



SPIRENT LANDSLIDE

VOLTE/IMS NODE AND SIP UE EMULATION

VOICE OVER LTE

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.

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, IMS Profile for Voice and SMS, and is the tool of choice for testing interoperable VoLTE network and equipment implementations.

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

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
- Unmatched scalability allows the user to simulate subscriber loads ranging from a small rural town to the largest metropolitan city
- Standard Web browser interface means no need to load software onto user equipment
- 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
- 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
- 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

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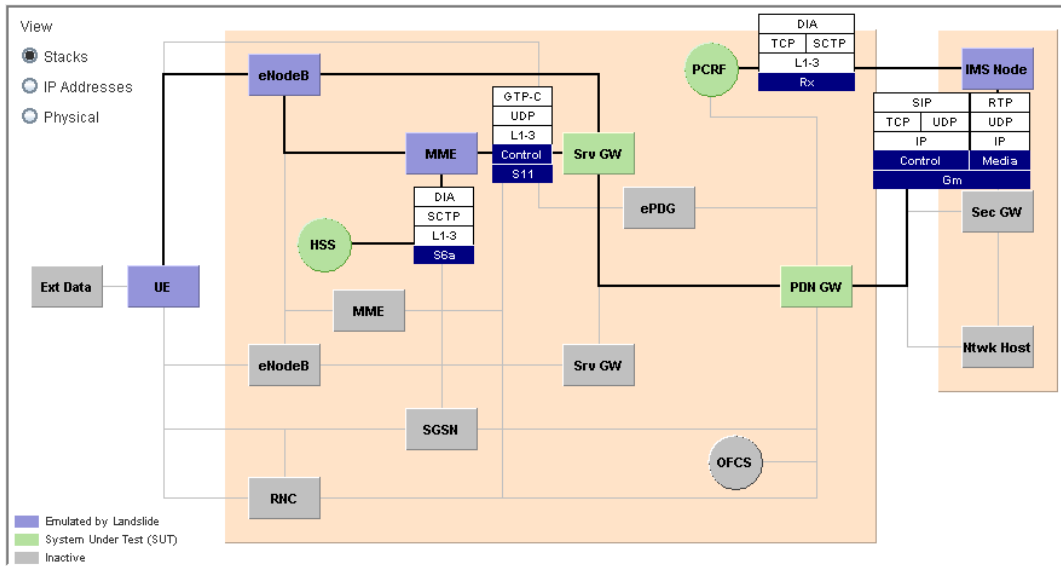


Figure 1

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.

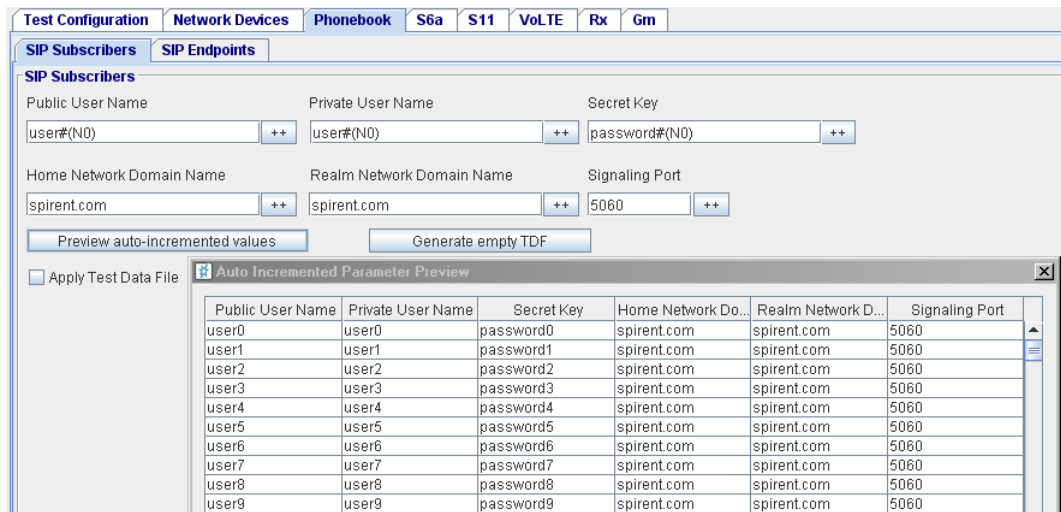


Figure 2

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.

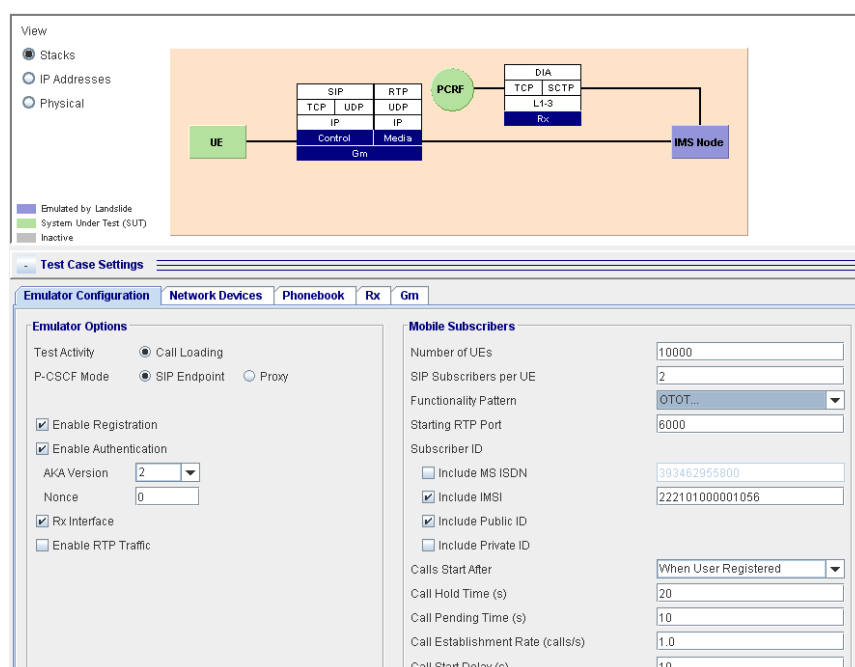


Figure 3

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. 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
- 3GPP TS 23.203 Policy and charging control architecture 3GPP
- 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 125 user accounts
 - Up to 48 simultaneous users
 - Up to 32 Landslide Test Servers
- Landslide Test Server
 - 1 million UEs with Extreme Capacity License
 - Up to 11 bearers per subscriber
 - More than 40 Gbps of bearer traffic
 - Up to 6,000 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

SPIRENT SERVICES

Spirent Global Services provides a variety of professional services, support services and education services—all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services website at www.spirent.com or contact your Spirent sales representative.

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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 LTE Gateway Test System: Landslide Manager, Test Server and LTE Gateway Test Application. Allows testing of LTE Serving Gateway, PDN Gateway and combined S/P gateways.	L-KIT-5020
Landslide LTE MME Test System: Landslide Manager, Test Server and LTE MME Test Application. Allows testing of Mobility Management Entity.	L-KIT-5021
Landslide GPRS Test Application: Adds GPRS Test Application to an existing Landslide Test System.	L-APP-001
Landslide UMTS Test Application: Adds UMTS Test Application to an existing Landslide Test System.	L-APP-005
Landslide IP Data Test Application: Adds IP Data Test Application to an existing Landslide Test System.	L-APP-007
Landslide PCRF Test Application: Adds PCRF Test Application to an existing Landslide Test System.	L-APP-012
Landslide eHRPD Test Application: Adds eHRPD Test Application to an existing Landslide Test System.	L-APP-025
Landslide HNB-GW Test Application: Adds HNB-GW Test Application to an existing Landslide Test System.	L-APP-037
Landslide WiFi Offload GW Test Application: Adds WiFi Offload GW Test Application to an existing Landslide Test System.	L-APP-038
Landslide Performance Accelerator License: Doubles Test Server data throughput and control plane performance for mobility test applications.	L-FT-532-B
Landslide Extreme Capacity Accelerator License: Increases control plane capacity to the maximum available for mobility test applications.	L-FT-532-C

