

Definitive VoIP for engineers

A 3 day **Hands on** training course



Description

Convergence of voice and data is now a common place mainstream technology. Our Voice Over IP course investigates the characteristics of voice transmission and then studies the impact on IP networks. Practical sessions with soft phones, hard phones and gateways allow the students to see all aspects of VoIP. Network analysers are used to study packets on the wire.



Key outcomes

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

- ✓ Describe the issues of voice and data convergence.
- ✓ Describe techniques, which can be used in IP to provide low uniform delay.
- ✓ Evaluate VoIP technologies.
- ✓ Design data networks, which will support voice.



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 working in the field of networking or telecommunications.

Prerequisites

TCP/IP fundamentals.

Duration: 3 days

Customer rating: ★★★★★

Generic training



Generic training compliments product specific courses covering the complete picture of all relevant devices including the protocols "on the wire".

"Friendly environment with expert teaching that teaches the why before the how."
G.C. Fasthosts

Small class sizes



We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.

"Excellent course. The small class size was a great benefit..."
M.B. IBM

Hands On training



The majority of our courses use hands on sessions to reinforce the theory.

"Not many courses have practice added to it. Normally just the theoretical stuff is covered."
J.W. Vodafone

Our courseware



We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.

"Comprehensive materials that made the course easy to follow and will be used as a reference point."
V.B. Rockwell Collins

Customise your course



Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.

"I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on."
S.R. Qinetiq

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Course content

What is VoIP

Voice over IP, brief review of IP, brief review of telephones and voice.

Configuring IP softphones

What are softphones? Downloading, installing. Hands on: Building the base IP network, a simple VoIP call with softphones, Internet telephony.

Addressing

E164, FQDN, IP addresses, URIs, DNS, SIP addressing, H.323 addressing.

VoIP issues

Bandwidth, Delay, Jitter, digitising voice, digitisation steps, coding, quality issues, MOS, voice compression, silence suppression, packetising voice, prioritising voice, jitter buffers. Hands on: Simple packet analysis.

Architectures

Desktop, backbone, gateway, hard phones, PoE, integrating phones and PCs, carriers, Softswitches. Hands on: Integrating Softphones, hard phones and analog phones.

IP performance and QoS

ITU delay recommendations, IP DSCP field, DiffServ, IP precedence, queuing strategies; FIFO, WFQ, custom, priority, RED, LLQ.

VoIP protocol stack

RTP, RTCP, mixers and translators, RSVP. Bandwidth, Erlang models, link layer overhead. Hands on: Calculating VoIP bandwidth, analysing RTP packets.

ITU Recommendation H.323

Architecture, protocols, terminals, Call setup, Gatekeepers, gateway discovery, H.323 registration with a gatekeeper. Hands on: PC to PC using H.323.

IETF – Session Initiation Protocol

What is SIP? SIP protocol stack, SDP, Sip architecture, SIP messages, Initial SIP phone startup, SIP servers, proxy server, redirect server. Hands on: PC to PC using SIP.

Carrier networks

Signalling systems, SS7, media gateways, Media gateway controllers, signalling gateways, MGCP, Megaco, SIGTRAN. Hands on: PSTN interworking.

Video over IP

Video components, digital video, pictures and audio, video codecs, issues and solutions, video conferencing, multipoint video conferencing, video protocol stack.

Appendix 1: Multicasting.

Appendix 2: Voice/data integration without IP.

