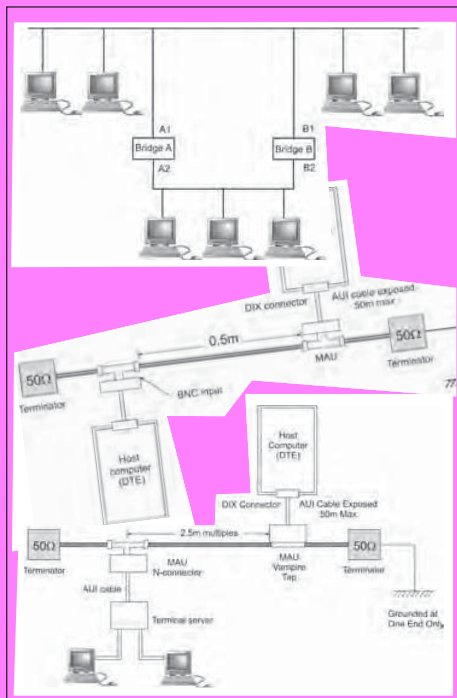


PRACTICAL TCP/IP AND ETHERNET NETWORKING FOR INDUSTRY



WHAT YOU WILL LEARN:

The workshop is designed to give you a superb fundamental grounding in TCP/IP and the internet, as it is applied to industrial automation and process control. The objective is to provide a useful and practical toolbox of skills that can be applied immediately to your plant or facility.

You will:

- Gain a practical understanding of what TCP/IP is and how to apply it
- Learn how to construct a robust Local Area Network (LAN)
- Learn the basic skills to effectively troubleshoot TCP/IP and LAN's
- Be able to improve the performance of a network
- Understand how to set up an intranet
- Understand how to connect your LAN or intranet to the internet
- Be able to apply appropriate network management tools

WHO SHOULD ATTEND:

Anyone designing, installing, commissioning, maintaining or troubleshooting TCP/IP and intra/internet sites will benefit, including:

- Instrumentation engineers
- Design engineers
- Engineering managers
- Network system administrators
- Technicians
- Network engineers
- Electrical engineers

The Workshop

The internet has made a substantial impact on the way we do business, as well as the plant and factory environment. One of the great protocols inherited from the internet is TCP/IP, which is used by most present-day automation and process control systems. SCADA systems, Programmable Logic Controllers (PLCs) and even low level instruments are using TCP/IP and Ethernet to transfer information. TCP/IP and Ethernet are truly open standards, available to competing manufacturers and providing the user with a common standard at low cost.

This workshop covers the main aspects of TCP/IP and Ethernet in detail, including the practical implementation of TCP/IP in computer and industrial areas and the practical use of the internet and intranets. You will learn to troubleshoot and maintain TCP/IP networks and communication systems in an office and industrial environment.

Pre-requisites

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

Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

Practical sessions include:

- Construct simple Ethernet LAN
- Configure IP addresses and subnet mask
- Analysis of ARP/ICMP/IP/UDP/TCP protocols with protocol analyser
- Ping, Arp, Netstat, Tracert and route commands
- Set up and analyse FTP/HTTP sessions
- Interconnect networks with bridge or router

The Program

INTRODUCTION

- LANs, WANs, VLANs and VPNs
- OSI and ARPA models

ETHERNET

- 10Mbps (half-duplex) Ethernet
- Fast and gigabit Ethernet
- Full-duplex, deterministic and dual redundant Ethernet

INTERNET LAYER PROTOCOLS (IP)

- IPv4, addressing, subnetting, fragmentation and header structure
- ARP
- ICMP
- Routing protocols
- IPv6 addressing modes, header structure and extension headers

HOST TO HOST LAYER PROTOCOLS (TCP)

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

APPLICATION LAYER PROTOCOLS

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

TCP/IP UTILITIES

- Ping, Arp, Tracert, Netstat, Ipconfig, Wntipcfg and hosts file

CONNECTION DEVICES

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

SECURITY CONSIDERATIONS

- Authentication, encryption and firewalls

SATELLITE COMMUNICATIONS (OPTIONAL)

- Essentials of satellites
- Challenges with TCP/IP

TYING IT ALL TOGETHER

- Current and future trends

SUMMARY, OPEN FORUM AND CLOSING