

EBU

OPERATING EUROVISION AND EURORADIO

PRODUCTION TECHNOLOGY SEMINAR

FROM LINEAR TO AGILE**TUESDAY 24 JANUARY**

KEYNOTE SESSION



09:00 – 09:05

Welcome to PTS

Dr Hans Hoffmann 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 production technologies department until moving to the EBU in 2000. In the EBU he has been leading many activities on media integration, production technologies, video codec evaluations, he established the EBU HDTV testing lab, and work with EBU Members on IT based digital workflows and recently UHDTV. He has been author of many EBU Technical documents; IEEE papers and is a standing speaker and contributor to international conferences.

Hans is a fellow of the SMPTE and a member of the SID and FKT and IEEE and was the SMPTE Engineering Vice President from 2011-13.



09:05 – 09:15

Introduction to PTS and moderator of the day

Mathias Coinchon is currently chief technology officer at rts swiss radio and television. before joining rts he was senior project manager at ebu technology&innovation in the fields of digital&hybrid radio, audio/video over ip and open source software. he was also vice-chair of worlddab technical committee and currently chairs radiodns organisation. his other past experiences include bbc research&development, swiss radio and srg-ssr. as a partime activity, he's also created opendigitalradio, a non-profit association maintaining open source software used for small scale dab in europe. he holds a master in communication systems engineering from epfl in switzerland.



09:15 – 09:45

Al Jazeera – Moving an organization into the cloud future

Miljenko Logozar (Aljazeera) With more than 20 years' of experiences in Television industry, Miljenko has over ten years' experiences as Technical and Operation Director. In his successful career, he builds and lead technical and operational teams and with them build a few TV stations. Recently he was responsible for delivering technical part of Al Jazeera Balkans and Al Jazeera America projects. Currently, he holds a position Director of Technology Solutions & Integrations and Chief Solution Architect for AJWT project for Al Jazeera Media Network in Doha. He would prefer to take responsibility for technology and operations.



09:45 – 10:15

Television but not as we know it

Linear technologies, and to a broader extent linear business models, are on the decline as new agile platforms and working practices are re-shaping today's media landscape. From creation to consumption, subtle paradigm shifts will favor players who can evolve and adapt to this brave new world of video content.

Michael Nugent (ERT) holds the position of Manager of Technical Development and Planning at the Greek Broadcasting Corporation (ERT) and is responsible for the public broadcaster's technology investment plan. With over 20 years of experience in television, Michael has served in engineering and management positions for the private and public sector. He is currently a member of the European Broadcasting Union (EBU) Technical Committee, contributing towards the goals and objectives of the EBU technical community. He holds a Bachelor in Electrical Engineering from Rice University, Texas, USA, and a Master's degree in Business Administration from ALBA, Athens, Greece.

SESSION 1: LATEST TRENDS IN CONTENT PRODUCTION

11:00 – 11:25

Digital First Strategies – Experiences of Web only Networks

Malte Blumberg (SWR)

11:25 – 11:50



Beyond the Virtual Studio – the world of Lightfield in real production

The computation of multi camera data or images from microlens arrays enables now a modelling of the lighttrays from real scenes. Lightfield computation allows using real captured scenes in the same way as CGI. Refocussing, depth calculation, relighting and virtual camera insertion are only some of the new tools based on lightfield. The presentation explains the principles of lightfield and its use in real applications.

Dr. **Siegfried Foessel** is head of the department Moving Picture Technologies at the Fraunhofer IIS in Erlangen and spokesman of the Fraunhofer Alliance Digital Media. He was responsible for projects like the camera development ARRI D20/D21, the DCI (Digital Cinema Initiatives) certification test plan or the JPEG2000 standardisation for Digital Cinema. Siegfried is member of various standardisation bodies and organisations like SMPTE, FKTG, ISO and DIN. In 2013 he received the SMPTE Fellow award for his work in Digital Cinema. In 2014 he received the Josef-von-Fraunhofer award for the development of easyDCP, a tool for creating and playback of Digital Cinema Packages. In 2014 he was elected to the president of the FKTG (Fernseh- und Kinotechnische Gesellschaft e.V.), the German equivalent to SMPTE. Since 2016 he is SMPTE board member and regional governor for Europe.

11:50 – 12:15



Haptic Tactile Essence in Live Broadcast Production

Haptic-tactile broadcasting is The end to end use of technology to capture, encode, broadcast – transmit, transport, decode, convert and deliver the haptic - tactile information [“feeling” or “impact”] of a live event so that a remote viewer can receive and experience that same haptic-tactile experience at a remote location, regardless of the means of broadcast - transmission and transport. This presentation will provide an overview of this new technology and discuss the various issues to be considered in the capture, addition and management of the live haptic data as well as end user considerations for the ultimate use of this haptic essence.

Mark Luden – President and CEO, The Guitammer Company. Mark has held positions with increasing executive responsibilities in sales, marketing and management in the enterprise software industry for 13 years before joining Guitammer Company. Mark is a member of the Standards Community of the Society of Motion Picture and Television Engineers (SMPTE). Mark is a past member of the Consumer Technology Association's Board of Industry Leaders and a member of its Executive Board in 2010 and 2011. Mark is the author of one issued patent, "Capture and remote reproduction of haptic events in synchronous association with the video and audio capture and reproduction of those events" and several patents pending in the haptic-tactile broadcasting space. Company)

12:15 – 12:40

New time code for IP on the horizon – why?

Howard Lukk is Director of Engineering and Standards for the Society of Motion Picture and Television Engineers (SMPTE). In this position he is working as a member of the staff responsible for maintaining the technical infrastructure for both the home office and the Standards Community. He is also an Associate member of the American Society of Cinematographers (ASC) and holds patents in the area of stereoscopic and computational cinematography. When he does have a rare day off you can find him filling the time making films and music.

SESSION 2: AGILE PROJECTS

14:00 – 14:25



BBC NewsLab - Best practises in successful media software projects

BBC News Labs is a partnership between editorial and technical teams. Its success depends on multi-disciplinary teams working closely with newsroom colleagues to create practical innovations. The innovations span internal tools and audience facing experiences. Not all innovation processes run smoothly, but we have gained an understanding of the main factors likely to cause problems, chief of which is the different expectations of editorial and technical teams. The Alto project is a good example of the challenges and advantages of this way of working, as the BBC creates a tool which will allow machine assisted translation and synthetic voices to increase the number of videos available to its online language service users.

Robert McKenzie is Editor of BBC News Labs, which leads innovation for the BBC across News. Leading a small, multidisciplinary team of developers, technologists and journalists (with some people combining more than one skill) Robert introduced the informal team mission statement “we’re here to help”. News Labs acts as a bridge between News, BBC R&D and best practice in the rest of the industry, providing agile solutions to problems for journalists and new approaches to audiences. Before joining News Labs, Robert spent nearly 25 years working in business, personal finance and technology journalism.

14:25 – 14:45



How we transformed our company culture to Lean-Agile – The story of the transformation of Finnish Broadcasting Company.

Mirette Kangas (MA & MBA) is the leader of lean-agile development at Finnish Broadcasting Company (Yle). She has 20 years experience of digital services in various roles and companies. During the past four years, she has led transformation from traditional project management to lean-agile model in all company levels at Yle, from service development to top executive team. Lean-agile transformation and new company culture is also scaled from internet to other areas and units such as traditional broadcast production and design, creative content, multiplatform and transmedia development, strategic management of key programme projects and the whole leadership culture in several units. In autumn 2016 the lean-agile model and company culture transformation of internet management at Finnish Broadcasting Company was awarded as the Best Lean Performance of The Year by Lean Association of Finland.



14:45 – 15:10

Changing the core of broadcasting at NRK

Norwegian broadcaster NRK have changed the core of its broadcasting infrastructure based on EBUcore and new CCDM. With agile development they have built a new metadata infrastructure spanning from ingest to publishing. The work includes both internal software development / user interfaces / workflows and external component deliveries (Tedral). Agile development is based on open source code and semantic web components – which now also is included in EBUcore version 1,7. How was this work done – and how did they manage to keep old systems running together with new components delivered after agile principles – and without crashing radio and TV-operations or web/mobile publishing?

Geir Børdalen (NRK) Background as a journalist and media engineer, project and process manager, head of news technology for 10 years, head of investments for 7 years. Project manager for NRK web-player software development for 3 years and for Origo project for 3 years

SESSION 3: TUTORIALS (15:40 – 17:10)

Tutorial 1



VR production deep dive – part 1

Pierre Routhier (Digital Trouble Maker) Former Aerospace Engineer Pierre Hugues Routhier, Eng., M.Eng., is a specialist in advanced imaging technologies. He has developed innovative solutions and workflows for studios and post-production facilities in all fields of advanced imaging: Ultra-High Resolution, High Dynamic Range, High Frame Rate, Stereoscopic 3D, etc... He is credited with more than a dozen patents related to advanced imaging and is published in several industry papers. He is currently working with major studios and broadcasters on production, research and training related to advanced imaging.

Tutorial 2



Object based audio production

Matthieu Parmentier (francetelevisions) started his audio career recording classical music CDs. He joined France Televisions in 1999 as a sound engineer for live programs, then in charge of sound recording, video editing and outdoor satellite transmissions for the news department. Since 2008, he has been working as manager for 3D audio and UHD video development projects, also organizing conferences and professional workshops. Matthieu chairs the audio strategic programme of the European Broadcasting Union, the French section of the Audio Engineering Society and chairs or participates in several collaborative R&D projects. He holds two license degrees in sound recording and video post-production and a master degree in audiovisual research from the Toulouse II University.

France Televisions is the French public TV broadcaster in charge of 5 national channels, 49 local channels and 9 overseas TV and radio channels. All its programs are available live and on demand through IP networks over connected TV, PC, smartphones, tablets and video game consoles.

Head tracked Immersive Binaural



Jean-Christophe Messonnier (CNSMDP) is a sound and acoustic engineer working for the Conservatoire de Paris (CNSMDP). He is also teaching recording and post-production methods.

Tutorial 3



Colour spaces – mix and match

Color Rendering – “From Camera RAW and LogC Wide Gamut to SDR and HDR as well as Rec.709 and Rec.2020” Color Space Conversion – “How to convert between different primaries like Rec.709 and Rec.2020 and between different transfer curves like Gamma, PQ and HLG?” Losses in Color Space Conversion – “How many lattice points are needed when using 3D-LUTs for color space conversion?” Gamut Mapping Strategies – “How to treat out of gamut colors when down converting from Rec.2020 to Rec.709?”

Harald Brendel is the Principal Engineer Image Science at Arnold & Richter Cine Technik in Munich since 2010. He started his career in post-production where he worked for more than 10 years. In 2001 he went to New Zealand to work for the Lord of the Rings Trilogy as Imaging Technology Supervisor.

Jan Froehlich is Senior Image Scientist at ARRI Munich. He recently submitted his PhD on high dynamic range (HDR) and wide color gamut (WCG) imaging. During his PhD he worked for Dolby Laboratories contributing to the development of the ITU Rec.2100 ICtCp color encoding and the Dolby Vision HDR and WCG content distribution platform. Before starting the PhD he was Technical Director at CinePostproduction GmbH in Germany. Jan is member of SMPTE, IS&T, SPIE, FKTG, and the German Society of Cinematographers (BVK)



Tutorial 4

Cloud & Virtualization in Professional Media

Rainer Kellerhals, in his role as Industry Lead Media & Cable EMEA at Microsoft, advises large media and cable companies on using the Microsoft software and services platform to streamline business processes, to reduce cost and to generate new revenue streams from interactive media experiences. Mr Kellerhals joined Microsoft in 2006 and has held several solution sales and sales management positions in the European and worldwide sales and marketing organization at Microsoft. Prior to joining Microsoft, Mr Kellerhals held senior management positions at one of Europe's most successful independent software vendors for large-scale media asset management systems. His responsibilities included product strategy, marketing, and sales management. Mr Kellerhals holds an M.D. (Diplom) in business administration and mechanical engineering from the University of Kaiserslautern in Germany. Following his studies, he worked as a research associate and lecturer, training students in using office applications and ERP systems and contributing to research on hypertext and hypermedia systems. &



Thomas Heigl (Microsoft) is responsible for the huge ecosystem of industry specific solutions running on the Microsoft cloud. He works with customers and partners helping to transform their business models into the digital era. The relationship between man and machine is at least as complicated as fascinating so Thomas spent his whole professional life building bridges between users and technology. Working with the power of the biggest software company on the planet and a rapidly changing media industry Thomas has gained a lot of experiences with digital transformation projects.

WEDNESDAY 25 JANUARY

MODERATOR OF THE DAY



Frans de Jong (EBU) holds a Masters degree in Information Theory from Delft Technical University. He has worked in the media industry all his life, both in hands-on and in development roles. Since 2003 Frans works at the EBU as a Senior Engineer in the production technology domain. He currently focusses on QC, IMF and subtitling. Frans is fond of cable cars and LEGO, two things which combine well.

OPENING KEYNOTE



09:00 – 09:30

Planet Earth 2 in UHD and HDR

Andy Qusted (BBC) started life in the BBC as a Technical Assistant becoming an editor in 1982 working across a range of BBC output but is best known as the editor of Keeping Up Appearances! In 2000 Andy moved to the BBC Technology Group taking a lead in the BBC's strategies for HD, 3D, UHD, QC and file workflows. Currently Andy is leading the work for the BBC's automated quality control project, is the technical lead for the UK Digital Production Partnership's AS-11 file format and chairs the EBU strategic Quality Control programme including the IMF sub group. Working as an ITU Rapporteur Group chair, Andy has lead international work on 3D, QC and the group looking at High Dynamic Range standards and is now chair of the ITU's Working Party 6C which is responsible for production and exchange standards including Recommendation ITU-R BT.2011 – HDR-TV.

SESSION 4: UHDTV IN PRACTICE

09:30 – 09:55

ARTE UHD trial production and UHD HbbTV streaming

Lothaire Burg (ARTE)

09:55 – 10:20

Establishing a UHD 24/7 Service

Markus Heinen (Qvest Media) Leading the system integration team of Qvest Media over 10 years, delivering international projects in the broadcast area



10:20 – 10:45

A UHD HDR documentary production

Michael Pochert (ZDF) Education as a Radio- and TV-technician.
A degree from the technical university in Kaiserslautern in communication and computer sciences
Lecturer and Product Manager by Sony and Panasonic
Production Engineer and involved by the creation of the New Media Department at ZDF
Head of Technical Training
25 semesters as a lecturer at the university of applied sciences in Wiesbaden
Member of the Project-Team "Children of the wild"

SESSION 5: STRATEGIC OUTLOOK ON IMMERSIVE MEDIA

11:15 – 11:30

UHDTV Standard Update and EU migration plans?

Adi Kouadio (EBU)



11:30 – 11:55

UHD Televisions: Immersive Viewing or Numbers Marketing?

Paul Gray (IHS) is a Principal Analyst/Researcher within the IHS Technology group. Mr. Gray joined IHS in November 2014, when IHS acquired DisplaySearch, a leader in primary research and forecasting on the global display market. At DisplaySearch, he served as director of European research. In addition to TVs, he also covered wearable devices, digital broadcast and semiconductor technology. He conducted in-depth analysis and forecasting of wearable devices, connected TV and 4K Ultra HD. Mr. Gray has more than 20 years of experience in market intelligence, marketing and product management. His work includes forecasting, product strategy, investment and R&D decisions. He has also been involved in consulting and conferences, and he has been cited as an expert in Nikkei, Los Angeles Times, Le Monde, Financial Times, The Korea Herald and other publications.



11:55 – 12:20

DTVP/DTG Plugfest Update & Objective BT.2020/HDR Display Evaluation

The German TV Platform / DTG organized the 5th UHD Plugfest for equipment interoperability tests, on-site debugging and HDR testing. Portrait Displays supported the event by conducting objective display performance test by the use of its CalMAN display calibration software. This paper provides a high-level summary of the Plugfest and shows where the CE industry currently stands in regards of UHD-1 – Phase 2 implementation, incl. PQ-EOTF, HLG, BT.2020 and its corresponding metadata recognition.

Marcel Gonska (PORTRAIT) features 20 years of professional business experience, covering the fields of content acquisition, post-production, CE, R&D, MARCOM, press organization, sales & training. Beside his activities as a video consultant and producer Marcel is the EMEA representative of Portrait Displays, the company behind the renowned CalMAN display calibration software. CalMAN offers artists and production companies total color accuracy and control from lens to lens in every step of the production workflow.



12:20 – 12:45

VR – What does VR/360 represents for broadcasters?

Prof. **Graham Thomas** leads Immersive & Interactive Content Section at BBC R&D, developing technology for new forms of content, with a focus on computer vision and image processing. His work has led to many commercial products, including a broadcast standards converter, and technology for sports graphics and virtual studios. Current work areas of his team include aspects of video standards beyond HD (higher frame rate and high dynamic range), augmented graphics overlays for video, and panoramic/immersive video for interactive scene navigation and VR. His team also covers audio work, including 3D and object-based audio. He is a Visiting Professor at the University of Surrey and a Fellow of the IET.



12:45 – 13:15

Panel discussion : Last Hurdles for UHDTV adoption ?

Dagmar Driesnack (IRT) graduated in Media Technology at the University of Applied Sciences in Mittweida. In her diploma thesis at IRT, she focused on quality investigations of HD codecs and on a comparison of HDTV formats. In summer 2006, she joined IRT as a research engineer and is now active in the department "AV Technologies" working on topics like compression in production, contribution and distribution for HDTV and beyond HD. She was leading the EU funded project DIOMEDES at IRT. She chaired the former EBU D/HDrec-group and now vice chair of the SP BHD group. She is also a member of the DVB project, SMPTE and the FKT.



& **Giorgio Dimino**, RAI Radiotelevisione Italiana, Research Centre of Turin. He is head of the research unit on digital archives and television production. His interests include the application of information technology in the broadcast production chain, the design of modern media archives and the evaluation of technical quality in video and audio signals. He is chair of the EBU Strategic Programme BeyondHD and co-chair of the FIMS Task Force.

SESSION 6: ADVANCED SOUND AND AUDIO

14:15 – 14:35

Internet-fit radio studio

Paul Morgan (BBC)



14:35 – 14:55

Loudness for streaming

Thomas Lund (Genelec) Out of a medical background, specialized in perception, Thomas has been active in global audio standards, and is current chairman of the EU committee to prevent hearing loss from the use of personal devices, e.g. smartphones, iPods and VR. Thomas has written more than 50 papers on multichannel audio, loudness measurement, audio quality and sound exposure. He holds position as senior scientist at Genelec.

14:55 – 15:15

Status quo of immersive audio

Florian Camerer (ORF)

15:15 – 15:55

Object based audio production for TV and VR content

Matthieu Parmentier (francetelevisions) & **Hervé Dujardin** (Radio France)

TUTORIALS (16:30 – 18:00)

Tutorial 1

VR Workshop on production and postproduction – part 2

Pierre Routhier (Digital Trouble Maker)

Tutorial 2

Object based audio production Head tracked Immersive Binaural

Matthieu Parmentier (francetelevisions) **Jean-Christophe Messonnier** (CNSMDP)

Tutorial 3

SDR HDR Cross conversion

Mike Christmann (University of Applied Sciences Wiesbaden)



Tutorial 4

Perspectives Cloud and Virtualization

Fox Networks Engineering & Operations is implementing a public-cloud based media supply chain. This includes transcoding, re-wrapping, QC, Closed Captions, and metadata management of video files coming from providers to prepare them for distribution. Goals of this project include reduction of labor costs, increased operational resilience, to elastically absorb peaks in volume, and establishing a transparent pricing regime on a unit cost basis.

Thomas Edwards is VP, Engineering & Development at FOX Networks Engineering & Operations, where he works on advanced technology development, such as UHD, OTT, and live IP production systems. Previous to joining FOX in 2007, he managed the engineering planning of the PBS video interconnection, and handled streaming media for the ISP DIGEX. He holds an M.S. in EE from the University of Maryland, is a board member of the Streaming Video Alliance, a member of IEEE, a SMPTE Fellow, recipient of the SMPTE Workflow Systems Medal, and chair of SMPTE 32NF-60 WG on Video over IP.

THURSDAY 26 JANUARY

MODERATOR OF THE DAY



Willem Vermost joined EBU Technology & Innovation as Network IP Media Technology Architect in 2016. He obtained a Master's degree in electronic engineering and a Master's degree in applied computer science. Before this, Willem gained 16 years of experience at the Belgian public broadcaster VRT in different roles. He has always sought to combine broadcast and IT technology in the best possible ways and in many different projects. Willem is a member of SMPTE and the AES.

SESSION 7: CONTENT LEVERAGING WITH METADATA



09:00 – 09:25

Valorising NHK content using Linked Data and WEB-API

This study was performed to discuss whether NHK contents were useful for tourism applications. In this experiment, we organized contents, which are EPG, VOD introducing Japan and web articles of food recipes, based on LOD (Linked Open Data) format in order to easily integrate them with other web services. Through an ideathon and a hackathon, we developed a tourism application which utilizes LOD and WEB-API. And we offered the application for examination to the participants of ISWC (International Semantic Web Conference) held at Kobe in Japan. The report introduces the way of integrating NHK's contents with other datasets and their usage in the application in practice.

Makoto Urakawa (NHK) studied image processing and earned the master degree of Information Technology in Yokohama National University. He joined NHK (Japan Broadcasting Corporation), which is the only public broadcaster in Japan, after graduating from the college in 2005. He worked as an operation engineer of production, playout, and terrestrial broadcasting for the first 5 years. After working as operational engineer, he was in charge of management of developing systems for broadcasting and internet services for 5 years. Now he's been studying about the way of apply the semantic technology to the broadcasting at NHK's Science and Technology Research Laboratories.

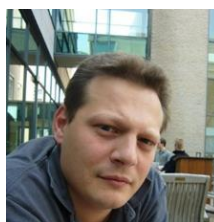


09:25 – 09:50

The power within – Using [meta]data to unlock the Radio Archive

Any Archive will come with a history (that's sort of the point) but how do you shape what you have, so that the items within become easier to find and more useful but also survive intact, to be re imagined again in the future. In this presentation Simon Tuff [BBC Principal Technologist] talks about the journey the BBC's radio archive has been over the last 5 years, how the team have used the relationship between metadata and essence to make it more useful to managers, programme makers and researchers and how that journey will continue using the next generation of technology...

Simon Tuff (BBC) is currently a Principal Technologist at the BBC but started his broadcasting career in Student Radio in 1983 when he was studying Electrical & Electronic Engineering at the University of Bradford. He joined the BBC in 1988 as a trainee Radio Engineer and having worked as an engineer across most the BBC's radio service. This expanded to include BBC TV work in 2006 when managing part of BBC R&D. He has worked on numerous BBC & EBU projects since including Loudness [& EBU R128], object based audio, binaural audio, audio over IP and audio archiving. Simon's current projects include introducing IP connectivity across the BBC's programme making infrastructure, development of a pan BBC Radio Archive and the introduction of environmental sustainable technology. He's a member of the DPP Technical Standards Committee and the World DAB Technical Committee. He chairs the Next Generation Audio group in the Technical Module of DVB and co-chairs the audio specialist group of FAME the Forum for Advanced Media in Europe working on a interoperable and sustainable approach to next generation UHDTV across Europe.



09:50 – 10:15

IMF-TV and metadata

Dan Tatut (Marquise Technologies) Dan Tatut benefits from over 15 years of expertise in computer science, computer graphics and colorimetry. He has founded Chrome Imaging in 1998 (products for the motion picture industry) and in 2010 he joined, as VP Business Strategy & Development, Marquise Technologies, a manufacturer and developer of high-end image processing solutions, in both broadcast & digital cinema fields. Today Dan focuses in the implementation of the IMF standard in Marquise Technologies product's range.



10:15 – 10:40

Data Journalism in RAI

Dr. Alberto Messina (PhD, 1971, M) is R&D Area Coordinator at RAI-CRIT, in the area concerning technologies for automatic extraction of information from media analysis. He is co-author of more than 80 technical and scientific publications and collaborates with international research institutions worldwide. He is

chair of the EBU Strategic Programme on Media Information Management. He worked in many financed projects including VISION Cloud, winner of IBC 2013 Special Award. His research activities have been awarded in 2010 with the award of Confindustria ICMT, delivered to RAI by Giorgio Napolitano, former President of Italian Republic.

SESSION 8: IP STUDIO, CLOUD AND VIRTUALIZATION



11:10 – 11:50

The IP STUDIO Roadmap Update

Felix Poulin (Senior Project Manager, EBU) Felix is a topic leader for Networked Media Production at EBU Technology & Innovation. He completed his diploma in electrical engineering at Montreal's Polytechnic with his final thesis done at MIT. He began working as an audio engineer at Cirque du Soleil and other international productions. Prior to the EBU, he also worked for CBC/Radio-Canada as an adviser in new broadcast technologies. Felix co-chairs the Joint EBU/SMPTE/SF/AMWA Task Force on

Networked Media and coordinates the annual Network Technology Seminar as well as the Strategic Programme on Future Networks. He also collaborates with the VRT Sandbox LiveIP project, the AMWA Network Media Incubator and some SMPTE standards committees.

& **Willem Vermost** (EBU T&I)

11:50 – 12:15

Latest results of PoCs of Broadcasters moving to IP

Edmond Debar (FranceTV) holds an engineering diploma issued by the school PolyTech Paris Sud.

In 1997 he began his career as systems and network engineer in a computer service company. In 1999 he joined France2 to implement ATM / Ethernet gateways and to implement the first SAN enterprise storage network. In 2001 he participated in the creation of the first tapeless news system, then in 2004 he leads the renewal of the infrastructure project by creating a new one organized around an Ethernet network. In 2009 he actively participated in the development of solutions to renew the news architecture and then he integrates the Innovations and Development department of France TV.

Since then he participated in the majority of the business storage projects of the FTV group and works on various topics such as cloud, object storage or, since 2015, Video over IP.



12:15 – 12:40

Moving to cloud and virtualization

Pedro Ferreira (MOG) was born in 1973, in Guimarães, Portugal. He has a MSc. in Telecommunications and Computer Science from the University of Porto.

After graduating, Pedro worked at INESC Porto as a researcher on the use of Distributed Systems technology in Digital Television, collaborating in the ACTS ATLANTIC and BBC ORBIT projects, and engaging in standardization activities in SMPTE and Pro-MPEG.

In 2002, Pedro became one of the founders MOG, where he is a member of the board of directors and has since played many roles. He was responsible for the development of the MXF::SDK, as well as various other products and bespoke solutions for clients such as NBC Olympics and European projects such as

Worldscreen, EDCine and SWITCH.

Pedro published several scientific and technical papers, in particular related distributed systems in television, file formats and workflows, including a series of articles on MXF published by the European Broadcasting Union.

He is also an experienced trainer, member of the Eurovision Academy Faculty and has delivered many trainings for television professionals all around the world.



12:40 – 13:20

Building the IP Broadcast Centre (panel discussion)

Phil Tudor (BBC) Phil Tudor is a Principal Engineer at BBC Research & Development, London, U.K. He read Electrical and Information Sciences at Cambridge University. Phil's technical background includes video compression research, software engineering, digital television standardisation, and the development and standardisation of professional media file formats. Phil leads a team of researchers looking at file-based workflows for production & archives, high-speed IP networking for live production, capturing richer production data sets, and the development of open standards. He is a board member of the Advanced Media Workflow Association and vice-chair of the EBU Strategic Programme on Future Network and Storage Systems (FNS). Phil is a SMPTE fellow, a Chartered Engineer and a member of the IET.



Dag Gulbrandsen (NRK) Started as an audio engineer at NRK back in 1980. Worked with various projects since 1994. Working full time as project leader for NRK at the MediaCity Bergen project



Wouter de Cuyper (VRT) During his 14 years at the Belgian broadcaster VRT, Wouter executed many different technology related roles and gained a high level of experience in a broad media spectrum (television, radio and digital products). He built a substantial part of the file based video production system and was part of starting the digital shift in distribution and production. Currently Wouter is working as technology architect responsible for implementing state of the art media facilities in VRT's new building.



Martin Richards (Sky). I have worked at sky since 2009 joining the projects department leading a variety of projects from studio, to newsrooms to MCR's and TX. Currently working as Technical lead on beginning the transformation of SKY UK's MCR from SDI to IP.
