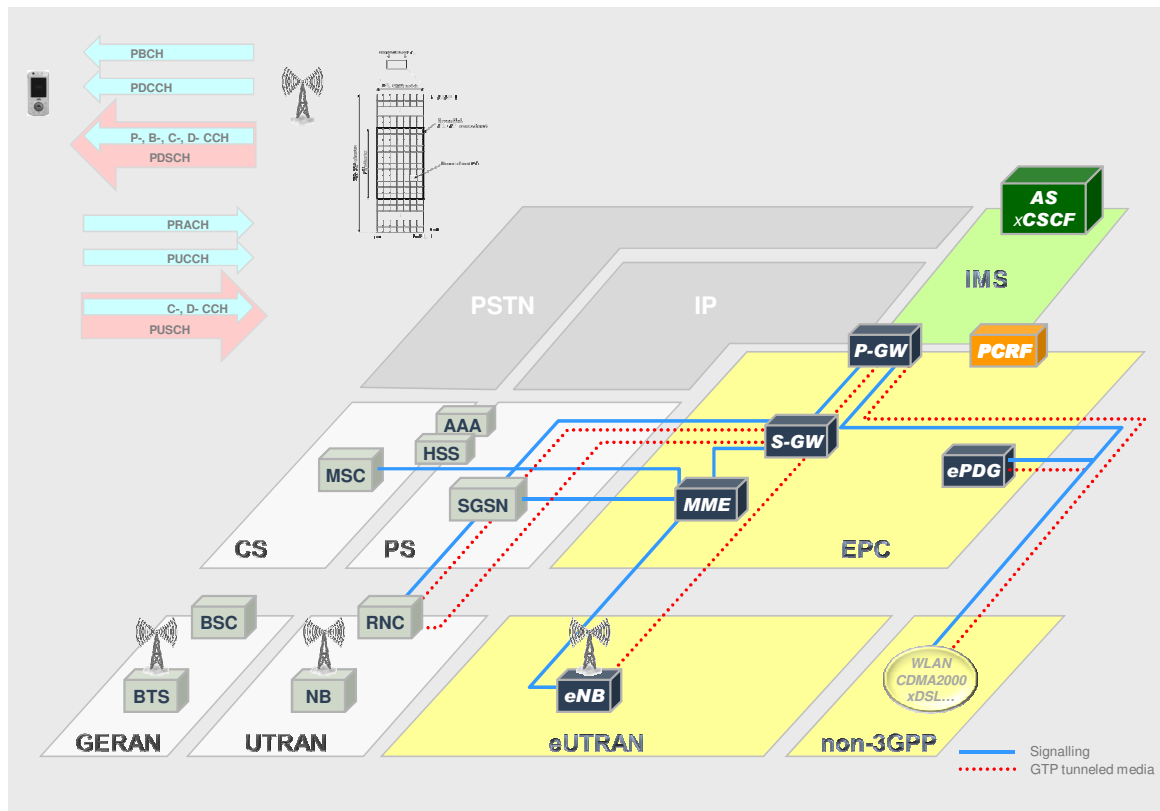


# LTE/EPC System Overview

An **Engineer's** Guide to 3G Evolution Technologies eUTRAN, HSPA+ and EPC (3GPP R'7 – R'8)  
2 Days

## Business Value

You will get a concise overview of the most important technical developments as 3G networks evolve to mobile broadband. This course addresses nodes, functions and procedures found in 3GPP Releases 7 and 8.



## Who should attend

The course is designed for engineers in Software-Design, Network-Integration/Verification, End-to-End Planning/Performance Testing, and other technical areas.

## Presentation/Exercises

Instructor presentation with the Futurenetz active learning tools. You get a text-book/work-book in which you fill out pre-printed graphics with information during lecture. This method is specially designed to help your comprehension and alertness.

Text-based exercises are included.

**3D-Memory-Map** is a 3-D workable model of the network used to enhance your understanding with its hands-on, activity-based approach. This method has been proven successful for over 6 years.

## Content Summary

- How 3G Technologies Evolve to Mobile Broadband**  
***A top-level view of eHSPA and LTE/SAE***  
 Concrete goals and performance requirements of 3G Evolution  
 Feature overview of 3GPP Releases 7 and 8 and beyond. Packet connection latency analysis and improvements in UMTS. The shared vs dedicated channel approaches, Fast Scheduling, CQI reporting, shorter TTIs, CPC and other features as HSPA evolves. In addition, you will understand the points that make up the case for LTE vs. HSPA+.
- Enhanced Packet Core (EPC) and e-UTRAN Design Introduction**  
***Basic functional blocks of the Enhanced Packet System (EPS)***  
 - MME, S-GW, and P-GW compared with SGSN-GGSN  
 - Roaming and non-roaming scenarios (Home vs Local Breakout)  
 - Missing RNC and interconnected eNBs (S1-MME, S1-U, X2, S5/S8 etc)  
 - EPS Bearers and QoS concepts (QCI, MBR, GBR, AMBR etc.)  
 - Simpler RRC State Machine, EMM and ECM states  
 - Access to EPC via non-3GPP networks
- LTE Radio Interface Essentials**  
***Easy to understand overview of the OFDMA radio access***  
 - What is the physical radio resource and how is it managed  
 - Downlink OFDMA and Uplink SC-FDMA transmission explained  
 - Frames, Subframes, Timeslots, Subcarriers and Resource Grids  
 - Radio Channels (PDSCH/PDCCH and PUSCH/PUCCH)  
 - High-level functions of radio protocols (RRC, PDCP, RLC, MAC)  
 - Example DL/UL transmission plus MIMO
- Signalling Procedures with the EPS**  
***How EPS connections are established and managed***  
 - Cell Selection System Information, Random Access and RRC Connection  
 - EPS Attach, Default Bearer and E-RAB Setup  
 - Dedicated Bearer Establishment  
 - X2-based Handover  
 - Voice Call handling and the missing CS domain  
 - eMSC, IWF, Circuit-switched (CS) Fallback, SRVCC and VoLG

## Contact

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