Systems & Network Training

Intro to data communications & networking

A 3 day **Hands on** training course

Save on expenses. This course is also available on your premises.

Description

A hands on training course introducing the concepts of data communications, moving on to covering both LAN and WAN technology. Quizzes are used extensively to ensure material has sunk in and to maximise learning time. Hands on sessions ensure that by the end of the course delegates have made cables, built LANS and WANS, configured TCP/IP, switches and routers.

Key outcomes

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

- Use the seven layer model to classify networking buzzwords.
- Build and troubleshoot Ethernet LAN/WAN and WiFi networks.
- Evaluate LAN and WAN technologies.
- Explain the difference between switches and routers.
- Connect networks with routers.

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?
Anyone who requires a technical introduction to networks.

Prerequisites
None.

Duration: 3 days

Course rating: ★★★★★

Generic training	Small class sizes	Hands On training	Our courseware	Customise your course
Generic training compliments product specific courses covering the complete picture of all relevant devices including the protocols "on the wire".	We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.	The majority of our courses use hands on sessions to reinforce the theory.	We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.	Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.
"*Friendly environment with expert teaching that teaches the why before the how.*" G.C. Fasthosts	*"Excellent course. The small class size was a great benefit..."* M.B. IBM	*"Not many courses have practice added to it. Normally just the theoretical stuff is covered."* J.W. Vodafone	*"Comprehensive materials that made the course easy to follow and will be used as a reference point."* V.B. Rockwell Collins	*"I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on."* S.R. Qinetiq

Intro to data communications & networking

Course content

What are networks?
What is data communications? What are networks? Types of network, LANs, LAN choices, WANs, WAN choices, PANs, SANs, MANs, connecting networks. Internetworks, the internet, clouds.

Networks and standards
Standards bodies, ISO, ITU, IEEE, IETF, OSI 7 layer reference model, TCP/IP and OSI, ping and the 7 layer model, encapsulation, fragmentation.

The physical layer
Transmission media: Copper, Fibre, RF, UTP, Cat 5/5e/6/7..., RJ45, straight and cross over cables. Coax, Fibre cable & connectors, SFP, MMF, SMF, radio spectrum, frequencies, ranges, noise and electrical distortion, repeaters.
Hands on: Cabling, ping.

Bandwidth
Definition, Bits, bytes, speeds, simplex, half/full duplex, a/symmetrical, aggregation, latency. Calculating bandwidth requirements.

The Data Link layer
Frames, classifications, standards, LAN/WAN layer 2 technologies (Point to point, virtual circuits).

Ethernet
What is Ethernet? 802.3, evolution from CSMA/CD, choosing cables, topologies, NICs, MAC addresses. Ethernet frame format.
Hands on: Analysing Ethernet frames.

Ethernet switches
Connecting multiple devices, switches work at layer 2, Switches vs. hubs, simultaneous conversations, full duplex, MAC address database, how switches work, switch benefits, loops, STP. Console ports.
Hands on: Switches and WireShark, configuring switches, broadcast storms, STP.

Wireless LANs
Type of wireless network. WiFi, 802.11b/g/n/ac, antennae, interference, 802.11 frame format, CSMA/CA, half duplex, Wireless Access Points, security.
Hands on: Building a WiFi network.

WANS
WAN architecture, WAN types, service providers, access equipment, DTE, DCE, core equipment, WANs and the 7 layer model, choosing a WAN.

WAN access
Point to point, multi access, Internet, phone lines, leased lines, ADSL, .xDSL, broadband architecture. DOCSIS, FTTH, PON, SD-WAN. Older technologies (if required): Modems, ISDN, 64k, E1, TDM.

Packet switched networks
Packet switching, virtual circuits, Hub & spoke, partial & full mesh, ATM, MPLS, MPLS and routers, Why MPLS? MPLS-TE, MPLS VPN, Internet VPN.

Service provider technologies
Transport plane, SDH, SONET, WDM, CWDM, DWDM, DWDM architectures, OTN.

TCP/IP
Definition, protocols, services, internetworking, the Internet, intranets, IAB, RFCs, IP header, IP addressing, subnet masks, IPv6, TCP, UDP.
Hands on: IP address and subnet mask configuration.

Routers
What are routers? Routers vs switches, when to route and when to switch, default gateways, routing tables, static routes, routing protocols. Firewalls, how firewalls work.
Hands on: Router configuration, tracert.

Applications
Clients, servers, web, HTTP, Email, resource sharing, IM, VoIP, Video over IP, terminal emulation, ftp, ssh.
Hands on: telnet