VoLTE Overview

VoLTE Overview is an intermediate level of technical training focused on GSMA IR.92 IMS Profile for Voice and SMS over LTE. VoLTE is presented in the broad context of existing multi-RAT mobile system. Hence, the training explains not only IMS architecture and procedures, but also integration of VoLTE with the existing network infrastructure and services (including CSFB and SMSoSGs).

Target audience:

This training is an excellent choice for engineers and managers who are already familiar with LTE and begin to introduce VoLTE in their network. Participants representing different departments are welcome on the same training session. Mixed groups result in much more interesting discussions and hence a better understanding of the subject among participants. Moreover, mixed groups also result in better inter-department personal relations that are especially important during initial VoLTE troubleshooting.

Duration:

2 days.

Contents:

Introduction

LTE, IMS, MMTel, VoLTE, SR-VCC, CSFB & SMSoSGs, RCS, standardisation bodies,

LTE overview

IP-CAN concept, network structure, PCC architecture, attach procedure including PCRF interactions, default and dedicated bearer, PCRF usage including PCEF initiated bearer establishment, QoS parameters (bearer related and bearer unrelated), subscriber data in HSS, mobility (handover and Tracking Area update), service continuity, fast signalling,

VoLTE efficient handling

- mandatory and optional features,
- DRX,
- ROHC,
- AMR-NB and AMR-WB speech codecs,

- link adaptation,
- EVS codec,
- Dynamic Scheduling and Semi-Persistent Scheduling (SPS),
- DTX,
- HARQ fast re-transmissions,
- Frequency Hopping (FH),
- VoLTE Performance,

IMS basics

IMS architecture components, USIM vs ISIM, IMPI, IMPU, IMS subscription data in HSS, P-CSCF discovery, Application Servers, addressing and routing principles, IMS registration, third-party registration, Initial Filter Criteria (iFC), DNS/ENUM, IPX, security, number portability,

VoLTE voice call

- mobile-to-mobile call,
- SIP and SDP,
- PCC (PCRF) interworking,
- interworking with CS system – calls between VoLTE and CS terminals,
- coexistence of VoLTE and CSFB – T-ADS,

SMS

- SMSoIP service architecture,
- SMSoIP registration,
- SMS transfer,
- integration with SMS Router,

Supplementary services

MMTel and VoLTE supplementary services, synchronization of subscriber profile between CS and IMS domains, examples of supplementary service procedures (Communication Hold – HOLD, Conference – CONF, Communication Diversion – CDIV, Message Waiting Indication – MWI, DTMF),

SRVCC

- SRVCC service architecture,
- SRVCC related identities,
- SRVCC registration,
- SRVCC handover from LTE to 2G/3G CS network,
- SRVCC enhanced with ATCS,

- registration using ATCS enhancements,

CSFB and SMSoSGs

- traditional CS services in LTE without VoLTE support, CSFB and SMSoSGs as the intermediate solution for roaming subscribers and emergency calls,
- CSFB and SMSoSGs architecture,
- CSFB – MO and MT calls,
- SMSoSGs – MO and MT SMS,
- UE domain selection,
- VoLTE migration path,

Security

3GPP & IMS Authentication and Key Agreement, Security Association setup, Ciphering, Generic Authentication Architecture, Generic Bootstrapping Architecture,

Interworking and Roaming

- inter-IMS interworking (IBCF, TrGW),
- PS/CS interworking (BGCF, MGCF),
- international roaming (Local Breakout – LBO, roaming support in PCC – V-PCRF and H-PCRF),

Emergency calls

IMS architecture for emergency calls, emergency service categories, sources for emergency numbers, emergency call initiation, emergency registration to EPS, emergency registration to IMS, geographical positioning, domain selection for emergency call set-up,

Charging & Accounting

charging architecture, offline and online charging, charging data correlation.

Prerequisites:

The participants should be familiar with basic aspects of mobile network architecture and services. Background knowledge of LTE is highly recommended.

Training method:

Lectures, multimedia presentations and practical exercises.