AES NY 2018

WHERE AUDIO PROFESSIONALS AND TECHNOLOGY CONNECT

145th Audio Engineering Society International Convention

Audio-over-IP Technology Pavilion

Introduction

- Professional media networking is becoming increasingly important throughout this industry

- The advantages that IP technology can provide are now clearly recognized

- Audio networking has become firmly established in a wide range of Pro Audio applications

- Integrated audio plus video networking via IP has recently become an extremely important topic for the broadcast industry, particularly with the arrival of the SMPTE ST 2110 suite of standards just over one year ago

Audio-over-IP Technology Pavilion

Introduction

- In recognition of these trends, the AES has partnered with AIMS (the Alliance for IP Media Solutions) to create this Audio-over-IP Technology Pavilion here at the AES Convention

- The AoIP pavilion provides an excellent platform to promote IP media networking and to provide the latest information from many of the leading experts working in this field

- There are three core elements in the AoIP Technology Pavilion

Audio-over-IP Technology Pavilion

Three Core Elements

- AIMS Demo System

- Exhibitor Pods

- Technology Pavilion Theater

AIMS Demo System

MNA – Media Networking Alliance

- Established in 2014
- Mission was to promote the AES67 standard
- Also to educate the Pro Audio industry about AES67

AIMS – Alliance for IP Media Solutions

- Established in late 2015

- Focus on promoting the adoption, standardization, development and refinement of open protocols for media over IP

- Initial emphasis at that time on VSF TR-03 and TR-04, SMPTE 2022-6 and AES67

AIMS Mission

To foster the **adoption** *of one set of common, ubiquitous,*

standards-based *protocols for* **interoperability over IP**

in the media and entertainment industry

Collaboration

- During 2017, the MNA and AIMS collaborated in sponsoring the very successful IP Showcase events at the NAB and IBC shows

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- Through this collaboration, it became clear that the two organizations had very much in common and could more effectively promote open standards for IP interoperability by joining forces

Merger

- This lead to the merger of the MNA into AIMS at the beginning of 2018

Audio-over-IP Technology Pavilion

AIMS – 100 members

- Following the merger with the MNA, AIMS has continued to grow and now has 100 members

- Manufacturers from the Broadcast, Pro Audio and ProAV industries

- End users of media networking technology including many major broadcasters

AIMS Members List

100 Members

21ST CENTURY FOX · β3 · ADVANTECH Enabling an Intelligent Planet · AJA · ALC NetworX · alteros An Audio-Technica Company · ARCHWAVE audio networking & streaming technologies · ARISTA · Artel · Atos

ATTERO TECH · AVID · AXIS COMMUNICATIONS · AXON THE HEART OF BROADCAST · BBC · BFE · BOSCH · BRIDGE TECHNOLOGIES · broadcast SOLUTIONS · CALREC

Canon · CBC · CBS · CDV 新奥特 · CISCO · Clear-Com · COBALT · CHYRONHEGO · DAYANG · DELL EMC

DELTACAST VIDEO SOLUTIONS FOR DEVELOPERS · digigram · DirectOut TECHNOLOGIES · Diversified. IMAGINATION ENGINEERED · embrionix · MediaKind everyone. everywhere. · euro media group BROADCAST FACILITIES & SERVICES · evertz · EVS · FS FLORICAL SYSTEMS

FITCAN · Focusrite · FVA FUYOH VIDEO · grass valley A BELDEN BRAND · GeFei · GENELEC · GRUPO GLOBO · HARMAN A SAMSUNG COMPANY · harmonic · Ikegami

Imagine COMMUNICATIONS · intoPIX · JUNIPER NETWORKS | Engineering Simplicity · LAWO · Leader · LINKER 联汇 ONE LINKER ONE WORLD · Luminex NETWORK INTELLIGENCE · LYNX Technik AG · MACNICA · Matrox

:mediaproxy · MEINBERG · Mellanox TECHNOLOGIES · MERGING AUDIO FOR THE NETWORKING AGE · NBCUniversal · Orchestrating a brighter world NEC · netinsight · nevion · NTC National TeleConsultants · Panasonic

pebble beach systems · PESA · PHABRIX · ProSiebenSat.1 Produktion · QSC · QVEST MEDIA THE LEADING SYSTEMS ARCHITECT · RIEDEL · ROHDE&SCHWARZ · ROSS LIVING LIVE! · skyline communications

sobey · Solid State Logic OXFORD · ENGLAND · sonovts · SONY · Soundking 音王集团 · STAGETEC · STUDIO TECHNOLOGIES INC. · sveriges Radio · TAG VIDEO SYSTEMS LTD · Tektronix

THE TELOS ALLIANCE Create. Communicate. Connect. · TOSHIBA · tpc · TVU networks · US Utah Scientific · vizrt · WBS WARD-BECK SYSTEMS · Wheatstone BROADCAST AUDIO PERFECTIONISTS · World Wide Technology · YAMAHA · commediaaudio

Audio-over-IP Technology Pavilion

AIMS Demo System

- This area represents collaboration between 20 members of AIMS (with 40 different devices) to demonstrate audio-over-IP networking interoperability, primarily using the AES67 standard

- Most of these devices provide networking based on one of several established networking systems (Dante, Livewire+, RAVENNA, WheatNet-IP)

- AES67 provides interoperability between these otherwise incompatible audio networks

- The SMPTE ST 2110 standard uses AES67 as the basis for the audio aspect of that standard – ST 2110-30

- The vast majority of the devices in this demo are also compatible with the SMPTE ST 2110 standard

AIMS Demo System

- In addition to networking together the devices in the AIMS demo racks, a number of other devices are also being integrated into this demo through connection with the exhibitor pods on the other side of the pavilion

- RAVENNA Partners, Telos Alliance and Riedel pods are all being connected to the AIMS demo racks to further demonstrate the capabilities of audio-over-IP networking

Exhibitor Pods

- Six exhibitor pods featuring a range of companies and organizations with a particular focus on professional media networking
  - Audinate
  - OCA Alliance
  - RAVENNA Partners
  - Riedel Communications
  - Studio Technologies
  - Telos Alliance

Audinate

- Demonstrate and explain Dante Domain Manager

- Demo Dante Controller and how it interfaces with AES67 and SMPTE ST 2110, and how well Dante works with both of those standards

- Answer any Dante questions people might have regarding Dante and AoIP

OCA Alliance

- The OCA Alliance will discuss and educate attendees on the AES70 Open Control Architecture Standard.

- In addition to overviews and presentations on the standard and the free resources that are available to developers who wish to implement the standard, demonstrations of AES70 in action will be provided.

- Demonstrations will include products from Focusrite, DeusO, and others that are on the market today as well as examples of applications that can be built using the standard and associated technical resources.

- Throughout the show, technical experts will be on hand to answer any questions related to AES70 and the activities of the OCA Alliance.

RAVENNA Partners

- Pod features a demo rack with gear from various RAVENNA partners

- Audio extracted from video flows as well as the new ST 2110-31 AES3 bit-transparent stream format can be seen live in action

- RAVENNA demo rack is connected and integrated into the AIMS interoperability demonstration allowing audio signals to be seamlessly exchanged between the two areas

Riedel Communications

- Riedel is showing their Artist digital matrix intercom and award-winning Bolero wireless intercom systems in the their pod

- Artist - 1024x1024 non-blocking matrix
  - Unique decentralized ring architecture
  - Rapid configuration merging
  - Fast configuration loads (2-3 secs)
  - Only SMPTE 2110-30 IP Comms solution on market
  - SmartPanels Apps concept
  - Many connectivity options (AES3, MADI, 4W, 2-way radio, VoIP, AVB, Dante, AES67)

- Bolero: 6 Channel wireless comms
  - Integrated with Artist or as Standalone
  - AES67 Networked antennas when integrated
  - Advanced DECT receiver
  - 10 Beltpacks per antenna
  - NFC registration
  - Walkie-talkie mode
  - Integrated Bluetooth

Studio Technologies

- Studio Technologies, Inc. will be presenting the new Dante-compliant Model 5412 Analog Interface and Model 5418 Mic/Line Interface

- Presented for the first time at AES NY 2018, these products offer additional capabilities to Studio Technologies' extensive line of Dante products

- Also part of the AoIP Pavilion are the ST 2110-compliant Model 5512 and Model 5518, highlighting the interoperability of contemporary IP-based products

Telos Alliance

- Featuring the Telos Infinity IP Intercom in their pod

- Telos Infinity replaces outmoded matrix technology with an advanced, distributed fully AES67 compliant network solution that provides superior functionality in a simplified, more elegant form
  - 1ru 16 Key IP Master Panel
  - 1ru 20 Key IP Expansion Panel
  - Dual Channel Wired IP Beltpack
  - Analog xNode AES67 Compact IP Interface
  - xSwitch Compact Managed Ethernet Switch

- Along with the RAVENNA partners and Riedel pods, the Telos demo rack is also connected and integrated into the AIMS interoperability demonstration

Audio-over-IP Technology Pavilion

AoIP Technology Pavilion Theater

- The other key aspect of the AoIP Technology Pavilion is this theater

- Throughout the three days of the AES Convention Exhibition, AIMS will be curating a continuous program of theater presentations covering a wide range of topics relevant to IP media networking

- Presentations will be made by members of AIMS as well as by representatives from the pavilion pods

- These include many of the leading experts behind the development and practical implementations of audio-over-IP standards and related technologies

- All these sessions are freely available to all visitors attending the AES NY and also the NAB NY Conventions

Theater Presentations

Wednesday

- **11:00 Optimizing Networks for Media - Patrick Killianey (AIMS)**
  - Examining the network technologies used to optimize a network for modern media transport

- **11:30 The Audio Parts of SMPTE ST 2110 - Andreas Hildebrand (AIMS)**
  - Explaining the fundamentals and possible variations of audio transport within ST 2110 and its compatibility with AES67

- **12:00 AoIP: anatomy of a full-stack implementation - Ievgen Kostiukevch (EBU)**
  - The presentation will explain that there is much more to consider when building an AoIP infrastructure than just the AES67 standard

- **12:30 RAVENNA and ST 2110 - Andreas Hildebrand (ALC Networx)**
  - This session will explain the fundamentals of RAVENNA and how it relates to AES67 and ST 2110

Theater Presentations

Wednesday

- **1:00 Telos Infinity: Next Generation Intercom - Martin Dyster (Telos Alliance)**
  - Introducing the Telos Infinity IP Intercom, a complete reimagining of broadcast communications technology

- **1:30 AES70 at a Glance - Ethan Wetzell (OCA Alliance)**
  - Discussion of the AES70 open control standard, how it fits within the media networking landscape, and will serve as an introduction to its structure and capabilities for device control

- **2:00 Audio over IP: Requirements for real-world usability - Brad Price (Audinate)**
  - Exploring how coherent solutions enhance the experience of audio networking, and how features beyond transport are crucial to the widespread adoption of the technology

- **2:30 Sample-Accurate Synchronization of ST 2110 Audio Streams - Andreas Hildebrand**
  - Detailed explanation of the synchronization fundamentals of ST 2110 and how these can be applied to achieve sample-accurate synchronization among audio streams

Theater Presentations

Wednesday

- **3:00 Monitoring audio streams in IP network-based workflow** - **Aki Mäkivirta (Genelec)**
  - IP-connectable monitoring loudspeakers are being used across the broadcast industry to directly monitor IP audio streams, and installed audio applications can also benefit from this technology

- **3:30 ANEMAN: Keeping Audio Networks under Control** - **Dominique Brulhart (Merging)**
  - With the increasing adoption of AES67, audio networks are rapidly becoming more open. The new challenge is to keep these networks under control and offer tools to easily manage them.

- **4:00 NMOS: The key to wide adoption of IP infrastructures** - **Rick Seegull (Riedel)**
  - This session will explain the differences between NMOS specifications IS-04, IS-05 and IS-06. It will also provide a behind the scenes look into IS-04 and IS-05.

- **4:30 AoIP and AES67 – why should you care?** - **Ievgen Kostiukevch (EBU)**
  - Presentation will explain the difference between audio over IP solutions and legacy audio networking solutions, and why you should consider going IP

Theater Presentations

Wednesday

- **5:00 AoIP, AES67 and SMPTE 2110-30, Implementation in the Real World - Ken Tankel (Telos Alliance)**
  - What are the practical requirements of putting an AoIP network in place that can allow equipment from different manufacturers to share audio over IP streams?

- **5:30 Routing AES67 Audio - Anthony Kuzub (AIMS/AES Toronto)**
  - Using a common language leveraging the work done in the already accepted RFC standards, a hugely complex audio system can be augmented with metadata

Theater Presentations

Thursday

- **11:00 AES67-2018 PICS: a basis for interoperability assessment - Gints Linis (AIMS)**
  - Information on what PICS is about as well as a brief history and the current status of the AES67 conformance criteria work, and how it can help equipment manufacturers and system integrators

- **11:30 RAV2SAP: a value-added AES67 micro service - Anthony Kuzub (Ward Beck/AES)**
  - AES67 Devices are not required to implement discovery services. Ravenna to SAP is an application that manages, monitors and creates announcements to networked devices

- **12:00 From analog, to digital, to audio-over-IP, a manufacturer's perspective - Gordon Kapes (Studio Technologies)**
  - Migration to Audio-over-IP from the perspective of an equipment designer and manufacturer

- **12:30 AES67 and SMPTE ST 2110 – How are they the same, how are they different? - Rick Seegull (Riedel)**
  - This session will provide a comparison between the broad specification of AES67 and SMPTE ST 2110-30 requirements

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- **5:30 What's new in AES70-2018 - Jeff Berryman (OCA Alliance)**
    - A revision of the AES70 media network control standard is currently in its public review phase, and will become official soon. It is a compatible upgrade to AES70-2015, the current standard. This talk will summarize the features of the new version.

Theater Presentations

Friday

- **10:30 AES67-101: the basics of AES67** - **Anthony Kuzub (AIMS/AES Toronto)**
  - An exploration of the AES67 standards document including an overview of synchronization, transport, audio encoding, packet timing, buffering mechanisms, and session description

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Theater Presentations

Friday

- **12:00 The Two Control Layers Of Large Media Systems** - **Jeff Berryman (OCA Alliance)**
  - For larger IP projects, it is important to provide a full range of features, extending from overall asset and workflow management down to detailed control of device parameters. A two-layer design concept can help cover this range - how do current standards fit into the picture?

- **12:30 AoIP, AES67 and SMPTE 2110-30, Implementation in the Real World** - **Ken Tankel (Telos Alliance)**
  - What are the practical requirements of putting an AoIP network in place that can allow equipment from different manufacturers to share audio over IP streams?

- **1:00 AES67 PICS, Certification, Self-certification and Plugfests** - **Kevin Gross (AIMS)**
  - The head of the AES67 standards group will discuss the PICS (Protocol Implementation Conformance Statement) annex to the standard and other activities aimed at ensuring interoperability between devices from different manufacturers

Theater Presentations

Friday

- **1:30 How AES67 & RAVENNA enables innovation** - **Bill Rounopoulos (Ross Video)**
  - How AES67 and open networking solutions such as RAVENNA allow multiple vendors to innovate and solve problems in particular markets & applications, without depending on a single supplier
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