

High-Performance TSN Networks

Basic Test Cases

- gPTP Synchronisation
- AVB
- SOME/IP

gPTP Synchronisation

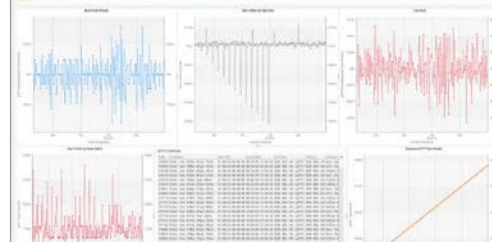
Any TSN-based communication builds on IEEE 802.1AS/gPTP synchronisation. Understanding and validating the gPTP-related communication integrity is therefore essential.

The combination of TSN Box and TSN Tools provides a very powerful feature set to generate, visualize and analyse gPTP synchronisation on device, link and system levels. With 1PPS I/O and gPTP failure insertion it far exceeds the means of standard tooling.



Features TSN CoreSolution: TSN Box

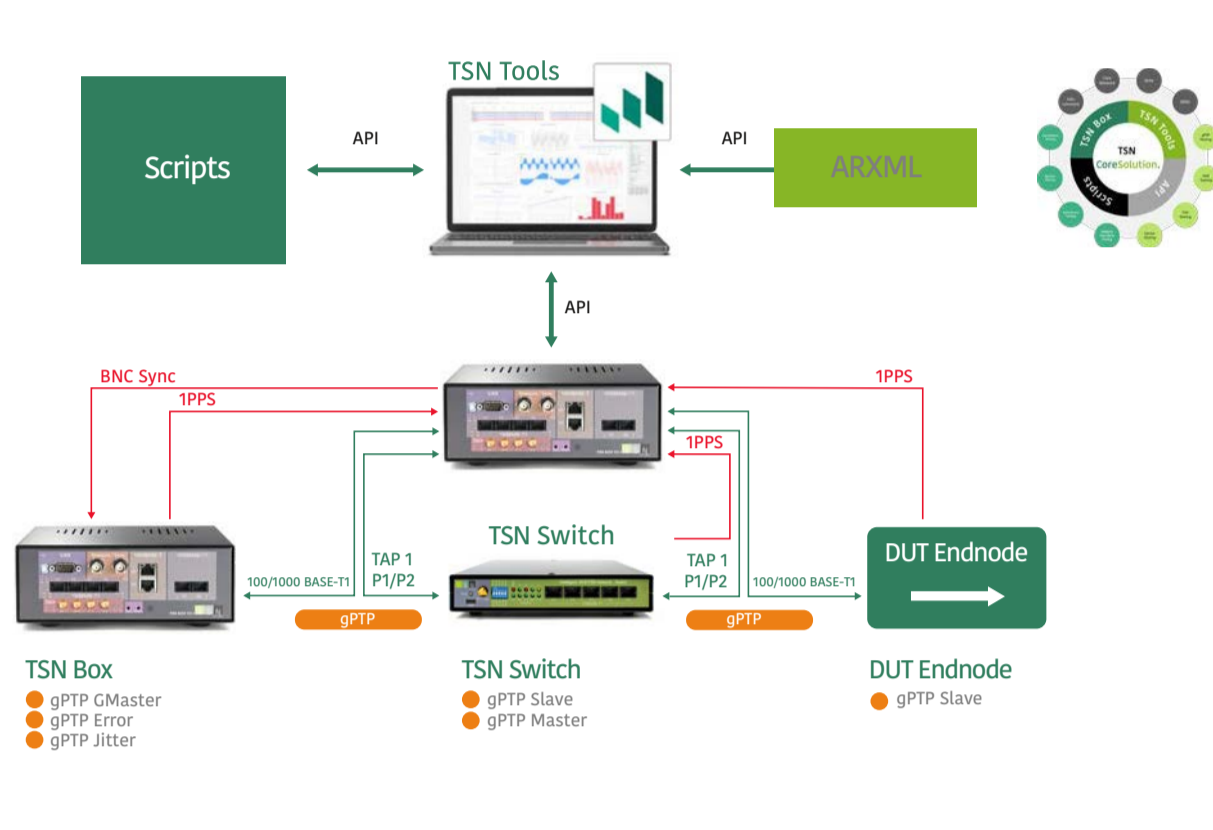
- IEEE 802.1AS gPTP Master/Slave
- DUT Sync feature on TSN Box as TAP
- 1PPS output
- Automotive and Standard gPTP profiles
- PTP parameters all fully configurable
- Signalling supported
- PTP jitter injection for robustness testing



Features TSN CoreSolution: TSN Tools

- Multi-link timing analysis
- Slave clock wander
- Sync packet delay
- Peer delay round-trip
- Profile analysis
- Master/slave detection

Test Case gPTP Synchronisation



AVB

The first step of deploying TSN solutions in an automotive architecture typically involves introducing AVB technology to infotainment applications. However, the challenges of dealing with the complexities of gPTP, credit-based shapers and IEEE1722 or 1733-based transports can be significant for TIER1 and OEMs to manage.

TSN Systems heavily focuses on these typical applications with an approach that is proven not only in the automotive sector but also pro-audio industries.

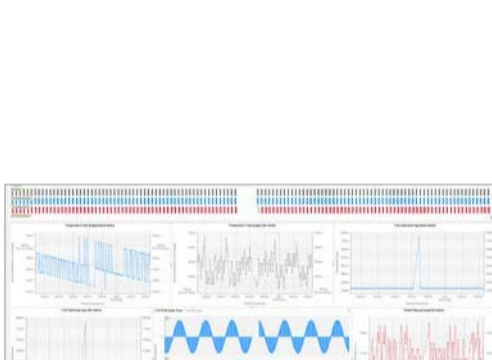
Features TSN CoreSolution: TSN Box

- IEEE 802.1AS gPTP Master/Slave
- IEEE 1722 AVTP/1733 support, CRF
- 1PPS out
- Up to 16 channel analog/digital audio in/out
- Pro-audio grade audio quality
- Flexible and precise media clock sync
- Jitter and failure induction for robustness testing
- Scripting API

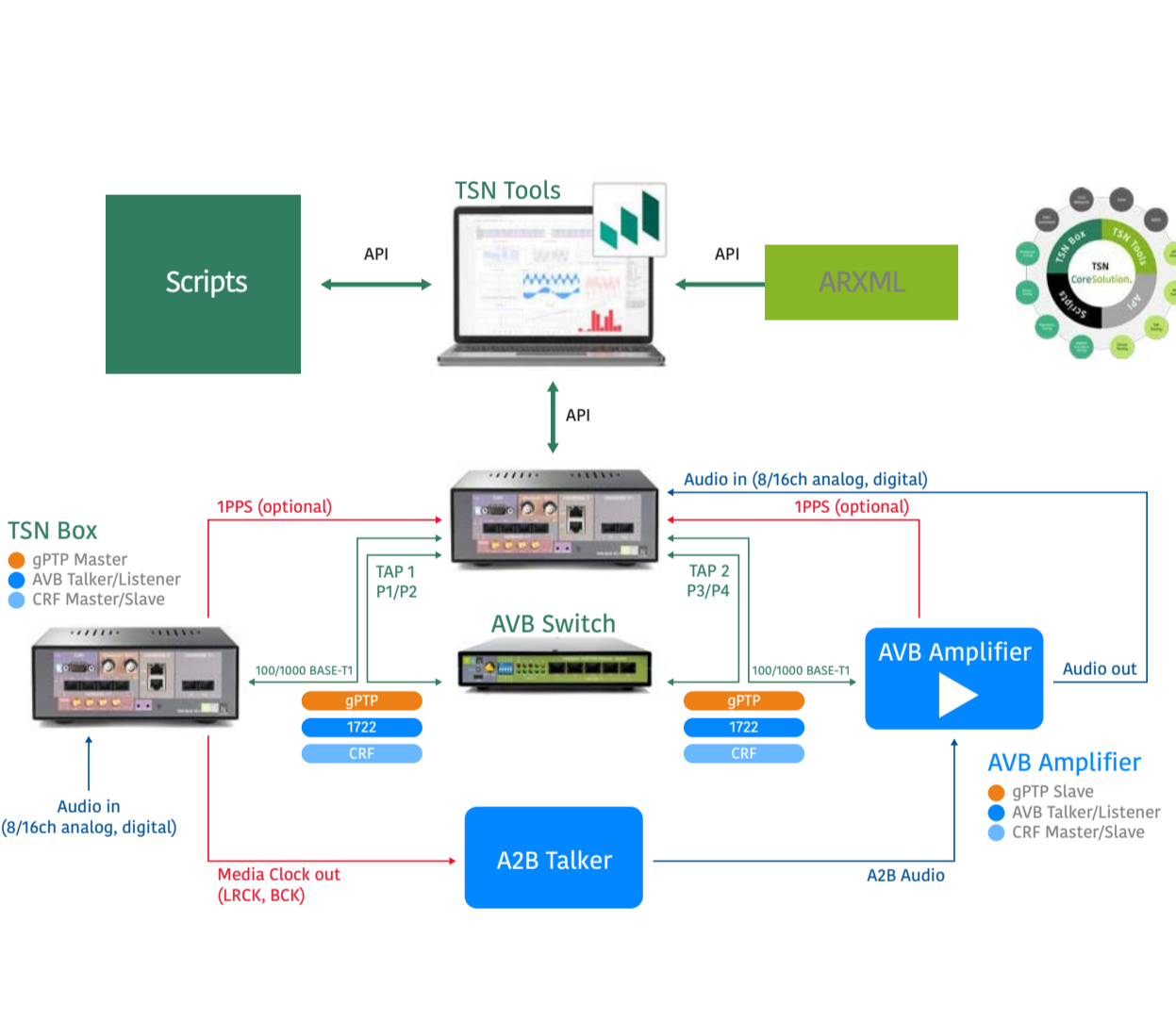


Features TSN CoreSolution: TSN Tools

- IEEE 802.1AS gPTP
- IEEE 802.1Qav shaper analysis
- IEEE 1722 AVTP/1733 support, CRF
- PCM Audio extraction
- Presentation time budget analysis
- Media clock quality metrics
- Scripting API



Test Case AVB



SOME/IP

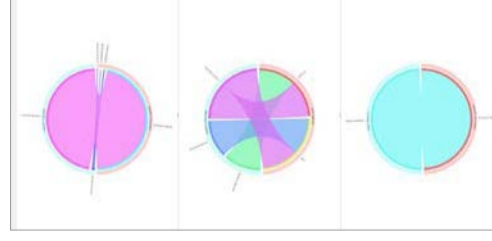
Service-oriented Architecture (SoA), often realized with SOME/IP, is a large building block of automotive E/E. Although not inherently a TSN topic, we provide SOME/IP based solutions for generation, testing and analysis of SOME/IP based solutions for two reasons:

- SoA is integral to TSN projects but can be very complex to generate and test, thereby complicating the TSN test networks.
- With TSN Box & TSN Tools this becomes straightforward and efficient. In addition, the coexistence of TSN and SOME/IP traffic on a single link means our tools are a convenient solution to analyse both.



Features TSN CoreSolution: TSN Box

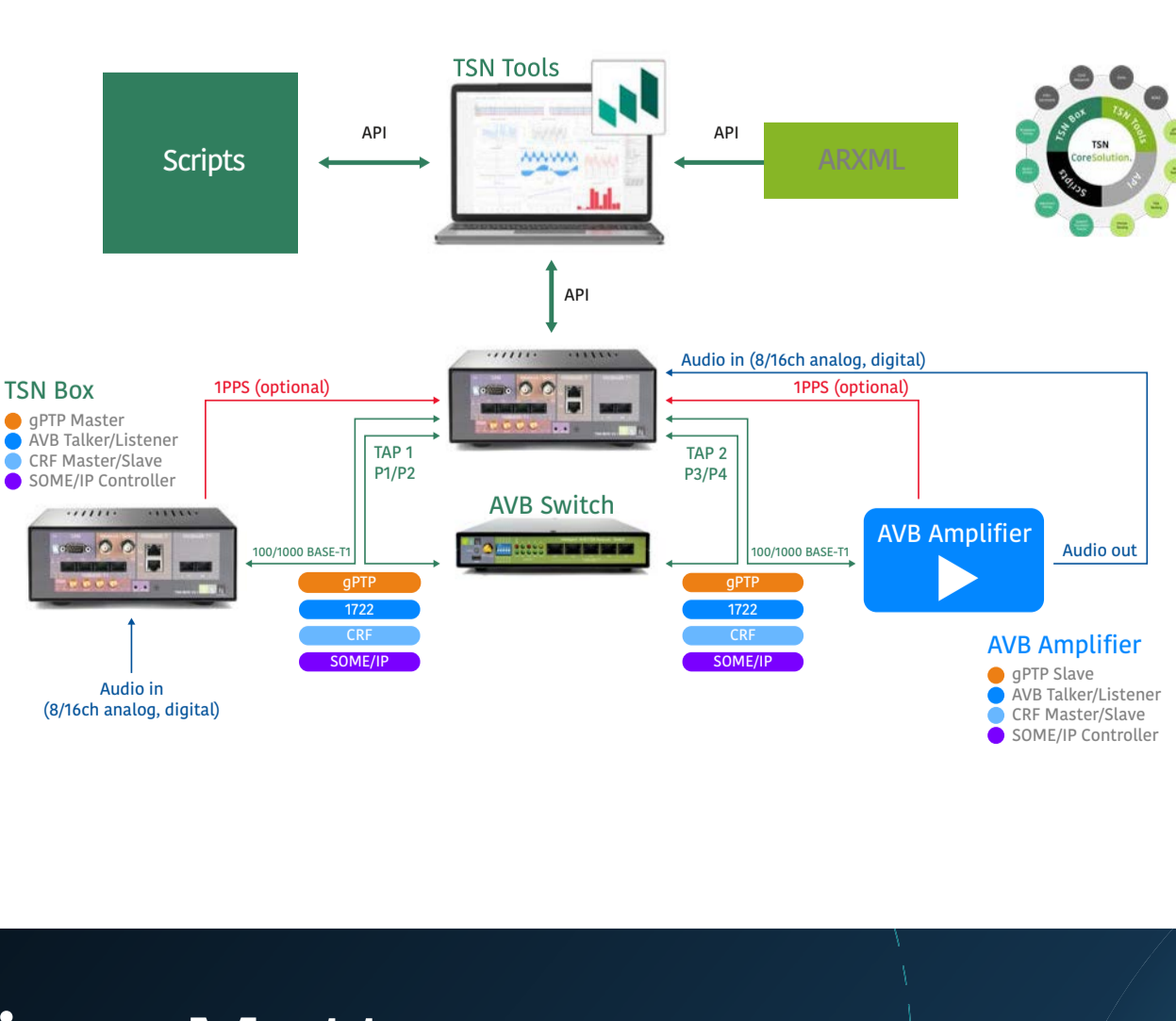
- SOME/IP stack with multiple service definitions
- ARXML workflow
- Controller, Entity with database
- Extensive real-time remote and scripting API for testing and RESTNet simulation
- Coexistence of SOME/IP with gPTP and TSN traffic generation (e.g. amplifier simulation)



Features TSN CoreSolution: TSN Tools

- ARXML workflow
- Service discovery analysis
- Service analysis
- Payload visualisation and analysis
- UDP, TCP/IP support
- Support for fragmented traffic

Test Case SOME/IP



Time Matters.

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