

TCP/IP – 2 days

CONTENTS

This course explains the basic functions in TCP/IP. The focus on this training is set on the protocols within the architecture TCP/IP. The purpose is to make the participants understand what the different protocols do and to have knowledge of other important functions such as routing and DNS. TCP/IP is a technology used in computers all over the world. This course will give you the fundamental TCP/IP knowledge in order to be able to attend other specific courses in areas such as routing-technology, VPN, realtime-IP, QoS and IT-security.

TARGET AUDIENCE

The target audience is technical personnel who work with company- and carrier-networks or others who need technical knowledge in TCP/IP.

PREREQUISITES

The students are expected to have knowledge on how computer works and knowledge in LAN and WAN technology before attending this course, equivalent to our course Data Communications Fundamentals.

NOTE: This course is not delivered with the FoldOut methodology.

Introduction

- A typical IP-based company network
- Functions in the network
- Protocol architecture
- Internet building blocks and sets of rules
- Different protocols in the same message

IP-protocol

- The main IP functions within TCP/IP
- Description of the IP-header
- Protocol functions
- Fragmentation
- Options

Addressing

- Network part and local part
- Public and private IP-addresses
- Multicast
- Subnetting and how to make an address plan
- CIDR and VLSM
- Theoretical exercise

IP-routing

- Routing functions
- Static routing versus dynamic routing
- Static routing
- Default route
- Dynamic routing
- Routing protocols
 - RIP

- OSPF
- BGP
- Internet routing
- Theoretical exercise

ICMP-protocol

- Echo/echo reply
- Ping
- Destination unreachable
- Redirect
- Router discovery
- Time exceeded
- Traceroute

QoS in IP-networks

- QoS-technology
- DiffServ
- MPLS
- RSVP
- RED/WRED
- To measure QoS

IP over different link technologies

- Ethernet protocol types
- ARP
- Request/response
- Packet format
- Proxy ARP
- PPP
- Packet format
- LCP/NCP
- CHAP
- IP in Mobil phones? How does it work?
- GPRS Tunneling
- GTP
- PDP Context
- UMTS
- Demo

TCP- and UDP-protocols

- Ports and port numbers
- Protocol description
- TCP Segment format
- Establish a session
- Reliability
- Sequence number
- Acknowledge number
- Resend packets
- Slow start/Fast Retransmit/Fast Recovery
- Flow control
- Disconnect a session

Realtime traffic on an IP media

- RTP
- RTSP
- SCTP
- Introduction to realtime-signalling on a IP-media
- H.323
- SIP

Applications

- DNS
- E-mail
- SMTP
- POP/IMAP
- DHCP
- WWW
- HTTP/HTML
- URL
- Active and passive FTP (file transfer)
- Terminal emulation/Telnet
- Codec

How to connect to Internet

- Access
- IP-addresses and domain-names
- Address translation NAT/PAT
- VPN
- Firewalls
- Firewalls rules

Summary

- How to establish a connection step by step.
- Name to address translation
- To find the link address
- Routing technique
- Address translation
- Firewall rules