EPS/LTE System Overview

This training is an excellent choice for engineers who have already gained experience with previous generations of mobile technology and begun to work with the new EPS/LTE system. Training maintains an appropriate balance between the topics related to E-UTRAN (radio part), EPC (CN part) and LTE based teleservices, giving the opportunity to understand the system as a whole. This training also provides required background knowledge needed to fully participate in more advanced training sessions focused on particular subsystem or network element issues.

Target audience:

The course is intended for EPS/LTE technical staff and their management.

Duration:

3 days.

Contents:

Introduction

3GPP mobile network evolution, LTE performance,

Network architecture

EPC: MME, S-GW, P-GW, HSS, EIR, PCRF, interfaces; E-UTRAN: eNB, S1 and X2 interfaces; interworking with GERAN/UTRAN: SGSN, S3, S4 and S12 interfaces; HPLMN routed traffic and local breakout international roaming scenarios; geographical network structure, identity numbers,

OFDMA and SC-FDMA

overview of multiple access technics used in 3GPP RANs, OFDMA fundamentals, OFDMA transmitter/receiver, OFDMA advantages/disadvantages, SC-FDMA fundamentals, OFDMA and SC-FDMA comparison,

E-UTRAN

FDD/TDD, Inter-Cell Interference, basic transmission structures and parameters, MIMO, channels, transmission process, air interface protocol stack,

EPC

MME in pool, signalling transport - SIGTRAN, user data transport – GTP, database communication – Diameter, default and dedicated EPS bearer, QoS,

PCC

Policy and Charging Control, PCRF in LTE, interworking between EPS/LTE and IMS/VoLTE/RCS via PCRF,

Traffic Cases

EPS attach, TA update, service request, connection release, dedicated bearer activation, UE requested bearer resource allocation, intra-LTE handover, inter-RAT handover, ISR,

Security

Authentication & Key Agreement, key hierarchy, ciphering, integrity protection, key chaining,

SON

Self Organising/Optimising Network – procedure examples: eNB self configuration, interference avoidance, handover optimisation, load optimisation,

CSFB &SMSoSGs

SGs interface, combined EPS/IMSI attach and TA/LA update, CSFB MT/MO call, SMS MT/MO,

IMS services

VoLTE and RCS service profile, LTE – VoLTE interworking, IMS architecture and principles, IMS registration, ASs examples, VoLTE call, SMS, SR-VCC, chat.

A-LTE overview

CA, MIMO, CoMP, eICIC and HetNet, Relay Node.

Prerequisites:

The participants should have general technical telecommunications/computer science knowledge on a degree level. Knowledge about GSM/UMTS GPRS services is very useful.

Training method:

Lectures and multimedia presentations.