A Model for Driving Interoperability of Time

WSTS/April 5, 2017

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Chairman, Avnu Alliance
(Also Sr. Principal Engineer, Intel)

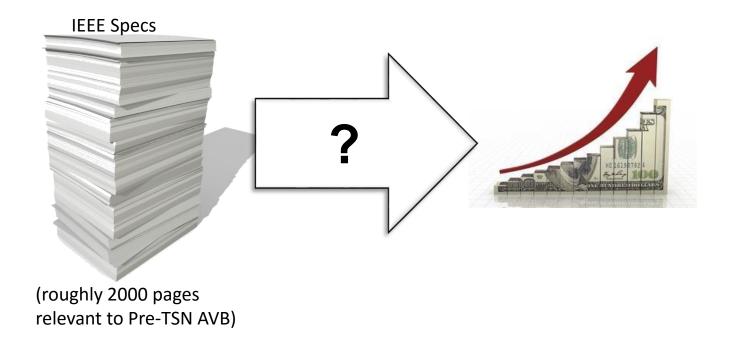**Avnu Alliance** is a **community** creating an **interoperable** ecosystem servicing the **precise timing** and **low latency** requirements of diverse **applications** using **open standards** through **certification and testing.**

From Standard ➜ Technology Adoption

IEEE Specs

?

(roughly 2000 pages
relevant to Pre-TSN AVB)

Approaches to Technology Adoption

- **"Because I was here first"**
- "Because I said so"
  - Government
  - The "800 pound gorilla"
- ➜ "Because we decided" ⬅
  - Formal Alliance
  - Ad Hoc

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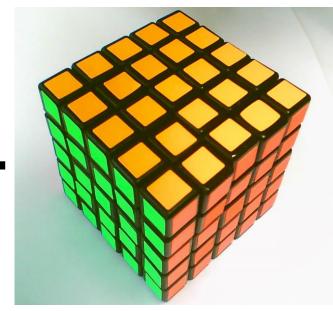 - → "Because we decided" ←
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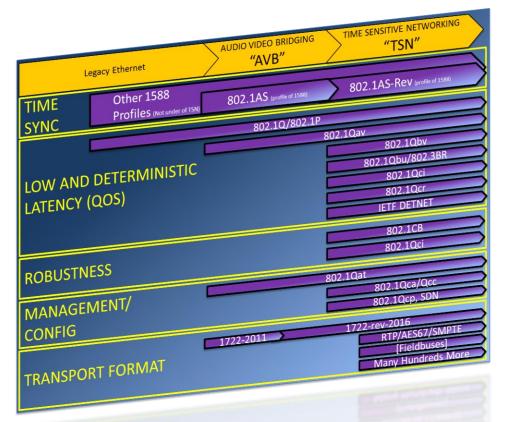# Approaches to Technology Adoption

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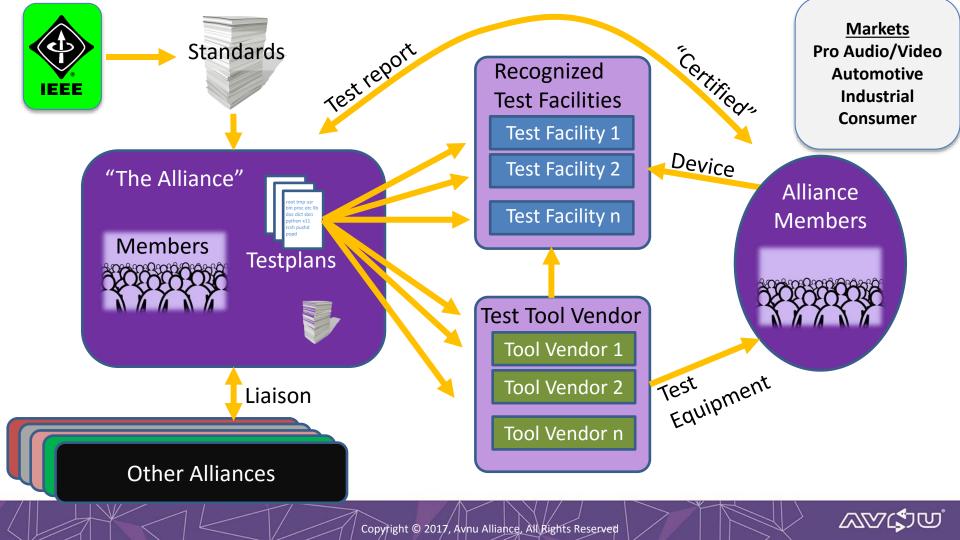 - Ad Hoc

The Challenge: Selecting Standards, Parameters

- Members decide **WHICH** *standards* of TSN should be deployed in **WHICH** *markets,* **WHEN** and **HOW**

Benefits of a Common Test Definition

- Baseline testing provides benefits:
  1. Less expensive than DUPLICATING testing effort at each company
     - Spread cost across multiple companies & industries
     - Consistent interpretation, consistent choices (e.g., 1588 profiles & parameters)
  2. Roadmap of the COMMON functionality
     - Silicon designers
     - Software developers / APIs
     - System/Module/ECU manufacturers
     - OEMs
  3. Consistent testing deployed around the globe
  4. Certification for Conformance & Interoperability

AV&U

IEEE

Standards

"The Alliance"

Members

Testplans

root tmp usr
bin proc etc lib
doc dict sbin
python x11
tcsh pushd
popd

Liaison

Other Alliances

Recognized
Test Facilities

Test Facility 1

Test Facility 2

Test Facility n

Test Tool Vendor

Tool Vendor 1

Tool Vendor 2

Tool Vendor n

Test report

"Certified"

Device

Test
Equipment

Markets
Pro Audio/Video
Automotive
Industrial
Consumer

Alliance
Members

AVNU

Structure and Flow

Provides a forum for companies
to come together

Legal Umbrella Non-Profit CORPORATION

| **IP Rights & Bylaws** (Time-tried legal framework) | **Interoperability** Testing Logistics and Framework | **Certification** Test Plan and 3rd Party **Test Houses** |

Define market-specific profiles
and related Conformance & Interoperability Cert. Testing

Working Groups

| Market Requirements | Technology: APIs and Specs | Testing and Interoperability |

MRD
Market Requirements Document

Theory of Ops

Interop Spec

Testplans

Software Development Resources for TSN

Open Source (BSD-style*)

AVnu / **OpenAvnu**

<> Code   ① Issues **98**   ⌥ Pull requests **2**

OpenAvnu - an Avnu sponsored repository for Ti...

SW APIs, Best Practices

AVnu Alliance™ Best Practices
AVB Software Interfaces
and Endpoint Architecture Guidelines

Revision 1.3
12/4/2015 12:05 PM

Eric Mann, Levi Pearson, Andrew Elder,
Christopher Hall, Craig Gunther, Jeff Koftinoff,
Ashley Butterworth, Daron Underwood,
Ganesh Venkatesan, Brant Thomsen

http://avnu.org/whitepapers/

*Other licenses might apply to individual
components (e.g. GPL for Linux kernel modules)

3rd Annual Avnu-Sponsored TSN Conference
http://www.tsnaconference.com/

Summary

- Multiple approaches for adoption of standards
  - Each may be appropriate somewhere

- For the suite of Ethernet TSN standards, Avnu's Members define and drive adoption in their markets
  - Industrial
  - Automotive
  - Professional AV

- Avnu members would love to have you to join us!

Questions?

Backup

The Importance of The Liaison

Title: Liaison response to Avnu
From: IEEE 802.1
For: Information
Contacts: Glenn Parsons, Chair, IEEE 802.1, glenn.parsons@ericsson.com
To: Avnu Alliance
            Kevin Stanton, Chair, Avnu Alliance, kevin.b.stanton@intel.com
Date: March 16, 2017

Dear Mr. Stanton, dear colleagues,

We thank Avnu Alliance for the continuation of our dialogue and Jordon Woods for the presentation of your recent liaison (http://www.ieee802.org/1/files/public/docs2017/liaison-AVnuResponseLetter-0313-v00.pdf, http://www.ieee802.org/1/files/public/docs2017/liaison-AVnuResponseCutthrgh-0313-v00.pdf).

We would like to inform you that the IEEE 802.1 TSN TG is investigating how to address cut-through. At this stage, the work is done via individual contributions. Further contributions are expected and welcome.

We are going to update you on the developments of our efforts on cut-through. We look forward to continued cooperation with Avnu Alliance.

Respectfully submitted,

Glenn Parsons
Chair, IEEE 802.1 WG

CC: John Messenger, Vice-chair, IEEE 802.1 WG;
        János Farkas, Chair, IEEE 802.1 TSN TG

www.ieee802.org/1/files/public/docs2017/liaison-response-avnu-0317-v01.pdf

Industry-Driven

Member A Member B

Market-Specific Profiles

PLUGFESTS

Pro Audio/Video Automotive Industrial Consumer

CUSTOMER

CERTIFIED
CERTIFIED