

LTE - EVOLVED PACKET CORE

- WITH FOCUS ON EPC SIGNALLING, VoLTE and CSFB

Course Description

The course “LTE Evolved Packet System with focus on EPC and EPC Signalling” is intended for telecom professionals with the task of implementing the mobile system standards based on 3GPP LTE and more specifically, the Core Network parts. Therefore the focus is set on understanding the LTE system from a mobile operator’s perspective, addressing the implementation issues and challenges of the Core Network Engineers.

A thorough system overview of the LTE/EPS is featured along with all the details on the Network functions, interfaces and network capabilities. The EPC parts and EPC signalling is analyzed in detail. Furthermore a number of traffic cases are studied and several comparisons are made to the existing UMTS technology and the inter-working with the UMTS and GSM systems. VoLTE and Circuit Switched Fall-back CSFB are also analyzed.

Content

THE OVERALL EPS, EVOLVED PACKET SYSTEM (LTE)

- EPS overall architecture and the major differences compared to UMTS
- LTE Radio and Core nodes and their relation to 3G systems
- LTE Service portfolio and compatibility to existing services
- IMS core functionality for operator centric end user services
- The fundamental TCP/IP functions in LTE
- Mobility and compatibility between 2G/3G and EPS networks
- Migration vs. replacement of 3G systems
- SON, Self Optimized/Organizing Networks
- LTE-Advanced: 3GPP R9 and 10 highlights



LTE RADIO NETWORK ASPECTS ON EPC SERVICES

- The all IP based protocol architecture
- The matching of radio bearers to QoS indicators in LTE
- Reusability of existing 2G/3G investments for LTE
- PS-to-PS Interworking with 2G/3G radio
- PS-to-CS Interworking with 2G/3G radio
- Fallback for CS services to 2G/3G radio

VOICE over LTE implementation in EPC, VoLTE

- VoLTE service architecture incl charging
- VoLTE provisioning and default APN attributes
- Roaming guidelines for VoLTE implementations
- Implementation of 112 and Supplementary services in VoLTE
- IM implementation and provisioning options in VoLTE
- IM/SMS service interworking in LTE

CS Fall Back implementations in EPC and CS CN

- CSFB requirements on network and terminals
- Subscription data related to CSFB services
- Dual registration and mobility support for CSFB
- SMS fallback or 'SMS over SGs' solution
- MT- and MO-scenarios covering voice fallback to 2G/3G
- Return to LTE after CSFB completion
- Fallback for CS services to 2G/3G radio

EPC, EVOLVED PACKET CORE FEATURES AND PROTOCOLS

- MME, S/P-GW, HSS and PCRF system functions
- S1-AP and GTP-C context and procedures in LTE
- Policy, charging and control procedures in LTE
- APN Default bearer vs. dedicated bearers
- UE vs. Network initiated bearer setup
- LTE QoS class indicators QCI
- VCC, Voice Call Continuity and CS fallback/interworking
- QCI mapping into 3G QoS classes and IP DSCP values
- Authentication and security in EPC
- Instant messaging vs. SMS services in LTE
- USIM/ISIM and service provisioning issues

MOBILITY MANAGEMENT OVERVIEW

- Tracking Area based mobility
- Mobility in IDLE mode
- Cell reselection principles
- Mobility in ACTIVE Mode
- Intra E-UTRAN mobility with X2 support
- Mobility with other non-3GPP access systems
- Inter (3GPP) system mobility

EPC SIGNALLING SCENARIOS

- The protocols and interfaces in EPC, including S1
- Signaling scenarios on GTPv2 control protocol
- Diameter protocol usage scenarios in EPC
- EPC Signaling with SIP based traffic
- EPS Bearer setup signaling flows over S1AP, GTPv2 and Diameter
- International Roaming guidelines with EPC signaling
- Charging Interfaces in EPC

TRAFFIC CASES IN LTE/EPS

- Combined 3G/LTE registration and mobility
- Network initiated Bearer setup for MT VoLTE traffic
- LTE Data Session setup procedures
- Mobile phone call set up (VoIP call session initiation)
- IMS application registration and IM message delivery
- Mobility in LTE: Paging and location update procedures
- Handover within E-UTRAN and Inter-RAT mobility

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Target audience

The course targets Core Network engineers with the task of implementing the mobile system standards based on 3GPP LTE.

Pre-requisites

The participants should have a good understanding and working experience from WCDMA and GSM Systems.

Course Length

3-4 days

BRIGHTCOMMS is an independent company specializing in providing solutions in the engineering of radio frequency (RF) with extensive experience and demonstrated reliability, responsibility and commitment to our clients and their goals, also taking priority attention from the needs they immediately.

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