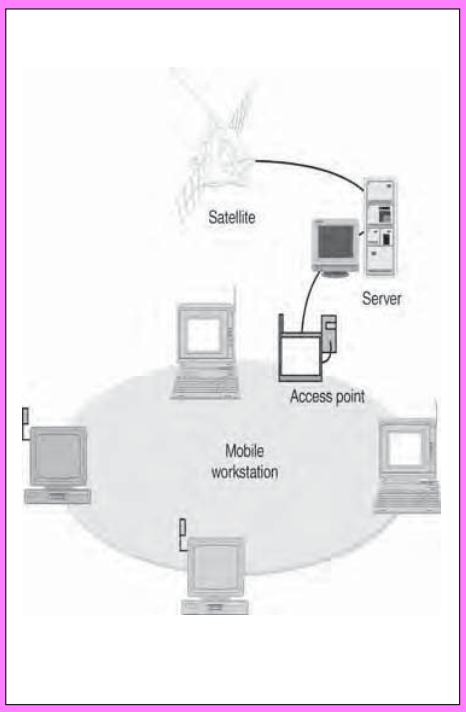
PRACTICAL FUNDAMENTALS OF TELECOMMUNICATIONS AND WIRELESS COMMUNICATIONS



WHAT YOU WILL LEARN:

- Fundamentals of telecommunications
- The "jargon" used in telecommunications
- The "nuts and bolts" of selecting and installing telecommunications systems
- How to increase the bandwidth by exploiting your existing copper wire more effectively
- How to make "best practice" decisions on the best and most cost effective access options for your company
- How to apply the latest technologies such as wireless communications
- To understand and apply high speed access systems such as ADSL and beyond

WHO SHOULD ATTEND:

- Electrical Engineers
- Technicians
- Managers
- Instrumentation Engineers and Technicians
- Process Control Engineers and Technicians
- Project Engineers
- Systems Engineers
- Process Engineers
- Maintenance Engineers
- Sales Engineers
- Engineering Managers
- Network Administrators
- Software Engineers
- Field Technical Support Staff

The Workshop

The make-up and structure of telecommunications networks has changed dramatically in the past few years. These changes impact on the equipment you purchase, the services you use, the providers you can choose and the means of transporting the data.

This workshop is of particular benefit to those who want to apply the latest and most effective telecommunications technology immediately. Your company may already be looking at operating its own telecommunications system or may be looking at using the systems on the market. With the vast array of equipment and systems and technology now available to you, you need the necessary knowledge to make the best decisions.

We believe this workshop allows you to achieve your objectives in learning and then applying the fundamentals of telecommunications to your next project.

Workshop Objectives

This is a cutting-edge practical workshop on the fundamentals of telecommunications for anyone looking for a complete understanding of the essentials of the terms, jargon and technologies used. This workshop is designed for those who require a basic but fundamental grounding in telecommunications and is of special benefit for those who want to apply the technology as quickly as possible.

The Program

INTRODUCTION
- Introduction
- Standards organisations

TELECOMMUNICATION BASICS
- Bandwidth, channel capacity
- Full vs. half duplex
- Baseband, broadband, narrowband and wideband
- Analogue vs. digital transmission
- Multiplexing techniques: FDM, TDM, PCM, WDM
- Connection oriented vs. connectionless communication
- Circuit switching vs. packet switching
- Switching vs. routing
- Local area vs. wide area networks
- The "Communications Cloud"
- The PSTN vs. the Internet
- The OSI model

THE PUBLIC SWITCHED TELEPHONE NETWORK
- PSTN infrastructure
- Local networks
- Switching
- Line circuit functions
- Signaling system #7

TRANSMISSION MEDIA COMPARISON
- Twisted pair
- Coaxial cables
- Fiber optic
- Power system carrier

PRIVATE SWITCHED SYSTEMS
- PBX
- Centrex
- Key systems

PUBLIC NETWORK TRANSPORT TECHNOLOGIES
- Analogue switched (dial-up)
- Public Switched Telephone Network (PSTN)
- Analogue dedicated (leased) alternatives
- Digital switched (dial-up) alternatives
- Digital dedicated (leased) alternatives

Practical Sessions

1. Fibre Optic Design Exercise - design a fibre optic system and calculate link power budgets
2. Network Design Exercise - involves given traffic flows between various offices and determining the number and type of communication links needed.
3. Microwave Design Exercise - to determine required antenna heights and calculate and select appropriate components to design the radio system
4. Basic Local Area Network Configurations
5. Overview Design Exercise - conceptual design of a company-wide communications network

TRANSMISSION MEDIA COMPARISON
- Microwave radio
- Satellite systems
- Infra-red

CUSTOMER ACCESS TECHNOLOGIES (BROADBAND)
- Digital Subscriber Lines (xDSL): Asymmetric DSL(ADSL); High-data-rate DSL (HDSL); Symmetric DSL (SDSL); Very High Speed DSL (VDSL); G.Lite (ITU G.992.2)
- Etherloop (next generation DSL)
- Hybrid Fiber Coax (HFC)
- Multipoint Microwave Distribution System (MMDS)
- Local Multipoint Distribution Services (LMDS)
- Bluetooth
- IEEE 802.16 WirelessHUMAN™

LOCAL AND WIDE AREA NETWORKING
- LAN topologies
- LAN media access control techniques
- LAN standards
- LAN extension and interconnection (bridging, switching, routing)
- Metropolitan Area Networks (MANs)
- Wide Area Networks (WANs)
- Virtual Private Networks (VPNs)

CONVERGED NETWORKS
- Applications: VoIP, FoIP, etc
- Protocols: Packet Transport
- WAN transport considerations
- Hardware: H.323 terminals; H.323 gateways; gatekeepers; multipoint control units; audio/video codecs
- Implementation considerations

WIRELESS COMMUNICATIONS
- Radio/cellular concepts and definitions
- Wireless local area networking: IEEE 802.11
- Wireless local loop applications
- Wireless data networks: Cellular Digital Packet Data (CDPD); General Packet Radio Service (GPRS)
- Cellular voice systems: Global System for Mobile Communications (GSM); Code Division Multiple Access (CDMA); Time Division Multiple Access (TDMA)
- Personal Communications Service (PCS)
- Wireless Application Protocol (WAP)
- Third Generation (3G) mobile communications technologies: Universal Mobile Telecommunications System (UMTS)

CONCLUSION
- Pulling all the strands together