

Wireless Core Test Solution



COTS hardware compatible



An easy-to-use, state-of-the-art, high-capacity load-testing solution that enables wireless core simulation and wireless core network testing during the various stages of development and deployment with both physical hardware and software (VNF) solutions.

SPEC SHEET

KEY FEATURES

Simulation of most of the networks nodes for testing any type of complex scenario

Flexibility to create or modify test plans to meet customized requirements and future needs

Powerful traffic-modeling capabilities to mimic live network conditions

Customizable statistics through the addition of user-defined KPIs

Ability to recreate failure conditions to verify robustness

Single multi-technology platform for all types and stages of testing

End-to-end testing and surround testing of all network elements

VoLTE with SRVCC to 2G and 3G

Simulation of iRAT handover across all RANs for end-to-end testing

Support on VMware and OpenStack

Scalable to meet future test requirements

OVERVIEW

Today's telecom industry is characterized by constantly evolving wireless networks that have morphed into highly complex, multi-technology systems mixing existing and newly emerging technologies. In addition, the increasing complexity of innovative new services like VoLTE, ViLTE, QoS and iRAT, next-generation technologies and overwhelming data traffic are driving the need for more advanced network testing processes and resources.

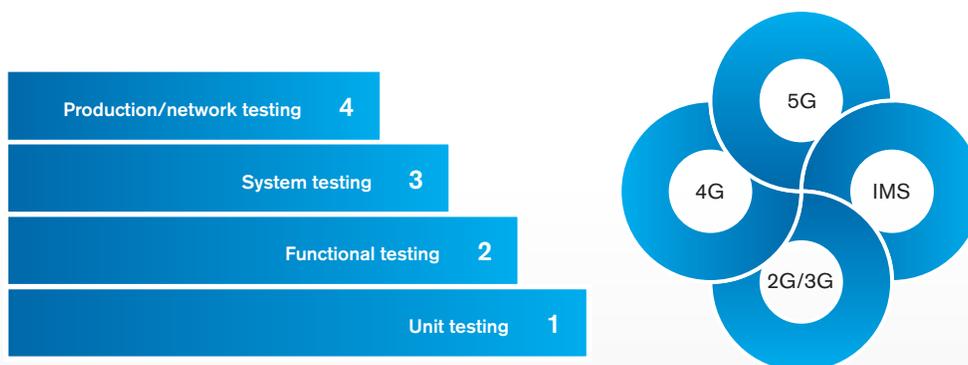
Network equipment manufacturers (NEMs) face the constant pressure of expediting the development, testing and deployment of new network components that offer a wide range of value-added, revenue-generating services. Mobile network operators (MNOs) are rapidly transforming their legacy networks to support new IP and multimedia services. Testing such complex network components in a service-oriented context while considering interoperability, service quality and end-user experience often poses a significant challenge.

Currently the market is heading towards a software-based approach to implementing NFV and SDN, which allows for swift upgrades in line with changing network and technology requirements.

EXFO'S WIRELESS CORE TEST SOLUTION

EXFO's wireless core testing solution is the industry's leading load-testing tool for validating comprehensive performance and capacity. EXFO's tool can perform conformance, negative, functional, regression and performance testing on the same platform, making it suitable for all stages of testing, from lab to production/network testing. Having one platform that supports multiple technologies allows users to verify nodes like MME and SGSN that require the support of both legacy 2G-3G and current LTE protocols. EXFO's solution supports IMS protocols and features an extensive range of audio and video codecs in one platform, extending its capabilities to include support of VoLTE and SRVCC testing. This solution, available on either a physical or virtual platform, is scalable to meet future requirements. New physical modules can be added to the physical QualityAssurer and new virtual network functions (VNFs) can be created on the virtual QualityAssurer to scale the load as per future test requirements.

By simulating subscribers and application servers, service providers ensure their networks can handle the required capacity and perform end-to-end as expected. And because it's possible to surround test individual nodes (e.g., MMEs) by simulating all the entities around them, operators can identify the right vendor for that node. It also helps vendors test their claims in the lab before launching their products on the market.



EXFO's QualityAssurer supports the characterization of performance for wireless core network and devices such as eNB, MME, SGW, PGW, HSS and with different interfaces such as Ga, Gd, Ge, Gm, Gn, Gr, Gx, Gxa, Gxc, Gy, Gz, luCS, luPS, S10, S101, S102, S11, S13, S1-MME & S1-U, S3, S4, S5, S6a, SBc, SGi, SGs, SLg, SLs, Sm, STa and Sv.

Some of the most common and complex use cases are explained below.

Wireless core testing

- › End-to-end testing with data
- › End-to-end testing with VoLTE/SRVCC
- › End-to-end testing with iRAT mobility
- › Surround testing of the EPC with iRAT mobility

Wireless core simulation

- › eNB testing
- › Gateway testing
- › MME surround testing

WIRELESS CORE TESTING SOLUTION

1. End-to-end testing with data

Test the control plane and user plane capabilities of the entire EPC by simulating the endpoint—i.e., VoLTE UEs, eNBs and the application server.

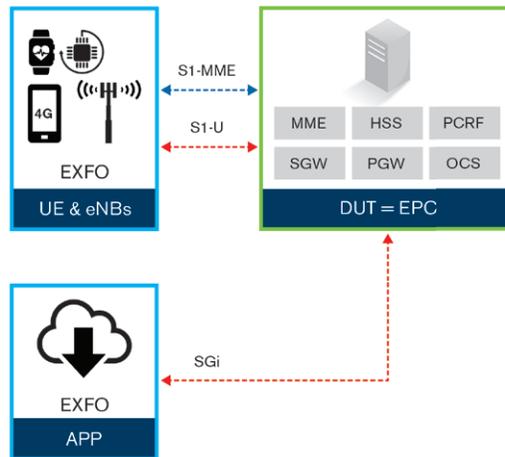


Figure 1. EPC end-to-end testing

2. End-to-end testing with VoLTE/SRVCC

Test VoLTE and SRVCC functions of the EPC and IMS network by simulating the VoLTE UEs, eNBs, application server and MSC. MSC simulation helps to test SRVCC with 2G/3G.

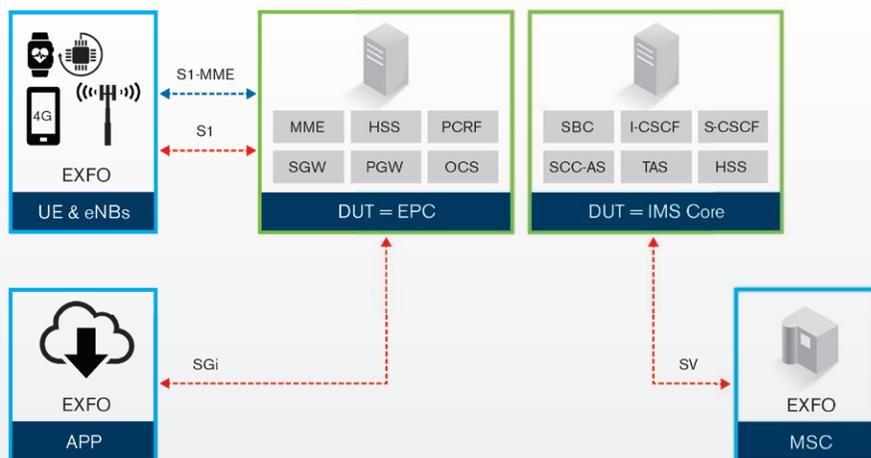


Figure 2. End-to-end testing with VoLTE/SRVCC

3. End-to-end testing with iRAT mobility

Test the entire core network comprised of the EPC and 2G/3G core functions for iRAT mobility by simulating the devices, app server and all types of radio access networks (i.e., eUTRAN, GERAN and UTRAN).

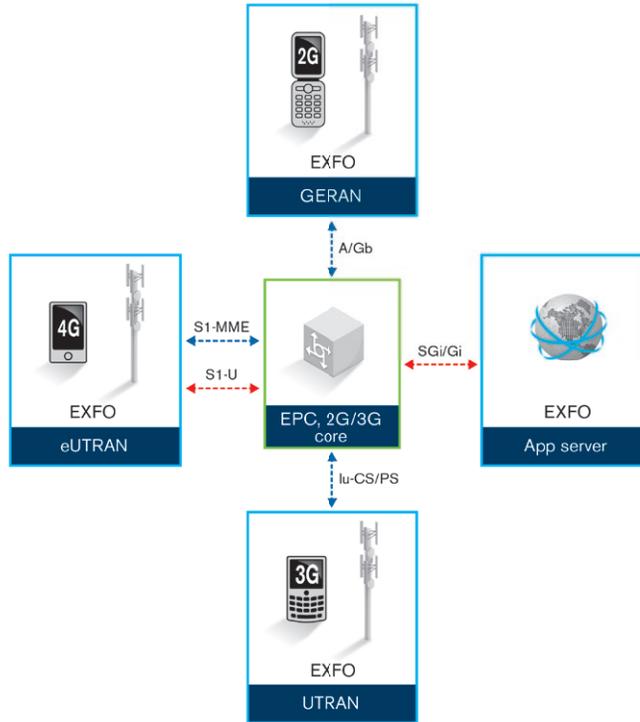


Figure 3. End-to-end testing with iRAT mobility

4. Surround testing of the EPC with iRAT mobility

Test complete EPC functions (MME, SGW and PGW) along with the AAA and PCRF by simulating subscribers, eNB, SGSN, MSC, TWAG and ePDG. TWAG and ePDG help to test Wi-Fi offloading with trusted and untrusted access respectively.

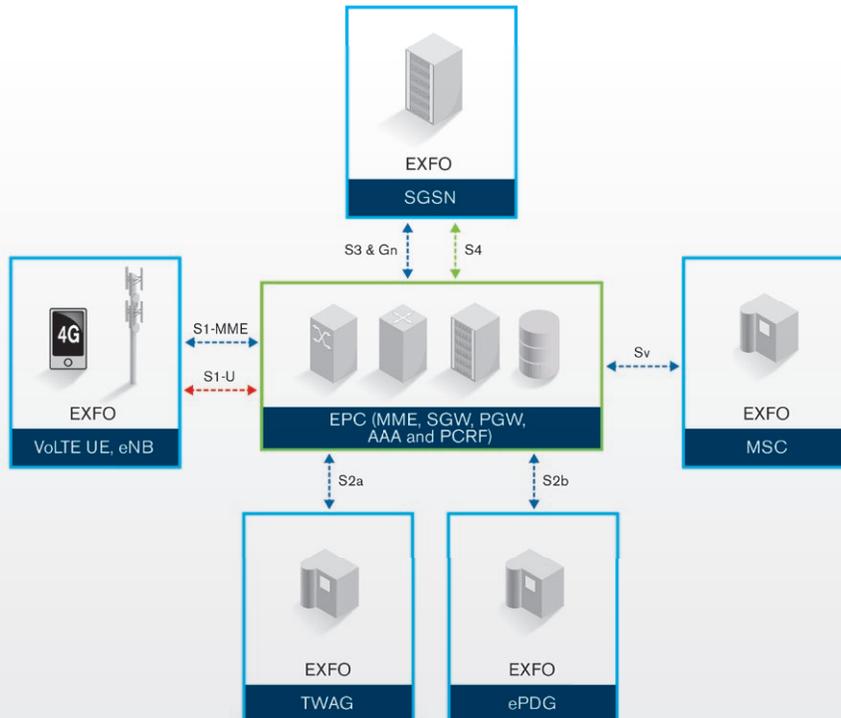


Figure 4. Surround testing of the EPC with iRAT mobility

WIRELESS CORE SIMULATION SOLUTION

1. eNB testing

Test the capability of the eNB to handle data and VoLTE traffic by simulating the EPC and the IMS core. Mimic heterogenous networks by simulating a mix of neighboring eNBs and HeNBs to verify the eNB's capability on the X2 interface.

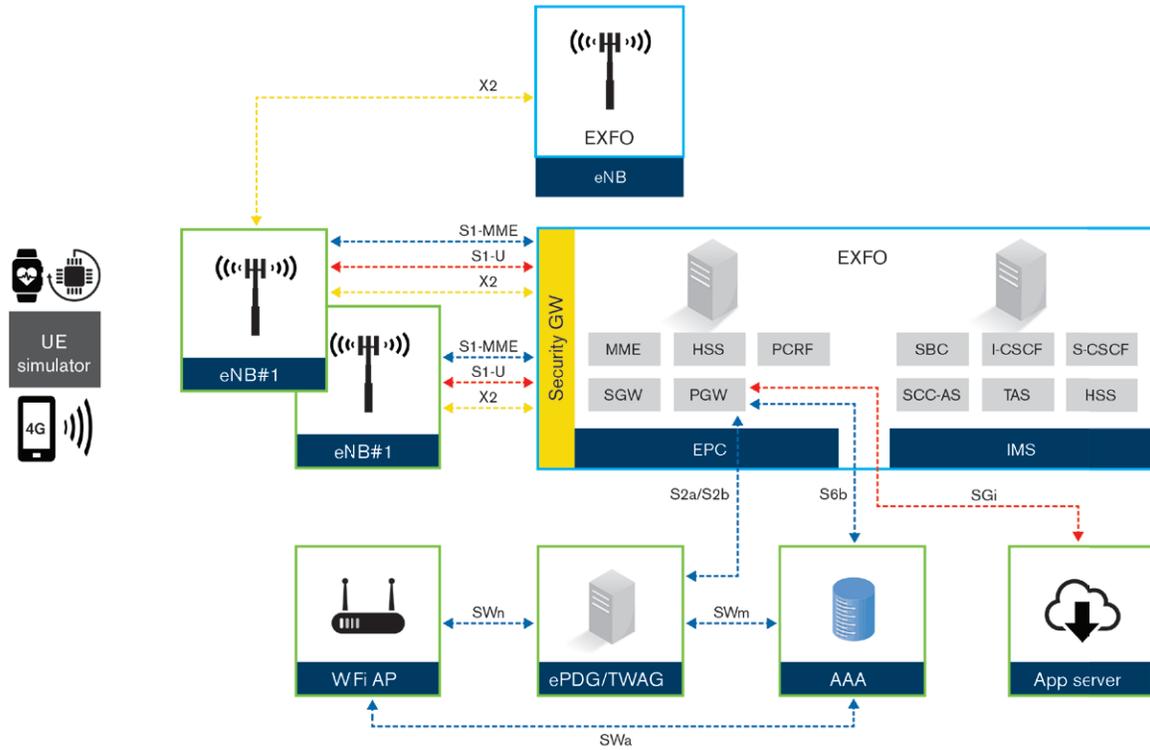


Figure 5. Surround testing of the eNB with data and VoLTE

2. Gateway testing

Test the SAE-GW (SGW and PDN GW) by simulating the eNB, MME, PGW, CGW, SGW, PCRF, OCS/OFCS and IMS core.

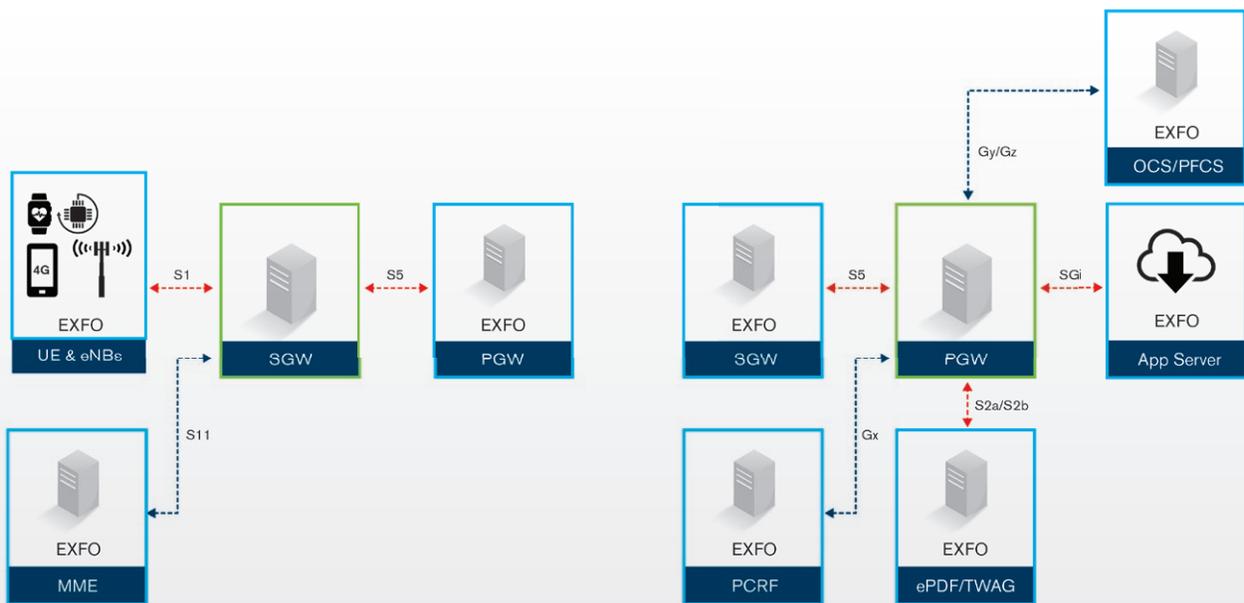


Figure 6. Surround testing of the SGW

Figure 7. Surround testing of the PGW

3. MME surround testing

Test MME by simulating all the surrounding nodes, including eNB, MME, SGW, MSC, EIR, HSS, GMLC/ESMLC, MBMS, CBC and SGSN.

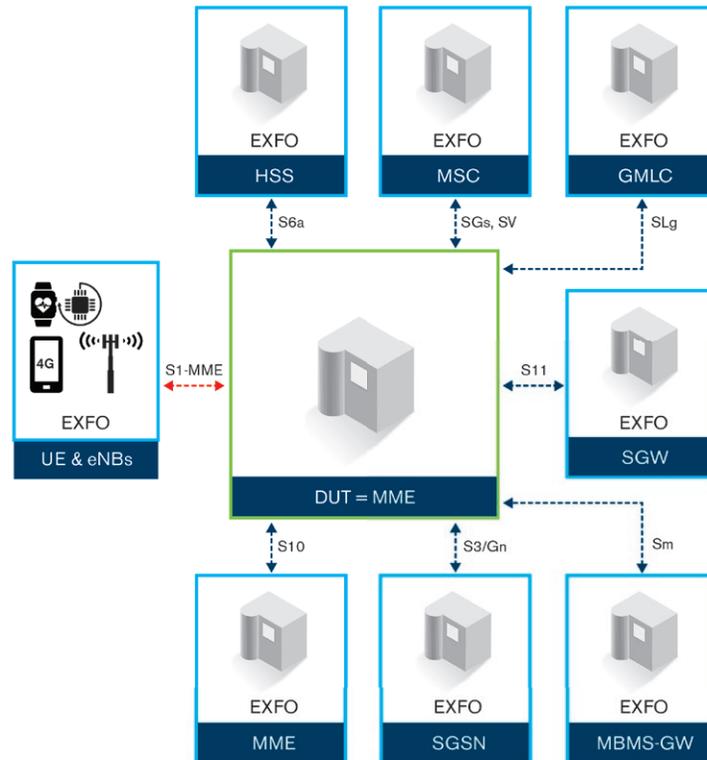


Figure 8. Surround testing of the MME

KEY LOAD-TESTING USE CASES

- › Simulates millions of LTE/VoLTE subscribers to test the wireless core network or devices.
- › Tests signaling performance and capacity, such as attach rate, handover rate, high messages per second and maximum simultaneously attached users.
- › Tests media performance and capacity, e.g., line rate throughput with different payloads, including media and data packets and concurrent active bearer sessions.
- › Verifies the impact of different security encoding like IPsec and RoHC testing.
- › Generates and analyzes line-rate (1G and 10G) voice and video streams for delay, jitter, packet loss and mean opinion score (MOS).
- › Checks interworking between different RANs (2G, 3G and 4G) and iRAT scenarios, like SRVCC, CSFB, PS HO and TAU with and without SGW change, etc.
- › Performs high-availability tests to determine how resiliently the wireless core network operates under overload conditions and other failover scenarios.
- › Tests that the wireless core network is able to scale linearly to accommodate growing loads without any performance/capacity degradation.
- › Exercises the entire operator wireless core network infrastructure and physical and network functions virtualization (NFV), by testing end-to-end service delivery and individual node testing.

SPECIFICATIONS

Platform	QA-805, QA-813 and vQA
Modules and interfaces	W ² CM-10GE (8x1GE and 2x10GE) W ² CM-10GE-Lite (8x1GE and 2x10GE) vQA (Any COTS server)
Transport and IP protocols	UDP, TCP, SCTP, IPv4, IPv6, dual stack
Security protocols	IPsec, TLS 1.0
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, like signaling only, signaling with data/media, handover, VoLTE, IRAT
Negative testing	Create invalid messages, create invalid and error call flows, and mix valid and invalid calls, etc.
Automation	Command-line interface (CLI), Test Suite
Capacity ^a	27 million UEs per system 768 thousand simulated eNBs per system

Note

a. The numbers mentioned above are under ideal lab conditions. The resource utilization (RAM, CPU) is up to 85%.

ORDERING INFORMATION

For ordering information, please contact: isales@EXFO.com.

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