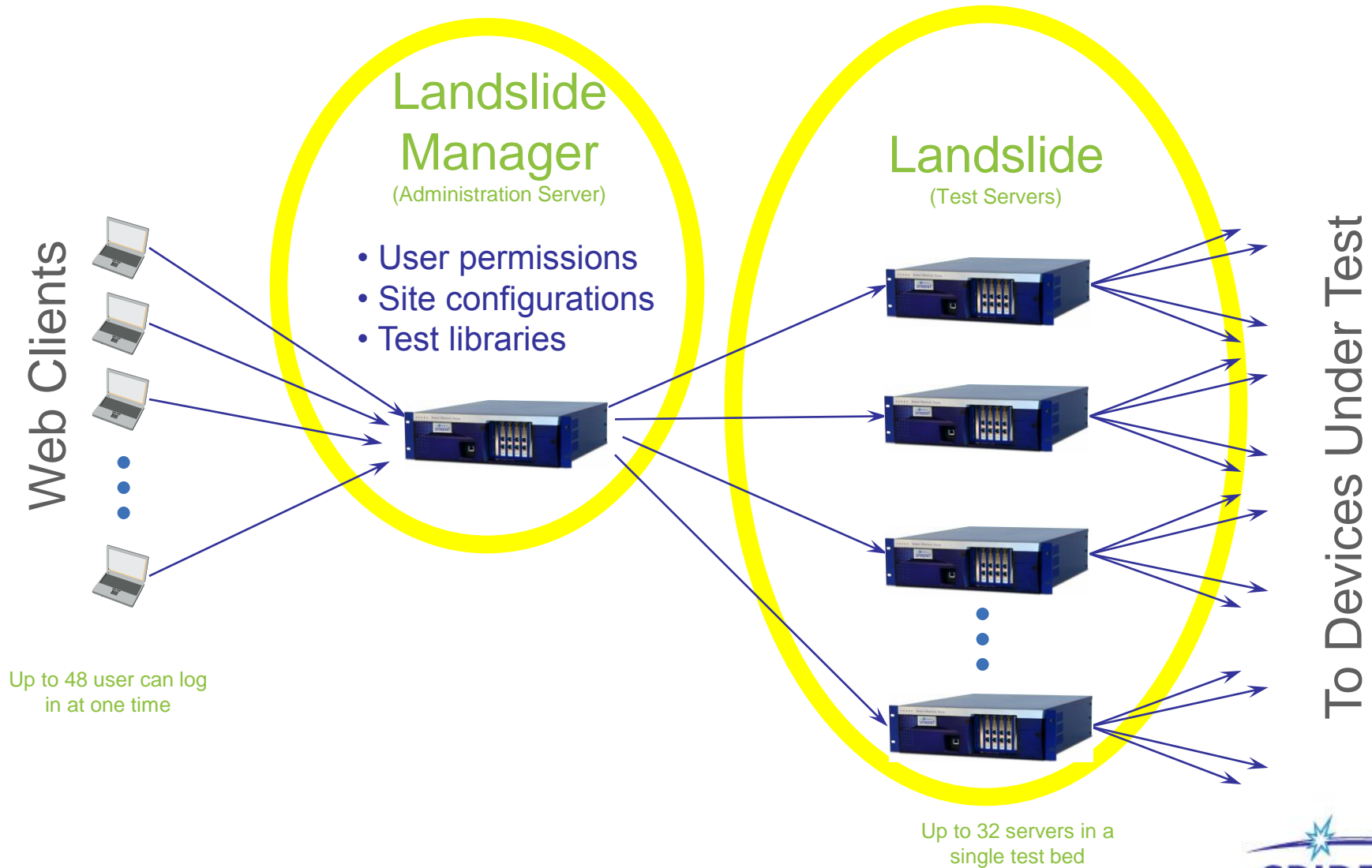




Landslide eHRPD Testing

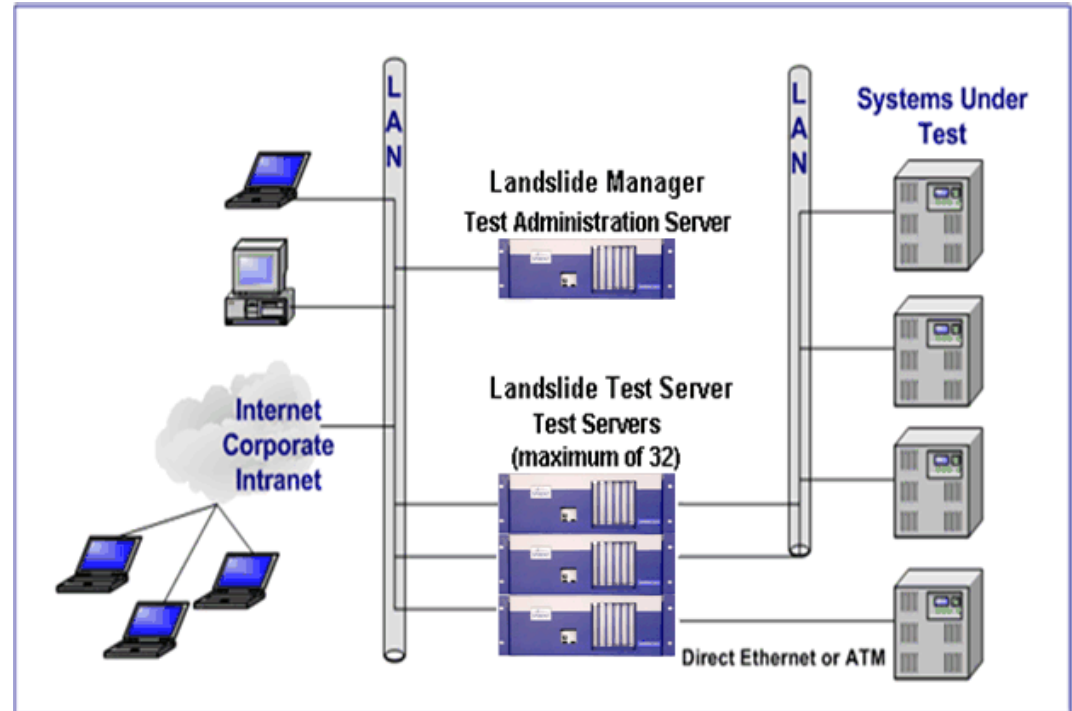


Components of Landslide system



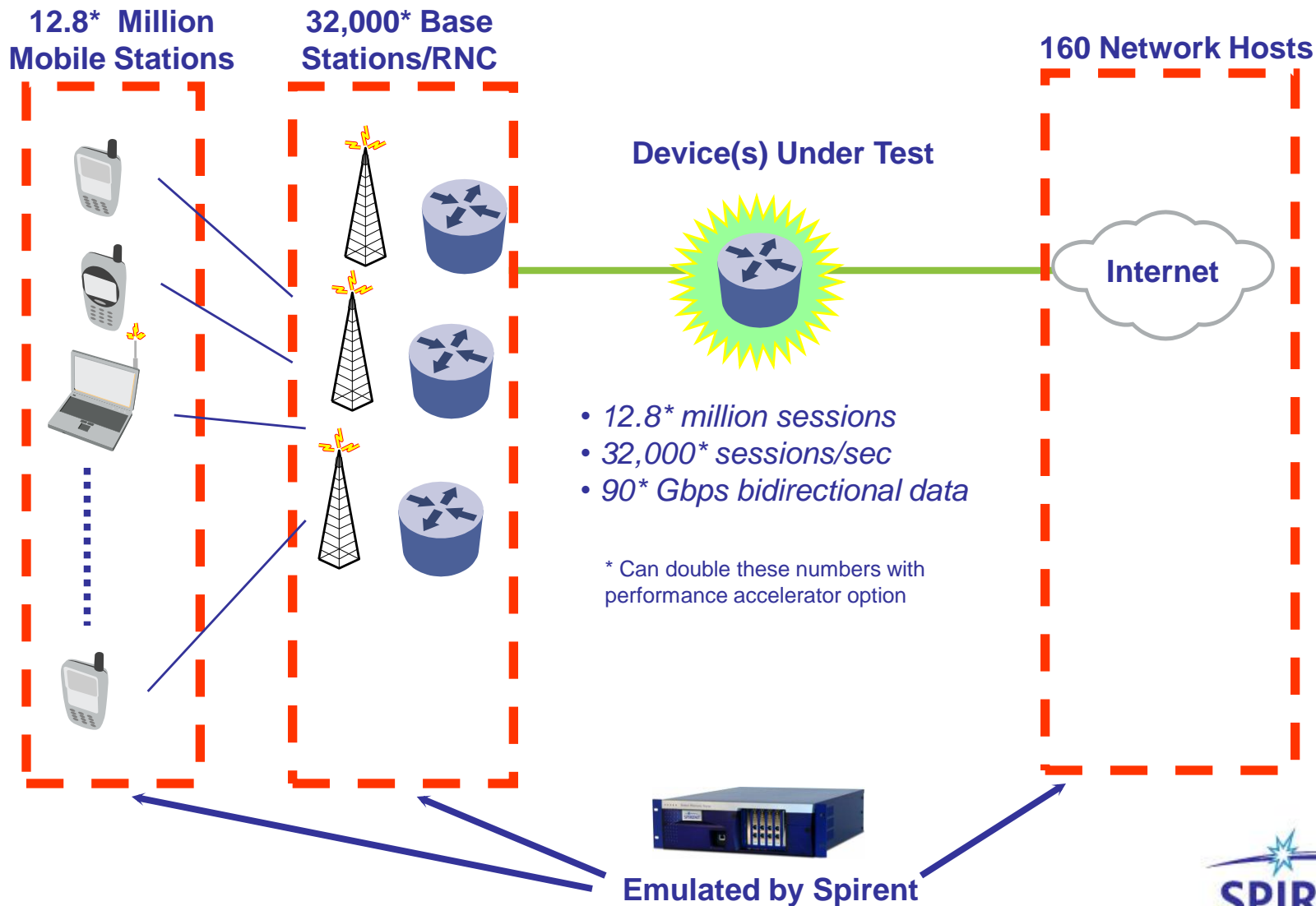
Landslide Applications/Features

- LTE Performance Testing
- WiMax Performance Testing
- UMTS Performance Testing
- GPRS Performance Testing
- CDMA Performance Testing
- Mobility over IPv4/IPv6
- AAA Performance Testing (RADIUS and Diameter)
- AAA Server Emulation
- Advanced Data with IPSec
- L2TP VPN Gateway
- Charging Gateway Function Emulator
- IMS Security and Policy Testing
- eHRPD
- Femtocell



- CDMA/WI-FI Convergence (PDFI)
- GPRS/WI-FI Convergence (PDG)
- DCCA - performance testing and server emulation
- PCRF - performance testing and server emulation

Network In a Box



Complete Network Coverage

Emulate

- AAA Diameter Servers
- AAA Radius Servers
- GGSN
- SGSN
- Foreign Agent
- Home Agent
- PDSN
- Base Station Controllers
- LTE Clients
- UMTS Clients
- GPRS Clients
- CDMA Clients
- WiMAX Clients
- WiFi Clients
- AAA Clients
- Mobile IP Clients
- Internet/Network Host
- IPSec Clients
- PCRF
- Femtocell

Test

- Foreign Agent
- Home Agent
- Corresponding Node
- LTE MME
- GGSN
- SGSN
- Security Gateways
- PDIF/PDG
- End-to-end Systems
- AAA Diameter Servers
- AAA Radius Servers
- L2TP VPN Gateway
- Application Servers
- Content Billing Systems
- CDR Records
- ASN/CSN
- PCRF
- eHRPD HSGW
- FNG

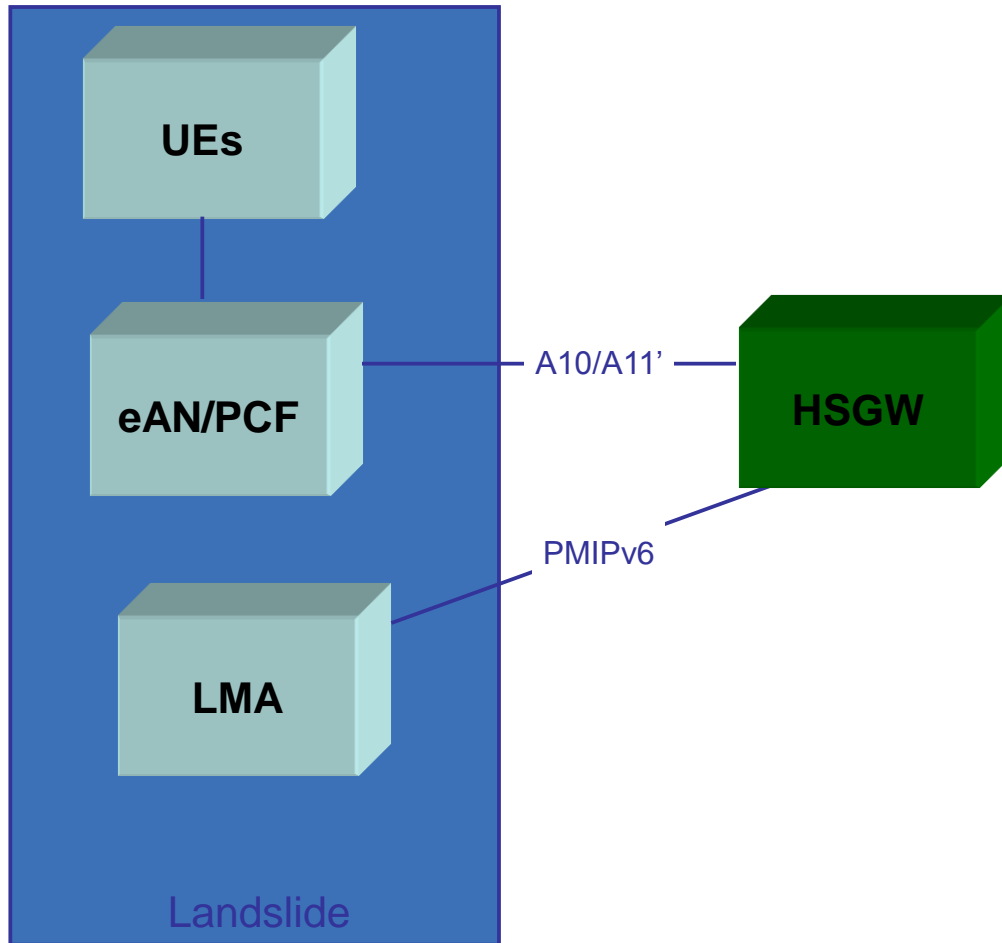


eHRPD Solution



Phase 1 - release 7.0

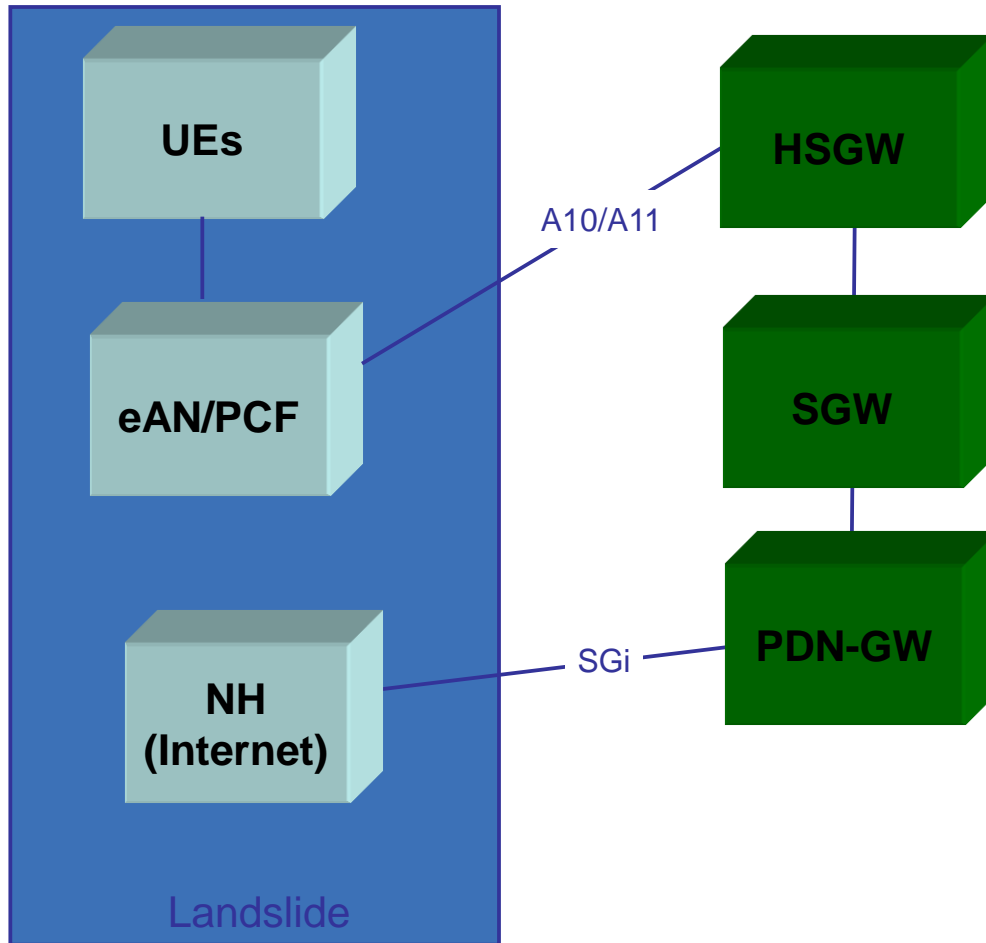
Test Configuration: HSGW Nodal



Landslide provides A10/A11' interface into HSGW and optionally supports PMIPv6 into the Local Mobility Anchor (LMA).

PMIPv6 can be carried by IPv4 or IPv6 and can be encrypted via IPsec.

Test Configuration: eHRPD End-to-End

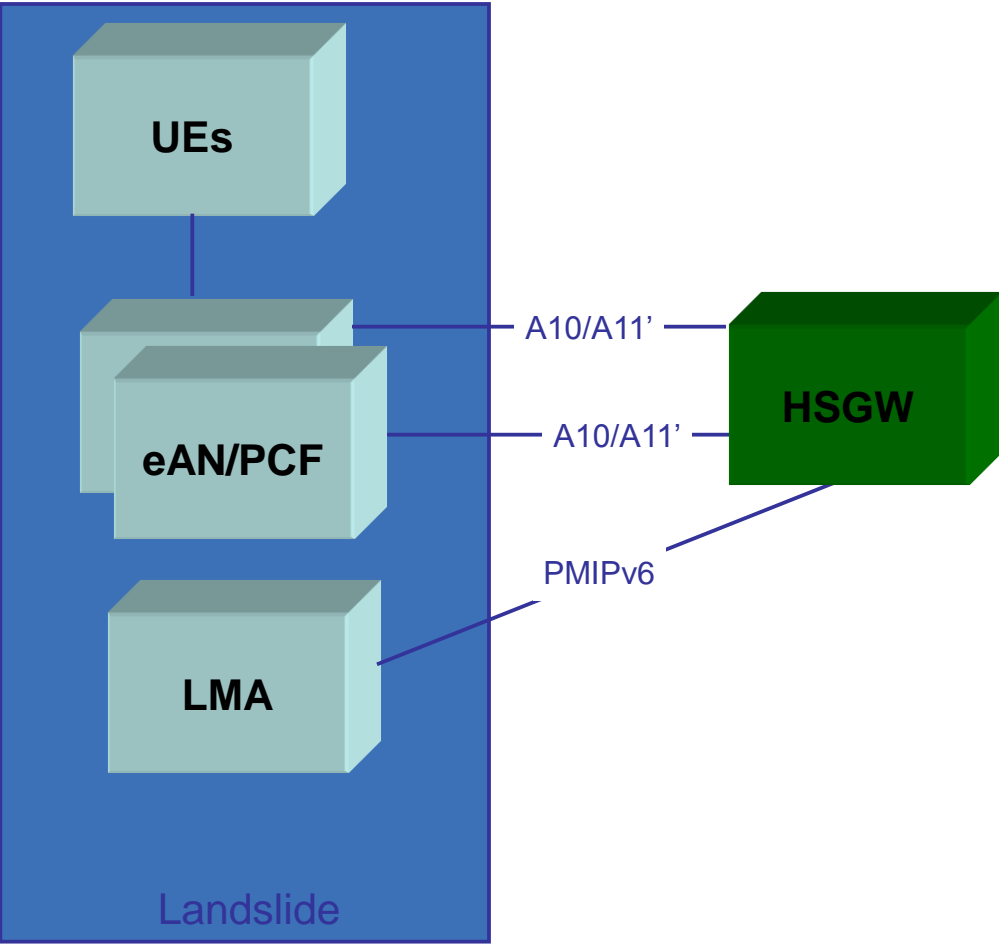


Landslide provides A10/11' interface into HSGW and provides a network host/SGi interface to the PDN GW.



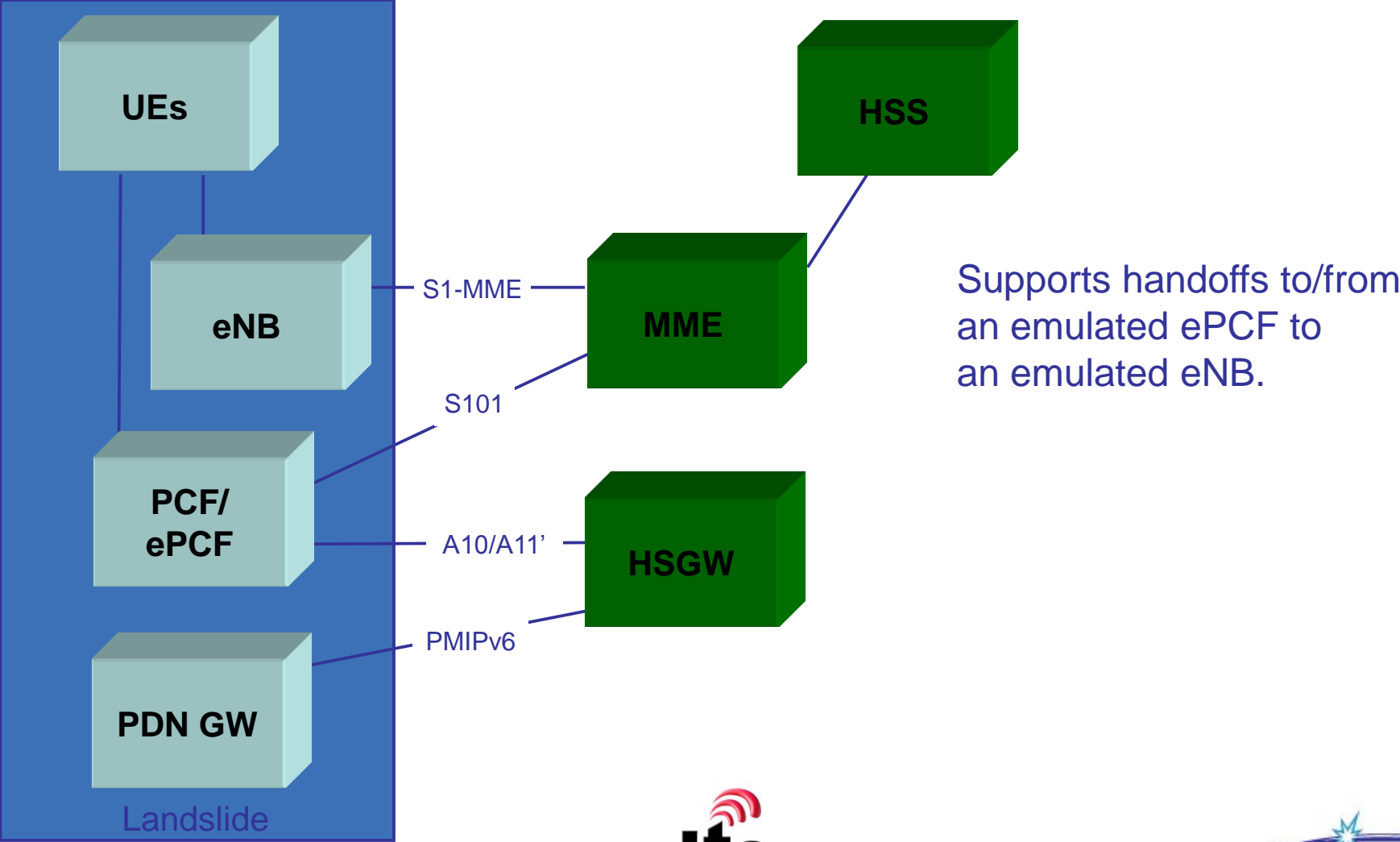
Phase 2 - release 7.5

Test Configuration: Intra-HSGW Mobility

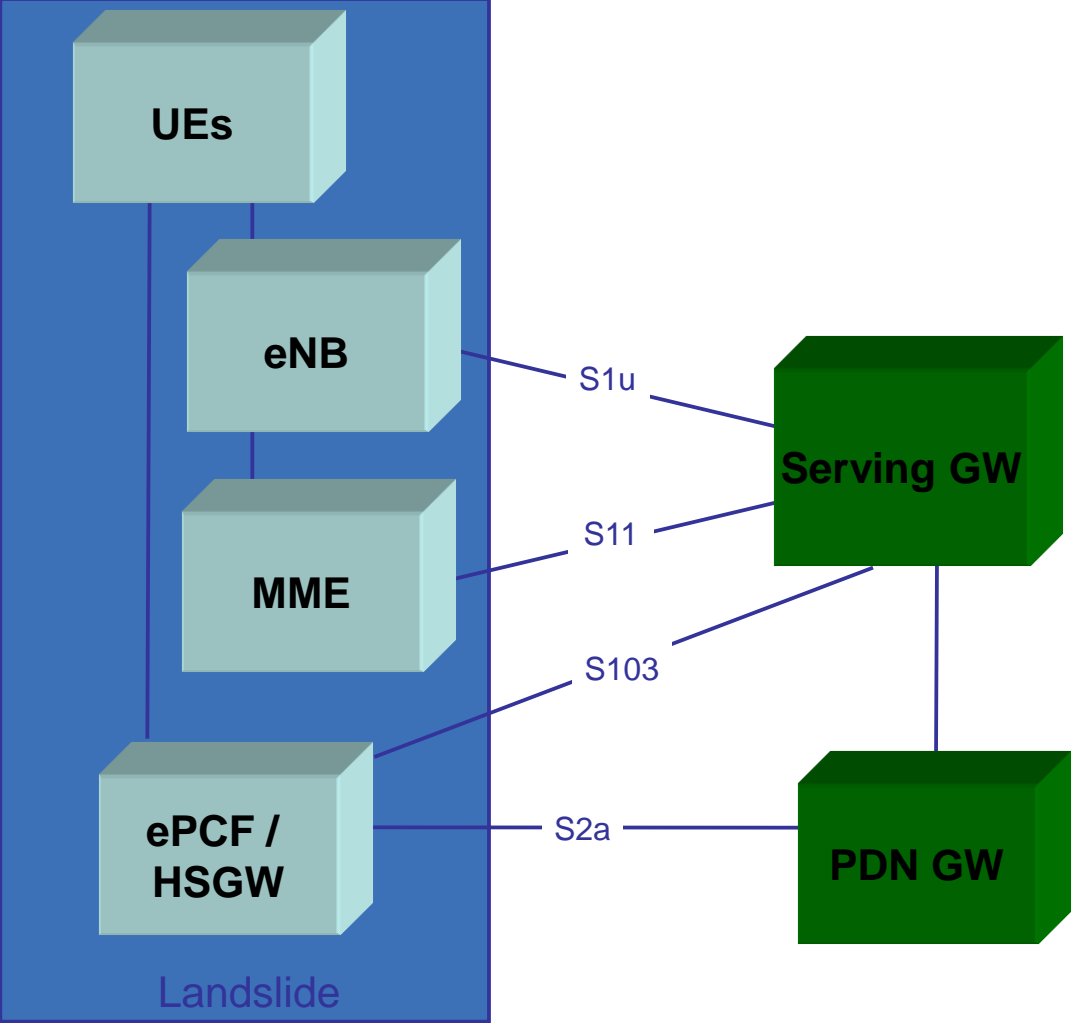


Supports handoffs from one emulated ePCF to another emulated ePCF (within the same HSGW)

Test Configuration: CDMA-LTE Handover



Test Configuration: CDMA-LTE Handover



Supports handoffs to/from an emulated ePCF/HSGW to an emulated eNB/MME with a real SGW and PDN GW.



Test Methodology

Performance Testing

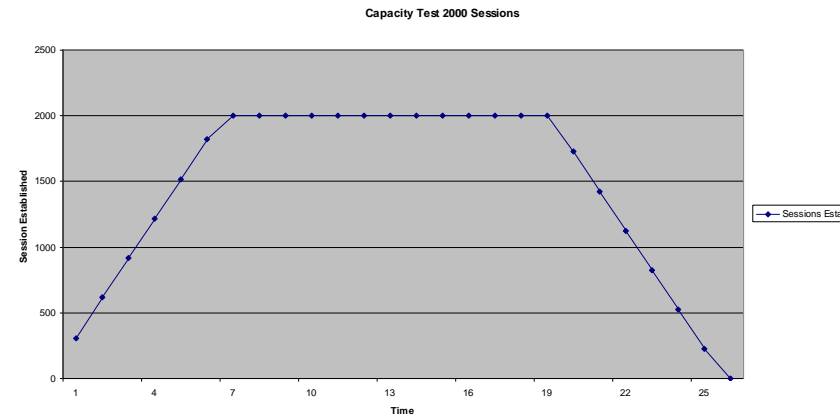
- Key Test Types
 - Capacity Test
 - Mobility Tests
 - Session Loading
 - Session Loading with Mobility

⊞ Data flows can be included in all test types.

⊞ Test types can be combined and complex traffic patterns can be simulated using automation control.

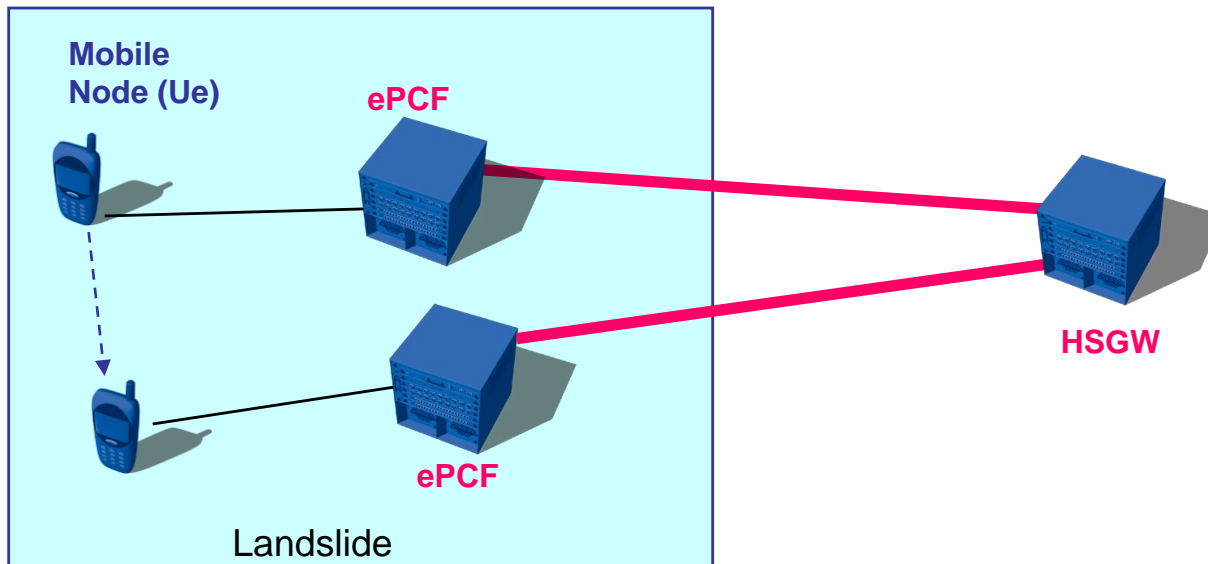
Test Methodology - Capacity Test

- A key measurement of a DUT is its capacity for simultaneous sessions
- The Landslide begins establishing sessions at a specified rate
- When the maximum is reached all subsequent sessions fail
- Established sessions are kept active for the specified period or until stopped
- Finally sessions are deactivated at a specified rate
- Help->Test Activities->Capacity Test
->About the Capacity Test

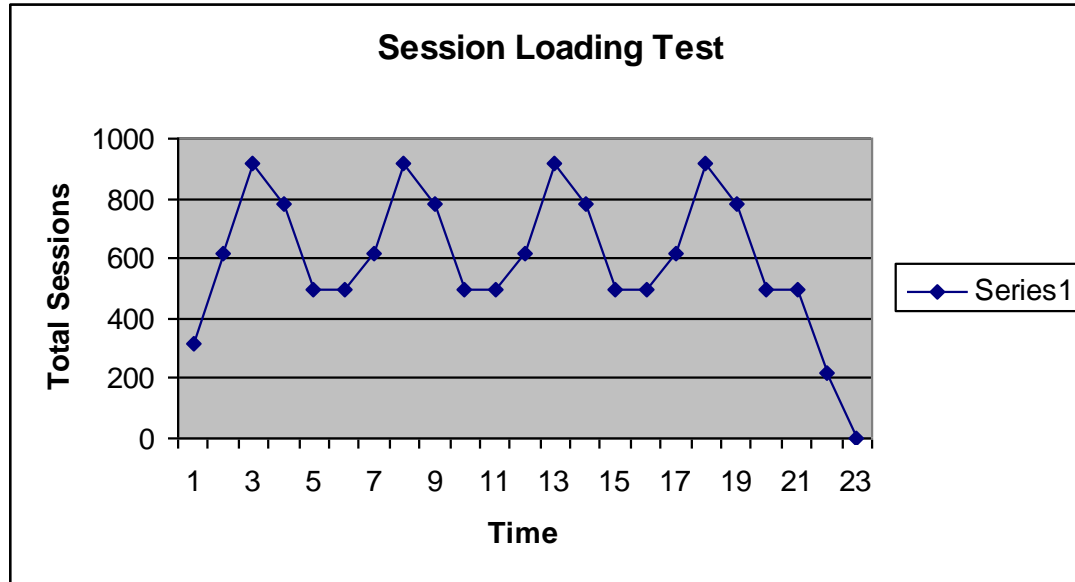


Test Methodology - Mobility

- Determines the HSGW ability to process handoffs between ePCF nodes
- The Landslide begins establishing sessions at a specified rate
- After a defined period, a session handoff from one emulated ePCF to another emulated ePCF will occur.



Test Methodology - Session Loading Test



- A key measurement of a DUT is its ability to process real world activity for a long period of time
- Session loading emulates multiple simultaneous real world events
 - Session activations
 - Session deactivations
 - Data transactions of various types
 - Handovers
- [Help->Test Activities->Session Loading->About the Session Loading Test](#)

Test Methodology -Continuous Data

- Data packets of a user defined flow(s) are transported over the sessions.
- User may select pre-configured data flows from the basic library or build custom flows using the powerful data flow editor.
- Capacity - transmission can begin as each session is established or after all sessions are successfully established.
- Session Loading - transmission begins as each session is established.
- Protocols flows currently supported include: Ping (ICMP), RAW, SCTP, UDP, TCP, HTTP, FTP, WAP 1.X, WAP 2.0, SMTP, POP3, IMAP, RSTP, RTP, SIP, Wireless Village and Custom built or imported

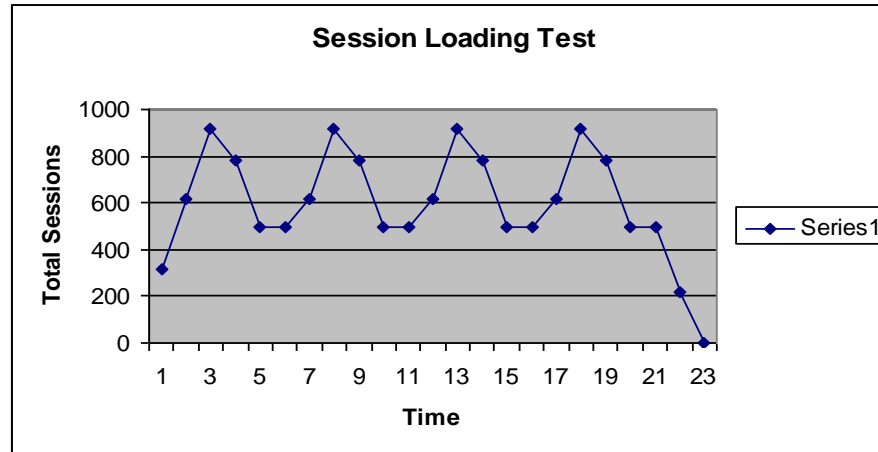
Combined Complex Test Cases

Capacity
Mobility



+

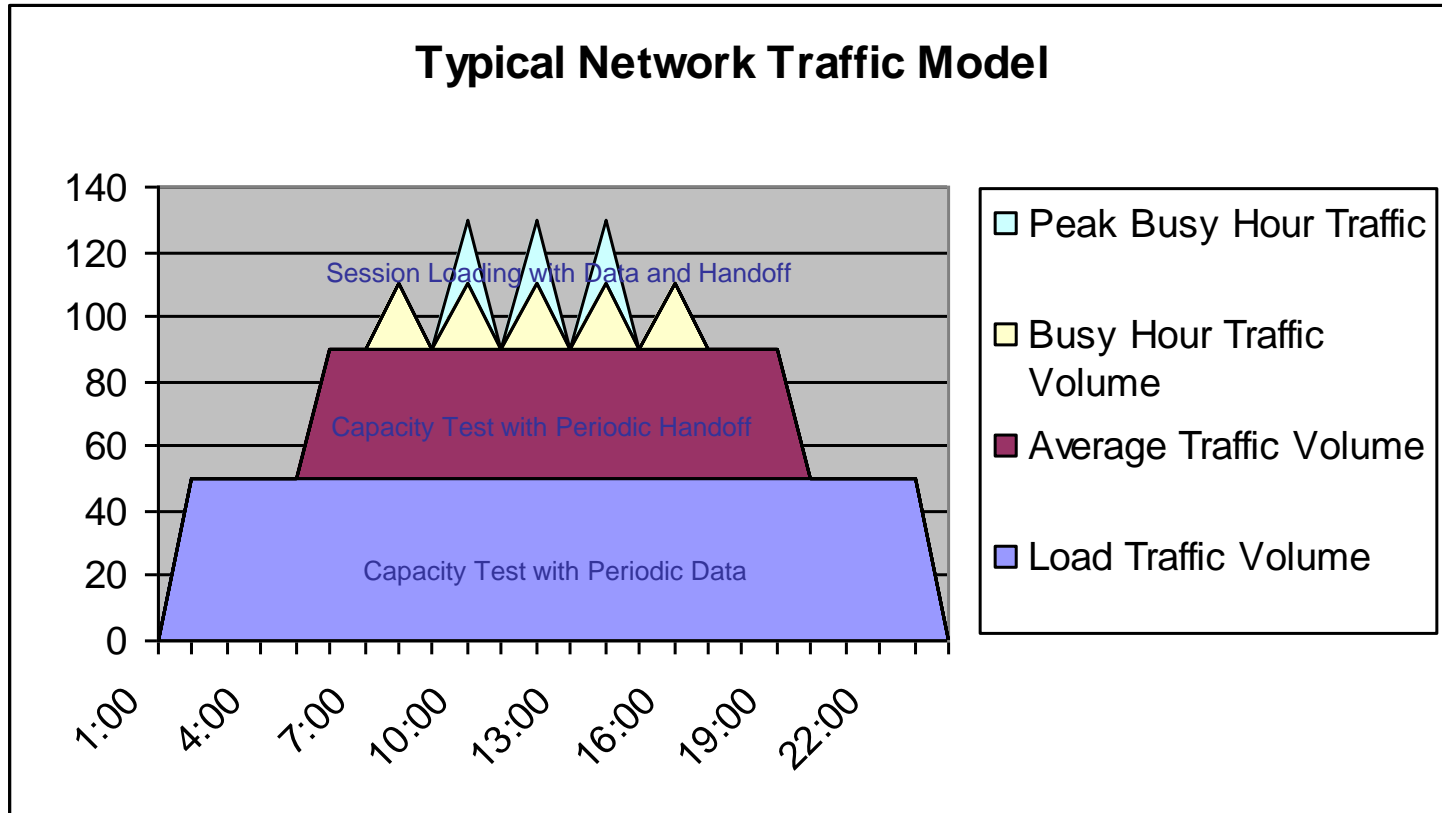
Session Loading



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Data Traffic
Generation

Real World Network Modeling



- Create real-world traffic patterns in lab
- Need wide range of control plane and data plane profiles
- Test with expect and worst-case use scenarios



Thank You!