Spirent AION

Ospirent™

Spirent TestCenter Layer 2-7 Traffic

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.

Layer 2-7 Traffic Generation and Analysis

Layer 2-7 Traffic is used by every application running on Spirent TestCenter and is enabled by the bandwidth and scale licenses. It encompasses two key blocks of functionality:

- Line rate OSI Layer 2 to 3 data-plane packet generation and analysis
- Enhanced Layer 4 to 7 application and protocols testing

When combined with protocol bundles, this permits the generation of full state client-server application traffic over TestCenter topologies/encapsulations (such as emulated L3 routed topologies, SP-SDN interconnects, and Wi-Fi). Users can simultaneously generate Layer 2-3 and Layer 2-7 application traffic via a single user interface and automation framework, over the emulated topology of choice.

Layer 2 and 3 Packet Generator/Analyzer (PGA)

PGA contains all the tools and functionality required to transmit, receive, and analyze Layer 2/3 traffic. It consists of the port settings, device and stream blocks, traffic generator and analyzer, traffic and custom test wizards, Command Sequencer, packet capture, Spirent TestCenter IQ results framework, and platform administration.

Enhanced Layer 4 to 7

Application realistic traffic is generated between groups of TestCenter emulated clients and servers. Intuitive graphical user interface tools enable the user to easily configure the required mix of application traffic (as shown in figure on the right) and adjust the required load expressed either in terms of desired bandwidth or the number of simulated users.

- **Reduced Time-To-Test—**accelerate time-to-market for your products and services

- **Cost-Effective—**emulate millions of devices right from the test tool with application and network testing in a single test solution

- **Total Realism—**application traffic over complex control-plane-driven emulated topologies for realism across the L2-7 stack

- **Quality of Experience—**comprehensive validation assessed by measuring with realistic test traffic that stimulates every part of the device or system under test

- **Actionable Analytics—**Giving answers you can act upon, not just tables of results. Leveraging Spirent testing expertise

- **Trusted Partner—**Benefit from decades of testing experience with Spirent as your guide through a world of complex full-stack testing
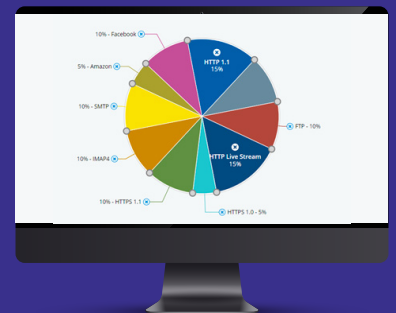
Easily configure & adjust the required mix of application traffic via an intuitive graphical user interface

Results

Making use of TestCenter IQ, users can quickly manipulate results, sort and filter data, and easily drill-down to identify problems and discover trends. The capability to correlate real time data-plane and control-plane values across the full Layer 2-7 stack is an industry-first and helps dramatically simplify troubleshooting. User defined thresholds for health indicators help to automatically isolate and present relevant data from millions of points and are also unique to this solution. With more coverage and information, users can answer questions faster in a single test run, where other tools might require multiple runs.

Automation

TestCenter users can customize the test environment to their unique needs, enabling them to bring higher quality products and services to the market faster. The Command Sequencer within the TestCenter application is used to run automatic tests directly from the user interface with no scripting experience required. TestCenter also integrates easily with Spirent iTest, Spirent Velocity, or Spirent TTworkbench for test creation and orchestration.

In addition, TestCenter may be controlled via many different APIs which are available under a separate bundle.

Features and Benefits

- Evaluate the performance, stability and scale of switches, routers, edge and many other devices under static or dynamic load conditions for minutes, hours and days
- Characterize and troubleshoot functional behavior (including negative testing) of new network functionality in the development lab or before deployment into the operational network, find the problems before your customers do to reduce customer churn
- Evaluate key performance parameters and functions such as per-flow QoS, fail-over time, or Access Control Lists (ACL), and ensure you can meet your SLAs
- Perform comparative analysis of devices or services with deterministic traffic during product development cycles or vendor comparisons, choose the right products/ services to build your own offering

- Unique ability to generate full stack mix of traffic over emulated topology, including SP-SDN interconnects, and Wi-Fi
- Single user interface and automation for L2-7 and Control Plane reduces investment required in learning
- Actionable analytics via user definable Health Indicators for consolidated, real-time monitoring & correlation to get the answers you need faster
- Integration of events with results data for deep analysis of system behavior
- Historical time series data allows running Health Indicators on historical data to analyze system behavior in new ways, replaying completed test to analyze at any time in the future

Technical Specifications

Parameter	Description
PGA Generator Parameters	
Frame Size	Fixed, random, increment, decrement, auto, iMIX (Internet Mix for even more realism)
Load	Mode/Units include Fixed, Random; % of line rate, bits/kbits/Mbits/sec, IFG, frames/sec
Scheduling	Modes for Port-based, Rate-based, Priority-based, Manual
Duration	Modes include continuous, bursts, step, seconds, repetitions
Packet Definition	Configure the L2/3 packet payload, adding additional headers, enabling packets modifiers for high scale flows, as well as injecting and detecting packet errors
PGA Generator Stream Types	
Bound Stream Blocks	Use dynamic emulated devices or routes to represent traffic endpoints for simple or complex traffic patterns between test ports. Automatic control/data-plane binding and rebinding (e.g. MPLS labels)
Raw Stream Blocks	Manually configured packets (i.e., not dynamic except for ARP/ND resolution). Reference a single source port. Addresses are static so there is no concept of endpoints as there is with Bound Stream Blocks
PGA Analyzer Modes	
Basic	Basic traffic counters for Tx/Rx Events and Rates for both test and non-test traffic
Histogram	Histogram counters for latency, sequence run length, and sequence diffcheck histograms
Jitter	Minimum/maximum/average jitter counter values including RFC 3393 Absolute value or RFC 4689 Absolute Value are available for Jitter Mode
Inter-arrival Time	Inter-arrival histogram and minimum/maximum/average counter values
Forwarding Performance	Advanced sequencing counters and minimum/maximum/average inter-arrival counters
Latency-Jitter	Minimum/maximum/average counter values for latency and jitter; the Latency-Jitter Mode is RFC 4689 Absolute Value

Technical Specifications (cont'd)

Parameter	Description
L2-3 Results	
Interesting Streams	Allows user to create search criteria such as frame loss, rate, latency, jitter or other combinations of measurements; the system will find all the streams matching the criteria and present them in the results view
Analyzer Filters	Incoming traffic can be segregated into different categories based on user-defined combinations of filters operating on the frame data itself
Stray Frames Detection	Automatically detect mis-routed frames (multicast, L2 and VLAN flooding/leaking) and bring them to the tester's attention
Hierarchical Results	Available at the port, Stream Block, or individual Stream and Flows
Tx to Rx Mapping counts	For devices that shape and police traffic; STC provides counts and rates for Tx streams per port with matching statistics on the Rx port
Charting	User-selected statistics to chart. High-resolution charts with user-specified triggering. Integrated control and data plane events on same chart with same time reference.
L4-7 Supported Protocols – Configurable Parameters	
CIFS-SMB	TCP port and domain name
FTP	TCP port and Send Message Size
HTTP 1.0	Client Get/Post method, Requests per connection, Server TCP port and File Size
HTTP 1.1	As above
HTTPS 1.0	As above plus Cipher type
HTTPS 1.1	As above plus Cipher type
HTTP Live Stream (Video)	VoD/Live Stream Type, Live Play Latency, Manifest File Download Timeout, Bitrate and more
IMAP 4	TCP Port
POP3	TCP Port
Raw TCP	TCP port, Packet Delay, Close Type
SMTP	TCP Port
Telnet	TCP Port
Application Import and Playback (AIP)	Import and playback PCAP files to cover any other protocol the user requires
Supported L4-7 Applications	
Amazon	
Facebook	
Instagram	Realistic Client/Server Traffic Profiles
Netflix	
YouTube	
L4-7 Measured Parameters	
TCP Goodput	Throughput after TCP connection is established
Successful TCP transactions	Provides the reliability of TCP where other protocols (HTTP, FTP) are dependent
URL Avg load time	Ave time to fully load a web landing page
TCP TTFB	Time to first byte — milliseconds response of your webserver
QoE Score	Valuation indicator that determines the expectation and predictability of a network
Advanced Sequencing Errors	Leads to multiple retransmissions and reset
Avg Latency	Average time taken for requested data to get to the server
Max Latency	Max time taken for requested data to get to the server
Avg Jitter	Average fluctuation of latency over time
Max Jitter	Max fluctuation of latency over time
Drop Count	Packets lost when traveling across a computer network fail to reach their destination and get dropped.
L4-7 Supported Platforms and Modules	

Spirent FX2/MX2 and MX3 Test Modules, Spirent C2/C50 Appliance (Ethernet, Wi-Fi 802.11ac/ax) and TestCenter Virtual (refer to Customer Support Center for latest supported hardware.)