



## Who Should Attend?

This training is targeted at engineers who want to see how roaming evolves together with LTE. It presents different aspects of roaming, including procedures, protocols, and billing.

## Course Scope

1. Roaming architecture.
  - LTE/EPS nodes.
  - LTE/EPS inter-operator interfaces (Gr, Gp, S6, S8, S9, Gy).
  - Mode of operation.
  - IMS architecture.
  - GSMA IR65 and IR88.
2. Diameter introduction.
  - Diameter Baseline Protocol.
  - Functional nodes (client, server, proxy, etc).
  - Diameter Routing Agent.
  - Routing in Diameter (realms, FQDN).
  - Transport (SCTP/IP).
3. Policy and Charging Control.
  - Principles and evolution.
  - Architecture.
  - PCC and SAE.
  - Binding (bearer, session, rules).
4. SAE mobility and roaming scenarios.
  - Home routed traffic.
  - Home control and visited breakout.
  - Visited control and visited breakout.
  - S8 vs Gp for interconnect.
  - Access control in VPLMN and HPLMN.
  - Attach and TAU.
  - EPS bearer activation - GTP, S8.
5. IPX.
  - Architecture and functionality.
  - Border nodes - BG, FW, SEG.
  - Connectivity options - IPX vs GRX.
  - DNS for GGSN/PGW selection.
  - Diameter aspects (architecture, DRA, edge agents).
  - Network Domain Security (NDS).
  - QoS handling in IPX.
6. SAE charging architecture.
  - Charging identifiers.
  - LTE charging architecture.
  - TADIG and IREG.



- Changes in TAP files for LTE.
- 7. IMS roaming and interconnect.
  - IMS roaming scenarios.
  - VoLTE call.
  - Border nodes - IBCF and TrGW.
  - Finding CSCFs in IMS.
  - ENUM procedures.
  - Non-IMS scenario for voice and SMS.
- 8. Rich Communication Services.
  - RCS 5 Architecture (GSMA IR92).
  - End-to-end RCS architecture.
  - RCS device modes, client types, and device architecture.
  - RCS registration procedures.
  - RCS services.
  - RCS interworking.

## Course Objectives

This training contains a technical overview of LTE technology with related functionality (VoLTE, RCS) with regards to roaming. It covers specific traffic cases, explanation of architecture supporting different roaming scenarios, analysis of protocols. Changes to billing process are also explained.

## Prerequisites

Familiarity with LTE/IMS mobile networks will be helpful, but is not required.

## Training Structure

Three-day training divided into logical sessions.

## Methodology

Instructor-led training, presentation, workshops based on examples prepared by the trainer, and discussions of actual problems in the participants' companies.