

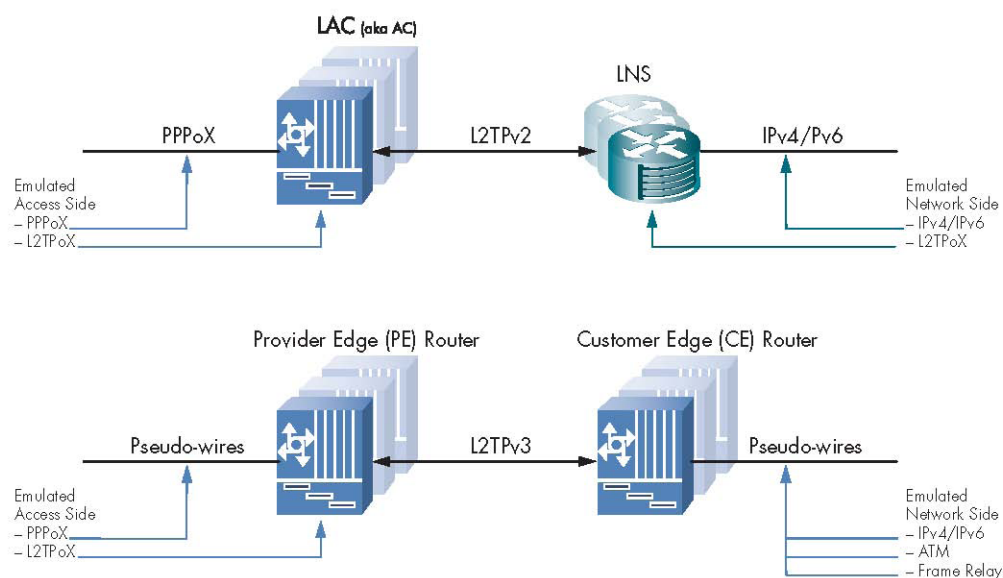
IxAccess



Ixia's IxAccess test suite provides an easy-to-use tool for comprehensive performance and scalability analysis of edge aggregation devices. By emulating PPPoX client sessions, L2TPv2 and L2TPv3 tunnels, and running data traffic over them, the testing of devices such as Broadband Remote Access Servers (B-RAS), DSLAMs and edge routers is substantially simplified - eliminating the need to configure thousands of individual clients and sessions.

The IxAccess test suite runs in conjunction with the Ixia TXS Gigabit, ATM and LSM 10 Gigabit Ethernet Load Modules. All PPPoX client/server variants (PPPoE, PPPoA, PPPoEoA, PPPoEo802.1q) and Layer 2 Tunneling Protocols variants (L2TPoE, L2TPoA) are supported for both Layer 2 Access Concentrator (LAC) and L2TP Network Server (LNS) testing. DHCP may be used to assign addresses to IP clients. Customer Edge and Provider Edge Routers that support L2TPv3 are tested through L2TPv3 and pseudo-wires (Ethernet, ATM and Frame Relay) emulation.

Evaluation and characterization of large-scale value-added services over broadband networks is available by integrating IxAccess with IxChariot®. Real-world applications can be emulated with IxChariot® without the need to install and maintain extensive client/server networks. The combination solution of IxAccess and IxChariot® offers the ability to assess the behavior of different applications by emulating hundreds of protocols across thousands of emulated network users.



Usage Scenario	DUT/SUT	Access Port Protocol	Network Port Protocol
LAC to LNS forwarding	LAC	PPPoX	L2TPoX
	LNS	L2TPoX	IPv4 / IPv6
	LAC + LNS	PPPoX	IPv4 / IPv6
LAC to LAC forwarding	LAC	PPPoX	L2TPoX
LNS to LNS forwarding	LNS	L2TPoX	L2TPoX
IP Clients to PPPoE equipped Router	PPPoE Router	IPv4 / IPv6	PPPoE (server)
L2TPv3 Provider Edge to Customer Edge forwarding	PE Router	L2TPv3	Pseudo-wires

Specifications

Load Module Support	<p>10/100/1000 Mbps Copper Ethernet (LM1000TXS4, LM1000TXS4-256)</p> <p>1000 Mbps Fiber Gigabit Ethernet (LM1000SFPS4, LM1000SFPS4-256)</p> <p>10/100/1000 Mbps Copper and Fiber Gigabit Ethernet (LM1000STXS4, LM1000STXS4-256, and LM1000STXS2)</p> <p>10/100/1000 Application Load Module (ALM1000T8) (session/tunnel setup and IxChariot® only)</p> <p>OC-3/OC-12 ATM (LM622MR)</p> <p>10 Gbps Ethernet (LSM10G1-01)</p>
PPPoX Emulation (RFCs 25, 6, 3336)	<ul style="list-style-type: none"> • Full PPP stack • Support for PPPoE, PPPoA and PPPoEoA • IPv4 and IPv6 sessions • DHCP support • VLAN and stacked VLAN (QinQ) support • ATM: LLC and VC Multiplexed encapsulation over AAL5 • Full session control: <ul style="list-style-type: none"> • Setup and teardown rates, with throttling • Total session count • Flapping • Retry attempts • Multiple sessions per VLAN or ATM VPI/VCI • LCP link control, IPCP network control and NCP address control • Access Concentrator selection • Authentication: PAP and CHAP (MD5) with unique user names and passwords • Keep-alive responses and requests • Domain groups used to direct access to network port traffic
L2TPv2 Emulation (RFC 2661)	<ul style="list-style-type: none"> • Full L2TPv2 LAC and LNS emulation stack • Support for L2TPoE and L2TPoA • Multiple PPP sessions per L2TP tunnel • Tunnel authentication with unique host names and secrets • Hello requests and responses • Bearer type and capacity control • Redial support



L2TPv3 Emulation (RFC 3931)	<ul style="list-style-type: none"> • Full L2TPv3 emulation stack • Extensive pseudo-wire support: <ul style="list-style-type: none"> • Ethernet • Ethernet with VLAN • Frame Relay DLCI • ATM: AAL5 SDU VCC, Transparent Cell, VCC cell and VPC cell - all with cell packing • Active and passive setup mode • Multiple pseudo-wires per tunnel • Full authentication support <ul style="list-style-type: none"> • Mode: host name, router ID or both • Message digest: none, MD5 or SHA1 • Unique host names and secrets • Hello requests and responses • Redial support • L2 sub-layer support
Traffic Generation	<ul style="list-style-type: none"> • Stateless and stateful traffic generation over established sessions/tunnels • Integration with Ixia's Real World Traffic suite, utilizing IxChariot®™, the industry's leading tool for application traffic emulation • Stateless Layer 4 traffic flows with configurable protocol (TCP, UDP) and variable source/destination port numbers • Full QoS control per traffic stream using DSCP, IP Precedence or IPv6 Traffic Class/Flow labels • Full bi-directional source to destination traffic flow, with variable data rates • Fixed, incrementing, or mixed frame sizes • IMIX mode allowing individual rates assigned to up to 5 different frame sizes • Frame rate control in frames per second or percentage of line rate • IEEE 802.1q VLANs and 802.1q stacked VLANs (QinQ) - full range of 4,095 IDs

Test Suites

Capacity

Measures the maximum number of concurrent sessions that can be sustained by the Device/System Under Test.

Setup/Teardown Rate

Tests the time required to setup and teardown a specific number of sessions.

Latency

Measures the minimum, maximum and average session setup latency.

Throughput

Data traffic sent over each established PPP/L2TP session/tunnel while throughput and latency statistics are collected.

No Drop Rate

The maximum rate at which the Device/System under test operates without dropping packets is determined through iterative searches.

Benefits

- Use in 1Gb Ethernet, 10Gb Ethernet, ATM and mixed technology networks
- Manage hundreds of client/host ports from one centralized console
- Scale to hundreds of thousands of concurrent emulation sessions in one Ixia chassis
- Benchmark end-to-end performance PPP/L2TPv2 and L2TPv3 devices with real-time graphs and statistics
- Perform simultaneous control plane and data plane testing



- Full wire-speed Layer 2/3/4 traffic combined with realworld PPP and pseudo-wire emulation
- Easy-to-use Graphical User Interface (GUI) with step-by-step setup
- Integrated Tcl API allows automated PPP session and L2TP tunnel establishment tests

Real-Time Statistics

IxAccess reports real-time statistics needed to analyze the functional behavior of broadband access devices. These performance metrics enable the characterization of the device under test for session setup rate, session capacity, data throughput and latency. Metrics are presented in easy to read charts. In addition, a comprehensive summary of tests results is available.

Scalability

Each Ixia test port can emulate thousands of concurrent PPPoX/L2TPoX clients and establish these sessions/tunnels within minutes, saving significant setup time. For higher capacity requirements, multiple ports can be used to generate over one million sessions from one chassis, across one or more access concentrators, and all managed from a central IxAccess console.

Easy-to-Use GUI

Users can quickly and easily configure and manage multiple test ports via the IxAccess GUI. The application interface is designed to lead the user through the test process with minimal training. Parameter defaults allow testing to commence with minimal initial configuration.

Standards Support

RFC 1332 IPCP
RFC 1334 PAP
RFC 1570 LCP Extensions
RFC 1661 PPP
RFC 1994 CHAP
RFC 2364 PPP over AAL5
RFC 2516 PPPoE
RFC 2661 L2TP
IEEE 802.1q VLANs

Product Ordering Information

IxAccess
IxAccess - High-Performance PPPoX/L2TPoX Test Application

