

VoLTE - Voice over LTE – 2 days

CONTENTS

The Voice over LTE course describes in a comprehensive – yet easily understandable – way how the IMS-based voice service is realized in LTE/EPS networks. The course explains SIP (Session Initiation Protocol), describes the IMS nodes and architecture and how LTE/EPS serves as an IP-CAN (IP Connectivity Access Network) as described in 3GPP specifications and GSMA (GSM Association) documents. The course also outlines the role of Application Servers in IMS, and how IMS interworks with other networks, e.g. for fixed and mobile traditional circuit switched telephony.

Throughout the course, message-level signalling flows are shown to illustrate various traffic cases, procedures and scenarios.

PREREQUISITES

General knowledge about the architecture, terminology and modes of operation of the GSM/UMTS/EPS networks is highly recommended. Basic knowledge of IP networks and protocol stack is recommended. For required background knowledge, we recommend Apis' LTE System Overview.

3GPP System Overview

- 2G and 3G radio and core networks
- LTE/EPS nodes, architecture and mode of operation
- IMS architecture and motives for IMS
- CS and PS voice scenarios

PDN Connection Setup in LTE/EPS

- IP-CAN: How the terminal connects to IMS
- Different EPS Bearers: Default vs Dedicated Bearer
- LTE Attach for IMS
- PDN Connection setup to IMS

SIP – Session Initiation Protocol

- SIP nodes and network architecture
- User Agent, Proxy Server, Registrar and Location Service
- SIP Identities
- SIP Methods – requests and responses
- SDP, RTP and RTCP
- SIP Traffic Case

IMS – the IP Multimedia Subsystem

- Multimedia over IP using SIP
- IMS nodes and architecture
- IP-CAN, CSCF (Call Session Control Function), HSS (Home Subscriber Server) and AS (Application Server)
- IMS subscriber identities – IMPI and IMPU
- Basic IMS traffic cases; Registration and Invitation

The IMS Profile for Voice and SMS

- VoLTE according to GSMA PRD IR.92
- Requirements on UEs and networks
- Registration in LTE/EPS
- Registration in IMS
- VoLTE Call setup traffic case
- Multimedia Telephony (MMTel)

Policy and Charging Control (PCC)

- What is it that PCC does?
- Sessions, Bearers and Service Data Flows (SDF)
- PCC nodes/functions (PCRF, SPR, AF and PCEF)
- PCC for VoLTE

Application Servers in IMS

- Role of Application Servers in IMS
- Filter Criteria and Service invocation over ISC
- Service examples for MMTel

Interworking with CS Networks

- CS Fallback principles
- SRVCC principles
- Breakout to CS Domain: roles of ENUM, BGCF, MGCF and IM-MGW
- Incoming call from CS Domain: Domain Selection

Voice over WiFi

- Why Voice over WiFi
- Similarities and differences vs VoLTE
- Architecture for of Non-3GPP access to EPC
- Trusted vs Un-Trusted Non-3GPP access
- ePDG and 3GPP AAA