



Asia-Pacific
Broadcasting
Union

Technical *Review*

No.273 January-March 2018



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Full Report Inside

**TECHNICAL
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Contents



Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk

The 14th ABU Digital Broadcasting Symposium was held recently. The event attracted over 1100 participants from 48 countries representing 355 organisations, we are happy to note that almost 100 of our member organisations joined the event. We would like to once again extend our appreciation to all our sponsors and partners for their support. The full report and coverage of the event is included in this issue.

This issue carries one technical article focusing on Accessibility and universal broadcasting. It looks at two specific technologies, Captions and Audio Description, and how our member TVNZ is incorporating them within their services. Also included are three reports highlighting the cooperation between ASBU, HFCC and IRIB, in addition to the event highlights from the Pacific Media Partnership Conference (PMPC) and the Media Summit on Climate Change and Disaster Risk Reduction held in Fiji early this year.

As usual news and technology updates from the region and around the world complete this issue. We hope the information and updates included in this issue will be of help to you and colleagues.

2
Transmission of Access Services
by TVNZ

8
ABU Digital Broadcasting
Symposium 2018

31
14th IRAN Media Technology
Conference

32
14th Global Shortwave
Coordination Conference

34
9th ABU Pacific Media
Partnership Conference

35
ABU-ASBU Capacity Building
Workshop / New Members

36
4th ABU Media Summit on
Climate Change and Disaster
Risk Reduction

38
News from the ABU Region

40
Digital Broadcasting Update

42
Equipment Trends

44
Personalities & Posts



Cover:
*ABU Digital Broadcasting
Symposium 2018:
Full Report Inside*

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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Transmission of Access Services by TVNZ

summary

Access services comprise Captions and Audio Description (AD). Captions enable hearing impaired viewers to follow television programmes. AD is an optional additional narrative of on-screen visuals, usually inserted between dialogue of a television programme. The service enables blind or vision-impaired people to access TV. The provision of Captions and AD by access services provider Able, and transmission by Television New Zealand (TVNZ) is described including formats, the allocation of audio tracks, the descriptor used to signal AD in the DVB PMT and audio selection by the receiver. The advantages of 'full mix' / 'broadcast mix' and 'receiver mix' formats are discussed.

Key words: Access services, Captions, Audio Description, AD, TVNZ, Able, New Zealand.



Introduction

Television New Zealand (TVNZ) provides captions and audio description (AD) services to enable access to its television broadcasts by visually and hearing impaired members in its audience. These services are provided in conjunction with Able, a publicly (government) funded trust. Able is responsible for the creation of the captions and AD audio. TVNZ and other broadcasters are responsible for the transmission of these access services. Captions are broadcast by TVNZ and also by two other broadcasters in New Zealand. TVNZ is the only broadcaster in New Zealand with audio description on its channels.

Background

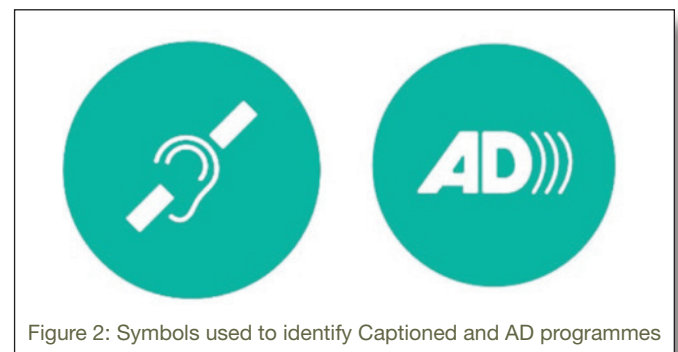
Teletext or DVB captions, also known as closed captions, are transmitted as a secondary data service in a television broadcast. These enable hearing impaired viewers, or anyone unable to hear, the broadcast sound, to follow television programmes. Captions for programmes were introduced by Television New Zealand in 1984.



Figure 1: Screens shot showing Caption and AD availability symbols (lower left). A caption is also active.

Audio Description (AD) is an optional additional narrative of on-screen visuals, usually inserted between dialogue of a Television programme. The service enables blind or vision-impaired people to access TV. The service is also of use to anyone who is not able to see their television. The TVNZ audio description service was launched in 2011.

A caption and/or AD logo is displayed next to all captioned and audio described programmes in the electronic programme guides and on-screen at the start of programmes. See figures 1 and 2.



Television News Zealand

TVNZ is New Zealand's nation television broadcaster wholly owned by the government, but operating as a commercial organisation with revenue earned through advertising. TVNZ operates five channels: TVNZ 1, TVNZ 2, one-hour delayed version of these as TVNZ 1+1, TVNZ 2+1 and DUKE. These are available nationally via on-line, UHF DTT, on free-to-air (FTA) DTH satellite and via a pay-tv DTH satellite service.

Able

Able is a provider of access services to the broadcast

industry. It was created from what was the Access Services department of Television New Zealand. It now operates as an independent not-for-profit trust, funded through 'New Zealand On Air' the government broadcasting funding agency. No funding for access services is provided directly to broadcasters.

There is no regulation in New Zealand requiring Access Services to be broadcast, however their broadcast is ensured by government funding of captions and AD creation and the cooperation of broadcasters to transmit them.

Able selects which programmes will have captions and/or audio description, in consultation with the relevant user groups. TVNZ (and some other broadcasters) then broadcasts the captions and/or audio description track as part of normal transmissions. Television New Zealand is the only broadcaster in New Zealand to broadcast audio description on its channels.

Volume of Access Services

In the 2017 financial year Able provided an average of 230 hours per week of captioned programming and an average of 47 hours per week of audio described programming across TVNZ 1, 2 and DUKE channels. This equates to the following percentages of programmes with access services:

TVNZ 1 captioning – 57%

TVNZ 2 captioning – 73%

TVNZ 1 audio description – 13%

TVNZ 2 audio description – 14%

Live and File Caption Production

Captions are provided for some, but not all programmes on Television New Zealand's domestic national channels TVNZ 1, TVNZ 2 and Duke, including the one-hour delayed repeater version of these channels. Both pre-recorded and live programmes can be captioned.

For pre-recorded programmes a caption file may be created by Able, or purchased from another captions service, when available. If Able is creating the caption file, a copy of the programme is supplied from TVNZ as a proxy viewing file in low-resolution H.264 by file transfer. This is part of the programme preparation work flow, but can only take place after TVNZ has edited it to be ready for broadcast. This adds additional lead time to the media logistics process.

For live programmes a feed of the network's distribution output is fed by a low-latency IP link to Able with the caption data returned via the same circuit. There are two video circuits from TVNZ to Able which can feed any of the three main networks, thus live captions can be provided on two channels simultaneously.

There is also one circuit from another broadcaster to Able for live captions.

When available pre-produced news packages are delivered

to Able ahead of live bulletins to enable stories to be captioned ahead of time.

The live caption data or the caption file is added to the channel output in the playout (presentation) centre at the time of transmission. Traditionally this has been in the form of WST Teletext, but now also as DVB captions.

Broadcast Caption Formats

Television New Zealand's broadcasts are carried in H.264 HD and SD on DTT, MPEG2 SD on free-to-air DTH satellite and via a pay-tv DTH satellite service, operated by another company, in H.264 HD.

Traditionally captions have been generated as Teletext added to a down-converted SD feed for FTA DTH transmission and then converted to DVB captions for inclusion in the HD feed to DTT and pay-Tv satellite. A rebuild of the encoding and compression Headend and (separately) playout system currently underway will reverse this process with captions created in the playout HD feed (as OP-47, reference 1) and then converted, in the transmission headend, to DVB captions, for DTT & DTH, and WST Teletext for legacy DTT receivers.

Audio Description Production

At present only pre-recorded programmes carry AD, however we plan to carry some live audio description in the future, when it is available.

When a programme has been selected for AD a copy of the programme is file transferred to Able.

As with captions, an AD track may be created by Able or purchased from another audio description service, when available.

A copy of the programme, after TVNZ has edited it ready for broadcast, is supplied to Able. As with captions this is as a low-resolution H.264 proxy viewing file but for AD we also provide a BWA format stereo audio file of the programme which Able use to create the audio described mix.

Able returns the AD track to TVNZ as a BWAVs stereo pair audio file. TVNZ must then combine this audio track into the original programme. This adds considerable complexity to TVNZ's systems and work flow as well as adding additional lead time to the programme preparation. Several changes were required to TVNZ's media management systems to accommodate AD, however it is now a normal part of our operations and as automation is increased and becomes more advanced this complexity becomes less manual. The TVNZ Media Asset Management System automatically imports the audio and then creates a new version of the programme where the BWAV is transcoded onto track 11 & 12.

'Full mix' / 'Broadcast mix' AD

TVNZ uses the 'full mix' (or 'broadcast mix') format for

simplicity and maximum compatibility with any supplied AD track.

The alternate method of broadcasting audio description is 'receiver mix' where a track containing only audio descriptions is broadcast.

Note however, that if a track is supplied in 'receiver mix' it can be converted to 'full mix'; but the reverse is not usually possible. Thus 'full mix' makes the greatest range of content available.

AD Track Continuously Broadcast

The AD track is continuously broadcast, even for content that does not have the AD commentary. This is done so that 'viewers' do not need to select the AD audio on a programme by programme basis. For non-AD content the normal stereo audio is copied to the channel's AD audio output in the playout (presentation) centre at the time of transmission. This is the default state, unless programmes are marked as 'AD' in the broadcast schedule.

When a programme does have an AD track it is allowed to pass through to the output.

Audio Tracks

Within the studio centre the AD is added as an additional stereo audio track, embedded as tracks 11 & 12 in the SDI. See accompanying table 'TVNZ Network Centre Standardised Audio Channel Layout'.

This additional audio will be a full broadcast mix, present at all times; with the addition of the Audio Description narration on selected programmes. See table 1.

Table 1:

TVNZ standard for audio track allocations of embedded audio

Channel 1	Stereo Left
Channel 2	Stereo right
Channel 3	Front Left
Channel 4	Front Right
Channel 5	Centre
Channel 6	LFE (Low frequency effects) - Optional
Channel 7	Left Surround
Channel 8	Right Surround
Channel 9	Lt Mix and Effects
Channel 10	Rt Mix and Effects
Channel 11	AD Stereo Left
Channel 12	AD Stereo Right
Channel 13	Stereo Left – Additional language 1
Channel 14	Stereo Right – Additional language 1
Channel 15	Stereo Left – Additional language 2
Channel 16	Stereo Right – Additional language 2

Modulation

Tracks 11 and 12 only apply within the station, at the transmission headend they are converted to a (second) stereo pair for Broadcast.

For both the DTT and DTH platforms this additional track becomes an additional audio stream in the MHEG.

The AD audio is carried in the same format as the main stereo on each free to air platform. See table two, 'TVNZ Caption, Audio & Video Formats'.

AD Signalling

In order to signal Audio Description we have to take account of both legacy and modern receivers. As such, there are two ways in which AD needs to be signalled with descriptors within the PMT: Audio labelled as "Italian" (to give compatibility with existing STBs) and also with an "Audio Description" descriptor (reference 2). 'Italian' is for compatibility with legacy receivers that do not recognise the 'audio description' descriptor. The Italian language descriptor was selected because it is otherwise not used in New Zealand. See table 2 and figure 3.

Table 2: TVNZ Caption, Audio & Video Formats

	DTT Terrestrial	FTA DTH Satellite	Pay Satellite
Video	HD & SD H.264	SD MPEG2	HD H.264
Captions	DVB	Teletext / DVB	DVB
Surround Sound	AC-3 (Dolby D)	(not used)	AC-3 (Dolby D)
Stereo	MPEG-HE AAC v.1 (AAC plus)	MPEG1-L2	(not used)
Audio Description	MPEG-HE AAC v.1 (AAC plus)	MPEG1-L2	MPEG1-L2

The screenshot shows the configuration for TVNZ 1 HD. Under 'SI Table Types', the following settings are visible:

- Enabled: ☒ PID: 1002 Mapped PID: ☐ Type: H.264 Video CA: Scrambled
- Enabled: ☒ PID: 1102 Mapped PID: ☐ Type: AC-3 Audio CA: Scrambled
- Enabled: ☒ PID: 1112 Mapped PID: ☐ Type: MP2 Audio Language: Italian CA: Scrambled
- Enabled: ☒ PID: 1902 Mapped PID: ☐ Type: Teletext CA: Scrambled

Figure 3: AD Audio formats within pay-tv mux

AD selection by Viewers

Television audiences access AD by selecting 'audio description' or 'Italian' in their television receiver's audio language settings.

Regional Duplication

Television New Zealand provides four regional variants of the TVNZ 1 channel. All regional variations of the DTT terrestrial service carry AD. For the DTH satellite service only one version of the TVNZ 1 AD service is carried on the satellite to keep it economically viable, in terms of the opportunity cost of space-segment bandwidth. Audio Description is only attached to the 'Auckland' (most populous, northern) regional feed of TVNZ 1. However any receiver throughout the whole country can receive DTH AD by selecting the 'Auckland' region rather than their local service.

Thus FTA satellite viewers who want the Audio Description service on TVNZ 1 can select the Auckland version of TVNZ 1 on their STB satellite receiver (even though they may be in a different region). This compromise has been found to be acceptable to AD users.

Viewer Audio Complaints

A complaint that is sometimes received from viewers is that of unwanted Audio Description which may be perceived as "director's commentary" or a voiceover "giving the actors direction". This arises from a viewer accidentally selecting incorrect audio settings in their receiver. This will be noted to be only on some programmes or only on a particular channel.

The problems can be easily solved by directing the viewer to select 'Stereo / AAC in English', the main (non-AD) stereo audio track.

Conclusion

Access services operate as a normal part of TVNZ's programme work flow.

The introduction of AD added considerable complexity to TVNZ's media management systems and workflow however as automation is increased this complexity becomes less manual.

The addition of access services to broadcasts in New Zealand has been well received by the vision and hearing impaired communities. Able has received responses from users of the service, reporting that it has enabled them to enjoy television more fully and allowed them to be included in social settings.

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1. Free TV Australia Operational Practice OP- 47 STORAGE AND DISTRIBUTION OF TELETEXT SUBTITLES and VBI DATA FOR HIGH DEFINITION TELEVISION Issue 5 December 2014.
2. D-Book 9 'Digital Terrestrial Television Requirements for Interoperability' Digital TV Group Updated 1 November 2016.

author

Wayne Huggard

Transmission Service Manager for Television New Zealand (TVNZ)

Wayne Huggard is Transmission Services Manager for Television New Zealand (TVNZ) with accountability for Contribution, Distribution and Transmitter networks. He has a 35 year career in television broadcasting; including studio engineering and satellite network operation. Television New Zealand is New Zealand's national television broadcaster and digital media company. TVNZ operates free-to-air DTT, DTH and On-line services.

ABU TECHNOLOGY CALENDAR OF EVENTS

2018

16-20 Apr	Training of Trainers Workshop	Kuala Lumpur
1-2 May	ABU Technical Bureau Mid-Year Meeting	Kuala Lumpur
26-28 June	BroadcastAsia 2018	Singapore
16-18 July	Metrics-based Corporate Innovation Management Workshop	Kuala Lumpur
23-27 July	ABU-WorldDAB-AIBD-ASBU Digital Radio Workshop	Kuala Lumpur
July-Aug	ABU Technology Webinars	Online

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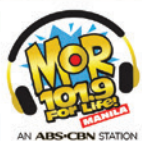
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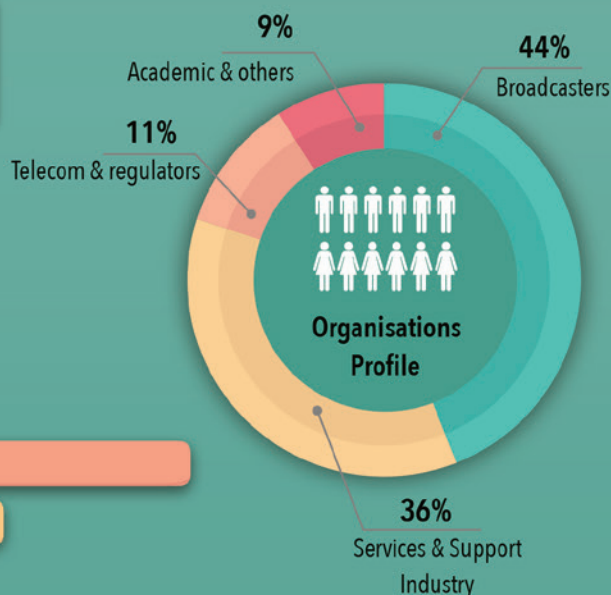
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ABU DIGITAL BROADCASTING SYMPOSIUM 2018

ENHANCING MULTIPLATFORM CONTENT

The 14th ABU Digital Broadcasting Symposium, with the theme "Enhancing Multiplatform Content", comprising of an international conference, industry exhibition and workshops was held from 5 - 8 March at the Royale Chulan Kuala Lumpur Hotel. The event attracted 1,105 participants from 48 countries representing 355 organisations. The DB Symposium, through its 12 conference sessions, 8 workshops, 22 masterclass sessions and a 52-booth exhibition, provided an opportunity for the broadcast and media industry stakeholders to network, share and experience wide-ranging technologies, advanced solutions and innovative content ideas. The event provides international and regional exposure to our members and the media industry alike.



Participants' Profile

13% C-Level / Decision Makers

42% Senior Managers

28% Specialists / Experts

17% Others

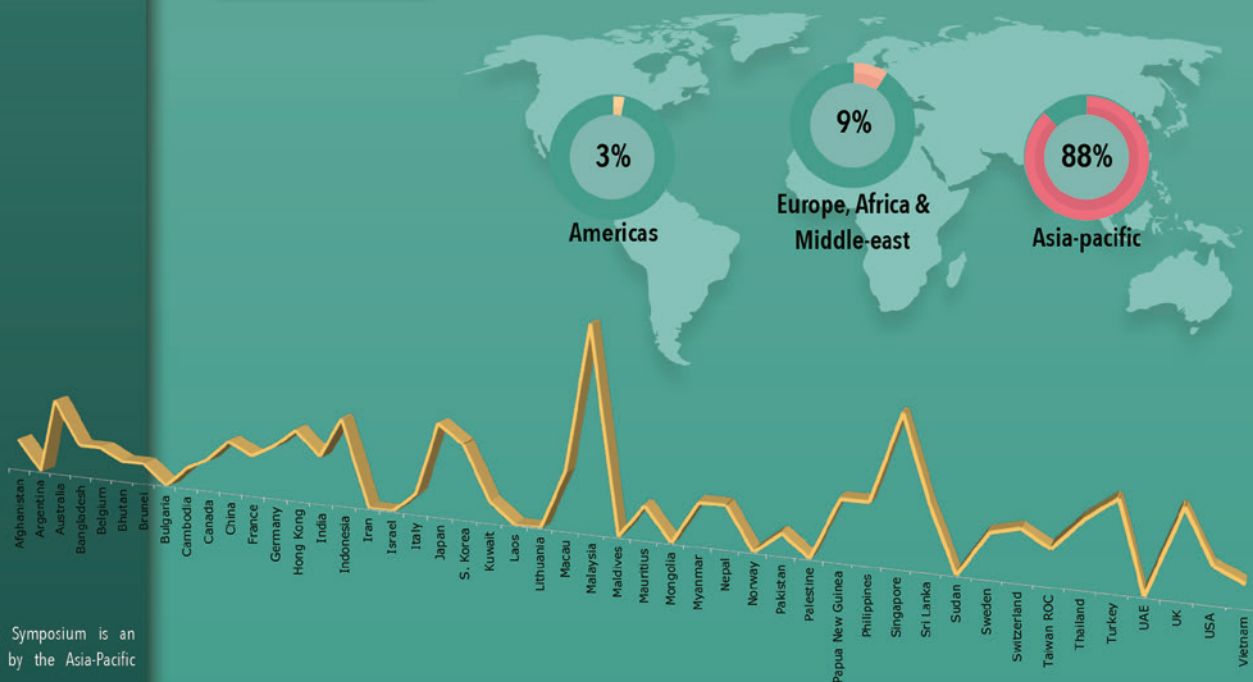
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ABU DIGITAL BROADCASTING SYMPOSIUM 2018:

Enhancing Multiplatform Content



Dr Javad Mottaghi, ABU Secretary-General, delivering the Opening Address

The 2018 ABU DIGITAL BROADCASTING SYMPOSIUM was held from 5-8 March at the Royale Chulan Hotel in Kuala Lumpur. This symposium is held annually by the ABU and this was the fourteenth edition, with the theme 'Enhancing Multiplatform Content'. Prior to the conference, a DVB workshop was held on the morning of 5th March followed by a DAB+ workshop in the afternoon. The 3-day conference, workshops and masterclasses together with the industry exhibition, provided the unique opportunity for attendees to have access to information on all the various aspects of broadcasting ranging from terrestrial to IP. The symposium attracted many participants representing broadcasters, telcos, regulators, manufacturers and other industry players.



Opening Session



Joan Warner, CEO, Commercial Radio Australia

The Industry Keynote entitled '*Leverage your Uniqueness in the Face of Digital Disruption*' was delivered by Joan Warner representing the principal sponsor, WorldDAB. Radio remains the most accessible and widely consumed medium. As UN Secretary General Antonio Guterres once

said, "In an era of dramatic advances in communications, radio retains its power to entertain, educate, inform and inspire. It can unite and empower communities and give voice to the marginalised".

In Australia, all newly manufactured vehicles are installed with a DAB+ receiver before they roll off from the assembly line at the factory. 30% of radio listening takes place while driving and streaming complements the service. EBU Document R138 entitled 'Digital Radio Distribution in Europe' recommends DAB+ for immediate European deployment and the Arab States Broadcast Union has followed suit.

A combination of DAB+ and IP retains the cost effectiveness of the broadcast channel, and at the same time offers interactivity. Smartphones incorporated with DAB+ chips, will enable users to listen to radio with no streaming costs. Streaming even for an hour in a day incurs heavy data charges. Thus, DAB+ makes sense if the user can receive it and the desired content is accessible. Blackspots can

be overcome, as broadcast content is still available, when the user is out of mobile network coverage. New business opportunities are emerging, as broadcasters extend brands and launch new services to better serve audiences, as well as increase revenue opportunities

Broadcasting Business Needs to Evolve: How & Where?



Frederico Rosario (TDM-Macau), Jason Power (Dolby), Cheong Yew Jin (Rohde & Schwarz), Dennis Breckenridge (Elevate Broadcast), Jørn Jensen (NRK-Norway) and Dave Cameron (Southern Cross Austereo)

The first session was moderated by Frederico Rosario, Teledifusao de Macau, S.A. and the panelists were Dave Cameron, Southern Cross Austereo; Cheong Yew Jin, Rohde & Schwarz; Dennis Breckenridge, Elevate Broadcast; Jørn Jensen, NRK Norway and Jason Power, Dolby. Southern Cross Austereo is Australia's biggest entertainment company with the ability to reach more than 95% of the Australian population, through its radio, television and digital assets. Its seventy-eight radio stations and additional six digital radio stations, broadcast across metropolitan and regional Australia. SCA is supported by leading social media, live events, video, online and mobile assets that deliver national and local entertainment and news content. All of its DAB+ stations are now aligned to the parent FM brands, in order to aggregate total audience. Client advertising is now simulcast across all FM and DAB+ brand streams, in order to provide greater reach to the clients, and maintain premium rate on radio inventory. Using its vast expertise in creating audio content, SCA has developed a new Australian



podcasting network, which offers listeners compelling original audio content on demand, available exclusively through the PodcastOne website and mobile app.

The broadcast business is changing from hardware to software with virtualization and cloud deployment. Content can be dispersed from around the world and can be accessed remotely. Destination-centric is transforming to content-centric with a single source, multiple outputs and formats. Content can thus be considered as converged rather than independent. Technology utilised has shifted from customised to generic with Commercial Off-The-Shelf (COTS) and the take up of IT-based technology. Existing transmission with satellite, fibre or content delivery network may work fine but they are cost-intensive and inflexible. IP contribution and primary distribution of live content can be conveyed over unmanaged Internet, resulting in cost efficiency.



Production at outside locations can be achieved successfully with significant cost reductions by sending core acquisition facilities to site and handling productions remotely. Traditional outside broadcast is challenging, as it causes wear and tear on the equipment, travel expenses, lost equipment and staff efficiency. The benefits of remote production are that the general production team do not need to travel to remote locations, efficiency of production equipment increases and maintenance reduction. In many situations, remote production leads to decreased costs and increased productivity.



Dave Cameron

The 2018 implementation of Digital-Switch-Over of DAB+ in Norway, was achieved region by region with the public broadcaster switching off earlier whilst allowing more time for the private broadcasters to follow suit. Full coverage is obtained with one frequency for all private stations and four frequencies for the public broadcasters. More than 3000 FM transmitters have been replaced by 1200 DAB+ transmitters. DSO was aided by the availability of cheaper radio sets, added value and many new channels. Effective marketing and proper information dissemination were also the other key points.

Standard Dynamic Range (SDR) limits the detail and colour of broadcast images. This limitation was partly influenced by the now obsolete cathode ray tube. However, the newer flat panel display including LED extends the range of colour and



Jørn Jensen

contrast. High Dynamic Range (HDR) exploits the advantage of advanced TV sets and mobile phones, by the provision of brighter and darker pixels. These better pixels mimic real viewing experiences to excite senses, physical and emotional responses. Dynamic metadata can deliver great images for all viewers, by delivering extra information that helps mapping to each type of display.

Immersive audio is growing fast in the cinema and is now entering the home. It 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, diffusion 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 latest development has negated the need for more speakers by the utilisation of sound bar models and TVs with integrated immersive audio. Audio can be more personalised too, with various kinds of replay system, where the viewer can choose a preferred speech volume, language or commentator.

Technologies & Standards: What's new? What's next?



Masakazu Iwaki,
NHK-Japan



Dr Peter Siebert,
DVB



Lindsay Cornell,
BBC-UK

The moderator of this session was Masakazu Iwaki, NHK with the panelists comprising of Dr. Peter Siebert, DVB Project Office; Lindsay Cornell, BBC UK; Kenichi Murayama, NHK; Mats Ek, Progira; Ruxandra Obreja, DRM Chairman and Andreas Streit, LS Telcom AG. They elaborated on the new developments of the various broadcast technologies over the years, and the improvements achieved. Traditional TV viewing remains overall stable, but with a growing gap between older and younger generations. Online viewing is progressively eating into TV viewing time, with the TV set becoming the main stream for streaming. In the future, all broadcast content will be delivered via IP but we are not there yet. Broadband delivery is not cost efficient, as compared to classical broadcast and broadband access is limited in many countries. The main challenges are scalability for live broadcast, delay for broadband access and market fragmentation for broadband solutions.

DVB has specified two IP solutions namely Multi-Protocol Encapsulation (MPE) for Transport Stream (TS) and Generic Streaming Encapsulation (GSE) for direct delivery of IP. DVB has developed a wide range of specification, for IPTV delivery over managed telco networks. For OTT delivery over unmanaged network, a DVB DASH profile has been defined. DVB has embarked on a new initiative with DVB-I (Internet).

DVB-I will bring the convenience and Quality of Experience (QoE) of broadcast TV also to OTT delivery. DVB-I will provide capabilities for discovery, integration and distribution for OTT services similar to deployed functionalities of DVB services distributed over DVB-T2/S2/C2/IPTV. DVB-I will enhance DVB services across different access networks, including DVB services on devices with multiple connections. With DVB-I, OTT will be as convenient as traditional broadcast, by facilitating its transition to seamless hybrid broadcast-broadband services and delivery.

The DAB standard is a mature digital radio technology, with its chipset installed in automotive, mobile devices, and expanding into new countries and regions. Another innovation is the portrayal of new characters in LCD/LED displays, thus solving the technical issue of letters having accents occurring with the different spoken languages around the world. ASEAN member countries which have non-Latin based scripts are interested in this new improvement of DAB+.



Kenichi Murayama,
NHK-Japan

NHK is conducting research and development on terrestrial broadcasting systems and field experiments on 8K terrestrial transmission. R&D Phase 1 area covers technology based on ISDB, encouraging effective utilisation of frequency for UHD satellite and terrestrial broadcasting system. Configuration modes with higher order QAM constellation, large FFT size, LDPC code, MIMO, Space-Time-Coding SFN have been introduced. Long distance 8K SHV terrestrial transmission was achieved with 91.8 Mbps within 6 MHz. R&D Phase 2 area focuses on the Advanced Digital Terrestrial TV Broadcasting system, based on new Bit Interleaved Coded Modulation (BICM) with LDPC code, frame structure and mobile reception technology.

Unlike the first generation ATSC which uses single carrier modulation, ATSC 3.0 is specified to use OFDM with 32k, 16k and 8k FFT, and guard interval up to 700µs, thus allowing the deployment of very large SFNs. Higher order constellation modes of non-uniform 4096 (4096 NUQAM) cater to the demand for increase of bitrate capacity. As it is, ATSC 3.0 has a transmission capacity of up to 55 Mbps, enabling both fixed UHD and HD mobile reception. Channel bonding which requires two tuners, complements the reception of UHD services. An interesting option is Layer Division Multiplexing (LDM) which combines mobile (robust low bitrate) services and rooftop reception (high bitrate) services.



Mats Ek,
PROGIRA



Ruxandra Obreja,
DRM

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 bring about more listener benefits, while at the same time provide extra revenue opportunities for broadcasters. Coverage areas are wide and the signal robust even with a single transmitter. Single frequency networks



Andreas Streit,
LS telecom

can be implemented since OFDM signals are used. Automatic tuning is now controlled by station name and no longer by frequency. The radio set is also capable of re-tuning when leaving coverage area. Emergency warning & alert system has been incorporated in all sets as a mandatory requirement. India has one of the world's largest digital radio deployments with thirty-five MW transmitters and four SW transmitters serving a population of 0.6 billion people. Many new car models with DRM reception as line-fit feature are now common on the streets.

The Changing Broadcast Environment: Integrating and Migrating to IP



Dr Fintan Mc Kiernan,
IDEAL Systems



Nick Piggott,
RadioDNS



Andrew Jones,
IABM



Tsuyoshi Nakao,
Sony



Paul Jones,
Megahertz

Moderated by Fintan Mc Kiernan, IDEAL Systems SAE and the panelists were Nick Piggott, RadioDNS; Andrew Jones, IABM; Tsuyoshi Nakao, Sony and Paul Jones, Megahertz. Hybrid Radio delivers audio using broadcast and enhances radio using IP. The broadcast component is reliable, free and economic whilst the IP component adds content, metadata & interactivity. Hybrid Radio conforms to Radio DNS which is an open standards platform and can be decentralised. In a decentralised scenario, radio sets receive signals directly from transmitters and failure of one operator does not affect others. The listener finds the station by tuning normally, but there is no central database of stations. The radio connects directly to radio station without any connection via RadioDNS.

Internet Protocol offers flexibility, relating to a uniform communications technology for media files, voice/intercom, audio, control, automation, video, e-mail etc. It is adaptable towards old and new formats (4K, 8K, HDR, AR/VR) without requiring complete change of the core network. It is inexpensive in the local area and reasonable in metropolitan areas. It's everywhere as shown by majority of businesses, households and mobile phones having Internet Protocol connections. The packet-switched nature of IP networking means that a single managed network can carry

all media traffic. If resilience and 24/7/365 days operation are required, then two independent media networks may be preferred.

IP adoption has been slower than predicted due to interoperability concerns. Finalisation of SMPTE ST 2110 at the end of 2017 looks set to drive growth in the adoption of IP technologies. End-users could increase their investment on IP enabling remote production workflows at events. SMPTE ST 2022 provides a single Serial Digital Interface (SDI) over IT networks using IP and Real-time Transport Protocol whereas SMPTE ST 2110 conveys audio, video and data as separate flows across the network. Packetised data is contained or "encapsulated" inside other packets for transport. Information in headers is vital to make it all work, but does represent an overhead. However, SMPTE 2110 needs a managed IP network without any packet dropping.

Serious issues with SDI-based 4K production system are the increase in space, weight and cost compared with SDTV or HDTV. There is an explosive increase of cable and installation and added complexity. In contrast, IP network technology solves production issues by allowing the broadcast communicate with each other by a simple configuration. There is reduction in total cost of ownership, by integrating file-based and live-based systems. An added benefit is the flexible expansion of system, when equipment is added for the smooth migration to 4K. The redundant system infrastructure increases system availability, when it is activated by router failure.

The Everything on Demand Era is here: Media Management and Workflow Enhancements



Alex Reza Shahrman
Othman, RTM



Johan Vanmarcke,
MEDIAGENIX



Straker Coniglio,
VIZRT



Chulbum Kim,
EBS-Korea

The session was moderated by Alex Reza Shahrman Othman, RTM and the panelist were Johan Vanmarcke, Mediagenix; Straker Coniglio, VIZRT and Chulbum Kim, EBS-Korea. Broadcast management system is gearing towards content centric workflow where VOD, Linear Scheduling, Rights and Finance Management and Reporting are integrated. The fully integrated Media Asset Management system manages the content workflow as it moves from initial concept to fully

prepared and formatted material – complete with promos and secondary events – allocated to diverse linear channels and VOD services. Through the process, the system ensures you stay within the budgets, maximise your rights, deliver quality media, reach your editorial targets and comply with regulatory requirements.

The present generation of audience, expect content to be immediately available, easily searchable, accessible by any device and at a high quality standard. In the past, lots of manual steps had to be followed and there were many different software applications. The result was specialist teams for each individual process had to be formed and it was time consuming to create and publish content. Broadcast, web, and mobile can be located within the same workflow with integrated multiscreen. The new automated workflow has a single UI for all users and any user can create content. It is possible to publish hundreds of clips, with streamlined workflows and high quality branding.

Korea Educational Broadcast System (EBS) E-Learning system is being benchmarked by many major countries around the world. It is a broadcasting service made available through Internet and mobile. EBS has provided all Korean citizens with educational materials and contents through its e-learning system designed by world-class ICT technology since 2004. EBS has also developed the radio broadcasting solution called “E.moti.on”. It includes the most innovative and powerful functions to build seamless workflow for the radio stations. The system comprises of E.moti.on Track – recording & editing software, E.moti.on Live – playlist management software and E.moti.on Fly – automation & controlling software. Total cost of ownership is lower, as it was developed by the EBS’s field engineers and with higher efficiency. It also does not need any specific hardware, but it is not freeware.

Challenges in Media Delivery

The session was moderated by Hanim Muhili, RTM and the presenters were Colin Prior, ENENSYS Network; Power Pan, APT Satellite and Miles Pavlovic, LS telcom.



Hanim Muhili,
Radio Television
Malaysia



Milos Pavlovic,
LS telcom



Colin Prior,
ENENSYS Network



Power Pan,
APT Satellite

The DTT platform is capable of offering local content due to its infrastructure and the major source of content is from the region. The challenge is to avoid creation and distribution of a multiplex for each region when the content is identical. This problem can be overcome by operating the DTT networks in SFN but there is need to handle advertisement requests. Centralised Ad insertion requires delivery of as many multiplexes as regions, and requires huge capacity to distribute regional multiplexes to transmission sites. The result is that national content distribution is duplicated many times. An alternative is regional Ad insertion to a regional head-end, which requires a secondary distribution network and must be implemented at the transmission site. A better method is to incorporate deterministic ad insertion, designed to target certain regions. It is SFN capable with no modification of A/V content and without service loss.

As a measure to reduce OPEX costs, satellite DTH architecture can be configured to feed DTT transmitters, thus enabling SFN operation. The DTH bouquet (MPTS) is broadcast by satellite directly to consumers in Ku band at up to 70 Mbps (DVB-S2), whereas the DTH consumers receive through satellite the MPTS to view the TV services. The DVB-T2 gateway generates the DVB-T2 multiplex (T2-MI), at up to 40 Mbps. It is distributed to the DVB-T2 transmitters that broadcast in SFN to DVB-T2 consumers, but DTH consumers cannot receive the T2-MI stream.

Dual illumination of MPTS and T2-MI with the same content on two transponders is costly. This aspect of separate DVB-T2 and DTH distribution has drawbacks. At the head-end, duplication of encoders and multiplexers for the same TV and radio services incurs high CAPEX. Satellite bandwidth with dual illumination, while the TV and radio services are identical, also results in both high CAPEX as well as very high OPEX.

On the contrary, single illumination solution with one transponder, saves annual OPEX cost as a single source is used for both DTH and DTT distribution. It also offers very fast Return on Investment (ROI). DTT multiplexes are generated at TX sites, using DTT Marker data inserted at the headend. Operation is deterministic to enable SFN operation.

OTT is a media distribution practice that allows TV content to broadcast directly to the end-user over the Internet bypassing telecommunications, cable TV or DVB-T/S service providers that traditionally act as a controller or distributor of such content. For people younger than 30 years old, OTT accounts for 80% of their total TV-viewing time. A comprehensive content distribution solution is by integrating satellite and OTT.

Changes in viewing habits have been observed over the past decade. Linear TV is being usurped by catch-up TV and OTT. Bigger screens and higher quality pictures requires higher transmission bandwidths. There has also been increased viewing of video content on ‘non-terrestrial’ devices (e.g. smartphones), and the trend of younger audiences is to watch less linear TV.

Next-Generation Audio and Video – Enhancing the Audience Experience



Dr Peter Siebert, DVB; Gordon Gu, Adinno;
Alexander Zink, Fraunhofer; Les Sabel, WorldDAB;
Jerry Gui, Dolby and Riichi Taniguchi, Ikegami

Moderated by Dr Peter Siebert, DVB Project Office with panelist comprising of Gordon Gu, Adinno; Jerry Gui, Dolby; Les Sabel, WorldDAB; Alexander Zink, Fraunhofer and Riichi Taniguchi, Ikegami. During traditional audio production or transmission, independent sounds were mixed into channels and discrete sounds (e.g. helicopter) were assigned to individual speakers rather than a natural position. Sounds were moved through channels, but had no overhead dimension and content was mixed for one particular speaker configuration (e.g. 5.1-channel). A new approach to immersive sound is a combination of an audio bed with complex audio textures represented as objects, representing discrete and moving sounds plus positional data. The result is Dolby Atmos® which provides unlimited creative freedom, flexible and translates to any speaker configuration. It is a hybrid approach of static and dynamic audio objects allowing content creators mix in a 3D space, including height.

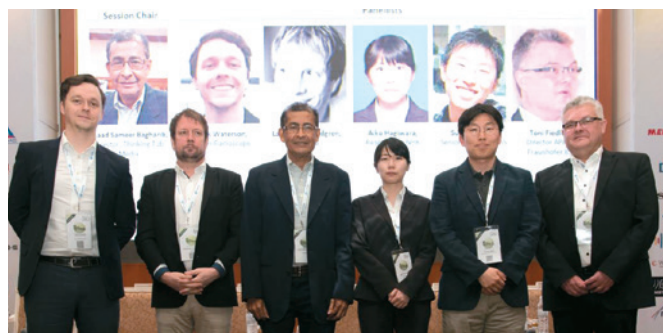
Dolby Atmos, enables the ultimate immersive experience where listeners are enveloped in the scene. To deliver Dolby Atmos and other new audio experiences, a new audio technology is needed that provides a smooth transition from traditional stereo and 5.1 channel workflows using existing infrastructure. Dolby ED2 is an extension to the Dolby E codec, that supports next generation immersive and personalised audio, as well as to provide new tools to solve audio production issues. Dolby ED2 is backward compatible with Dolby E and allows broadcasters to integrate next-generation audio using existing contribution encoders, decoders, routers, and monitoring tools. Dolby DD+JOC are used or transmission and delivery to consumer devices.

Traditional radio is valuable as it is 'hands free', allowing drivers to listen without visual distractions. Listeners want local and live quality content which they like, together with social interaction. The future may change with driverless cars, with DAB+ radios that respond to voice activated commands. These commands include activating the play music switch, play business news and visually display the traffic map. Digital broadcast with standard metadata plus streamed TPEG information is needed for this infotainment

system. The future scenario would encompass integration of non-linear content into linear content, delivery of data services while the original audio service plays out and delivery of weblinks for content purchases.

Next generation video would be progressing to higher resolution of 4K or 8K, Higher Frame Rate (HFR) of 120 fps, Higher Dynamic Range (HDR) and greater colour gamut. The demand of HDR/SDR simultaneous broadcasting is increasing. A key point of simultaneous broadcasting is the gain difference between HDR (HLG) and SDR. Video processing for 4K and HD are conducted independently while gamma curve, colour and DTL can be adjusted together or separately.

Future Technologies for Production and Delivery



James Waterson, Factum-Radioscape; Lars Peder Lundgren, Paneda; Asaad Sameer Bagharib, Thinking Tub Media;
Aiko Hagiwara, NHK-Japan; Sungho Jeon, KBS and Toni Fiedler, Fraunhofer

The session was moderated by Asaad Sameer Bagharib, Thinking Tub Media, Singapore and the panelist were James Waterson, Factum-Radioscape; Lars Peder Lundgren, Paneda; Aiko Hagiwara, NHK; Sungho Jeon, KBS and Toni Fiedler, Fraunhofer. Smart Production technology enhanced with Artificial Intelligence, can be utilised for newsgathering and editing as well as converting programme accessibility into forms that can be easily understood by all viewers. Weather information is expanded by a sign language Computer Graphic (CG) animation system. The fixed pattern CG animation system generates sign language animations directly from weather data. Simplified Japanese (for non-native Japanese speakers) can be generated, by automatically rewriting news sentences in easy Japanese with a machine translator. Automatic audio description is a form accessibility technology for visually challenged people and is enabled by XML sports data. In the past, TV reporters have been manually transcribing video footages such as interviews for accurate production. Utilisation of speech recognition system is thus strongly recommended. The Rapid Transcription system produces transcripts from video footage both quickly and efficiently. The system has 80% speech recognition accuracy, with user friendly application for correcting misrecognised words.

At 5 AM on 31 May 2017, the world's first ATSC 3.0-based regular terrestrial broadcasting started in Korea. By December 2017, ATSC was extended to five metropolitan cities and the Pyeong Chang Olympic Winter Games region. On 9 January 2018, the Five-Year ATSC 3.0 Standards-Development

Process culminated at the Consumer Electronic Show (CES) 2018. Taking place was also, the installation of ATSC 3.0 end-to-end chain comprising of the UHD TV Master Control room, Transmission site and ATSC 3.0 chipset embedded UHD TV set. ATSC 3.0 based terrestrial UHD TV broadcasting offers four times better image quality compared to HD and realistic broadcasting when combined with HDR, WCG, HFR techniques. Fixed, portable, mobile reception in a SFN, and direct reception anywhere, provides viewer-friendly reception environment. An added benefit is improved service with Internet, forming an IP-based interactive & customised service and home portal service with second screen, disaster and safety information notice.

ATSC 1.0 digital TV uses single carrier modulation with 8-Vestigial Sideband (8-VSB) and is limited to Multi Frequency Network (MFN). On the other hand, the ATSC 3.0 UHD TV can be configured into a Single Frequency Network (SFN), thus optimising frequency spectrum. Korean can watch ATSC 3.0-based terrestrial UHD TV broadcasting, either by fixed reception for 4K-UHD channel or mobile reception for UHD-Mobile channel. ATSC 3.0 utilising 2-Subframe (TDM) configuration can technically support mobile with 64 QAM and fixed reception with 256 QAM. Efforts to ensure seamless service coverage, include installation of MATV (Master Antenna Television) inside buildings, transmission in the underground subway train tunnel and underground parking lot.

MPEG-H is an immersive and interactive audio system for digital TV broadcast and IP delivery. South Korea has adopted the second generation ATSC 3.0 standard using MPEG-H 3D audio and DVB standard has incorporated MPEG-H 3D as part its toolbox. In preparations for the 2020 Olympics, ARIB Japan has specified 8K Video and 22.2 audio, which MPEG-H supports and is a candidate for the emission codec. In China, testing of 3D audio was finished, with MPEG-H also as a candidate meeting the stringent requirements. MPEG-H is a complete system that supports 5.1 + 4 height speakers plus objects, contains a universal renderer and uses audio object description metadata. Data stream at 192 – 768 kbps, of which the composition of metadata is less than 10%, is conveyed over SDI or IP. The audio data is rendered to discrete speakers, soundbars and headphones. Immersive audio for enthusiasts, is produced with 5.1 / 7.1 + 4 height speakers. Mainstream consumers hear through the 3D soundbars, which incorporate an algorithm that simulates the sense of immersion.

Cyber and Content Security –Taking Action and Best Practices

The session was moderated by Dr Ahmad Zaki Mohd Salleh, Media Prima and the presenters were Kath Brown, Commercial Radio Australia; Masakazu Iwaki, NHK and Ruzamri Ruwandi, MCMC Malaysia. The importance of a risk management plan during an emergency cannot be understated, as it prepares a broadcaster to foresee risks, estimate impacts, and define responses to issues. The plan is part of the Occupational, Health & Safety requirement for staff and inspires public order and confidence. It minimises



Dr Ahmad Zaki
Mohd Salleh,
Media Prima



Kath Brown,
Commercial Radio
Australia



Masakazu Iwaki,
NHK-Japan



Ruzamri Ruwandi,
MCMC Malaysia

environmental and community disruption, reduces the impact on GDP and saves both human life and wildlife. Planning approach should take into account, all hazards encompassing environmental events, cyberattacks and health. Useful tools are modelling, identification of key assets, cross sector collaboration and post event review. Radio is a vital part of the plan, as it reaches 95% of Australians and around 8 in 10 Australians listen to commercial radio.

Long-range weather predictions in October showed a major weather event slated to occur in Queensland, during the Christmas period. Radio stations worked with State Emergency Service in October to call for volunteer recruits. The stations developed and promoted on air, a retailer offer to sell battery powered radios for \$10. On January 10, the station suspended normal programming over the eight days to cover all aspects of flooding. Stations were isolated by flood waters for six days, so people slept at the stations while maintaining service on air and round the clock. The phone systems (70 lines) were fully occupied and the public was provided information about rising floodwater, road closures, medical assistance and food shortages. General calls for help including 'life threatening situations' were passed through to the evacuation centres and clean-up assistance. After the flood, the stations provided the community with advice and safety information, comfort for displaced people and helped to target where volunteer effort is required.

Using open standards-based IP network and delivery for a device, which a consumer wants to use is certainly good business: it allows a direct, more personal and ideally, more profitable relationship with those who purchase and also consumer content. However, it also opens up significant new risks that could lead companies' content, data and business systems to be compromised.

The World Broadcasting Union TC Cyber Security Subcommittee has mandated several steps to counter these threats (1) Establish and maintain best practice recommendations to prevent, detect and mitigate cyberattacks from threat agents. (2) Establish minimum cyber security technical standards to be incorporated by equipment manufacturers and service providers, including

all forms of cloud services. (3) Develop consensus positions on cyber securities issues in support of the WBU-TC (4) Provide assistance in cyber security training and education to Unions and their members, as the need arises (5) Represent WBU positions on cyber security to external forums.

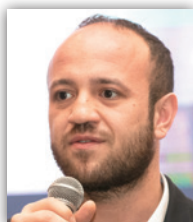
The next WBU Recommendation: Basic Cyber Hygiene has documented the following steps (1) Maintain an inventory of every physical device and system in the enterprise (2) Maintain an inventory of every software platform and application authorised for use in the enterprise (3) Ensure all software systems are patched and operating systems are at their latest release (4) Institute proper Identity Management (5) Institute Multi-factor Authentication (5) Institute Privileged Access Management. Undertaking these steps can prevent up to 70% of cyberattacks.

The broadcast industry is now quickly adopting cloud services, multi-protocol delivery of content over IP to a wide range of consumer devices, OTT services for direct consumer delivery of digital content and IP-based technology to support the bandwidths of next generation television systems. These new developments can broaden the threat "surface" and make the industry more vulnerable to attack. Potential damage that can be inflicted, include damage to reputation (news organisation), content piracy, data leakage (financial information, personal data, e-mails, etc.) and software corruption. Some of these could result in a broadcaster to cease operation.

Media and the New Reality: VR, AR, MR, 360 Video and other trends



Paul Jones,
Megahertz



Salar Shahna,
World VR Forum



Aniket Rangnekar,
IDEAL Systems



Aale Raza,
Whiteways Systems



Inbeom Shim,
KBS-Korea

Moderated by Paul Jones, Megahertz and with speakers comprising of Salar Shahna, World VR Forum; Aniket Rangnekar, IDEAL Systems Singapore; Inbeom Shim, KBS and Aale Raza, Whiteways Systems. In Virtual Reality (VR), in order to immerse the spectator into a new world, before a 'mental immersion', there should be 'physical immersion'. VR is a computer-generated scenario that simulates a realistic experience. The immersive environment can be similar to the real world, in order to create a lifelike experience grounded in reality or sci-fi.

VR technology most commonly uses virtual reality headsets or multi-projected environments, sometimes in combination with physical environments or props, to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual or imaginary environment. A person using virtual reality equipment is able to "look around" the artificial world, move around in it, and interact with virtual features or items. The effect is commonly created by VR headsets, consisting of a head-mounted display with a small screen in front of the eyes, but can also be created through specially designed rooms with multiple large screens. VR systems that include transmission of vibrations and other sensations, to the user through a game controller or other devices are known as haptic systems.

360-degree videos are video recordings where a view in every direction is recorded at the same time, shot using an omnidirectional camera or a collection of cameras. During playback the viewer has control of the viewing direction like a panorama. 360-degree video is typically formatted in an equirectangular projection and is either monoscopic, with one image directed to both eyes, or stereoscopic, viewed as two distinct images directed individually to each eye for a 3D effect.

These videos are typically viewed via personal computers, mobile devices such as smartphones, or dedicated head-mounted displays. Users can pan around the video by clicking and dragging. On smartphones, internal sensors such as the gyroscope can also be used to pan the video based on the orientation of the device. Taking advantage of this behaviour, stereoscope-style enclosures for smartphones can be used to view 360-degree videos in an immersive format similar to virtual reality. The phone display is viewed through lenses contained within the enclosure, as opposed to virtual reality headsets that contain their own dedicated display.

Augmented reality systems may also be considered a form of VR that layers virtual information over a live camera feed into a headset, or through a smartphone or tablet device. Augmented Reality (AR) relates to the insertion of real people as objects into real and virtual scenarios. There is interaction of real people with virtual objects, within a real or virtual background. This means that a live anchor can be inserted into an event that happened in the past or future. AR enables the insertion of real-time 3D objects into real-time background, casting real shadows, with changed lighting parameters. It also permits triggering of events using simple hand movements. The talent would be transported from a virtual environment into another real video seamlessly.

Multiplatform Broadcasters – OTT & IBB Technologies and Implementation

The moderator was Kath Brown, Commercial Radio Australia. The panelists were Oliver Linow, Deutsche Welle; Tegshgerei Oyunotkh, MNB World Channel; Charles Sevier, Dell EMC and Andi Permadi, Radio Republik Indonesia. Deutsche Welle (DW) has developed regional television lineups in English, German, Spanish and Arabic with radio and



Kath Brown, Commercial Radio Australia; Andi Permadi, Radio Republik Indonesia; Charles Seviar, Dell EMC; Tegshgerei Oyunogtokh, MNB World Channel; Oliver Linow, Deutsche Welle

online content available in thirty different languages. DW's television line-up offers news, features and documentaries covering everything from business, science and politics to arts, culture and sports. DW relies on distribution based a global satellite network, partner stations and online services to make tuning in as easy as possible. DW also utilises other means of distribution like apps, podcasting, livestreaming, on-demand and mobile services.

Mongolian National Public Radio & Television is in a transition phase to multi-platform, with integration between traditional and digital media being the key point. The rationale behind the project is misperception and lack of national brand identity. The project would provide contemporary and accurate view, instead of delving into events which occurred in Mongolia's past history such as Genghis Khan. There is a need to change TV audience's behaviour because of insufficient news and information in English.

Viewing habits have been slowly changing over the past few decades. Time spent daily watching TV is dropping. Live and linear TV is commanding 50% of viewers, whilst on demand TV is being watched by the other 50%. By 2020, half of all viewing will be mobile whereas the other half of all viewing will be on-demand. Hence, there is

an urgent need to develop a media cloud platform, with the broadcaster controlling it. The OTT delivery platform carries the public CDN for YouTube whilst private CDN carries Netflix.

OTT needs to add storage as the viewers increase. The future vision for media cloud facilities is a scale-out architecture with cloud integration. It would be server-based having converged infrastructure, and flash & disk scale-out storage for block, file & object. Radio Republik Indonesia employs a cloud system storage located in Jakarta, in order to serve the country consisting of thousands of islands.

Digital Broadcast Roll-Out: Case Studies, Updates and Experiences

The last session was chaired by Aale Raza, Whiteways Systems and the panelists were Murat Duran, RATEM Turkey; Les Sabel, Commercial Radio Australia; Guillermo Narvaja, RadioCut and Andrea Manara, ITU. The DAB+ rollout in Australia is continually progressing with over 34% of all new cars installed, three million receivers sold and over 26% of listeners. All stakeholders have embarked on a mission to make an industry better through collaboration, so that all parties benefit. Listeners want content expansion, quality, interactivity and simplicity. Broadcasters need to increase their reach, competitiveness and profits. Regulators demand balanced control, reduced costs and red tape. The government mandates appropriate content delivery, and emergency support.

The initial rollout was in metropolitan areas, but in 2015 the industry decided it must move forward with DAB+ in regional Australia. The formation of the Digital Radio Planning Committee found that times have changed, whilst policies have not been adjusted, resulting in no regional focus. Technical planning was evolving across the globe, but implementation process is too heavy. The allotment planning process proved too complicated, due to the high demand and small number of channels.





Aale Raza, Whiteways Systems; Murat Duran, RATEM Turkey; Les Sabel, Commercial Radio Australia; Guillermo Narvaja, RadioCut and Andrea Manara, ITU

Hence, a Technical Sub-Committee was formed, to resolve the issues facing regional Australia. The planning methodology took into account, the population coverage which could be divided into 103 commercial license areas. The issues which arose were that there are only eight DAB+ channels available, and the public service broadcasters demanded their own networks with no sharing with the private broadcasters. The technical planning had its own parameters that also had to be considered. The field strength classes vary for vehicle, suburban, urban and dense urban. Interference allowances and protection ratios were field tested, so that interference reception was obtained. The limited spectrum required sharp focus on accuracy, to ensure appropriate balance of coverage/power and interference.

Under Phase 1 regional deployment, population coverage would increase from 65% to 72% by 2018. Phase 2 regional deployments with fifteen license areas, would see an increase in population coverage from 72% to 80%. Finally, under Phase 3 regional deployments with further

15+ license areas, population coverage would be over 85% by the 2020 timeframe. The Australian broadcast industry has collaborated and compromised to ensure that the industry stays healthy. The important lesson learnt, was to collaborate on engineering and compete on content.

The ITU has investigated the general regulatory aspects pertaining to DTT and frequency coordination process. Benefits of Frequency Coordination include harmonising the use of spectrum, and prevent the occurrence of harmful interference. Joint efforts facilitate the analogue to digital television transition, and the allocation of the digital dividend. It is wise discuss future national plans and build informal consensus towards the conclusion of formal agreements. The Broadcasting Services Division of ITU has provided assistance in frequency coordination, to African Telecommunications Union (ATU) for Sub-Saharan Africa, and to Arab Spectrum Management Group (ASMG) for the Arab Region. The ITU is willing to contribute should any of its members require assistance.

Thank You Taylor's University



The ABU wishes to thank the Taylors' University Student Ambassadors especially Martin Lee Yuen Ming and Foong Yin Xi, for their energetic enthusiasm, dedication, kindness and passion in carrying out every assignment given to them.

Special thank you also to Assoc. Prof. Dr. Ramachandran Ponnann, Ms Jenny Heng and Mr Philip Gan for their continued support.

Industry Debate – Enhancing Multiplatform Content

Is Content Key for Multiplatform Success?

One of the highlights of the DBS2018 was the industry debate session which discussed the role of content in the success of multiplatform delivery. The main theme of this years' symposium revolved around the importance of having creative and engaging content for multiplatform applications. The session was chaired by Abdul Hakim Amir Nazri of ASTRO Malaysia, and he was joined on the panel by; Joan Warner, Commercial Radio Australia; Oliver Linow, Deutsche Welle; Marini Ramlan, Primeworks Studios Malaysia; Charles Sevier, Dell EMC; Lindsay Cornell, BBC; and Aniket Rangnekar, IDEAL Systems Singapore.



Abdul Hakim
Amir Nazri,
ASTRO Malaysia

Oliver Linow then touched on the opening of new platforms, as old ones are not working efficiently. There is lots of content but not all can be seen as there is limited time to do so. Hence, it is a wise move to put the additional content on social media platforms after appropriate editing and repurposing. In fact, Facebook is part of the multiplatform for Deutsche Welle now. It is important to customise the content to attract advertisers, and create content that enables consumer engagement.



Oliver Linow,
Deutsche Welle



Joan Warner

Joan Warner stated that Radio has lots of content within their archives and radio can go hand in hand with other platforms by repurposing this content. Broadcasters need to monetise the content and at the same time understand who is using the content. The good thing is that the online platforms do provide such information and broadcasters need to focus some effort

on this type of audience research to understand the kind of content desired by the audience.



Aniket Rangnekar,
IDEAL Systems
Singapore

Aniket Rangnekar reported that live streaming on OTT is a better proposition, where broadcasters can definitely increase their reach to a wider audience with the use of multiple platforms. However, there is a need to train staff to understand and research on the types of audience and what type of content suites them. Ratings can provide a lot of information but it needs to be further studied to identify specific groups of audiences. Besides

that we also have to be careful illegal streaming platforms which have mushroomed very quickly.

Lindsay Cornell commented that BBC has changed its approach to content, at both national and international levels. The BBC is not permitted to carry advertising or sponsorship on its public services. This keeps the BBC independent of commercial interests, and ensures it can be run purely to serve the general public interest. Broadcasters have to invest in internet platforms to be cost effective, but then there is a need to serve tens of thousands of streams. They have to apply different methods and also on different platforms to get the content across to the user. The BBC is multiplatform based and makes several versions of content to market it. In fact, social media can be used to host the trailers before going on air and this has proven to be a successful model.



Lindsay Cornell,
BBC

Marini Ramlan felt that there is a need to create content that is related to the local situation, as well as content that can be sold internationally. International companies are interested in co-production with local players as they want to enter the local market. Specific data on viewership, such as where the viewer and what he is watching needs to be studied and this data can help attract international partnerships for different types of content.



Marini Ramlan,
Primeworks
Studios Malaysia

According to Charles Sevier, there are many technical tools available to analyse the data that is being generated following audience access and interaction with content. Media content is exploding, resulting in a need to keep track of which content more appealing and which are not. The data analytical tools can easily help identify such content and broadcasters can then monetise by attracting advertisers.



Charles Sevier,
Dell EMC

The panel collectively agreed that with the emergence of multiple platforms, the need for more content has grown exponentially. Digital platforms provide the opportunity to target different groups of audiences with different types of content. But to understand the requirements of audiences requires a little bit of effort from broadcasters. By creating specific content to target specific groups can also provide opportunities for broadcasters to actually attract more advertising and hence generate additional revenue streams. The industry debate ended on the note that the broadcast industry should see it as a challenge to go digital and continue to grow and be relevant as the behaviour and the requirements of the audience are changing.

DBS Exhibition



The DBS Exhibition was held from 6-8 March playing host to 40 exhibitors who took up 50 booths.

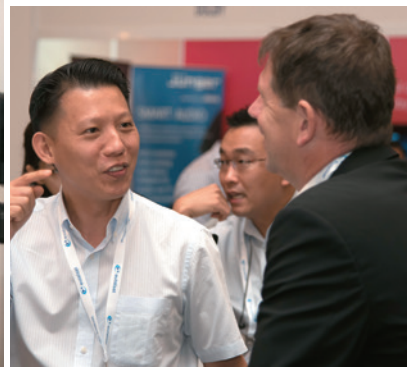
Held in conjunction with the symposium, the DBS exhibition showcased the latest trends in technologies, applications and services provided by major manufacturers and other industry players.

The products ranged from VR headgear, antennas, digital cameras, mixer and frequency & coverage planning software.

Rohde & Schwarz was awarded the 2018 Best Booth Award.

Mr Faisal Hamdi Mohammed Ghouth, Deputy Director, MCMC, presented the award to Ms Ng Sze Ming, Marketing Executive of Rohde & Schwarz.





DAB+ is a vital part of keeping radio competitive in a multi-platform world

This year's ABU DBS saw strong interest in DAB+ during the conference programme and in the WorldDAB workshop, which once again broke attendance records with 150 delegates taking part.

In the opening keynote, Joan Warner of Commercial Radio Australia and Vice-President at WorldDAB warned that, with more competition from smart speakers and streaming services, radio needs to continue to innovate, utilising its strength and expertise in creating engaging and valuable audio content in the digital space. Moving to digital allows broadcasters to offer new services and regulators to introduce an accessible digital platform, while offering protection from interference for broadcasters.

Key areas of interest throughout the conference included hybrid radio, the growing number of cars with DAB+ fitted as standard and the success that commercial broadcasters have found by switching to digital. Dave Cameron of Southern Cross Austereo showed how brand extensions on DAB+ have enabled SCA to continue to build strength around their key network brands, while opening new revenue opportunities.

In the exhibition, GatesAir, Factum Radioscape, Paneda and RadioDNS joined a DAB+ Pavilion where delegates met the experts who provided information and advice on implementing DAB+ digital radio and the latest supply-chain developments.

WorldDAB breaks 100-member threshold

Across Asia Pacific and beyond, digital radio continues to make great progress. WorldDAB's membership has now reached over 100 companies and membership has grown by over 30% since 2012. The latest companies to join reflect the growing interest in DAB+ worldwide, from new countries rolling out trials to those expanding coverage and major manufacturers from the automotive and professional equipment markets.

In Australia, the number of DAB+ digital radios climbed to 3.8 million in 2017, up 24% over the past 12 months. The number of DAB+ receivers totalled 2.37 million at the end of the calendar year, with 1.42 million in cars as digital radio is now fitted as standard in 47% of all new vehicles.

WorldDAB continues to support broadcasters, regulators and manufacturers in Asia Pacific, offering to share advice and best practice from these DAB+ deployments.



DAB+ in Asia Pacific



Australia: DAB+ expanding to regions



China: DAB in Beijing



Malaysia: DAB+ in trial, planning underway



Indonesia: DAB+ trials on air



Myanmar: DAB+ trial on air in Yangon



NZ: DAB+ trial on air Auckland



Thailand: Trials planned 2018



Vietnam: planning digital radio roadmap

In November 2017 ASEAN country regulators began the discussion on a regional approach to digitising radio.



475 million
people covered by DAB/DAB+



2,230
DAB/DAB+ services on air worldwide



99%
DAB+ population coverage in some markets reaching FM footprint

DAB+ around the world:

- DAB+ is well established in Australia
- Several countries in Asia Pacific, Arab States and South Africa have started trials
- In Europe:
 - Norway switched off FM in 2017
 - Switzerland will follow in 2020-24
 - Continued progress in UK, Germany, France, Italy, Denmark and NL
- Over 400 DAB+ receiver models available – prices from USD 18
- All major car manufacturers now fit DAB+

WorldDAB offers support to broadcasters in the Asia Pacific region in the transition from analogue to digital radio. Contact us for assistance with:

- Tailored DAB+ workshops
- On-air demonstrations
- Technical expertise
- Regulation & licensing
- Network design and roll-out
- Content production
- DAB+ receivers

WorldDAB is the global industry forum responsible for defining and promoting DAB, the digital radio broadcasting standard for many broadcasters around the world.

With unique cross industry representation, our 100-plus members cover 29 countries and include experts from broadcasters, regulators, network providers through to manufacturers of receivers, chips, professional equipment and automobiles.

Sharing case studies and best practice, our not-for-profit remit allows us to give unbiased advice. We support and host industry events, briefings and tailored workshops providing insights, analysis and market intelligence.

Together we define and promote DAB by offering support on all aspects of the switch from analogue to digital radio. This includes regulation, licensing, technology trials, network build out, marketing and production of digital radio content.



First Masterclass on “Lighting & Make-up Techniques for HD and beyond” was held during the ABU Digital Broadcasting Symposium 2018

Broadcast technology has progressed by leaps and bounds and it is truly interesting to see how lighting and make-up techniques have transformed with advancements in technology, from Standard Definition Television System (SD) to High Definition (HD) and beyond. Experts from Turkey (Mr Ali Dogan & Ms Hülya Yalçiner, TRT-Turkey) and Japan (Mr Taku Atoda, NHK- Japan) and Mr Kenz from Malaysia had been invited to present. The Master Classes were conducted over three days, two sessions in the morning and another two in the afternoon.

The first and third day saw the two experts from TRT-Turkey conducting the sessions. They only had half an hour each to present and some time was allocated for question and answer. Mr Ali Dogan's presentation on lighting was quite academic at first. It began with technical details of lighting beginning with the Electromagnetic Spectrum. It was enlightening how a seemingly difficult subject become so easy to understand.

Ms Hülya Yalçiner covered make-up techniques. Real models were used to demonstrate the kind of make-up used for SD and for HD and participants could actually see the difference immediately. The HD make up was light and more natural where as SD make-up was like theatre make-up. On the HD monitor one could clearly see the difference. HD can be cruel. It captures all the blemishes and shortcomings of make-up applications.





The Japanese Lighting Director chose to present in English to save time and perhaps to relate better with the audience and the interpreting was only necessary during the Q & A session. Mr Kenz of KAI IMAGE ACADEMY-Malaysia provided lots and lots of examples from his works and mesmerised the audience with his air-brushing techniques for make-up. On the second day, all the experts changed their presentation styles learning from the earlier sessions. The first day session garnered many questions from the floor but the second and third day session by the experts seemed much easier to understand.

The make-up session by Malaysian Kenz, the Malaysian expert and the Turkish expert both had their preferences in brands of make up they used. But the types of make-up used and of course the techniques were also different for

SD and HD. Lighter make-up for HD and heavier make-up for SD.

Both the Turkish and Malaysian make-up experts expressed the need to differentiate make up for news and other types of programs and dramas. Ms Hulia said with a smile, "Surely you want the audience to focus on the news and not so much the newsreader. Newsreader make-up should be simple."

The session by the NHK expert was well-structured. His presentation was titled "Types of Lighting". Mr Atoda started off by going back to basics of the purpose of lighting in TV ie 1. Gaining appropriate illuminance 2. Controlling contrast 3. Creating shadows 4. Creating the balance of brightness and darkness by light distribution). He then went on to compare the differences in SD and HD. Being a veteran in lighting for dramas, Mr Atoda shared how important lighting was in dramas in creating the Visual Tone that matches the script, Empathy with the characters and how to Dramatize the visual image in order to stir the audience's hearts. He shared examples from some of the dramas he had worked on the past to demonstrate his points. Truly impressive. Mr Atoda explained that with the advent of HD TV people's preferences with regard visuals and lighting too seemed to have changed. When expressing a day scene with clear weather in drama, it has become mainstream at NHK to create a softer picture with high contrast ratio by combining high power spotlight and soft light and examples were shown from his dramas.





WVRF Immersive VR Masterclass at DBS 2018

6-8 March 2018, Kuala Lumpur, Malaysia

Introduction

At this year's Digital Broadcasting Symposium, ABU partnered with World VR Forum (WVRF) to bring a unique VR Masterclass which showcased state-of-the-art storytelling and content creation in the Virtual Reality domain. The core mission of this Masterclass was to showcase VR as a true form of art to bring an unparalleled experience of storytelling and content creation. This marks the first time ABU has showcased immersive VR technology at DBS.

60 minutes, combining 30-35 minutes of synchronized VR experiences carefully chosen by WVRF, followed by 20 minutes of experience-sharing and questions and answers from participants.

During each session, a group of up to 10 participants were guided by WVRF team to experience the most cutting-edge medium of communication. An average of 3 to 5 experiences, with a focus on new VR content that emerge around the world, were showcased during each session.

Concept and Format

Throughout DBS 2018, WVRF presented the immersive VR Masterclass in the form of a "classroom", delivering 8 sessions over the course of DBS. Each session lasted about

Outcomes

At the end of the VR masterclass, the following objectives were successfully met:





- Participants learned methods for combining story structure, interaction, and user experience design that utilise the full potential available with virtual reality technologies.
- Participants explored how some organisations are taking the lead in experimenting with new forms of VR content creation and why are they successful.
- Participants discovered how VR technologies present a space beyond physical limits to create something that would not be possible in the real world.

participants benefitted from the masterclass in 8 sessions that was conducted in 3 days over the course of DBS.

Please see Annex for the full list of participants.

The Team

The WVRF team, led by Salar Shahna, Creative Director and CEO of World VR Forum, included Delphine Seitiee, Chief Operating Officer and Ellen Kuo, Director - Market and Partnerships.

World VR Forum is an international, non-profit organisation based in Switzerland dedicated to advancing the virtual reality industry.

Participants Profile

With more than 80 participants, the VR masterclass was an instant hit among the visitors to DBS this year. In total, 82



DBS Workshops

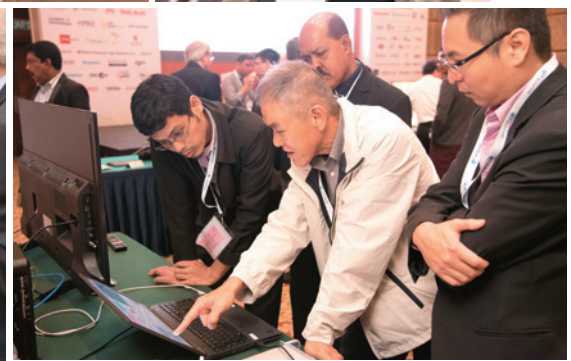
DVB and WorldDAB both held half-day workshops on 5 March. They drew appreciative audiences.



DVB-S2/S2X: Advanced Features and Applications



The DVB workshop, moderated by DVB's Dr Peter Siebert, focused on advanced features and applications of DVB-S2/S2X. The workshop and accompanying hands-on demonstrations were warmly received by the more than 120 delegates in attendance. The workshop included contributions from several DVB members. Satellite is a popular means of transmission in the region and virtually all television services use DVB-S/S2/S2X.



DAB+ in a Multiplatform World



The annual WorldDAB workshop saw its largest attendance yet, with 150 delegates gathering to hear the latest digital radio news and updates.



Joan Warner



Jørn Jensen



Dave Cameron



Nick Piggott



Bernie O'Neill



Lindsay Cornell

Joan Warner opened the workshop by highlighting the strength of radio around the world. She said it had a connection with listeners that no other medium could match, but needed to innovate to stay ahead.

Jørn Jensen of Norwegian broadcaster NRK spoke about the digital switchover in Norway, which was completed in December 2017. He shared the background and the lessons learned.

Dave Cameron of Southern Cross Austereo explained how brand extensions on DAB+ have enabled SCA to continue to build strength around its key network brands.

Nick Piggott of RadioDNS presented the latest developments in hybrid radio, outlining how radio and IP can work together to deliver the best possible experience to listeners.

Bernie O'Neill, WorldDAB's Project Director, presented an update on DAB+ deployments around the world, from the next countries looking at digital radio switchover in Europe to the new trials and services on air in the Middle East and Asia.

The BBC's Lindsay Cornell, Chair of the WorldDAB Technical Committee, outlined the latest work being undertaken with the DAB+ standard, including dealing with non-Latin text and work being undertaken with OMRI on developing applications for mobile phones with DAB+.

(With reporting by Darren Willsher of WorldDAB)



Rohde & Schwarz Workshop

Chatchai Nimboonjat, Support Engineer, Regional Headquarters Singapore Pte Ltd, covered the topic From SDI to IP Architectures.

Eric Li Bin, Regional Manager, Regional Headquarters Singapore Pte Ltd, spoke on Convergent monitoring solution for multiplatform delivery – SDI, TS, IPTV and OTT.



Chatchai Nimboonjat



Eric Li Bin



DOLBY Workshop



Jerry Gui, Senior Staff Solutions Engineer, DOLBY, spoke on Issues and Solutions - Audio Transitions from Analogue to Digital TV Services.

Nandakumar Seshadri, Staff Field Applications Engineer at DOLBY India, spoke on Enhancing Audio Experience Across Devices by Dolby.



Jerry Gui



Nandakumar Seshadri



DALET Workshop



Sebastien Letemple, DALET Head of Pre-Sales Design for the Asia Pacific, conducted a workshop on Enabling Next Generation Workflows.



Sebastien Letemple



DRM Workshop



The DRM workshop focused on Best Ways for Introducing and Implementing Digital Radio Mondiale DRM - Practical Lessons and Best Practice. The presenters were key experts of the DRM Consortium: Ruxandra Obreja, Alexander Zink, Lindsay Cornell, Radu Obreja and Charles W. Kelly, Jr.



Ruxandra Obreja



Radu Obreja



Lindsay Cornell



Charles W. Kelly, Jr.



Alexander Zink



Whiteways Systems Workshop

Aale Raza, Chief Executive Officer, Whiteways Systems Pte. Ltd., conducted the workshop on Augmented Reality in Graphics.



Aale Raza

14th Iran Media Technology Conference

Smart Media,
Future Media
12-13 December 2017

14th IRAN Media Technology Conference

Islamic Republic of Iran Broadcasting Development & Media Technology Division



Islamic Republic of Iran Broadcasting (IRIB) organised the annual technical event as Media Technology Conference 2017: Smart Media, Future Media, on 12th and 13th December 2017. The conference was held at IRIB International Conference Centre and participants were Broadcast Engineers and IRIB experts. Also there was a big exhibition for professional broadcast companies. Over 65 booths provided opportunity for IRIB and industry players to showcase the latest RF and Audio Visual products and projects.

The IRIB strategy will keep the Digital Terrestrial Television (DTT) or Linear Television Services as the main IRIB service. However, audience consumption patterns are changing over the time and new distribution opportunities, like Over the Top (OTT) services or the development of future mobile options like 5G, are becoming more and more popular in the future. So this conference was an opportunity to define the evolution processes of DTT. In addition, during two days presentations and discussions, IRIB's opportunities for attracting more audiences was examined.

This year, the Annual Conference focus was on the above subjects and more. Briefly the main topics presented were as follows:

Optimisation of Media workflow by smart systems

- Security and integration solutions in IT networks and data centre infrastructure

- Radio, TV, News, and Archive automation chain
- New signal distribution/contribution solutions
- Multimedia content and service transmission over new platforms (IPTV, OTT, Social TV, ...)
- Design, implementation and maintenance solutions for the Single Frequency Networks (SFN)
- Implementation of content and audience analysis tools in the Media
- Smart Media Technologies
- Immersive & beyond HD production technologies
- Live IP production
- Advanced Broadcast & Broadband technologies (HBBTV, LTE, FOBT, 5G, ...)
- Process and Procedure of Secure operation in cyberspace
- The role of Cloud Computing and Software Defined Networking (SDN) in broadcast

Widespread use of the ICT in the smart processes related to the media, as well as world-wide evolutions in the media industry, providing the opportunity of establishing smart organisation (with new and widespread services) for IRIB. The existence of these kinds of organisations is a key requirement of the Iran knowledge-based community. In the knowledge-based era, in the smart organisations, along with the reinforcement



in teaching and learning processes, an integrated interactive environment is provided to promote new media technologies and some main capabilities in the communication infrastructures, data centres and audio and video automation chains based on smart processes.

According to the importance of the mission related to utilising new technologies in making current and future agile processes, rapid change in the technologies, creating the smart infrastructure of aggregation, distribution and analysis, and using internal (IRIB engineers & Iranian companies) and external (international institutions) capacities, the Deputy of Development and Media Technology held the 14th global conference of the media technology with keynote speakers from ABU and EBU and several other organisations and private sectors together with senior experts in the Media and Broadcast industry.

From ABU, Mr. Masakazu Iwaki, the Chairman of ABU Technical Committee and Head of Human Interface Research Division, NHK STRL, presented **"Immersive & beyond HD production technologies - 8K Broadcasting and Tokyo 2020"**

From EBU, the speaker was Mr. Darko Ratkaj, senior project manager of Technology & Innovation of EBU, and he presented **"5G: Developments in the Context of Media Services"**

On the same day there was a discussion panel about **"Future**



Technology Trends in Broadcasting" as a group discussion with Mr. Masakazu Iwaki (NHK-ABU), Mr. Darko Ratkaj (EBU) & Dr. Minoo.

The agenda of the conference is attached.

Along with the Annual Conference, in order to honor the efforts of the technical engineers, the best implemented plans and top ideas were introduced and, based on the vote of the evaluation committee of technical deputy, selected Broadcast Engineers in Tehran and the Provinces were honored. The organiser hopes that this conference provided the capacity and facilities, along with the new technologies, to influence the speed of developing and expanding infrastructures and IRIB smart processes, as well as promoting the position of the national media.

For more information, please refer fani.irib.ir



14th Global Shortwave Coordination Conference

22nd - 26th January 2018, Kuala Lumpur

The High Frequency Coordination Conference (HFCC), the Arab States Broadcasting Union (ASBU) and the Asia-Pacific Broadcasting Union (ABU-HFC) jointly held the 14th Global Shortwave Co-ordination Conference at Hotel Istana, Kuala Lumpur from 22nd to 26th January 2018. The conference was hosted by the ABU. Eighty five participants from the three coordination groups, representing global shortwave broadcasters and related stakeholders from 84 countries, all over the world, coordinated schedules for the coming transmission season. They took part in this conference to coordinate shortwave frequency schedules for the A-18.

Shortwave broadcasting has a unique position in that the radio channels used by international stations are not assigned, but regularly coordinated for two seasons each year. The frequency channel situation for shortwave radio is always changing because of the 11 year solar cycle and seasonal effects, as well as because of new or changed frequencies of shortwave broadcasters around the globe.



Co-ordination methods were started by broadcasters with support from the broadcasting unions. The International Telecommunication Union (ITU) set up a special task group that studied the emerging co-ordination procedures in the 1990s and concluded that the system should become an integral part of shortwave spectrum management. The principles were incorporated in Article 12 of the International Radio Regulations in 1997.



At present a single global seasonal database of frequency requirements is kept by the secretariat of the High Frequency Co-ordination Conference for each of the two seasons of the year. There is an on-line upload process available and all participants are requested to update any frequency changes between seasonal conferences. The automatic processing software notifies all participants, not only on the entered changes, but also on the possible collisions or incompatibilities that may have resulted from the submissions.

The reduction in shortwave transmissions could be observed in many countries. This raised an alarm over for the future of international shortwave broadcasting and the role it plays in serving listeners in sparsely populated areas.

Reasons for switching off short wave (SW) transmission was budgetary constraints that the SW broadcasters often faced, together with the maintenance cost of such facilities. As technology advanced, narrowband services could not offer matching high fidelity audio to listeners.



However, traditional sound radio broadcasting from terrestrial shortwave transmitters can remain available for many more years to come. The emergence of new transmission technologies has never replaced an old one immediately, allowing some technologies to co-exist side by side. Hence it was important to coordinate transmission mechanism of SW to mitigate any possible un-intentional interference.

The conference came up with a coordination scheme and a number of proposals to enable acceptable SW reception where receivers could be tuned to signals with minimum interference. While working hard to agree on a coordination plan the delegates were also able to enjoy their time in Kuala Lumpur.

The Coordination Conference provides delegates and their organisations with a valuable opportunity to coordinate their frequencies directly with the frequency managers of other broadcasters and prevent interference occurring in your radio services. In the ABU-HFC meeting, ABU members raised concern that if SW broadcast organisations were not present at this conference, elimination of interference in their shortwave services and preservation of their shortwave frequencies could not be ensured. Therefore, it was recommended strongly that ABU member organisations consider participating in the conference to represent their organisation and broadcast interests. Thirty seven ABU members from ten organisations attended this event.



Human Friendly Broadcasting

9th ABU Pacific Media Partnership Conference



The 9th Pacific Media Partnership Conference (PMPC) was held in the city of Nadi, Fiji. The event was jointly hosted by our members Fiji Broadcasting Corporation, Fiji TV and the Government of Fiji and was co-organised with the ABU's Media Summit on Climate Change and Disaster Risk Reduction. The PMPC was held from 6-7 February 2018 with the theme "Human Friendly Broadcasting".



As usual the conference sessions address both Technical and non-technical issues specially focusing on disaster reporting, the role of broadcast media in climate change education with experts sharing experiences on how to create effective content to inform the public on effects of climate change and disasters. The event was attended by 161 participants from 21 countries.



The conference concluded with the adoption of a Fiji Action Plan, where the delegates undertook to return to their countries and carry forward the spirit of the conference through the on-going production of informative and high-quality radio/TV programmes and social media postings, thus bringing the challenges of climate change, environmental pollution and disaster mitigation to the urgent attention of wider national audiences.



ABU-ASBU Capacity Building Workshop

This year's training programme, in partnership with ASBU, was held at the ASBU Academy in Tunis from 12th to 17th March. The themes of the training were IPTV, IBB and OTT as digital media distribution platforms.

Ten participants, from Algeria, Oman, Palestine 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 Integrated Broadcast Broadband (IBB) 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, AI and cyber security.

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.



New Members

Additional Full Members

TVLAO-Laos

TVLAO is a television channel based in Laos. Founded in 2012, it broadcasts entertainment programmes, Sports, News and Business News. Its vision is to be a leader in television broadcasting in the Lao People's Democratic Republic and ASEAN within five years and establish itself as a public listed television station in the future.



TVLAO aims at producing quality TV content and believes in variety in presentations and fast delivery. It airs up-to-date information to the public on socio-economic developments and promotes the national culture and traditions using state-of-the-art technology.

Radio Sagarmatha – Nepal

Established in 1997, Radio Sagarmatha was the first independent community radio in all of South Asia. Since then, it has evolved as a truly independent and highly credible community radio broadcaster in Nepal. It was founded following the steadfast efforts of leading journalists who had associated themselves under Nepal Forum of Environmental Journalists (NEFEJ) in 1986.

Radio Sagarmatha has a very wide reach. It is available in 14 districts of the country with an audience of over 2.5 million regular listeners. At times it has nearly 10 million listeners when its programmes are relayed and re-broadcast by local community radio stations throughout the country.

This radio channel is very popular in Kathmandu, Bhaktapur, Lalitpur, Kavre, Makwanpur, Sindhupalchowk and Nuwakot districts.

Must Technology – Mongolia

Must Technology is a very young TV news channel, called NEWS CHANNEL HD and which is based in Mongolia. Founded



in August 2017, its main mission is to deliver and present current hard-breaking national and international news with the best source to viewers. NEWS CHANNEL HD broadcasts across the whole country and so far it has 400,000 subscribers.

Must Technology is a Free to Air channel and broadcasts through Cable TV-Univision, Skymedia and MNBC nationwide. It is not on satellite but can easily reach Ulaanbaatar City where the majority of Mongolians live.

Must currently 15 employees and intends to recruit more once additional revenue can be earned from advertising.

Affiliate Member

AXON from Netherlands joined ABU as Affiliate Member

AXON is a global leader in broadcast network infrastructure products and solutions. For more than 30 years, major broadcasters, network and service providers worldwide have trusted its pioneering and enabling technology to control and monitor operations, delivering at the highest level.



Headquartered in The Netherlands, AXON has offices in other parts of Europe, Africa, India, China, Singapore, Baltic States, Latin America and Canada.

With the widest and most advanced range of ultra-compact modular systems and equipment for audio and video signals processing available today, Axon's award-winning solutions are at the heart of broadcast. Their portfolio includes: Interfacing and Conversion, Master Control, Routers, 4K and IP Multiviewer, (IP) Control and Monitoring System, DVB Monitoring, 4K Solutions, IP Solutions, SCTE 104 insertion, Compliance Recording.

4th ABU Media Summit on Climate Change and Disaster Risk Reduction

The 2018 CCDRR was held in Nadi, Fiji on 5-6 February.



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News

from the ABU Region

Australia to begin DVB-T2 Broadcast Trials

Free TV and Broadcast Australia are to conduct trials of the digital terrestrial broadcast standard DVB-T2, which has the potential to allow 4KTV reception. Broadcasters SBS and ABC will also participate in the Sydney-based trials, which will determine whether Australia will upgrade from its existing DVB-T standard in line with the UK, India, New Zealand and Malaysia.

Terrestrial free-to-air television delivers its service to 99% of the population and over 20 million Australians tune into television every week. This trial is an important part to ensure that when the time is right, the terrestrial television platform is ready for the next stage of its evolution and that it can deliver the best possible viewing experience, according to Broadcast Australia (BA).

Free TV shared that while their current platform has many years of life in it, this trial is about planning for our long-term future. Over the past 62 years, television broadcasters have demonstrated their ability to evolve with the times, from black and white to colour, analogue to digital, standard to high definition. We are very pleased to be working with BA to ensure that all Australians will continue to have access to the free news, sport and entertainment programmes that they rely on and love.

(Rapid TV News)

Islamic Republic of Iran Broadcasting-IRIB Launches iFilm 2 to Air on Iranian TV Films and Series for Persian-speaking Nations

An iFilm 2 pilot channel has been in operation since February, broadcasting a large number of Iranian film productions across Afghanistan and Tajikistan.

"Having cultural, civilizational and historical affinities with Afghanistan, Tajikistan and other Persian-speaking nations in the Central Asian illustrates the necessity of launching the channel," iFilm 2 director Nasser Hajazifar told the Persian service of MNA on Saturday.

The 24-hour channel has selected the motto "A Friend of Families". Hajazifar said that the channel will broadcast productions with "an appropriate content" in comparison with Turkish and Western TV series. He also added that the difference in the Persian dialects being used in the region would not make it difficult for the nations to understand the language of films and series. Earlier in September 2010, IRIB launched three channels of iFilm in English, Arabic and Persian.

(ABU News)

TV-on-Go without Internet: Doordarshan bets big on app that doesn't require data to stream TV on mobile phones Doordarshan have come out with an app, yes, an app that lets you watch Television on your mobile phones. That's pretty normal, You may say. What if the app doesn't require data to stream. What? Yes, DD's app doesn't require internet connection to work. DD is betting on DTT – Digital Terrestrial Transmission – a technology that lets consumers stream TV channels via radiowaves on tabs or smartphones.

The app that is aptly named TV-on-Go, Doordarshan offers live tv streaming of DD National, DD News, DD Sports, DD Bharati and DD Kisan. The service that was started in Feb 2016 (yes, maybe it wasn't advertised well, so we didn't know about it) has 1,00,000 downloads so far. Meanwhile, there are reports that Telecom Regulatory Authority of India could allow private players too, to provide DTT services along with Prasar Bharti to ensure there is equal-opportunity-market for both. However, TRAI said the maximum number of DTT players maybe capped at five.

Digitalization of Doordarshan's Terrestrial TV Transmitters was started in 63 cities. Not just mobiles, these Transmitters are equipped for Fixed and Portable equipment too. Doordarshan plans to install DTT Transmitters at 630 locations all across the county in future. The channels can be viewed on Fixed TV Sets using antenna on integrated Digital TV (iDTV) sets or using special Set Top Boxes. The iDTV sets of Sony, LG, Panasonic, Samsung and other make can easily be purchased from the market. The dongles for mobile reception are also available with ecommerce stores like Amazon and Flipkart. A one-time investment for DVB-T2 Dongle is required by viewers and no recurring expenditure is there.

(India TV News)

SBS's Untold Australia VR Immerses Audiences

SBS's Digital Creative Labs has released the final Untold Australia VR (virtual reality) immersive experiences, 'Every King Tide' and 'A Thin Black Line', which bring to life two diverse Torres Strait Islander stories.

Every King Tide explores the community of Poruma, who are at risk of losing their homes and livelihoods, as well as their connection to history, country and culture. The VR documentary takes audiences on a journey to meet the residents of this tiny island in the Torres Strait, which is slowly being eroded and swallowed by the sea. Despite the challenges faced by the 200 individuals who call Poruma home, Every King Tide, produced by Bunya Productions (Sweet Country), gives audiences a first-person perspective of this community's spirit, faith and passion for the island they call home.

(C+T)

AsiaSat and TVNZ to Deliver Live Coverage of the 2018 Gold Coast Commonwealth Games

According to TVNZ, the collaboration is integral to its plan of providing the largest-ever Free-to-Air (FTA) coverage of the Games in New Zealand and enabling broadcast rights holders in the Asia-Pacific region to have full access to the event's live coverage and daily highlight packages.

The 2018 Commonwealth Games, taking place between April 4 and April 15 in Australia's Gold Coast, will gather more than 6,600 athletes and team officials from 70 Commonwealth nations and territories. TVNZ will distribute the Commonwealth Games through AsiaSat 5's wide C-band beam to rights-holding broadcasters in Asia in partnership with the Asia-Pacific Broadcasting Union and TVNZ's sub-licensees in the Pacific region. Event coverage will include the opening and closing ceremonies, as well as 11 days of live and replayed television action showcasing athletes competing in 18 sports and seven para-sports across 18 sports venues.

As the exclusive broadcast rights holder for New Zealand, TVNZ will deliver live coverage, replays and highlights across TVNZ 1, TVNZ Duke, new pop-up channel Games Extra and fully streamed channel Games Online for sports fans. *(Satellite Today)*

Vietnam Targets Raising \$240m from IPO of pay-TV Player VTVcab

The Vietnam government has decided to pare its 47.8 per cent stake in one of the country's largest pay-TV players, VTVcab, a unit of state-owned broadcasting agency Vietnam Television (VTV), in its initial public offering (IPO) slated for March 14.

According to an announcement from Hanoi Stock Exchange, the government will offload 42.29 million shares in the auction. At a starting price of VND140,900 (\$6.23) per share, valuing the company at VND12.4 trillion (\$544.3 million), the government aims to raise at least VND6 trillion (\$240 million) from the IPO. Under the privatization plan, VTVcab has a charter capital of VND884 billion (\$38.8 million). After the IPO, the state ownership at the firm will reduce to 52.2 per cent. Since 2015, VTV has proposed to divest its interest in three pay TV units, VTVcab, SCTV and K+. The divestment aims at enhancing the efficiency of the pay-TV units and bringing more benefit to shareholders. *(DealstreetAsia)*

Mongol TV Launches Global OTT TV Service

Mongolia's leading free-to-air TV channel Mongol TV has launched a new OTT TV streaming service using technology from Brightcove. The new service, Ori TV, provides live and on-demand content to viewers worldwide. The service uses Brightcove's OTT Flow platform, powered by Accedo.

Other technology partners for the service include Cleeng, which provides subscriber management technology. The Ori TV service streams Mongolian TV content including live

events, sports, entertainment, festivals and local versions of US franchise shows such as The Voice Mongolia, Mongolia's Got Talent and Shark Tank Mongolia. The service is available via subscription, on the web, iOS, and Android.

Mongol TV delivers services to Mongolia and adjacent markets via the Apstar satellite, and also broadcasts in PAL from a terrestrial transmitter on the Chingeltei mountain overlooking the Mongolian capital Ulaanbaatar. *(DigitalTVEurope)*

ABC announces 'ABC KIDS Listen' - A New, Dedicated Digital Radio Station and App

The ABC has announced ABC KIDS listen, a dedicated kids digital radio station and app for pre-schoolers and their families. ABC KIDS listen is aligned with the Early Years Learning Framework for Australia, the national early childhood curriculum for childhood educators, that encourages children to learn through play. ABC KIDS listen aims to enhance learning, imagination, cognitive and physical activity, creativity and family experiences, which will assist parents and caregivers to bridge the gap between home and child-care.

Available through DAB+ radios and a live radio stream online, families can enjoy 14 regular weekly audio programs from 6am every day. The programs are themed and designed to suit a child's daily routine, encouraging children to explore, learn, play, and later wind down, rest, and sleep. Listeners can select programs on demand to suit their child's changing needs. Listeners can also download a full program within the ABC KIDS listen app allowing families seven days to listen to their selected program anytime and anywhere without an internet connection. *(RadioToday)*

TVNZ and Getty Images Sign Global Distribution Deal

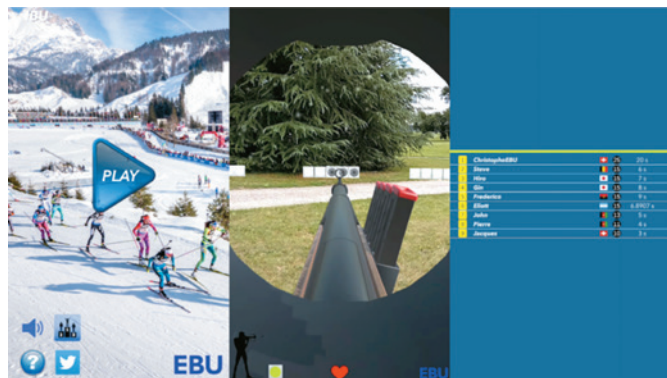
TVNZ has signed an exclusive partnership deal with Getty Images, a worldwide leader in visual communication, to license and distribute its video clips around the world. Getty Images' representation will bring the broadcaster's collection to a larger international market.

According to Getty Images, its extensive experience as the guardian of its own internationally renowned and historically significant Hulton Archive, as well as distributor to nearly 400 other well-known collections including BBC Worldwide and Japan's NHK, make the company an ideal partner for TVNZ.

TVNZ customers will be able to access the TVNZ Collection through Getty Images' website. They can expect the same quality service and price, but with a key difference being a stronger and wider sales offering, enabling customers to access content online from anywhere in the world 24 hours a day. The TVNZ Collection is available from Getty Images website now. *(C+T)*

Digital Broadcasting Update

EBU publishes Augmented Reality Guide



Screenshots of a biathlon app created to illustrate key AR concepts

The EBU has published a new guide to help Members understand the landscape of Augmented Reality (AR) technologies on consumer devices and platforms. Younger audiences are already familiar with the concept of AR: Pokemon Go, an AR-based smartphone game, was downloaded over 100 million times within just a few weeks of its release in 2016. The subsequent release of AR Software Development Kits by Amazon, Apple, Facebook, Google and Snapchat in 2017 made the technology widely available to content producers. But for many broadcasters, AR technologies and applications are still unfamiliar territory.

A big question for public service media is where and how AR might fit in with the range of existing service offerings and content production processes. Ideas and concepts for content in news, entertainment, sports and other genres exist and are being developed, but the majority of these have not reached a mass audience yet. There is also a significant knowledge gap to overcome, with AR production being closer to game development than TV production. And then there is a lack of standardisation, which various bodies, including ETSI, IEEE, MPEG and W3C, have now started to address.

In an EBU survey on AR late last year, Members reported a mixed appetite for in-depth guidance on AR content creation, as many were still assessing the media genre. To help Members understand the technology, its possibilities and implications, the EBU has now published a First Guide For Broadcasters on Augmented Reality (EBU BPN 115). The document provides an overview of available platforms, key challenges, a list of use cases, and links to AR example code created by EBU to help Members experiment with the technology.

(EBU)

DVB approves Single Illumination Specification



DVB Steering Board has approved a new technical specification for a Single Illumination System. The system allows for the combination of DVB-T/T2 contribution and DVB-S/S2/S2X distribution in a single satellite beam. The specification has been published as DVB BlueBook A175 and will be sent to ETSI for publication as a European Technical Specification.

In addition to being widely used for direct-to-home (DTH) broadcasting, satellite is very often used to feed the transmitters in digital terrestrial television (DTT) networks, a process known as contribution. In both cases satellite is typically the most cost-efficient mechanism for signal delivery, owing to the wide area coverage provided.

Ideally the signals used for DTH distribution and DTT contribution would be identical, so that one satellite transponder would be sufficient for both applications. This concept, called Single Illumination, was previously not possible since terrestrial transmitters expect a signal compliant to the DVB-T2 Modulator Interface (T2-MI) specification. This provides the timestamps required to synchronise several transmitters in a Single Frequency Network (SFN). Furthermore, even if the T2-MI signal could easily be derived from the underlying Transport Stream, DTH satellite receivers could not process it.

Network operators and network equipment manufacturers came together in DVB to identify a technical solution for a Single Illumination System. The Technical Module, based on commercial requirements defined by the Commercial Module, created a technical specification titled "Metadata generation and deterministic DVB-T-megaframe/DVB-T2-MI stream generation from MPEG-2 Transport Stream(s) for a DVB Single Illumination System".

In line with the commercial requirements, DVB-SIS signals

can be received by all DVB-S/S2/S2X receivers while simultaneously feeding DVB-T/T2 networks.

(DVB)

WorldDAB Launches Guidelines for in-car Digital Radio User Experience



Recommendations based on consumer research across five European markets on what drivers want from their digital radio

WorldDAB has produced a set of guidelines for automotive manufacturers and broadcasters on how to deliver the best possible digital radio user experience. The guidelines are based on consumer research carried out in five different countries where drivers were asked to carry out simple tasks using different car radios. They are available to download from the WorldDAB website.

Developed by the WorldDAB Automotive Working Group, the guidelines are the result of collaboration between broadcasters and car manufacturers. The design guidelines are based on seven use-cases, informed by the research, to ensure the guidelines are based on the actual experience of consumers.

The research showed that drivers expect a great, simple user experience, with a radio button to access DAB easily and quickly. It also found that an A-Z station list provides the best way to search for stations, pre-sets should be easy and intuitive to set, and that terminology must be consistent and easier to understand. This formed the basis for the resulting guidelines document, which is split into seven consumer use cases.

This document is part of WorldDAB's ongoing work to help improve the user experience of digital radio in the car.

(WorldDAB)

HEVC Advance Eliminates Content Distribution Royalty Fees and Reduces Certain Royalty Rates and Caps



Changes will accelerate consumers' access to the best video experiences wherever and however they choose.

HEVC Advance, an independent licensing administrator, has announced that it has eliminated "subscription" and "title-by-title" content distribution from the HEVC Advance Patent License in an effort to further accelerate HEVC adoption and support streaming, cable, over-the-air broadcast, and

satellite distributors to bring the best video experience to consumers. With this announcement, HEVC Advance will no longer license nor seek royalty fees for non-physical HEVC content distribution including Internet streaming, cable, over-the-air broadcast, and satellite.

HEVC Advance has further (i) expanded its discounts for Region 1 Lower-Priced Connected Home and Other Devices Category to include sales up to \$80 per unit, (ii) reduced its combined \$45MM Device and Content Distribution Enterprise caps to a single Enterprise cap of \$40MM, and (iii) expanded its Trademark Program discounts to include physical media. Physical content distribution (i.e., Blu-ray Discs and other types of physical media) and devices will continue to be licensed. Details and an updated Royalty Chart can be found at <https://www.hevcadvance.com>.

(HEVC Advance)

HbbTV Association Publishes New Version of Core Specification to Support HDR, HFR and NGA



The HbbTV Association has announced the immediate availability of HbbTV 2.0.2. This update of the second version of the core HbbTV specification enables HbbTV applications to benefit from new "Ultra High Definition" video and audio technologies such as High Dynamic Range, High Frame Rate and Next-Generation Audio – delivered as streaming services using, e.g., MPEG-DASH. More specifically, the new release brings the following enhancements to HbbTV content:

- High Dynamic Range (HDR), which significantly increases the contrast ratio in video content, producing crisper and livelier video. The specification supports both Hybrid Log Gamma (HLG) and Perceptual Quantizer (PQ) coding.
- High Frame Rate (HFR), which increases the current 50/60 frames per second to 100/120 fps. HFR offers sharper images of moving objects. This is especially useful in fast-moving sports content.
- Next Generation Audio (NGA) technologies, which support object- or scene-based audio for a much more immersive audio experience. The specification supports both AC-4 and MPEG-H.

(HbbTV)

Equipment Trends

Live Production Switcher

Sony introduces XVS-9000, a flagship live production switcher enhancing the XVS series offering

Expansion of the XVS Series will also bring new capabilities of IP and 12G-SDI in 4K



Sony has announced its new live production switcher, the XVS-9000, designed to address the demands of advanced 4K and HD productions in the rise of High Dynamic Range (HDR) content. The XVS-9000 offers up to 80 inputs and 40 outputs in 4K and up to 160 inputs and 80 outputs in HD1, adopting the latest interfaces for both IP (SMPTE ST 2110) and 12G-SDI in 4K as well as hybrid system of both, for large sporting and entertainment events.

Sony continues to deliver efficient and flexible workflows through its IP live production system and has reinforced IP Live interoperability to support two key industry standards – SMPTE ST 2110 media transport over IP and AMWA NMOS Device Discovery. A core part of Sony's strategy is its commitment to deliver fully interoperable solutions that are ready to implement. Sony will also now offer new 12G-SDI interfaces to provide greater choice to its customers.

The XVS-9000 offers flexibility and operability when handling live 4K video sources, featuring a larger capacity processor with evolved signal processing technology. It also inherits the functionality and operability well-received across current XVS series, including the well-known operation through the ICP-X7000 Panel of a modular style design, with OLED display.

The XVS-9000 is planned to be available in October 2018. (Sony)

ST 2110 Generation and Analysis

Tektronix, Inc. has announced that its PRISM media analysis solution now includes support for the recently published SMPTE ST 2110 suite of standards (-20, -30, -40, -21) for professional media over managed IP networks. In addition, Tektronix introduced new, low cost field-upgradable signal

generation capabilities for PRISM that will give customers more confidence when testing IP and 12G-SDI for hybrid/SDI networks.

With the publication of the ST 2110 standard, the direction for the broadcast industry has been set for the transition from SDI to IP infrastructure. However, broadcast engineers and IT professionals face the challenge of managing complex hybrid SDI and IP environments during the transition period. With its ability to connect to any broadcast signal in a facility and new ST 2110 signal generation capabilities, PRISM provides the comprehensive measurement, network analysis and troubleshooting solution needed for a smooth transition to the full IP-based infrastructure and workflows of the future.



A major challenge when commissioning or debugging issues in a new network is figuring out where connectivity errors or other issues begin. One of the most effective methods of finding these errors is to inject known good signals into the network to check signal paths and system redundancy. The new MP-GEN option module for PRISM does just that by providing ST 2110-20, -30 and ST 2022-7 test patterns for use on IP networks and on 12G-SDI for hybrid/SDI networks.

(Tektronix)

Media Transport Platform

Net Insight has announced the launch of its next generation media transport platform, Nimbra 1060, enabling terabit network speeds for an all-IP media future.

Nimbra 1060 is unique in that it brings IP-based media services across national and global media networks easily, without the complex traffic engineering typically associated with high-quality media transport.



The exponential increase in demand for higher quality video content such as Ultra HD/4K, HDR (High Dynamic Range), HFR (High Frame Rate), VR and 360 together with changing production workflows and the shift to IP technologies, such as the new SMPTE 2110 standard, means future media networks need to do more. To meet these new demands, they need to provide broadcasters with more capacity, be more flexible and support new technologies, all with guaranteed service quality. Nimbra 1060 is designed specifically to meet these new requirements. In addition to providing the industry's highest capacity density, it is built around one common hardware architecture to enable flexible deployment of media functions anywhere in the network and a datacenter building practice to support new cloud-oriented sites and locations.

On top of this the Nimbra 1060 retains all the characteristics from existing Nimbra MSRs in an all-IP world. Service providers and network operators get a carrier grade platform, with assured service quality and service agility guaranteed at any level of network utilization. With this combination of assurance and agility at any utilization they can always use all available network capacity without ever sacrificing quality.

Nimbra 1060 provides a unique combination of terabit capacity networking for IP-based media services such as SMPTE 2110, guaranteed service quality for the most demanding live media events and agility for customer-provisioned and automated real-time service provisioning. And it does so while being very easy to manage and operate. The Nimbra 1060 is available for commercial deployments during the second quarter 2018.

(Net Insight)

Monitor Featuring Thunderbolt 3 Connectivity

CJ791 QLED Monitor featuring Thunderbolt 3 connectivity Streamlines Performance and Enhances Content Presentation for Entertainment and Professional Users

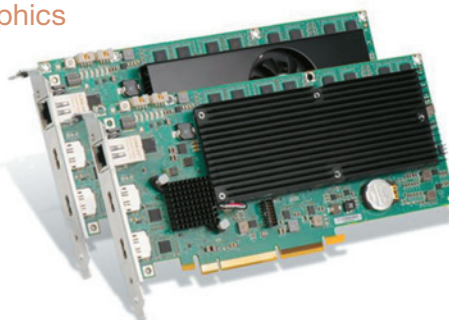


Samsung Electronics Canada expanded the connectivity and performance capabilities of its signature curved display line-up with the debut of its new CJ791 monitor, the first curved monitor to feature Intel Thunderbolt 3 connectivity. Designed for entertainment and business audiences, the 34-inch CJ791 model aligns single-source power and processing speed with an exceptional picture quality for a comfortable and productive user experience.

Through a single Thunderbolt 3 cable, CJ791 users can link and dock their monitor and laptop without extensive wiring. The Thunderbolt 3 connection provides processing speed of up to 40 Gigabits per second (Gbps) – a rate nearly four times faster than current USB alternatives – allowing users to enjoy connectivity across a full ecosystem of docks, displays and peripheral devices including iOS laptops, USB type-C laptops, and other desktop accessories like storage drives or external graphics cards. The Thunderbolt 3 interface also enables the CJ791 to provide up to 85 watts (W) of laptop charging power.

(Samsung)

DisplayPort 1.2 Capture Cards for 4K60 Video and Graphics



Matrox® Graphics Inc. added to its award-winning video wall portfolio with the Matrox Mura IPX 4K DisplayPort capture and IP encode/decode cards. The new dual DisplayPort™ 1.2 capture boards feature 4K60 full colour support, providing systems integrators and OEMs the ability to seamlessly capture, encode, stream, record, and decode demanding 4K60 content—including fast-moving video content and high-frequency desktop graphics and text. These new Mura IPX boards will make their debut at Integrated Systems Europe 2018 (Matrox stand #11-D120), driving a variety of networked scenarios for today's most popular video wall applications.

Available in passive and active cooling options, the latest Mura IPX cards feature two full-size DisplayPort 1.2 connectors to natively capture 4K60 baseband sources, while the network connector enables the encoding and decoding of up to two 4Kp60, four 4Kp30, eight 1080p60, sixteen 1080p30, or exponentially more SD streams. System builders now have an easy option to satisfy the increasing requirements of multi-4K60 content—pixel for pixel—and can continue to mix and match from a wide selection of Matrox video wall cards to construct scalable, high-density, low-footprint video walls.

Matrox Mura IPX 4K DisplayPort capture and IP encode/decode cards come in passive or active cooling versions, and will be available in Q2 2018

(Matrox)

Personalities & Posts



Ms Valery Tan

New ABU Liaison Officer/Technical Liaison Officer for Sichuan Radio and Television

Ms Valery Tan has been appointed the ABU Liaison Officer/Technical Liaison Officer for Sichuan Radio and Television. After graduation from the Communication and Journalism School in Wuhan University in China with a bachelor's degree, Valery first worked as a social news reporter in Hunan Television, then as editor for a daily international news programme. She then worked at Sichuan Radio and Television for the well-known Sichuan TV Festival (SCTVF). As Head of International Cooperation at the SCTVF office, Valery has wide experience in awards competition, conference organising and moderating.



Dr Amal Punchihewa

has left the ABU after almost five years as Director ABU Technology & Innovation

Dr Punchihewa joined the ABU in 2013 from Massey University in New Zealand, where he was a Senior Lecturer. He was previously Head of Engineering at Sri Lanka's national TV network, SLRC, and has more than 30 years' experience in ICT and broadcasting.

We thank Dr Amal for his contributions and wish him all the best.



Magli Alias

Retires as Deputy Director of RTM

Magli Alias retired on 1 June as Radio Television Malaysia's Deputy Director of Network & Transmission in the Multichannel Section of the Engineering Division.

Mr Magli was with RTM for 31 years and held various positions in its Engineering Division. He was also closely involved in ABU activities. He was a member of the ABU Technical Bureau and represented RTM as a speaker at the ABU Digital Broadcasting Symposium for many years.

Mr Magli has been involved in digital TV since mid-1997 and was Chairman of the Working Party that proposed the DTT Standards recommendation for the country's adoption. Since then he has been actively involved in digital TV study and planning.

He was responsible for the pilot digital TV project that began in 2007, deploying the DVB-T standards and MHP middleware. He has been actively involved with the Malaysian Communications and Multimedia Commission and the Malaysian Technical Standards Forum, helping draft standards and specifications. He has also been attending the ASEAN Digital Broadcasting Meeting group since 2008.

We thank Mr Magli for his strong support for the ABU and its activities, and wish him every success in the future.



Jamel Bin Seman

Appointment New Technical Bureau Member

Radio Televisyen Malaysia (RTM) has appointed Mr Jamel Bin Seman, Director of Broadcast Centre and Multichannel Network Control, as its representative on the ABU Technical Bureau.

He succeeds Mr Magli Alias.

Mr Jamel has worked at RTM since 1985. He started as Engineer-in-Charge of Sri Aman Broadcasting Station in Sarawak, looking after medium wave transmitting station and radio studios.

He later worked in the development division, eventually becoming Deputy Director RTM Sarawak before being transferred to Kuala Lumpur.

We welcome Mr Jamel to the ABU Technical Bureau.

November 2017, Chengdu, China



November 2017, Chengdu, China



November 2017, Chengdu, China



November 2017, Chengdu, China



ABU ENGINEERING AWARDS 2018

November 2017, Chengdu, China



October – 1 November 2017, Chengdu, China



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 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 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 2018 – Call for Nominations

30 June 2018 – Deadline

July 2018 – Judging

1 October 2018 – Announcement of Winners ABU Technical Committee Meeting Ashgabat, Turkmenistan

THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT. PETER F. DRUCKER



Why are we watching the global Television shipment data ?

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