



Who Should Attend?

This course is intended for anyone who needs to broaden his/her knowledge about VoIP technology. This 4-day session gives the participants deep understanding and practical knowledge of SIP, and VoIP related protocols.

Course Scope

1. VoIP Background.
 - VoIP—Benefits and Problems.
 - Circuit-switching vs. Packet-switching for Real-time Services.
 - Voice Service Quality and Measurement Standards (MOS, etc.).
 - Real-time Services in ATM, Frame Relay, and IP Networks (RTP/RTCP).
 - Voice Compression (Linear Prediction, G.72x codecs) and Packetisation.
 - VoIP Signalling Overview (Call Control, Media Negotiations, Mobility Management).
 - VoIP Standards Evolution.
 - H.32x Standards Overview.
 - H.248 Overview.
 - SIP Overview, History, Standard Evolution.
2. SIP Fundamentals.
 - SIP Main Architecture.
 - SIP Components (servers and clients) and Their Functions; SIP User Agents (AU client and server).
 - SIP Servers: Proxy (stateful and stateless), Redirect, and Registrar.
 - SIP Location Servers.
 - SIP Gateways
 - SIP Message Structure.
 - SIP Requests and Response Codes.
 - SIP Supporting IETF Protocols (SAP, SDP).
 - SIP Sessions: Setup, Proxying and Redirecting Requests, Address Resolution, and Media Negotiation via SDP.
 - SIP Security.
 - General SIP Message Flow (examples).
3. Transport Protocols in VoIP Networks.
 - IP4 vs. IP6.
 - RTP and RTCP Protocols.
 - Secured Media Transport—SRTP Protocol.
 - Media Streaming—RTSP Protocol.
4. Aspects of Voice Coding.
 - Basic Information about Speech; Narrowband Coding.
 - Speech Codecs, Basic Facts, and Speech Compression.
 - PCM, ADPCM, and CELP codecs; Key Differentiators for Codecs Used in VoIP.
5. Quality of Service in VoIP.
 - Quality of Voice and Service Expectations.
 - Media quality; Key Facts.



- Speech QoS—Sources of Network Impairments.
 - QoS Measure: MOS, PESQ Model, E Model.
 - QoS Testing Methods.
6. VoIP Usage in Mobile Networks—IMS System.
- Architecture.
 - Call Session Control Function (CSCF).
 - P-CSCF, I-CSCF, S-CSCF.
 - HSS & SLF.
 - SIP—Multimedia Session Set-up.
 - P-CSCF Discovery.
 - IMS Registration.
 - IMS Session Set-up (MO).
 - Authorisation of QoS Resources.
 - IDs of IP Multimedia Flows.
 - SIP Forking.
 - Policy and Charging Control.

Course Objectives

This course teaches the participants the workings of new VoIP technology, the architectures used to offer services based on VoIP, and problems stemming from deploying real-time service in packet networks.

Prerequisites

None. Basic IP knowledge recommended.

Training Structure

Four-day training divided into logical sessions.

Methodology

Instructor-led training.