



**IBC2019 Rooms E106/107**

**Putting the Business and Creative  
Benefits of IP to Work for You**

- > Education Sessions**
- > IP Product Demonstrations**
- > Real-World Deployments and Use Cases**

Standards-based IP installation, maintenance, and security have never been easier. Gain the knowledge, inspiration, and contacts you need to realize your IP vision.

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**The IP Showcase returns to IBC stronger than ever, with a wealth of opportunities to learn about standards-based IP infrastructures for real-time, professional deployments. At IBC2019, the IP Showcase will emphasize standards, strategies, and solutions for making IP installation, maintenance, and security easier and more straightforward. The focus is on open standards for AV-over-IP interoperability and the new JT-NM TR-1001-1, which provides specifications and guidance designed to make SMPTE ST 2110-based systems easier to deploy and operate, leading to greater efficiencies for broadcasters.**

**The IBC2019 IP Showcase is hosted by AES, AIMS, AMWA, EBU, SMPTE®, and VSF.**



The IP Showcase is dedicated to open standards for real-time professional media applications. In the **IP Showcase Theatre**, industry-leading vendors and broadcasters are offering instructional and case-study presentations that highlight the broadcast and pro AV industries' momentum towards a standards-based IP infrastructure. Plus, 42 vendors are showcasing equipment and giving **IP-based product demonstrations** in a massive assembly of interoperable IP products.

Appearing for the first time at IBC, the **IP Showcase Future Zone** is a demonstration area focused on the latest advances in standards for IP-based broadcast operations. Demos highlight core standards as promoted by the latest AIMS roadmap, which now includes JT-NM TR-1001-1 that offers specifications and guidance for simplified and straightforward configuration of SMPTE ST 2110-based systems, and leverages AMWA NMOS IS-04 (discovery and registration) and IS-05 (connection management). The Future Zone also shows higher-level functionality such as carriage of trigger, tally, and counter metadata over IP with AWMA IS-07 and grouping of related metadata with BCP-002-1.

The **JT-NM Tested** program offers prospective purchasers of IP-based equipment greater, more documented insight into how vendor equipment aligns to the SMPTE ST 2110 and SMPTE ST 2059 standards and JT-NM TR-1001-1. Another key highlight is **AV Over IP**, a demonstration area highlighting real-world technology solutions for AV-over-IP interoperability based on the SMPTE ST 2110 suite.

## IP Showcase Theatre Presentation Schedule

TIME	Friday 13 Sept.	Saturday 14 Sept.	Sunday 15 Sept.	Monday 16 Sept.	Tuesday 17 Sept.
10:00 - 10:30		SMPTE ST 2110 Using JPEG-XS (intoPIX)	Avoiding Pitfalls When Designing SMPTE ST 2059-2 PTP Networks (Mellanox)	NMOS Now and Next (BBC R&D)	Tutorial Session:  <b>Fundamentals of IP in Broadcast Production</b>  (Telecompro.tv, Q3 Media Training)
10:30 - 11:00		IP Workflows with ST 2110 and VC2 Compression (IML Co. Ltd.)	PTP in Media Virtualized Environments (Mellanox)	AMWA NMOS Automated Testing (BBC R&D, Sony Europe)	
11:00 - 11:30	Tutorial Session:	Remote Production: Coping with Bandwidth Limitations (Lawo)	Tips for Commissioning and Monitoring an ST 2059/PTP System (Imagine Comm.)	NMOS IS-07 – GPI Replacement and Much, Much More ... (Pebble Beach)	
11:30 - 12:00	<b>Fundamentals of IP in Broadcast Production</b>  (Telecompro.tv, Q3 Media Training)	Efficient Carriage of Sub-rasters using ST 2110-20 (Televisionary)	IP Test and Measurement for ST 2110 Systems (Leader Europe Limited)	Discovery and Connection Management Security for ST 2110 Media (Riedel)	Using AMWA IS-06 for Flow Control on Media Networks (Sony Europe, Cisco)
12:00 - 12:30		Panel Discussion: <b>Real-World SMPTE ST 2110 and AMWA NMOS Implementations</b>	Panel Discussion: <b>Keeping Control of the IP Transition</b>	ST 2110 over WAN – Update (Nevion)	Panel Discussion: <b>RIST: Field Deployments and Future Development</b>
12:30 - 13:00	JT-NM Tested August 2019 Test Plans and Results – Explained (EBU, BBC R&D)	Moderated by Matthew Goldman, MediaKind	Moderated by Thomas Bause Mason, SMPTE	JT-NM Cybersecurity Assessment, August 2019 – Methods and Results (VRT, EBU)	Moderated by Ciro Noronha, Cobalt Digital
13:00 - 13:30	<b>CASE STUDY</b> Benefits of IP Systems for Sporting Venues (Imagine Comm.)	<b>CASE STUDY</b> IP Interoperability for Public Broadcasters (BBC, EBU)	<b>CASE STUDY</b> The Rise of IP in Remote Production Networks (Telstra)	<b>CASE STUDY</b> BBC Studies of ST 2110 and NMOS in an On-Premise Cloud (BBC)	What's New in NMOS? The Latest in Video over IP Control and Security (Nextera)
13:30 - 14:00	<b>CASE STUDY</b> JPEG XS in Action for IP Production (Nevion)	<b>CASE STUDY</b> FIS Alpine Skiing World Cup: Largest Uncompressed IP Remote Production (Grass Valley)	<b>CASE STUDY</b> BBC Cardiff Central Square – Update (BBC)	<b>CASE STUDY</b> CPAC – Replacement of a CWDM System with an IP System (Embrionix)	Network Automation with Google Sheets? (EBU)
14:00 - 14:30	<b>CASE STUDY</b> M6 France – Master Control and Playout IP Migration (Evertz)	<b>CASE STUDY</b> Eurosport Technology Transformation (Discovery/Eurosport)	<b>CASE STUDY</b> The Good and the Ugly – IP Studio Production (Cisco)	<b>CASE STUDY</b> Building a Large OB-Truck Using SMPTE ST 2110 (BFE Studio)	
14:30 - 15:00	ST 2110 – Timing Tails and Buffers (The Broadcast Bridge)	Reinventing Intercom with SMPTE ST 2110-30 (Telos Alliance)	<b>CASE STUDY</b> A Conversation with NEP Netherlands (SVG/NEP)	The Transition to Microservices-Based Media Processing (MediaKind)	
15:00 - 15:30	Jitter, Wander, and Time Lock of ST 2110 Video Streams (M3L Inc.)	The 7th Circle of Hell; Making Facility-Wide Network Audio Work (Jigsaw24)	Simplifying JT-NM TR-1001-1 Deployments Through Microservices (Mellanox)	NMOS and ST 2110 for AV over IP in Pro AV: How and Why? (Macnica Americas)	
15:30 - 16:00	Buffering Walkthrough for IP Broadcast Traffic (Cisco Systems)	ST 2110-30 and NMOS IS-08 – Audio Transport and Routing (ALC NetworX)	Investigating IP Multicast Hurdles in Containerized Platforms (Telos Alliance)	NMOS and ST 2110 Pro AV Roadmap (PESA)	
16:00 - 16:30	Designing an IP Studio – Some Practical Lessons From the Field (Arista Networks)	Subtitling and Ancillary Workflow with ST 2110-40 (EEG)	Undertaking an Interoperability Lab at NFL Network (NFL Network)	ST 2110-41 Fast Metadata – Under the Hood and Applications (Televisionary)	

## FRIDAY - September 13

### **Tutorial Session: Fundamentals of IP in Broadcast Production**

11:00 – 12:30

**Wes Simpson – Telecompro.tv**

**Ed Calverly – Q3 Media**

Join two technology training experts for a 90-minute exploration of the key technologies used in modern IP video and audio networks. Learn about ST 2110, AES67, PTP, and NMOS and see how they work together to enable all-IP live production. If you haven't been exposed to these technologies before, or if you are looking to enhance your knowledge, this is an excellent way to see what innovators are doing today and what the future holds for the full range of IP media production.

### **JT-NM Tested August 2019 Test Plans and Results – Explained**

12:30 – 13:00

**Ievgen Kostiukevych – European Broadcasting Union**

**Andrew Bonney – BBC R&D**

EBU's Ievgen Kostiukevych and BBC R&D's Andrew Bonney, editors of the JT-NM Tested August 2019 test plans, will explain everything you wanted to know about the Joint Task Force on Networked Media's Tested program, but were too afraid to ask!

#### **CASE STUDY**

#### **Benefits of IP Systems for Sporting Venues**

13:00 – 13:30

**John Mailhot – Imagine Communications**

Most major sporting venues have a significant in-house audio/video production infrastructure, which augments the in-venue customer experience. This paper examines the benefits and challenges of IP-based ST 2110 infrastructure for these live sport environments.

#### **CASE STUDY**

#### **JPEG XS in Action for IP Production**

13:30 – 14:00

**Andy Rayner – Nevision Ltd.**

An overview of JPEG XS technology for low-latency compressed video signals using ST 2110-22. An example of a recent deployment in live IP production is described in detail.

#### **CASE STUDY**

#### **M6 France - Master Control and Payout IP Migration**

14:00 – 14:30

**Fernando Solanes – Evertz Microsystems Inc.**

M6, a major private broadcaster in France, has recently commissioned an IP core within their multichannel payout facility. Two channels are currently on the air with additional channels transitioning to the new core.

This presentation describes:

- An ST 2110/NMOS-based system
- PTP master clocks

### **ST 2110 – Timing Tails and Buffers**

14:30 – 15:00

**Tony Orme – The Broadcast Bridge**

Making real-time video and audio IP systems work with greater efficiency requires an advanced appreciation of timing measurement. This presentation exposes the timing extremities of the bell distribution curve and suggests strategies to improve signal throughput resulting in improved productivity and performance.

### **Jitter, Wander, and Time Lock of ST 2110 Video Streams**

15:00 – 15:30

**Koji Oyama – M3L Inc.**

This presentation shows how ST 2110 streams can be locked as well as how much jitter and wander they have. By showing the videos and experimental results of our implementation as an example, you can understand how ST 2059-based PTP technology synchronizes and reproduces stable video clocks.

**Buffering Walkthrough for IP Broadcast Traffic****15:30 – 16:00****Nemanja Kamenica – Cisco Systems**

This presentation will explain buffer implementation in IP switches and routers used for IP broadcast traffic forwarding. The session will dive into the buffer architecture and IP multicast traffic forwarding with respect to different buffer architectures. It will also look at how quality of service can be implemented to protect traffic.

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**Designing an IP Studio – Some Practical Lessons From the Field****16:00 – 16:30****Gerard Phillips – Arista Networks**

All you wanted to know about designing an IP ST 2110 studio network, but were afraid to ask.

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## SATURDAY - September 14

### SMPTE ST 2110 Using JPEG-XS

10:00 – 10:30

Jean-Baptiste Lorent – intoPIX

JPEG-XS is a new ISO JPEG standard that has been created in collaboration with the broadcast industry to meet live production quality requirements while offering important bandwidth reductions that enable one to get more from the new ST 2110 standard.

### IP Workflows with ST 2110 and VC2 Compression

10:30 – 11:00

Tae-Han Kim – IML Co. Ltd.

A case study that examines the development and testing of an IP-enabled workflow for a broadcasting studio. In a small test studio, a managed SDN network with ST 2110-20/30 uncompressed sender and receiver hardware and IP, ST 2042 VC2 compressed encoder and decoder, and NMOS manager are implemented and live broadcasting tested for future design guide setup.

### Remote Production: Coping with Bandwidth Limitations

11:00 – 11:30

Erling Hedkvist – Lawo AG

Remote production is becoming a matter of course and picture quality expectations are on the rise. More data needs to be pushed down the same lines. A close look at the strategies available to broadcasters for “doing more with less” at the highest-quality level.

### Efficient Carriage of Sub-rasters Using ST 2110-20

11:30 – 12:00

Paul Briscoe – Televisionary Consulting

This presentation discusses the use of ST 2110 for the carriage of small raster bitmaps such as logos and lower thirds.

### Panel Discussion:

### Real-World SMPTE ST 2110 and AMWA NMOS Implementations

12:00 – 13:00

Moderated by Matthew Goldman – MediaKind

Hear from the experts! This panel session will discuss real-world examples of SMPTE ST 2110 Professional Media over Managed IP Networks implementations, including what worked well and areas where there have been challenges to overcome. The panel also will discuss the impact on real customers of the Joint Task Force on Network Media’s (JT-NM) Technical Recommendation JT-NM TR-1001-1:2018, which addresses the configuration of SMPTE ST 2110 equipment and other issues, and AMWA NMOS Best Current Practices (BCPs).

### CASE STUDY

#### IP Interoperability for Public Broadcasters

13:00 – 13:30

Judy Parnall – BBC, EBU

What interoperability means for public broadcasters’ transition to IP. How ST 2110, NMOS, and TR-1001 are important in making this happen, and a review of how in practice these are being adopted and used in EBU members’ new facilities.

### CASE STUDY

#### FIS Alpine Skiing World Cup, the Largest Uncompressed IP Remote Production to Date

13:30 – 14:00

Robert Erickson – Grass Valley

A case study on the equipment, infrastructure, and workflows that were leveraged by SVT Sweden to support FIS Alpine Ski World Cup. With the remote site in Åre, Sweden separated by over 600 km from the production studios in Stockholm, new and unique technologies were required to make this remote production a success.



**CASE STUDY****Eurosport Technology Transformation****14:00 – 14:30****Gordon Castle – Discovery/Eurosport**

Eurosport Technology Transformation (ETT) is a major investment that will create two private clouds for live production. These private clouds will be fully ST 2110 compliant, with AES67 audio, supporting hundreds of playout channels in 22 languages. The ETT project is an industry-leading implementation of a fully IP-based infrastructure. We are at the early stages and can share the opportunities and the challenges.

**Reinventing Intercom with SMPTE ST 2110-30****14:30 – 15:00****Martin Dyster – The Telos Alliance**

This presentation looks at the parallels between the emergence of audio-over-IP standards and the development of a product in the Intercom market sector that has taken full advantage of IP technology.

**The 7th Circle of Hell; Making Facility-Wide Network Audio Work****15:00 – 15:30****Matt Ward – Jigsaw24**

An empirical, practical guide to making network audio systems with shared resources work.

**ST 2110-30 and NMOS IS-08 – Audio Transport and Routing****15:30 – 16:00****Andreas Hildebrand – ALC NetworX GmbH**

This presentation explains how audio essence is transported with ST 2110 in general, and further explains how individual input channels are bundled into an audio stream and how they can be assigned to dedicated outputs on a receiving device utilizing NMOS IS-08.

**Subtitling and Ancillary Workflow with ST 2110-40****16:00 – 16:30****Bill McLaughlin – EEG**

An updated tutorial on subtitling, closed captioning, and other ancillary data workflows using the ST 2110-40 standard. Topics include synchronization, merging of data from different sources, standards conversion, and differences between SDI, compressed IP, and uncompressed IP architectures.

## SUNDAY - September 15

### Avoiding Traps and Pitfalls When Designing SMPTE 2059-2 PTP Networks

10:00 – 10:30

**Thomas Kernen – Mellanox Technologies**

As the SMPTE ST 2059-2 flavour of the IEEE 1588 Precision Time Protocol is being deployed in many of the early adopter projects, constraints have arisen and a number of workarounds have been necessary due to either PTP stack, media node and/or network limitations. This may lead to a biased perspective as to what may actually be accomplished with the protocol. This presentation focuses on the key questions that need to be taken into account whilst designing for PTP.

### PTP in Media Virtualized Environments

10:30 – 11:00

**Alex Vainman – Mellanox Technologies**

**Nir Nitzani – Mellanox Technologies**

The M&E industry is moving to virtualized environments, cloud on premises, and finally to cloud deployment. Timing is the next trivial step in adopting SW IP solutions and its advantages – but is it trivial? On the list of challenges, timing is high. This presentation will try to describe the environment, understand the key challenges, explore existing solutions, and look forward.

### Tips for Successfully Commissioning and Monitoring an ST 2059/PTP System

11:00 – 11:30

**Leigh Whitcomb – Imagine Communications**

ST 2110 requires an ST 2059/PTP infrastructure. These are complex and have many subtleties. If done well, they are easily deployed and monitored.

### IP Test and Measurement for ST 2110 Systems

11:30 – 12:00

**Kevin Salvidge – Leader Europe Limited**

With video-over-IP standards now well established and early adopters demonstrating the operational and commercial benefits of COT's IP infrastructure, what are the test and measurement tools you need to ensure you continue to deliver the same quality of service that can be achieved with SDI infrastructure?

### Panel Discussion:

### Keeping Control of the IP Transition

12:00 – 13:00

**Moderated by Thomas Bause Mason – SMPTE**

SMPTE ST 2110 is maturing as we near the verge of mainstream adoption of SMPTE ST 2110 IP infrastructure. While SMPTE ST 2110 has proven it has great promise for success, some issues still remain. There are some misconceptions, and to a degree confusion, in the industry on what other standards and specifications are required besides the SMPTE ST 2110 transport of audio, video and data. How do I build a "full stack" IP facility for live production? What do I do about control? Is this technology secure? These are just a few of the questions this panel will address. Listen to industry insiders who work on the relevant standards to keep abreast of what's being adopted during this transition.

### CASE STUDY

#### The Rise of IP in Remote Production Networks

13:00 – 13:30

**Carl Petch – Telstra**

Two case studies on the journey from trial to deployment of a remote IP production for live sporting events. We'll show and investigate the underlying network technologies, compression type, unprocessed vs. compressed, and present different perspectives from broadcast production, telco, and network service providers.

### CASE STUDY

#### BBC Cardiff Central Square - Update

13:30 – 14:00

**Mark Patrick – BBC**

**Andy Appleyard – BBC**

BBC Wales's new headquarters building in Cardiff is going live a few months after IBC. This presentation gives an update on the implementation of the IP core built around ST 2110, AES67, and Dante.

**CASE STUDY****The Good and the Ugly – IP Studio Production**

14:00 – 14:30

**Ammar Latif – Cisco Systems**

This session is a case study of a new IP production studio for a major broadcaster in the US and will present the architecture, best practices, and lessons learned from a real, live studio production using an IP infrastructure.

**CASE STUDY****A Conversation with NEP Netherlands**

14:30 – 15:00

**Ken Kerschbaumer – Sports Video Group**

Join Peter Bruggink, CTO | NEP Europe & Media Solutions and Ken Kerschbaumer, co-executive director, editorial services, Sports Video Group for an informative discussion about NEP's ongoing deployments of IP media technologies in the Netherlands and beyond.

**Simplifying JT-NM TR-1001-1 Deployments Through Microservices**

15:00 – 15:30

**Richard Hastie – Mellanox Limited**

This presentation shows how the full JT-NM TR-1001-1 specification can be implemented using container-based microservices. DNS, DNS-SD, DHCP, and AMWA NMOS services can now be fully automated and abstracted through the use of dematerialised microservices. The result is broadcast engineers of tomorrow no longer need to worry about these services as they've become as ubiquitous as any other data centre technology.

**Investigating Media-Over-IP Multicast Hurdles in Containerized Platforms**

15:30 – 16:00

**Greg Shay – Telos Alliance**

Probing the conflicts between the SMPTE ST 2110 media-over-IP standards and the difficulties of multicast support in modern containerized server software methods.

**Undertaking an Interoperability Lab at NFL Network**

16:00 – 16:30

**Alan Wollenstein – NFL Network****Charley Haggarty – NFL Network**

An outline of the benefits of using ST 2110 essence streams over WAN for remote and distributed live production, the challenges involved, and real-life implementations of distributed IP live productions.

## MONDAY - September 16

### NMOS Now and Next

10:00 – 10:30

Peter Brightwell – BBC R&D

An introduction to the AMWA Networked Media Open Specifications, including an outline of the specifications themselves, how they have been developed and tested, the state of industry adoption, and broadcaster perspectives.

### AMWA NMOS Automated Testing

10:30 – 11:00

Andrew Bonney – BBC R&D

Gareth Sylvester-Bradley – Sony Europe

An introduction to the open source AMWA NMOS Testing Tool, which can be used to automatically ensure that Media Nodes and other appliances are adhering to the NMOS specifications.

### NMOS IS-07 – GPI Replacement and Much, Much More ...

11:00 – 11:30

Miroslav Jeras – Pebble Beach Systems Ltd.

IS-07 Event & Tally is a new addition to the NMOS suite that defines how states and state changes are communicated in an IP environment. It is not only a GPI replacement, but it also provides a platform for resolving many other problems broadcasters are facing in the IP transition.

### Discovery and Connection Management Security for ST 2110 Media Devices

11:30 – 12:00

Arne Bönninghoff – Riedel Communications GmbH & Co. KG

This session will describe the current workflow of the BCP-003 Security best practices. It elaborates current proposed mechanisms to encrypt NMOS APIs with TLS to prevent man-in-the-middle attacks. Furthermore, AMWA IS-10 is reserved to specify authorization mechanisms to secure access to NMOS APIs like IS-04, -05, or -08. The current concept of an authorization server is explained, as well as how it can issue tokens for controllers and nodes. Access to NMOS-nodes for starting/stopping/configuring media endpoints can then be secured against unwanted access.

### ST 2110 over WAN – Update

12:00 – 12:30

Andy Rayner – Nevion Ltd

An update on the VSF Activity Group addressing the issues of transporting ST 2110 media essences over Wide Area Networks.

### JT-NM Cybersecurity Assessment, August 2019 – Methods and Results

12:30 – 13:00

Gerben Dierick – Vlaamse Radio en Televisieomroep (VRT)

Adi Kouadio – European Broadcasting Union

As the industry continues the journey toward live IP technologies, cybersecurity is becoming a critical point of consideration. The EBU Infrastructures & Security group had teamed with JT-NM to perform a new round of vulnerabilities assessment during the JT-NM Tested August 2019 event. The methods and results will be presented during this talk.

#### CASE STUDY

##### BBC Studies of ST 2110 and NMOS in an On-Premise Cloud

13:00 – 13:30

Peter Brightwell – BBC R&D

An overview of BBC R&D's work on building on-premise facilities to examine how technology and architecture developed for cloud computing can provide flexibility and scalability for the broadcast industry, and how it can be used in conjunction with ST 2110 and NMOS.

#### CASE STUDY

##### CPAC – Replacement of a CWDM System with an IP System

13:30 – 14:00

Roy Folkman – Embrionix

The Cable Public Affairs Channel's critical bilingual governmental programming reaches 11 million homes in Canada. Implementing a unique real-time media-over-IP system to replace an aging CWDM system allowed them to realize the benefits of IP. The commissioning and training for this successful system took just 3 days and CPAC was ready for air.

**CASE STUDY****Building a Large OB-Truck Using SMPTE ST 2110**

14:00 – 14:30

**Hartmut Opfermann – BFE Studio und Medien Systeme**

When ORF needed to build their FÜ22 OB-Truck, they chose to use IP technology and ST 2110 for media transport. In this presentation we talk about the challenges we faced and the lessons we have learned during the planning, integrating, and testing of the truck.

**The Transition to Microservices-Based Media Processing Architecture**

14:30 – 15:00

**Arnaud Caron – MediaKind**

This session provides an overview of the role of microservices architectures across a range of critical media processing tasks. Using real-world examples, the session examines the process changes and technical challenges that need to be overcome to meet the agility demands of end-to-end video flows.

**NMOS and ST 2110 for AV over IP in Pro AV: How and Why?**

15:00 – 15:30

**Andrew Starks – Macnica Americas**

The Alliance for IP Media Solutions (AIMS) is working with standards organizations to promote an open standard for AV over IP in the Pro AV market. We'll discuss the motivation for our work and share a high-level view of our approach.

**NMOS and ST 2110 Pro AV Roadmap**

15:30 – 16:00

**Scott Barella – PESA**

In this presentation, we will introduce the roadmap for Pro AV technologies within the AIMS effort and discuss the progress, work left to be done, and how to get involved.

**ST 2110-41 Fast Metadata – Under the Hood and Applications**

16:00 – 16:30

**Paul Briscoe – Televisionary Consulting**

This presentation offers a look at the mechanisms of the coming ST 2110-41 Fast Metadata (FMX) standard. An overview of how it works and a number of potential applications are discussed.



## TUESDAY - September 17

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### **Tutorial Session: Fundamentals of IP in Broadcast Production**

10:00 – 11:30

**Wes Simpson – Telecompro.tv**

**Ed Calverly – Q3 Media**

Join two technology training experts for a 90-minute exploration of the key technologies used in modern IP video and audio networks. Learn about ST 2110, AES67, PTP, and NMOS and see how they work together to enable all-IP live production. If you haven't been exposed to these technologies before, or if you are looking to enhance your knowledge, this is an excellent way to see what innovators are doing today and what the future holds for the full range of IP media production.

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### **Using AMWA IS-06 for Flow Control on Professional Media Networks**

11:30 – 12:00

**Rob Porter – Sony Europe B.V.**

**Sachin Vishwarupe – Cisco Systems Inc.**

AMWA IS-06 is an open specification for setting up and modifying flows on a professional media network, allowing the use of Software Defined Networking to both authorise and optimise network usage. This talk describes the current IS-06 APIs and some of the future areas of development.

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### **RIST Panel Discussion:**

12:00 – 13:00

**Moderated by [Ciro Noronha](#) – [Cobalt Digital Inc.](#)**

The Reliable Internet Stream Transport (RIST) Specification from the Video Services Forum aims to provide multi-vendor, interoperable video transport over the Internet using best-in-class techniques. This panel discussion will include a review of RIST Simple Profile field deployments, as well as the new features and functionality being added to RIST Main Profile. These features include tunneling, security, authentication, and further bandwidth optimization. Panelists include some of the major contributors to the Specification, as well as implementers.

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### **What's New in NMOS? A Tutorial on the Latest in Video-over-IP Control and Security**

13:00 – 13:30

**Jed Deame – Nextera Video**

The latest advancements in NMOS, including IS-08 (Audio Mapping), IS-09 (System Discovery), BCP-002 (Grouping) and BCP-003 (Security) take NMOS to a new level, surpassing the level of control provided in SDI while also adding a layer of security that has been sorely needed in control systems for quite some time.

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### **Network Automation with Google Sheets?**

13:30 – 14:00

**Ievgen Kostiukevych – European Broadcasting  
Union**

How can you automate your network infrastructure in a decentralized and collaborative way? We will tell you how we did it at the JT-NM Tested events!

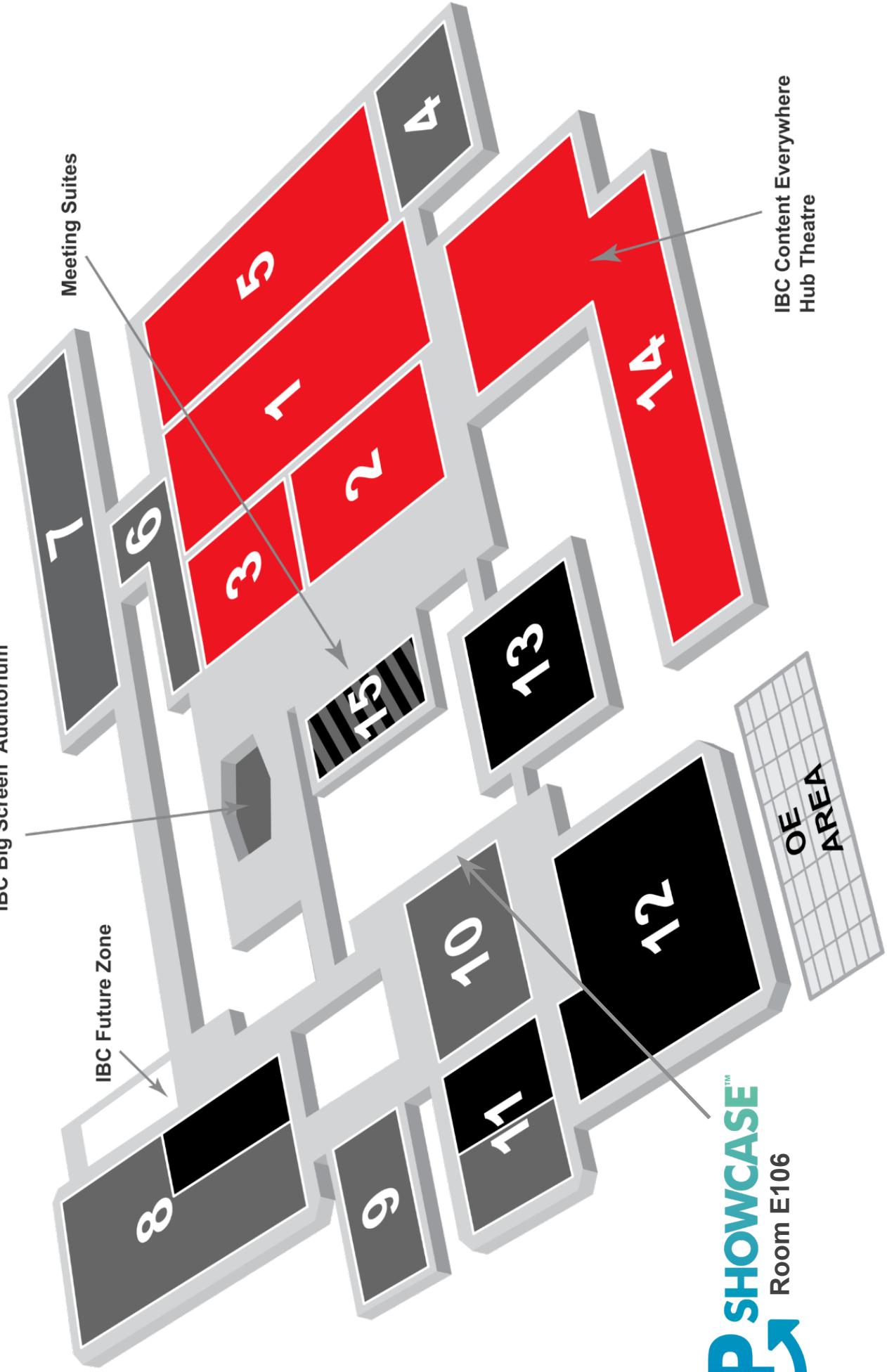
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