

IP SHOWCASE

REAL-TIME MEDIA

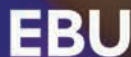
IP: HERE AND NOW

- > Education Sessions
- > Live Demonstrations
- > Real-World Use Cases

Learn how to put
the business and
creative benefits of
IP to work for you

Central Hall C12634

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IP SHOWCASE

REAL-TIME MEDIA

IP Showcase at 2018 NAB Show to Feature IP's Readiness for Prime Time

More than 50 manufacturers to demonstrate the benefits and practicality of moving to IP workflows

The first documents in the SMPTE ST 2110 suite of standards have been approved and published, and the industry is forging ahead with its move to real-time IP signal flows. Reflecting this step change, the IP Showcase at 2018 NAB Show will be dedicated to educating NAB Show visitors about the considerable potential of internet protocol (IP) as a foundation for a more flexible, efficient, and creative broadcasting industry.

Located in the Las Vegas Convention Center's Central Hall in booth C12634, the IP Showcase is positioned to be the largest and most advanced demonstration of real-time professional media over IP interoperability yet. More than 50 manufacturers and eight of the industry's premier standards bodies and trade organizations have come together to demonstrate the benefits and practicality of transitioning to IP workflows using the SMPTE ST 2110 suite of standards, AES67 and AMWA NMOS specifications.

Visitors to the IP Showcase have the opportunity to interact with equipment and see how realtime IP offers many

valuable operational benefits, which include the following:

- format flexibility and efficient cabling
- resiliency and data-loss protection
- plug-and-play connection management
- a broad choice of interoperable audio equipment

The showcase also offers guidance in making a seamless transition from SDI to hybrid IP/SDI systems and on to all-IP; designing deterministic systems; and using new tools for automatic alignment of signals. The IP Showcase also features information on a host of IP reference deployments so that visitors can measure their expectations against real-world IP installations. A live all-IP studio within the IP Showcase provides visitors with a firsthand look at live program production and output using SMPTE ST 2110.

Rounding out the IP experience, the integrated IP Showcase Theater, curated by IABM, provides educational opportunities through continuous presentations covering the full gamut of knowledge about real-time IP production and intra-facility distribution.

To download all presentations following NAB Show please visit www.theiabm.org/iptheater

MONDAY – APRIL 9

IP Showcase Informative Track

10:30am – 12:30pm

This session explains the specifics of IP and Hybrid SDI and IP. SMPTE ST 2110 is explained along with case examples and a special panel session.

What IP Showcase is All About

10:30 – 10:40am

Stan Moote – *Chief Technology Officer, IABM*

A brief introduction about the IP Showcase.

A Basic Guide for Real-Time IP Video

10:40 – 11:00am

Andrew Jones – *Head of Training, IABM*

The IP video ecosystem is filled with vocabularies we must know to migrate into the all-IP studio. Andrew provides an overview of the IP terms such as SMPTE ST 2110, IEEE 1588 and NMOS IS-04/05 to get you up to speed and how they all work together in the IP and IP/SDI hybrid environment.

IP and SDI Work Seamlessly Together

11:00 – 11:20am

Karl Paulsen – *CTO, Diversified*

One of the strong benefits of IP is that it works with SDI. Hybrid systems allow you to use existing workflows while migrating over to IP. Karl explains the ins and outs of IP/SDI Hybrid systems that are in use today with a clear focus on migrating to 100% SMPTE ST 2110 in the future.

IP Use Case Benefits

11:20 – 11:40am

Luann Linnebur – *Head of Business Development, Nevion*

Simply replacing SDI with IP is pointless unless tangible benefits can be obtained. Luann reviews the benefits installations have discovered by going IP.

IP Showcase Panel – What is the Big Deal about Real-Time IP?

11:40am – 12:30pm

Stan Moote – *IABM*

Mike Cronk – *AIMS*

Luann Linnebur – *Nevion*

Mike Bany – *FOX*

IABM's CTO, Stan Moote will grill Mike Cronk, representing AIMS, Luann Linnebur from Nevion, and Mike Bany from FOX about installations, technical hang ups and real-world interactions, and will uncover whether going IP within a studio is worth the effort.

Benefits, Use Cases and Understanding IP Track

1:00 – 4:00pm

IP isn't about replacing SDI, it is about growth, scalability, business and new workflows. These presentations will help you on your way towards understanding why and how to go IP.

Creating the Broadcast Operations Center of the Future

1:00 – 1:20pm

Paul Suters – *GM, Engineering and Service Management, Telstra Broadcast Services*

Located in Sydney, Australia, the Telstra Broadcast Operations Centre (BOC) went live in June 2016. As a pioneering broadcast data center, it continues to evolve on the journey towards a fully IP facility. This state-of-the-art facility manages over 400 satellite, media and data services for Australian and international customers, including leading global media companies. Three million permanent channel hours and 20,000 ad hoc event bookings pass through the BOC every year. This presentation covers the journey so far, lessons learned, and the next steps on our transition to a fully IP facility.

SMPTE ST 2059 – How to Synchronize the All-IP Studio Using the Precision Time Protocol

1:20 – 1:40pm

Nikolaus Kerö – *General Manager, Oregano Systems*

This presentation will give a quick introduction on the principles of PTP followed by highlighting different deployment strategies for use cases in the broadcasting industry, demonstrating effective yet simple ways for improved reliability as well as quality monitoring.

Evaluating Features of IP End Points

1:40 – 2:00pm

Patrick Daly – *Director of Technology, Diversified*

That shiny new box supports SMPTE ST 2110. Great but what else matters when selecting an IP endpoint? The SMPTE ST 2110 standard provides a robust technical framework upon which vendors build their application solutions. Vendor implementations can and do vary. In this presentation, we discuss an approach to evaluating IP endpoints that considers the functional requirements of the end-user's system and the particulars of the use-case.

True Native-IP Virtualization of Real-World Live Remote Production Explained

2:00 – 2:20pm

Joop Janssen – *CEO, Aperi*

In this session Joop will use examples of real-world native-IP deployments to show the technology's suitability for live production environments. At the same time, the presentation will address the still-present misunderstandings around live IP advanced workflows and how content producers can really benefit from virtualized media functions.

How to Select the Right Server Package for Virtualized Production

2:20 – 2:40pm

Thomas Burns – *CTO, Media & Entertainment, Dell|EMC*

Software and system developers have learned to minimize latency and jitter when writing to physical NICs, but what are the parameters for virtual NICs in virtual machines? This presentation will explore select variables in hardware and software packages for virtual production.

IP Networking for Real-Time Video

2:40 – 3:00pm

Robert Welch – *Technical Solutions Lead, Arista Networks*

SMPTE ST 2110 is all about professional media over managed IP networks. Robert reveals the considerations and design architectures for building, maintaining and operating the all-IP real-time workflow.

Report on Real World Uncompressed IP Media Infrastructures. Lessons Learned Through Multiple Open Standards-Based Installations

3:00 – 3:20pm

Robert Erickson – *Advanced Technology Manager, Grass Valley*

So how does all this work in the real world? IP based infrastructures have brought us new types of equipment, new standards, and new capabilities that have been revolutionary to the broadcast TV industry. Robert will be sharing vendor agnostic experiences and lessons learned from years of applying these.

Planning a SMPTE ST 2110 Infrastructure for tpc Sports, News and Technology Center in Zurich

3:20 – 3:40pm

Ulrich Voigt – *Head of Design, Qvest Media GmbH*

Andreas Lattmann – *CTO of tpc Switzerland AG*

tpc Switzerland AG is building a new sports, news and technology center in Zurich. The center will be built fully on an SMPTE ST 2110 infrastructure and as such is one of the largest SMPTE ST 2110 projects in Europe. The start of this project had been announced during NAB Show 2017. Now, 12 months later, tpc and Qvest Media will jointly describe the journey taken during that time, where PoCs and tests have been conducted, specification and planning work has been performed and RFIs have been issued and evaluated.

Into the Green Zone – The Agile Media Blueprint

3:40 – 4:00pm

Richard Cartwright – *CTO, Streampunk Media Ltd*

For the transition from broadcasting to personalized content, is it time to break down the walls of traditional media facilities? The Agile Media Blueprint (AMB) is a plan for end-to-end media production using Internet technologies. Complementary to SMPTE ST 2110, NMOS and MXF, what is the AMB, when will it be realized and how?

Understanding Connection Management

4:00pm – 6:00pm

Connecting Devices into an IP Infrastructure Requires a Different Approach from SDI to Achieve the Benefits of IP. This session explains AMWA's NMOS and more importantly arms you with the tools you need to learn about for orchestration and connections.

Getting Started with NMOS IS-04 and IS-05

4:00 – 4:20pm

Robert Porter – *Project Manager, Sony Europe Limited*

The AMWA NMOS specifications, IS-04 and IS-05, provide methods for the discovery, registration and connection management of devices on professional media networks. This talk will explain how to get started with NMOS development and describes the open source software that is available to assist implementers, including Sony's own nmos-cpp contribution. Robert will go on to discuss how this software is being used to conduct a scalability study to address some of the key user requirements for the NMOS specifications, namely that they can be used reliably for very large networks comprising thousands of devices such as might be found in a typical broadcast installation.

Standardized Connection Management for Essences and Network Flows in SMPTE ST 2110 and AES67

4:20 – 4:40pm

Arne Bonninghoff – *Head of IP Research, Riedel Communications*

This session will demystify NMOS IS-04, IS-05 and IS-06. It will explain what they offer to small ad hoc installations, as well as large facility systems. It will also demonstrate, how to realize plug and play connection management for all SMPTE ST 2110 and AES67 network flows with standard IT technology.

Using AMWA IS-04/IS-05 Technologies in a Routing Control Environment

4:40 – 5:00pm

John Mailhot – *CTO, Networking & Infrastructure, Imagine Communications*

In parallel with the development of SMPTE ST 2110, AMWA has been developing registration, discovery, and connection management tools needed to build IP-based workflow systems more rapidly. This talk covers the IS-04/05 specifications and how they integrate into routing control environments.

Automation and Orchestration of Networked Media Workflows

5:00 – 5:20pm

Glenn Booth – *VP, Marketing, Dimetis*

As we move down the JT-NM road-map and media professionals migrate to SMPTE ST 2110, a new set of workflow tools are being developed to help make the transition easier – management, automation and orchestration of workflows. They can manage and monitor these IP flows and help optimize a media production and distribution system.

SDN for Contribution, Live Production and Playout Environments – “To IGMP or not to IGMP, That is the Question”

5:20 – 5:40pm

Gerard Phillips – *Systems Engineer, Arista Networks*

An introduction to how IP Multicast flows, the foundation for the delivery of SMPTE ST 2110 and ST 2022-6/7, are delivered from source to destination in an IP network. Both IGMP and SDN approaches are discussed, with the aim to help end-users identify when and where these two approaches may be useful in their media networks.

Benefits of AMWA NMOS IS-04 Registration and Discovery

5:40 – 6:00pm

Daniel Lynch – *VP of Broadcasting Services, Xytech*

A major challenge in spinning up a resource and scheduling management system is the time-consuming data entry of the resource inventory. AMWA's NMOS IS-04 registration and discovery solves this challenge by automatically registering equipment into the inventory for immediate and future scheduling. NMOS IS-04 assists facilities with equipment asset tracking and onboarding of new equipment as well as providing valuable insight into usage patterns, reliability statistics and efficiencies.

TUESDAY – APRIL 10

IP Use Cases Architectures and Connection Strategies Track

9:30am – 12:00noon

In-use IP Installations are presented. Networking architectures are explained along with a special panel to help you understand connections control options.

IP Networking for Real-Time Video

9:30 – 10:00am

Robert Welch – *Technical Solutions Lead, Arista Networks*

SMPTE ST 2110 is all about professional media over managed IP networks. Robert reveals the considerations and design architectures for building, maintaining and operating the all-IP real-time workflow.

A National Broadcaster's all IP Media LAN and WAN Infrastructure

10:00 – 10:20am

Ole Johan Skogheim – *Head of Systems, TV 2 Norway*

When the national broadcaster TV 2 recently relocated both of its locations, an all IP infrastructure for live production was chosen. The main goal was to reduce impact of distance and to merge production islands, connecting all resources in a network based infrastructure. Initially based on SMPTE ST 2022-6/-7+AES67, but planned for SMPTE ST 2110 upgrade, the project resulted in a true multi-vendor environment giving TV 2 greater freedom in the allocation of resources and location of operations.

BCE's Journey Video Over IP Infrastructure

10:20 – 10:40am

Costas Colombus – *Director of Technology, BCE*

BCE broadcasts more than 35 channels through its 100% IP-based infrastructure. With a very tight schedule, BCE implemented SMPTE ST 2022-7 in its IP workflow in order to be on air in Q1 2017 before the new standard's publication.

IP Showcase Panel – Understand IP Connection and Traditional Interconnect Strategy

10:40 – 11:40am

Thomas Edwards – *FOX*

Costa Colombus – *BCE*

Ole Skogheim – *TV 2*

Subha Dhesikan – *Cisco*

John Mailhot – *Imagine Communications*

Thomas Edwards from FOX will deliver a short presentation on the benefits of AMWA IS-series followed by a panel to discuss existing and newer installation connection strategies.

Live Centralized IP Sports Production Across Australia

11:40 – 12:00noon

Marc Segar – *Director of Technology, NEP Australia*

Marc will explain the drivers and key benefits behind having a multi-client, multi-user and centralized environment as NEP Australia embarks on the largest IP roll out to date. Four new all-IP broadcast trucks, seven upgraded existing trucks, and two new IP production centers are creating centralized facilities for equipment, whilst technical and production staff have the flexibility to work anywhere on the new network. All equipment and resources are shared in real-time across all connected 29 tier one sports arenas.

IP Showcase Explanatory Track

12:30 – 3:40pm

Besides overviews, this session covers specific unique topics you will want to know as you deploy real-time video IP systems.

What is the IP Showcase All About

12:30 – 12:40pm

Stan Moote – *CTO, IABM*

A brief introduction about the IP Showcase.

A Basic Guide for Real-Time IP Video

12:40 – 1:00pm

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The IP video ecosystem is filled with vocabularies we must know to migrate into the all-IP studio. Andrew provides an overview of the IP terms such as SMPTE ST 2110, IEEE 1588 and NMOS IS-04/05 to get you up to speed and how they all work together in the IP and IP/SDI hybrid environment.

IP Use Case Benefits

1:00 – 1:20pm

Luann Linnebur – *Head of Business Development, Nevion*

Simply replacing SDI with IP is pointless unless tangible benefits can be obtained. Luann reviews the benefits installations have discovered by going IP.

Handling Metadata in SMPTE ST 2110

1:20 – 1:40pm

Paul Briscoe – *Consultant, Evertz*

Metadata serves many purposes and comes in many flavors. Additionally, SMPTE ST 2110 has its own metadata considerations. This presentation looks at the requirements that need to be met for business continuity and the new ones introduced by SMPTE ST 2110 and examines the solutions available in IP to accommodate them. Examples include closed captioning, time code, HDR metadata and SDP.

Practical Multi-Vendor Application of SMPTE ST 2110 – Technical Challenges and Solutions

1:40 – 2:00pm

Nestor A. Amaya – *Director, IP Solutions and Infrastructure Product Marketing, Ross Video*

François Legrand – *Senior Project Manager, CBC*

Standards only matter when multiple vendors are at play. Find out how SMPTE ST 2110 works in real deployments, and what challenges remain. François from CBC will join in this presentation providing an end-user point of view.

Understanding PreRoll in the SMPTE ST 2110 Domain

2:00 – 2:20pm

Thomas Burns – *CTO, Media & Entertainment, Dell|EMC*

Controlling latency is critical when using IP networks in production. The interval between “1st byte requested” from the disk subsystem and the delivery of a fully formed and discoverable SMPTE ST 2110 video stream is similar to “PreRoll”, and just as important to get correct. This presentation will discuss methods of measuring latency from disk to IP stream.

SMPTE ST 2110 Infrastructure and IP Flow Monitoring

2:20 – 2:40pm

Thomas Gunkel – *Broadcast Market Director, Skyline Communications*

Thomas reviews a practical example of a SMPTE ST 2110 UHD OB-truck and the challenges to monitoring its infrastructure and the media-over-IP flows. The presentation explores the most relevant KPIs in an ALL-IP environment, looks at SMPTE ST 2022-7 and PTP monitoring, explains how to resolve multicast flow topology in combination with label management and how to present such aggregated data to an operator.

AIMS Reference System Architecture Guidelines

2:40 – 3:00pm

Chuck Meyer – *Chief Technology Officer, Production, Grass Valley/AIMS*

Chuck discusses providing reference system designs and guidelines that take account of the different types of live productions, as technology moves from SDI to IP.

Disrupting Live Sports Contribution

3:00 – 3:20pm

Carl Petch – *Business Development Executive, Telstra Broadcast Services*

Remote or “at home” production allows for the broadcast of more sports with more consistency, reducing operational costs while ensuring reliability, flexibility and scalability. This presentation introduces Telstra’s Distributed Production Network (DPN), which has enabled broadcasters to revolutionize the way sport is produced from distances of up to 3,500 kms (2000 miles). Don’t miss the opportunity to hear from one of the leading experts in remote production networks on the experience of developing, testing and launching the Telstra DPN in Australia.

The Advantages of Moving from Coax to Fiber

3:20 – 3:40pm

Greg Doyle – *Sr. Consultant, Media and Entertainment Division, Diversified*

Greg will cover why you need to plan for a fiber infrastructure in your next system design, bandwidth requirements in an IP based signal flow, planning for growth and expanding bandwidth requirements for your broadcast and corporate infrastructure, and planning a structured fiber backbone.

SMPTE ST 2110 Transport Technical Track

3:40pm – 6:00pm

This session covers traffic shaping, synchronization, ancillary data, high bandwidth throughputs and redundant path switching.

SMPTE ST 2110 Step 2: Perfecting the Picture and Sorting the Sound – Optimizing IP Media Designs for Maximum Flexibility and Benefit

3:40 – 4:00pm

Andy Rayner – *Chief Technologist, Nevion*

Based on experience of real-world deployments to-date, we will take a look at some of the principles for designing complete systems. Now the basics for SMPTE ST 2110 are complete and in place, developments and deployments are focusing on achieving the ‘whole solution’. An all-IP environment offers immense flexibility which is yet to be fully realized but is coming to fruition as vendors mature their capabilities. As well as basic architectures, some of the areas explored including optimising buffering, audio manipulation, conversion between SMPTE ST 2110 and ST 2022 & going on/off campus in IP.

The SMPTE ST 2110-21 Timing Profiles

4:00 – 4:20pm

Paul Briscoe – *Consultant, Evertz*

Unlike SDI where pixels are delivered like clockwork, IP is a comparatively bursty and irregular means of sending groups of pixels. This jittery nature of IP means that buffering is required, and a lot of it by comparison to SDI. It's also a reality that software-based transmitters have a harder time delivering low jitter packets. This presentation examines the differences between SDI and IP transmission, the buffering required, its impact on system latency, and how the SMPTE ST 2110-21 transmitter models work.

Deep Dive into SMPTE ST 2110-40 Ancillary Data

4:20 – 4:40pm

Leigh Whitcomb – *Architect, Imagine Communications*

This presentation is a deep dive into the SMPTE ST 2110-40 Ancillary Data standard. The ANC standard for SMPTE ST 2110 is made up of two parts, one from the IETF and one from SMPTE. This presentation covers how SDI ANC services are transported by SMPTE ST 2110. New flexibility enabled by the standard will also be covered.

Live Closed Captioning and Subtitling in SMPTE ST 2110: Carriage, Synchronization and Steps to Transition

4:40 – 5:00pm

Bill McLaughlin – *VP Product Development, EEG*

This presentation will cover how live closed captioning and subtitling data is created and synchronized using the SMPTE ST 2110-40 metadata standard. Example workflows that leverage broadcasters' existing relationships with live transcription vendors will be demonstrated for native SMPTE ST 2110 production, as well as transitional workflows from SDI to IP.

Deep Dive into SMPTE ST 2110-21 Traffic Shaping and Delivery Timing for Video

5:00 – 5:20pm

Leigh Whitcomb – *Architect, Imagine Communications*

Are you sure that the SMPTE ST 2110-20 receiver that you purchased can receive the SMPTE ST 2110-20 streams from all the SMPTE ST 2110-20 transmitters you purchased? What is this "Type N" and "W" all about? Why is there an SMPTE ST 2110-21 standard? This presentation explains the SMPTE ST 2110-21 standard and examines when equipment is interoperable and not.

How to Use SMPTE ST 2110 to Solve High Bandwidth Flows in IP Infrastructures

5:20 – 5:40pm

James Stellflug – *VP Product Marketing, Global, EVS*

Mike Cronk – *Senior VP, Core Technologies, Grass Valley*

IP can do more than simply replace SDI, it can enable endpoints to become smart, simplify configurations, and provide flexible infrastructure choices that scale and meet the needs that match your business. Come learn about how IP and SMPTE ST 2110 can help us solve problems that SDI could not overcome for UHD-4K and SuperMotion cameras and workflows to video servers.

How Redundant Paths Work Using SMPTE ST 2022-7 for SMPTE ST 2110 Streams

5:40 – 6:00pm

Merrick Ackermans – *Principal Engineer, MVA Broadcast Consulting*

SDI redundant paths required a frame sync to switch in to aid with a seamless switch over to a redundant feed. Not so with IP. The SMPTE ST 2022-7 is the standard for seamless protection which is packet-based, so no frame sync is required. Merrick explains how this works with SMPTE ST 2110 streams.

WEDNESDAY – APRIL 11

IP – Specific Interests and Topics

9:30am – 12:00 noon

Pretty much all industry people are curious about specific IP items on their own agendas. This session covers topics from How do I Genlock? Where does audio fit into? Is IP plug & play?

IP Use Case Benefits

9:30 – 10:00am

Luann Linnebur – *Head of Business Development, Nevion*

Simply replacing SDI with IP is pointless unless tangible benefits can be obtained. Luann reviews the benefits installations have discovered by going IP.

Timeline's IP 4K HDR Outside Broadcast Truck

10:00 – 10:20am

Daniel McDonnell – *Managing Director, Timeline Television*

Daniel will discuss Timeline Television's triple expanding, 32-camera IP 4K HDR outside broadcast truck, UHD2. With an Arista 100G switch at its heart and SAM IP infrastructure, UHD2 delivers large-scale complex OBs simultaneously in uncompressed 4K UHD HDR and 4K UHD SDR. UHD2 is based around the SMPTE ST 2110 standard, enabling both audio and video to be processed in the IP stream.

Essential Measurements in the SMPTE ST 2110 Environment

10:20 – 10:40am

Ievgen Kostiukevych – *IP Media Architect, European Broadcasting Union*

As the broadcast industry is now replacing SDI with IP for critical live applications, new ways of measuring, monitoring and fault detection need to be explored. This presentation breaks down certain major technical aspects of SMPTE ST 2110 suite, like timestamping and packet delay variation. It also explains the challenges of building software-based SMPTE ST 2110 implementations. The talk will also cover the work of EBU members who are facing the challenges of moving to new IP-based facilities.

Practical Aspects for a Large Scale IP Install

10:40 – 11:00am

Jeff Rivera – *Managing Engineer, Diversified*

Planning a large scale IP installation is one thing, the actual installation is another. Jeff will discuss some of the practical aspects for a large scale IP facility installation, from cable infrastructure and resiliency over multiple equipment rooms, to product research and commissioning and support considerations.

IP Showcase Panel – User Panel

11:00 – 12:00 noon

Thomas Edwards – *VP Engineering & Development, FOX*

Thomas will have an open discussion with people that have, or are planning, IP installations. They will share their thoughts (pros and cons), talk about workflows, and how their clients are dealing with the changes. Future directions will be shared across the panel participants.

IP Showcase Explanatory Track

12:30 – 4:40pm

Besides overviews, this session covers specific unique topics you will want to know as you deploy real time video IP systems.

SMPTE ST 2110 Step 2: Perfecting the Picture and Sorting the Sound – Optimizing IP Media Designs for Maximum Flexibility and Benefit

12:30 – 1:00pm

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Based on experience of real-world deployments to-date, we will take a look at some of the principles for designing complete systems. Now the basics for SMPTE ST 2110 are complete and in place, developments and deployments are focusing on achieving the ‘whole solution’. An all-IP environment offers immense flexibility which is yet to be fully realized but is coming to fruition as vendors mature their capabilities. As well as basic architectures, some of the areas explored including optimising buffering, audio manipulation, conversion between SMPTE ST 2110 and ST 2022 & going on/off campus in IP.

An update on the Live IP implementation for the BBC Wales Cardiff Central Square project

1:00 – 1:30pm

Mark Patrick – *Lead Architect BBC Design & Engineering*

Mark is working on the technical delivery of Cardiff Central Square, the new home for BBC Wales. This project is delivering a whole new broadcast headquarters with state-of-the-art facilities and it includes an IP based ‘Live Core’ routing system built on SMPTE ST 2110 and NMOS standards. Mark will give an overview of why IP based solutions have been chosen for the project and progress to date including selection of systems, detailed design and testing.

IS-06: The Network Traffic Cop to Protect and Reserve Your Bandwidth

1:30 – 2:00pm

Thomas Edwards – *VP Engineering & Development, Fox*

Subha Dhesikan – *Principal Engineer, Cisco*

For reliable IP media operation, bandwidth needs to be reserved for flows and the network needs to be protected from unauthenticated senders and receivers. AMWA NMOS IS-06 Network Control is a publicly available multi-vendor interface specification between a broadcast controller and one or more network controllers. It allows the broadcast controller to learn about network topology, to authorize endpoints, and to allow networked media flows to move with reserved bandwidth, and it is supported by multiple network equipment companies to avoid vendor lock-in.

PTP and SMPTE ST 2110 – The Inside Story

2:00 – 2:20pm

Paul Briscoe – *Consultant, Evertz*

This presentation explains how PTP is used in SMPTE ST 2110 systems, and discusses topics such as derivation of RTP timestamps from PTP, how RTP timestamps are used to re-align streams at receivers, and how the SMPTE ST 2110-21 transmitter profiles affect timestamp processing and system latency.

The Journey to Live IP Infrastructure

2:20 – 2:40pm

Mark Davies – *Director of Products & Technology, TSL Products*

With standards now ratified, Mark shares his experience with real live IP production deployments. These include some of the world’s first IP trucks and fixed studios and the challenges of living up to the format-agnostic promise as early deployments of SMPTE ST 2022-6 mature in record time and transition to SMPTE ST 2110. Not forgetting this new technology still needs to be controlled, timed and secure.

Using AMWA IS-04/IS-05 Technologies in a Routing Control Environment

2:40 – 3:00pm

John Mailhot – *CTO, Networking & Infrastructure, Imagine Communications*

In parallel with the development of SMPTE ST 2110, AMWA has been developing registration, discovery, and connection management tools needed to build IP-based workflow systems more rapidly. This talk covers the IS-04/05 specifications and how they integrate into routing control environments.

How Redundant Paths Work Using SMPTE ST 2022-7 for ST 2110 Streams

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IP Showcase Panel – JT-NM roadmap in action: Experiences learned from Telstra's all-IP remote sports Digital Production Network (DPN)

3:20 – 4:00pm

Stan Moote – *IABM*

Anna Lockwood – *Telstra*

Steven Soenens – *Skyline*

Joop Janssen – *Aperi*

Nick Ciarleglio – *Arista*

In this panel session, service provider Telstra and the technology providers of its IP core network, media gateways and orchestration & monitoring system, will be quizzed by Stan Moote to explain the engineering and operational experiences of setting up a real media over IP deployment for remote live sports production.

A Basic Guide for Real-Time IP Video

4:00 – 4:20pm

Andrew Jones – *Head of Training IABM*

The IP video ecosystem is filled with vocabularies we must know to migrate into the all-IP studio. Andrew provides an overview of the IP terms such as SMPTE ST 2110, IEEE 1588 and NMOS IS-04/05 to get you up to speed and how they all work together in the IP and IP/SDI hybrid environment.

IP and SDI Work Seamlessly Together

4:20 – 4:40pm

Karl Paulsen – *CTO, Diversified*

One of the strong benefits of IP is that it works with SDI. Hybrid systems allow you to use existing workflows while migrating over to IP. Karl explains the ins and outs of IP/SDI Hybrid systems that are in use today with a clear focus on migrating to 100% SMPTE ST 2110 in the future.

SMPTE ST 2110 Audio Technical Track

4:40pm – 6:00pm

This session covers audio aspects of SMPTE ST 2110 and AES 67

The Audio Parts of SMPTE ST 2110 Explained

4:40 – 5:00pm

Andreas Hildebrand – *Technology Evangelist, ALC NetworX GmbH*

When published in late 2017, SMPTE ST 2110 consisted of parts -10, -20 and -30 which cover the fundamental definitions for synchronization and transport of elementary essence for uncompressed video and audio. Meanwhile, further parts of the standard have been, or are to be released shortly, including definitions for AES3 transparent transport. This presentation provides an overview and update on the audio parts of SMPTE ST 2110, including their relationship with AES67.

Deep Dive into SMPTE ST 2110-30, 31 and AES67 Audio

5:00 – 5:20pm

Leigh Whitcomb – *Architect, Imagine Communications*

Why is there a separate SMPTE ST 2110-30 standard from AES67? Are AES67 devices compatible with SMPTE ST 2110-30? Why is there a SMPTE ST 2110-31 standard? This presentation is a deep dive into the SMPTE ST 2110-30, 31 and AES67 audio and will answer all these questions.

The Roles of AES67 and SMPTE ST 2110 in the Production World

5:20 – 5:40pm

Patrick Killianey – *Network Applications Engineer, Yamaha Commercial Audio Division*

Montgomery Scott (Star Trek) famously said, “You’ve got to use the right tool for the job, lad.” This session takes this lesson to heart. We’ll examine the needs of audio and video separately, discussing how open standards represent different opportunities to each trade and how they cooperate with private solutions – each being the “right tool” in different situations. Simple network infrastructure structural models will also be shown that lend themselves to quick maintenance by the teams that operate the A/V systems.

Practical Lessons: Managing Migration Towards SMPTE ST 2110

5:40 – 6:00pm

John Ball – *Systems Engineer, Microsoft Production Studios*

In 2013, Microsoft Production Studios began pioneering work on a property-wide audio-over-IP production workflow. Through its ties to MSNBC, it forged relationships and shared knowledge with other broadcasters charting the same frontier. In this session John will share practical experience – both successes and lessons learned. Also, as Microsoft has already begun the infrastructure upgrades to accommodate a SMPTE ST 2110 video workflow, practical comparisons can be drawn on the adoption process for audio and video.

THURSDAY – APRIL 12

Final Day Track

9:30am – 12:00noon

Some attendees and exhibitors don't get a chance to see the show until the last day. This track is tailored to cover general right through to specific details that vendors need to know.

What is the IP Showcase All About

9:30 – 9:40am

Stan Moote – *CTO, IABM*

A brief introduction about the IP Showcase.

IP and SDI Work Seamlessly Together

9:40 – 10:00am

Karl Paulsen – *CTO, Diversified*

One of the strong benefits of IP is that it works with SDI. Hybrid systems allow you to use existing workflows while migrating over to IP. Karl explains the ins and outs of IP/SDI Hybrid systems that are in use today with a clear focus on migrating to 100% SMPTE ST 2110 in the future.

The Challenge of IP Video: Empower and Educate Staff

10:00 – 10:20am

Wes Simpson – *Presenter, MEDIA 180 INC*

IP video systems need more than standards and cool new software to run smoothly, they need properly trained engineers and technicians to design and maintain them. Wes presents a case study of the hands-on training program used by a major broadcast services provider to educate its existing staff.

SDN for Contribution, Live Production and Payout Environments – “To IGMP or not to IGMP, That is the Question”

10:20 – 10:40am

Gerard Phillips – *Systems Engineer, Arista Networks*

An introduction to how IP multicast flows, the foundation for the delivery of SMPTE ST 2110 and ST 2022-6/7, are delivered from source to destination in an IP network. Both IGMP and SDN approaches are discussed, with the aim to help end-users identify when and where these two approaches may be useful in their media networks.

Deep Dive into SMPTE ST 2110-21 Traffic Shaping and Delivery Timing for Video

10:40 – 11:00am

Leigh Whitcomb – *Architect, Imagine Communications*

Are you sure that the SMPTE ST 2110-20 receiver that you purchased can receive the SMPTE ST 2110-20 streams from all the SMPTE ST 2110-20 transmitters you purchased? What is this “Type N” and “W” all about? Why is there an SMPTE ST 2110-21 standard? This presentation explains the SMPTE ST 2110-21 standard and examines when equipment is interoperable and not.

AIMS Reference System Architecture Guidelines

11:00 – 11:20am

Chuck Meyer – *Chief Technology Officer, Production, Grass Valley/AIMS*

Chuck discusses providing reference system designs & guidelines that take account of the different types of Live Productions, as technology moves from SDI to IP.

How to Select the Right Server Package for Virtualized Production

11:20 – 11:40am

Thomas Burns – *CTO, Media & Entertainment, Dell|EMC*

Software and system developers have learned to minimize latency and jitter when writing to physical NICs, but what are the parameters for virtual NICs in virtual machines? This presentation will explore select variables in hardware & software packages for virtual production.

Into the Green Zone – The Agile Media Blueprint

11:40 – 12:00 noon

Richard Cartwright – *CTO, Streampunk Media Ltd*

For the transition from broadcasting to personalized content, is it time to break down the walls of traditional media facilities? The Agile Media Blueprint (AMB) is a plan for end-to-end media production using Internet technologies. Complementary to SMPTE ST 2110, NMOS and MXF, what is the AMB, when will it be realized and how?



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