Course ID
LTESIG

Course Title
LTE Signaling

Course Duration
3 days

Related Courses

- LTE: Technology & Business (LTE-BIZ, 2 days)
- LTE Air Interface Techniques (LTEAI, 4 days)
- LTE Network Planning (LTE-NPC, 5 days)

Aimed At

Technical audiences with prior knowledge of WCDMA, HSDPA/HSUPA, and an overview of LTE.

Group Size

5-25

Prerequisites

- LTE/SAE Technology (3 days, LTE-TECH)
- UMTS (3 day(s), UMTS-FDD)
- HSDPA (2 day(s), HSDPA)
- HSUPA (2 day(s), HSUPA)

Course in a Nutshell

This is second in our series of courses on LTE aimed at technical audiences. The first one, LTE/SAE: A Technology Overview, is a recommended prerequisite.

This course provides detailed information on the signaling layers in the LTE air interfaces including the channel structures and the mapping up to the physical layer.

Customize It!

- For those with good wireless technologies background but without exposure to WCDMA/HSPA, we can cover the prerequisite material upfront by extending the course to five days.
- We can tailor the course to focus on the technology aspects most pertinent to your audience, whether radio/core network engineers, application/device developers, or other.
- Add a workshop day at the end of the course, for a total of four days, for a deep dive into the transmission network IP backbone issues.

Course Outline

- LTE/SAE Introduction
  - How we got here: A brief overview of cellular
  - 3GPP Releases (Release 99 to Release 8)
  - EPS (E-UTRAN and EPC) logical architecture
  - EPS interfaces
  - EPC (Evolved Packet Core) architecture
  - SAE/LTE interfaces
- Radio Interface Principles
  - Channel models

  - BPSK, QPSK, 16QAM, 64QAM
  - OFDM: Principles of operation
  - MIMO systems overview
  - Radio interface techniques: Uplink/downlink
  - Channel structure
  - Exercises

- LTE QoS
  - EPS bearers
  - Signaling radio bearers
  - Authentication
  - Integrity protection
  - Ciphering
  - IP Sec solutions for transport network security

- Radio Interface Layers
  - Radio procedures
  - NAS security functions
  - Radio Resource Control (RRC)
  - RRC security functions
  - Packet Data Convergence Protocol (PDCP)
  - Radio Link Control (RLC)
  - Medium Access Control (MAC)
  - Packet data flow and multiplexing
  - Channel structure : Logical channels, transport channels, physical channels
  - 3GPP standards references
  - Exercises using logfiles and air interface protocol analyzer data

- LTE Signaling Cases
  - Periodic location update
  - IMSI attach
  - Mobile originating service
  - S1 handover signaling flow
  - X2 handover signaling flow
  - Inter-pool (SGW) handover
  - Inter-system handover signaling flows
  - VoLTE – IMS signaling
  - CS Fallback signaling flow
  - Exercises: Protocol analyzer log files

- Course Wrap-Up

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