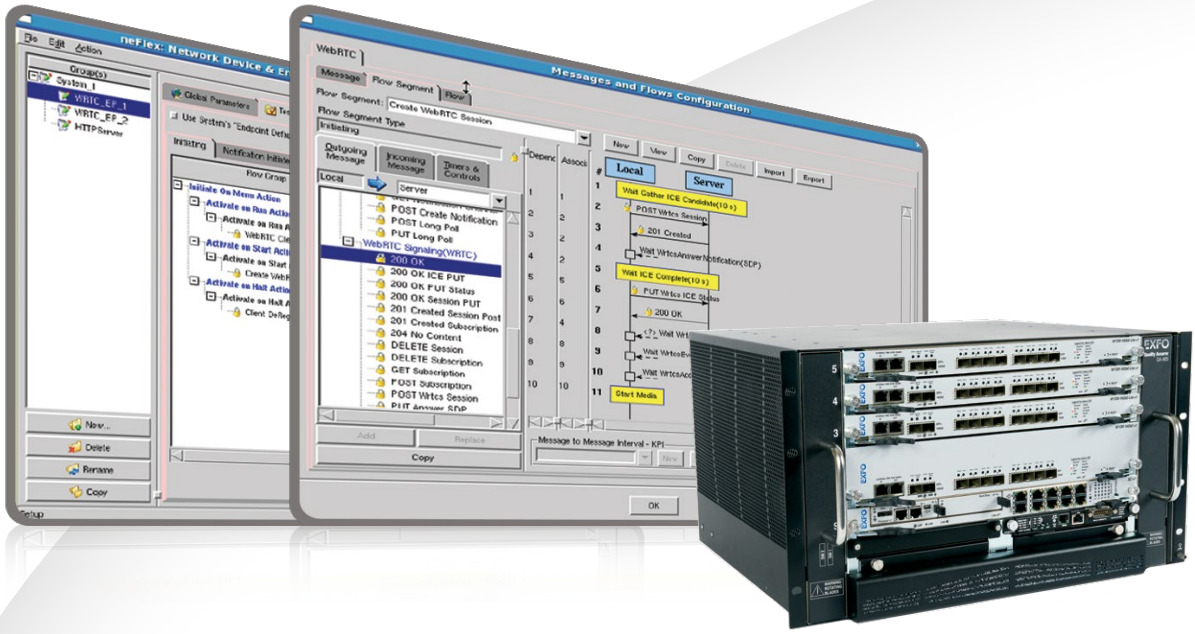
VoLTE and SRVCC test solution



IMS load-testing simulator used in labs to verify whether the IMS network and associated devices are delivering the expected VoLTE and eSRVCC performance prior to deployment.

SPEC SHEET

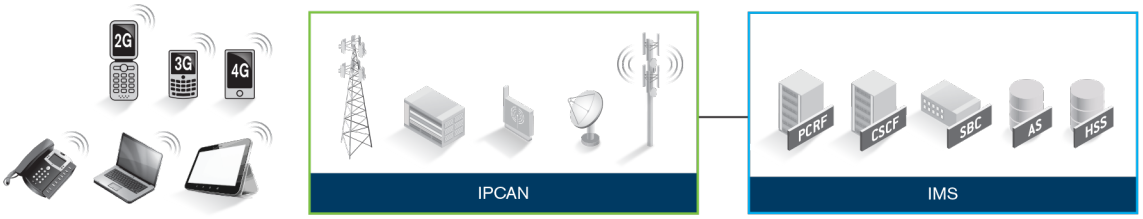
KEY FEATURES

- 10 million VoLTE endpoints
- 5 million IPsec and TLS sessions
- 1.28 million RTP/SRTP and RTCP/SRTCP streams
- 256K RTP streams per port
- Real-time quality of service (QoS) metrics for all streams
- Voice, video and data QoS metrics
- Distributed denial-of-service (DDoS) attacks and theft-of-service (ToS) tests
- Media-pinhole opening and closing tests
- Policy and charging rules function (PCRF) emulation
- Home-subscriber-server (HSS) emulation
- Enhanced mobile-switching-center (MSC) emulation for SRVCC and eSRVCC tests
- Application server (SCC-AS) emulation
- IMS (CSCF) core network emulation
- Mix of VoIP, VoLTE, RCS and WebRTC service tests
- Available in physical QA (pQA) platforms or as virtual QA (vQA) in VMware and OpenStack

EXFO

OVERVIEW

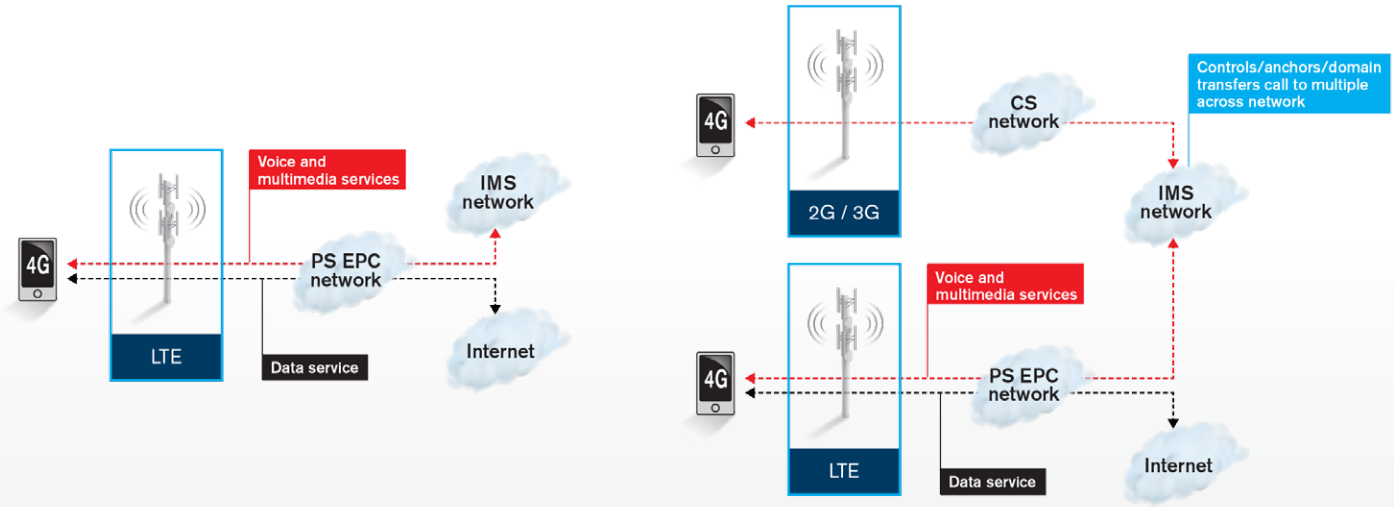
Driven by data hungry applications, the mobile world has made the shift to LTE. Voice remains a half-trillion-dollar business that is embracing voice over LTE (VoLTE). Furthermore, web real-time communication (WebRTC) and rich communication services (RCS) are necessary to protect declining revenues for mobile network operators as a result of free over-the-top (OTT) services. These services are hosted and delivered by IP-multimedia-subsystem (IMS) infrastructure (devices and network) to end users across different IP-connectivity (IP-CAN) access networks.



VOLTE AND eSRVCC

VoLTE is a GSM Association (GSMA) profile of the standards definition for the delivery of services currently provided via circuit-switch networks—mainly voice and SMS—over the packet-switched-only network of LTE, leveraging the core network IMS. Single radio voice call continuity (SRVCC) provides seamless voice call continuity when user equipment (UE) handovers occur from LTE to 2G/3G access networks.

Enhanced SRVCC (eSRVCC) introduces support for advanced features such as mid-call and alerting. Access transfer control function (ATCF) and an access transfer gateway (ATGW) anchor the media in the IMS network to drastically reduce handover time from over one second to less than 300 milliseconds. The ATCF function is implemented in P-CSCF and session-border-controller (SBC) devices, and the ATGW function is implemented in IMS-MGW and SBC.



EXFO'S VOLTE AND SRVCC TEST SOLUTION

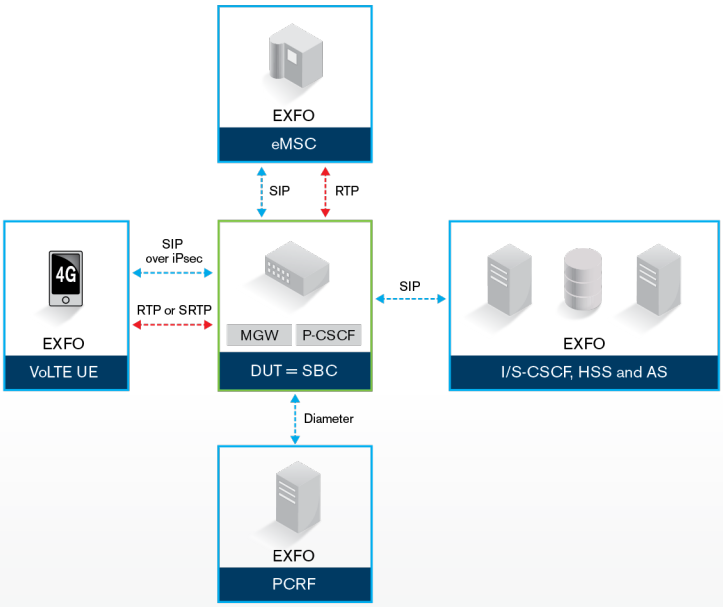
Years of experience from various VoLTE trials and deployments has proven the inherent complexity of this whole environment and shown how challenging it can be to reap the benefits of the IMS promise. The all-too-high costs and delays incurred are invariably linked to the high number of failures taking place in the field, as well as interworking failures between different devices in the IMS network, particularly during high busy-hour call attempts (BHCAs). However, these failures can be mitigated if they are detected and corrected in the lab.

EXFO's QualityAssurer is an IMS load-testing simulator used in labs to verify whether the IMS network and associated devices are delivering the expected VoLTE and eSRVCC performance prior to deployment. The QualityAssurer comes with a comprehensive set of advanced high-capacity and high-performance load-testing capabilities. Thanks to these easy-to-use features, the QualityAssurer helps ensure the timely identification of failures as well as faster time-to-market for solutions. This enables operators to deploy an IMS network, devices and services (such as VoLTE) in live networks with the highest levels of service quality and customer satisfaction.

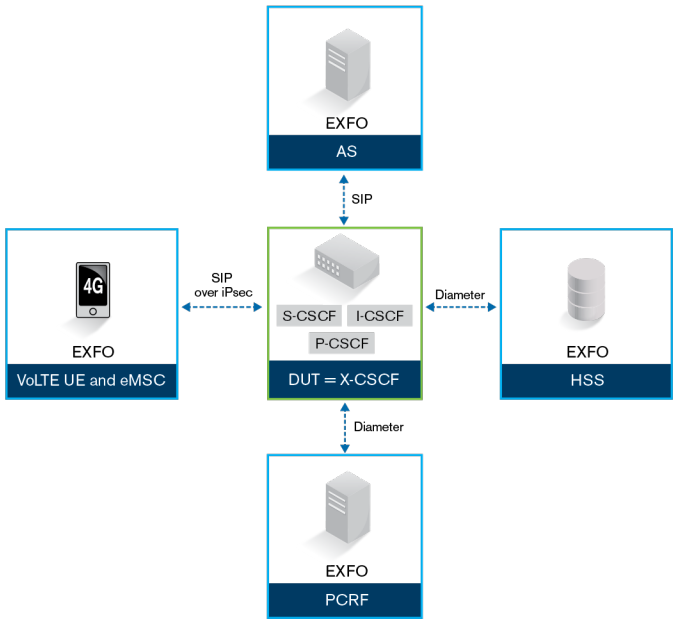
Top five VoLTE test configurations

The QualityAssurer supports the characterization of performance for IMS networks and devices such as A-SBC, I-SBC, E-SBC, P-CSCF, I-CSCF, S-CSCF, MGW, SCC-AS, TAS, HSS, DRA and PCRF. The top five VoLTE test configurations are described below.

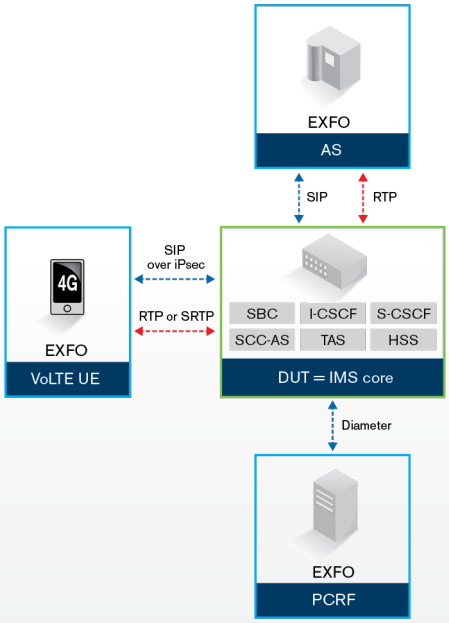
1) Test SBC VoLTE, SRVCC and eSRVCC functions by emulating the following: VoLTE subscribers, enhanced 2G/3G MSC (e-MSC), PCRF, call session control function (I-CSCF and S-CSCF), HSS, and the service centralization and continuity application server (SCC-AS).



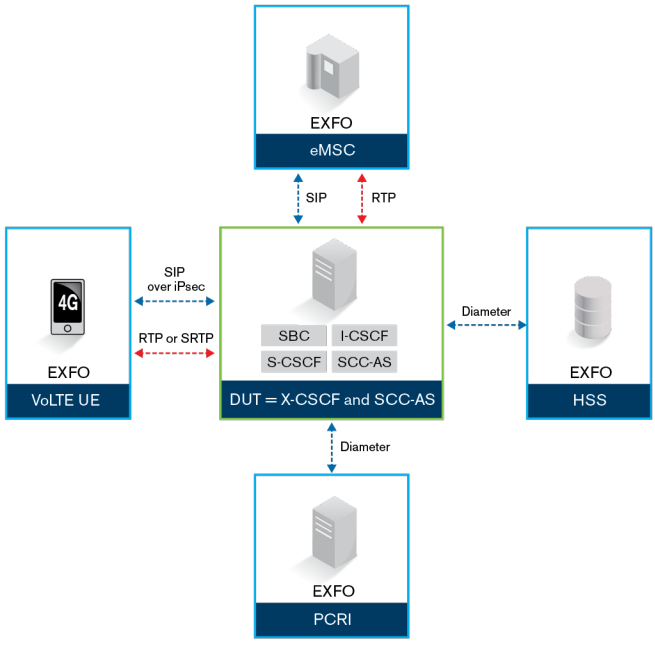
2) Test call-session-control-function (P-CSCF, I-CSCF and S-CSCF) VoLTE, SRVCC and eSRVCC functions by emulating VoLTE subscribers, e-MSC, PCRF, HSS and SCC-AS.



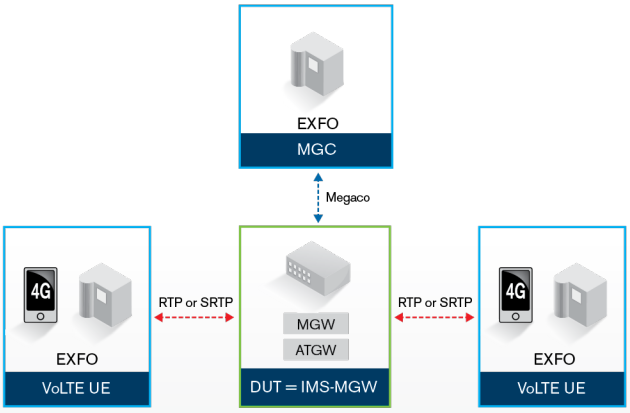
3) Test end-to-end IMS core (SBC, I-CSCF, S-CSCF, HSS, SCC-AS and TAS) VoLTE, SRVCC and eSRVCC functions by emulating VoLTE subscribers, e-MSC and PCRF.



4) Test SBC, call-session-control-functions (I-CSCF and S-CSCF) and SCC-AS VoLTE, SRVCC and eSRVCC functions by emulating the following: VoLTE subscribers, PCRF, e-MSC and HSS.



5) Test IMS-media-gateway (IMS-MGW) VoLTE, SRVCC and eSRVCC functions by emulating VoLTE subscribers, e-MSC and MGC.



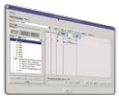
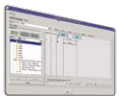
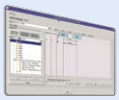
KEY LOAD-TESTING USE CASES

- Simulate millions of VoLTE subscribers to test an IMS network or devices to determine the right network devices for VoLTE service deployment.
- Test signaling performance and capacity such as registration rate, registration capacity, call session establishment rate and call session capacity.
- Test media performance and capacity, e.g.,whether the IMS network and devices are able to set up and maintain the dimensioned concurrent media sessions, with and without transcoding.
- Verify the impact on VoLTE service performance as a result of resource-intensive functions such as signaling security interworking (TLS to/from IPsec) and media security interworking (RTP/RTCP to/from SRTP/SRTCP).
- Generate and analyze line-rate (1G and 10G) voice and video streams for delay, jitter, packet loss and mean opinion score (MOS).
- Check whether an IMS network and related devices can deliver the expected QoS with various quality parameter settings such as ToS/differentiated services code point (DSCP), virtual local area network (VLAN) and multiprotocol label switching (MPLS.)
- Benchmark the performance of handover functionality for access transfer control function (ATCF), access control gateway function (ATGW) and SCC-AS devices.
- Test SRVCC and enhanced eSRVCC packet-switched (PS) to circuit-switched (CS) call features from basic-call to alerting to mid-call (two or three UEs) features.
- Perform high-availability tests to determine how resiliently the IMS network operates under overload conditions, security attacks (DDoS and rogue media), and card and port failover scenarios.
- Test that an IMS network is able to scale linearly to accommodate growing loads without any performance/capacity degradation.
- Exercise the entire operator IMS network infrastructure—physical and network function virtualization (NFV) based—by testing end-to-end service delivery with a mix of business VoIP, VoLTE, RCS/MSRP and WebRTC services.
- Test TLS and IPsec security switchover capabilities of P-CSCF.

SPECIFICATIONS

Platform	QA-805
Modules and interfaces	W2CM-10GigE (8x 1 GigE and 2x 10 GigE) W2CM-10GigE-Lite (8x 1 GigE and 2x 10 GigE) W2CM-4GigE (4x 1 GigE) W2CM-Sig (8x 1 GigE, signaling only)
Application protocols	SIP, SIP-I, SIP-T, MSRP, Megaco, RTP and RTCP
Transport and IP protocols	UDP, TCP, SCTP, IPv4, IPv6, dual stack
Security protocols	IMS AKA v1, IMS AKA v2, SIP digest, TLS 1.0, TLS 1.1, TLS 1.2, IMS TLS, TLS certificate chain, IMS IPSEC, SRTP and SRTCP
Codecs	G.711(μ-Law), G.711 (A-Law), ILBC, G.729 (A), G.729 (AB), G.721, ILBC, G.722, G.722.1, G.722.2/AMR-WB, AMR-NB, G.726, G.723, G.728, EVRC, EVRC-B, GSM–EFR/FR/HR, H.263, H.264, Silk, OPUS, VP8, DTMF (G.711 in-band and RFC 2833 out-of-band)
VoLTE endpoint capacity	10 million per QA-805 platform, 1M per port
Number of RTP/SRTP sessions	1.28 million concurrent streams per QA-805 platform, 256K concurrent streams per port
Quality measurements	Voice (ITU-T G.107 E-Model) Video (RFC 4445–VQT MDI) Jitter, loss, delay, etc.
Network configuration	Unique MAC addresses, VLAN tag, MPLS label, ToS and DSCP settings
Security testing	DoS, DDoS, theft of service, rogue media, pinhole closure, path verification, etc
Interworking	IP (IPv4 to IPv6) Transport (TCP to UDP to SCTP) Signaling (SIP to SIP-I/SIP-T) Media (RTP/RTCP to SRTP/SRTCP) Security (TLS to IPsec to clear)
Statistics and logging signaling	Trace monitor, call records, user-defined key performance indicators (KPIs), summary and call-flow statistics, table, histogram and chart format, and report generation in HTML and .CSV
Call profiling	Mix of real-world network traffic service testing, including VoIP, business VoIP, VoLTE, RCS/MSRP, video, DTMF and more from a single profile
Negative testing	Create invalid messages, create invalid and error call flows, and mix valid and invalid calls, etc.
Automation	RESTFul API, TCL command-line interface, and auto conversion of fixed IMS test profiles (sipFlex) to VoLTE profiles (volteFlex)

QUALITYASSURER APPLICATIONS

QA APPLICATION	DESCRIPTION
 volteFlex	A VoLTE subscriber emulator to test end-to-end VoLTE service, the IMS network and the devices. volteFlex can also be used to emulate VoLTE IMS network peering in order to test other VoLTE IMS network peering. This upgrade license requires sipFlex and IMS licenses.
 bgfFlex	Emulates a VoLTE subscriber and media gateway controller to test the decomposed media gateway.
 hssFlex	A diameter testing application that emulates and tests any type of diameter interfaces/devices, such as HSS, PCRF and OCS.
 proxyFlex	Emulates P-CSCF, I-CSCF and S-CSCF IMS functions/devices for performing surround testing of SBC and CSCF.
 asFlex	Emulates the SCC-AS application server to test IMS core functions, such as SBC/P-CSCF, I-CSCF and S-CSCF. In addition, it provides a framework that can be customized to test various back-to-back user agent (B2BUA) application server scenarios.

ORDERING INFORMATION

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