies unique on-site training delivery service can save your company up to 50%, or more, off the total per-head costs associated with delegates attending a public workshop. One of our qualified and experienced Instructors can discuss the content with you, then come to your venue and present a workshop designed to your own specifications!

Why not call or e-mail and ask about having components from a number of courses combined together? It's affordable, effective, convenient and much easier than you may have thought.

"Technology Training that Works" we mean it! Try us soon and see the difference. For more information, or a customized proposal to run any of our practical workshops at your own venue, contact your nearest business development manager for manager (see page 32).

THE PROGRAM

DAY ONE

BACKGROUND AND INTRODUCTION TO ETHERNET

- Network communications
- Open Systems
- Network Topologies

OPERATION OF ETHERNET SYSTEMS

- Ethernet Standards (10Mbits/s to 10Gigabits/s)
- Full Duplex Ethernet

TROUBLESHOOTING THE DIFFERENT ETHERNET CABLE TYPES

- Twisted Pair
- Fibre Optic
- Fast Ethernet Twisted Pair
- Fast Ethernet Fibre Optic
- Gigabit Ethernet Twisted Pair
- Gigabit Ethernet Fibre Optic
- Structured cabling
- Industrial versus commercial networks

TCP/IP

- Quick Review of essentials of TCP/IP
- Internet Layer Protocols (IP)
- Host-to-Host Layer Protocols (incl. TCP/UDP)
- Application Layer protocols (incl. DHCP, FTP, SNMP, DNS)

TOOLS FOR TROUBLESHOOTING

- Basic Utilities
- Protocol Analyser
- Ethernet Performance
- Troubleshooting of Ethernet and TCP/IP rules

TROUBLESHOOTING THE NETWORK INTERFACE CONNECTION

- NIC hardware errors
- Frame Collisions and how they impact on performance
- Incompatibilities with 802.3 and Ethernet V.2 Frames

TROUBLESHOOTING THE INTERNETWORK CONNECTION (IP PROTOCOL)

- DNS configuration errors
- DHCP configuration problems
- Fragmenting and reassembly of Long Messages
- ARP related problems
- Duplicate IP Addresses
- Incorrect SubNet mask
- Using ICMP Echo Messages (Ping)
- Misdirected Datagrams
- Incorrectly configured Routers



DAY TWO

TROUBLESHOOTING THE HOST-TO-HOST CONNECTION (TCP PROTOCOL)

- Using BOOTP with UDP Transport
- Clock Synchronisation with UDP
- Establishing and Terminating TCP Connections
- TCP data transfers
- Repeated Host Acknowledgments
- Using the Finger User Information Protocol
- Optimising TCP Window Size
- Problems with high delay links (e.g. satellite)

TROUBLESHOOTING THE PROCESS/APPLICATION CONNECTION

- Using FTP and TFTP
- Hacking Passwords and Security problems
- Telnet Problems
- NetBios and TCP Interactions
- Implementing Multi Protocol Stacks

TROUBLESHOOTING ROUTERS AND SWITCHES

- Ethernet Repeater hubs
- Ethernet Switching hubs
- Routers

NETWORK MANAGEMENT

- Simple Network Management Protocol (SNMP) client/server session

WRAP UP AND CONCLUSION

- Revision of key concepts
- Summary of the basic rules

