DATASHEET

Spirent AION

Spirent TestCenter Data Center Standard and Advanced Bundles

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.

Application Overview

Spirent TestCenter Data Center test solutions support high performance and realistic topologies for Layer 2 and Layer 3 overlay networks, data center interconnect, multi-path high-availability, switching and storage technologies used in Data Centers and enable Network Equipment Manufacturers, Service Providers and Enterprises to quickly evaluate and troubleshoot functionality, performance, and scalability of any data center fabric. These solutions allow users to expose the true performance of high-speed, high-density switches and routers and overall system architecture for datacenter network with ever increasing port densities and speeds under various traffic conditions.

- **Data Center Interconnect Validation—**emulate vast number of VTEPs, PEs, and CEs devices and validate performance and scalability of Data Center Interconnect
- **Network/Service Reliability—** verify scale, reliability, performance of Layer 2 & 3 services including data, multicast, and video delivered over data center fabric
- **Testing Converged Fabrics—** end to end FCoE to FC performance emulating virtual machine initiators on Ethernet and storage array targets on native Fibre Channel test ports
- **Increase Productivity—**test and configuration wizards allow quick setup; capture functionality, protocol events and live status views make troubleshooting easy with TestCenter IQ and help save time
- **Cost-Effective Solution—** complete data center protocol emulation suite in a single package which is also light on budget
- **Trusted Partner—**benefit from decades of testing experience with Spirent as your guide through a world of complex testing

Data Center Bundle

The **Data Center Bundle** features offer comprehensive testing of Layer 2 overlay multipath networks and storage fabrics.

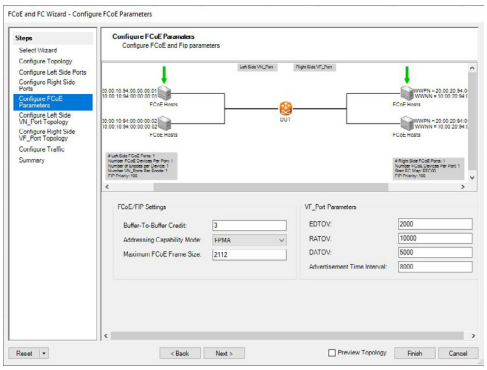
Layer 2 (L2) Overlay Protocols such as Shortest Path Bridging (SPB), Transparent Interconnect for Lots of Links (TRILL), Overlay Transport Virtualization (OTV), Provider Link State Bridging (PLSB), Virtual Ethernet Port Aggregator (VEPA) included in this package, help quickly evaluate and troubleshoot different types of L2 fabric, forwarding behavior, and performance in devices and data center networks.

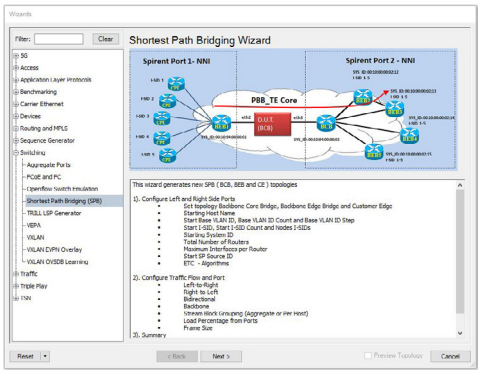
SPB emulation facilitates multiple SPB adjacencies, hundreds of SPB nodes, and thousands of emulated ISIDs and MAC addresses, SPB traffic with 802.1ah MAC in MAC encapsulation, to test the throughput scale of data center switches and fabrics. It can further be used to test 802.1aq SPB in combination with 802.1ag Connectivity Fault Management capabilities.

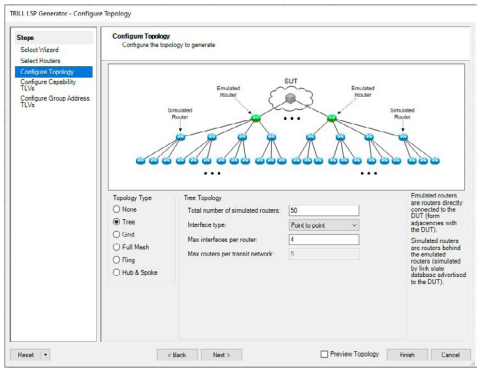
TRILL emulation validates the implementation of TRILL Routing Bridge (RBridge) regarding Ingress/Egress or Transit functions, IS-IS exchange information, multicast tree pruning, load balancing, and topology changes. It allows emulation of large networks by generating thousands of TRILL LSPs and complex network maps.

OTV emulation delivers a virtual L2 transport over any L3 Infrastructure.

Fibre Channel over Ethernet (FCoE) technology provides a method of transporting Fibre Channel traffic over a physical Ethernet connection. The FCoE Initialization Protocol (FIP) allows the switch to discover and initialize FCoE-capable entities that are connected via Ethernet. The Data Center Bridging eXchange (DCBX) protocol is an extension of the LINK Layer Discovery Protocol (LLDP). This package helps to test end to end FC and FCoE interoperability scenarios.



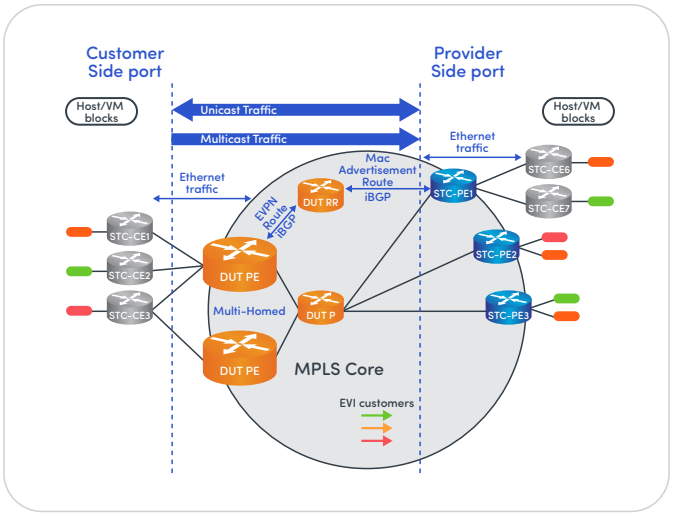




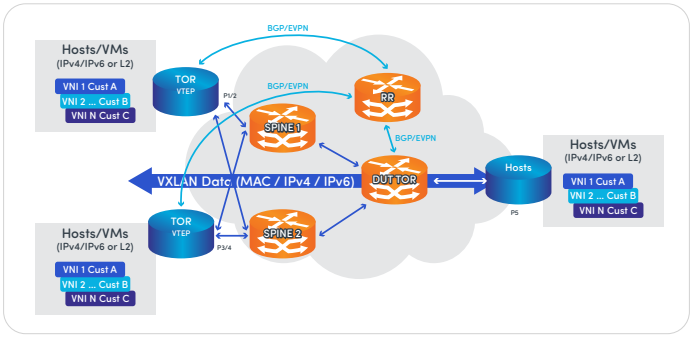
Data Center Advanced Bundle

Data Center Advanced Bundle features cover complete testing of Layer 2 and Layer 3 data center networks with advanced technologies such as Virtual Extensible Local Area Network (VXLAN), Ethernet Virtual Private Network (EVPN) control plane with MPLS and VXLAN data-plane and data center interconnect architectures.

EVPN enables user to connect a group of dispersed customer sites using a Layer 2 virtual bridge. As with other types of VPNs, an EVPN is comprised of customer edge (CE) devices (host, router, or switch) connected to provider edge (PE) devices. The PE devices can include an MPLS edge switch (MES) that acts at the edge of the MPLS infrastructure. **EVPN emulation** supports data plane encapsulations of MPLS, MAC-in-MAC(PBB) and VXLAN.



VXLAN Overlay helps users create large private networks of virtual machines across existing Layer 2 and Layer 3 networks. VXLAN Tunnel End Point (VTEP) emulation provides a unique and easy to use interface that creates large multi-segment, multi –virtual machine, and multiple VTEPS to allow for validation of VXLAN enabled devices. **VXLAN emulation** supports a number of ways of learning including traditional data plane-based flood and learn, manual configuration of unicast address or flood list and advanced BGP-EVPN control plane- based learning.



These two packages are integrated component of Spirent TestCenter and work with other Spirent TestCenter components to deliver easy, consistent TCL and Python scripting API and Command Sequencer NoCode automation. These can also be combined with Routing and Switching, Access or Segment Routing control-plane over VXLAN/EVPN-MPLS topology with stateful or stateless data-plane traffic.

Features and Benefits

Data Center Bundle

- Layer 2 data center overlay technologies like SPB, TRILL, OTV help with testing of functionality, interoperability and staggered network upgrades
- Verify SPB Adjacency, Node, Link and Service scale in CPU (control plane) and ASIC (data plane) components of switches and fabrics
- Test availability of multiple TRILL paths simultaneously for load balancing, multi-homed traffic, and failover scenarios
- Storage testing with Fiber Channel over Ethernet emulation support with dynamic network discovery using LLDP/DCBX
- Validate FCoE single hop vs. multi hop fabric redundancy and performance impact of possible head of line blocking (HLOB) with nanoseconds accurate data plane latency
- Verify no flooding, MAC learning and broadcasts over Shortest Path Bridging 802.1ah MAC in MAC data plane and FCoE data plane, VLANs and MAC address spoofing prevention capabilities of the fabric, VSANs and FIP snooping with dynamic Access Control Lists (ACLs)
- Report SPB Multi-path and Multi-priority Queueput per latest IETF draft specification with FCoE, unicast and multicast LAN traffic utilizing the Spirent TestCenter data center bridging benchmarking test package

Data Center Advanced Bundle

- Support for dual-stack IPv4 and IPv6 in EVPN emulation with EVPN routes Type 1 to Type 8
- Support for dual-stack VXLAN emulation for IPv4 and IPv6 underlay
- BGP-EVPN control plane integrated with widely used VXLAN-EVPN Overlay and PBB EVPN with comprehensive support for most data plane encapsulations, namely MPLS, VXLAN and MAC-in-MAC
- Inter-subnet forwarding for EVPN and VXLAN with Integrated Routing and Bridging (IRB) Symmetric and Asymmetric
- Support for MAC Mobility in EVPN/VXLAN and measure MAC Mobility Convergence for VXLAN-EVPN overlay
- Support for EVPN services like E-TREE and E-LINE (VPWS)
- Use wizard to quickly emulate large and complex VXLAN/EVPN leaf-spine topologies running broadband access protocols, or stateful application-layer protocols from a single application interface.
- Setup and test complex Data Center Interconnect topologies and internetworking between EVPN-VXLAN, EVPN-MPLS and IP VPN
- Support for multiple extension to VXLAN-EVPN Overlay technologies like Multi-Site, Tenant Routed Multicast, Any Source Multicast Underlay.
- Support for Access protocols (DHCP/PPPoE/IGMP/MLD) over VXLAN tunnels
- VXLAN VTEP emulation integrated with OVSDB emulation to test VXLAN tunnels in a SDN network

Common Features

- Validate scalability and protocol functionality in the same test by running multiple protocols concurrently on each port
- Using advanced multi-threading architecture, user can scale number of sessions or route scale with multi-dimension
- Use the Command Sequencer with TCL scripts to send SNMP commands, get SNMP data, configure the device under test, run entire test and generate pass/fail results; advanced command sequencer capabilities allow users to extend Spirent TestCenter to meet their test needs

Technical Specifications

Parameter	Description
Data Center Bundle	
Storage Fabrics	
FCoE	• FIP—FCoE Initialization Protocol emulation (FLOGI/FLOGO) • Server VN_Port and Fabric FCF VF_Port emulation • Automatic VLAN discovery • Multiple ENode and VN_Port emulation to FCF switch • NPIV VN_Port emulation to FCF, NPV and FIP snooping bridge switches
LLDP/DCBX	• Link Layer Discovery Protocol (LLDP) emulation • Auto-negotiation of 802.1Qbb Priority Flow Control (PFC) and 802.1Qaz Enhanced • Transmission Selection (ETS)
Layer 2 Overlay	
TRILL	• RBridge (Routing Bridge) emulation • Multi-VLAN support • Designated RBridge election • RBridge nickname collision resolution • Appointed Forwarder designation
SPB	• 802.1aq Shortest Path Bridging MAC (SPBM) BEB or BCB emulation • 802.1ah traffic via Mac-in-Mac encapsulation • ISIS emulation of Level 1, Level 2, Level 1/2 routers • SPBM ISID UNI and NNI Node and Link
OTV	Overlay Transport Virtualization
VEPA	Virtual Ethernet Port Aggregator (IEEE 802.1QBG)
PLSB	Provider Link State Bridging
Data Center Advanced Bundle	
Data Center Interconnect	
EVPN	• EVPNv4/v6 • EVPN Route Types 1,2,3,4,5,6,7,8 • Inter-subnet forwarding with IRB (Symmetric and Asymmetric) • PBB-EVPN • Data Plane support for MPLS, VXLAN and MAC-in-MAC • All Active / Single Active Aliasing and Load Sharing • Split-Horizon • MAC Mobility
VXLAN	VTEP Learning – • Flood and Learn • Manual configuration Unicast and Flood list • EVPN Control Plane • OVSDB (requires license AON-PB-SECURITY)
VXLAN-EVPN Overlay	• VXLANv4/v6 with EVPN Control plane • Inter-subnet forwarding with IRB (Symmetric and Asymmetric) • PIM-ASM support in underlay for BUM traffic • Border Gateway (BGW) emulation in Multisite topology • Tenant Routed Multicast • DHCP/PPPoE/IGMP/MLD control plane over VXLAN tunnel (requires Access Domain license) • MAC Mobility and MAC Mobility Convergence Measurement

Ordering Information

Product Number	Description
AON-PB-DC*	AION Data Center Bundle
AON-PB-DC-ADV*	AION Data Center Advanced Bundle

**Requires AION Routing & Switching Bundle (AON-PB-RTSW)*

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