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ABU Digital Broadcasting Symposium 2017: Full Report Inside

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Cover:
ABU Digital Broadcasting Symposium 2017: Full Report Inside



Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



This edition of Technical Review contains detailed reports on DBS-2017. The issue also carries three technical articles, news from the EBU and APAC regions, plus updates on digital broadcasting and equipment trends.

Three articles on, Cybersecurity; Digital Radio and HD Infrastructure, explain developments, challenges and actions taken by ABU stakeholders in each of those areas. Three reports highlight the cooperation between ASBU, BES and IRIB.

The first day of the Digital Broadcasting Symposium, (DBS) 2017 was dedicated to workshops, followed by three days of conference presentations and an exhibition.

The symposium commenced with DVB, DAB+ and Social Media workshops. The DVB workshop demonstrated the complete chain of digital broadcasting. During their workshop, WorldDAB addressed issues and challenges in migrating to digital radio.. A number of presenters discussed deployments in other regions. The workshop was concluded with group discussion sessions, addressing the impact of Technology and Content in the planning of a digital radio service.



The Asia-Pacific Broadcasting Union (ABU) is a professional union of broadcasting organisations in the Asia-Pacific area which aims to co-ordinate and promote the development of radio, television and allied services in the region. It is non-governmental, non-political and non-commercial.

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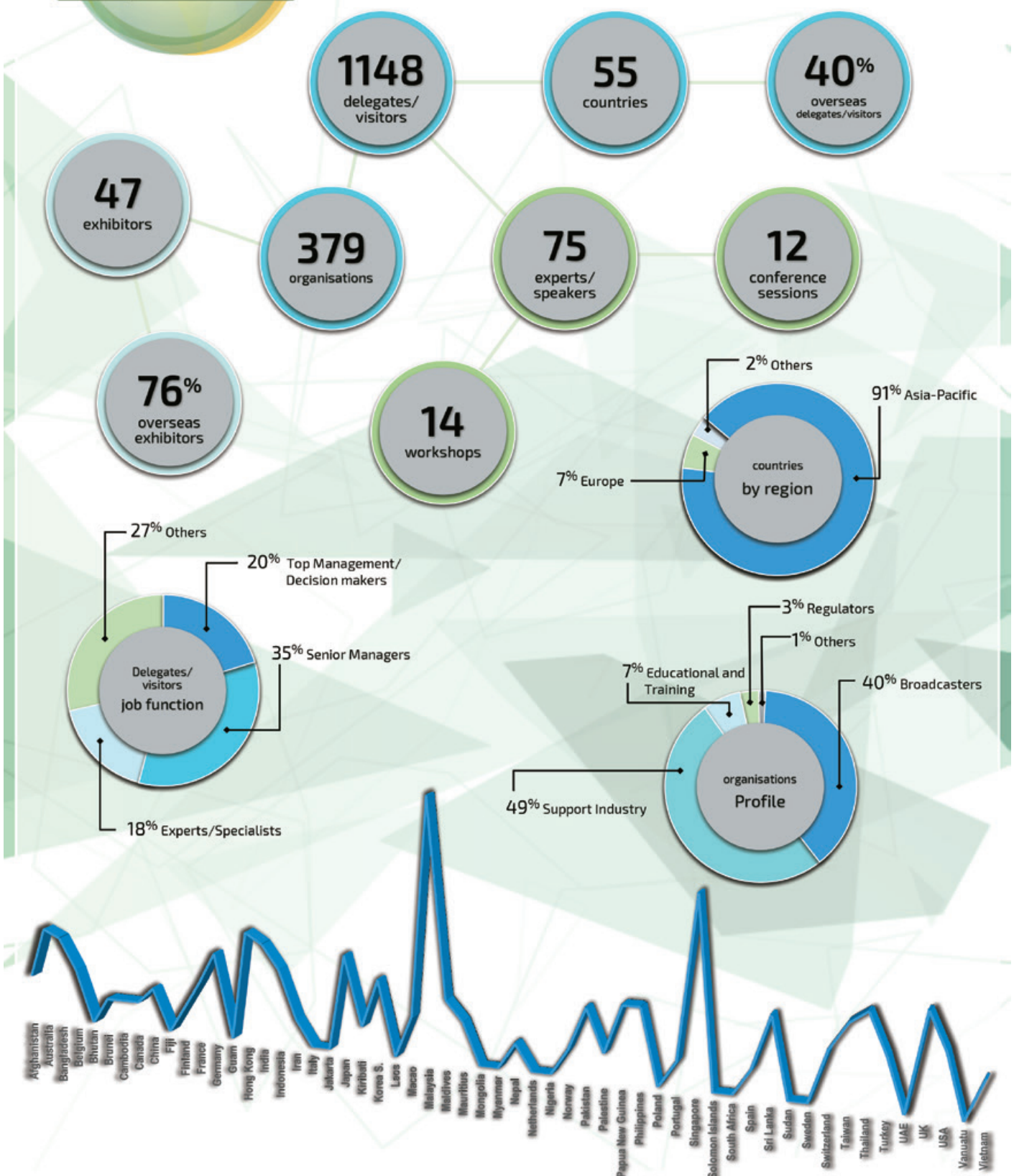
EVENT SUMMARY



ABU DIGITAL BROADCASTING SYMPOSIUM 2017

"Digitise, Digitalise and Dominate"

6-9 March 2017, Kuala Lumpur



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ABU DIGITAL BROADCASTING SYMPOSIUM 2017: DIGITISE, DIGITALISE & DOMINATE



The 2017 ABU DIGITAL BROADCAST SYMPOSIUM was held from 6-9 March at Hotel Royale Chulan, Kuala Lumpur. This symposium, aptly themed 'Digitise, Digitalise & Dominate', was the thirteenth in the series of digital broadcast symposia, organised annually by the ABU. Three pre-conference workshops were held on the first day. A full day 'New Media Masterclass' workshop, focusing on 'Transmedia Storytelling and Audience Engagement' and a parallel DVB workshop on Network Planning was held in the morning, followed by a DAB+ workshop in the afternoon. The 3-day conference, plus a total of fourteen workshops together with an exhibition, provided a unique opportunity for attendees to have access to information on all the various aspects of broadcasting ranging from terrestrial to satellite. The symposium attracted over 1100 participants representing broadcasters, telcos, regulators, manufacturers and other industry players.

Opening Session

The 13th edition of the ABU Digital Broadcasting Symposium (DBS) was officially opened by the Malaysian Deputy Minister of Communications and Multimedia, YB Dato' Jailani Johari.

The Deputy Minister said that "Over the years this symposium has grown to be a well-recognised event within the region and the media industry. It provides broadcasters and other media stakeholders with a valuable opportunity to know and experience the cutting-edge technologies and related service developments from around the world. It gives a platform for media professionals to network with eminent experts and like-minded colleagues."

He added that today the digital revolution has allowed alternate delivery mediums and easy integration with social media platforms. The Deputy Minister warned that these advantages should be exercised with caution and the highest

degree of integrity to safeguard the public interest and the well-being of society. He stated that networks are prone to cyber-attacks.

YB Dato' Jailani Johari, accompanied by the ABU Secretary-General, Dr Javad Mottaghi and the Deputy Director General of RTM-Malaysia, Mr Magli Elias also inaugurated the exhibition held in conjunction with the DBS.

The Industry Keynote address, entitled 'DAB+: Delivering Digital Radio's Digital', was delivered by Joan Warner representing the principal sponsor, WorldDAB. She asserted that Radio remains the most accessible media worldwide, as it can be received anywhere without any fee being imposed. It is robust and has proved its reliability in situations of emergency. Both Analogue AM and FM are compromised by their susceptibility to multipath interference and hence cannot promise sustainability as regards to the future of broadcasting.



Joan Warner, CEO, Commercial Radio Australia, representing the Principal Sponsor, WorldDAB, delivering the Industry Keynote.

Ms Warner said that, in comparison, DAB+ is efficient in terms of energy, transmitter infrastructure costs and RF spectrum usage. From a global perspective, the number of people able to receive DAB services had increased to 405 million, whilst the number of receivers sold had reached 55 million units. Hybrid Radio, an innovation that is a combination of DAB+ and IP, retains the cost effectiveness of a broadcast channel and at the same time offers interactivity. Streaming with mobile phones incurs data costs and drains more power from batteries. Smartphones incorporating DAB+ chips enable users to listen to radio with no streaming costs. They provide a richer radio experience with newer stations, broadcast images and live scrolling text. There is increased opportunity for listener interaction, with station websites and social media channels just one click away. These enhanced smartphones combine the best of Broadcast and IP, leading to the reliability of broadcast radio with interactivity of internet. They overcome blackspots where broadcast content is still available when the user is out of mobile network coverage area.

Advances in Technology: Improvements and New Technology

The first session was chaired by Masakazu Iwaki of NHK-Japan and the panelists were Dr Peter Siebert, DVB Project Office; Lindsay Cornell, BBC UK; Ruxendra Obreja, DRM Chairman and Tomoki Matsubara, NHK. They elaborated on the new developments of the various broadcast technologies over the years and the improvements achieved.



Masakazu Iwaki of NHK-Japan, chairing the first session of the DBS Conference

UHDTV Phase 1 receivers incorporating H265/HEVC chips are now capable of decoding UHDTV formats up to 2160 P, 60 Hz. Phase 2 will have more features; including a higher frame rate (HFR) of 120 Hz, wider colour gamut, higher dynamic range (HDR) and an advanced sound system. The Higher Frame Rate reduces motion blur as well as improving the sharpness of objects during motion. The wider colour gamut allows almost all surface colours to be reproducible.



Dr Peter Siebert of DVB, Lindsay Cornell of BBC, Masakazu Iwaki of NHK-Japan, Ruxendra Obreja of DRM and Tomoki Matsubara of NHK-Japan

HDR does not lose detail in dark areas and also reduces highlight compression. Two solutions for HDR have been proposed by either using the PQ Inverse EOTF or HLG OETF. PQ EOTF, or Perceptual Quality Inverse Electro Optical Transfer Function, is not backwards compatible to UHD Phase 1 Receivers. HLG OETF or Hybrid Log-Gamma Optical Electro Transfer Function (OETF) is backwards compatible with UHD Phase 1 Receivers, but only with standard dynamic range.

Digital Radio Mondiale (DRM) is available throughout the 30 kHz–300 MHz frequency range. Local and regional coverage can be implemented in the VHF bands (Band I, II – FM band, III). Medium and large area coverage can be undertaken in the HF band or AM bands using Long Wave (LW), Medium Wave (MW) and Short Wave (SW). DRM offers FM like sound quality without fading, crackling or distortions. It covers large areas using a single frequency which is a plus point for rural coverage, mobile reception and car receivers. A new generation of Chipset and Software Defined Radio (SDR) allows radio to be received on all frequencies by cars and mobile devices. Migration from FM to DRM can also bring significant cost savings in the form of lower transmitter power consumption, smaller floor space and reduced cooling requirements.

Enhancements in Workflow and Media Management

The Chairman was Dr Ahmad Zaki Mohd Salleh of Media Prima, with the panel comprising Michael Beke, MediaGeniX; Charles Sevier, Dell EMC; James Thia, Sony Electronics; MC Patel, Emotion Systems and Shoaib Usman, Evertz.



James Thia of Sony, MC Patel of Emotion Systems, Michel Beke of MediaGeniX, Dr Ahmad Zaki Mohd Salleh of Media Prima, Mr Charles Sevier of Dell EMC and Mr Shoaib Usman of Evertz

In the past, media evolved from (1) Black & White to Colour (2), Analogue to Digital and (3) Standard Definition TV to High Definition TV. Current transitions are from (1) SDI to IP; (2) specialised hardware to IT infrastructure; (3) on premise storage facilities to cloud and (4) the broadcast engineer to media technologist. The present transition is not just about replacing old boxes with new boxes but requires the simultaneous transformation of business model, operational processes, working culture and technology. Future-proofing broadcast workflows should take into account recent developments in 4k UHD, Higher Frame Rate, Higher Dynamic Range and surround audio. These factors, entail

the adoption by TV broadcasters of an all-IP architecture with multiplatform content delivery. Archives should be active with online storefront, resulting in content storage needs growing exponentially. Predictions from industry are that for every 5 years, the CPU complexity and memory storage will increase exponentially by 10 times. It is to be noted here that the laptops now use flash memory instead of hard drives. The media data centre must meet the business requirements of efficiency, agility and speed. These can be realised by utilising flash memory, cloud storage facilities and software defined networking.

Storage costs and complexity are becoming a massive challenge, spurred by HDTV and UHDTV with increased frame rates. Current tiered storage architectures are divided into primary storage, near line storage and archival storage (LTO). Data is constantly transferred and restored between these storage pools because primary and near line are more expensive than LTO. However, the ODA or Optical Disc Archive can serve as both near line and archive at a lower cost. Optical disc provides high-speed access, reliability, a lifetime of more than 50 years and is cost effective. It can be stored at room temperature and is not affected by humidity.

An IP revolution is happening with the Software Defined Video Network (SDVN) solution for the new media and broadcast industries. SDVN utilises a software defined network architecture to provide all the flexibility of a network based solution together with all the reliability of baseband video routing. SDVN offers broadcasters a flexible format agnostic and scalable infrastructure for SD, HD and Ultra HD (4K and 8K). Benefits of going IP include less cables, bi-directional workflow and single routing systems for video, audio and metadata.

Production Technologies from HD to UHD

Chaired by Prashant Butani, MEASAT Satellite Systems, the panelists were Jun Tsumochi, NHK; Ajeet Khare, Canara Lighting Industries; Dawoon Chung, Korea Broadcasting Service and Prashant Chotani, Travelxp.

A wireless link system is needed to collect HD video and audio streams transmit from OB site to broadcasting station. These streams are used for live-broadcasting, post production and archiving. With the advent of 8K UHDTV, a tremendous increase in bit rate is required compared to HD.



Ajeet Khare of Canara Lighting, Jun Tsumochi of NHK-Japan, Prashant Butani of MEASAT, Prashant Chotani of Travelxp and Dawoon Chung of KBS-Korea

The baseband signal bit rate of 8K is 16 times greater than the bit rate of HD whilst 8K satellite broadcasting capacity of 85 Mb/s is 3.5 times greater than HD bit rate. Thus, the 8K wireless link system requires more than 200 Mb/s compared with a HD wireless link that has a capacity of 60 Mb/s. In Japan, frequency allocation for wireless wave links have been made in the microwave and millimetre-wave band. The microwave link system uses B, C and D band with 18MHz channel spacing, as done now in the case of HD signal transmissions. The millimetre-wave link system in the 41-42 GHz band has been allocated a wider channel spacing of 125 MHz to cater for higher bitrates of 600 Mb/s. Both systems utilise dual polarized MIMO-OFDM technology together with a Forward Error Correction subsystem comprising of LDPC/BCH coding. Higher order constellation modes of 1024 QAM are needed in the case of microwave link whereas the millimetre wave link uses 32 QAM.

In the last few years, lighting equipment has been evolving with digital technology incorporating LED, which offers colour correction, Hue Saturation Intensity (HSI) correction and virtual filters. Among the functions available, are setting colour temperatures between 2800K and 10000K and choosing millions of colour shades with ease. This digital transformation is bringing about significant improvements in lighting control and supports green technology with an associated reduction in carbon emission.

Korea would be using the second-generation Advanced Television Systems Committee or ATSC 3.0 for UHDTV transmission. The first generation ATSC uses single carrier modulation with 8-Vestigial Sideband (8-VSB), a FEC subsystem of Trellis Coded Modulation concatenated with Reed Solomon code and MPEG-2 Video compression. It has a transmission capacity of 19.39 Mb/s but cannot deliver robust signals for mobile reception. In contrast, ATSC 3.0 uses multi carrier modulation or OFDM, a FEC subsystem of LDPC concatenated with BCH code and HEVC. Higher order constellation modes of non-uniform 4096, cater to the demand for increase of bitrate capacity. As it is, ATSC 3.0 has a transmission capacity of up to 52.2 Mb/s and can enable both fixed UHD and HD mobile reception.

Advance Solutions and Future Challenges

This session was chaired by Sharad Sadhu, Broadcast Media Consultant and the panelist were Nils Ahren, Rohde & Schwarz; Tsubasa Uchida, NHK; Akira Negeshi, NHK and Elizabeth S. Mendoza, Courseline Training Centre.

OTT entails the delivery of a multimedia service over an unmanaged network. Current technology uses the public internet and standard protocols to deliver multimedia content either Live or On Demand. There is no guaranteed QoS, so bits/pixel quality is more important. A huge variety of devices and capabilities must be supported simultaneously with different streaming standards, bit rates and resolutions. For video streaming, three ways exist to solve fluctuating network bandwidth: (1) Accept loss of data; (2) Try to outlast the low bandwidth periods through buffering and (3) Reduce the bitrate of the video. However, a better solution for OTT is Adaptive Bit Rate or ABR, which



Akira Negeshi of NHK-Japan, Nils Ahrens of Rohde & Schwarz, Sharad Sadhu, Media Specialist, Tsubasa Uchida of NHK-Japan and Dr Elizabeth S Mendoza of Courseline Training

first produces multiple files from the same source file to distribute to viewers who are watching on different powered devices via different connection speeds and at different resolutions. Secondly, ABR distributes the files adaptively, changing the stream that's delivered, to adapt to changes in effective throughput and available CPU cycles on the playback station. Thirdly, ABR operates transparently to the user, so that the viewer clicks just one button and all stream switching occurs behind the scenes.

In the context of helping the handicapped citizens of Japan, NHK has conducted research into tactile and haptic presentation methods, Japanese sign language computer graphics (CG) system and Speech recognition for closed captioning. It is vital to convey information in sign language to those who are born with hearing difficulties, as it is the equivalent of their mother tongue. A closed caption service is not sufficient for them and few TV programmes are produced with sign language. However, there are not enough sign language interpreters and it is not easy to have sign language interpreters on site any time. Weather information for the disadvantaged public is expanded by sign language computer graphic animation system. The fixed pattern CG animation system generates sign language animations directly from weather data.

Another commendable effort by broadcasters, notably the ABU, is the aid in the form of Radio in a Box, delivered to the teachers of a province in the Philippines which is regularly struck by typhoons. The Philippines has drafted a comprehensive National Disaster Risk Reduction Management Plan to mitigate the effects of natural disasters such as typhoons. Radio in a Box fits perfectly well with

this plan, by educating young children and training adults as well as acting as an Emergency Warning System.

Innovating the Audio Experience

The session was chaired by Steve Ahern, AMT Australia and the presenters were Kartini Kamarul Ariffin, IM4U Radio Malaysia; Firdaus Shamshuddin, IM4U Radio Malaysia; Andi Permadi, Radio Republik Indonesia; Jørn Jensen, NRK Norway; Shanthi Bhagirathan, MBC Sri Lanka and Alexander Zink, Fraunhofer.

DRM offers more choice for listeners with four programmes on one frequency. Audio quality is excellent with no distortion and comes with stereo and 5.1 surround sound. Multimedia applications brings about more listener benefits while at the same time provide extra revenue opportunities for broadcasters. Coverage area is very wide and the signal robust, even with a single transmitter. Single Frequency Networks can be implemented since OFDM signals are used. When all these capabilities are combined, the result is that DRM is 'green' and energy efficient. Automatic tuning is now controlled by station name and no longer by frequency. The radio set is also capable of re-tuning when leaving a coverage area. Emergency warning & alert systems have been incorporated in all sets as a mandatory requirement.

DRM Multimedia applications that provide great listener benefits & revenue sources are TextMessages, Journaline, MOT Slideshow and TPEG / TMC Traffic Information. Journaline is a text based information service (Unicode), supporting all classes of receivers triggering interactivity and geo-awareness. Services based on Journaline can be set up to accompany the radio programme provided by the broadcaster and to reuse existing information or Internet content. Journaline can also be set up as a standalone service, enabling commercial / group or closed user groups. Journaline enables efficient, on-demand text information services on digital radio and is free-to-air with no Internet required. It is specifically designed for digital broadcast services as it has a low bitrate requirement of 200 b/s and reuses existing data sources for broadcasters such as RSS or XML. XML files are used for static content and menu structure, whereas RSS feeds are used for half-dynamic content with periodic update from the Internet. Another source is real-time feed for highly dynamic content such as sports results tables that update the individual page with every re-transmission.



Steve Ahern of AMT, Jørn Jensen of NRK, Firdaus Shamshuddin and Kartini Kamarul Ariffin of IM4U Radio Malaysia, Andi Permadi of RRI-Indonesia, Shanthi Bhagirathan of MBC-Sri Lanka and Alexander Zink of Fraunhofer



Naoya Kimoto of NHK-Japan, Toni Fiedler of Fraunhofer, Jayant Shah of Dolby, Dr Peter Siebert of DVB, Dennis Breckenridge of Elevate Broadcast, Joe Lamdani of AVID and Deokjoon Woo of KBS-Korea

Immersive Media: Future of TV Experience

Chaired by Dr Peter Siebert, DVB Project Office, with a panel comprising Jayant Shah, Dolby Laboratory; Deokjoon Woo, KBS; Toni Fiedler, Fraunhofer; Dennis Breckenbridge, Elevate Broadcast; Naoya Kimoto, NHK and Joel Lamadani, AVID.

The shift from 5.1 channel surround sound to a more realistic immersive sound suitable for UHD was discussed. This is multi-dimensional audio that fully immerses the viewer with sound objects that move around and above thus adding the perception of height dimension. The objects describe position, size and require dynamic metadata. Immersive sound engages human sensory system more naturally, by allowing the sensors to process information more similarly to the natural world. It allows fluid movement of audio in a 3D space, removing the constraints of channel-based audio. The benefits are greater control of perceptual space or higher resolution and robustness across listening environments. Immersive audio can be experienced at home by installing upward firing speakers that do a remarkable job of introducing the dimension of height. Standards for Immersive Audio have already been specified with Dolby AC-4 and MPEG H. South Korea has adopted the second generation ATSC 3.0 standard using MPEG-H 3D audio and it is to be noted that DVB standard has incorporated MPEG-H 3D as part its toolbox.

Next generation video would be progressing to higher resolutions of 4K or 8K, higher frame rate (HFR) of 120 fps, higher dynamic range (HDR) and greater colour gamut. The combination of a larger quantity of pixels and better pixels mimic real visual experiences to excite the senses and stimulate physical and emotional responses.

Towards the IP Ready Broadcast Chain

The session was chaired by Dr Fintan Mc Kiernan, IDEAL Systems Singapore and the panelists were Markus Fritzt, Eutelsat; Anthony Gofton, Solid State Logic; Oliver Linow, Deutsche Welle; Eric Hamilton, Caton Technology and Nick Piggott, Radio DNS.

In a fast-changing broadcast environment, satellites are uniquely placed to provide a first-class platform for delivery on a multichannel basis, distribute to multiscreen and access to multi-region. Hybrid Broadcast Broadband TV (HbbTV) offers VOD services to all DTH users. The addition of a hard drive to the decoder enables it to store popular content sent via satellite. The user can access it on demand and view it in the best quality without buffering. Briefly put, VoD / Catch-up TV is available to all homes with best image quality irrespective of internet connection or data quota. The benefits are flat-fee distribution cost, irrespective of the number of viewers and guaranteed quality of service.



Nick Piggott of Radio DNS, Oliver Linow of Deutsche Welle, Markus Fritz of Eutelsat, Dr Fintan Mc Kiernan of IDEAL Systems, Anthony Gofton of Solid State Logic and Eric Hamilton of Caton Technology

Furthermore, the coverage of VoD service is broader, enabling HD or UHD services to all viewers and even those beyond the broadband footprint. Satellite multiscreen video delivery, based on IP technologies can be dedicated to mobile devices. It distributes linear TV, on-demand content and Free-to-Air by seamlessly integrating with existing OTT services and mobile applications. Ubiquitous coverage is available with guaranteed quality of service irrespective of local internet connections. It is suitable for people at home who can watch the video on a smartphone or tablet. They are able to watch TV easily, everywhere at home, independent of the availability and quality of terrestrial networks. There are no restrictions on volume or additional mobile data traffic costs. IP-Native Multiscreen Distribution via Satellite is also suitable for public venues where a large number of users can simultaneously watch different channels.

There is a need for a game-changing infrastructure that redefines real-time video and data flow on the Internet. The challenge is that demand for moving large data is increasing faster than allowable capacity. Remote-to-remote transfer protocol (R2TP) is very efficient with anti-congestion, error-recovery mechanisms and low latency. R2TP can power open or public internet broadcasting which is less expensive compared to broadcasting over private Internet connections. Other advantages are highly secure broadcasting with maximisation of Quality of Service (QoS) and Quality of Experience (QoE).

Cloud Technologies, Media & Cyber Security

This session was chaired by Dr Amal Punchihewa, ABU and the presenters were Jew Kok Lin, ASPERA-IBM; Dr Siebert Fell, EBU; Aale Raza, Whiteways Systems and Azleya Ariffin, MCMC Malaysia. Dr Siebert represented Simon Fell, who could not make it to the symposium this year. He presented the EBU recommendations on Cyber Security which laid out the guidelines for broadcasters in confronting virus attacks and hackers. The recommendations were rather timely as there had been recently a spate of botnet attacks on broadcast installations.

The term botnet is coined from both words robot and network. A botnet is a number of Internet-connected devices

used by a malicious programmer to perform various tasks. Botnets can be used to perform Distributed Denial Of Service (DDOS) attacks, steal data, send spam and allow attackers access to a broadcast station's systems.

The goals of the EBU Media Cyber Security Group are: (1) Raise awareness of Media Security as a business risk; (2) Define best practices and best processes adapted to the media industry; (3) Provide a trusted platform for information sharing Hands-On learning and tutorials. The major concern for broadcasters are cloud service security, ransomware and production security of IP based workflows.

The growth in the number of botnet attacks is due to the increased utilisation of IP Networks, which provide direct connectivity. A typical connected broadcast network offers huge benefits as it permits immediate access to data and audio/video files. It allows instant playback by providing "live" pictures and breaking news. It also results in saving a lot of manpower hours and money. It is this very accessible nature of IP networks which has the negative side-effect of making them vulnerable to botnet attacks.

Broadcasters can inhibit malicious software from attacking them by securing their facilities with firewalls, anti-viruses and other security measures. Control rooms should not be accessible to outsiders and network architecture should be isolated from the main office systems. Storage should be checked for viruses, malwares, phishing and botnet periodically. Ingest machines must always have up to date anti-virus protection and staff should be sent for periodical training.

The Changing Media Business: Opportunities for Broadcasters The session was chaired by Jamel Seman, Radio Television Malaysia with panelists Jon Flay, Megahertz; Hitesh Upadhyay, The Weather Company; Steve Ahern, AMT Australia and Peter Bruce, IABM.

The media industry is facing challenges from evolving technology, shifts in audience, changing financial models and competition from non-traditional broadcasters. Technology is evolving to ultrahigh resolution pictures spurred by advances in IP, UHD, HDR, and HFR. This technological evolution requires new systems, operations and workflow. The audience



Azleya Ariffin of MCMC, J K Lim of Aspera-IBM, Dr Amal Punchihewa of the ABU, Dr Peter Siebert of DVB representing Simon Fell of the EBU (who joined via Skype) and Aale Raza of Whiteways Systems



Peter Bruce of IABM, Hitesh Upadhyay of The Weather Company, Jamel Seman of Radio Television Malaysia, Jon Flay of Megahertz and Steve Ahern of AMT Australia

is shifting to OTT, Mobile or VOD, causing new customer behaviours and driving new content. Financial models are changing to revenue models based on Subscription VOD and transactional VOD. These make CAPEX risky as result of changes in budgets, operating expenditure and profits. Competition from Internet media, social media, broadcasters require an agile approach to changing market.

The changing trends of the broadcast media industry include the decline of linear TV, as was evident from the Rio Olympic 2016 games. On the other hand, subscriptions for SVOD services such as Netflix have been growing in number in the past three years. Linear TV is far from dead, although broadcasters are increasingly investing in new media offerings to accommodate changing viewing habits. Transition to OTT and multi-platform delivery continues to disrupt the traditional broadcast landscape. Changing viewing habits have forced broadcasters to launch new media offerings, by transformation infrastructures capable of delivering both linear & non-linear channels.

Many traditional broadcast and media technology suppliers still rely on hardware as their primary source of revenues. However, end-users are moving to software-defined infrastructures built on COTS equipment, putting pressure on hardware revenues. Traditional suppliers are therefore embarking on a difficult transition from purpose-built hardware to delivering software running on general-purpose equipment

Evolving Platforms-OTT, IBB and the Interactive Audience
The chairperson was Che Rohana Che Omar, Radio TV Malaysia. The panelists were Mika Kanerva, Sofia Digital; Roy Reinbach, NeuLion; Mariano L Monteverde, VSN APAC and Dr Megat Al Imran, University Putra Malaysia.

The panel examined the market trend towards HbbTV and the key factors triggering it. Although viewing time and device reach are prominent factors, the most important factor

for the consumer is the content. The red button on the TV remote grants the user, direct access to an on-demand video catalogue and the visually rich Electronic Programme Guide. The user is able to play all the past episodes of shows directly from current TV show. There is also a greater number of TV Channels as result of the extended channel line-up over IP video streaming and curated thematic streaming channels for audiences' specific interests.

HbbTV technology is set to be part of Malaysian DTTV standard which is the second-generation DVB-T2. When officially launched, the Malaysian DTTV DVB-T2 network will have HbbTV services available from day-one. There is a system update for existing Smart-TV to support DTTV and HbbTV. Thus, HbbTV features would be activated for more than the 1 Million receivers already out in the market. HbbTV test suite and certification processes are



Dr Megat Al Imran of University Putra Malaysia, Mika Kanerva of Sofia Digital, Che Rohana Che Omar of Radio Television Malaysia, Roy Reichbach of NeuLion and Mariano L Monteverde of VSN APAC



Les Sabel of Commercial Radio Australia, Aale Raza of Whiteways Systems, Pham Nhu Hai of the ITU, Simon Tsang of Enensys Technologies/Test Tree, Andy Joseph of Factum Radioscape and Arne Borsum of IZT

currently underway, together with the distribution of HbbTV-enabled Set-Top Box. MYTV has envisaged both premium subscription-based services and MyFreeview, which is a common platform for DTTV broadcasters.

FINAS and Filem Negara Malaysia, the leading government agencies under the Ministry of Communication Multimedia are to implement six key initiatives of which one is to digitise content. The outcomes are increased digital reference of local heritage and locally host local digital content for easy access by public. Digitisation activities include the provision of digitisation infrastructures for the agencies, building facilities for upgrading the contents and developing Digital Assets Management for the digital contents produced.

Digital Transition – Experiences in Digitising and Digitalising Infrastructure

The final session was chaired by Les Sabel, Commercial Radio Australia and the panelists were Aale Raza, Whiteways Systems; Pham Nhu Hai, ITU and Simon Tsang, Enensys Technologies. Video and audio archives are of great historical importance, deserving long-term preservation for future generations. Challenges faced by content owners are storage media conditions, where the media is worn out and players not available. The video quality is unsatisfactory and metadata not properly marked. The main concern is that even though one retrieves the footages from old tapes, they are still not usable. The reasons are picture impairments arising from colour degradations, stains, film grain, noise and vertical line scratches. However, the good news is the availability of software which can perform cleaning and restoration for old and defective videos.

The ITU Radiocommunication Bureau has come out with a new Handbook on DTTB Networks and Systems

Implementation, 2016 Edition. The last ITU-R Handbook on Digital Terrestrial television broadcasting in the VHF/UHF bands was published in 2002. Since then the broadcast world has undergone many changes in technology including HDTV, UHDTV, Immersive sound and Integrated Broadcast Broadband (IBB). These new developments encouraged the ITU to publish a handbook that reflects the new environment.

The ITU has provided assistance for the preparation of national digital roadmap for more than 30 countries since 2009. It has a Digital Switchover database and laid out the guidelines for the transition to digital broadcasting. DSO is still ongoing around the world, leading the ITU to revise its publication, 'The Guidelines for Transition to Digital Broadcasting', first prepared in 2010 for Africa. The guideline was revised in 2014 for global usage and has been updated for Satellite TV, Cable TV and IPTV.

The ITU's view is that Radio and Television are evolving, beyond their formal definition of broadcast via electromagnetic spectrum, as the ways in which people consume audio and visual content are shifting. In the internet age, broadcast must be both digital and hybrid with more stations providing interactivity. Linking content across platforms seamlessly combines Broadcast and the Internet.



Report on DBS by
Jeewa Vengadasalam

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DBS Exhibition

The DBS Exhibition was held from 7-9 March with the new location providing us with a welcome change.

The DBS exhibition played host to 47 companies and organizations, made up of equipment manufacturers, system integrators, transmission network integrators, frequency planners, internet and broadcast service providers, digital system proponents, regulatory agencies and other media players.

For the second year in a row, Sony was the winner of the Best Booth Award. Mr Jon Flay of Megahertz presented the award to to Mr Alen Nor Mahat of Sony.



DBS Workshops

Three workshops were conducted as part of the ABU Digital Broadcasting Symposium, DBS 2017 at the Royale Chulan Hotel in Kuala Lumpur. They took place prior to the conference and provided in-depth knowledge of some of the latest developments and opportunities in the broadcast industry.



DVB Workshop: From Network Planning to the Living Room – How to set up a DTT Network



Broadcasters must identify the kind of network needed, that is either an SFN (Single Frequency Network) or MFN (Multiple Frequency Network). Next would be to specify the type of service needed, which can be fixed, mobile or portable. The network has to be designed for either local or nationwide coverage. Hence the transmitter distances must



be ascertained and the guard interval specified, after taking into account the different configuration modes for the OFDM carriers ranging from 1k, 2k, 4k, 8k, 16k and 32k mode. The resolution of the programme should be determined as to whether it is to be SD or HD. This in turn affects the choice of technical parameters including the code rate, modulation, and pilot pattern. Thus, it can be deduced that starting with the right basics is an essential part of the initial plan. Selection and availability of broadcasting sites have to be carried out. Network optimisation can be obtained by conducting project-specific antenna design. Taking into consideration is the use of existing infrastructure from analogue TV network and its suitability for DTT.



Professional network planning saves time, money and prevents problems from cropping up at a later stage when it is too late. It ensures optimized CAPEX and OPEX, making possible the analysis of various options to find the best solution. Planning also ensures an interference optimised network that takes into account the various constraints such as self interference in case of SFN, protection of analogue TV, interferences between DVB-T2 and other services and bi-multilateral agreements between neighbouring countries.

The DVBT2 Gateway is located at the head-end, taking in the output from the multiplexer and providing adaption of the transport streams for DVB-T2 transmission in MFN and SFN. The several DVB/MPEG-2 transport streams are encapsulated into a single T2-MI stream (DVB-T2 distribution protocol), enabling the synchronisation of the various DVB-T2 modulators for SFN and MISO broadcasting. All DVB-T2 transmitters in a SFN cell must transmit exactly the same content at exactly the same time and on exactly the same frequency. Therefore, all the transmitters must be synchronized with common timing reference from GPS and T2-MI packets carrying T2-MI timestamp and T2 framing.

The consumer is also affected by advancements in STB design and LCD/LED display technology. HEVC is the next generation codec and it is mass market ready now. In 2015, all mobile handsets and TVs were shipped with HEVC support. Furthermore, all TVs support up to 10 bits for both 2K and 4k HDR needs.

DAB+ Workshop: Expansion in the Asia Pacific

2017 has been a landmark year for DAB+ as the number of countries on air have reached 36, with 405 million people receiving and 55 million sets sold. In advanced countries, DAB+ is widely available in cars with market penetration of 87% in the UK, 83% in Norway and 65% in the Switzerland. Taking into context the Australian environment, there has been a significant increase in audio quality for AM stations. The share of listening for AM networks has been trending downwards, and AM listening makes up less than one quarter of total radio audiences.



DAB+ represents a substantial audio improvement and a level playing field for AM in capital cities. Operational cost of DAB+ is roughly 30 times lower than AM, while it is 8 times cheaper in the case of FM.

ABC radio has experimented with bit rates and is satisfied with the existing quality, deciding that it is unnecessary to increase it from current levels. In addition a properly designed antenna can provide excellent reception without multipath interference, even on while on the move. The use of Single Frequency Networks allow broadcasters to be economical with the use of RF spectrum. Single transmitters carrying a number of different services also lead to a level playing field in terms of reception quality.



Joan Warner,
Commercial Radio
Australia



Bernie O'Neill,
WorldDAB



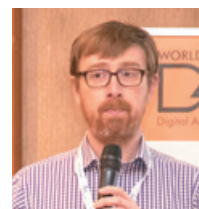
Jorn Jensen,
NRK



Dr Les Sabel,
Commercial Radio,
Australia



Lindsay Cornell,
BBC



Nick Piggott,
RadioDNS





There are also opportunities to cater for niche markets and broaden the range of content. Audiences can be served better by making content available on multiple platforms and simulcasting on IP audio for playback. Hybrid Radio delivers audio using broadcast which is reliable and free, while enhancing radio using IP adds interactivity. Last year, the world's first DAB+ enabled smartphone went on sale in over 20 countries.

New Media Masterclass: Transmedia Storytelling and Audience Engagement

In the fast-changing digital landscape, broadcasters are faced with the challenge of adapting to innovative ways of doing things to cater to the demands of extremely fragmented audiences.



This was the basis for the New Media Masterclass under the theme of 'Transmedia Storytelling and Audience Engagement', which took place on 6 March 2017 and was organised by ABU



Madiana Asseraf,
EBU



Keiko Bang,
Bang Productions



Marini Ramlan,
Primeworks Studios



Hamdhoon Rashad,
ABU

Programme Department. It attracted a crowd of more than 130 of the delegates who attended the ABU DBS 2017.

The aim of the Masterclass was to inspire broadcasters to create innovative and engaging content to attract new age audiences and to share knowledge and experiences with broadcasters on new ways to enhance their content to reach to wider audiences. The Masterclass focused on how innovative and engaging content are created and distributed for new age audiences.. Major topics covered in the Masterclass ranged from new media content, innovative storytelling and audience engagement.

Divided into three modules, the Masterclass explored ways to expand existing media content for multi-platform presentation and how to use transmedia tools and concepts to enhance content. The Masterclass also looked in detail into the realm of transmedia storytelling and the importance of investing in a transmedia strategy to place the users at the centre of the story.

In addition, participants were engaged in a discussion on what is meant by 'innovative storytelling' and why innovating is important in our era. It also discussed how to implement story-driven innovation within organisations with emerging examples on new formats of storytelling, Gaming, Augmented Reality (AR) and Virtual Reality (VR).

There was an also a stimulating discussion on the importance of understanding audiences and their role and expectations, to produce more relevant content. It also shared experiences on matching content to audience on different platforms, and the importance of allowing and encouraging audience participation. Recent examples and case studies on data-driven content production and audience participation were also presented and discussed.

The Masterclass concluded with a group discussion exercise on key learning and major take-aways to help participants identify concrete applications of the learning to their daily work.

The Masterclass was facilitated by Ms Madiana Asseraf, Senior Media Development Manager at EBU. Ms Asseraf was supported by 4 guest speakers; Mr Steve Ahern, Managing Director of Ahern Media and Training, Ms Ayako Takada, Program Director at NHK Japan, Ms Keiko Bang CEO and Founder of Bang Productions Singapore and Ms Marini Ramlan, GM Innovation & Distribution at Primeworks Studios & Primeworks Distribution in Malaysia.

On 7 and 8 March 2017, Dolby hosted a series of presentations and demos at ABU DBS 2017. Next-generation Dolby Technologies presented and demonstrated were; High Dynamic Range Video Technology; Object-based immersive audio for broadcast; Enhanced audio for mobile OTT, Dolby 5.1; Content Production Workflow and HbbTV- Interactive Digital TV.



Key technology elements behind Dolby Vision span content creation (production and postproduction), distribution (codec), and playback (decode and display, plus interfaces).

Object-based Immersive Audio for Broadcast

Dolby Atmos delivers moving audio – sound that can be precisely placed and moved anywhere in three-dimensional space, including overhead. It brings entertainment alive, all around the audience, in a powerfully immersive and emotive experience.



High Dynamic Range Video Technology

Dolby Vision™ delivers a dramatically different visual experience - astonishing brightness, incomparable contrast, and captivating colour, bringing entertainment to life before your eyes. It achieves this stunning image quality by leveraging breakthrough HDR and wide colour gamut imaging technologies, both on-screen and through specially mastered content. As a result Dolby Vision enabled devices to deliver images with much greater brightness, and to provide much deeper, more nuanced and detailed darks, while rendering a fuller palette of rich colours, never before seen on screen.

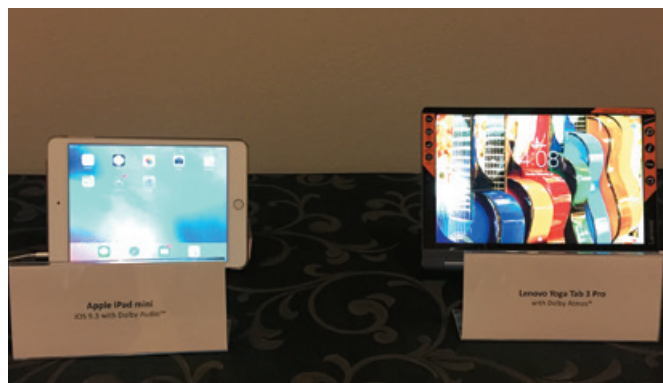
To deliver this experience, Dolby Vision augments the video fidelity of 2k and 4k content for cinema, and Ultra HD and HD video for over-the-top online streaming, broadcast, and gaming applications, by maintaining and reproducing the high dynamic range and wide colour gamut of the original signal created during the artistic post production process.



Enhanced Audio for Mobile OTT

Dolby Audio for Mobile Applications meets the needs of audiences around the world, by bringing:

- Loud and clear sound
 - Enhanced dialogue control and loudness management provides greater detail across a wide range of sounds, letting audiences hear pivotal dialogue in crystal clarity.
- Personalisation Capabilities
 - A robust set of features allows viewers to personalise their listening experience.
 1. A selection of languages in Dolby Audio quality
 2. A choice between home/away commentators while watching live sports
 3. Improved accessibility through descriptive video services
- Immersive audio experience
 - To allow audiences to feel like they are in the centre of the scene or live event, viewers can now enjoy virtual Dolby Digital 5.1 surround sound and Dolby Atmos of



the highest quality, when listening through headphones or built-in speakers.

- Consistent Dolby Audio quality across platforms
 - Dolby Audio for Mobile Applications is compatible across device platforms, empowering all audiences, regardless of device OS, to fully immerse themselves in their stories.

Dolby 5.1 Content Production Workflow

Dolby Digital Plus is the established standard for 5.1-channel surround sound in HD broadcasts and gives content creators the freedom to explore their creative visions and the power to realize them. Surround sound can be easily implemented with small changes in workflow and use of some additional equipment. Surround sound adds realism, enhances the experience and complements HD pictures with high quality audio.



HbbTV- Interactive Digital TV Feature

With transition from analogue to digital terrestrial television comes the opportunity for the broadcast industry to offer better picture and audio quality, and HbbTV can bring the TV experience for the user to a new level. HbbTV is a standard by which broadcasters can complement their services delivering additional content and features via broadband. Some newer DTT (Digital Terrestrial Television) platforms are now offering HbbTV. South East Asia has started adopting this technology and among the early adopters are the DTT platforms in Malaysia and Vietnam. At Dolby, we are working with broadcasters in SEA ensuring that the audio quality for HbbTV continues to be “broadcast quality” thus helping a seamless transition between broadcast and online. Offering Dolby audio via HbbTV also helps to meet the consumer’s expectations for online content where well established and very successful online video delivery services like Netflix, Amazon Video and iTunes offer Dolby audio.

New Members

Affiliate Members

RATEM and Videoship join the ABU as Affiliate Members

RATEM, based in Istanbul, Turkey is a professional union of broadcasting organisations.

Founded in 2001, it is the largest professional semi-public, non-profit organisation in the broadcasting industry, which represents 796 radio and television companies including the public broadcaster TRT (Turkish Radio and Television Corporation). It aims to protect the intellectual property rights of its members, arising under the Law of Intellectual Property Right; as well as finding solutions to the problems of the industry and developing activities in order to ensure continuous development.

It also operates the MEYESER – Vocational Assessment Center (www.meyeser.org) which is accredited both nationally and internationally, and provides certification for a number of broadcasting occupations. Another service for the broadcasting industry is the RATEM Academy, which was founded in 2014, in cooperation with the BBC Academy. It aims to meet qualified employee needs and to fill the scientific resource gap for the radio and television broadcasting industry in Turkey and offers a research center for broadcasting, e-library, face to face and remote education systems.

Another RATEM activity includes the organisation of IFTV (Istanbul International Film-TV Forum & Fair). The objective of this event is to discover the ever growing Turkish Media Market, exploit new opportunities in the EMEA region and to build global partnerships.

VideoShip Enterprises Ltd is a Canadian company with affiliated offices in Ottawa (Canada), Atlanta (USA), Pensacola (USA), and Dublin (Republic of Ireland). The company was established in 2000 and has drawn on the rich experience of its core engineering and design team to deploy innovative, mission critical solutions for high profile clients in the cable and broadcast industries.

VideoShip has a commitment to excellence in providing robust turnkey solutions that include:

- Video aggregation, workflow and distribution
- System integration – video encoding and transcoding technologies
- Optimal use of existing network infrastructure – terrestrial/satellite hybrids
- Customized and branded user interfaces

Since 2005, VideoShip has been working with Cox Media to develop software tools for the cable advertising industry. This suite of integrated modules gradually expanded to become what is now known as the Media Management System (MMS). VideoShip also developed Cox Media’s highly successful SpotXpress system – the first public website of its kind that allows advertisers to submit spots over the Internet. It also provides similar services to Comcast Corporation.

Tom McGann Memorial Summit 2017 – Engineering the Future



Tackling Skill Shortages in Broadcast & Media Technology

The Tom McGann Memorial Summit is a new initiative from the IABM Educational Foundation, the charitable body supported by the IABM, the trade organisation for technology suppliers in the broadcast industry.



Tom McGann spent his career in the broadcasting industry. He was one of the founders of the IABM, driving forward the interests of technologists in the industry as well as its commercial status. During his time at the IABM he played a pivotal role in the movement to transform IBC into the truly international, annual convention we know today.



The aim of the Tom McGann Memorial Summit is to bring together all sides of the industry to analyse the requirements for engineering and technical talent in the future, and to determine how that talent can best be attracted, developed and retained. The intention is that the event will take place in different parts of the world, stimulating the debate and promoting the industry as a challenging and satisfying place to work.

The first Tom McGann Memorial Summit took place in Geneva in late November 2014 in association with the European Broadcasting Union (EBU). Its aim was to convene all sides of the broadcasting industry to tackle technical skills shortages and to determine the future needs for engineering staff resources and how they might be met.



The second summit, addressing skill shortages in broadcast & media technology, was held in Kuala Lumpur on 4th and 5th of March. Summit delegates came from across the technology supply chain and from Asia-Pacific countries. They included broadcasters, their product and service suppliers, and representatives from training academies, relevant academic institutions and students interested in a career in broadcast and media technology. This delegate mix enabled the summit to consider issues from secondary education through recruitment, retention and continuing professional development. Inevitably, these issues were also shaped to take account of changing technology, new business models and economic realities.

The outcome is an industry-wide call to action supported by an initial framework of related commitments to up-skill technical staff.

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Outstanding Control | 86-90% Efficiency | Compact
Proven NX Series Technology with over 20 Megawatts Deployed



Making Digital Broadcasting Work.

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Cyber Security for Broadcast Media Organisations and Professionals

introduction

Cyber security is an increasingly important domain today. Cyber-attacks are increasing all the time, and they are becoming more sophisticated. Media organisations around the world, many of them leading service providers, are spending significant resources to combat cyber-attacks, and yet the number of attacks continues to rise. Threats are also continuing to increase in both volume and sophistication. The impact is that countries across the world are concerned about breaches of cyber security which could prejudicially impact their sovereignty and their national security. Consequently, cyber security law, as a discipline, has emerged. This article aims to outline emerging issues around cyber security for media operations. How are certain terms defined in the discipline of Cyber Security? What is the significance of cyber security and connected issues for media? How significant is this new discipline of cyber security law likely to be in the coming times? This paper attempts to describe complicated technical issues connected with cyber security concerns of computer networks and computer systems used in media operations.



Dr Amal Punchihewa
Focal point at ABU for
Cyber Security Studies of
WBU-TC,
Director Technology &
Innovation of ABU
A Vice Chair of World
Broadcasting Unions
Technical Committee

ABU Activities

On 8th March during the ABU event, the challenges and issues around cyber-attacks were discussed. European Broadcasting Union-EBU, a sister union of ABU, shared the work they have done to educate and mitigate vulnerabilities due to cyber threats. Later in a chapter, EBU recommendations are discussed.

In the opinion of the author, cyber security needs an approach which addresses three facets, viz. people (human resources), organisation and infrastructure. The sense of urgency for cyber security has increased due to the emergence of IP everywhere in the media value chain. Media professionals need to act swiftly as expanding globalisation and new business and business models involve, changing global

regulatory frameworks, greater sanctions and penalties, intense media and social media focus on privacy and security breaches and the need for companies to protect IP from violating fundamental rights to privacy.

There are heightened concerns over cyber-attacks, the need to balance privacy rights against the reporting of cyber-attacks, intrusive technology accessing personal data, with new technology driving the importance of privacy considerations (cloud, IoT) and moves towards data sovereignty vs cross border flows.

Various aspects must be addressed to understand vulnerabilities and attacks. They are:

- I. Distributed Denial-of-Service (DDoS)
- II. Connected devices (TV etc.)



- III. Vendor system vulnerabilities
- IV. Malware Attacks
- V. Ransomware Attacks
- VI. The cloud

With Integrated Broadcast Broadband (IBB) systems and connected media devices, security may be loosely organised (presenting vulnerabilities that are easy to attack) leaving room for simple attacks.

Cyber Security for Media: Some basics

In the following chapter, the author presents some definitions and descriptions of commonly used jargon or terminology for cyber security.

Malware: (Malicious software) or a program code designed to harm a computer or its data. (Note: Where used as a prefix 'mal' is from Latin and means 'evil')

In the world of malware, there are several standard types of villain.

Some of the main villain categories are:

- I. Viruses
- II. Worms
- III. Trojans
- IV. Bot armies
- V. Keystroke loggers
- VI. Spyware
- VII. Adware
- VIII. Scareware
- IX. Ransomware

In August 2009, attackers shut down Twitter for nearly three hours, leaving 44 million 'tweeters' worldwide out of touch. If that doesn't sound like a big deal, imagine broadcast services like CNN or Fox News being driven off the air for an afternoon.

Bot network: A collection of remotely controlled bots. Hackers often use bot networks to launch attacks against other computers.

Once a hacker has assembled a bunch of machines compromised with bots, the hacker has literally an army of "bots" that can be used to attack other machines. Frequently, the bots execute a denial of service (DoS) attack where so many compromised machines try to connect to a single website that the site itself crashes. In this type of attack, the goal is to flood the target machine with data packets. The data transmitted is usually harmless in itself, but the large amount of traffic consumes the target machine's bandwidth. In using up the Internet resources available to the target machine it is prevented from being able to communicate properly. The end result is the same in all cases. Legitimate users are denied service because of all the bogus traffic.

DoS: A denial of service attack. In a DoS attack, the victim is flooded with so much Internet traffic that legitimate users can't get through.

Ransomware: A form of malware in which the user's computer files are encrypted, or the system (or Internet connected cell device) are disabled. A ransom is demanded to restore the system or device to normal use.

Hacker: A programmer who breaks into someone else's computer system or data without permission.

Ethical hacking: Using security tools to find security holes and to test and improve security.

Phishing: A con artist scam which tricks people into giving out personal, security, or financial information.

EBU Recommendations

EBU has published five recommendations and is currently working on its sixth recommendation on Cloud security. The first five published recommendations address the following areas and can be downloaded from its website.

R141 – Mitigation of Distributed Denial of Service Attacks

As mentioned earlier a distributed denial-of-service (DDoS) attack occurs when multiple systems flood the bandwidth or resources of a targeted system, usually one or more web servers. Such an attack is often the result of multiple compromised systems (for example, a botnet) flooding the targeted system with traffic.

R142 – Cybersecurity on Connected TVs

R143 – Cybersecurity for media vendor systems, software & services

R144 – Cybersecurity Governance for Media Companies

This Recommendation addresses the following aspects related to cyber security functions.

- I. Asset Management
- II. Cybersecurity for Human Resource
- III. Infrastructure Security
- IV. Platform Security
- V. Software Security
- VI. Audit Management
- VII. Business Continuity Management
- VIII. Change and Configuration Management
- IX. Cybersecurity Risk Management
- X. Identity and Access Management
- XI. Security Incident Management
- XII. Threat and Vulnerability Management

R145 – Mitigating Ransomware and Malware Attacks

R146 – Cloud Security Recommendation will cover the different perspectives of "cloud" including:

- I. Procedural considerations
 - Procurement
 - Definition of business requirements

II. Service architectural considerations

- Description of cloud delivery models and overview of “shared responsibilities”
- Required security functionalities to meet security needs (Cloud WAF, Cloud Networking, Cloud Hardening, Cloud Identity Management, ...)
- Best practices

III. An approach for performing a cloud service provider assessment

- Linkage to existing assessments
- Data Privacy limitations and impact
- Existing certifications

NABA Activities

Our sister union NABA also carried out work in educating and taking action to address challenges due to cyber security issues. It has published ‘10 things that you need to know about cyber security, which it has made available to its members with Digital Production Partnership (DPP), a not for profit organisation in the UK.

WBU-TC Activities

The World Broadcasting Union Technical committee has been working on pooling knowledge and learning to propose best practices, share information on vulnerabilities and make recommendations to media organisations and professionals. It also informs vendors that they also have a responsibility, as future systems will be mainly software defined.

Actions to Mitigate

We can carry out various actions to mitigate possible damage due to cyber-attacks. Among them the following are fundamental.

- I. Security Standards
- II. Best Practices
- III. Governance
- IV. Recommendations

However, training staff on procedures and increasing the number of security professionals may not be enough to redress the balance, given the prevalence and the nature of emerging attacks, many of which are automated and require automated responses. Service providers and other organisations are turning to technology to deliver such responses, using encryption and sandboxing technologies to protect data from intrusions, and ultimately from data losses. Sandboxing is often used as a defense against email-borne threats, and offers an isolated environment where suspicious code can be tested and observed. Encryption is a most effective way of protecting data, but just under half of all online traffic is encrypted, partly due to issues concerning authentication.

Collaboration is a key approach and is another way service providers must respond to the evolving threat environment is by learning to collaborate more closely and share intelligence about threats.

In design and architecture, it is required to make clear boundaries between production areas and general office networks. This becomes harder to manage when operations are moved to the public cloud as clear isolation is not possible. The workflows needs to be isolated using cyber security layers.

author

Dr Amal Punchihewa

Director Technology & Innovation of ABU

A Vice-Chair of World Broadcasting Union Technical Committee (WBU-TC)

Amal graduated with BSc (Eng) Hons specialising in Electronics and Telecommunication Engineering from Sri Lanka, MEng from Technical University of Eindhoven, The Netherlands & PhD from Massey University in New Zealand. He has published over 100 scholarly articles (peer-refereed technical journal and conference articles) in various journals including IEEE and IET digital libraries and transactions. He has held visiting positions at Tokyo University of Science (Japan) as a visiting associate professor and visiting professor. He was a Royal Dutch fellow of The Netherlands and Japan Society for the Promotion of Science (JSPS of Japan). He has served on technical/programme committees, organising committees and as track/session chairs for many international conferences. He advises on many International conferences including CCBN conference in China, BES in India and BCA in Singapore. Amal is a Senior Member of IEEE, Chartered Professional Engineer-CEng, Fellow of IET (UK) & Fellow of IPENZ (New Zealand).

Amal is currently Director Technology & Innovation at ABU. In that position, Amal drives innovation of media technology in the complete chain of media, starting from acquisition to consumption in the broadcasting industry. He influences the development of media technology in the best interest of ABU members. He leads a team of specialists, he facilitates technical guidelines and standards, and provides expertise related to the convergence of media, and evolving technical needs. He creates, encourages, and manages member communities, and understands and explains the trends that shape the media, to empower Members to continue to take good strategic decisions. He ensures that the Department continues to be a vital and respected partner for its members and for the media industry. As a member of the ABU Headquarters Management Team, he also plays a major part in shaping ABU strategy.

Amal is active in many of the WBU-TC and ITU broadcast related technical activities. He is a vice chairman of the WBU-TC. He is an advisor to IET Vision and Imaging Professional Network having served as an executive of IET Vision and Imaging Professional Network.

He possess more than 30 years of experience in all three sectors of broadcasting; viz. Academia, Research and Industry in senior broadcasting technology and ICT roles, including research and developments, regional capacity building in media and head of engineering of national TV-Sri Lanka, having started his career in computer engineering.

Record attendance and interest at DAB+ workshop during ABU DBS

Over 140 industry professionals from 20 different countries joined the DAB+ workshop at ABU DBS this year, discussing the progress of DAB+ in the region, hybrid radio, the business case for implementing DAB+ and the benefits of DAB+ in smartphones.

Titled “DAB+ expansion in Asia Pacific,” the WorldDAB workshop also featured three breakout sessions, during which delegates discussed key aspects of DAB+ rollout: regulation, technology and developing new content.

During breakout sessions, attendees discussed challenges including: spectrum management across borders, the impact of the self-driving car and the cost of delivering radio over mobile data.

DAB+ featured prominently throughout the DBS programme this year, with the opening keynote from Joan Warner, Asia Pacific Chair of WorldDAB and CEO of Commercial Radio Australia.

In the keynote, Ms Warner highlighted the reasons Australia chose DAB+, progress to date with the rollout and called on broadcasters across the region to take proactive steps to secure their future by reserving spectrum.

2017 looks set to be a landmark year for DAB+ and there is real interest from Asia Pacific in the new content and services that DAB+ offers. The workshop was the first part of a programme of activity and support for the region from WorldDAB, with the next workshop taking place during RadioAsia in April.

To find out more about how WorldDAB can support trials and rollout of DAB+, visit the website or email the Project Office projectoffice@worldadab.org



To find out more about WorldDAB and events in the Asia Pacific region visit

www.worldadab.org

Transition to Digital Sound Broadcasting in Asia with Digital Radio Mondiale (DRM)

Background

Over the past 90 years, sound broadcasting has developed as an essential part of daily life for providing the public with rich, advanced and diversified information and entertainment. It is set to play a continuing role in shaping and participating in the global knowledge and the information based economy. Terrestrial broadcast delivery offers truly mobile reception, particularly in cars, that is both cost effective and reliable for content providers. However, the introduction of new forms of digital information and entertainment, including satellite radio and Internet streaming of radio programming present challenges for analogue radio. Analogue radio needs to make a transition to digital broadcasting in order to allow radio broadcasts to add new programming and new features necessary to make radio competitive with new forms of digital entertainment and information. Some countries/broadcasters have strongly supported the transition, others have taken a cautious approach and some have expressed little or no interest.

Considering the combined technical and propagation characteristics that sound broadcasting provides, it remains the best medium for relaying news and information as well as entertainment. The different characteristics of the frequency bands available for terrestrial sound broadcasting should be seen as providing the flexibility for matching the various genres of sound broadcasting to audience expectations.

- The propagation characteristics of the broadcasting bands below 30 MHz are ideal for wide area/long distance coverage free from the constraints that can be imposed on other methods of delivering services.
- The propagation characteristics of the VHF broadcasting bands allow service areas to be matched closely to the distribution of population, the various types of distribution topologies required (i.e., national coverage segments, regional/county coverage, citywide coverage, as well as smaller local/community operations) and the terrain involved.

Given the above background, the Digital Radio Mondiale (DRM) standard is being seriously considered by many countries around the world for the very specific benefits it brings to all the stakeholders in the broadcast industry. The very essence that it caters to the entire spectrum available for

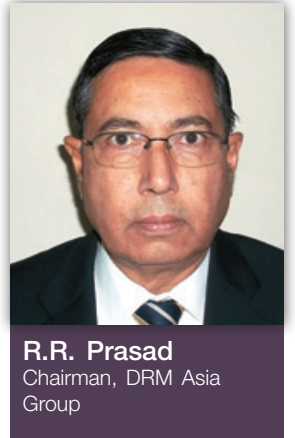
sound broadcasting makes DRM a natural choice for transition to digital broadcasting. India, one of the largest countries in the world, has adopted DRM and All India Radio has just finished the tremendous task of installing 35 powerful medium wave (MW) DRM transmitters, which will cover approximately 600 million people. The Indian digital radio roll out – the most comprehensive in the world so far – provides an unparalleled flexibility for broadcasters to use the standard for whatever needs they have and all this at much reduced costs.

DRM can have a unique value chain for all stakeholders in Asia: for listeners, manufacturers, broadcasters and regulators alike. The following is a Q&A format, based on the experiences so far, highlighting the major aspects of this value chain, which DRM offers to any kind of broadcasters. The rest of the article addresses some of the questions that broadcasters and audiences ask.

Since reaching all citizens in a country with the latest information is a mandate of every government, how can DRM broadcasters reach millions of people, spread over the large territories of Asia in a cost-effective way?

DRM for large-area coverage (in Medium Wave and Short Wave) is perfect for broadcasters aiming at regional, national or international audiences, especially in countries spanning large and varied geographical areas. With only a few AM transmitters, which are DRM enabled, every single citizen can be reached, wherever he or she lives. What is important is the fact that such digital broadcasts are less expensive than the current analogue ones, because digital broadcasts can reduce substantially the use and cost of energy; in certain instances by up to 80% (depending on the frequencies used). Therefore, for broadcasters, DRM can save them a lot of money.

As an example, if one 100 kW analogue transmitter with a given earth conductivity, covers an area 600 kilometres wide, the same transmitter, when DRM enabled, can cover the same area using only 40 kW. It is also very important to note that the broadcasters will use this reduced power (hence energy consumption) for broadcasting not only



R.R. Prasad
Chairman, DRM Asia
Group

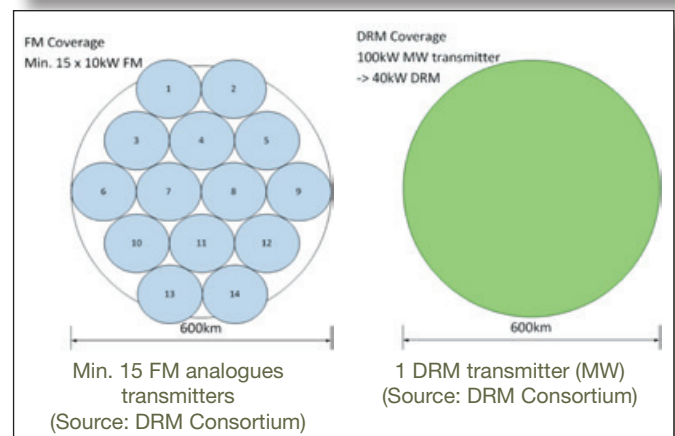
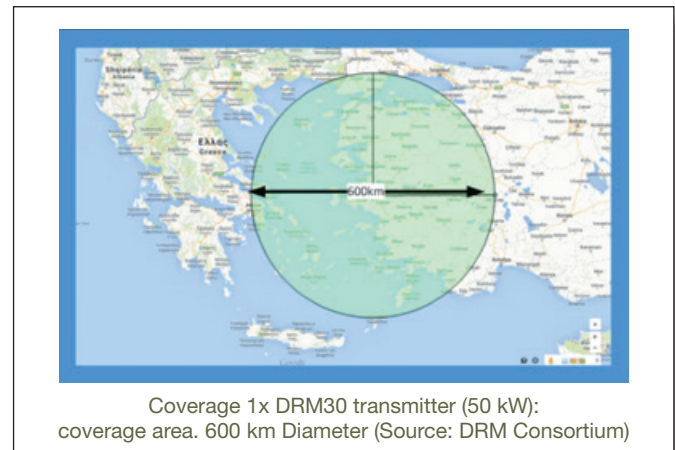
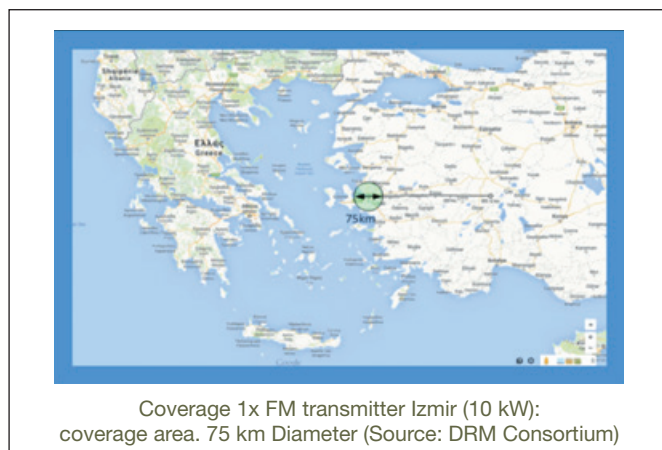
one programme, as in analogue, but for two or three programmes in parallel using the same frequency band, with exceptional improvements in sound quality. In addition, the broadcasters can add to these programmes, another channel for multimedia services, such as texts, pictures, very short video clips and slideshows to enhance the content of their programmes. All this can also be achieved in multiple languages or dialects with the reduced power consumption just described.

FM in the VHF band has become very popular in recent years, as the sound quality is much improved, though FM remains a local solution. Over large territories, FM analogue broadcasts can be quite expensive due to their energy consumption and the infrastructure needed to cover such large territories with many FM transmitters. By contrast, DRM using the Medium Wave frequencies can avoid such high costs. Just as an example, if for the same area of 600 kilometres in diameter there is a need of around 15-20 FM transmitters (depending on the power of those FM transmitters). One single 100 kW MW transmitter, equipped with DRM, can cover that same area using only 40 kW of power. DRM is thus five times more cost-effective than analogue FM.

How can DRM be used by broadcasters to focus on a specific area for a specific audiences, like communities for instance?

DRM in the VHF bands (band I, II and III) allows smaller commercial (or public broadcaster) and community stations to focus on smaller geographical areas for their specific needs. DRM allows community radio stations or specialised broadcasters to reach their intended audiences bypassing the congestion and high costs of the analogue FM band, or the involvement of third parties which may use expensive multiplexes and force broadcasters to cover the same coverage area, share audiences and sometimes advertising revenues. The advantages of DRM using the VHF bands are like those for DRM in the AM bands: more programmes on one frequency, multimedia services and the use of several languages for those programmes.

Examples of the coverage capabilities between FM and DRM MW transmissions are illustrated below:



Do broadcasters have to replace their entire transmitting infrastructure, in order to roll out DRM?

The DRM standard is extremely cost efficient, as just a few transmitters can achieve excellent coverage over very extensive territories, allowing the full coverage of a country. The current infrastructure, the existing sites and the channel distribution can be reused with DRM. Existing analogue transmitters, in most cases, can be upgraded to digital in a very short period by adding a few components to the analogue ones. In addition, antennas can also be reused. The cost involved for the upgrade is a fraction of the cost of a new transmitter.

What is the difference between the quality of the analogue sound and the sound produced by using the DRM standard?

DRM is the first digital radio standard to embrace the high efficiency audio codec (xHE-AAC), the latest in the MPEG AAC family of audio codecs, allowing for a natural fit with all modern digital devices. This delivers very high sound quality for both music and speech at very low bit rates, which is a big advantage for radio broadcasts. The audio is crystal clear and does not have any fading, crackling or other distortions wherever the listener tunes in.

It is well-known that many Asian countries are exposed to natural calamities such as earthquakes, floods, tsunamis, etc. What are DRM's capabilities to help governments

inform populations quickly and efficiently about such impending disasters and, once these strike, to help the people affected so that they can survive?

The DRM standard has an embedded disaster warning functionality (called Emergency Warning and Alerts Functionality), which enables the delivery of emergency programmes containing both audio and text in several languages at the same time. This provides essential and real time information and safety advice to the population and fulfils one of the major roles of governments across the world, to ensure the wellbeing of part of a country's population struck by disaster. DRM can trigger automatic activation of the emergency channel, even when a receiver is switched off and regardless of the receiver's location.

What is the status of DRM receivers today?

During the September 2016 IBC in Amsterdam, it was heartening to note the progress made in this field. Not only that more receiver types were presented,, which is important, but also that a new receiver technology has been implemented for new models. This new type of receiver will be the future as Software Defined Radio or SDR breaks new ground. The Fraunhofer tablet, as well as the SDR solution, incorporated in the PantronX tablet (Titus II) are two examples of the prototypes presented at IBC and more recently at the ABU General Assembly in Indonesia. These will become truly multi-standard in the year. Other SDR receiver manufacturers may use the opportunity that DRM roll-out in India and the interest for DRM in other countries provide to incorporate full DRM standards in their receivers.

In addition, Gospell in China have developed a sturdy DRM receiver, aimed at the developing world, which should be commercially produced towards the end of the year. Avion, the Indian receiver, is being constantly improved and we hope that a smaller version will be developed to ensure a more affordable price for the Indian market. All models presented at IBC and the ABU GA have been designed

in such a way as to be priced below the \$100 mark. In addition, work is being carried out to equip cars with existing in-built radios, with a small DRM receiver which can be placed anywhere in the car and which can relay the digital programmes via Bluetooth to the existing, in-car receiver. Three car manufacturers in India have already installed DRM radios in select models of their cars.

Can broadcasters make money out of DRM digital radio?

DRM is perfect for broadcasters planning to roll out new, additional digital services, which can generate new revenue streams through advertising without compromising their existing content offer. Even for smaller commercial and community broadcasters targeting well defined, urban niches, DRM has an answer. DRM in the VHF bands allows community radio or specialised commercial broadcasters to reach their intended audiences, bypassing the congestion and high costs of the analogue FM band. Again, competitive advertising can be a good revenue booster for smaller independent broadcasters.

Finally, how can the DRM standard contribute to the development of Asian economies?

DRM is perfect for broadcasters planning to roll out new, additional digital services, which can generate new revenue streams. More content also means more journalistic, production and technical jobs at the source radio stations.

In addition, the local production of DRM radio receivers for desktops, tablets, laptops, for mobile phones and cars in Asian countries will ensure new jobs and wealth creation. There are other opportunities in software and R&D development, distribution, retailing and a new kind of journalism. The DRM digital radio standard should be a strategic opportunity for the local industry to increase business and profits. We strongly believe this in India, and once the roll-out is in full swing, such opportunities will undoubtedly arise.

author

Rajiva Ranjan Prasad

After graduating in Electronics & Communication Engineering, Rajiva Ranjan Prasad joined the Indian Broadcasting Engineer's Service (IBES) in April, 1972. He worked in various capacities in both All India Radio & Doordarshan before retiring as Engineer-in-Chief, Doordarshan on 31 Dec., 2010. During his long service, of around 39 years, he remained closely associated with International bodies and the INSAT programme. Had been a member of the apex technical body, namely, the Technical Advisory Group (TAG) of the Insat Coordination Committee for almost 14 years. Had also served Vietnam as a nominated Expert of the Asia-Pacific Broadcasting Union for planning of the broadcast network in that country. He was chairman of the drafting group of the then CCIR JIWP CMTT-4-10-11/1 from 1987 to '90 and was appointed as ITU Consultant (Senior Expert) in 1996, serving in the Republic of Yemen on planning of the Radio/TV network in that country.

He is a Life Fellow and past President of Broadcast Engineering Society (India) and also a Life Fellow and past council member of the Institution of Electronics and Telecommunication Engineers (India).

Rajiva Ranjan Prasad was appointed Vice-Chairman, International Telecommunication Union – Radiocommunication (ITU-R) Study Group-6, by the Radiocommunication Assembly of the ITU held in Geneva in October, 2007 for the study period 2007-2011. He remained associated with different committees of the Ministry of Information & Broadcasting (Govt. of India) and Prasar Bharti (Broadcasting Corporation of India) during the period 2011 to 2013. He was appointed on board of Directors of BECIL (Broadcast Engineering Consultants India Ltd.) as Independent Director from April, 2012 to April, 2015. Presently he is Senior Advisor to BECIL and also Chairman, Asia-Pacific Group of DRM.



An invitation to PMPC-2017

Organised by ABU and Hosted by SIBC

PACIFIC MEDIA PARTNERSHIP CONFERENCE 2017 – Islanders are on Screen



15-17 August • Solomon Kitano Mendana Hotel • Honoria, Solomon Islands



The PMPC-2017 conference in the Solomon Islands will focus on how broadcasters continue to offer broadcast services by augmenting public free-to-air broadcasting. Key session topics have been identified to lead the discussions and deliberations. Those sessions are intended to determine desired policies and identify rationale for programming, business models for both public and private broadcasters, social responsibilities of media, environmental issues; responsibilities and technical quality of public service media services across evolving distribution platforms, such as broadband to ubiquitous devices. The workshops and conference also aim to discuss both technical and non-technical (regulatory, market, business, etc.) strategies to protect Public Service Media-PSM delivery as free-to-air broadcasting.

The venue and accommodation will be located at the Solomon Kitano Mendana Hotel and we will update you on how to make room bookings at a special rate for PMPC-2017.

A majority of countries have visa-on-arrival agreements with Solomon Islands. However it is strongly recommended to check with appropriate authorities and government websites.

Hybrid Technologies – New Opportunities: BES Expo and Conference 2017



What is BES?



BES, The Broadcast Engineering Society, is a professional body of broadcast Engineers in India which has more than 3000 members and various broadcast equipment manufactures on its roll. It has recognition of the Broadcast Engineering Society (USA). The primary aim of the society is to promote broadcast engineering technology in India and to educate broadcasting engineers about the latest developments in the field of broadcasting. It routinely conducts seminars, workshops and exhibitions in various cities throughout the country and it has a number of chapters and centres across the country to disseminate knowledge in the field of broadcasting. The biggest show held by BES is its annual Expo and Conference held in Delhi. It is the largest exclusive broadcast technology exhibition and Conference in this part of the globe.

BES Conference and EXPO 2017

The Indian broadcasting industry is going through revolutionary changes. The 24th edition of BES Expo was held in New Delhi from 2nd to 4th February at the Leela Convention Ambiance Hotel in Delhi and the conference gave an insight into vital issues related to digital technology

and various media platforms. The exhibition was held in the Grand Sapphire hall of the hotel and the conference in the adjoining convention hall. Visitors and exhibitors interacted on opportunities to uncover innovative broadcast solutions for business needs, while evaluating how technology is transforming and enhancing the broadcast industry, while widening business networks. The conference and the exhibition were inaugurated by the Hon. Minister of State for Information and Broadcasting, Sri. Rajyavardhan Singh Rathore, in the presence of media luminaries like Dr Subhash Chandra, founder Chief of Zee TV, RS Sharma, Chairman of TRAI, Rajiv Singh, board member of Prasar Bharati (Finance), Dr Amal Punchihewa, Director Technology & Innovation of Asia Pacific Broadcasting Union and delegates from many Indian and international broadcasting organisations and equipment manufactures.



Col. Rajyavardhan Singh Rathore Inaugurating the BES Conference and Expo 2017

Dr Amal Punchihewa, Director Technology & Innovation of ABU delivered the keynote address on the theme of the conference. He elaborated on the statistics of the viewership in the current scenario of multiple delivery of broadcasting content, especially over broadband. He also gave a summary of various technologies available for the broadcasters, other

than the over the air broadcasting and summed up that medial broadcasting will continue to use IP, both in delivery, contributions and production environments.

The 300 exhibitors displaying their latest products included Sony, Hitachi, Panasonic, Nautel, RFS, and Worldcast. India's public service broadcaster, Prasar Bharati, had on display aspects of its latest state-of-the-art DTT technology, wherein a consumer can view more than 10 TV channels on a mobile phone and TV set without any cable, DTH, or Internet connection.

A three-day conference on the theme, Hybrid Technologies in 'Broadcasting – New Opportunities', held concurrently with the exhibition, featured speakers presenting papers on new technologies. Besides keynote addresses, the conference had presentations on future broadcast radio and TV broadcasting technologies. Topics discussed included OTT technology, digital terrestrial TV transmission, Digital India, and digital radio broadcasting. Business leaders gave an insight on the ongoing market trends, future growth expectations, and plans of vendors.

Conventional broadcasting is facing a lot of challenges from Internet-enabled broadcast technologies like OTT, IBB, and hybrid TV. Issues were discussed by experts. Terrestrial television broadcasters are exploring horizons like DVB-T2 Lite, which may provide an efficient new platform for broadcasting to a mobile device. An exclusive session, with experts from DVB and other organizations, discussed the topics threadbare. An interesting session on radio broadcasting with eminent speakers and stakeholders was held on the Future of Radio. Radio broadcasting is at the crossroads, the dilemma being whether digital technology

would be sustainable given high receiver costs, or should there be a continuity of conventional analogue broadcasting, with a special thrust on FM broadcasting. Eminent speakers discussed its growth prospects over the next few years, backed by likely trends in digitisation, regionalisation, convergence, and innovation.

"Digital technology platform acted as an equalizer, ensuring level playing field and providing equal opportunities for all, irrespective of age, region, and economic background. Digital technology apart from providing better services also ensures transparency that enables plugging of leakages at every level so that the intended benefits trickle down to every citizen."

Col. Rajyavardhan Singh Rathore

*Minister of State for Information & Broadcasting,
Government of India*

This year, the BES conference left the broadcasters with a lot to ponder on in examining future courses of action.

The Expo 2017 was visited by manufacturers, dealers, distributors, and suppliers of products, equipment, systems, and services related to terrestrial and satellite broadcasting for radio and TV as well as studio and post-production, both analogue and digital. The expo was approved by ITPO, endorsed by DRM, UK, and supported by Prasar Bharati, Ministry of Communications & IT, Government of India, the ABU, and SBE USA.

The Hon. Minister of State for Information and Broadcasting, Sri. Rajyavardhan Singh Rathore presented prestigious awards to outstanding broadcasting engineers during the conference.



13th Media Technology Conference of IRIB in Tehran

The 13th Media Technology Conference (IICC) for IRIB engineers and Iranian companies, with the theme "Media Convergence & Hybrid Media (policies and practices)" was organised by the Department of Development and Media Technology of IRIB at the IRIB International Conference Centre in Teheran on 17th and 18th January, 2017.

The ABU and its members contributed to the conference in special sessions, with presentations on various topics, including video encoding, QoE, and compression artefacts. The conference provided simultaneous translations for the presentations. More than 2500 IRIB engineers and technicians from all regional stations attended the conference. Over 75 booths in three pavilions (named 'New Media', 'New Technology' and 'Self-sufficiency') provided an opportunity for both industry and IRIB to showcase their latest audio-visual products.

WBU Technical Committee Elected

Simon Fell elected Chair, Amal Punchihewa and John Lee Elected Vice Chairs

There are eight broadcasting unions which include collectively the national broadcasters of the world. The umbrella entity is the 'World Broadcasting Union' or WBU. It has a standing Technical Committee, the WBU-TC which includes representatives from each of the unions. The office of the WBU is in Toronto, Canada, alongside the North American Broadcasters Association headquarters.

Simon Fell, director of the European Broadcasting Union Technology and Innovation Department, has been elected chair the World Broadcasting Union (WBU) Technical Committee. He will serve a two-year term in the role (2017/18). Fell will be joined by Amal Punchihewa, Asia-Pacific Broadcasting Union technical director (Director of Technology and Innovation, ABU) and John Lee, chairman of the North American Broadcasting Association Technical Committee, who will both serve as vice-chairs.

The WBU-TC takes action in areas of common interest to all broadcasters throughout the world. For example, it conducted a campaign in 2014-2015 to secure access to radio and television signals over-the-air (OTA) using radio frequencies, or commonly known as broadcast frequencies until next WRC meeting. It advocates and promote common worldwide systems for television, radio and online delivery wherever possible.

"There are many challenges for the WBU-TC, as there are rapid developments in broadcast technologies. It becomes more difficult to achieve consensus on common technical standards throughout the world due to many factors, such as advancements in mobile technologies, convergence with information technology, commercial interests and diversity in national media marketed Amal, continuing; "We are slowly migrating to a world where, many elements of media value chain are software, which need to be interfaced using flexible inter-connections. The next two years will be challenging, addressing issues around use of IP for media production while fully completing the digital migration to delivery. However the WBU-TC and individual broadcasting unions are working with the industry, manufacturers and standard-making bodies to mitigate interoperability issues."

Simon Fell

Director of Technology & Innovation, EBU (Chair)

Simon Fell leads the team spearheading developments in media technologies at the EBU. He has four decades of experience, formerly with ITV as Director of Future Technologies; previously he helped establish Carlton Television where he held several executive positions and helped launch digital broadcasting.



Simon is currently Chairman of the ETSI Mobile Broadcast Convergence Group and was previously President of DigiTAG and chaired the Technical Council at the UK's Digital Television Group. He was also Chairman of the HD Forum.

Additional roles include, Director of Engineering for Rushes, Chief Engineer of 625 and establishing Channel Four. His early career included periods in the USA with Rank Cintel and at YTV in Leeds. He is a Fellow of both the SMPTE and RTS.

Amal Punchihewa

Director of Technology & Innovation, ABU (Vice-Chair)

Amal Punchihewa is currently the Director of Technology & Innovation at ABU. In that position, he leads a



team of specialists, driving innovation in media technology in the best interest of ABU members. He facilitates technical guidelines and standards, providing expertise related to the convergence of media, and evolving technical needs. He is an advisor to IET Vision and Imaging Technical and Professional Network, having previously served as an Executive committee member.

He possesses more than 30 years of experience in all three sectors of broadcasting; viz. academia, research and industry, including roles in regional capacity building in media and as head of engineering of national TV-Sri Lanka. He graduated with B.Sc. (Eng) Hons. specialised in Electronics and Telecommunication Engineering from Sri Lanka, M. Eng. from Technical University of Eindhoven, the Netherlands & PhD from Massey University in New Zealand. He is a Senior Member of IEEE, Chartered Professional Engineer-CEng, Fellow of IET (UK) & Fellow of IPENZ (New Zealand).

John Lee

Chairman of the NABA Technical Committee (Vice-Chair)

John Lee retired in December 2016 as Executive Director, Technology Solutions, for CBC/Radio-Canada, Canada's national television and radio public broadcaster. In this role, he was responsible for all DTV and Radio transmission facilities, all



satellite stations and facilities, telecommunications, mobility, telephony, unified communications; and for IT, including data centers, end-user computers, applications, Information Security and governance.

In 2001, he and his project team won the Canadian Gemini Award for Outstanding Technical Achievement for the National Satellite DVC Project and, subsequently, the National Association of Broadcasters (NAB) International Broadcasting Excellence Award in 2002. He was the executive sponsor of the Next Generation Converged Network (NGCN) project, a high-speed 58 city software-defined fibre-optic network, which won the 2012 CBC President's Award for Technical Innovation.

John Lee is a Vice-President of the North American Broadcasters Association (NABA) and is Chairman of NABA's Technical Committee. He is Vice-Chairman of the World Broadcasting Union (WBU) Technical Committee.

About the World Broadcasting Unions (WBU)

The World Broadcasting Unions (WBU) is the coordinating body for the broadcasting unions which represent broadcaster networks across the globe. It was established in 1992 as a coordinating body at the international broadcasting level. Since then, the WBU has provided global solutions on key issues for its member unions. The North American Broadcasters Association (NABA) acts as secretariat for the WBU.

The broadcasting unions who belong to the WBU are the Asia-Pacific Broadcasting Union (ABU), the Arab States Broadcasting Union (ASBU), the African Union of Broadcasting (AUB), the Caribbean Broadcasting Union (CBU), the European Broadcasting Union (EBU), the International Association of Broadcasting (IAB/AIR), the North American Broadcasters Association (NABA) and the Organizacion de Telecomunicaciones Iberoamericanas (OTI).

ABU-ASBU partnership in Technology and Innovation



This year's training programme, in partnership with ASBU, was held at ASBU headquarters in Tunis from 13th to 18th March. The themes of the training were compression and evolving technologies for digital media.

Twelve participants, from Sudan, Algeria, Oman and Tunis, attended the five day training course, which addressed a number of critical learning areas for broadcast and IT engineers in the media field. Among the topics were the latest compression technologies for audio and video, integrated broadcast broadband technologies and services based on media engines such as HbbTV, increasing use of IP in broadcast operations, including production and evolving workflows based on IP and cyber security.

Dr Ridha, a former Director General of Tunis Radio and Television, is working with Dr Adnan to operationalise ASBU's new academy by end of April 2017. The discussions among ABU, Dr Ridha, Dr Adnan, Mr Suleiman-Director General of ASBU and Mr Bassil Zoubi, Technical Director of ASBU, consolidated the joint training conducted in Kuala Lumpur and Tunis.



All participants and other stakeholders were pleased with the outcomes of the training course. Participants mentioned in their feedback that they were looking forward to applying what they had learned in the course at their work places. Once the academy of ASBU is operational, some hands on sessions will also be incorporated into the training courses, with access to a fully fledged studio, control room, multimedia centre and a computer network.



The participants were enthusiastic to explore the new studio and to see the ASBU academy's state-of-the-art energy-saving LED lighting fixtures.

Present Status of Doordarshan's HD Infrastructure



P S Srivastava
DD(E), DDI

abstract

HD production has now become the mandatory requirement of all programme productions, as recent advancement in the field of broadcasting and display technologies has raised the popularity of HDTV. It has increased the aural-visual expectations of the common viewer.

Doordarshan, India's Public Service broadcaster also needs to migrate to HD technology. Doordarshan being one of the biggest broadcasters in the world cannot migrate to HD technology in a single go due to huge fund requirements. Hence, a planned and systematic approach has been adopted for migration in a phased manner.

Introduction

For the last few years, HD production has become the mandatory requirement of all programme production, as recent advancement in the field of broadcasting and display technologies have raised the popularity of HDTV. Sharper and wider images with digital sound quality have dramatically raised the bar for television viewership all over the world and it has increased the aural-visual expectations of the common viewer.

Doordarshan, India's Public Service broadcaster also needs to migrate to HD technology in a phased and planned manner and has adopted the following approach to migrate to HD technology, from production to transmission.

Doordarshan, being one of the biggest broadcasters in the world, with studio based production facilities at 67 locations across India, more than 1400 terrestrial transmitters of various capacities, ranging from 10 Watts to 30 Kilo Watts, 41 fixed Earth Stations and 34 fly-away/vehicle mounted DSNG's of C/Ku band, cannot migrate to HD in a single go. Hence, a planned and systematic approach has been adopted for migration in phased manner.

Eng & Field Based Production

For acquisition of niche programmes, Doordarshan has purchased 2/3" CCD based HD camcorders for ENG and field based production. These camcorders use MPEG-2 long GoP compression with 50 Mbps recording bit rate and 4:2:2 sampling ratios. Compact camcorders with 1/3" CMOS image sensors using AVC HD recording format have been procured for news applications. These camcorders have already been deployed for production of documentary, reports, musical programmes, and other field based productions at around 50 Doordarshan centres. The requirements of remaining centres are being fulfilled within the current financial year. By early next year all the production centres

of Doordarshan will be able to produce ENG/Field based content in HD format.

Studio Based Production

The pace of upgrading of existing Studio set-ups to HD format is very slow due to a paucity of funds. Presently one Studio each in Delhi and Mumbai have been upgraded with multi-camera production facilities. These production facilities are also capable of producing 5.1 surround sound in Dolby E. Apart from recording in tapeless media of optical disc, the content can be recorded directly into central storage and the content made available for post-production work in a collaborative environment. Three more multi-camera HD studios have been planned by next year.

Outdoor Broadcast (OB) Production

Presently, five Multi-camera HD Outdoor Broadcast (OB) vans are available to the network. These OB Vans have 4 to 12 HD camera set-ups. Another OB Van will be commissioned by the fourth quarter of 2016. The International musical concert "Ehsaas-e-Kashmir" by Maestro Zubin Mehta, an international icon of western classical music, was covered in HD by Doordarshan. Apart from this, events of National importance like Independence Day and Republic Day Celebrations have already started to be covered in HD format.

Collaborative Non-linear Post-production

For post-production work of either ENG/Field based production, Studio & OB, non-linear editing systems, working in tapeless and collaborative formats, have been provided to metro centres. The post-production set-up is capable of producing 5.1 surround sound in Dolby-E. Other centres have been equipped with stand-alone non-linear editing systems in HD format.

Preview Set-up

The quality of HD content can only be realised on a big screen with digital surround sound. Keeping this in view, an 84" Digital Light Processing (DLP) projection system, having resolutions of 1920 x 1200 pixels for a true HD image, has been provided. This has been supplemented with a Dolby-E surround sound monitoring systems to preview the quality of recorded or acquired content.

Automated Channel Payout System

A single channel automated playback system, capable of generating two parallel streams of HD and SD, has been installed in New Delhi. While designing the system and implementing the facilities, the following issues were faced and addressed in a professional manner:

- (i) Doordarshan caters to masses, living in both rural and urban areas. To safeguard the interests of Standard Definition (SD) TV viewers, who cannot afford to switch to HD TVs immediately, it was decided to design the system to generate two parallel streams – one for HD viewers & the other for SD viewers and to simulcast both streams. This was done to ensure retention of the existing viewers and to avoid advertising revenue losses.
- (ii) As Doordarshan is currently passing through the critical phase of SD to HD transition, the availability of HD content for round the clock transmission was an issue and content has to be in both the standards i.e. SD and HD, to begin with. While designing the system, it was planned that there should not be double conversion, like SD to HD and again back to SD or vice-versa, at any stage throughout the chain. To implement this concept the selection of a video server was done in such a way that the content would be ingested in its native standard (either in SD or in HD). While playing back to the SD stream, the SD content will play as it is and HD content will play after down conversion to SD, with 4:3 aspect ratio and pillar box configuration. Similarly, for HD stream, the HD content will play as it is and SD content will play after up-conversion to HD with 16:9 aspect ratio and letterbox configuration.
- (iii) Selection of a Graphics System was done such that the delivery machine provides simultaneous HD and SD outputs. Also, while designing the graphics templates, the safe area for 4:3 was kept in mind.
- (iv) To synchronise the HD and SD streams, it was necessary that the triggering of playlists should be simultaneous. Provision of necessary hardware for ganged operation was planned for automation system.

- (v) Efforts were made to design the system for recording to be format agnostic. Hence, provision for popular encoders/decoders like MPEG-2 Long GoP, AVC-Intra, DV 50, DV 25 etc. were kept in the design of the system to facilitate ingest of content in these formats. This has minimized transcoding losses. The system is also capable of base-band ingest.
- (vi) As the national channel of Doordarshan has live content as well as packaged programmes, the automation system was chosen to have a manual override facility as well.
- (vii) Though the system has been designed for transmission through Video Server, last minute content, arriving on tape or tapeless media, can also be played through VCRs/Decks of a particular format.

Further to this, a multi-channel automated play-out facility for four other DD channels are under implementation in the current financial year.

C-Band and Ku-Band Uplinking

A C-band up-linking facility in HD format has been installed in New Delhi for contribution purposes. Doordarshan also provides a free DTH service known as 'DD Free Dish' (earlier known as 'DD Direct Plus'). The provision to include one HD channel has been made in this DTH platform. The whole chain of play-out to C-band & Ku-band up-linking was successfully tested during the Commonwealth Games telecast in HDTV format for Indian viewers. The existing DTH platform has been extended from 59 TV channels to 97 TV channels and it has been envisaged that this will be upgraded to 250 TV channels by 2017. The enhanced capacity will accommodate multiple HD channels.

Terrestrial Transmission

Doordarshan is in the process of migrating from analogue terrestrial services to digital by adopting DVB-T2 technology. 46 High Power Digital terrestrial transmitters are under various phases of installation throughout the country. Doordarshan has estimated to replace its more than 1400 analogue terrestrial transmitters (HPTs/LPTs/VLPTs) by 630 High Power DVB-T2 transmitters capable of transmitting multiple channels of SD & HD.

Conclusion

Doordarshan is currently gearing up slowly but steadily for HD technology adoption in a planned and phased manner as the required infrastructures, from acquisition to transmission, are being put in place.

author

P S Srivastava, DD(E), DDI

Mr P S Srivastava, a 1992 batch IB(E)S officer is presently working as Director (Engg.) in Studio Planning & Development Wing of Doordarshan Directorate, New Delhi. Mr. Srivastava achieved his engineering graduation in Electronics in the year 1990 from Madan Mohan Malviya Engineering College, Gorakhpur (UP), India. Mr Srivastava has approximately 21 years of experience in the capacity of Broadcast Engineer, of TV Studio & OB operations, maintenance, TV studio design, training and installation. He has vast experience of working in News and Sports divisions of Doordarshan and has played a key role in the phased digitalisation of Doordarshan's production facilities of entire network. He has significant achievement in the introduction of HDTV technology in Doordarshan to his credit. In the year 2008, Mr Srivastava was invited by the ABU as an expert for a TAS (Technical Advisory Service) mission for Radio the Voice of Vietnam (VOV) to assist in setting up a TV Channel.

Since 1959
DOORDARSHAN
 India's Public Service Broadcaster

DD
NEWS

Only News. Complete News

We speak the truth

DD News is the only terrestrial cum satellite News Channel of the country. The News Channel of India's Public Service Broadcaster has been successfully discharging its responsibility to give balanced, fair and accurate news without sensationalizing as well as by carrying different shades of opinion. DD-News channel was launched on 3 November 2003 by converting DD-Metro into a 24-hours news channel. Its satellite footprint is available across the country. DD News terrestrial reach is 49% by population and 25% by area of the country. DD News is currently producing news content in Hindi, English, Urdu and Sanskrit languages. Over 17 hours of LIVE transmission include telecast of more than 30 news bulletins in these languages. Besides this 14 Regional News Units of DD News are producing four regional shows in a day which are aired on DD News. The channel also telecast daily three sports bulletins, one business show, daily current affairs programme.



ABU TECHNOLOGY CALENDAR OF EVENTS

Date	Event	Venue
4-5 April	ABU Technical Bureau Mid-Year Meeting	Colombo
13-14 April	ABU Central Asia Media Forum 2017 & Intellectual Property & Legal Committee Meeting	Tashkent
10-12 May	Media Summit on Climate Change and Disaster Risk Reduction	Dhaka
22 May	ConneXion Forum on "IP: A Pathway to Resilient Future-Proof Workflow"	Singapore
23-26 May	BroadcastAsia 2017	Singapore
5-8 June	ABU-ITU-AIBD Regional Workshop on Digital Broadcasting, Policy and Transition	Qingdao, China
7 June	WBU Technical Committee Meeting	Stuttgart
8-9 June	EBU Technical Assembly 2017	Stuttgart

Making Sense of Cybersecurity

EBU DIRECTOR OF TECHNOLOGY & INNOVATION **SIMON FELL** INTRODUCES A SET OF RECOMMENDATIONS DESIGNED TO BRING CYBERSECURITY BEST PRACTICES INTO THE MEDIA DOMAIN.

Earlier this year I had the pleasure of visiting the USA with members of the EBU Technical Committee, dropping in on a number of different companies whose services impact in some way on broadcast media. It was an eye-opening experience! One of the things that struck me was the extent to which the tech industry has embraced the cloud, upon which entire business empires are now being built.

While the cloud holds plenty of promise for broadcasters – virtualizing operations such as encoding and transcoding, and soon editing and playout, can deliver real efficiencies – there remain very significant concerns, not least around security. Indeed, as our sector moves away from dedicated hardware that evolved on a technology island and into the connected world of IT, IP and the cloud, we are stepping into a cybersecurity minefield. As BBC's Peter Brightwell said at our recent EBU Media Cybersecurity Seminar, "IP offers flexibility, but also open doors to hack".

The EBU Technical Committee recognized a need to provide support to Members in this area, deciding back in 2014 to create a strategic programme focusing on Media Cybersecurity. The group, which has been meeting regularly since 2015, brings together the chief information security officers (or equivalent) of Europe's Public Service Media to develop best practices in a collaborative manner. It is a sensitive topic of course, so we take appropriate precautions to ensure we provide a safe space within which to share experiences. My colleague Adi Kouadio, who manages the group, says they are not reinventing the wheel in this domain; they are simply customizing it for the context of media organizations, building on existing security standards and practices.

During 2016, the Technical Committee approved our first set of EBU Recommendations in the area of media cybersecurity. The documents, listed below, are publically available from our website at <https://tech.ebu.ch/publications>. Participants at the ABU's recent Digital Broadcasting Symposium in Kuala Lumpur had the opportunity to hear a presentation on this topic from DVB's Executive Director Peter Siebert, who was kindly representing the EBU. While commitments elsewhere meant I couldn't attend in person, I was pleased to participate, over a live video link, in the Q&A session that followed.

I warmly encourage colleagues at ABU Members to consult our cybersecurity recommendations and get in touch with us if you have experiences to share.

EBU Media Cybersecurity Recommendations

- R 141 – Mitigation of Distributed Denial of Service (DDoS) attacks
- R 142 – Cybersecurity best practice for connected TVs and services
- R 143 – Cybersecurity for media vendor systems, software and services
- R 144 – Cybersecurity Governance for Media Companies
- R 145 – Mitigation of Ransomware and Malware attacks
- [R 146 – Forthcoming recommendation on cloud services]

Upcoming Events

Finally, we are in the middle of one of our busiest ever seasons of seminars and workshops at the EBU, with something for just about everyone who is interested in media technology! As I write this, we have already welcomed delegates to our popular Production Technology Seminar and Digital Radio Summit, along with the above-mentioned Media Cybersecurity Seminar. Take a look below at our other upcoming events. ABU Members are always most welcome, with many benefitting from discounted registration fees by virtue of being Associate Members of the EBU. (Check the list at www.ebu.ch/about/members.)



Innersource Commons Summit 2017

18-20 April

tech.ebu.ch/innersource2017

BroadThinking 2017

3-4 May

tech.ebu.ch/broadthinking2017

Object-Based Audio Workshop

17-18 May

tech.ebu.ch/oba2017

IMF Workshop

30-31 May

tech.ebu.ch/imf2017

Network Technology Seminar 2017

20-21 June

tech.ebu.ch/nts2017

Metadata Developer Network

27-29 June

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For more information and to register, please email chloe.cai@sesallworld.com.



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The ABU Technical Review is a quarterly publication which is mailed directly to the senior technical management in broadcasting organisations, prominent industry personalities, academics and students. The Technical Review is available to the broadcast industry and general public on the ABU website, free of charge. This approach has significantly enhanced the exposure of the magazine, bringing more value to the advertisers.



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Inside Full Page	Annual Rates (4 issues)	US\$1,800	US\$2,000
	Per Edition Rates	US\$475	US\$525
Inside Half Page	Annual Rates (4 issues)	US\$1,100	US\$1,200
	Per Edition Rates	US\$300	US\$325

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News

from the ABU Region

Hong Kong Announces Spectrum Release Plan

Hong Kong's Communications Authority (CA) has published its Spectrum Release Plan (SRP) for 2017 – 2019 following consultation with the industry through the Radio Spectrum and Technical Standards Advisory Committee of the Office of the Communications Authority (OFCA).

Spectrum is a scarce public resource and its supply is by no means limitless. Currently, all the 552 MHz of spectrum which is available and is subject to competitive demand has been assigned to mobile network operators for the provision of public mobile telecommunications services. As to the 34.6 MHz of spectrum in the 2 GHz band which is held in reserve, it can be readily released to the market upon expression of interest by any industry player, as explained by a spokesperson for the Communications Authority.

The first working target of the HK Government is to switch off analogue terrestrial television services (Analogue Switch Off – ASO) by 2020 with a review to be conducted in 2017/18. Upon completion of ASO and frequency coordination with the Mainland regulatory authorities to avoid cross-boundary interference, the CA will release spectrum in the 700 MHz band for the provision of public mobile services.

Meanwhile, OFCA says it will also be exploring with the industry the technical feasibility of using spectrum in the 3.5 GHz band, which is currently allocated to fixed satellite services (FSS) in Hong Kong, for use by public mobile services. In view of the potential interference problems between public mobile services within the 3.5 GHz band and FSS, OFCA says it will be cautious and prudent in the process to minimise any adverse impacts on the current FSS users, including the hundred thousands of households receiving satellite television services.

(Comms Authority HK)

Generation What? to be Launched Across Asia-Pacific

'Generation What?', one of the most significant trans-media and transnational campaigns, has been highly successful in Europe. Following this success, the same exercise will be done throughout the Asia-Pacific region at the beginning of 2018, commencing simultaneously with 'Generation What? – Arabic in the Middle East'.

Generation What? helps broadcasters to re-connect with young people, develop their online presence and programming and their capacity to launch trans-media or new media campaigns. The campaign consists of two main components: the website, which hosts an online questionnaire and online

data, and TV documentaries based on central themes of the questionnaire. The ABU is partnering with the United Nations Educational, Scientific and Cultural Organisation (UNESCO), Upian and Yami 2, the founders of Generation What? Europe, to launch this youth-oriented, global trans-media project in Asia-Pacific.

The 1st Steering Group Meeting of Generation What? Asia-Pacific (GWAP) concluded successfully in Bangkok, Thailand. Hosted by UNESCO Bangkok, the two-day meeting ran from the 16th to the 17th of February, 2017. Sixteen participants from 10 ABU member organisations took part in the meeting. They were NHK-Japan, VTV-Vietnam, RRI-Indonesia, BB-Bangladesh, TVK-Cambodia, ACORAB-Nepal, Thai PBS-Thailand, MCOT-Thailand, CTC-Philippines, and Mongolia. The aim of the meeting was to provide detailed information on the scope of the project and discuss the next steps in launching this ground-breaking global campaign in Asia-Pacific region.

(C+T)

New Commercial Radio Industry Code of Practice

Commercial Radio Australia has welcomed the registration of the new Commercial Radio Industry Code of Practice by the Australian Communications and Media Authority (ACMA). Developed by the industry in consultation with ACMA, the code regulates the content of commercial radio and aims to ensure broadcasts meet community standards and attitudes while protecting the right of freedom of speech.

CRA Chief Executive Officer, Joan Warner, said the new code had been developed following an extensive review and consultation process and would come into force on the 15th of March, 2017. The code has been updated to reflect changes in the modern media environment and to provide clear guidance to radio stations and listeners on what is required in each of the areas covered by the code. These include taste and decency, accuracy and impartiality in news, broadcast of Australian music, procedures for complaints handling and the broadcast of information in times of emergency.

The updated code contains no change to the amount of advertising on commercial radio and retains the high levels of community safeguards in relation to the protection of children, privacy and the broadcast of offensive content. CRA has also published a new guideline on the responsible reporting of domestic violence, based on guidelines developed by Our Watch, the national organisation leading Australia's work in preventing domestic violence.

(CRA)

Mediacorp Purchase 56 Tieline Merlin Codecs for STLs

Tieline recently announced that Mediacorp, Singapore, has installed almost 60 Merlin IP audio codecs in the new Mediacorp Campus facilities in Mediapolis and at its Bukit Batok Transmitter site. The codecs carry 12 radio channels which are broadcast in four languages to Singapore's multilingual audience.

The size and scope of the Mediacorp installation at their new facility at Mediapolis is impressive. Critically important with live content is the reliability in delivering over 100,000 hours of unsurpassed audio quality to the audience each year. Mediacorp has selected Merlin IP Audio codecs for their studio-to-transmitter links as they are equipped with multiple layers of redundancy and are already used by major broadcasting networks across the globe.

Tieline's Singapore distributor, Telesto Broadcast Solutions, delivered and supported the installation and commissioning of the near 60 Merlin codecs used for main and redundant studio transmitter links.

(C+T)

Preparing for the Shift to Digital TV in Philippines

Digitalisation is taking over every aspect of our environment. The television industry is no different – countries across Southeast Asia have been moving towards digital TV broadcasting. For instance, Singapore is preparing for analogue switch off (ASO) in 2017, completing the switch from the conventional analogue transmission to digital transmission.

The Philippines is the latest nation to commit to digital. The Department of Information and Communications (DICT), in partnership with other government agencies, has announced the launch of the Digital Terrestrial Television Broadcasting (DTTB) migration plan, to move TV broadcasting from analogue to digital. The plan aims to have 95 percent of Filipino households switch to digital television transmission by 2023. As the transmission systems evolve, consumers can expect higher quality video and audio signals. Broadcasters will also be able to offer new services through datacasting and Broadcast Markup Language (BML).

However, the migration requires swift action from all stakeholders involved. In order to make the shift seamlessly and for consumers to enjoy the associated benefits, it is important that service providers are equipped with the right digital delivery platforms. Operators will require advanced set-top box software and system integration services to support the transition to an all-digital platform within the planned time frame. Although it may seem like a significant undertaking at this time, working with the right technology partner can enable rapid and smooth implementation. Operators who action the change in a timely manner will be primed to tap into the growing digital TV customer base and stay ahead of the competition.

(C+T)

Astro AWANI Migrates to Octopus 8

Astro AWANI, a 24-hour news network produced for viewers in Malaysia and Brunei, is the latest broadcaster to upgrade its newsroom infrastructure to Octopus 8.

Octopus 8 is a software-based system which integrates easily into the existing workflow, making the transition to Octopus very easy for the newsroom staff. The management reporting tool helps track the productivity of the newsroom in terms of story creation, duration of selected stories or topics on air. The Octopus team provided strong support during a detailed pre-sale demonstration of the system, giving the confidence that Octopus 8 will meet the current needs as well as being fully scalable for the future.

Available for Apple OS X, Linux and Microsoft Windows operating systems, Octopus 8 gives newsroom staff the ability to ingest all incoming audio, video and still-image files, news agency wires, RSS feeds, emails, SMS messages and even faxes. All content relating to a specific task can be seen in a single view. Octopus 8 is MOS compliant so can be integrated into any environment or workflow that supports the MOS protocol. Octopus 8 integrates easily with existing and new MOS devices. It fully supports placeholder workflow, thumbnails and proxy preview, item status, channel assignments and many other commands.

(Octopus-news)

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(CRA)

Digital Broadcasting Update

Ultra HD Phase A Industry Guidelines



The Ultra HD Forum has released version 1.2 of its Ultra HD Phase A industry guidelines. “Ultra HD Phase A” encompasses practices and technologies that are commercially feasible in UHD services today. This revision builds on best practices and lessons learned in 2016 and feedback on previous versions of the guidelines to better assist operators with real UHD deployments.

Key updates in the new version include information on the following:

- Implementation of channel-based immersive audio for Phase A (e.g. Dolby Atmos),
- Down-converting HDR/WCG to SDR/BT.709 with ETSI TS 103 433 method,
- Carriage of signaling for transfer function, analogue colour container and colour matrix, including newly added information for file-based video formats,
- A brief summary/comparison of ITU-R BT.709, BT.2020 and BT.2100,
- ACES Workflow for colour and dynamic range,
- Dynamic HDR metadata technologies as candidates for the forum’s future work on Phase B.

The guidelines already include a security chapter on best practice for content encryption.

(Ultra HD Forum)

Version 2.1 of the HDMI Specification



HDMI Forum, Inc. has announced the upcoming release of Version 2.1 of the HDMI Specification. This latest HDMI Specification supports a range of Higher Video Resolutions and refresh rates including 8K60 and 4K120, Dynamic HDR, and increased bandwidth with a new 48G cable. Version 2.1 of the HDMI Specification is backward compatible with earlier versions of the Specification, and was developed by the HDMI Forum’s Technical Working Group whose members represent some of the world’s leading manufacturers of consumer electronics, personal computers, mobile devices, cables and components.

HDMI Specification 2.1 Features Include:

- Higher Video Resolutions support a range of higher resolutions and faster refresh rates including 8K60Hz and 4K120Hz for immersive viewing and smooth fast-action detail.
- Dynamic HDR ensures every moment of a video is displayed at its ideal values for depth, detail, brightness, contrast, and wider colour gamuts—on a scene-by-scene or even a frame-by-frame basis.
- 48G cables enable up to 48Gbps bandwidth for uncompressed HDMI 2.1 feature support including 8K video with HDR. The cable is backwards compatible with earlier versions of the HDMI Specification and can be used with existing HDMI devices.
- eARC supports the most advanced audio formats such as object-based audio, and enables advanced audio signal control capabilities including device auto-detect.
- Game Mode VRR features variable refresh rate, which enables a 3D graphics processor to display the image at the moment it is rendered for more fluid and better detailed gameplay, and for reducing or eliminating lag, stutter, and frame tearing.

The new specification will be available to all HDMI 2.0 Adapters and they will be notified when it is released early in Q2 2017.

(HDMI)

Digital Single Market: EU negotiators agree on new rules allowing Europeans to travel and enjoy online content services across borders

Europeans will soon be able to fully use their online subscriptions to films, sports events, e-books, video games or music services when travelling within the EU, according to the agreement reached this evening by negotiators of the European Parliament, the Member States and the European Commission. This is the first agreement related to the modernisation on EU copyright rules as proposed by the Commission in the Digital Single Market strategy.

The future regulation will enable consumers to access their online content services when they travel in the EU the same way they access them at home. For instance, when a French consumer subscribes to Canal+ film and series online services, the user will be able to access films and series available in France when he or she goes on holidays to Croatia or for a business trip to Denmark.

The online content service providers like Netflix, MyTF1 or Spotify will verify the subscriber’s country of residence by using means such as payment details, the existence of an internet contract or by checking the IP address. All

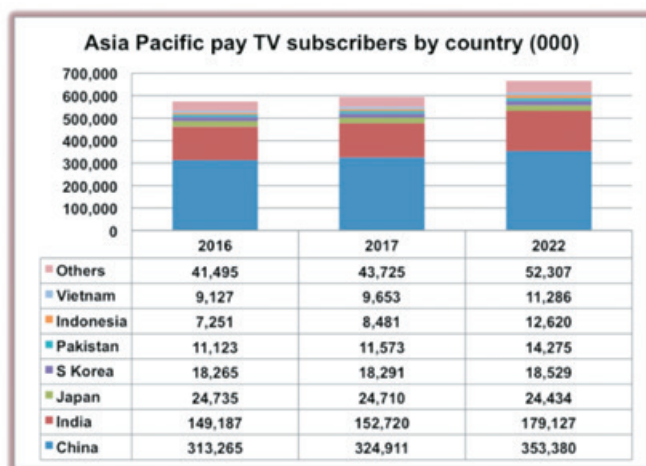
providers who offer paid online content services will have to follow the new rules. The services provided without payment (such as the online services of public TV or radio broadcasters) will have the possibility to decide to also provide portability to their subscribers.

The agreed text must now be formally confirmed by the Council of the EU and the European Parliament. Once adopted, the rules will become applicable in all EU Member States by beginning of 2018 as the Regulation grants providers and right holders a 9 month period to prepare for the application of the new rules.

(European Commission)

Impressive pay TV growth forecast for Asia-Pacific

Unlike most of the rest of the world, the Asia Pacific pay TV sector is vibrant, with subscribers and revenues forecast to rise over the next five years.



China and India together will account for 80% of the region's 666 million pay TV subscribers by 2022. China will add 40 million subs between 2016 and 2022, with India bringing in an extra 30 million. However, five of the 22 countries covered in **the Asia-Pacific Pay TV Forecasts report** will lose subs between 2016 and 2022.

Digital cable will supply 72 million of the 92 million pay TV subscriber additions between 2016 and 2022. However analogue cable subscriptions will fall by 70 million – leaving cable nearly flat overall. IPTV will contribute in an extra 57 million subs, with pay satellite TV up by 32 million.

Together China, India and Japan will account for more than two-thirds of the region's \$40.13 billion pay TV revenues by 2022.

Pay TV revenue will increase by \$5.75 billion between 2016 and 2022. India will contribute \$3.25 billion to the additional revenues, with China bringing in \$1.10 billion more. Pay TV revenues will double in Bangladesh and Myanmar, but will fall in six other countries.

China Radio and TV will gain 19.97 million digital cable subscribers between 2016 and 2022. However, the operator will lose 20.50 million analogue cable subs; giving a net loss of 531,000 subs. The next biggest loser will be Japan's SkyPerfectTV; down by 289,000 subscribers over the same period.

IPTV operators China Telecom (plus 24.39 million) and BesTV (plus 12.19 million) will gain the most pay TV subscribers over the same period, followed by India's Dish TV (plus 5.20 million).

China Radio & TV will remain the region's dominant pay TV operator in revenue terms by a massive distance. However, its revenues will fall by \$763 million between 2016 and 2022. Meanwhile, China Telecom will gain more than \$1 billion and BesTV will climb by \$608 million.

(Digital TV Research)

New Indian Car Integrates DRM Receiver and Chip

Chips and receivers are being deployed in DRM-fitted car infotainment receivers



Hyundai Mobis has announced the successful completion of field trials of Mobis DRM receivers and NXP chips designed in India.

The chips and DRM receivers are now deployed in DRM-fitted car infotainment receivers available in a newly launched Hyundai vehicle in India.

The development of these chip and receivers were the result of collaboration between All India Radio, NXP, Hyundai Mobis and the DRM Consortium. With this new technology, India radio listeners car receive higher quality AM broadcasts, traffic updates, natural disaster warnings and news.

All India Radio has thus far completed the installation of 35 transmitters and has announced a second phase of the project, which will make all DRM features available.

(Radioworld)

Equipment Trends

Automated Captioning Engine



The Link Electronics ACE-2000 is an Automated Captioning Engine that will receive audio containing speech directly from the source and output captioning data to be encoded by a closed caption encoder. It uses a cutting-edge computational linguistics program to convert speech to text and then sends that text out with captioning data. The captioning data and text can be sent to the encoder either RS 232 (Serial) or TCP/IP.

The ACE-2000 can receive the audio in one of many different ways. It can de-embed the first two channels of audio from a SDI input or a HDMI input. Balanced AES or balance analogue audio is other methods that the unit can receive audio. The unit also has the ability to receive streaming audio using http, tcp, udp, mmsh, and most types of rstp and rtmp. It also supports the most commonly used codecs.

The ACE-2000 has a web based Graphical User Interface (GUI) that will allow remote controlling of this device. The GUI contains an event scheduler that will allow you to use different audio inputs and caption outputs at different times. The unit comes preset with standard audio and caption data outputs for Link encoders making the setup for this device simple. A keyboard, mouse, and monitor will be required to change the settings from the standard setup. This unit is compatible with most closed captioning encoders or devices.

(Link Electronics)

World's First Voice-controlled Hybrid Radio for Cars

Radioplayer Car is the world's first voice-controlled hybrid radio adaptor, offering an easy upgrade for car stereos. It's a 'smart radio' system, able to switch intelligently between DAB, FM or streaming, to find the strongest signal.



A small box, professionally fitted behind the dashboard, links to the 'aux input' on an existing car radio. It connects wirelessly to the driver's smartphone, held safely in a mount, which is supplied. A free app enables the driver to control the multiplatform radio safely, navigating between stations which have been set as 'favourites'.

The voice control system is woken by saying 'Radioplayer', then the name of a favourite station, which will automatically play on DAB, FM or mobile. 'Wave-to-wake', can also be used, by moving a hand near the phone. Station names are announced over the speakers, ensuring there is no need to look at the screen. If the signal varies while driving, Radioplayer Car automatically switches to a different platform, keeping drivers listening via the best method possible.

Radioplayer Car also enables drivers to 'Bluetooth' their own smartphone music collections, take hands-free calls, listen safely to inbound text messages and receive instant audio travel news, customised by GPS to their location and direction of travel. The app and the box can both receive updates 'over the air', meaning that, even after purchase, Radioplayer Car can be made smarter and smarter.

Developed by Radioplayer (the not-for-profit collaboration between the BBC and commercial radio), the hardware is manufactured under licence by market-leading supplier of car audio interfaces, Connects2. The largest installer of audio products to the retail sector, Hyde Park Corner, are the preferred installer. Customers can arrange for Radioplayer Car to be fitted at a time and a place to suit them.

The two-year development process was a true partnership across the radio industry, with firms like Togglebit, All In Media, Travel For Media, and Furthermore involved in designing and building the software and applications. 40 beta-testers were enlisted from across the UK radio industry, to ensure the system performs well in all cars.

Radioplayer Car has been developed by UK Radioplayer, the industry partnership between the BBC and commercial radio which was established in 2011 to make listening to the radio easier on connected devices. Radioplayer can be found on browser-player, iOS app, and Android app –

including integrations with Apple CarPlay, Android Auto, Chromecast, and smartwatches. The team recently launched a hybrid radio app for the LG Stylus 2 smartphone, and a voice-controlled integration with the Amazon Echo smart speaker. Radioplayer now operates in eight countries around the world, through the non-profit Radioplayer Worldwide organisation.

(Radioplayer)

Studio Monitor Management Tuning System



HARMAN Professional Solutions has announced the new JBL Intonato 24 Monitor Management Tuning System, the industry's most comprehensive solution for easy set up, precise automated calibration, and complete control of monitoring systems in stereo, surround, and immersive audio production rooms. Housed in a 2U rack-mount enclosure and shipping with more included I/O than any monitoring control solution available today, Intonato 24 can calibrate and control systems of up to 24 speakers with customized recallable routing of up to 24 sources selected from 24 dedicated analogue, 24 digital and 256 networked audio sources. Included software and an optional Desktop Controller put the system's powerful monitoring features at your fingertips, and take control room monitoring to the next level.

Intonato 24 includes a calibration microphone and innovative Automated Speaker Calibration process that "tunes" each speaker to compensate for speaker placement and room acoustics, delivering neutral response to the mix position—even in less-than-ideal work spaces. The result is a finely-tuned system that takes the guesswork out of mixing by tackling room-related low-frequency issues and precisely matching the level and "time-of-flight" from each speaker to the mix position.

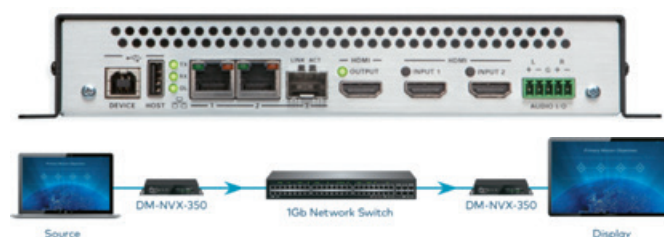
Intonato 24 comes standard with the most I/O in its class and features flexible internal routing and a mixer to provide unprecedented monitoring flexibility. With the power to manage monitoring systems of up to 24 speakers—including up to four subwoofers that can be assigned as "Bass Management" subs with selectable crossover settings—Intonato 24 is compatible with all monitoring formats including stereo, 5.1, 7.1 and makes immersive monitoring possible in any control room. In addition, with the ability to patch, route, and selectively monitor any combination of 24 analogue, 24 digital and 256 networked sources including DANTE via an optional interface, Intonato 24 will easily be right at home in any professional studio environment. An intuitive graphical user interface allows you to control

Intonato 24 from Mac, Windows, and a range of tablets. Complete configurations, including speaker setup parameters, EQ, subwoofer settings, input source patching, and down-mix preferences can be stored as "profiles" and "scenes" and instantly recalled (even mid-session) to meet the requirements of specific projects and clients. The optional Intonato Desktop Controller puts monitor system control at your fingertips, providing elegant control of system volume, recall of user-configured scenes, activation of speaker mutes and solos, and other frequently used features.

Intonato 24 pairs with JBL 7 Series and JBL M2 Master Reference studio monitors to create the first complete monitoring system designed for immersive audio production in control rooms of any size. While Intonato 24 was designed as the hub of JBL's new 7 Series installed reference monitor system, the unit can be used with any passive or powered speaker. In addition, HARMAN BLU link network protocol allows Intonato 24 to be digitally networked with Crown power amplifiers and an assortment of system components. The JBL Intonato 24 will be available through authorized resellers starting in February 2017, with the optional Intonato Remote becoming available mid-year.

(JBL Professional)

Network AV Solution



Crestron is now shipping the DigitalMedia NVX Series, the latest ground breaking addition to Crestron's extensive family of DigitalMedia products. The DigitalMedia NVX Series makes it possible to transmit stunning 4K60 4:4:4 HDR video over standard 1 Gigabit Ethernet, with no latency. DigitalMedia NVX Series provides an infinitely scalable network AV solution, from a simple point-to-point setup, to thousands of endpoints, and requires only DM® NVX Series Encoders/Decoders.

Security

DM NVX Series leverages the most advanced network security technologies. 802.1X authentication ensures that every DM NVX device is explicitly authorized, Active Directory® credential management ensures that only authorized administrators gain access, and Secure CIP protocol ensures secure connections between DM NVX and Crestron control systems. Crestron stands alone in its commitment to network security, and the DM NVX Series sets the standard.

Easy to Configure, Deploy, and Manage

Intelligent software residing in the DM NVX Series Encoder/Decoder boxes and cards makes it simple to configure, deploy, and manage entire systems from the web. Integrators simply choose sources and displays, and easily adjust settings to meet the needs of the application and infrastructure.

(Crestron)

Personalities & Posts

ABU Technical Liaison Officer and Member of the ABU Technical Bureau, TVB-Hong Kong



Mr Garry Kum

Head of Engineering of Television Broadcasts Limited of Hong Kong

Mr Garry Kum, Head of Engineering of Television Broadcasts Limited of Hong Kong, has replaced Mr W B Leung as the ABU Technical Liaison Officer and member of the ABU Technical Bureau.

Mr Kum joined the TVB Engineering Division in 1995 and was promoted to his current position as Deputy Controller in 2016. In addition to all technical and operational aspects of conventional analogue, digital terrestrial and satellite television services, he provides engineering support to IT and new media based operations such as pay TV, and local and overseas OTT services. He is also responsible for engineering support to field and studio production, and post-production facilities, digital asset management and metadata systems, centralized file transcoding and delivery systems, TVB City optical fibre network infrastructure, apps development for smartphone and set-top box, and content watermarking and security.

In addition, he has started a study on next generation MCR, and transmission and encoding standards for next generation digital terrestrial TV.

Mr Kum obtained a Master of Business Administration degree from the University of Leicester in 2012.

Mr W B Leung retired from TVB at the end of 2016. The ABU wishes to thank Mr W B Leung for his excellent service to the Bureau these past few years.



ABU Technical Liaison Officer and Member of the ABU Technical Bureau, TBS-Japan



Mr Keisuke Miki

Deputy Vice President, Department of JNN Technology Strategy, Division of TV Technology at TBS-Japan

Mr Keisuke Miki, Deputy Vice President, Dept. of JNN Technology Strategy, Division of TV Technology at TBS-Japan, has replaced Mr Tsutomu Shimizu as the ABU Technical Liaison Officer and member of the ABU Technical Bureau.

Mr Miki joined TBS in 1993 and was engaged in the digitalisation of the SNG system. From 1996 to 1998 he was loaned as an engineer to Japan Entertainment Television in Singapore.

From 1999 to 2010, Mr Miki was engaged in research and development of broadcasting technology. From 2010 to 2013 he worked in live programme production as a video engineer. Since 2013 he has been engaged in standardisation work for domestic broadcast.

The ABU thanks Mr Tsutomu Shimizu for his contributions to the Bureau especially his excellent work as the past Chairman of the Production Topic Area.



ABU Technical Bureau member, TRT-Turkey



Mr Kazim Pektas

Chief Engineer, Turkish Radio Television Corporation

Mr Kazim Pektas, Chief Engineer, Turkish Radio Television Corporation, has replaced Mrs Hanife Saliyir as Chairman Production Topic Area.

Mr Pektas started working in Turkish Radio Television Corporation (TRT) in 1998. After joining TRT he worked at the maintenance department and was responsible for VTRs and NLEs maintenance. He now works in the Studios and Program Transmission Systems department as a project engineer, responsible for defining video systems architectures. Currently he is also studying SDI over IP and UHTV projects.

The ABU wishes to thank Mrs Hanife Saliyir for her outstanding work over the past several years as Chairman of the Production Topic Area.



New ABU Technical Liaison Officer for AsiaSat



Barrie Woolston

Chief Commercial Officer

Asia Satellite Telecommunications Company Limited

Barrie Woolston, AsiaSat's Chief Commercial Officer, has 30 years of experience in the Technology, Media, Telecom sectors and is responsible for leading the commercial activities of the Company. Prior to joining AsiaSat he held various product, sales and operational positions in Europe and the US in the media, telecommunications and automotive sectors.



ABU ENGINEERING AWARDS 2017

ABU Green Broadcast Engineering Award

- Awarded for outstanding contributions in developing, implementing and/or promoting green technology in the broadcasting industry.
- The award comprises a trophy presented at the opening session of the annual ABU Technical Committee meeting.

ABU Engineering Industry Excellence Award

- Awarded for outstanding engineering contribution made by an individual to the broadcasting industry in the Asia-Pacific region.
- The award comprises a citation plaque and a trophy.

ABU Broadcast Engineering Excellence Award

- Awarded for outstanding contributions in broadcast engineering and related disciplines.
- The award consists of a citation plaque and a trophy.

ABU Developing Broadcasters' Excellence Award

- Established in 2013 to recognise innovation and excellence among the ABU's developing broadcasters.
- Awarded for contributions of an outstanding nature in broadcast engineering made by an individual in a developing broadcasting organisation.
- The award comprises a citation plaque and a trophy.

April 2017 – Call for Nominations

31 July 2017 – Deadline

August 2017 – Judging

31 October 2017 – Announcement of Winners **ABU Technical Committee Meeting**
Chengdu, Sichuan, China



For more information and nomination forms
www.abu.org.my/engineering-awards

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