

Spirent TSN Test Solutions

Conformance and Performance Testing

Test TSN-enabled networks, cabling, devices and systems with a solution emulating a realistic and deterministic environment that speeds up product development and improves quality.

Spirent's TSN solution can emulate TSN and non-TSN capable end-points allowing creation of realistic network environment with multiple connections, domains and different traffic profiles.

Solutions

- Conformance testing (TTworkbench application)
- AVB Conformance Test Suites based on Avnu test plan
- TSN Conformance Test Suites
- Performance & functional testing
- Spirent TestCenter application
- Support across all of the Spirent TestCenter platforms

The Spirent Time-Sensitive Networking (TSN) Test Solutions offer the complete set of tools to achieve conformance and performance testing in a single hardware platform over variety of interfaces and speeds.

Applications

TSN test solutions allow Automotive, Industrial, Networking, and Pro AV system and equipment manufacturers, as well as silicon manufacturers to ensure functionality and performance objectives in the following areas:

- R&D testing involving technology feasibility studies and performance modeling
- Device and protocol functional testing
- Conformance and certification testing
- Device, sub-system, or services performance characterization, scalability and availability
- Stress testing requiring higher device and traffic emulation scaling capability as well as higher physical interface connection
- Negative testing to characterize the system resilience

Features & Benefits

- Full TSN emulation of multiple talker or listeners on each port
- A comprehensive set of TSN standards supported (please refer to the TSN Standard Coverage table on next page)
- **True Preemption** support allowing creation and scheduling of real preempted segments along with Express traffic at line rate
- Standard specific wizards and result view allow easy to use and quick configuration and analysis possible
- Mixed TSN and non-TSN traffic generation capability on each port
- Highly scalable test topology with precise and consistent timing across the ports regardless of the scale
- TSN specific metrics and statistics measurements
- Highly accurate and precise timing measurements
- Verification of precise synchronization and presentation time
- Support for different Ethernet media types and speeds (10M to 400G)
- Real-time capture and analysis capabilities
- Full protocol decode in Wireshark

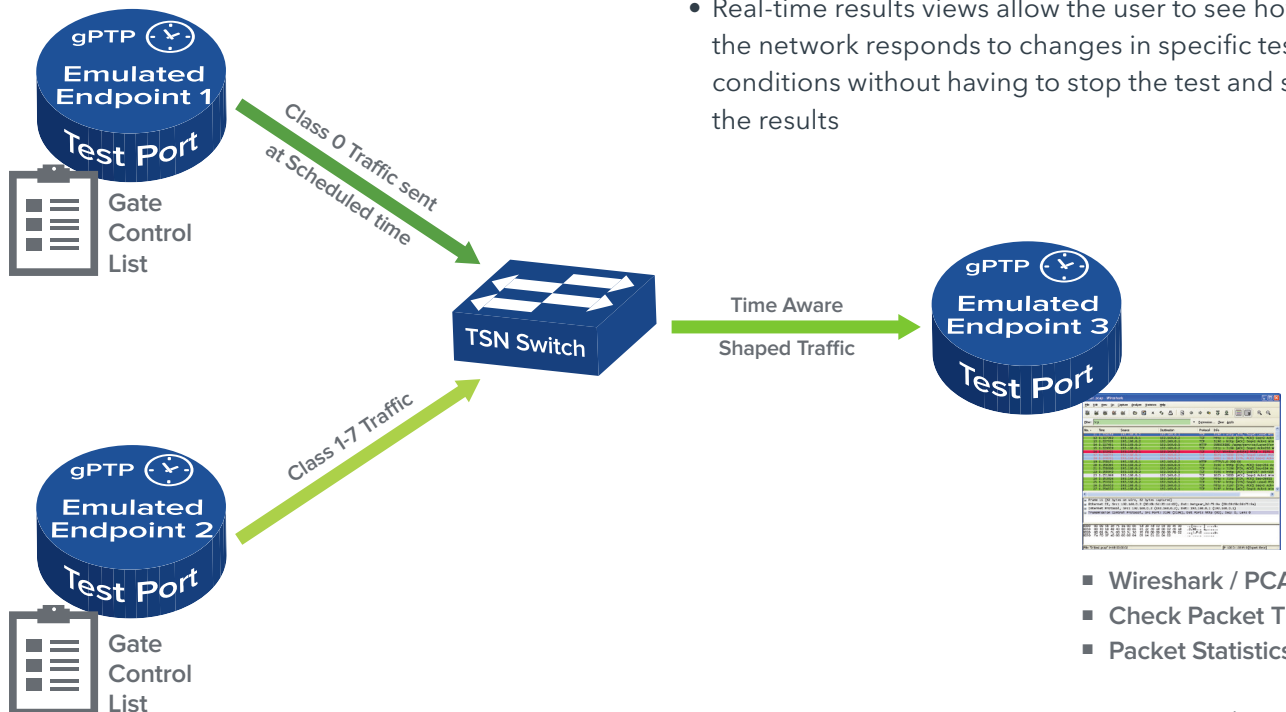
TSN Standard		Support for Port Type	
		dX/pX	fX/mX
IEEE 802.1AS-Rev	Timing and Synchronization for Time-Sensitive Applications	✓	✓
IEEE 802.1Qat	Stream Reservation Protocol (SRP)	✓	✓
IEEE 802.1Qav	Forwarding and Queuing for Time-Sensitive Streams (FQTSS)-Credit Based Shaping	✓	✓
IEEE 802.1Qbv	Enhancements for Scheduled Traffic-Time Aware Shaping	✓	✓
IEEE 802.1Qcr	Asynchronous Traffic Shaping	✓	✓
IEEE 802.1Qch	Cyclic Queuing and Forwarding		✓
IEEE 1722	Layer 2 AVB Transport	✓	✓
IEEE 1733	Layer 3 AVB Transport	✓	✓
IEEE 802.1Qci	Per-Stream Filtering and Policing	✓	✓
IEEE 802.3br	Interspersing Express Traffic		✓
IEEE 802.1Qbu	Frame preemption		✓
IEEE 802.1CB	Seamless Redundancy	✓	✓

Realism

- Realistic stateful protocol emulation to exercise protocol state machines
- Realistic emulation of a TSN or a mixed (TSN and non-TSN capable) Ethernet network with multiple connections, endpoints, domains and different traffic profiles

Productivity

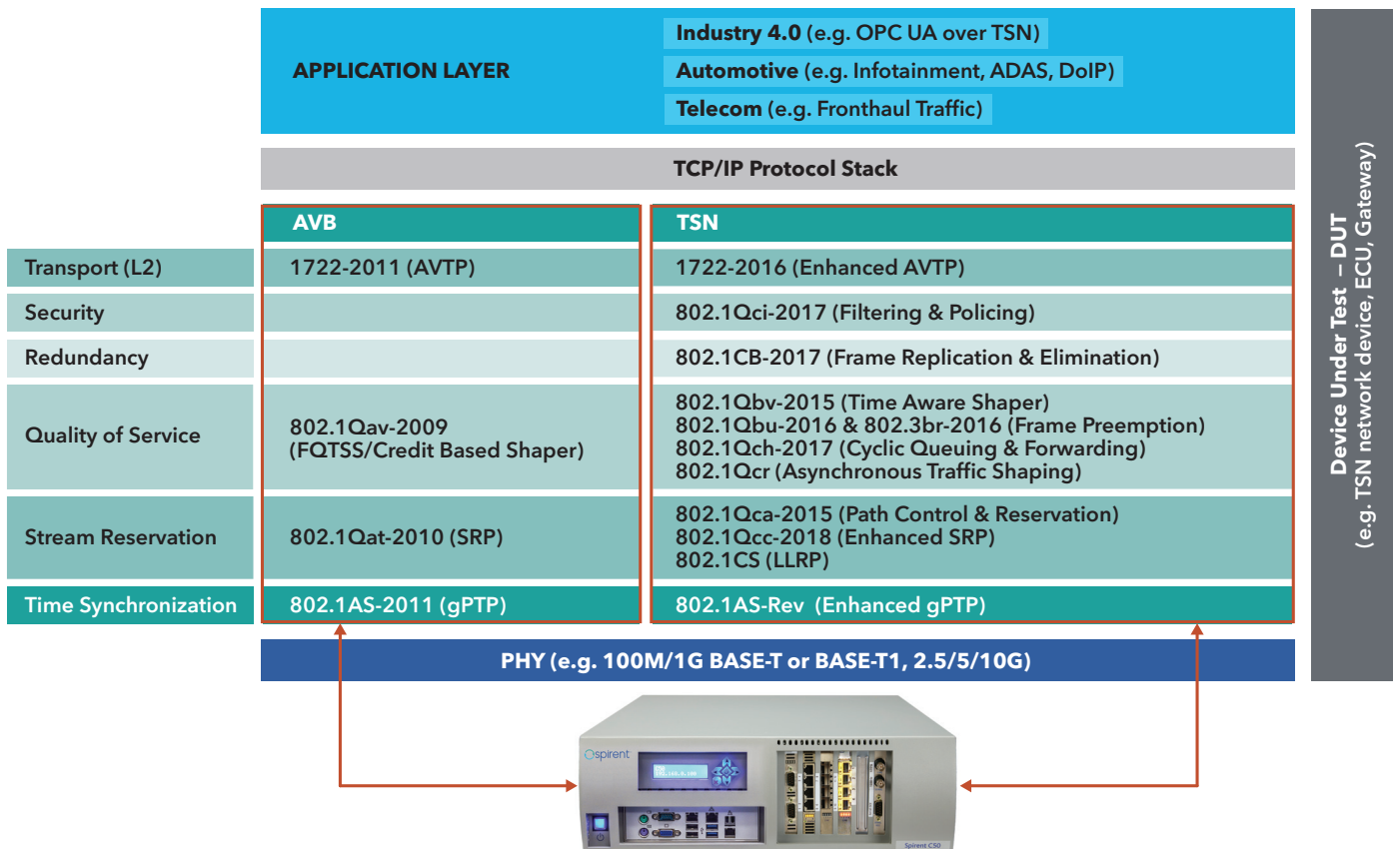
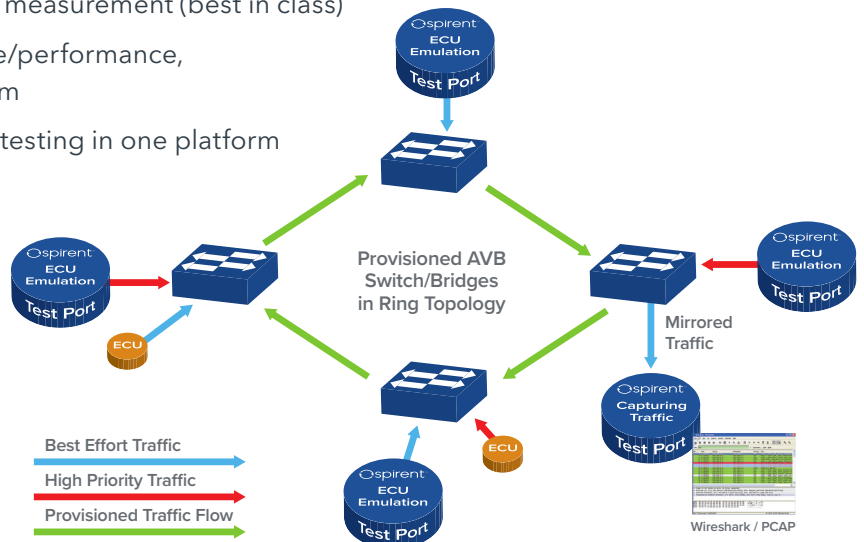
- Intelligent Results™ allow users to quickly confirm positive results and identify problematic areas
- Real-time traffic and protocol controls enable the tester to validate and troubleshoot problems by altering the test configuration while the test is running
- Real-time results views allow the user to see how the network responds to changes in specific test conditions without having to stop the test and save the results



- Wireshark / PCAP
- Check Packet Timing
- Packet Statistics

The Spirent Advantage

- Easy to use TSN wizards and result views
- The only **True Preemption** support available allowing creation and scheduling of real preempted segments along with Express traffic at line rate
- Highly capable and accurate traffic generation and analysis
- Highly accurate timing and synchronization measurement (best in class)
- Multi-faceted solution for L2-3 conformance/performance, L4-7 and vulnerability testing in one platform
- Conformance, performance and functional testing in one platform
- Support on all types of interfaces including 100BASE-T1 & 1000BASE-T1
- Support across all speeds from 10M to 400GbE
- Solutions in portable, desktop and rack-mount form factor
- Expandable and scalable test setup



Conformance, Performance & Functional Testing

Ordering Information

Spirent TestCenter Application - Bundled Packages

Part Number	Description
AUTO-SWA-001	TSN- IEEE 802.1AS & AS-Rev: Enhanced Timing and Synchronization
AUTO-SWB-201	AVB IEEE 802.1BA STC Pack for Functional and Performance Testing Includes: IEEE 802.1 (AS (-Rev), Qat, Qav), IEEE 1722 & IEEE 1733
AUTO-SWB-203	TSN PACK 1 - ALL TSN STANDARDS EXCEPT FOR IEEE 802.1QBU (Pre-emption) Includes: IEEE 802.1 (AS (-Rev), Qat, Qav, Qbv, Qci), IEEE 1722, IEEE 1733 & IEEE 802.3br
AUTO-SWB-204-C1 AUTO-SWB-204-C50	TSN PACK 2 - PRE-EMPTION BUNDLE FOR C1/C50 Includes: IEEE 802.1Qbu & IEEE 802.3br
AUTO-SWB-205-C1 AUTO-SWB-205-C50	TSN SUPER PACK (INCLUDES PACK 1 AND PACK 2) FOR C1/C50 Includes: IEEE 802.1 (AS (-Rev), Qat, Qav, Qbu, Qbv, Qci), IEEE 1722, IEEE 1733 & IEEE 802.3br
AUTO-SWB-206	TSN TIMING & SYNCHRONIZATION SOLUTION PACK. IEEE 1588 & IEEE 802.1AS
AUTO-SWB-207	TSN- IEEE 802.1Qci (Per Stream Filtering & Policing) & IEEE802.1AS (gPTP) Pack
AUTO-SWB-208	TSN- IEEE 802.1Qbv (Time Aware Shaper) & IEEE802.1AS (gPTP) Pack
AUTO-SWA-010	TSN- IEEE 802.1CB: Frame Replication and Elimination for Reliability

Individual Packages and License References

A AUTO-SW-A001	IEEE 802.1AS-Rev: Timing and Synchronization for Time-Sensitive Applications (gPTP)
B AUTO-SW-A002	IEEE 802.1Qat: Stream Reservation Protocol (SRP)
C AUTO-SW-A003	IEEE 802.1Qav: Forwarding and Queuing for Time-Sensitive Streams (FQTSS)
D AUTO-SW-A004	IEEE 1722: Layer 2 AVB Transport
E AUTO-SW-A005	IEEE 1733: Layer 3 AVB Transport
F AUTO-SW-A006	IEEE 802.1Qci - Per Stream Filtering & Policing
G AUTO-SW-A007	IEEE 802.1Qbv: Time Aware Shaper
H AUTO-SW-A008	IEEE 802.3br: Interspersing Express Traffic
I AUTO-SW-A009	IEEE 802.1Qbu: Preemption (per chassis license-all capable port in the chassis are enabled)

Spirent TWorkbench Application (Conformance)

TEC-SUITE-AVBA	Avnu Automotive AVB Test Suite Pack (for Bridges and End Stations)
TEC-SUITE-AVBA-BRIDGE	Avnu Automotive AVB Test Suite Pack (for Bridges)
TEC-SUITE-AVBA-ENDSTATION	Avnu Automotive AVB Test Suite Pack (for End Stations)
TEC-SUITE-TSN-PRE	TTsuite-TSN-Preemption: <i>Conformance test package for TSN Pre-emption (IEEE802.1Qbu & 802.3br)</i>
TEC-SUITE-TSN-TAS	TTsuite-TSN-Time Aware Shaper: <i>Conformance test package for TSN Time Aware Shaper</i>
TEC-SUITE-TSN-FP	TTsuite-TSN-Filtering & Policing: <i>Conformance test package for TSN Filtering & Policing</i>
TEC-SUITE-TSN-RED	TTsuite-TSN-Redundancy: <i>Conformance test package for TSN Redundancy (IEEE802.1CB)</i>
TEC-SUITE-TSN-TSP	TSN Conformance Test Suite Pack: <i>TSN conformance test suite pack includes Pre-emption (PRE), Time Aware Shaper (TAS), Filtering & Policing (FP) and Redundancy (Red) test packs</i>

Contact Us

For more information, call your Spirent sales representative or visit us on the web at www.spirent.com/ContactSpirent.

www.spirent.com

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