EPC, VoLTE
Architecture & Signalling Protocols

Who Should Attend?

The course is intended for those who require in-depth understanding of architecture & signalling procedures in the core part of EPS. Targeted audience are network Engineers, responsible for network maintenance, troubleshooting, planning and commissioning.

If you already have LTE network or you are going to deploy it; if you plan to implement VoLTE technology – than this training is just for you!

Course Content

1. EPS Introduction
   a) 3GPP Core Network Evolution
   b) EPC Architecture
   c) Protocols in EPC – overview
   d) Roaming in LTE (conceptual view)
      ✓ Home-routed traffic
      ✓ Local traffic breakout

2. Voice over LTE. Architecture introduction
   a) Circuit Switched Fallback (CSFB),
   b) IMS – based
   c) VoIP Over-the-top (OTT)
   d) Road towards VoLTE – various deployment strategies.

3. Signalling protocols in EPC.
   a) Overview of key EPC procedures
      ✓ Network Attachement, & Detach,
      ✓ Tracking Area Update,
      ✓ Service Request,
      ✓ Dedicated Bearer Activation, Modification & Deactivation
   b) NAS protocol & procedures.
   c) S1AP protocol & procedures
   d) GTP protocol & procedures
   e) S6a protocol & procedures
      ✓ Optionally, includes Diameter introduction

4. CSFB. Technical Realisation
    a) SGsAP protocol and procedures.

5. IMS, technical aspects.
    a) IMS standardisation.
    b) IMS architecture & functional elements.
    c) IMS identities.
    d) Charging aspects in IMS.
    e) IMS interfaces & signalling protocols

Optional

6. SIP Fundamentals.
    a) SIP components (servers and clients) and their functions.
    b) SIP servers: proxy (statefull and stateless), redirect, registrar.
    c) SIP message structure.
    d) SIP sessions: session setup, proxying and redirecting requests, address resolution.
    e) SDP (Session Description Protocol).
    f) General SIP message flow examples.

7. Policy & Charging Architecture.
    a) Introduction to content-based charging and policy enforcement.
    b) Online and offline charging
    c) PCC architecture
    d) Roaming aspects in PCC enforcement
    e) Gx,Gxx, Rx, Gy Diameter Applications & procedures

8. Q&A, Open discussion.

Course Objectives

4/5-days “EPC, VoLTE Architecture & Signalling Protocols” advanced course is focused on explaining how EPS network works and how it is integrated with previous-generation (2G/3G) networks and services.

Training starts with architecture introduction, including also possible voice over LTE deployment strategies. That is followed with general overview all key signalling procedures and completed with detailed explanation of all key protocols in EPC network.

Policy & Charging architecture will be also separately discussed due to very high importance for IMS operation, especially in context of mobile-based IMS deployments.

Most of the protocols are illustrated with example traces captured in commercial networks. Practical issues related to testing and troubleshooting will be also discussed.

Pre-requisites

Participants should know architecture of mobile networks and have some knowledge about signalling protocols in telecommunication networks.

Training Structure

Four days (or five – if optional IMS part is selected) training divided into logical sections.

We recommend also one (or more) days of workshop with our Expert to gain even more experience in network testing and troubleshooting.

Methodology

Instructor led training extended with illustration of real signalling traces.