

Spirent **Landslide**™

VoLTE/IMS Node and SIP UE Emulation

Voice over LTE (VoLTE) is the combination of IMS-based voice, messaging and video services over the 4G mobile network. To ensure a successful transition, mobile carriers and equipment manufacturers must ensure that voice quality and call reliability are as good as, if not better than, existing circuit switched voice services. Spirent's Landslide VoLTE/IMS Node Emulation tests the mobile and IMS core nodes to ensure they are capable of meeting the scale, performance and stability needed for successful VoLTE product and service rollouts.

Applications

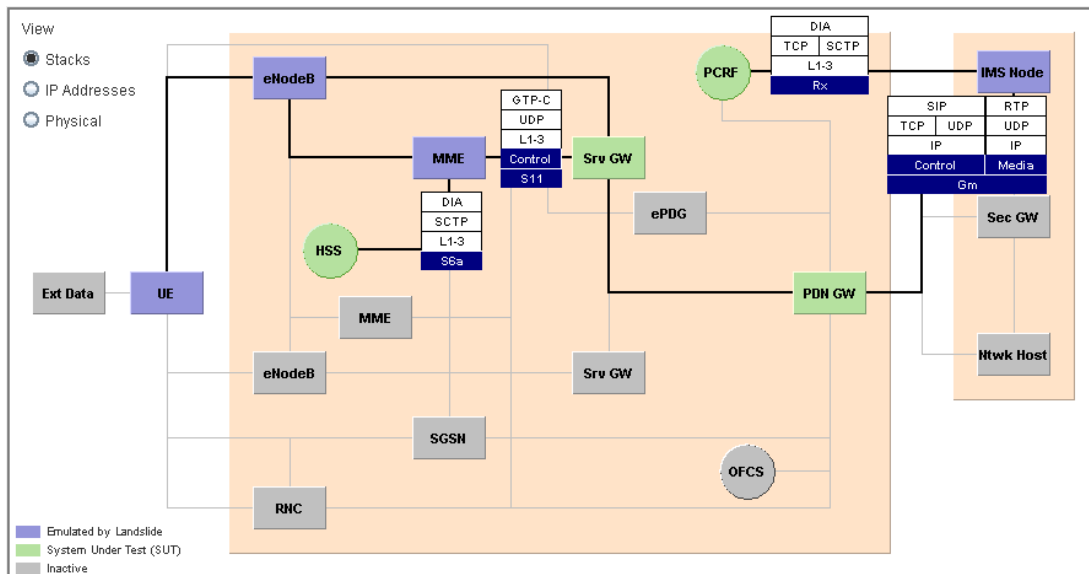
- Validate system scalability and identify capacity limits
- Measure control plane capacity
- Stress data plane performance
- Perform intra-LTE and IRAT mobility
- Characterize system before trial and delivery
- Identify performance ceilings
- Perform Busy Hour Call Attempt testing
- Evaluate SIP proxy performance and limitations
- Test EPC behavior under dynamic PCC conditions
- Determine data traffic impact on VoLTE call QoE

The Landslide VoLTE/IMS node emulation feature adds SIP-based VoLTE client emulation capabilities to LTE MME and LTE Gateway Test Applications. In addition, it adds a standalone SIP proxy/IMS P-CSCF node for testing scenarios that do not require emulated UE SIP clients. Landslide's VoLTE/IMS emulation feature allows the creation of test scenarios with thousands of UEs placing and receiving VoLTE calls while simultaneously sending and receiving data.

Complex call modeling scenarios can be created that include UEs in various stages of activation, deactivation, handovers, data transfers and VoLTE calling. Landslide can test against the entire EPC or it can emulate most network elements based on test bed requirements. The Landslide VoLTE implementation follows GSMA IR.92, and GSMA IR.94, and is the tool of choice for testing interoperable VoLTE network and equipment implementations.

Features & Benefits

- Realistic, real-world simulations that allow equipment vendors to accurately specify the performance characteristics of their equipment under real-world conditions
- Simultaneous control and user plane that allow service providers to measure the performance of their network and to validate new features and services in the lab
- Test any ePC network element in isolation or in an end-to-end configuration using realistic data while UEs place and receive VoLTE calls
- Easily test ePC network element performance, scalability and VoLTE call handling capability while the effects of dynamic PCC is investigated
- Use Landslide's data message flows, traffic mixer and emulated SIP clients to determine the impact of real-world traffic profiles on VoLTE QoE
- Unmatched scalability allows the user to simulate subscriber loads ranging from a small rural town to the largest metropolitan city
- Emulate multiple network elements to test a variety of network topologies
- Emulate key network elements to reduce capital expenditure and ongoing support costs
- Create real-world scenarios for heavy load, BHCA modeling and long duration stability tests
- Test any ePC network element in isolation or end-to-end configuration with realistic UEs
- Use Landslide's POLQA to measure speech quality
- Measure QoE for streaming video services with Landslide's PEVQ
- Provides more effective lab equipment utilization
- Automation control for repeatable, multi-test server complex test scenarios and lab configurations
- Use higher-level test management systems and Tcl to control and monitor Landslide
- Compile combined test reports that include the emulation (Landslide) and the device under test using Landslide's Tcl interface
- Voice Codecs—AMR-NB, AMR-WB, EVRC-B, EVS, G.711, G.722, G.729, ILBC and OPUS
- Video Codecs—H.263, H.264 and VP8



The Landslide LTE Gateway Test Application combined with the VoLTE/IMS feature provides a means of testing LTE gateway performance using data traffic, VoLTE calls or both. Integrated support for the Rx interface from the IMS node or SIP Proxy provides a means of testing PGW and/or PCRF operation and performance when using dynamic policy and charging control for dedicated bearer creation, modification and deletion.

Test Configuration | Network Devices | Phonebook | S6a | S11 | VoLTE | Rx | Gm

SIP Subscribers | SIP Endpoints | Server Profile

SIP Subscribers

Public User Name: user#(N0) | Private User Name: user#(N0) | Secret Key: password#(N0)

Realm Network Domain Name: spirent.com | Home Network Domain Name: spirent.com | Signaling Port: 5060 | IMSI: 5050241#(N0121507:7)

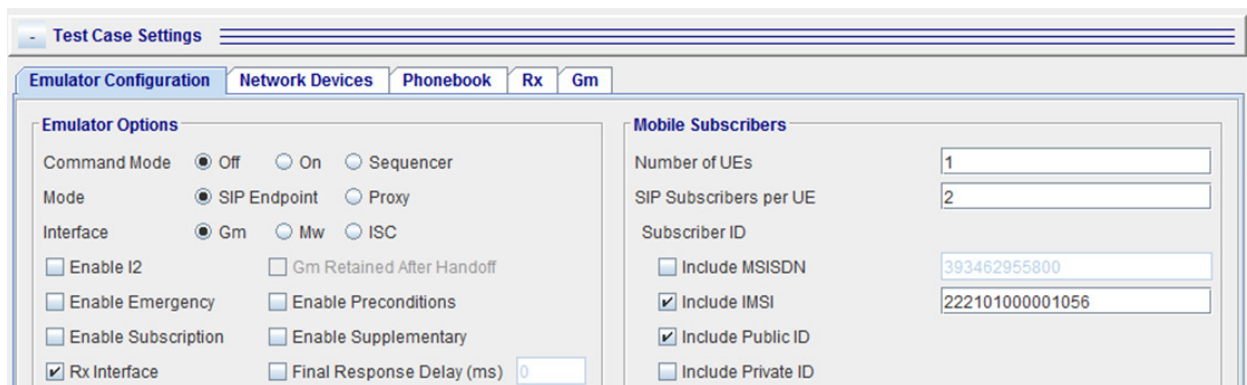
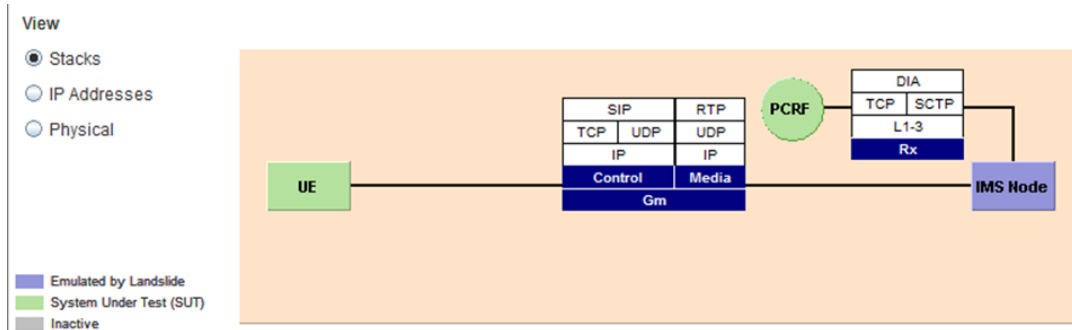
Secured Client Port: #(N32001 0/2) | Secured Server Port: #(N32000 0/2) | Client SPI: #(N257 0/2) | Server SPI: #(N256 0/2)

Preview auto-incremented values

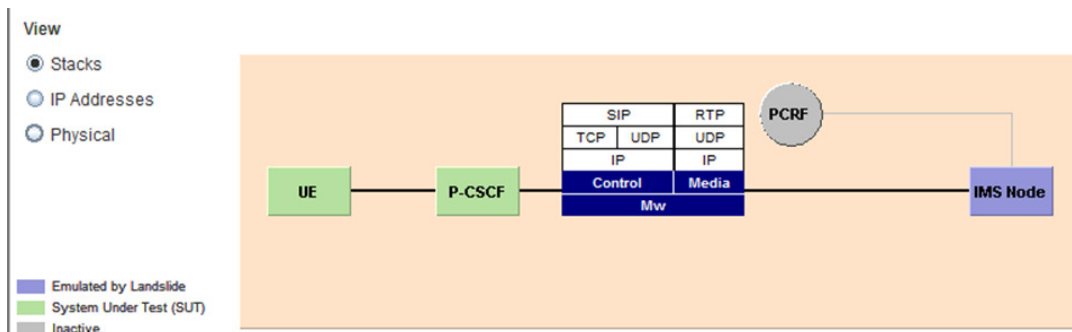
Public User Name	Private User Name	Secret Key	Home Network Domain ...	Realm Network Domain...	Signaling Port	IMSI
user0	user0	password0	spirent.com	spirent.com	5060	50502410121507
user1	user1	password1	spirent.com	spirent.com	5060	50502410121508
user2	user2	password2	spirent.com	spirent.com	5060	50502410121509
user3	user3	password3	spirent.com	spirent.com	5060	50502410121510
user4	user4	password4	spirent.com	spirent.com	5060	50502410121511
user5	user5	password5	spirent.com	spirent.com	5060	50502410121512
user6	user6	password6	spirent.com	spirent.com	5060	50502410121513
user7	user7	password7	spirent.com	spirent.com	5060	50502410121514
user8	user8	password8	spirent.com	spirent.com	5060	50502410121515

SIP subscribers, emulated SIP clients and endpoints are simple to configure using the Phonebook. Test data files provide a "define once and use many times" capability and facilitate defining heterogeneous user populations for modeling real-world UEs. Landslide mobile SIP clients are able to place and receive mobile-to-mobile calls, as well as mobile-to-network calls. In the mobile-to-mobile scenario one emulated UE calls a different emulated UE on either the same or different PLMNs. Mobile-to-network calls provide a means of testing UEs placing or receiving calls to or from the PSTN.

The IMS node emulation provides users a standalone SIP proxy/P-CSCF emulator that can emulate SIP end points or the proxy function and drive the Rx interface to the PCRF.



The IMS node also provides P-CSCF emulation for SBC and Roaming testing:



Coupled with Landslide's other powerful node emulators such as, HSS, PCRF or OCS complete EPC functionality, scale and performance can be easily tested.

Referenced Standard (Partial List)

- GSMA IR.92 IMS Profile for Voice and SMS
- GSMA IR.94 IMS Profile for Conversational Video Service
- 3GPP TS 23.401 General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access
- 3GPP TS 23.402 Architecture enhancements for non-3GPP accesses
- 3GPP TS 24.229 Stage 3 IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP)
- 3GPP TS 29.212 Technical Specification Group Core Network and Terminals; Policy and Charging Control (PCC) over Gx/Sd reference point
- 3GPP TS 29.214 Policy and Charging Control over Rx reference point
- 3GPP TS 29.272 Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol
- 3GPP TS 29.274 Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C)
- 3GPP TS 29.275 Proxy Mobile IPv6 (PMIPv6) based Mobility and Tunnelling protocols
- 3GPP TS 29.281 General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)
- 3GPP TS 36.413 (E-UTRAN); S1 Application Protocol (S1AP)
- IETF RFC-2617 HTTP authentication: Basic and Digest Access Authentication
- IETF RFC-1889 RTP: A transport protocol for real-time Applications
- IETF RFC-2960/4960 Stream Control Transmission Protocol
- IETF RFC-2069 An Extension to HTTP: Digest Access Authentication
- IETF RFC-3261 SIP: Session Initiation Protocol
- IETF RFC-3264: An Offer/Answer Model with the Session Description Protocol (SDP)

Technical Specifications

- Test Activities
 - Capacity Test
 - Session Loading
 - Command Mode/Command Sequencer
 - Session Loading with Mobility (MME and SGW Nodal)
 - Intra-LTE Mobility Scenarios
 - Inter-Technology/I-RAT Mobility Scenarios
- Landslide Manager
 - Up to 128 user accounts
 - Up to 48 simultaneous users
 - Up to 64 Landslide Test Servers
- Landslide Test Server
 - More than 4 million UEs with Ultra Extreme Capacity License
 - Up to 11 bearers per subscriber
 - Up to 400,000 bi-directional RTP flows
 - Up to 32,000 activations/deactivations per second
 - Up to 3 simultaneous users per test server
 - Emulate up to 2,000 eNBs and 2,000 serving gateways
- Landslide test server Ethernet ports
 - Quad-port, 10/100/1000Base-T NIC
 - Quad-port, 10/100/1000Base-SX multi-mode NIC
 - Dual-port, 10G Base-SR, 850 nm multi-mode NIC
 - Dual-port, 25G Base-SR, 850 nm multi-mode NIC
 - Dual-port, 40G Base-SR4, QSFP+ 850 nm multi-mode NIC

About Spirent Communications

Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks.

We help bring clarity to increasingly complex technological and business challenges.

Spirent's customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled.

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Ordering Information

Description	Part Number
Landslide VoLTE/IMS Node Emulation Feature: Adds VoLTE SIP client UE emulation capabilities to LTE MME and LTE Gateway Test Applications and standalone IMS P-CSCF/SIP Proxy node emulation. Provides the means of testing VoLTE call support capabilities in the EPC.	L-FT-055
Landslide VoLTE/IMS Command Mode: Add Tcl and GUI accessible on-demand commands and command sequencer for VoLTE call modeling	L-FT-064
Landslide VoLTE Supplemental Services: Adds 3GPP TS 22.173 Supplementary Services to VoLTE/IMS emulation	L-FT-071
Landslide P-CSCF Test and Emulation: Adds P-CSCF Test and Emulation to an existing Landslide System	L-APP-047
Landslide IMS TAS Testing: Adds IMS Telephony Application Server Testing to an existing Landslide System	L-FT-097
Landslide Ut Interface Emulation: Emulates UE using XCAP to configure and manipulate Supplementary Services over the Ut interface	L-FT-102
Landslide MCPTT Support: Adds MCPTT call flows for emulated UEs in LTE and 5G test cases; enables MCPTT AS emulation in IMS node test case	L-FT-107
Landslide WebRTC Call Flows: Adds WebRTC call flow support for emulated UEs	L-FT-108
Landslide POLQA Voice Quality Analysis: Adds 12 Effective Channels of POLQA Voice Quality measurements, including MOS scores.	L-FT-077
Landslide PEVQ Video Quality Analysis: Allows PEVQ Video Quality analysis on up to 5 channels	L-FT-092
Landslide VoIP/VoLTE EVS Codec: Adds EVS Codec to Landslide VoIP/VoLTE	L-FT-089
Landslide VoIP G.729 Codec: Adds G.729 codec to Landslide VoLTE/VoIP	L-FT-090