Ospirent™

Spirent AION

Spirent TestCenter Broadband Access Bundle

Overview

Spirent AION is a flexible delivery platform that enables users to achieve improved deployment and provisioning for all their cloud and network testing needs. It is designed to deliver ultimate flexibility in how Spirent TestCenter platforms are purchased and utilized.

The extended platform combines a wealth of industry-leading test solutions with a flexible licensing architecture to support a wide range of next-generation solution-based domain applications.

AION offers a centralized management hub to help leverage software and hardware functionalities across all lab users and locations for a simplified management and decision-making process:

- **Flexible purchasing options** available via subscription, consumption-based, and perpetual plans, with the ability to license different bandwidth, scale, and protocol bundles.
- **Flexible deployment options** offered include cloud-delivery, on-prem, and laptop-hosted licensing services.

Enhanced user serviceability delivers always-on platform services from auto-discovery and inventory management to user and workspace administration, notifications, and log aggregation.

Broadband Access Bundle

Spirent TestCenter Broadband Access Bundle enables customers to emulate millions of subscribers using different services across multiple ports. It simplifies large-scale test configurations to identify issues involving equipment selection, setting competitive Service Level Agreements (SLAs) and planning growth with confidence. It helps determine QoS per subscriber at different subscriber capacities and to determine capacity at a set QoS bandwidth and it can simulate typical or extreme subscriber traffic load conditions for minutes, hours or days, and evaluate key performance parameters of aggregation devices under controlled conditions. For Triple Play testing, this package supports testing of multiple services per subscriber.

PPPoX is one of the most widely deployed protocols for broadband subscriber authentication and session management. Stability and performance of PPPoX is critical to many service providers' IPTV and data services. **Spirent Broadband Access PPPoX** test solution helps Service Providers and Network Equipment Manufacturers validate subscriber scalability, performance and functionality of access servers and relay agents.

- **Enhanced Realism—**Spirent TestCenter Access test solution emulates real world broadband subscriber behaviors, Triple Play services, and failure scenarios

- **Improved Testing Capacity—** accomplish more in less lab space with the highest number of emulated subscribers per port and port density

- **Reduced Test Time—**set up tests quickly and easily to validate system performance in realistic, unstable environments rather than an environment optimized for pure performance

- **Detailed Analysis—**Data plane analysis down to the subscriber, service and stream to quickly identify and resolve performance issues that occur in only a small number of subscribers when supporting tens of thousands of subscribers
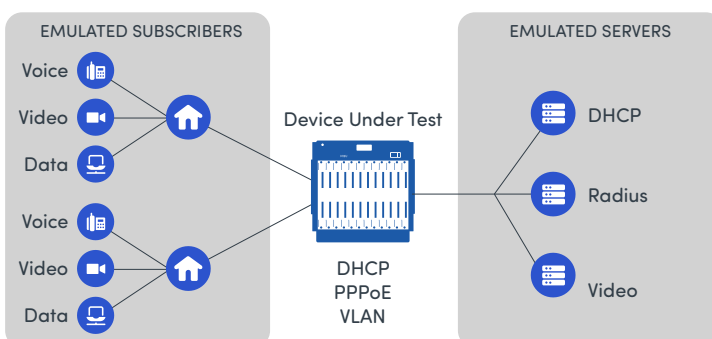
Spirent Broadband Access DHCP test solution enables service providers and network equipment manufacturers to quickly test the subscriber scalability and performance of access networks, DHCPv4, DHCPv6 and DHCP-PD servers and relay agents. Allocation of IP addresses is critical in any network design. The most common method used for issuing IP addresses is through Dynamic Host Configuration Protocol (DHCP). When rolling out next generation access networks and services, many service providers are moving to DHCP for address assignment. Combining authentication and other security measures with DHCP simplifies the provisioning of services like VoIP and IPTV with minimal overhead. To ensure devices like residential gateways, relay agents and DHCP servers are working correctly, network equipment manufacturers and service providers must test their performance and functionality.

Layer 2 Tunneling Protocol (L2TP) is used to support Virtual Private Networks (VPNs) or as part of the delivery of services by ISPs. Layer 2 Tunneling Protocol (L2TP) is used to tunnel PPPoE subscriber sessions to domains. L2TPv3 supports multi-protocol tunneling and provides additional security features, improved encapsulation, and the ability to carry data links other than simply Point-to-Point Protocol (PPP) over an IP network. L2TPv3 provides the flexibility and scalability of IP with the privacy of Frame Relay and ATM. Stability and performance of L2TP is critical to many Service Providers and data services.
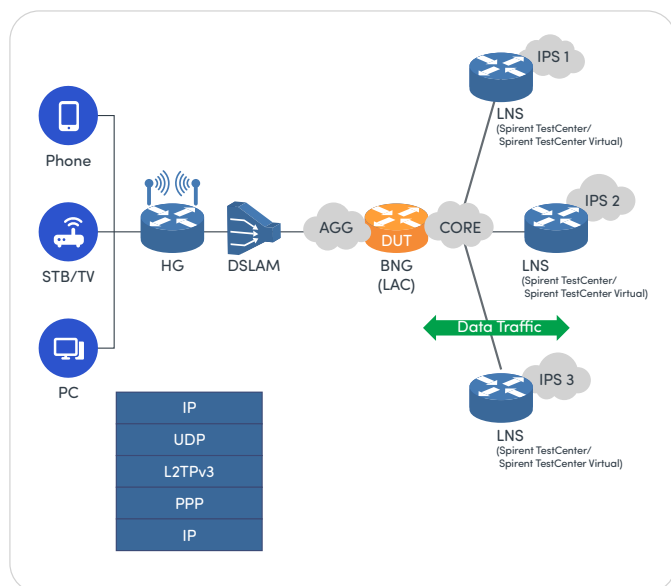
Spirent Broadband Access L2TP test solution enables users to emulate thousands of L2TP sessions using different services across multiple ports:

- Users can combine it with PPPoX base package to test DSLAM type devices initiating incoming calls to the LAC.

- Service Providers can emulate multiple LNS instances, one per customer and test fast scale up for optimal utilization of hardware resources.

- L2TP used along with the Topology Emulation feature (DBD) allows user to easily create test scenarios such as DHCP over PPPoL2TP or PPPoL2TP, etc.

- L2TP Stability Wizard lets you quickly set up and tear down PPPoL2TP sessions while optionally running traffic over them.

IPTV is a primary component of Triple Play services (voice, video and data). IPTV provides television content and other services such as Video on Demand (VoD) to broadband subscribers via IP.

One of the most important features of any IPTV service is "channel zapping," the ability for the subscriber device to change channels rapidly. It is extremely important to determine just how much time users wait for video (channel gap) and/or if there are multiple IPTV streams at the same time (channel overlap). Both of these parameters will affect the users' Quality of Experience (QoE).

The greatest concern in any deployment of an IPTV service is the impact on the network. Since it is IP based, there could be hundreds if not thousands of video channels crossing the network, consuming gigabytes of bandwidth and affecting other services. A single HD IPTV channel could be 8 Mbps, and many providers are planning on at least 4 set top boxes (STB) in a single house, resulting in total potential downstream traffic of up to 32 Mbps per subscriber.

Service Providers and Cable Providers need to test IPTV quality of experience, STB scalability and network performance. **Spirent Broadband Access IPTV** test solution fulfills these needs by:

- Determining the impact that hundreds or thousands of channels have on the network

- Evaluating key performance parameters such as channel gap and channel overlap of STBs and other multicast devices

- Stressing the backplane of edge aggregation devices with thousands of clients changing channels across hundreds of ports

- Benchmarking against ideal environments with test equipment generating the traffic on real world servers

- Troubleshooting channel or video quality issues through analysis of extensive reports and channel buffers

Features and Benefits

- Emulate up to 128K PPPoE or IPoE subscribers per port
- Emulate up to millions of PPPoE or IPoE subscribers per chassis
- Support both PPPoX server and client mode
- Support IPCPv4 and IPCPv6 simultaneous on same port
- Support DHCPv4, DHCPv6 and DHCP-PD
- Support both DHCP server and client mode
- Support up to 1024 emulated DHCP servers per port
- DHCP Init-Reboot provides faster binding for roaming subscribers with valid lease
- Support multiple addresses per device, using IAID value and IA_NA & IA_PD options in DHPCv6/PD
- Support DHCP over L2GRE tunneling using device behind device functionality
- Support both L2TPv2 and L2TPv3
- Support both LAC and LNS emulation
- Support multiple LNS per port including dual-stack LNS on a single port
- Validate 32-bit session (L2TPv3) & tunnel ID and tunnel authentication over entire message
- Emulate complex subscriber & DSLAM topologies 'behind' L2TPv3 tunnels
- L2TP stability wizard lets you configure session/tunnel stability tests within minutes
- Access over LDP VPLS and Access over BGP VPLS Wizards allow the user to easily configure complex scenarios such as L2TP over LDP VPLS or PPPoL2TP over LDP VPLS
- Support encoded as well as hidden L2TP AVPs and access line AVP extensions for L2TP
- Support encoding the originating number for incoming calling number
- Requests (Connect Speed Update Request: CSURQ) can be setup to be sent on-demand or
- automatically at regular intervals
- Support testing multiple tunnel types: PW, L2VPN, PPP, IPv6
- Support L2TPv3 over IP and UDP
- Support PPP over L2TPv3 over UDP/TCP
- Support Layer 2 VPN tunneling - Ethernet, VLAN and QinQ pseudowires (PW) over L2Tpv3
- Support IPv4 or Ipv6 over Ethernet over L2TPv3
- Support reliable delivery of L2TP control messages

- Support L2TP control message authentication
- Create traffic patterns to test Triple Play
- Set VLAN and QoS settings for subscribers
- Detailed analysis: upstream, downstream and peer-to-peer analysis per subscriber or port
- Interactive feature allows functional and negative testing including connecting and disconnecting groups of subscribers
- Support custom PPPoX , DHCP, and L2TP option editor
- Support auto retry failed or disconnected sessions
- Integrated protocol counters allows user to track protocol messaging
- Analyze and chart detailed results in real time or export to HTML or PDF
- Duplicate and copy/paste feature allows quick setup of many host blocks
- Easily create large-scale tests with features such as duplicate and copy/paste
- Powerful Command Sequencer enables realistic scenarios and session flapping, and provides integrated control plane connect and disconnect and data plane events, allowing users to view the result of a control plane event graphically in real time
- Integrated capture feature allows users to capture and decode control plane and data plane traffic, enabling deep functional troubleshooting
- Support IGMPv1, v2, v3
- Support MLDv1, v2
- Support IGMPoPPPoE, IGMPoPPPoEoQnQ, IGMPoPPPoEoVLAN, IGMPoDHCP, IGMPoDHCPoQnQ, IGMPoDHCPoVLAN, IGMP/MLDoQnQ, IGMP/MLDoVLAN
- Emulate thousands of IPTV subscribers per port who are changing channels
- Create different client profiles for measuring the impact of IPTV subscribers channel zapping/surfing
- Identify the min/max/avg of when there is no traffic (gap) or when there are two channels at once (overlap)
- Detailed graphical results of statistics such as min/max/avg channel change
- Configurable IGMP/MLD join/leave latency thresholds to determine failures
- Use simulated IP multicast traffic or test against a real IP multicast source

Technical Specifications

Parameter	Description
PPPoX	
RFC 1332	The PPP Internet Protocol Control Protocol (IPCP)
RFC 1334	PPP Authentication Protocols
RFC 1570	PPP LCP Extensions
RFC 1661	The Point-to-Point Protocol (PPP)
RFC 1877	PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
RFC 1662	PPP in HDLC-like Framing
RFC 1994	PPP Challenge Handshake Authentication Protocol (CHAP)
RFC 2364	PPP Over AAL5
RFC 2472	IP Version 6 over PPP
RFC 2516	A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 4241	A Model of IPv6/IPv4 Dual Stack Internet Access Service
RFC 5072	IP Version 6 over PPP
TR-101	DSL Forum TR-101
DHCP	
RFC 2131	Dynamic Host Configuration Protocol
RFC 2132	DHCP Options and BOOTP Vendor Extensions
RFC 3046	DHCP Relay Agent Information Option
RFC 3118	Authentication for DHCP Messages
RFC 3203	DHCP reconfigure extension
RFC 3315	Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
RFC 3363	Representing Internet Protocol version 6 (IPv6) Addresses in the Domain Name System (DNS)
RFC 3527	Link Selection sub-option for the Relay Agent Information Option for DHCPv4
RFC 3633	IPv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6
RFC 3646	DNS Configuration options for Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
RFC 3736	Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6
RFC 4580	Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Relay Agent Subscriber-ID Option
RFC 4649	Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Relay Agent Remote-ID Option
RFC 4862	IPv6 Stateless Address Autoconfiguration
RFC 5107	DHCP Server Identifier Override Suboption
RFC 6221	Lightweight DHCPv6 Relay Agent
L2TP	
RFC 2661	Layer Two Tunneling Protocol – Version 2
RFC 3931	Layer Two Tunneling Protocol – Version 3
RFC 5515	Layer 2 Tunneling Protocol (L2TP) Access Line Information Attribute Value Pair (AVP) Extensions
ANCP	
RFC6320	Protocol for Access Node Control Mechanism in Broadband Networks
draft-lihawi-ancp-protocol-access-extension-00	Access Extensions for the Access Node Control Protocol
draft-wadhwa-gsmp-l2control-configuration-02	GSMP extensions for Access Node Control Mechanism
IGMP & MLD	
RFC 2236	Internet Group Management Protocol, Version 2
RFC 3376	Internet Group Management Protocol, Version 3
RFC 2710	Multicast Listener Discovery (MLD) for IPv6
RFC 3810	Multicast Listener Discovery Version 2 (MLDv2) for IPv6

Ordering Information

Product Number	Description
AON-DL-ACCESS	Broadband Access Bundle

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