

# Spirent TSN Test Solutions

## Compliance & 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 compliance 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)
- 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 type and speed (10M to 100G)
- Real-time capture and analysis capabilities
- Full protocol decode in Wireshark

		Support for Port Type		Licensed Wizards and Analysis Support
	TSN Standard	dX	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 802.1Qcc	SRP Enhancements and Performance Improvements	✓	✓	✓
IEEE 802.1QCB	Seamless Redundancy	✓	✓	✓

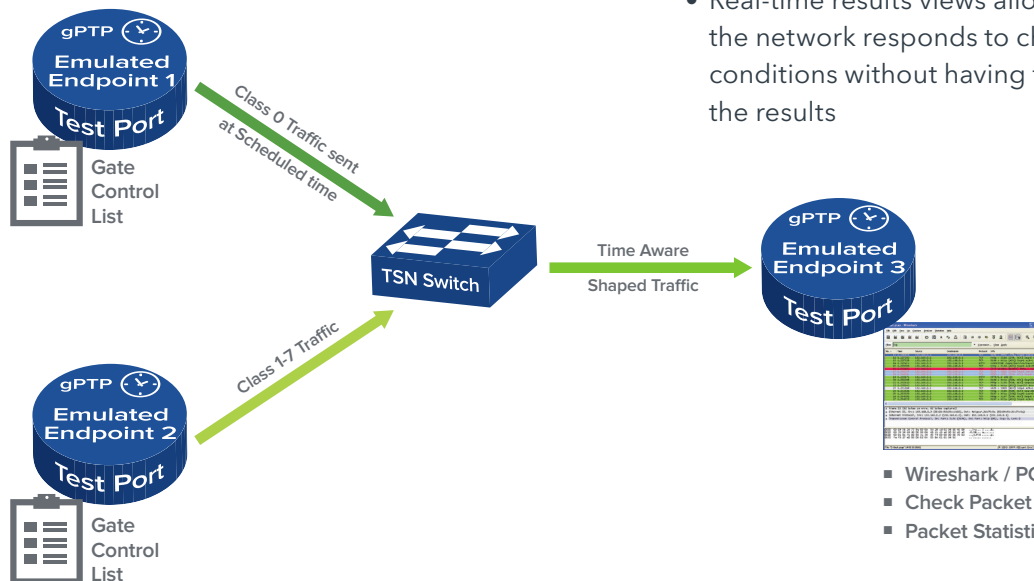
✓ Available now   
 ✓ Available in Q1 2019   
 ✓ Available in Q2 2019

### 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

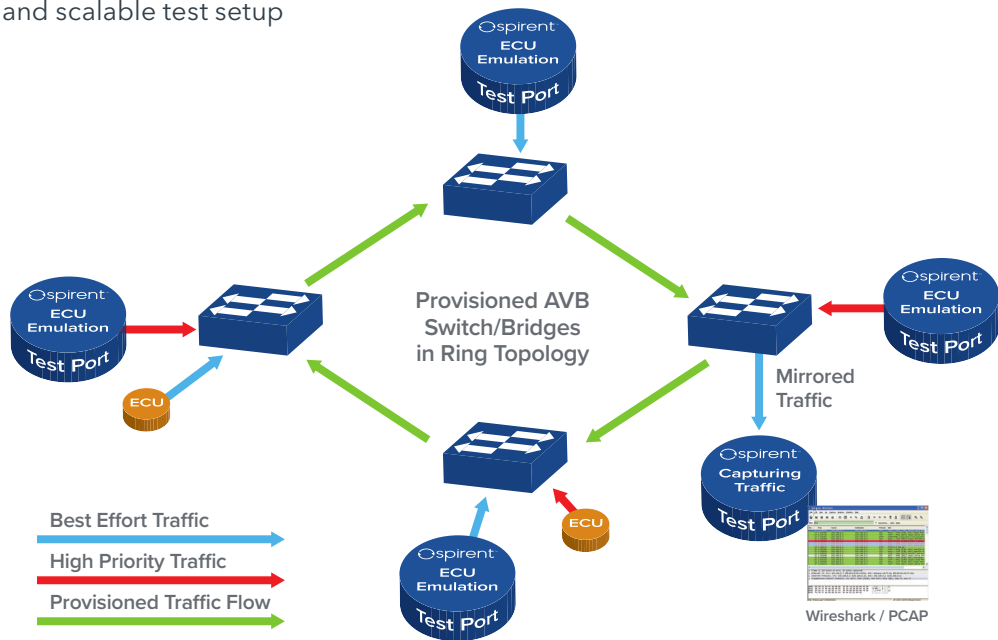
- Intelligent Results™ allow users to quickly confirm positive results and identify problematic areas
- Real-time traffic and protocol controls enable the tester to validate and troubleshoot problems by altering the test configuration while the test is running
- Real-time results views allow the user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



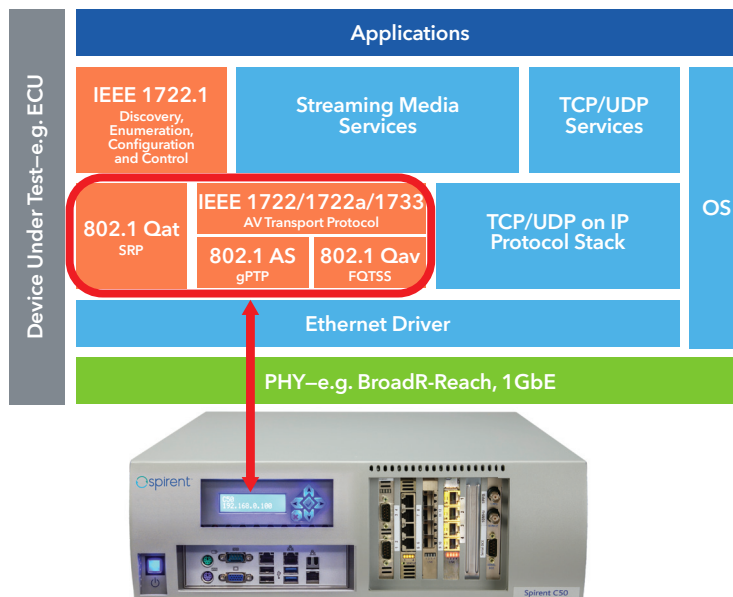
- Wireshark / PCAP
- Check Packet Timing
- Packet Statistics

### The Spirent Advantage

- Easy to use TSN wizards and result views
- 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, Functionality and Performance Testing in one platform
- Solutions in portable, desktop and rack-mount form factor
- Expandable and scalable test setup



Performance & Functional Testing – Spirent TestCenter Application



Conformance Testing – TTworbench TSN/AVB Conformance Test Suites

## Ordering Information

### Spirent TestCenter Application - Bundled Packages

Part Number	Description
AUTO-SWB-201	Automotive IEEE 802.1BA AVB Protocol Includes A, B, C & D licenses below
AUTO-SWB-202	Professional AV IEEE 802.1BA AVB Protocol Includes A, B, C, D & E licenses below
AUTO-SWB-203	TSN Pack 1 - All AVB and TSN standards included except for IEEE 802.1Qbu & IEEE 802.3br Includes A, B, C, D, E, F & G licenses below
AUTO-SWB-204	TSN Pack 2 - Pre-emption Bundle: IEEE 802.1Qbu & IEEE 802.3br Includes H & I licenses below
AUTO-SWB-205	TSN Super Pack (includes Pack 1 and Pack 2) Includes A, B, C, D, E, F, G, H & I licenses below

### Individual Packages and License References

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

### Spirent TWorkbench Application (Conformance)

<b>TEC-SPT-AVBA-1</b>	Automotive AVB Conformance Test Suite Pack 1
<b>TEC-SUITE-TSN-PRE</b>	TTsuite-TSN-Preemption <i>Conformance test package for TSN Pre-emption (IEEE802.1Qbu &amp; 802.3br)</i>
<b>TEC-SUITE-TSN-TAS</b>	TTsuite-TSN-Time Aware Shaper <i>Conformance test package for TSN Time Aware Shaper (IEEE802.1Qbv)</i>
<b>TEC-SUITE-TSN-FP</b>	TTsuite-TSN-Filtering & Policing <i>Conformance test package for TSN Filtering &amp; Policing (IEEE802.1Qci)</i>
<b>TEC-SUITE-TSN-RED</b>	TTsuite-TSN-Redundancy <i>Conformance test package for TSN Redundancy (IEEE802.1CB)</i>
<b>TEC-SUITE-TSN-TSP</b>	TSN Conformance Test Suite Pack <i>TSN conformance test suite pack includes Pre-emption (PRE), Time Aware Shaper (TAS), Filtering &amp; 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](http://www.spirent.com/ContactSpirent).

[www.spirent.com](http://www.spirent.com)

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