Contact: Caster Communications, Inc. at 401.792.7080

Avnu Alliance Delivers First TSN Conformance Tests for Industrial Devices

Nuremberg, Germany – November 28, 2017 – Avnu Alliance, the industry consortium driving open, standards-based deterministic networking, announces the first set of Avnu TSN conformance test plans for time synchronization of industrial devices are ready and available now for test houses to implement.

Avnu Alliance has built a rich set of conformance and interoperability tests with a defined procedure for certification in various markets. Leveraging that multi-industry experience, Avnu defined a baseline certification in the industrial market that consists of robust and comprehensive test requirements based on the market requirements for industrial automation devices and silicon. These conformance tests ensure that the device or silicon conforms to the relevant IEEE standards, as well as additional requirements that Avnu has selected as necessary for proper system interoperability.

"Time Synchronization, or 802.1AS, is the foundation for all TSN devices, hence it is the first set of conformance tests that are ready and available," said Todd Walter, Avnu Alliance Industrial Segment Chair. As the standards and networks continue to evolve, so does Avnu's work to define and certify the standard foundation. In the future, Avnu will also be able to test and certify other traffic shaping mechanisms, frame preemption, redundancy, ingress policing, strict priority, and security. "Our work with the Industrial Internet Consortium (IIC), OPC Foundation and other industry organizations drives the industry closer toward achieving an interoperable ecosystem," added Walter.

A relationship between Avnu Alliance and OPC Foundation has been established to provide conformance testing and certification of OPC UA over TSN devices. These groups and more are currently working together to create a unified standard and interoperable ecosystem for the industrial market, however the market continues to require multiple upper layer protocols for networked industrial systems. Avnu bridges these various protocols with a common foundation and the accompanying conformance tests for that base communication level, including silicon and infrastructure. Avnu works with other protocol and standards organizations, such as OPC Foundation, who provide conformance testing for application layers to develop a certification that will allow the industry to test for conformance at all layers and certify for interoperability based on those tests.

Avnu is a member of the IIC TSN Testbed, which hosts regular plugfests for members to test their TSN devices for interoperability. "Testbeds and plugfests help test for a certain degree of interoperability and allow us to create real-world systems as an early check for problems but conformance testing ensures alignment with the standards in a more complete way. Leveraging the work done through these relationships and interoperability workshops helps to create a stronger environment for interoperability," added Walter. "The conformance testing and

certification provided through Avnu will be critical to provide the needed foundation for interoperable IIoT networks and give industrial vendors a more streamlined vehicle for participation in the TSN ecosystem."

In October 2017, Avnu Alliance and Industrial Internet Consortium (IIC) held an Interoperability workshop with more than 20 leading industrial companies across silicon, infrastructure, and automation in order to demonstrate interoperability of TSN devices. This weeklong face-to-face workshop focused on vetting the usage of TSN for flexible manufacturing and working on configuration for these systems. The lessons learned from the ongoing IIC TSN Testbed activities and the results from this workshop contributed to the conformance test development and will continue to feed into standards revisions as necessary.

Avnu is committed to speeding up the path to an interoperable foundation. To this end, Avnu members have made open source code available for 802.1AS timing and synchronization in the OpenAvnu repository on GitHub. To encourage and enable multiple industry groups, vendors and protocols to share a TSN network, Avnu has outlined the system architecture and requirements for this industrial model built on an Avnu certified foundation in a document entitled "Theory of Operation for TSN-enabled Industrial Systems," which is available for download. This document introduces the fundamental mechanisms needed for a system architecture to build on, including time synchronization, quality of service using scheduled transmission and network configuration and walks through the requirements of several industrial use cases including how to enable and integrate non-TSN technologies where needed. Avnu Alliance members have created this document to help designers and engineers in the industry understand the real-world application context and build a TSN network that is configured for multiple vendor and industry groups. Avnu's defined foundation will continue to support additional capabilities, including support for multiple IEEE 1588 profiles, guidelines for scaling to very large network architectures, centralized and distributed configuration for the network, and aggregation/composition of multiple networks into a single TSN-enabled network domain.

Video from the Avnu and IIC Interoperability Workshop:
https://www.dropbox.com/s/cpmybo9v91jkn9b/Interoperability%20Workshop%202017.mp4?dl=0

Images from the Avnu and IIC Interoperability Workshop:
https://www.dropbox.com/sh/zz081t9xnuy882w/AACMu3X5cmbelUfSw66x64HWa?dl=0