Systems & Network Training

Voice over LTE

A 3 day training course

Save on expenses. This course is also available on your premises.

Description

This course provides a basic understanding of the 3G LTE Air Interface, SAE, as well as Voice over LTE options and LTE Advanced features. Investigating the standards for the EPS , formulated by the 3GPP standards body, the course will set out to examine and explain the 4G environment from user equipment to border gateway and beyond. This course will ensure the delegate has a grasp of all aspects of the current global deployments, the next steps in upgrades and the promise of things to come.

Key outcomes

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

- ✔ Describe the complete EPC architecture.
- ✔ Explain the use of QoS within the air interface & core network.
- ✔ Explore the features of LTE advanced.
- ✔ Describe the various methods of supporting voice services with 3G LTE.
- ✔ Describe IMS structure and control entities.
- ✔ Explain an IMS session.

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?
Any engineers who are assisting in the deployment of voice services within their LTE networks.

Prerequisites
Intro to data communications and networking.
Telecommunications Introduction.

Duration: 3 days

Overall rating: ★★★★★

Generic training	Small class sizes	Hands On training	Our courseware	Customise your course
Generic training compliments product specific courses covering the complete picture of all relevant devices including the protocols “on the wire”.	We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.	The majority of our courses use hands on sessions to reinforce the theory.	We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.	Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.
“*Friendly environment with expert teaching that teaches the why before the how.”* G.C. Fasthosts	*“Excellent course. The small class size was a great benefit...”* M.B. IBM	*“Not many courses have practice added to it. Normally just the theoretical stuff is covered.”* J.W. Vodafone	*“Comprehensive materials that made the course easy to follow and will be used as a reference point.”* V.B. Rockwell Collins	*“I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on.”* S.R. Qinetiq

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Course content

3GPP standards body

Release 8 – Release 12, Supported and expected features.

The EPC revisited

3G LTE & EPC Architecture, NB, MME, SGW, PDNGW, PCRF, Interworking capabilities, Protocol stack explored, NAS signalling, Default EPS bearer, Slot allocation algorithms, Scheduling algorithms, Quality of Service requirements, Dedicated EPS bearers.

VoLTE deployment strategies

Common networks everywhere, GSM/WCDMA view, CDMA view.

VoLTE system architecture

LTE radio, LTE Radio background, LTE radio architecture, Evolved packet core, EPC entities & functions, EPS mobility management, MS entities, Home subscriber server, Policy & charging rules function.

VoLTE functionality

Radio functionality, Bearers & 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, Relationship between public & private identity, identification of users device, identification of network entities, identification of services, identification without ISIM. IMS service provisioning, Enforcement of allowed services, Service triggering information, Selection of the AS, AS behaviour, Service provisioning in action.

VoLTE end-to-end & signalling

VoLTE subscription & device configuration.EPS attach for CSFB/IMS VoIP & default bearer. IMS registration, Constructing the REGISTER request, From UE to P-CSCF, From P-CSCF to I-CSCF, From I-CSCF to 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 & re-authentication, De-registration, Related standards. IMS VoIP session, Constructing the INVITE request, Routing, Media negotiation, Media resource reservation & policy control, Charging, Session release. Voice continuity, PS – PS intersystem handover, Single radio voice call continuity. IMS emergency session, PDN Connection setup for emergency session, Emergency registration, Emergency session. CS fallback for EPS call case, Architecture of CS fallback in EPS, Description of SGs interface, Idle mode signalling reduction, Idle mode vs active mode, CS fallback attachment, Mobile originating call using CSFB, Mobile terminating call using CSFB, Call unrelated CSFB procedures, Mobile terminating roaming retry & forwarding. VoLTE Messaging, Native IMS messages, SMS interworking, Multimedia messaging service. Unstructured supplementary services data simulation in IMS.

IMS services

VoLTE radio performance
Coverage, Latency, Capacity.

LTE advanced features

Carrier aggregation, Coordinated mMulti-point Operation (CoMP), ICIC & eICIC, Relay node deployment & donor eNBs, Improved cell edge coverage, Reduced control plane latency, Heterogeneous networks, HeNB, security gateways, HeNB gateways.