

Advanced VoLTE Training

Advanced VoLTE Training, Voice over LTE (VoLTE)

Advanced VoLTE Training covers VoLTE planning, VoLTE implementation, end-to-end signaling, security, validation and verification, testing, operations and troubleshooting.

Learn about the importance of QoS and policy control to VoLTE, delivery of rich media services, differentiated services to handle various services including voice, rich media, and video services, and finally VoLTE client end-to-end access and the role of UE/eNB across VoLTE.

Voice over LTE (VoLTE) is the set of LTE standard for voice call and rich multimedia setup and management. Learn about IMS and SIP signaling to setup multimedia sessions in VoLTE including IMS call setup and release, SMS over IMS and RCS.

Learn about VoLTE and IMS procedures and challenges, Session Initiation Protocol (SIP) procedures, effect of inter-RAT (Radio Access Technology) mobility, policy and Quality of Service (QoS) challenges when planning, designing and managing VoLTE deployments.

Our Advanced VoLTE Training created and designed by LTE and VoLTE experts, covers a practical framework and step-by-step approach for thoroughly planning, evaluating, testing, validating, operating, troubleshooting and managing all aspects of VoLTE to ensure a high-performing VoLTE deployment. Advanced VoLTE Training covers VoLTE/IMS/SIP procedures and scenarios dealing with major VoLTE and IMS functions, security, QoS and performance.

Advanced VoLTE Training Course Objectives

Upon completion of completing of Advanced VoLTE Training course, the attendees are able to:

- Describe concepts behind VoLTE and voice calls over LTE/EPC/IMS
- List functions in mobile networks deploying VoLTE
- List steps toward successful implementation of VoLTE
- Describe importance of QoS and Policy Control to VoLTE
- Illustrate VoLTE network architecture
- Explain VoLTE operational scenarios, IMS security and registration, related SIP messages and related parameters for: VoLTE registration, VoLTE to VoLTE call setup and release, VoLTE to PSTN call, and Emergency Calls
- Describe VoLTE deployment in parallel with Video calls over LTE and RCS multimedia services such as video share, multimedia messaging, chat and file transfer
- List lessons learned on RCS and VoLTE launches

Course Agenda

VoLTE Network Components in LTE and IMS

- Overview of LTE/EPC
- Overview of IMS
- UE and ISIM
- New ISIM VoLTE/IMS user identities
- eNB
- MME, S-GW, P-GW and PCRF
- IMS nodes
- SIP proxies and registrar servers
- Media gateways
- Call agents
- Session border controllers (SBCs) and application-layer gateways
- Application servers
- EUTRAN components (eNodeB)
- EPC components (S-GW, P-GW, MME, HSS, PCRF)
- IMS components (x-CSCF)

VoLTE and IMS Procedures and Protocols

- IMS Procedures
- PDN Connectivity
- NAS Signaling
- Authentication
- Bearer Setup and EPS Attach
- P-CSCF Discovery
- SIP Registration
- Event Subscription
- VoLTE Call

VoLTE and IMS Related Associations and Protocols

- SIP and SDP
- Session Description Protocol (SDP)
- Real-time Transport Protocol (RTP)
- RTP Control Protocol (RTCP)
- VoLTE and IMS security association
- User Agent and a P-CSCF association
- Role of ISIM and IMS public and private keys
- ISIM and the HSS association
- SIP Registration
- IMS registration

- IMS registration with IMS AKA
- SIP subscribe precudye
- SIP de-registration and UE power down
- SIP de-registration on network release
- Event Subscription
- VoLTE Call
- SMS over LTE
- End-to-end system tests
- VoLTE test cases

VoLTE Operational Scenarios

- VoLTE setup
- LTE attach call flow
- VoLTE client end-to-end access
- UE/eNB across VoLTE
- IMS APN bearer setup
- Default bearer setup
- VoLTE Registration
- IMS registration
- SIP signaling over IMS/P-CSCF
- Application registration
- Voice Call Continuity
- Emergency Call Support
- Emergency session call flows

Basic VoLTE Setup

- LTE Attach Call Flow
- Attach Request
- Update Location Request
- Update Location Ack (IMS APN, QCI 5)
- Create Session Request (IMS APN, QCI 5)
- Authentication HSS PCRF SPR
- IMS Registration Call Flow

VoLTE and IMS Related Associations and Protocols

- VoLTE Voice-Only Call
- VoLTE voice codec options
- VoLTE Voice-Only Call with Wideband AMR

- VoLTE Call Release Initiated by the Calling
- VoLTE Call Release Initiated by the Called
- Redirect VoLTE Call to Voice Mail after
- Redirect VoLTE Call Not Answered to Voice
- Originator Cancels the Call Before Ringing
- Originator Cancels Call after Ringing
- Loss of PDN Connectivity
- Loss of SIP Signaling
- Loss of Media Bearer
- Voice Call Waiting, Second-Party Hold
- Voice Call Switch Hold
- Handover During VoLTE Voice-Only Call
- VoLTE Emergency Registration
- VoLTE Emergency Call
- VoLTE Send SMS
- VoLTE IR.94 Registration with IMS AKA
- VoLTE 2-Way Video Call with 2-Way Audio
- Voice Call Transition to Video Call
- Voice Call Transition to Video Call Rejected
- Video Call Put on Hold
- Video Call Switch Hold

Importance of QoS and Policy Control to VoLTE

- VoLTE Test Challenges and Requirements
- Testing VoLTE's complex mix of voice, video, and messaging services
- Testing functionality, quality, and resiliency
- VoLTE testing
- Functional validation
- Capacity planning and network scalability
- Effectiveness of QoS and policy control mechanisms
- Voice and video quality
- System interoperability
- Network resiliency and error handling

Unique Challenges in VoLTE

- VoLTE and the multimedia telephony (MMTel) service
- Rich Communications Services (RCS)
- joyn™ by GSMA Potential

- Pitfalls of poor UE and network design
- Best practices and methodologies for guaranteeing mobile subscribers QoE
- Scalability and bottlenecks of their specific
- Network designs validating VoLTE
- VoLTE voice quality
- VoLTE voice quality with wideband AMR
- VoLTE call release initiated by the calling party
- VoLTE call release initiated by the called party
- VoLTE system evaluation including:
 - Functional validation
 - Capacity planning and network scalability
 - Effectiveness of QoS and policy control mechanisms
 - Voice and video quality
 - System interoperability
 - Network resiliency and error handling
 - Enriched voice, enlivened video, and intuitive messaging

VoLTE Testing and Validation

- Setup/Registration
- UE Registration with the IMS network
- Voice
- SMS
- Video
- Advanced
- Rich media