

# Essential Voice over LTE

A 3 day training course



## Description

This course is designed to give the delegate a grounding in the options for voice traffic within an LTE network. We look at and describe the various options available including, CSFB, VoLTE and voice call continuity in LTE.

The course will be enhanced with call flow and SIP session examples. We will also investigate the full working of Session Initiation Protocol (SIP) and the IP Multimedia Subsystem (IMS), together with Private & Public Addressing.



## Key outcomes

By the end of the course delegates will be able to:

- ✓ Describe methods of supporting voice with 4G LTE
- ✓ Describe the EPC core network and procedures
- ✓ Recognise the QoS requirements in LTE
- ✓ Describe the IMS structure and control entities
- ✓ Describe the policy and charging rules function
- ✓ Explain the content of the HSS
- ✓ Describe the default EPS bearer setup
- ✓ Recognise the role of dedicated EPS bearers
- ✓ Understand IMS Service Identity Modules
- ✓ Explain private and public User Identities
- ✓ Explain an IMS session
- ✓ Describe Circuit Switched fallback procedures
- ✓ Describe VoLTE radio performance



## Training approach

This structured course uses Instructor Led Training to provide the best possible learning experience. Small class sizes ensure students benefit from our engaging and interactive style of teaching with delegates encouraged to ask questions throughout the course. Quizzes follow each major section allowing checking of learning.



## Details

### Who will benefit?

Technical staff working in mobile communications.

### Prerequisites

Essential 4G Core protocols and signalling

**Duration:** 3 days

**Customer rating:** ★★★★★

### Generic training



Generic training complements product specific courses covering the complete picture of all relevant devices including the protocols "on the wire".

*"Friendly environment with expert teaching that teaches the why before the how."*  
G.C. Fasthosts

### Small class sizes



We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.

*"Excellent course. The small class size was a great benefit..."*  
M.B. IBM

### Hands On training



The majority of our courses use hands on sessions to reinforce the theory.

*"Not many courses have practice added to it. Normally just the theoretical stuff is covered."*  
J.W. Vodafone

### Our courseware



We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.

*"Comprehensive materials that made the course easy to follow and will be used as a reference point."*  
V.B. Rockwell Collins

### Customise your course



Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.

*"I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on."*  
S.R. Qinetiq

# Essential Voice over LTE

## Course content

### LTE architecture

- eNB,
- MME,
- SGW,
- PGW,
- HSS,
- PCRF

### Bearer concepts and QoS

- Radio functionality,
- Bearers and schedulers,
- Mobility,
- Circuit Switched fall back handover,
- Mobility from 2G/3G back to LTE,
- Power saving features,
- Positioning services,
- UE radio access capabilities for VoLTE users,
- EPC functionalities,
- LTE Subscriber Identification,
- PDN connectivity establishment,
- EPS dedicated bearer setup,
- IMS Identification,
- IP multimedia identification,
- Module,
- Public User Identity,
- Private User Identity

### SIP and SDP protocols

- SIP requests,
- SIP responses,
- Exploring the content of the SDP message,
- The Offer/Answer,
- Process,
- Dialogues and sessions,
- Managing QoS,
- RTP/RTCP

### VoLTE end-to-end signalling

- VoLTE subscription and device configuration,
- EPS attach for CSFB/IMS VoIP and default bearer IMS registration,
- Constructing the REGISTER request,
- From the UE to the P-CSCF,
- From the P-CSCF to the I-CSCF,
- From the I-CSCF to the S-CSCF,
- S-CSCF challenges the UE,
- UE's response to the challenge,
- Registration at the S-CSCF,
- The 200 OK response,
- Third-Party registration to application servers,
- Subscription to registration event package,
- Re-registration and re-authentication,
- De-registration,
- Related standards,
- IMS VoIP session,
- Constructing the INVITE request,
- Routing,
- Media negotiation,
- Media resource reservation and policy,
- Control,
- Charging,
- Session release,
- IMS emergency session

### VoLTE radio performance

- Coverage,
- Latency,
- Capacity

