

### BIOS

TUESDAY 15 JUNE 2021 (10:00 – 17:45 CEST)

10:00 – 10:15 **Welcome & Introduction**



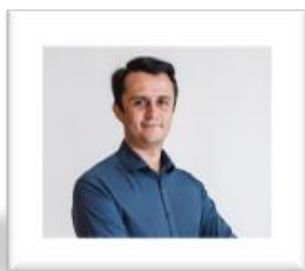
**Antonio Arcidiacono** is the EBU's Director of Technology & Innovation. He has extensive experience in conceiving, developing and taking new products and services to market. He is an internationally acclaimed expert in digital television, satellite communications, IP-based multimedia services and mobile telecommunications. With strong knowledge of the European market, he has worked closely with the leading players in the fields of Digital TV and Multimedia Services, and with European institutions at a technical, standardization, regulatory and competition level. Antonio was Director of Innovation, and a Member of the Management Committee, at Eutelsat from 2008 -2018 where he was responsible for launching innovative IP based satellite services. He joined Eutelsat in 1990 and took part in key phases of its development from an international organization to privatization in 2001 and to the IPO in 2005. Before working at Eutelsat, Antonio worked for the European Space Agency and started his career working for Telespazio and Selenia Spazio. He has a Doctorate in Electronics & Telecommunications Engineering from the University of Pisa.

**Hans Hoffmann** (PhD) is EBU Senior Manager and head of unit on media fundamentals and production technologies in the EBU Technology and Innovation department. He has been for 9 years with the Institut fuer Rundfunktechnik (IRT) as research staff in new television technologies until moving to the EBU in 2000. In the EBU he has been leading many activities on media integration, production technologies, technology evaluations, and he established the EBU HDTV testing lab, and work with EBU Members on IT based digital workflows and open innovation strategies. More recently he and his team looked at emerging technologies such as immersive media (UHD, NGA), AI-Data, EU 5G projects, IP and cloud-based media. Hans is the current president of the SMPTE for 2021-22 ("the global home for media professionals, technologist and engineers"). He has been author of many EBU Technical documents; IEEE papers and is a standing speaker and contributor to international conferences and recipient of the 2020 Richard Theile Medal.



### SESSION 1: EMBRACING THE CLOUD

10:15 – 10:45 **Introduction**



**Conrad Gouws** has been working in broadcast technology for 13 years. Conrad joined RTÉ in 2014 as a broadcast systems engineer, and is currently working as RTÉ's Technical Architect. Along with Markus Ostertag from SWR Conrad chairs the EBU Hybrid and Cloud Based Production group

10:45 – 11:15 **Audio in the Cloud with AES67**

This presentation highlights the challenge of moving AES67 streams out of the LAN and into the WAN and Cloud. We will see how problems like delay, sync and reliability can be addressed and the challenge of processing AES67 streams in the cloud. Real world experiences will be discussed as illustrations



**Nicolas Sturmel** is a senior technologist at Merging Technologies, working on simplifying and improving use of media networks. He is the product Manager of ANEMAN, an open specification software that aims at simplifying connection and monitoring devices. He is involved in the standard committee on AES67 development where he is currently leading a project on AES67 beyond the LAN (WAN, Cloud). He also was a testing leader during the 2017 and 2018 AES67 and ST2110 testing event. Before that, Nicolas worked as Head of Research for Digigram from 2012 to 2016 and for the French research center (CNRS). Nicolas got a PhD from the University of Paris Saclay and a Master from UPMC/IRCAM.

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### 11:15 – 11:45 **Moving infrastructure to the cloud? How to measure the impact**

As we are moving more and more our infrastructures in the cloud, it's important to understand its environmental impact. We propose a protocol to measure cloud infrastructures.



**Cedric Lejeune** (Workflowers) Starting as a VFX artist, then an application engineer for media systems, been lucky enough to participate the early days of digital cinema post-production.



**Benjamin Davy** (teads.tv) Engaged in measuring the environmental impact of our digital advertising platform at Teads. Working on tools and methodologies to better grasp the underlying physical reality of cloud infrastructure.

### 11:45 – 12:15 **High Quality Live Production in the Cloud, with CDI and JPEG XS**

While ST 2110-20 brought uncompressed over IP to the on-premises broadcast plant, it is not well suited for transport to or inside the cloud. The open-source Cloud Digital Interface (CDI) SDK abstracts software interfaces for uncompressed video, audio, and metadata flows inside the cloud. AWS implements CDI using the Scalable Reliable Datagram (SRD) cloud-fit mechanism for media transport. To get media to and from the cloud, JPEG XS is an attractive high-quality, low-latency codec. This talk will look at CDI, SRD, and JPEG XS, and will describe how these technologies were used by a new media center built by the US broadcaster FOX.

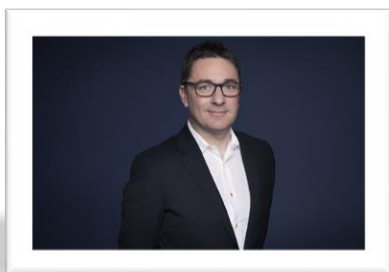


**Thomas Edwards** is a principal solutions architect at Amazon Web Services (AWS), specializing in media and entertainment. Before joining AWS, he spent 20 years working for broadcasters PBS, Fox, and Disney on satellite systems, digital TV, and advanced video projects. He explores, proves out, evangelizes, and standardizes media technology. He holds an MS degree in electrical engineering from the University of Maryland, is a board member of the Video Services Forum and Streaming Video Alliance, is a SMPTE Fellow, and was awarded the SMPTE Workflow Systems Medal for his work on live IP production technology.

## KEYNOTE

### 13:30 – 14:00 **Keynote**

Experience and lessons learned from adopting cloud-based live production workflows and technologies.



**Paul Cheesbrough** is the Chief Technology Officer and President of Digital for Fox Corporation. In this role, he leads the Company's technology teams and operations and also oversees FOX's digital strategy and streaming products. Before the March 2019 spin off of FOX by 21st Century Fox and the establishment of FOX as a standalone public company, Mr. Cheesbrough served as Chief Technology Officer for 21st Century Fox, where he oversaw the Company's technology operations globally. Prior, he served as Chief Technology Officer for News Corp, overseeing the enterprise technologies and digital products and platforms across the business as well as the technology investment portfolio. In these roles, Mr. Cheesbrough has led significant change and transformation through the implementation of modern technologies using internal teams and a range of established and earlier stage technology partners. Before joining News Corp, Mr. Cheesbrough served as Chief

Information Officer at the Telegraph Media Group, where he pioneered the development of a wide range of new digital products. Earlier, he was the Controller of Digital Media for the BBC, having started his career in IBM's media division as a software engineer.

### SESSION 2: GOING HYBRID

#### 14:00 – 14:30 Introduction and tour

We'll take the audience on a virtual tour through VRT. What have we been doing lately? Working on IP based facilities, introduce prosumer tech and took a deep into game engines for virtual productions.



**Willem Vermost** recently moved to VRT as Design & Engineering Manager. Prior to this role, he was the subject of the transition to IP-based studios at the European Broadcasting Union (EBU). With 20 years of experience in broadcast, he is an expert and project manager of international strategic, expert groups and events. Willem has a master in electrical engineering and a master in applied computer science. He worked on several projects, including the multi-award-winning VRT Live IP proof of concepts, the JT-NM Tested Program. He acted as a deputy in the JT-NM admin board and the AWMA board of directors. As a faculty member of the EBU Academy, he provides training on the transition to live IP-based media facilities and is passionate about the underlying mechanisms of IP-based media. Willem started the open-source project EBU Live IP Software Toolkit project (LIST) which has grown into an international project. Recent efforts at VRT focus on new possible workflows with Software-Based Studios.

#### 14:30 – 15:00 Video editing in our on-prem cloud

We will present the results of the proof of concept "Video editing with Vmware" (with Nvidia vGPU)



**Jonas Rymenants** is an enthusiastic young system engineer at VRT with a background in video editing and graphic systems at VRT. After his studies "multimedia technology" Jonas first started out as a broadcast technician at a Belgian commercial broadcaster. He joined VRT in 2016 where he quickly proved himself to be a great addition to the technical support department. During this corona year, Jonas has been absolutely key in developing and enabling our remote video editing solutions at VRT.

**Joris Grauwels** is a linux and virtualisation expert at VRT. He joined VRT in 2006 and through the years has taken up several different roles and responsibilities within the Technology Department, always with a focus on bringing the benefits of virtualisation, automation and monitoring to the forefront. One of his most recent projects has been the design and deploy of

the virtual environment for the new radio playout system but he has also been heavily involved in the virtualisation process of VRT's Media Asset Management system and other core mediaIT systems at VRT.



#### 15:00 – 15:30 RIPE Atlas - Probing the state of the Internet

This presentation will be about RIPE Atlas, a platform to measure the Internet infrastructure

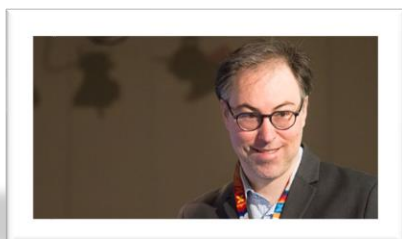


**Emile Aben** is a research scientist at the RIPE NCC, one of the 5 Regional Internet Registries. He builds prototypes and analyses the global Internet, specifically around IP interconnect and the border gateway protocol (BGP).

### SESSION 3: DELIVERING ON-PREM

#### 16:00 – 16:45 Introduction and tour

CBC/Radio-Canada are currently moving to their new broadcasting house in Montreal, they will give us a visit of the new facility that is built with all-IP technology.



**Félix Poulin** is with the national public broadcaster CBC/Radio-Canada where he leads the Media over IP Architecture Lab. Before that mandate, Felix was lead expert on live IP at the EBU. Felix completed his diploma in electrical engineering at Montreal's Polytechnique with his final thesis done at MIT. Felix is an active contributor to the SMPTE, EBU and user-chair of the AMWA NMOS Steering board.





**Francois Legrand** has been with CBC/Radio-Canada since 2004. He joined the Corporation as a designer of broadcast systems and became an electronic engineer in 2005. In this role, he has been involved in a wide range of projects and has had a variety of different responsibilities, such as the design of digital, television and radio systems, the preparation of plans and specifications as well as the financial management and supervision of large-scale projects. From 2011 to 2016, he has held several management positions such as Operations Manager, Regions of Quebec, where he coordinated the technological development of Quebec's regional stations and Senior Project Manager within the Transformation Unit of CBC/Radio-Canada's French Services where he played a major role in the transition of all national news shows to automated production. Since 2015, François is now Senior Director of Core Systems Engineering where he manages a team responsible for all capital projects related to CBC/Radio-Canada core infrastructure, including the implementation of the new media over IP infrastructure.

François is frequently invited to present the initiatives and the technological vision of CBC/Radio-Canada for conferences like IBC, the NABSHOW and various SMPTE and EBU activities.

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### 16:45 – 17:15 **Networked microphones and IEM**

A sound signal from a person's mouth to a person's ear can be broken down into tiny, networked, controllable components. This presentation explores the hidden complexities in networked audio and the challenges of wireless microphones in a large production facility.

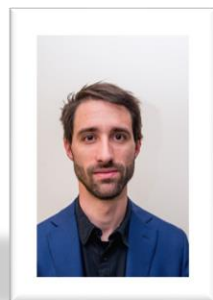


**Anthony Kuzub** (CBC/Radio Canada) is a 3rd generation recording / broadcasting Engineer. 20+ years of owning music studios, producing / mixing TV audio. He Chairs AES Toronto and AES sub committee on Connectors and EMC practices. He Leads Engineering projects with the CBC Media Technology and Infrastructure Services.

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### 17:15 – 17:45 **Metecho: One Year after OnAir: What has changed?**

Over the years, the EBU community has been able to follow SRG's Metecho project: A sophisticated full IP facility for SRF in Zurich. Since exactly one year the new building has the first services OnAir. One year later, Sandro's presentation provides some insights into the project, an overview of the sub-projects that are still open and some lessons learned. What is new for the journalists, for the editors or for the technicians when working in a full IP facility? How are outages or interruptions handled? And what's next?

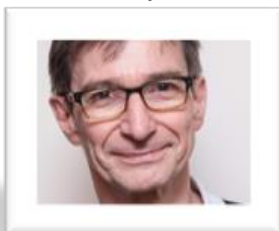


**Sandro Furter** is working as a Project Manager at SRF in Zurich. He is responsible for the IP community and the realtime IP technology. With his team, he focusses on the implementation of a SMPTE ST2110 based building on an all-IP production facility for TV, radio and online. Sandro graduated from FHNW University of Applied Sciences and Arts Northwestern Switzerland with a bachelor degree in systems engineering and a specialization in realtime systems. As a holder of the IPMA Level C certification he has extended project management skills to lead large projects.

WEDNESDAY 16 JUNE 2021 (10:00 – 16:30 CEST)

### KEYNOTE

10:00 – 10:30 **Keynote: The race to re-tool the media factory**



**Mark Harrison** began as a freelance film director, winning numerous awards. He later became BBC Head of Arts; Head of Multiplatform; Controller of Production, BBC North and Director of Transformation, BBC Design & Engineering. In 2015 Mark became Founder and CEO of the DPP – the media industry's business network, with over 400 member companies worldwide.

### SESSION 4: LOOKING INTO THE FUTURE

MODERATED BY LUCILLE VERBAERE (EBU)



**Lucille Verbaere** joined EBU as Senior Project Manager, coordinating Media Cybersecurity activities. She has 20y-experience in Cybersecurity, Telecommunications, Air Transport and Semiconductor industries: she started as an R&D engineer at ST Microelectronics, doing research on wireless telecom systems (Today's IoT domain). Then Lucille joined SITA as program and product manager for infrastructure and cloud-based data management services to airports and airlines worldwide. In her last position at ID Quantique in Geneva, Lucille was responsible for a portfolio of cybersecurity products, based on quantum physics.

10:30 – 11:00 **Synthetic Reality: VR meets Broadcasting**

VR and AR are emerging as both potent technologies and active marketplaces. Both offer opportunity to leverage the best of traditional broadcasting with these incredible emerging forms. A discussion based on some early experiments with Mixed Reality productions.



**Michael Nunan** (Bell Media). A 29-year veteran of the Television and Audio industries, Michael is a multi-disciplinary specialist in Production and Post-Production Sound, with emphasis on multi-channel acquisition, editing, sound design and mixing. Michael has an international reputation for his work in the deployment of multi-channel sound technologies and workflows in large-scale broadcast environments, and for his advocacy for immersive surround production in long-form factual, music and variety production.

11:00 – 11:30 **Virtual production – the new picture**



**Ed Plowman** (DISGUISE) 27 years industry veteran technologist working ostensibly in multimedia, graphics, gaming, computer vision and more recently machine learning applications. Linked to industry changing events like the founding of Khronos Group, creation of OpenGL ES, the mobile graphics revolution and the rise of heterogeneous compute afforded him unique experience and considerable knowledge

**Raed Al Tikriti** is the Chief Product Officer at disguise and is responsible for the product strategy and roadmap. Prior to disguise, Raed spent 20 years at Grass Valley where he ultimately ran the payout business and championed the transition to software and the cloud.



### 11:30 – 12:00 Quantum Technologies and their applications for telecommunications

I will introduce quantum technologies, highlighting why they are so unique. I will briefly describe quantum imaging, sensing and timing before addressing quantum computing and quantum communications in more depth. I will cover the work BT has been doing here over the past 8 years including our various trials of Quantum Key Distribution, which is an ultra secure method of encrypting optical transmission links. Finally I will look to the future and introduce the so-called quantum internet.



**Prof. Andrew Lord** heads BT's optical core, access and quantum research. He was Chair of the Optical Fiber Communications Conference 2017 in Los Angeles. He is Visiting Professor at Essex University. He won the prestigious BT Martlesham Medal in 2018. He leads the AIRQKD UK-funded collaborative project on Free-space QKD.

### TECHNOLOGY BRIEFINGS

#### MODERATED BY IEVGEN KOSTIUKEVYCH (EBU)



**Ievgen Kostiukevych** is a member of the EBU Technology & Innovation team. He has gained more than a decade of experience in the broadcasting and sound production industry, including experience in change management, solutions architecture and AoIP integration. He is working on topics of IP networks, media over IP, PTP, networks programmability and automation, etc. Ievgen is a member of SMPTE and AES.

### 13:00 – 13:45 How clouds are built

This presentation starts with a service-orientated approach to public cloud operations. It maps those offerings against the major public cloud providers products. Then it discusses orchestration against multi-tenanted and multi-cloud environments covering the current potential solutions in the marketplace. By using a "virtual server" as an example, we show how on deployment all the required resources are deconstructed and abstracted. Finally, we summarize with an example use case how users are already capitalising on these capabilities.



**Thomas Kernen** is a Senior Staff Architect at NVIDIA. His main area of focus is defining architectures for transforming the broadcast industry to an All-IP infrastructure. He is a SMPTE Fellow, serves as co-chair of SMPTE's 32NF committee and is a member of the IEEE Communications and Broadcast Societies. Thomas has served for many years as the editor of the Digital Video Broadcasting (DVB) TS 101 154 "Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream" supported by millions of digital receivers worldwide. Additionally, he has authored over 20 publications in leading journals, holds multiple patents that cover both network and video coding optimizations for media transport and delivery. Kernen is a frequent speaker at leading industry events both in broadcast and networking industries. Prior to joining Mellanox (acquired by NVIDIA), Kernen spent over 20 years in the IP industry including driving Cisco's entry into live media production, co-founding Internet Service Providers,

Telecom carriers and architecting Fiber to the Home networks.

**Richard Hastie** currently is a Senior Business Development Director for NVIDIA (previously Mellanox which was acquired) specializing in Video, Cloud and Edge use-cases. Richard has worked across Information Technology for over 25 years in a variety of different verticals including Telecommunications, Financial Services, Cloud Services and Media and Entertainment. He currently focuses on Media use-cases across the cloud, on-premise and edge landscapes. He has worked in and around the broadcast production industry for nearly 10 years. During this time he has been at the forefront of the digital transition to IP-based networking, playing a key role in the establishment and growth of Studio Video over IP. His main focus is supporting customers and partners deploying leading video and edge solutions for all markets. He has a strong passion for reducing customer costs and improving business agility. He sees software-defined broadcast as the future and operating agnostically across on-premise, hybrid and cloud infrastructures as being the key to optimising and democratising the future of broadcast and content





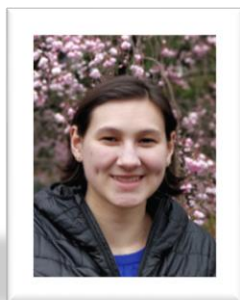
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creation. He represents NVIDIA in several bodies including SMPTE, AMWA, VSF, AIMS with the goal of driving and accelerating the adoption of software-defined broadcast ecosystems. In a prior life, Richard was a keen skydiver and has had the honor of parachuting into Manchester United's stadium.

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### 14:00 – 14:45 **Getting started with cloud deployment for media applications**

An introduction to common deployment and automation tools such as Docker, Terraform and Ansible. We'll demonstrate how they can be used to deploy practical systems to your own (or public!) cloud, along with having a look at how a mature development team manage and automate deployments of cloud-fit production systems.



**Georgina Shippey (BBC)** is part of the Computing and Networks at Scale Team (BBC R&D, Automated Production and Media Management) where alongside helping to maintain a private cloud deployment she has looked into Federated Authentication systems.

**Sam Mesterton-Gibbons (BBC)** is Project R&D Engineer at BBC R&D, investigating software-based production systems built around scalable cloud services, and how they can be used for various workflows to move, store and transform media, while using automated testing, CI/CD and Infrastructure as Code techniques to automate as much of

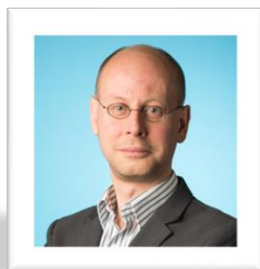
the system as possible. @samdbmg (Twitter, LinkedIn, GitHub, etc.)



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### 15:00 – 15:45 **Perfecting ST2110 with testing capabilities**

Now SMPTE ST 2110 is being operated in many facilities and OB vans, it is time to complement it with some recommendations concerning testing and measurement. This presentation will cover the latest efforts of the industry in achieving this goal.



**Willem Vermost** recently moved to VRT as Design & Engineering Manager. Prior to this role, he was the subject of the transition to IP-based studios at the European Broadcasting Union (EBU). With 20 years of experience in broadcast, he is an expert and project manager of international strategic, expert groups and events. Willem has a master in electrical engineering and a master in applied computer science. He worked on several projects, including the multi-award-winning VRT Live IP proof of concepts, the JT-NM Tested Program. He acted as a deputy in the JT-NM admin board and the AWMA board of directors. As a faculty member of the EBU Academy, he provides training on the transition to live IP-based media facilities and is passionate about the underlying mechanisms of IP-based media. Willem started the open-source project EBU Live IP Software Toolkit project (LIST) which has grown into an international project. Recent efforts at VRT focus on new possible

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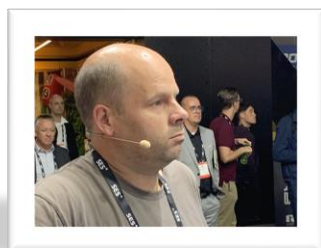
**Pavlo Kondratenko (EBU)** is a project manager (media production over IP networks) at EBU Technology & Innovation. His background is network engineering. He is a document editor of PICS for SMPTE ST 2110 standards suite



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### 15:45 – 16:15 **Pre-wrap up: One more thing... Keep Safe!**

A last word of advice on keeping safe and/or secure and avoiding unnecessary risks in these challenging times.



**Gerben Dierick** combines running the network team at VRT with his role as Information Security Officer. He currently co-chairs the EBU's Media Cybersecurity Group and lectures on networking and cybersecurity topics at the University College Leuven Limburg.

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### 16:15 – 16:30 **Wrap-up**

**Ievgen Kostiukevych (EBU)**

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