

SPIRENT LANDSLIDE

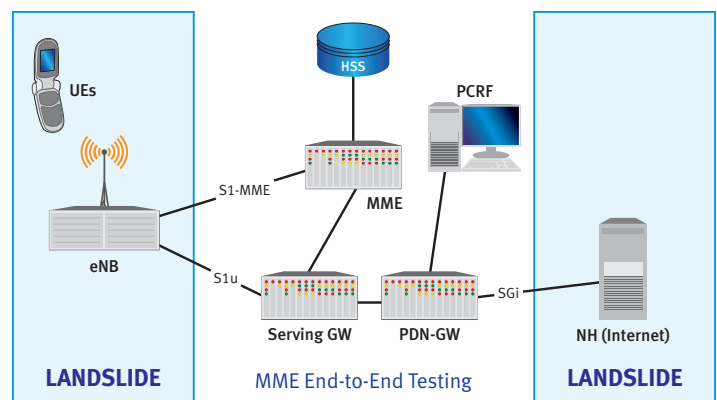
LTE TEST APPLICATIONS

Spirent's LTE performance test system is the preeminent mobility test tool for simulating real-world traffic models for LTE packet core network testing. The Landslide® LTE Test Applications are part of the Landslide family of test applications available on Spirent's proven Landslide platform.

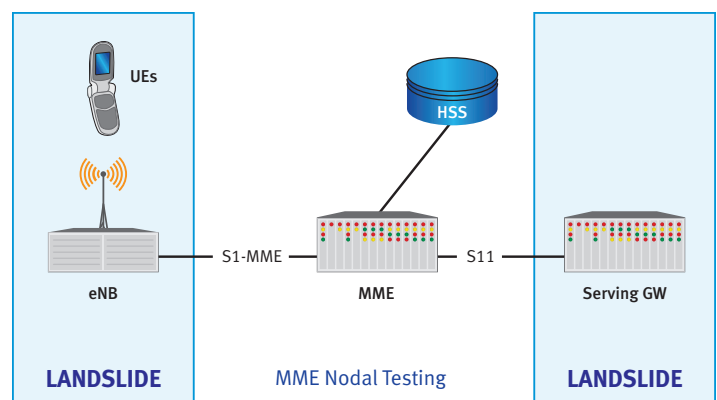
Landslide LTE Test Applications provide a comprehensive end-to-end test system that emulates millions of mobile data subscribers, all simultaneously accessing the LTE-enhanced packet core network. By emulating the key LTE packet data network elements and combining control plane and data plane simulation, the Landslide LTE Test Applications provide real-world emulation of millions of UEs in various stages of activation, deactivation and handoff between cells. Emulation takes place while sending and receiving real-world application data.

APPLICATIONS

- Validate system scalability and identify capacity limits
- Measure control plane capacity
- Stress data plane performance
- Perform mobility testing
- Characterize system before trial/delivery
- Identify performance ceilings
- Enable accurate capacity planning



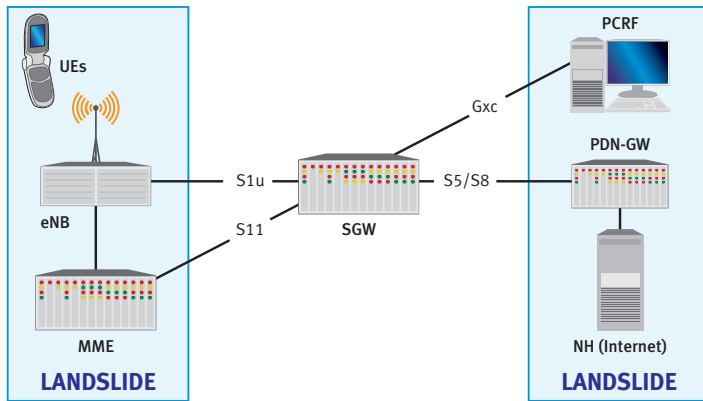
The Landslide LTE MME Test Application provides testing of the MME, in both end-to-end and nodal configurations. Landslide emulates the UEs and eNodeB accessing the LTE network, as well as the Internet or network host to which the subscribers will connect. In this configuration the LTE network core control and data plane performance can be validated and measured.



In the MME Nodal test configuration Landslide emulates the eNodeB, UEs and the Serving Gateway to isolate the Mobility Management Entity for control plane performance validation and benchmarking.

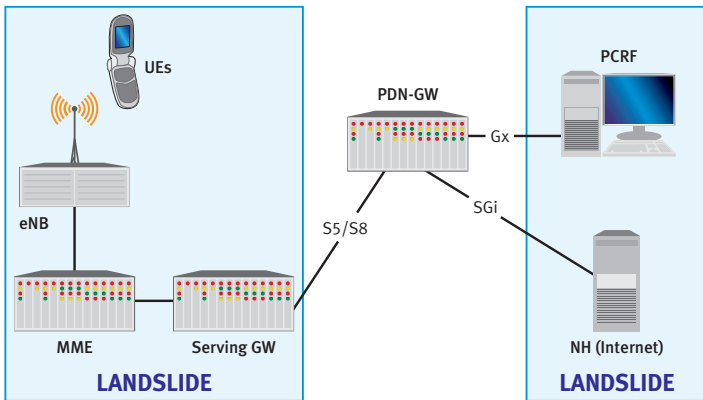
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The Landslide LTE Gateway Test Applications provide testing of Serving Gateways and PDN Gateways in both combined and nodal configurations. In the SGW Nodal test configuration Landslide emulates the MME, eNodeB, UEs and the PDN Gateway to isolate the Serving Gateway for control and data plane performance validation and benchmarking. Additionally in this test configuration the Landslide can emulate 3GPP access (RNC and SGSN) into the LTE SGW.



SGW Nodal Testing

In the PDN GW Nodal test configuration Landslide emulates the SGW, MME, eNodeB, and UEs to isolate the PDN Gateway for control and data plane performance validation and benchmarking. Additionally in this configuration the Landslide can emulate non-3GPP access to the PDN GW (providing the S2a/S2b interface).



PDN Nodal Testing

FEATURES & BENEFITS

- TCL Interface allows the user to control/monitor the Landslide from a higher-level management system, thus making it possible to compile specific test reports for both the emulation (Landslide) and the device under test
- 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
- Emulation of multiple network elements allows the user to test in a variety of network topologies which provides more effective utilization of lab equipment and reduces capital expenditure and ongoing support costs associated with a test lab
- Automation control allows the user to run many test cases simultaneously or serially on multiple Landslide test servers, creating real-world scenarios for heavy load and long duration stability tests
- MME Nodal Testing allows the user to isolate the MME in a “nodal” configuration to specifically test the performance and scalability of the MME itself
- SGW mobility—Landslide provides the ability to test X2 intra-SGW mobility (same emulated MME, different emulated eNB) as well as S1 intra-SGW and S1 inter-SGW mobility
- MME Mobility—Landslide provides the ability to test both intra-MME mobility as well as inter-MME mobility. Intra-MME mobility when a new (emulated) SGW is used and when the same (emulated) SGW is used is supported
- SGW Nodal—The user can isolate the SGW in a “nodal” configuration to specifically test the performance and scalability of the SGW itself
- PDN GW Nodal—The user can isolate the PDN GW in a “nodal” configuration to specifically test the performance and scalability of the PDN GW itself
- End-to-end testing allows the user to test the entire LTE core
- With Landslide’s LTE Gateway Functional Test Option the user has the capability to edit message headers and add/modify/delete message IEs for GTPv2 messages. Both methods can be used to generate error conditions
- Landslide also offers a PCRF Node Emulator that can be used in cases where a real PCRF is not available. The PCRF emulator supports the Gx and Gxx interfaces for LTE

TECHNICAL SPECIFICATIONS

- Test Activities
 - Capacity Test
 - Session Loading
 - Intra-MME Mobility (MME Nodal only)
 - Inter-MME Mobility (MME Nodal only)
 - Session Loading with Mobility (MME and SGW Nodal)
 - Intra-SGW Mobility (SGW Nodal only)
 - Inter-SGW Mobility (SGW Nodal only)
- Landslide Manager
 - Up to 125 user accounts
 - Up to 48 simultaneous users
 - Up to 32 Landslide test servers
- Landslide Test Server
 - 200,000 simultaneous bearer sessions
 - Up to 11 bearers per subscriber
 - More than 12 Gbps of bearer traffic
 - Activate/deactivate up to 2,000 sessions 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, 10/100/100Base-SX multi-mode NIC
 - Single-port 10 Gigabit XF SR multi-mode NIC
- Referenced Standards
 - 3GPP TS 23.401 General Packet Radio Service (GPRS) Enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access
 - 3GPP TS 24.301 Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3
 - 3GPP TS 36.413 Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)
 - 3GPP TS 23.402 Architecture enhancements for non-3GPP accesses
 - 3GPP TS 29.274 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

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LTE TEST APPLICATIONS

ORDERING INFORMATION	
DESCRIPTION	PART NUMBER
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-GW and PDN-GW) Gateway testing.	L-KIT-1020
LANDSLIDE LTE MME TEST SYSTEM Landslide Manager, Test Server and LTE MME Test Application. Allows testing of MME.	L-KIT-1021
LANDSLIDE GPRS TEST APPLICATION Adds GPRS Test Application to an existing Landslide Test System.	L-APP-001
LANDSLIDE UMTS APPLICATION Adds UMTS Test Application to an existing Landslide Test System.	L-APP-005
LANDSLIDE IP DATA APPLICATION Adds IP Data Test Application to an existing Test System.	L-APP-007
LANDSLIDE PCRF APPLICATION Adds PCRF Test Application to an existing Landslide Test System.	L-APP-012
LANDSLIDE EHRPD APPLICATION Adds EHRPD Test Application to an existing Landslide Test System.	L-APP-025
LANDSLIDE HNB-GW APPLICATION Adds HNB-GW Test Application to an existing Landslide Test System.	L-APP-037
DATA THROUGHPUT ACCELERATOR LICENSE Improves Test Server data throughput for Landslide Test Applications.	L-FT-032-A
PERFORMANCE ACCELERATOR LICENSE Improves Test Server data throughput and control plane performance for mobility Test Applications.	L-FT-032-B
DYNAMIC IPSEC EMULATION Adds IPSec emulation to an existing Test System. Requires L-ACC-004 per Test Server.	L-FT-004
IPSEC ACCELERATOR CARD Provides four channels of hardware-assisted IPSec processing for a Landslide Test Server. Requires L-FT-004 and L-FT-032-A or L-FT-032-B.	L-ACC-004

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/gs or contact your Spirent sales representative.

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