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**ABU Digital Broadcasting Symposium 2015:
Full Report Inside**

**TECHNICAL
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ABU Digital Broadcasting Symposium 2015: Full Report Inside



Asia-Pacific Broadcasting Union

TECHNICAL REVIEW

From the Editor's Desk



As usual this, first quarter, edition of the Technical review is dedicated to reporting the Digital Broadcasting Symposium (DBS) concluded in March 2015.

Over-the-air broadcasting is increasingly threatened by a lack of frequencies available to offer new and future services, such as 4K. The ABU, together with other partners, is making efforts to secure access to broadcast spectrum to maintain plurality and access to information. Once again, DBS-2015 dedicated a session to spectrum issues, followed by a session debating the need for spectrum in broadcasting.

The 2015 ABU Digital Broadcasting Symposium explored all the exciting prospects of high dynamic range, UHDTV and cloud technologies, for the broadcasting industry to move forward with new services, especially in the converging world. A collection of photos and articles related to a number of the sessions is also included in this edition of Technical Review. Seventy-three speakers presented in eleven conference sessions and thirteen workshop sessions over four days. A total of 954 participants attended the event, including 600 conference delegates. Fifty five exhibitors exhibited their products and services and reported that they were pleased with the interactions with visitors to their booths.

This issue also carries two articles; one on the live terrestrial broadcasting of UHDTV-1 (4K) sports events and the other on OTT for all media stakeholders.



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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Terrestrial 4K UHD Live Broadcasting of Sports Events

by Injoon Cho, Byungsun Kim, Sangjin Hahm, Sanghun Kim, Sungho Jeon

KBS (Korean Broadcasting System), Korea

abstract

KBS (Korean Broadcasting System) has carried out 4K terrestrial live broadcasting of three big sports events in 2014, the KBL (Korean Basketball League) finals, the 2014 FIFA World Cup, and the 2014 Incheon Asian Games. 4K UHD live coverage of the KBL finals was the world's first terrestrial 4K live broadcasting. This article covers from on-location live production of sports events, SFN (Single Frequency Network) transmission, as well as experimental IP transmission of uncompressed 4K video via KREONET, a national R&D network run by KISTI (Korea Institute of Science and Technology Information).

Introduction

KBS (Korean Broadcasting System) has been steadily working on bringing 4K UHD to terrestrial TV channels since it succeeded in the world's first terrestrial 4K UHD experimental broadcasting in 2012 [1][2]. During the first two years of our experiments, 2012 and 2013, our focus was set on building and enhancing systems for 4K post-production, HEVC encoding [3], and DVB-T2 transmission [4]. In 2014, on the foundation hardened during the first two years of our terrestrial 4K UHD experimental broadcasting, 2012 and 2013, we set out to raise the bar with terrestrial 4K live coverage of big sports events.

These are the three sports events and their technological significance.

- Game 3 of the KBL (Korean Basketball League) finals: the world's first terrestrial 4K live broadcasting.
- Three matches of the 2014 FIFA World Cup: terrestrial 4K live broadcasting via satellite.
- Men and women's volleyball of the 2014 Incheon Asian Games: full-scale 4K terrestrial live broadcasting.

Game 3 of the KBL Finals

On 5th of Apr. 2014, KBS succeeded in the world's first terrestrial 4K live broadcast. The target of our 4K live broadcast was Game 3 of the KBL finals in Ulsan located in southeastern part of Korea.

Outside Broadcast Production

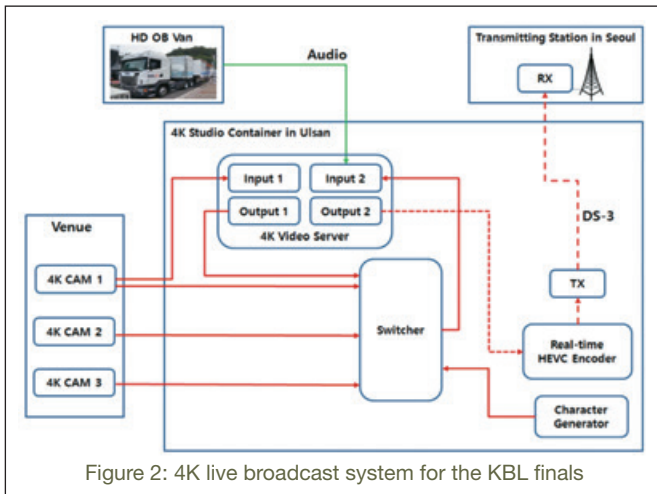
We set up a container for 4K video production studio near the venue (Figure 1) and drew audio signal from our HD OB van which was being used for HD live broadcasting of the



Figure 1: Pictures of the outside and inside of the 4K studio container near the venue

game. Figure 2 is the diagram of 4K broadcast system used. Three 4K cameras were taken and one of those cameras was connected to a 4K video server for slow-motion video. A character generator was also used for inserting sports graphics and station logo. The switcher's video output was combined with the audio in the 4K video server and the combined signal was fed into a 4K HEVC real-time encoder. 4K video was encoded in HEVC at 34Mbps. Audio data format was MPEG-4 AAC-LC at 144Kbps. 4K video and

audio were multiplexed into 35Mbps MPEG-2 TS (Transport Stream). The MPEG-2 TS was delivered to KBS' Nam-San transmission station via DS-3 circuit and then broadcast inside Seoul using DVB-T2 transmission. Figure 3 is a screenshot of our 4K live broadcast of the game.



Public Viewing Event

Alongside terrestrial 4K live broadcasting, a public viewing event was also held in Seoul station, the largest and the most crowded railway station in Korea. Figure 4 is the spot picture of the event. 4K UHD TVs in Figure 4 had built-in DVB-T2 tuner and HEVC decoder. Therefore, they were able to receive 4K terrestrial signal directly in the station and decode 4K video itself.



The 2014 FIFA World Cup

A big sports event like the FIFA World Cup is a good material to attract public attention and in the 2014 FIFA World Cup, a total of three games, Colombia vs. Uruguay (round of 16), France vs. Germany (the quarterfinal), and Germany vs. Argentina (the final), were shot in 4K UHD. In an attempt to give wider publicity to terrestrial 4K UHD broadcasting, we broadcast those three World Cup matches live in terrestrial 4K UHD via satellite reception.

Satellite Reception and 4K Production

4K live feed from Brazil via AsiaSat5 (a communications satellite) was divided in four HD signals and four IRDs (Integrated Receiver and Decoder) were used to reconstruct 4K video out of those four HD signals. The most difficult part of getting perfect and faultless 4K video was synchronization of the IRDs. Against to our expectations, IRDs' alert lamps were often turned on and frame locking was momentarily broken. We tried in-house tri-level sync and sync obtained from an IRD to firmly synchronize all four IRDs. After tedious trial and error, our conclusion was to use in-house tri-level sync in combination with FS (Frame Synchronizer) to synchronize in-house tri-level sync with sync from IRD, and we had no problem. Our 4K live coverage of the FIFA World Cup matches didn't end at simply converting satellite signal into terrestrial one. We followed KBS' standard sports broadcasting format. To raise degree of completion of our 4K live broadcast, we set up a temporary 4K studio (Figure 5) and added Korean-language commentary, Korean-language sports graphics, and unique opening and closing graphics to our 4K live broadcasting of the FIFA World Cup.



Figure 6 is the system diagram of our 4K live broadcast. 4K video was encoded in HEVC at 32Mbps. Audio data format was MPEG-4 AAC-LC at 128Kbps. Video and audio were multiplexed into 34Mbps MPEG-2 TS. The MPEG-2 TS was delivered to Nam-San transmitting station and Gwan-Ak transmitting station. Then it was broadcast using DVB-T2 transmission. An important matter which challenges attention in this 4K live broadcasting was the use of SFN technology between the two transmitting stations. A detailed explanation of our SFN technology will be given later. Figure 7 is a screenshot of our 4K live broadcast of the final.

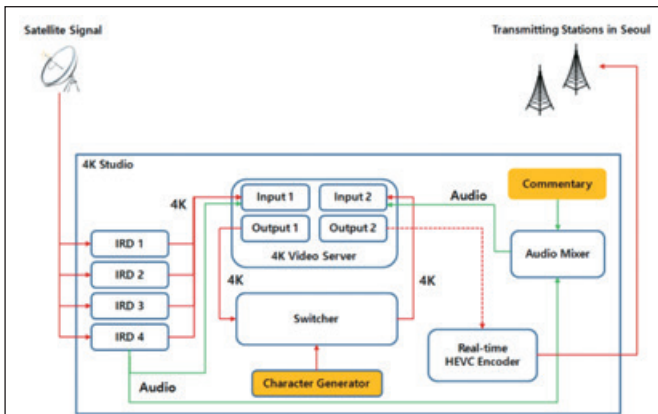


Figure 6: 4K live Broadcast System for the 2014 FIFA World Cup



Figure 7: 4K Live Broadcast of the 2014 FIFA World Cup's Final

Public Viewing Event

In April's KBL finals, our 4K public viewing event was confined to Seoul only. But World Cup has always been an object of nationwide attention and is a good opportunity for us to effectively imprint the superiority of 4K video on local people's mind. We added two provinces, Daejeon and Jeju island, in our 2014 FIFA World Cup's 4K UHDTV public viewing location list. Daejeon is fifth largest metropolis of Korea and about 167 kilometers away from Seoul. Jeju island is about 450 kilometers away from Seoul to the south and the largest island in Korea. To hold 4K live public viewing events in those provinces, we had discussions with KISTI to use their KREONET [7], a national R&D network of Korea. Figure 8 shows how we had public viewing events in Daejeon and Jeju island. MPEG-2 TS, the real-time HEVC encoder's output, was sent to KBS Daejeon and Jeju Technopark over KREONET. In KBS Daejeon, the MPEG-2 TS over IP passed through IP to ASI converter and was converted to ASI signal. The ASI signal was modulated onto DVB-T2 signal and then fed into a 4K UHDTV in the

main lobby of KBS Daejeon. In Jeju island, the MPEG-2 TS over IP was first sent to Jeju Technopark, a non-profit organization for developing competitive future industries, then converted into ASI signal, fed into DVB-T2 transmitter, and broadcast via terrestrial network of Jeju island. A 4K UHDTV in KBS Jeju's main lobby received the DVB-T2 signal transmitted from Jeju Technopark. In this way, we were able to show spectacular 4K live broadcast of the 2014 FIFA World Cup to the people of the two provinces. Figure 9 is pictures of public viewing in Seoul station, KBS Jeju, and KBS Daejeon.

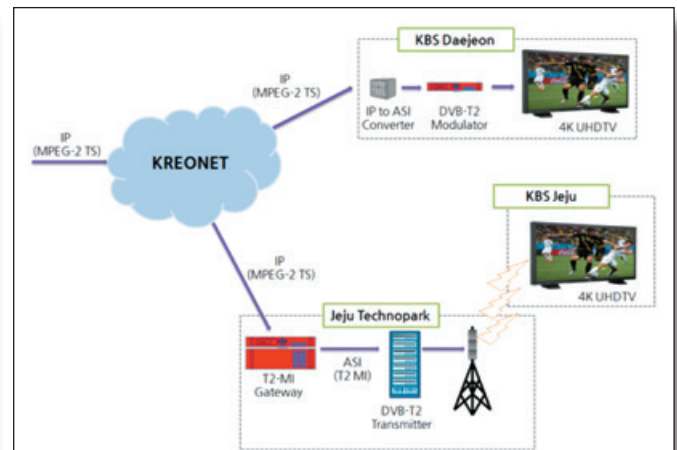


Figure 8: 4K data flow for public viewing in Daejeon and Jeju Island



Figure 9: 4K public viewing in (a) Seoul station, (b) KBS Daejeon, and (c) KBS Jeju

Volleyball at the 2014 Incheon Asian Games

Terrestrial broadcasters of Korea, KBS, MBC, and SBS, have been cooperating in experimental 4K broadcasting since April, 2014. We the terrestrial broadcasters of Korea agreed to make the culmination of our cooperation by 4K live coverage of 2014 Incheon Asian Games. Due to budgetary limitations and manpower shortages, many events couldn't be covered in 4K live. Having gone through careful discussions, each broadcaster picked sports events which suit its best interest. KBS took men and women's

volleyball. MBC chose track events, opening and closing ceremony. SBS picked beach volleyball. The period of KBS' 4K live production was the longest, two weeks, among the three broadcasters'. A noteworthy thing in Incheon Asian Games' terrestrial 4K live broadcasting was that there were no public viewing events. The reason is simple. Now 4K UHDTVs with built-in DVB-T2 tuner and HEVC decoder were already in market in Korea and anybody who lives in capital area could watch terrestrial 4K live of Incheon Asian Games.

Outside Broadcast Production

Unlike our April's 4K live of the KBL final in which only three 4K cameras were taken, seven 4K cameras were mobilized to do full-scale 4K live broadcast. Figure 10 shows the placement of 4K cameras used. Among those seven cameras, three cameras' output could be used for slow-motion video. Especially, one of the three cameras was a high speed (360 fps) 4K camera and needed no video server.

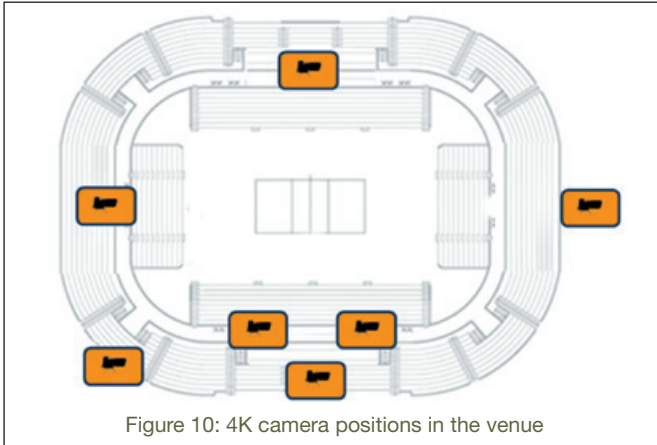


Figure 10: 4K camera positions in the venue

Full-scale 4K live means multiple equipments for production, and those equipments take a plenty of room. Figure 11 is the container we installed near the venue for 4K production and its inside.



Figure 11: 4K studio container and its inside

Figure 12 is the system diagram of the 4K live broadcasting. As shown in the diagram, we used two real-time 4K 60p HEVC encoders, one for main encoder and the other for backup. Between the two, the main real-time 4K 60p HEVC encoder was the one jointly developed by KBS and Thin Multimedia Co. Ltd. 4K video was encoded in HEVC at 30Mbps. Audio data format was MPEG-4 AAC-LC at 128Kbps. Video and audio were multiplexed into 31.5Mbps MPEG-2 TS. The MPEG-2 TS was delivered to Nam-San transmitting station and Gwan-Ak transmitting station. Then it was broadcast using DVB-T2 SFN transmission. Figure 13 is a screenshot of our 4K live broadcast of volleyball at the 2014 Incheon Asian Games.

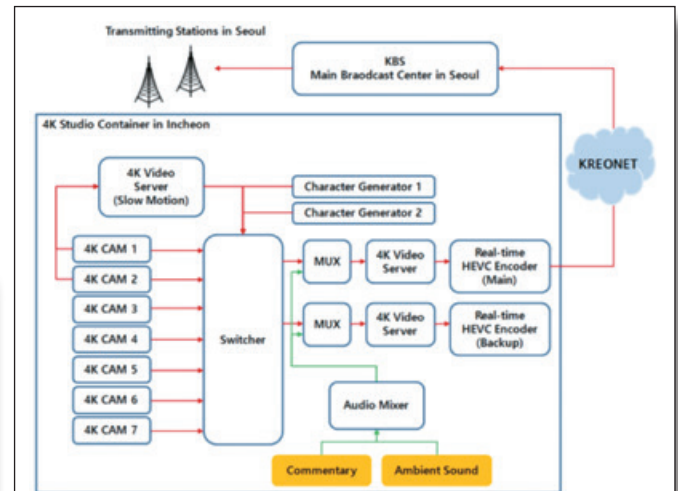


Figure 12: 4K live broadcast system for volleyball at the 2014 Incheon Asian Games



Figure 13: 4K live broadcast of volleyball at the 2014 Incheon Asian Games

Data Distribution and Terrestrial Transmission

To deliver MPEG-2 TS from our 4K studio container in Incheon to Nam-San and Gwan-Ak transmitting stations. We contacted KISTI to use KREONET and induced their cooperation. But there was no direct route from the 4K production spot in Incheon to our transmitting stations in Seoul. Therefore we had to take the route described in Figure 14. 4K data was first passed to Inha Univ. in Incheon via 10G network and then, sent over KREONET from Inha Univ. to KISTI's Seoul branch. Lastly, it was delivered to main broadcasting center of KBS in Seoul and sent to Nam-San and Gwan-Ak transmitting station via local network. SFN technology was used between Nam-San and Gwan-Ak transmitting stations.

Apart from the compressed 4K data, uncompressed 4K data was also delivered together to check how big amount of data could be sent over KREONET stably. But the frame rate of 4K video had to be reduced from 60p to 30p because data amount of uncompressed 4K 4:2:2 60p video almost reaches transmission capacity of KREONET. The uncompressed video was sent to KBS' main broadcast center in Seoul and KISTI's main laboratory in Daejeon. The uncompressed 4K 30p data transmission experiment was successful.

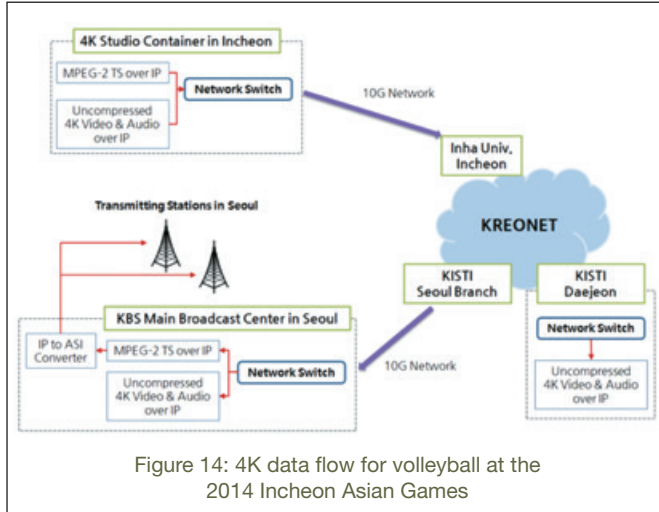


Figure 14: 4K data flow for volleyball at the 2014 Incheon Asian Games

SFN (Single Frequency Network) for 4K Experimental Broadcasting

The DVB-T2 system being used for the terrestrial transmission of 4K UHD TV in Korea is based on OFDM and it can support SFN [4]. 16K and 32K FFT options of DVB-T2 give improved SFN performance compared with the DVB-T. DVB-T2 extends guard interval range to allow reduced overhead and additional flexibility. Guard interval absorbs inter-symbol interference due to echoes.

SFN transmission network was built for this 4K UHD TV live experimental broadcasting. SFN means a network of synchronized transmitting stations radiating identical signals in the same RF channel. Every transmitter and repeater of the transmission network uses the same frequency in SFN. Therefore, SFN provides a reduction of the number of the required frequency and an increase of the received electric field strength by the network gain. The possibility of valid reception and its performance can be improved by the space diversity in the SFN.

The network deployment of MFN (Multiple Frequency Network) is a process of frequency planning, whereas the network deployment of SFN is a process of time synchronization planning. In order to implement SFN, the broadcast network should be carefully designed and managed so that every transmitter should radiate the same data at the same time and at the same frequency. In general, the procedure of SFN deployment consists of three steps such as the determination of transmission parameters, synchronization of transmitters, and validation of SFN implementation [5][6].

STEP 1: Determination of transmission parameters

- Determine a guard interval duration in consideration of the distance between the transmitters and the size of the service area.
- Determine the appropriate FFT mode according to the objective of the broadcast network such as fixed/portable/mobile [5].
- Determine a pilot pattern in consideration of the selected guard interval and FFT mode, the required reception performance, and capacity overhead.
- Determine a modulation type and channel coding code rate in consideration of transmission capacity and receiving performance characteristics.

STEP 2: Synchronization of transmitters

- T2 gateway located in the master control room of the broadcasting station and all transmitters use the same reference clock of 10MHz and 1pps generated with reference to a GPS.
- Be synchronous in time: The network delay difference from the master control room to the respective transmitter is managed by Dynamic Delay compensation using the time stamps set in the T2 gateway [6]. The processing delay difference of the respective transmitter is managed by Static Delay compensation to set directly on each transmitter.
- Be nominally coherent in frequency: Set all transmitters to synchronize their system clocks with the GPS reference signal.
- Have identical multiplex content: Set all transmitters to generate the identical transmission signal by using the same data and the same signaling information from the same T2 gateway.

STEP 3: Validation of SFN implementation

- Measure the channel impulse response at the point where the analyzer receives signals concurrently from a plurality of the transmitters.
- Check all peaks are located within the guard interval in the channel impulse response and the interval of the peaks matches the distance difference from the reception point to the transmitting stations.
- Optimize SFN performance by additionally adjusting the Transmitter Offset Delay, if necessary.

The SFN configuration for 4K UHD TV live experimental broadcasting is shown in Figure 15, and its transmission parameters in Table 1, respectively.

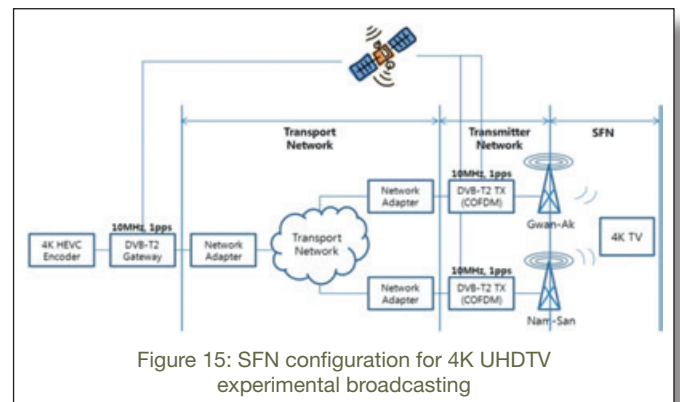


Figure 15: SFN configuration for 4K UHD TV experimental broadcasting

Table 1: Transmission Parameters

Site	Gwan-Ak	Nam-San
TX Power	5KW	600W
Antenna Configuration	0° 90° 180° 270° [4:4:4:4]	0° 90° 180° 270° [2:2:2:2]
Antenna Gain	Gain : 10.81dB	Gain : 7.8dB
Specification	DVB-T2	
Frequency	713MHz (CH54)	
Channel Bandwidth	6MHz	
FFT Size	32K Extended	
Guard Interval	1/16 (298μs)	
Pilot Pattern	PP4	
PLP	256QAM	
Constellation Rotation	On	
PLP Code Rate	5/6	
Data Rate	34.7Mbps	
C/N Gauss Raw	22dB	

The validation results of SFN implementation are shown in Figure 16. ETL TV Analyzer with DVB-T2 option of Rohde-Schwarz was used to measure DVB-T2 RF signal and SFN configuration. Figure 16(a) shows geographical locations of two transmitting stations and a receiving point. Channel Impulse Response measured at the receiving point is shown in Figure 16(b) and (c), and it can be seen that there are a number of multi-path signals, but they are located within a guard interval. In addition, the interval between two peaks measured by the marker is about 12.3μs. It coincides with the time corresponding to the distance

difference of 3.7km from the receiving point to Gwan-Ak and to Nam-San, respectively. Channel spectral information and constellation diagram is shown in Figure 16(d) and (e). From these results, it can be concluded that SFN is constructed precisely.

Conclusion

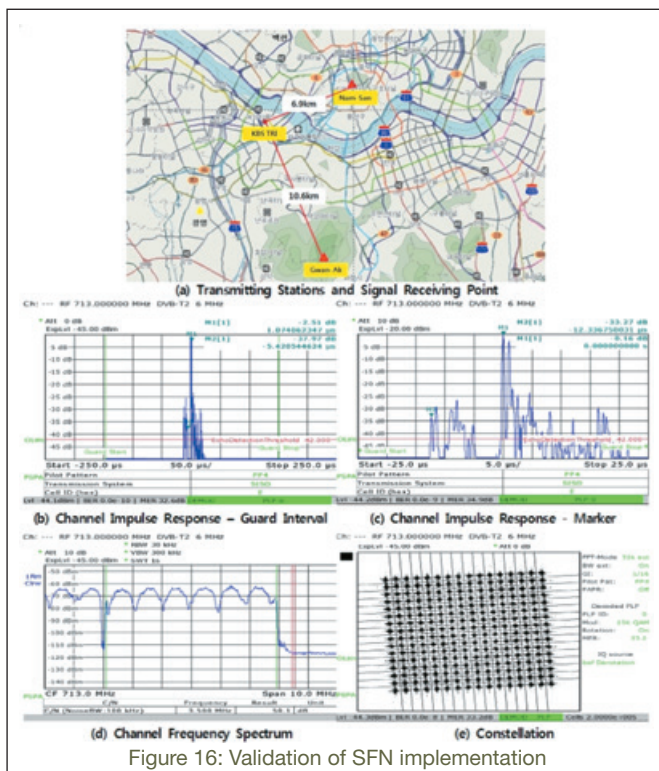
The skepticism about terrestrial 4K UHD broadcasting has been around since we first started our experimental broadcasting. But we have stood against the skepticism and rather, elevated the level of completeness of our 4K experimental broadcasting throughout 2014's experiments. Anyone who once watched our 4K live coverage could not deny 4K UHD's superiority over HD. Our successful 4K live broadcasting is expected to give an impulsion to moving from HD era to 4K UHD era. KBS, as the biggest public broadcaster of Korea obligated to dedicate itself to betterment of our society, would continue strenuous efforts to become the spearhead of the future of broadcasting, UHDTV.

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ABU TECHNOLOGY CALENDAR OF EVENTS

Date	Event	Venue
5-6 May	ABU Technical Bureau Mid-Year Meeting	Bali
11-16 May	Network and Multimedia Training for Broadcast Engineering and IT	Myanmar
25-28 May	Asia Media Summit 2015	Kuala Lumpur
2-5 June	BroadcastAsia 2015	Singapore
9 June	WBU Technical Committee Meeting	Krakow, Poland
11-12 June	EBU Technical Assembly 2015	Krakow, Poland
23-26 June	In-country Training	Sri Lanka
July	WRC-15 Preparatory Meeting - APT	Korea
23-24 July	ABU Central Asia Media Forum 2015	Uzbekistan
27-31 July	ABU-ASBU-WorldDMB DAB+ Technology Workshop	Kuala Lumpur
25-27 Aug	Pacific Media Partnership Conference 2015	Apia, Samoa

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- Creating new revenue opportunities
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OTT for All Media Stakeholders

by **Dr Amal Punchihewa**

Director of ABU Technology

abstract

Over the years, Over-the-top (OTT) has evolved from delivery of video on demand (VOD) content to users upon request, to a broader media content provider/service, while traditional broadcasting mechanisms such as terrestrial, cable and satellite were used mainly to deliver linear radio and video contents to many users at the same time. Adding live channels and advanced “place and time shifting” capabilities of live TV to an OTT solution is a significant step towards a comprehensive OTT radio or television service. The new Hybrid radio and television experience allows the user to have a single source for all types of media content to be accessed on most of the devices.

Broadband

‘Broadband’ and ‘Internet’ are two common words that appear when discussing OTT. Though it is not critical to have a clear definition of broadband or internet, knowing that the term broadband does not refer to either a certain speed or a specific service is useful. Despite its worldwide growth and promotion by policymakers, network operators, content providers and other stakeholders, broadband does not have a single, standardised definition. The term “broadband” may refer to multiple aspects of the network and services, including:

1. the infrastructure or “pipes” used to deliver services to users
2. high-speed access to the Internet
3. the services and applications available via broadband networks, such as Internet protocol television (IPTV) and voice services that may be bundled in a “triple play” package with broadband Internet access.

Further, many countries have established definitions of broadband based on speed, typically in Mbit/s (Mbps) or kilobits per second (kbps), or based on the types of services and applications that can be used over a broadband network (i.e., functionality). Due to each country’s unique needs and history, including economic, geographic and regulatory factors, definitions of broadband vary widely.

Many people associate broadband with a particular speed of transmission or a certain set of services, such as digital subscriber loop (DSL) or wireless local area networks (wLANs). However, since broadband technologies are constantly evolving, the definition of broadband also

continues to change. In current context, the term broadband typically describes recent internet connections that range from 5 times to 2000 times faster than earlier internet dial-up technologies. As previously mentioned, the term broadband does not refer to either a certain speed or a specific service. Broadband combines connection capacity (bandwidth) and speed. The ITU Recommendation I.113 of the ITU Standardisation Sector defines broadband as a “transmission capacity that is faster than primary rate Integrated Services Digital Network (ISDN) at 1.5 or 2.0 Megabits per second (Mbits)¹” [ITU, 2003].

Broadband has changed user habits, for example, by encouraging users to be connected always, while using the PC, notebook, tablet or mobile phone as a multimedia entertainment device. The most popular consumer broadband applications today are social media applications, web surfing, online games, file sharing and access to audio and video content. With the advent of broadband and its faster, dedicated connections, ITU anticipates further development of internet services, in the areas of web surfing, instant messaging, file sharing, e-commerce and e-mail in addition to multimedia content delivery. In addition broadband has opened the path to the development of interactive applications, virtual reality and other high-quality, bandwidth-hungry digital services.

The Internet

Broadcasting delivery platforms have evolved over the years from terrestrial, cable, satellite to virtual pipes using Internet Protocol-IP. The description of broadband as a high-speed access to the Internet differentiates that broadband

¹ <https://www.itu.int/osg/spu/publications/birthofbroadband/faq.html>

predominantly refers to the pipe and the Internet, which is a network of networks. The Internet being a network of networks, no single entity manages the entire network of the Internet. The internet works on the principle that the delivery is on the basis of 'best effort'. Hence, without having any pre-conditions and agreements data delivery over the Internet is not consistent or in technical terms service levels are not guaranteed. Delivery performance conditions are agreed among parties to assure minimum level of service quality known as Quality of Service or QoS. When dealing with audio and video which are to be delivered from one end to the other, additional processing such as encoding and decoding are involved (also commonly known as compression/decompression). These add impairments to the content. Hence, in end-to-end media delivery has to address the new challenge of assuring quality as experienced by the user that is known as Quality of Experience (QoE).

Over-The-Top (OTT)

Over the top services can be described as services delivered over un-managed networks. They are often referred to as "over-the-top" because these services ride on top of an existing service that the customer already possesses and OTT does not require any business or technology affiliations with the customer's network operator. In legacy broadcast services, the broadcaster assured the quality of content and the minimum signal strength at all receive-points (at least majority over 95%). ITU-R standards define the minimum signal strengths that all broadcasters agreed to provide in their services within their countries or service regions. Most of the public broadcasters used to deliver radio and television content that meet those standards. They can be considered as the gold standard for legacy broadcasting.

Due to the nature of the protocols that are used to deliver audio and video content, service suffer from many new impairments. Among them are latency, jitter and packet loss. When content is compressed heavily to fit a given bandwidth (pipe), compression artefacts will appear at consumption end. The combination of all of those impairments influences the experience that users will undergo. This is what the media community attempts to measure as QoE, preferably by using objective techniques and metrics.

Despite the fierce competition, new OTT service providers are entering the media market. Technically, the OTT market has no boundaries as the Internet is global. The OTT service provider has the control over the market spread, possibly based on rights issues. Access location can be identified using geo-codes to honour copyright restrictions. The legacy broadcaster could also offer OTT services as catch-up, VOD and premium services to its existing customers. Though market research firms claim soaring revenue from OTT, still the profitability is not to the same scale. The studies of EBU and OFCOM in UK have revealed that linear television is still the dominant form of media consumption. Hence, legacy broadcasters are still in the box seat with ability to offer OTT as well as IBB services as described in the previous technical review.

Challenges in Offering OTT

New entrants to the media market, having a combination of widely available across end-devices, user-friendly interfaces, and access to vast content libraries, together with OTT providers, continue to challenge traditional terrestrial, cable and satellite radio and television content providers and such services will erode the legacy broadcasters' revenue and market share. However, legacy broadcasters should have the much larger libraries of content that they need to produce appealing content. Having devices, interfaces and the Internet are common to all service providers and legacy broadcasters will be in a better position than new entrants if they can offer better content.

However, launching over-the-top TV service is not a trivial enterprise. It is required to have access to appealing content and customer acquisition, thorough preparation of the content, and easy ways to define business rules to manage subscribers with multiple content packages on multiple devices and to deliver a compelling multiscreen experience on all major consumer devices. Although there are many complex and essential elements that require integration, selecting a technology platform that is integrated yet flexible and scalable is a solution that mitigates the potential complexities, risks and time to market. A core feature of such technology is to offer a substantial customer experience that will reward subscribers with a platform complementary to traditional radio and television content consumption methods.

author



Dr Amal Punchihewa
Director of ABU Technology

Dr Amal Punchihewa is the Director of ABU Technology. He possesses nearly 30 years of experience in all three sectors of broadcasting; viz Academia, Research and Industry in senior broadcasting technology and ICT roles, including research and developments, regional capacity building in media and head of engineering of national TV-Sri Lanka (SLRC-Rupavahini), having started his career as a computer engineer.

Amal graduated with Master of Electronics Engineering (Digital Video Signal Processing) from the Technical University of Eindhoven and hold a PhD in image and video compression artefacts. He has published over 100 scholarly articles in reputed journals and conference proceedings. Amal is a Chartered Professional Engineer-CEng, Fellow of IET(UK), Senior Member of IEEE(USA) and Member of IPENZ, New Zealand. He is also a Vice-Chair of WBU-TC (World Broadcasting Union-Technical Committee)

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DIGITAL BROADCAST SYMPOSIUM 2015: Enabling Change Smartly

Report by Jeewa Vengadasalam

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The 2015 ABU Digital Broadcasting Symposium was held from 2-6 March at Hotel Istana, Kuala Lumpur. This symposium, an annual event organised by the ABU Technology, was the eleventh with the theme 'Enabling Change Smartly'. The symposium consisted of four days of workshops and exhibition and a three-day conference.

A full day DVB-T2 workshop focusing on Technologies and Implementation was conducted on 2nd March. On 3rd March, four workshops were conducted by Ericsson, MediaGuru, WASP3D and WorldDMB.

DBS Conference

The three-day conference, having a total of eleven sessions provided a unique opportunity for participants to have access to information on various aspects of broadcasting, ranging from terrestrial to satellite.

Opening Session

The Industry Keynote address entitled 'How Asia Pacific Adoption of DAB+ Helps Drive Innovation for Broadcast Radio Around the World' was delivered by Joan Warner representing the principal sponsor, WorldDMB. She related from her experience that radio is the most trusted of all media and broadcasters should push their services to the discerning public. In tandem with population growth, is the increase in energy consumption and digital broadcasting

can provide the solution as it needs lower power and less space. Radio reception in cars is also an important factor to take into account as time spent in traffic on the roads is substantial. WorldDMB is willing to give advice and help to broadcasters who have the intention of starting Digital Radio transmission and is also planning a think tank for the region.



Ministerial Session

"The ABU Digital Broadcasting Symposium 2015 was officially opened by the Deputy Minister of Communications and Multimedia of Malaysia. Dato' Jailani Johary. He congratulated ABU for organising the symposium and said that his ministry is happy to support and be part of it. The Government's vision, he added, is to provide free-to-air DTT transmission offering new and sophisticated content to 98% of Malaysians by 2017. In his opening remarks, ABU Secretary General, Dr Javad Mottaghi recalled the main task for broadcasters is to deliver content and to reach the public. To do so, spectrum is of vital importance, he said."



Session 1:

Evolving Technologies



Masakazu Iwaki,
NHK-Japan



Dr Hiroshi Shimamoto,
NHK-Japan



Craig Todd,
DOLBY

The first session was chaired by Masakazu Iwaki, NHK-Japan and the panelists were Dr Hiroshi Shimamoto, NHK-Japan; Dr Peter Siebert, DVB Project Office; Femín John, ATEME; Lindsay Cornell, BBC UK; Craig Todd, Dolby and Ruxandra Obreja, DRM Chairman. They looked at the various broadcast technologies evolving over the years and now reaching a mature stage. UHD TV conveys to the viewer the sense of being there, and a sense of reality, as if the viewer were watching a real scene. There are more pixels in the 8K mode with 7,680 x 4,320 pixels, better pixels with a wider colour gamut of 12 bits/pixel are used and faster pixels at 120 frames/sec. The strong sensation of reality is produced by the increase in the Field of View (FOV) to 100° and the higher pixel density of 8K, which results in a pixel structure that is imperceptible, even at close viewing. The high frame rate portrays better and smoother motion while the wider colour gamut allows almost all surface colours to be reproducible. The sound system has been improved with a 22.2 multichannel 3D surround sound system that complements the visual sensation of reality.

Over the past decade, DVB has improved transmission standards from DVB-S, DVB-C and DVB-T to DVB-S2, DVB-C2 and DVB-T2. These developments have kept in line with improvements in ITU and MPEG video coding standards that evolved from MPEG-2 for SDTV, H264/AVC for HDTV now H265/HEVC for UHD TV. The latest development, H265 is able to reduce the bitrate by 50% when compared to H264 whilst maintaining the same picture quality. The next generation of coding standards is expected to materialise around 2023. DVB-S2 was improved but since the change was not significant enough to be classified as revolutionary, the new standard was named DVB-S2X. Tomorrow's receivers will incorporate the H265/HEVC chip, capable of decoding HDTV formats up to 1080P, 60Hz and during Phase-1, the UHD TV formats up to 2160P, 60 Hz. Phase-2 will have more features, including a higher frame rate of 120 Hz, higher dynamic range and an advanced sound system. In the pipeline are the next generation subtitles, specifically for UHD TV. Additionally there will be a common Interface, CI Plus v2.0 and a new Emergency Warning System that wakes up the receiver.

Hybrid Radio is the combination of broadcast and IP where the precise mix depends on the broadcast technology and the broadcaster's requirements. ETSI has published some new standards on RadioDNS that transforms metadata into web addresses, Hybrid Slideshow that allows connected devices to access customised images via IP and Hybrid SPI or Service Programming Information which is the combination of the broadcast EPG and IP Radio EPG into a single XML document. Of significant interest is in the personalisation of radio reception that context and user preferences can bring.

Session 2:

Delivery of Beyond HD Resolution



The Chairman was Dr Peter Siebert, DVB Project Office with the panel comprising Dr Masayuki Sugawara, NHK STRL; Keong-Seop Kim, KBS Korea; Koji Kumano, Sony; Oliver Linow, Deutsche Welle and Tommy Ng, AsiaSat.

UHDTV offers a wider field of view (FOV) from 300 to 1000 with more pixels and now there is to be further improvement with High Dynamic Range. HDR prevents loss of detail in the dark areas and also reduces highlight compression. Experts have expressed two views on the reasons for the current practice of highlight compression. The first view is that the current DR expression has been based on the limitation of the maximum luminance of CRT display, which is around 100 cd m⁻². The second view is that optimal highlight expression, as the current highlight-compressed DR expression, provides visual comfort. Two solutions have been proposed by either using the 'absolute' luminance approach or 'relative' luminance approach for HDR. The former approach specifies a larger absolute luminance range that requires the Electro Optical Transfer Function (EOTF) to be included as part of the specification but without the need to include the Optical Electro Transfer Function (OETF). The latter approach specifies the signal range for highlights that requires the OETF to be part of the specification as consistency of programme quality is necessary. ITU-R is studying the matter and ABU members are invited to participate in the discussion.

The price of UHDTV receivers has become lower than HDTV sets, and UHDTV can therefore no longer be regarded as a premium service only for privileged. 56% of Korean viewers prefer UHDTV via terrestrial delivery and content is readily available as costs of production have come down over the past few years. Between September and December 2012, Phase-I UHDTV was conducted with the world's first terrestrial 4K 30P on air trial using DVB-T2 256 QAM and HEVC source coding. From May-October 2013, Phase II took place, with 4K 60P again using DVB-T2 and HEVC coding. Phase III ran from May to December 2014, with live broadcasting of sports events including FIFA World Cup. The Korean 4K Roadmap has been drawn up for a period of 20 years. By 2019, 80% coverage is expected by targeting major cities and metropolitan areas. 40% of the programmes will be in UHD and indoor reception will be available. By 2024, nationwide coverage is projected where 90% of the content will be in UHD and mobile reception included. In the year 2025, HDTV will be terminated and preparation for 8K transmission started.

UHDTV brings about many challenges not only for terrestrial broadcaster but also the satellite industry. One of the key

factors is bandwidth limitation of the transponder which has to be overcome by a better transmission technology. The improved DVB-S2X uses 16 APSK and a 5% roll off factor resulting in efficiency improved by almost 40% when compared to DVB-S2 with 8PSK and 20% roll off factor. The combination of DVB-S2X and HEVC source coding allows even more UHD channels to be transmitted.

Session 3:

New Business Models



Chaired by Joan Warner, WorldDMB, the panelists were Dr Les Sabel, Commercial Radio Australia; Peter Bruce, IABM; John Kjellmo, Conax; Sanjay Salil, MediaGuru and Steve Ahern, Ahern Media & Training, Australia.

Interactive radio or Hybrid Radio would be the vision of the future. Content for Hybrid radio can be delivered by broadcast or IP more efficiently compared to streaming which costs both broadcasters and listeners. Not only that, streaming content one-to-one costs more than broadcasting it one-to-many. Another factor that needs to be taken into account is that streaming on mobile is not robust. Hybrid Radio utilises logos that adds visual branding and enabling easier selection of service. There is faster access to online content associated with broadcast delivered content. Advertisement value is enhanced because of the potential for a 'click through' sales model. Hybrid Radio brings in more revenue as it adds links to specific products and services offered by the sponsor. The key business drivers are improvements in branding, value added services, listener loyalty and interactive participation.

The traditional radio/music business model was compared to the streaming music business model. The traditional model identifies a target audience, promotes to them and plays whatever music they like, while mixing it with personalised information and advertising. Transmission is free to the listener and the broadcasters conduct surveys on listener consumption habits using sampling methodology. The broadcasters also pay the musicians a share of the revenue, defray other expenses and keep the profit. The streaming music model identifies a target audience and gives them a free app and some access in return for their personal information and consumption habits. It allows them choose music they like and helps them with music selection if they need it. It advertises to them or let them have ad-free listening if they pay a subscription. The operator also pays the musicians a share of the revenue and defrays other expenses.

When streaming started, there were no ads and music was delivered via a computer. The operators thought they would set up a 'rent the music' business model with subscriptions.

However faulty download system caused buffering and the audience was too small. Only few streaming companies could survive, radio broadcasters thought it was a threat and the record companies could not anticipate its effect on them. Now the scenario has changed with more ads that can be specifically targeted and the music can be delivered both by computer and mobile, resulting in music in your pocket. The subscription business model is only activated by about 10% of users and the main income comes from gathering and using audience data. Marketing data is the big game and is increasingly seen as a 'digital business'. The delivery system has been perfected as the buffering problem has been solved with new technology. There is a large audience and many streaming companies but the threat to radio is not as bad as many people think.

Session 4:

Content in High Definition



The session was chaired by Jack Nadarajah, Radio TV Malaysia and the panelists were Ajeet Khare, Canara Lighting Industries; Ryoong Sang Yoon, Korea Broadcasting Service and Yun Hwan Jeong, ABU.

At present studios worldwide are using hybrid lighting comprising Halogen and CFL (Compact Fluorescent Lamps) which generate excessive heat as well as high power consumption. The heat causes discomfort to the presenters and powerful air conditioning is required. Frequent & costly lamp replacement is needed resulting in high maintenance costs. Furthermore there is a health hazard in the form of Ultra Violet emissions from the lamps.

Future LED Technology has lower power consumption at only 20% as there is no loss due to heat radiation. Lamp lifetime is much longer at 50,000 hours with consistent colour temperature and no UV emissions. Less input power for the LED leads to lower cable ratings and smaller power distribution panels. The physical size of air conditioning plant is reduced by 50% and hence the power is similarly reduced. Separate dimmers and colour gels are not required as RGB versions of LEDs are available to generate the combination of colours needed. The studio is also cooler and more comfortable for the presenters. Although the initial cost of equipping a studio with LED Technology is higher, the yearly savings in reduced maintenance expenses results in higher Return on Investment (ROI). LED Technology represents Green Technology and is eco-friendly because fewer lamps are discarded due to their longer life spans. Furthermore, the Greenhouse effect is minimised and, being mercury free, it is non-toxic.

Session 5:

Spectrum



Kanit Sunchatavirul, NBTC-Thailand Yahya Khaled, ATDI Hj Aisharuddin Nuruddin, MCMC Yushiro Kushiuro, NHK-Japan

Chaired by Kanit Sunchatavirul, the panelists were Kath Brown, WorldDMB; Yahya Khaled, ATDI; Hj Aisharuddin Nuruddin, Malaysian Communication & Multimedia Commission; Yushiro Kushiuro, NHK; Luc Haerberle, Colibrex LS telco and Lindsay Cornell BBC UK/DRM. Radio is the only mobile mass medium with robust networks and wide area coverage. There is no cost to the user and it engages the community with its programmes ranging from talk shows, quizzes and on air announcements. Radio has the right to its share of the allocation of spectrum and should not be taken for granted even if it is free. On the other hand, Telecom operators charge for carriage, content and devices. Therefore, they can afford to pay well for spectrum, which the Governments are keen to sell to the highest bidder. When comparing broadcast and smartphone coverage, it should be realised that when more people listen to the radio there is no impact on the network. In the case of smartphone, when more people listen on mobile, a denser network with more spectrum is needed. Briefly put, a smartphone is spectrum hungry and a denser mobile network requires more towers. Mobile Broadband can't do what radio can because one-to-many distribution is cost effective. 4G advanced LTE cannot replace broadcast.

The broadcasting service in Malaysia operates in the 174- 230 MHz VHF band and 470-742 MHz UHF band. After ASO and frequency re-stacking exercise, the DTT service is to operate within the frequency band 470MHz – 694MHz. The Malaysian Communications & Multimedia Commission (MCMC) mandated the DVB-T2 standard in Sep 2011 and HbbTV middleware in Jan 2013. Multi-screen & multi-choice are becoming the norm in TV viewing due to OTT video technology and broadband & smart devices penetration. Increasingly, media experiences are not only consumed across devices and time but also across services. There is now a wider choice of service providers, access anywhere and anytime, together with broader selections of content. As in many other countries, MCMC in Malaysia is facing many challenges to regulate OTT TV. Effort to block access to OTT TV services can be circumvented by technical means. Any attempt to regulate may be restricted by territorial jurisdiction as OTT TV providers and servers operating outside its country cannot be controlled. The complex OTT service architecture presents both a technical and political challenge to regulators worldwide.

WRC-15 would be reviewing international frequency allocations and this may affect the broadcaster's part of the spectrum. On the agenda are 'New spectrum allocations to Mobile Service on Primary Basis use for IMT and mobile broadband applications'. Preliminary views from APT members have indicated opposition to this move in sharing broadcast

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service spectrum with IMT. The next item on the agenda is 'Examine the use of 694-790 MHz for Mobile Service in Region 1'. It should be noted that DTTB in Region 1 and Iran is governed by the GE06 agreement. APT Preliminary Views are that any possible regulatory actions be limited to Region 1 and the Islamic Republic of Iran which is party to GE06 Agreement. There should be no additional constraint on existing primary services in Region 3.

A Rapporteur group on "Future spectrum demands and use of the Broadcasting Service" has been established in ITU-R Study Group 6 (Broadcasting Service) and a questionnaire on spectrum use was circulated among ITU-R Member States (Administrations) and Sector Members (Circular 6/LCCE/90). This was based on current spectrum use of Broadcasting Service (TV/Radio, Digital/Analogue, LW-SHF) and future spectrum use (HDTV to UHDTV and/or 3DTV). The deadline is 22 May 2015 and broadcasters are strongly urged to discuss the matter with their regulators as their share of the spectrum is at stake.

Session 6:

Enabling Change Smartly



The session was chaired by Simon Fell, EBU and the presenters were Colin Prior, Enensys Technologies ; Nils Ahren, Rohde & Schwarz; Martyn Horspool, GatesAir and Milos Pavlovic, LS Telcom. Many different sets of commercial requirements including Indoor/mobile reception, Fixed rooftop, SFN operation and Pay TV have been successfully fulfilled by DVB-T2 Technology. The 'OneBeam' solution enables the use of DTH satellite to distribute signals to T2 transmitters operating in SFN, offering considerable savings in satellite transponder capacity. The single satellite distribution for T2-MI and DTH does away with the need for secondary distribution from main transmitters. EWS implementation on DVB-T2 enables disaster coordination agencies to deliver emergency information to viewers on a regional basis.

The Malaysian Communications and Multimedia Commission (MCMC) released a tender in April 2012 for rolling out and management of digital infrastructure for free-to-air broadcasters using the DVB-T2 standard. Detailed proposals from shortlisted bidders were thoroughly evaluated to carefully select a single party to function as a Common Integrated Infrastructure Provider (CIIP) for Free-to-Air (FTA) broadcasters in the country. Among the business plans is the provision of 98% fixed rooftop coverage nationwide by optimisation of existing transmitting infrastructure. It would also provide portable, indoor coverage nationwide by deploying low-power transmitters. Maximising the utilisation of the limited RF spectrum is to be fulfilled by deploying 8 MUXs in phases. The plans include subsidising a certain number of DVB-T2 STBs and indoor antennas.

Transmitter network design can vary from a few high-power transmitters on high towers to many low power transmitters or a mixed setup. High power transmitters rated above 2kW cannot guarantee 100% coverage. However low power transmitters are able to support high power transmission in order to ensure a better coverage for shadow areas such as buildings, indoor coverage for malls and small communities. Low power equipment ratings range from 1-200 W and can be classified into transmitters (small sized or mini), re-transmitter or gap-filler. A recent innovation is to introduce LTE mobile offload where LTE content is inserted into Future Extension Frames (FEF) of DVB-T2 signals. This unique solution combines DVB-T2 and LTE-A+ signals using a common hybrid exciter platform and over-the-air transmitters to deliver simultaneous digital TV and LTE content to all devices from a traditional DVB-T2 broadcast tower.

New Zealand completed in 2013 putting it among the four Asia Pacific countries which have done so. The other three countries are Japan, Korea and Australia. Lessons learnt from the New Zealand experience are that providing robust signal in rugged terrain is difficult to achieve. There is also as need to have a mix of terrestrial and satellite delivery for optimum reception.

Session 7:

Smart Technological Solutions



Dr Ahmad Zaki,
Media Prima



Guillaume Boutin,
WorldCast Systems



Nuno Ribeiro,
rprobe



Rick Asahina,
TVU Networks



Martin Roberts,
Adstream

The session, chaired by Dr Ahmad Zaki Mohd Salleh, Media Prima and with panelists comprising Guillaume Boutin, WorldCast Systems; Nuno Ribeiro, RPROBE; Rick Asahina, TVU Networks and Martin Roberts, Adstream Asia.

A professional monitoring strategy is needed when deploying a Digital TV network. The strategy encompasses the business model, architecture and technical specifications. The components of the business model are tower companies, broadcasters, regulation bodies and service companies. Tower companies have to provide the best broadcasting quality to their customers. With a professional monitoring network, tower companies can measure and provide evidence of the quality and the continuity of their services. They also need to reduce network maintenance costs which can be

done by undertaking troubleshooting and first maintenance actions with aid of remote controlled equipment.

Broadcasters want to monitor the Quality of Service of the tower companies. With a professional monitoring network, broadcasters can measure the QoS to compare with tower company reports. They also want to check the reception of a programme which can be obtained from recordings and other evidence. The regulators main concern is that broadcasters respect the standards as regards to frequency, power or MPEG errors. They need to reduce the number of field measurement exercises and again a professional monitoring network makes their work much easier and more efficient. The service companies sell the monitoring service which can be customised.

The architecture that is to be defined covers the monitoring network, the sites, user friendly software and communication capabilities with the central station. The specifications that are to be defined include the specific technical parameters that need to be measured, ease of installation and staff training.

Session 8:

Cloud Technologies in Broadcasting



The chairperson was Hj. Zulkifli Abdul Rahim, Radio TV Malaysia. The panelists were Charles Sevier, EMC Emerging Technology Division; Katrine Finstad, Appear TV; Paul Jones, Front Porch Digital; Hiroki Nonoshita, Ikegami and Jew Kok Lim, Aspera IBM. The OTT audience is growing and video usage is changing with more content is being available online. People are increasingly utilising their smartphones and tablets to watch what they want, when they want, where they want. OTT is rapidly evolving with fast IP connections, next generation compression, newer delivery standards make it easy to target any device, advanced targeted advertising solutions and Cloud access to shared Content Delivery Networks (CDN).

A broadcaster can reach anyone anywhere using unmanaged IP networks. OTT enables broadcast video delivery over unmanaged networks including 3G and 4G mobile. In countries with fast IP infrastructure, traditional terrestrial or satellite broadcast were found to be inadequate and could not satisfy viewers. Broadcasters must complement their services with OTT delivery as it offers several advantages and can be used to provide catch-up, on demand and linear TV for devices connected via IP.

Next-generation transport technologies are needed to move the world's digital assets at maximum speed, regardless of file size, transfer distance and network conditions. Existing TCP is unsuitable to the demands of today's big-data applications. Long distances degrade conditions

on all networks due to latency, packet losses and traffic bottleneck. TCP is designed for low bandwidth and adding more bandwidth does not improve throughput. A solution is provided by FASP 3, a universal high-speed data transport system which is file size independent with maximum transfer speed, optimal bandwidth utilization and maximum I/O throughput on any storage platform.

Session 9:

Industry Debate: Is Spectrum Essential for Broadcasting?



Dr Amal Punchihewa, Director ABU Technology, led the debate by posing the question of the availability of spectrum for the broadcasters to the panel members and participants. He elaborated further by stating that Radio & TV programmes which, packed and delivered to the users, do not take up spectrum space. On the opposing side the telcos are taking up the stand that mobile phones with their cellular concept of two way communication can also do this efficiently, effectively and if not even better. Mr Martyn Horspool from GatesAir USA put forth his perspective that terrestrial broadcasting will definitely continue as it is the most effective method of reaching the user. It can cater for the localisation of news as well as transmission across the entire country and around the world.

Dr Ahmad Zaki Mohd Salleh, Media Prima Malaysia, responded by stating that terrestrial broadcasting is the mainstream for delivering content to viewers. IP is not designed for broadcasting with its one to one connectivity. It cannot handle huge numbers of users as the streaming required tends to impose a tremendous strain on the infrastructure leading to traffic congestion and ultimately a drop in picture quality at the receiving end. However, it is essential for broadcasters to follow technology and OTT can complement Free to Air.

Dr Amal Punchihewa then touched on the aspect of Early Warning System and Ruxandra, DRM informed the panel that when disaster strikes, the TV tower as well as the Mobile tower can be struck, but Radio is always on air. Radio has always proven to be the last line of resistance. Digital Radio Mondiale is capable of providing sound and instructions in several languages. DRM can get messages across vast continents and long distance. Compared to a dedicated EWS that is expensive to maintain, an inbuilt system within a DRM set is more accessible and cheaper. Kathryn Brown, Commercial Radio Australia, replied that when cyclones struck parts of Australia recently, the mobile towers were knocked down whereas the high powered Radio Transmitters stayed intact and alerted the public to stay in the basements. Simon Fell of EBU commented that 250 million people in Europe relied on terrestrial TV as it had proven over the years to be resilient in a disaster recovery situation.

As for the agenda on WRC-15, Dr Amal Punchihewa stated that the ABU stand was to resist any changes to the broadcast spectrum as he foresees the need, even after the Digital Dividend, to reserve it for future developments such as 4K UHDTV. The cost of distribution via the mobile network is very high and since the public enjoy free terrestrial TV then they deserve to keep it.

The question of Quality was also debated by the panel which led to the comment that the mobile network tends to lose connectivity resulting in loss of service. Quality is the key factor that keeps listeners attached to the service. Better quality of reception can be obtained by Free to Air as long as the signal strength is adequate. In Russia, quality monitoring is conducted over a vast area, stretching thousands of kilometers with measuring devices both at the transmitter and consumer end.

The panel also raised the issue of the demand by the IMT group for more spectrum. Their claim is based on data showing population growth growing exponentially in the same geographical area. The panel however contested this report by saying that the base is greater as population survey indicates that people are migrating to cities. The broadcasters must defend their portion of the spectrum by showing they are vibrant and have plans to harness the spectrum. The real motive of the telcos is to grab the business model of broadcasters. They are well aware that in order for advertisements to work, a large population that provides a ready market is needed. Not everybody wants to watch TV on mobile as the small screen does not fully give a comfortable viewing experience. A new way of experience is watching TV on the tablet which inherently has a slightly larger screen. Therefore coverage planning should also cater for indoor and mobile reception even if the costs are higher.

The industry debate ended on the note that broadcasters must transmit programmes that are attractive and HDTV is one of the methods to gain and also retain audience.

Session 10:

4K Production, Workflow, MAM and Archiving



Genya Kamada,
SONY



Mike Grayson,
Spectra Logic



Dr Yuan-Xing
Zheng, BBC-UK



Brad Redwood,
PlayBox
Technology

The session was chaired by Dr. Amal Punchihewa, Director of Technology at ABU and the panelists were Genya Kamada, Sony Japan; Mike Grayson, Spectra Logic; Dr Yuan-Xing Zheng, BBC UK and Brad Redwood, Playbox Technology.

Technology trends from 2K HD to 4K/8K UHD and increased frame rates from 25fps to 120fps have led to a phenomenal growth of files causing a massive challenge to storage costs and its associated complexity. Archiving storage media format vary; ranging from tape, hard drive to optical disk. Memory is used for temporary storage of data whereas permanent storage is on other media. Optical Disk provides high speed access, reliability, lifetime of more than 50 years and is cost effective. It can be stored at room temperature and is not affected by humidity.

Broadcasters should also set up a Disaster Recovery Centre and look at the various features that it must have to ensure reliability. It must be simple to set-up and use, without the need to revise normal operational workflows, nor add extra staff. The centre must maintain continuous programme transmission even when there is total failure of the Station MCR or links. Therefore work needs to be immediately continued from the replicated site. It must be fully automatic, so that the system transports files to a silo for protection and can play-out in sync with the main facility. There must also be facilities that enable extended periods of operation and the use of assets from the Deep Archive library.

Session 11:

Integrated Broadband - Broadcast Systems



Magli Alias,
RTM-Malaysia



Dr Yusei Nishimoto,
NHK-Japan



Haji Ibrahim
Haji Mohamad,
RTB-Brunei



Dr Fintan Mc
Kiernan,
IDEAL Systems



Régis Saint Girons,
HbbTV Association

The final session was chaired by Magli Alias, Radio TV Malaysia and the panelists were Dr Yusei Nishimoto, NHK; Hj. Ibrahim Hj Mohamad, Radio TV Brunei; Dr Fintan McKiernan, Ideal Systems; Régis Saint Girons, HbbTV Association and Simon Fell, EBU.

HbbTV or Hybrid broadcast broadband TV is the seamless merger of Television and the Internet. It is designed to work in a mixture of broadcast and broadband (OTT) as well as in pure Broadcast mode. HbbTV gives broadcasters the freedom to enhance their TV programmes and users easy access to services through TV channels. It is the most popular open interactive TV standard being deployed in over 20 countries and on more than 20 million devices.

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DBS Workshops

The thirteen workshops that were conducted at the Digital Broadcast Symposium 2015 provided an in-depth knowledge of the latest developments and opportunities in the broadcast industry.

DVB-T2: Technologies and Implementation



Dr Peter Siebert,
DVB

A detailed explanation on the latest development of DVB-T2 worldwide was delivered by Dr Amal Punchihewa, ABU; Dr Peter Siebert, DVB; Simon Fell, EBU; Colin Prior, Enensys Technologies; Eric Li Bin, Rohde & Schwarz; Lachlan Michael, Sony; Elmar Möller, Media Broadcast; Laurent Le Morvan, STMicroelectronics; Martyn Horspool, GatesAir; Andy Hickman, Digital TV Labs and Chrystophe Clement, NagraVision.



Lachlan Michael,
SONY

Research into improving DVB-T2 is being conducted by studying (1) Nonlinear denser constellation which would increase spectrum by 10% (2) MIMO that would increase capacity by 85% and (3) Time Frequency Slicing which when combined with network planning increases capacity by 75%.



Elmar Möller,
Media Broadcast

DVB-T2 is also utilising HEVC source coding so that it can transmit 4K UHDTV efficiently. The next phase of DVB-T2 introduces mobile services by transmitting T2 Lite signal that is inserted into Future Extension Frames. Mobile TV can find a ready market in APAC and it can provide new entertainment on the smartphone.

The ITU's target date for Analogue Switch Off is 17 June 2015 for UHF and 17 June 2020 for VHF which involves 33 countries. The deadline may not be achieved but most countries have some form of digital terrestrial services either a full scale service or trial. The



Simon Fell,
European
Broadcasting Union

majority of DTT services are still DVB-T SD with MPEG-2 compression. There is difficulty in transitioning from a legacy of millions of MPEG-2 DVB-T to the next generation of MPEG-4 DVB-T2 and



Colin Prior,
ENENSYS

would take many years. However, the latecomers to the digital terrestrial world would be able to benefit from MPEG-4 over DVB-T2 and achieve some HD services. More advanced services are due to try HEVC codecs delivered by DVB-T2 which will give many more HD services in the same capacity but again this requires new hardware at higher cost.



Laurent Le Morvan,
STMicroelectronics

From DVB-T2 to Virtualised Headends – What will Delivering TV Services in the Future look like?



Khush Kundi,
Ericsson

Khush Kundi from Ericsson presented this workshop on TV delivery platforms. Video now accounts for 40% traffic on the telco networks and is expected to rise to 55% by 2020. The rise is linked to demand for more content and the speed of the network. When compared to traditional broadcasting, which is multicast, LTE Broadcast brings advanced personalised services by unicast. One data channel is available per user and there are unlimited channels with a restricted number of users. Any content is available at anytime, anywhere. LTE Broadcast allocates blocks of spectrum, switching dynamically to cater for the shifting traffic demand which occurs for a dense population. Frequency reuse is also optimised.

Digital Archiving of Audio-Visual Content and Digitization Value Chain for Broadcasters



Poonam Sharma,
MediaGuru

The MediaGuru workshop was presented by Poonam Sharma and Sushil Khanna, this workshop looked into Digital Archiving using the wide lineup of tape, disk and memory. Digitalisation converts content into an output which is future-ready and readily accessible. It provides a solution that easily retrieves and repurposes content in digital output files.

Digital Preservation is necessary for broadcasters to preserve, retrieve and monetize their archives. Audio and video formats have evolved over the years leading to the problem of legacy content recorded in obsolete formats and thus inaccessible. Digitisation also leads to major cost savings and better monetisation possibilities.



Sushil Khanna,
MediaGuru



Kathryn Brown,
Commercial Radio
Australia



Dr Les Sabel,
Commercial Radio
Australia



Haji Zulkifli Abd
Rahim, Radio
Television Malaysia

Other countries such as Switzerland and Denmark would be following suit at a later date.

DAB+ chips must be incorporated into smartphones and portable devices in order to reach the tech savvy younger generation of listeners. Therefore, the future of radio lies in using Hybrid Radio which is a combination of broadband and broadcast. Another innovation is the portrayal of new characters in LCD/LED displays and thus solving the technical issue of letters having accents occurring with the different spoken languages around the world.

WASP 3D



Tushar Kothari,
WASP3D

Tushar Kothari presented the WASP3D workshop on Real Time Graphics/On Air Graphics which has become an integral part of television channels. It is important as it occupies a high percentage of on air time and is also a source of revenue. The current video wall has limited graphic capabilities, suffers from the delay in loading images and has no interactivity with content.

The new approach is to connect a graphic engine and create single to multiple outputs from 1k to 4k resolution. The virtual set has also been improved by doing away the need for an external chroma layer and reducing the cost of camera tracking.

Review of Transmitter Total Cost of Ownership

Presented by Martyn Horspool, the GatesAir workshop explained the definition of Total Cost of Ownership of a transmitter, data needed and the calculations involved. Total Cost of Ownership is the total cost of acquisition and operating costs over the asset life cycle. Key factors that need to be taken into account include equipment acquisition cost, taxes, loan terms, floor space, installation and commissioning costs and operational costs. A TCO analysis can be used to gauge the viability of any capital investment. It can be used when the time is reached to upgrade or purchasing a new transmitter.



Martyn Horspool,
GatesAir

WorldDMB



Bernie O'Neill,
WorldDMB

The WorldDMB workshop was presented by Bernie O'Neill, WorldDMB; Joan Warner, Commercial Radio Australia; Lindsay Cornell, BBC; Simon Fell, EBU; Dr Les Sabel, WorldDMB; Ariza Dinga, Radio Republik Indonesia; Zulkifli Abd Rahim, Radio TV Malaysia and Kath Brown, Commercial Radio Australia.

Launched in 2009, DAB+ is transmitted in five major cities in Australia, covering 65% of the population. 100,000 cars with DAB+ radio as standard accessory have been sold. Regular DAB+ services have also been launched in Hong Kong, Tunisia, Qatar and Kuwait while trials are taking place in Malaysia, Indonesia, South Africa. Norway has achieved 99% coverage is the first country set to have Digital Switch Over in 2017.



Lindsay Cornell,
BBC



Abdul Haleem
Rahiman, ATEME

Future of TV: UHD TV and Livesphere

The ATEME workshop presented by Femin John and Abdul Haleem Rahiman provided a technical overview of HEVC/H265 and UHD TV and compared them with H264 and HDTV. The HEVC Main profile would enable broadcast quality UHD TV at video bitrates below 13 Mbps. HEVC is source coding and is compatible with MPEG 2 Transport Stream (MPEG-TS), enabling the use of existing transmission technology including DVB-T2 or DVB-S2. As for UHD TV, 10 bit encoding and an extended color space (BT 2020) are part of the standard. The human eye is very sensitive to certain colours, for instance dark blue. Compression artifacts in these colour ranges are very visible and are very annoying. These artifacts are not present using the standard HDTV colour space (BT 709) but visible with the new extended



Femin John,
ATEME

UHDTV colour space. Using extra precision, from 8 bits to 10 bits reduces these defects.

In 3600 Video Broadcasting or LiveSphere, the scene is captured from all possible viewing angles with multiple overlapping wide angle cameras. The multiple views are stitched together into a single ultra-high resolution video. On the rendering screen, viewers may choose and dynamically modify the field of view by moving around and touching the screen.

Even More Channels, Ever More Platforms... Can Your System Manage?

The MediaGeniX workshop was presented by Michel Beke and this workshop dealt with software for channel management, cross-media scheduling, workflow and content lifecycle. Broadcast organisations operate many channels with some run from a central site and others in an external playout site in the region. It is a complex and costly operation and impossible to grow in a changing media landscape. These issues can be solved with installing appropriate software to manage the daily operations, media assets and playout. The net result is smoother, fault free operation with less cost.



Michel Beke,
MediaGeniX

DVB-T2 Receiver Compliance Automation & "Connecting Islands, Not Building New Ones"



Chan Tuck Kay,
Rohde & Schwarz

The Rohde & Schwarz workshop on DVB-T2 Set Top Box/Integrated Digital TV compliance testing was presented by Eric Li Bin and Chan Tuck Kay. Compliance testing results in certification of the device under test should it pass all the requirements. To the operator, a certified receiver can guarantee the subscribers' viewing experience. To the manufacturers, a logo test is the best way to reduce field complaints and is a MUST if their competitors have already obtained it. To the shop, it can bring better sales as the buyers are guaranteed quality.



Eric Li Bin,
Rohde & Schwarz

Clever Radio for Smart Countries



Ruxandra Obreja,
Digital Radio
Mondiale

The presenters of the DRM Workshop were Ruxandra Obreja, Alexander Zink and Lindsay Cornell. This workshop explained the benefits of DRM, its technology and the steps necessary for its implementation. DRM offers more choice for listeners with 4 programmes on one frequency. Audio quality is excellent with no distortion and comes with Stereo and 5.1 surround sound. Multimedia applications brings about

more listener benefits while at the same time provide extra revenue opportunities for broadcasters. Coverage areas can be very wide and the signal robust, even with a single transmitter. Single Frequency Networks 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 a coverage area. The emergency warning & alert system has been incorporated in all sets as a mandatory requirement.



Alexander Zink,
Fraunhofer

Lessons Learnt from DTT Network Implementation in Terms of Planning, Coordination, Installation and Verification



Milos Pavlovic,
LS telcom

The LS telcom workshop on DTT implementation was presented by Luc Haeberle and Milos Pavlovic. It included the multimillion dollar project announced last year by the Malaysian government. Starting with the right basics must be part of the initial plan by identifying the main targets with their Quality levels of Service: SD/HD/UHD, type of reception, coverage, cost of receiver and cost of the investment in the distribution network. The roll-out should be scaled out in different phases. Selection and availability of broadcasting sites have to be carried out.



Luc Haeberlé,
Colibrex GmbH

The workshop also discussed the typical errors in network planning and how to avoid them. Network optimisation can be obtained by conducting project-specific antenna design. Taken into consideration has to be the use of existing infrastructure from the analogue TV network and its suitability for DTT.

Simple and Effective Surround Audio Production Techniques with Local Production Case Studies

The workshop from Dolby was presented by Geoffrey Low who introduced simple and effective surround production techniques and shared some regional production case studies. Surround audio production is very much similar to Stereo audio production. Mixing In surround will simultaneously give stereo & mono mixes without the need to remix for individual format. Only one audio mixing effort is necessary to produce results in 5.1, stereo and mono mixes. Mixing in surround is easier than stereo because of more space & headroom and easier separation. Once the sound technician is familiar with the system, he can work equally as fast in 5.1 as he can in stereo.



Geoffrey Low,
DOLBY

Content Archive & OTT Content Delivery



Samuel Kajindran,
EMC²

Charles Sevier and Samuel Kajindran presented the EMC² workshop on archiving and content delivery, including the aspect of marketing. Audiences in the digital age are changing and new strategies in marketing have to be formulated. Marketing can no longer be based on demographic patterns but

on behavioural segmentation. Mass advertising is no longer workable and now requires one to one communication. There is also a need for shift from on air blasts of adverts on a time interval basis to a continuous relationship.



Charles Sevier,
EMC²



Exhibition

Fifty-five exhibitors took part in the DBS exhibition which showcased the latest trends in technologies, applications and services provided by major manufacturers and other industry players. Products ranging from antennas, digital cameras, mixers and Frequency & Coverage planning software. Needless to say, UHD TV sets were also on display.

From Smart Cards to Multiscreen



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Industry Debate: Is Spectrum Essential for Broadcasting

Moderator:

Dr. Amal Punchihewa

Panellists:

Simon Fell, Dr Ahmad Zaki,
Kathryn Brown, Martyn Horspool,
Ruxandra Obreja

*Shortened version of a report by
Lindsay Cornell, Principal Systems
Architect, BBC Future Media*

Amal introduced the session, pointing out the difficulty of having a debate when all the delegates and panellists already agreed that broadcasting needed spectrum; but who would argue against them? So, Amal had collected together some questions to create the debate. The important thing was to demonstrate that everyone understood and actively supported, by their actions, the importance of spectrum to the business of broadcasting and to communicate this to colleagues, national regulators and so on, so that the broadcasters' future was protected.

Broadcasters, whether radio or television, create content and then package it, by analogue or digital techniques, and deliver it to consumers. The telecoms people claim that they can do it better! But is this true? What do we say to counter these arguments? How do we convince regulators and governments that broadcasters do an essential job to inform, educate and entertain the people?

Martin said that, through its international contacts and contracts, he believed that broadcasting would continue for a long time to come. Issues of economy, reliability, emergency warning information, local, regional, national coverage all pointed to the essential role of broadcasting. Dr Zaki said that regarding OTT, it was essential for broadcasters to move with technology. Media Prima felt that its OTT offering was complimentary to the traditional broadcasting platforms. Young people especially do not like to do as their parents do, so to reach them with our services, OTT helped enormously. But it was only complimentary – it could not replace broadcast.

Ruxandra highlighted the role of radio in the event of national disasters. In her experience, following news stories, the only communication remaining was radio – TV and mobile become useless, whilst battery powered radios kept going. Analogue radio did this and digital even better because, with digital, additional information could be supplied, like messages in multiple languages. In the lower frequency bands radio could be delivered from long distances away – UK to India, New Zealand to Brazil etc.

Kath added that CRA had requested information from operators, after the flooding in Eastern Australia, regarding what had happened to their services. The high power broadcast transmitters were still in operation, but most of the mobile telecoms base stations were not working because of a failure of mains power, which was lost for three days. This supported Ruxandra's comments about radio being the only service still available.



Simon reiterated that DTT was the major platform in Europe – it provided services to 250m people. Most DTT users were consuming free-to-air content and that was really only possible with dedicated terrestrial spectrum. Simon mentioned OTT platforms where a large proportion of viewing was catch-up for linear free-to-air TV – content that had established itself due to its mass-audience broadcast tradition. One of the great things about free-to-air linear TV was serendipity: if you always had to search for content then you might end up with just watching one show, whereas with broadcast TV you saw something you didn't expect to enjoy and so you could enrich your life. This was surely an important point in terms of social cohesion – if people only consumed what they already knew, their prejudices would be enforced rather than dissipated.

What about access with satellite or IP? What was the experience with OTT? Was it reliable? What about quality? Dr Zaki said that whilst rain-fade affected satellite, no such problem existed with UHF! Throughout the years broadcast spectrum has been eroded: from 470-860 down and down. How far would it go? These things happened at the WRCs and there was another one in the coming year. The report M.2990 said that requirements for IMT would triple but others had studied the report [EBU] and showed that it made no sense! It was based on estimates of population growth, etc., but the assumptions were not reasonable. Simon said there was also a paper from LS Telecom questioning the measurement methods proposed. He also shared that the figures were incredibly speculative – Cisco had revised their estimates downwards by 50%. Simon also mentioned C-band distribution of TV in tropical regions and the threat from IMT. The spectrum that IMT already had was not fully used, but no-one had been properly checking this. Most use of IP video was not by mobile broadband, but via Wi-Fi (87%) and the projections in M.2290 did not take account of that. These discussions, though, needed to be turned into action so that these arbitrarily large demands for spectrum were countered.

ABU ENGINEERING AWARDS 2015



ABU Green Broadcast Engineering Award

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



ABU Engineering Industry Excellence Award

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

ABU Broadcast Engineering 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 2015 – Call for Nominations

31 July 2015 – Deadline

August 2015 – Judging

27 October 2015 – Announcement of Winners **ABU Technical Committee Meeting** Istanbul

30 October 2015 – Presentation of Trophies **ABU Prizes Night** Istanbul



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

BES Conference and EXPO 2015



The Broadcast Engineering Society (India) organised the BES EXPO 21st International Conference & Exhibition on Terrestrial and Satellite Broadcasting from 15 to 17 January in Hall 12A, Pragati Maidan, New Delhi. As an international event, the expo was endorsed by IABM and DRM and supported by Prasar Bharati, ABU, Society of Broadcast Engineers, U.S.A., Ministry of Communications & IT and IETE. The theme of this year's conference was the "Social Media and Broadcasting – New Opportunities".

This Annual event, the largest broadcasting engineering exposition and conference in this part of the sub-continent, was conducted most successfully. The function was attended by more than 800 broadcasting professionals,



media representatives and visitors. The Hon. Minister, while inaugurating the event, highlighted the role of social media and new technologies in the competitive broadcasting arena. The keynote address emphasised the role of social media which has come forward as an alternate form of broadcasting with millions of viewers across the world. Broadcast Engineering Society also presented awards for technical excellence in the fields of broadcast technology.

Over 800 delegates attended the BES conference having eight sessions and one tutorial session. 44 speakers presented at the conference, including 24 from overseas. Themes included, Resurgence of Terrestrial, Audio Visual Repository – An imperative asset of broadcasters, Challenging Content for Broadcast Revenue in New Platforms, Ultra – Breaking the ice, Make in India – Opportunities for Manufacturers and Broadcasting as an Effective Social Power. Dr. Amal Punchihewa, Director of ABU Technology presented in the session of Social Media and Broadcasting – Thou are great, having the title Broadcast meets broadband. Dr. Punchihewa also chaired the session on Over the Air to Over the Top.

Each session, having five speakers on various topics, was rich and interactive. Conference proceedings, issued in hard copy as well as on CD, were made available to the delegates during the conference.

The exhibition was visited by over 4000 Broadcast Professionals, Engineers, Media Personnel, Engineering students and media students. There were over 300 companies from 20 countries displaying the latest broadcast products and technologies from across the world, either directly or through their dealers in India. The media industry in India is a multi-million dollar market and this type of product exhibition has the clear potential to create awareness and develop business in the field of broadcasting in the time to come.

Mr I.I.George, Chairman of Conference Committee, also the Vice President of the Broadcast Engineering Society (India) and Additional Director General of Training at Prasar Bharati was commended for his leadership in the BES conference and expressed his pleasure with the outcomes.

Next year's BES EXPO-2016 will be held from 4 to 6 February 2016 at Hotel Kempinski Ambience, Delhi.

The convergence of Broadband Broadcast Technologies

This is the first edition of the Technical Review for the year 2015 and we are observing a number of trends in the media market. Among these are OTT and better picture and audio delivery for more immersive viewer and listener experiences. All media stakeholders will also stretch the use of broadband for media production, contribution and delivery.

The OTT market has been gaining maturity, offering various opportunities to traditional broadcasters, new video content providers/operators and telcos. OTT technology providers will offer user-friendly interfaces that content consumers can use to interact with and move beyond passive, one-way content delivery.

OTT players will offer a wide range of innovative services. OTT will enable global services from broadcasters which, by definition, will extend beyond geographical borders. For example, in recent times a number of ABU member broadcasters have been concentrating on broadband delivery of content, exploring both wired and wireless broadband to offer services, including mobile reception.

Different stakeholders will compete for a share in the competitive media market. Traditional broadcasters will enjoy a competitive advantage by offering Integrated Broadcast-Broadband (IBB) services using technologies such as HbbTV.

In September, 2014 Australia introduced an IBB service, branded as Freeviewplus and New Zealand will possibly introduce a similar service early this year. A number of other countries in Asia, such as Malaysia, Vietnam, Indonesia and Thailand, will introduce such services via broadband, enhancing catch-up, time-shift, beyond 8 day EPG, video on demand and other value added services.

Currently HbbTV is the de facto standard in Europe. Also in Oceania and Asia, HbbTV is the dominant form of IBB or hybrid television broadcasting standard. Both OTT and IBB services create opportunities for Cloud services.

OTT services still cannot match the broadcast quality of delivery standards that traditional broadcasters used to offer via terrestrial and satellite delivery. Cloud services and content delivery networks (CDN) will enable a more acceptable level of Quality of Experience to content delivered as OTT and IBB services over broadband. A number of operators will compete to offer cloud services for media players in the Asia-Pacific region.

Hopefully all stakeholders in the media market can survive and thrive while the broadcasting eco system is constantly challenged by the latest technological innovations.

From Amal, Nadeem, Kyaw Zaw, Nam, Geraldine and Hamidah



ABU Asia-Pacific Broadcasting Union

PACIFIC MEDIA PARTNERSHIP CONFERENCE 2015

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New Members

Additional Full Member

RADIO MARSHALLS V7AB, MARSHALL ISLANDS – (2.1.15)

Radio Marshalls V7AB, located in Majuro, Marshall Islands, was established in about 1960 when the country was still administered by the United States under a mandate from the United Nations. They are a public service broadcaster under the Ministry of Internal Affairs and licensed to broadcast on FM, AM and SW bands. They are a 100% government funded public service broadcaster with a total of 12 full-time employees.

Radio Marshalls V7AB provides nationwide radio broadcasting to approximately 55,000 residents who live on 24 scattered and isolated atolls in an area of 750,000 square miles of the central Pacific. Programmes are delivered in both Marshallese (local language) and English which is the second language used in the Marshall Islands. They are in joint initiatives with the National Telecommunications Authority to broadcast online streaming to Marshallese residing around the world. The radio station is able to broadcast a maximum of 2.5-thousand KW to 5,000 KW.

The radio station continues to play a pivotal role in providing information, education and entertainment for people not only within the RMI but those living outside the Republic. The station can be heard online via the following link www.117.103.88.115:8000/v7ab-live.mp3.m3u. The radio station is also researching and testing other online streaming in order to compliment the NTA online streaming.

KANTIPUR TELEVISION NETWORK PVT. LTD., NEPAL – (26.1.15)

Kantipur Television Network Pvt. Ltd. (KTV) is a private commercial television channel established in 2003 in Kathmandu, Nepal. The Board of Directors comprises Nepalese and non-resident Nepalese businessmen who make policies and major decisions and it has a work force of nearly 250 experienced and creative personnel related to television media.

KTV uses up-to-date professional equipment, production studios and three outdoor production vans. Ninety-nine percent of the programmes transmitted are self-produced while others are out-sourced. Currently, KTV has ten news bureaus, nineteen stringers with link facilities across the country making its production and news coverage the largest in the country. Today, KTV is also known as the leader in live coverage of sports and other events.

With the increasing number of live coverage of sports and events, KTV will soon be launching its second channel sometime in February 2015. A channel named, Kantipur Gold, will be dedicated to sports and entertainment only.

Also with the increasing demand for KTV programmes by the Nepalese community living abroad, its signal is being carried by mobile, cable, DTH and IPTV service providers. It also has its own online web page from which viewers abroad can watch programmes of their choice.

KTV welcomes broadcasters and production houses for co-production, equipment and studio rentals and the expertise of its personnel for filming in Nepal as well as audio visual footage from its archive.

Affiliate Member

KARNALI INTEGRATED RURAL DEVELOPMENT AND RESEARCH CENTRE, NEPAL – (20.1.15)

Karnali Integrated Rural Development and Research Centre (KIRDARC) is an NGO registered at the District Administration Office, Jumla under the Society Registration Act, 1978, and is affiliated to the Social Welfare Council in Kathmandu.

It has been in operation in Karnali Zone since 1999 with its central office located in Jumla district with offices in four other districts viz. Kalikot, Humla, Mugu and Dolpa, a Programme Support Office at Nepalgunj and a Coordination Office in Kathmandu.

KIRDARC's objectives are:

- To improve the human rights situation of Karnali people in relation to civil, political, economic, social and cultural rights.
- To promote democratic practices in the workings of all institutions and organisations in the region, and create capacity for peaceful social transformation.
- To improve livelihoods and employment opportunities of the Karnali people through improved basic public services and humanitarian assistance.

To achieve the goal envisioned, KIRDARC is currently working in line with its five years strategic operation plan (2009-13) (Abstract of Strategic

Operation Plan is in Annex-II). Among the six outputs envisioned, output -3 "Advocacy and campaigns launched at all levels to establish economic, social and cultural rights as fundamental entitlements, and to promote people's access to basic services, such as safe drinking water, health, sanitation, employment and livelihoods opportunities, as their human rights in order to improve the overall condition of the people of Karnali" is related with WASH programme.

For effective organisation effort to achieve its strategic outputs and to address the geographical needs, KIRDARC has uniquely organised its operation and management functions by integrating thematic approach. They have been working in education, human rights, food security, livelihood, income generation, community empowerment, WASH, DRR & CCA, media and advocacy having active engagement of community groups, local NGOs with government institutions, community institutions and civil society organisations.

KIRDARC is currently implementing 16 different projects with the support of different funding partners.

Associate Member

iM4U RADIO SDN. BHD., MALAYSIA – (5.2.15)

iM4U Radio Sdn. Bhd. is a government-backed radio company registered on 26 June 2014 in Kuala Lumpur, Malaysia. They are a free-to-air provincial station currently broadcasting only in the Klang Valley. They produce 100 percent of their own programmes. They are a new radio station and their first radio transmission was on 15 September 2014. They provide online streaming access as well via their website www.iM4Ufm.my.

iM4U Radio Sdn. Bhd. is a community platform targeted to involve the youth in social and entertainment news and issues to disseminate positive messages centered on youth volunteerism and activities, youth nation building, youth success stories and DrE1m Fund announcements in hope of creating social responsibilities' awareness.

The station broadcasts music produced by local artists as well as latest international artists, news and traffic reports, special celebrities' and performers' appearance interviews and talk shows to encourage the youth to speak their mind on youth and social issues.

KOREA BUSINESS NEWS CO. LTD, KOREA – (6.2.15)

Korea Business TV was established in Seoul, Korea on 31 August 1999. It is Korea's Bloomberg channel which has set foot under the name "WOWTV" on August 1999 together with their main 3 values; i.e. democratization of information, commercialization of investment, internationalization of the market. After its founding, Korea Business TV began to broadcast nationwide since the establishment of their internet broadcasting station on January 2000, and cable channeling on August of the same year.

Korea Business TV has become true to the name "Korea's main finance & economics news" after changing its name on March 2004, and after being listed at the Korea Exchange KOSDAQ on July 2004. When the stock quotations were in a bull market on 2004, the ratings have recorded 1st place during weekdays (8:00AM ~ 3:00PM), and 10th place during weekends and holidays.

During the media satisfaction results conducted by global research, Korea Business TV was selected as a favorite channel in the finance category, and was selected as a favored media amongst individual investors in 2008. The Korea Communications Commission gave "Excellent" ratings during the contents creation competence evaluation conducted on 2012, and they have also received the highest rating in 2013.

Korea Business TV is more than a simple cable channel for it is currently opening an N screen era; it utilizes all devices such as satellite channeling, IPTV, DMB, Smart TV, and Smart phones. Korea Business TV is also loaded into apple TV which has allowed it to grow as a global media which is acceptable by global subscribers. Furthermore, they are currently strengthening their web based platform which allows the use of netizen and professional broadcasts.

Aside from this, Korea Business Daily TV is helping men, women, and the disabled from all levels of society by introducing jobs through the conduction of "Youth Employment Academy". It is an outsource project by "TV Work Net", and is a part of Ministry of Employment's Society contribution project. The TV Work Net was selected as a public channel in 2012, and currently perseveres to fulfill their responsibilities and roles to the society.

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2015 SPEAKER HIGHLIGHTS



James Osmund
Director,
Non-Linear Product
Fox International Channels



Daina Middleton,
Head, Global Business
Marketing,
Twitter



Henri Setiawan
Vice President,
Innovation Management
TELIN



Parameswaran N
Principal Advisor, Broadcasting
and Cable Services
**Telecom Regulatory
Authority of India**



Peter Musngi
Head, Manila Radio
ABS-CBN



Mette Charis Buchman
Senior Manager of Archive
**Danish Broadcasting
Corporation (DR)**



Rahul Thappa
Vice President,
Business Analytics
Astro



Patrick Tang
Vice President, Retail Voice
**Philippines Long
Distance Telephone
Company**



Roger Gichuhi
Chief Operating Officer
Buni.TV



Jamie Mackinlay
Senior Vice President,
Sales and Marketing
PayWizard



Kazuhiro Chida
Research Engineer
**Japan Broadcasting
Corporation (NHK)**



Martin Andanan
Senior Manager and
Project Director
TV5 Philippines

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- **Achieving reach, resonance and reaction** with second screen services and social TV
- Innovating TV services with **big data analytics** and **actionable intelligence**
- Leveraging **cloud-based TV technologies** and **network virtualisation** to drive efficiencies
- **Digital Broadcasting** – Standards, technologies and implementation challenges
- Best practices in delivering an **immersive TV experience**
- Leveraging automation technologies to **drive agility, scalability and modularity in your workflow**
- **Sustaining radio broadcasting** in an online age

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International Broadcasting Equipment Exhibition

by Wayne Huggard

TVNZ New Zealand

Japan is an industry leader in product and market which makes the International Broadcasting Equipment Exhibition (InterBEE) a noteworthy event in the broadcast technology calendar. The 50th anniversary InterBEE was held in November 2014. A Content Forum ran concurrently with the exhibition as a series of presentations and symposiums conducted in a mix of Japanese and English, with simultaneous translation.

Keynote Presentations

The keynote speech, by Mr. Yasuto Hamada, of NHK (Japan Broadcasting Corporation), gave an account of Broadcasting in Japan from 1953 to the diverse media environment of 2016. A road map for 4k and 8k development was presented to achieve widespread 8k broadcasting by the time of the 2020 Tokyo Olympics. Progress in production, workflow and distribution was detailed; in addition to more pixels (8k), the quality (12 bit) and speed (120Hz) of pixels are also being worked on.

Mr. Sam Matheny, Chief Technology Officer of NAB, opened the forum with a perspective of the USA broadcast industry. A complex spectrum auction process and frequency re-packing (restack) is now underway in the United States to release more spectrums for mobile broadband. The new ATSC3 standard was outlined. Mr. Matheny noted that Telecoms have the 'Long Term Evolution' (LTE) strategy but Broadcasters need a similar plan.

Mr. Yasubumi Honma, of the Tokyo Broadcasting System spoke of the need for an appropriate order of development from 2k to 4k to 8k with a call for an 'all Japan effort' to develop decoder chips.

Special Session

Mr. Kamon Iizumi, Governor of Tokushima Prefecture, lead a forum on the 'Tokushima method'. Tokushima is an isolated fishing village of mainly elderly people. An ageing population and disaster mitigation (eg earthquake, tsunami) are key social issues in Japan and these can be address by combining Television services and cloud platform personal communications. In Tokushima, personalised, detailed emergency warning messages can be sent to the homes of senior citizens. Testing has demonstrated that people are more likely to follow emergency warnings when they are personally addressed.

Exhibition

InterBEE is a huge event spread over six stadium halls (one more than last year) of Japanese and international suppliers showing everything from 14m wide screens to 15m ENG masts. Overall nearly a thousand exhibitors, including over five hundred from outside Japan, provided more than 1,700 booths.

In addition to Video and Broadcast equipment, within the exhibition dedicated areas were allocated to sound, lighting





and ICT/Cross-media technology. A new addition to InterBEE was the 'Interconnected' programme in its own area of the exhibition floor with presentations and panel discussions additional to the main Content Forum.

Content Forum

Mr. Peter Owen, Chairman of the IBC Council presented a look back at 50 years of European broadcasting. ASO in Europe is largely complete but there are now multiple delivery options and a changing audience ("I want choice, I want it anywhere"). Advertising revenue is moving to internet services and there is possible loss of spectrum: 800 MHz has gone to LTE and there is now debate on 700MHz. Broadcasters are responding with catch-up services and broadband for live.

The intriguing new concept of 'Content gravity' was introduced by Mark Ramberg from Amazon Web Services. Given that storage is growing faster than processing speed, and processing speed is increasing faster than connection speed, as files get bigger they will run in to movement limitations. Content movement will continue to be a constraint and it is easier to move processing to the content; thus 'Content pulls process to it'.

The IMF digital master format for distribution was introduced by Rohde & Schwarz's Mr Simon Roehrs. This format will allow a single file, including language and market variations, to be used for distribution to platform different platforms, including broadcast.'

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This year the Visual symposium, chaired by Mr Hideichi Tamegaya, debated the 'Current Situation and Problems of Ultra High Definition Video Production'. Satellite, cable and IP for VOD for 4k were considered. The many technical difficulties still to overcome were debated. It is expected that UHD will be available as consumer camera equipment, with even 8k cameras in smart-phones.

The final afternoon provided a cutting edge audio symposium on audio over IP. Audio is moving to IP distribution but there are various standards for audio over IP/Ethernet.

Special Displays

Adjacent to the Content Forum, NHK Media Technology had their display of advanced technology. They had set up live 8k Studio Cameras and a Control Room Vision Switcher. 8K in 3D with 22.2 surround sound on a 5m screen gave a compelling virtual reality effect. There were also 3D displays that did not require glasses and a medical application for 3D video of brain surgery on a large screen was not for the squeamish.

Demonstrating that there is no limit to the development of this technology Sony were showing 12k video on a 3 x 14m screen in their TOPPAN virtual reality theatre.

For one day of the exhibition, acoustic companies provided a 'Line Array Speaker' demonstration in the adjacent Event Hall.

Makuhari, Chiba City

Visiting Japan is like traveling to the future, with events like InterBEE demonstrating leading edge technology which exists alongside traditional culture. During InterBEE, a nearby traditional garden, had lanterns and trees lit up in the evening for an autumn colours celebration. Although Tokyo can be crowded, the new urban area of Makuhari, in Chiba City, where InterBEE is held, is calm and spacious, making a visit to InterBEE enlightening and engaging.

My thanks to Mr Ryuo Nagai of Ivy Planning Inc. and Dr Amal Punchihewa, Director Technology at the ABU for facilitating my time at InterBEE.



Training Course on IPTV and Networking Technologies in Tunis for ASBU



A week-long training course was held in Tunisia to strengthen ties between the ABU and the Arab States Broadcasting Union (ASBU). Thirteen broadcast and IT engineers from Arab States attended the IPTV and Networking technologies course at the ASBU headquarters in Tunis from 3-10 December 2014.

This was the second training conducted by ABU Technology Director Dr Amal Punchihewa as a follow-up to the first course on the same topic in Damascus, Syria, in 2010. In 2012, Dr Punchihewa conducted a Digital Television Broadcasting course for the ASBU in Tunis.

The thirteen engineers were from broadcast and Information Technology areas of broadcasters in Saudi Arabia, Sudan, Kuwait, Algeria, Yemen and Tunisia. They examined the use of IP in broadcasting value chains, including contributions, distribution and delivery, as well as over-the-top (OTT) and integrated broadcast broadband technologies and services. During the discussions between ABU and ASBU, the Head of the Production and Operation Department of the ASBU, Ms Ines Jebali Gdoura, said that Arab State broadcasters had decided on HbbTV as the IBB technology standard for the ASBU and MENA region, though it was up to the individual broadcaster to commence such services at appropriate times.

Dr Adnan Salhab, Head of Training and Director of Engineering, ASBU-Damascus Training Centre, was instrumental in organising and coordinating the event.

Dr Adnan and ASBU thanked ABU and Dr Punchihewa for continued support for capacity building in rapidly evolving digital media beyond APAC region. Mr Bassil Zoubi, Head of Transmission, Technical Department, ASBU said that the ASBU was experimenting with IP contribution arrangements to complement its satellite contribution network MENOS.

The ABU could explore similar mechanisms in future for its members in a broader deployment. During discussions, Dr Punchihewa expressed that the ABU would work closely with the ASBU to share experience and to assist capacity building in ICT areas. A proposal for an ABU-ASBU Technology week event, similar to those between the ASBU and the European Broadcasting Union (EBU) will be explored in 2015-2016, in addition to working on strong representations to be made to the WRC-15 meeting of the ITU on spectrum requirements for future broadcasting.





TRAINING & WORKSHOP ON ENGINEERING FUNDAMENTALS FOR BROADCASTERS

With strong determination a workshop and training programme on basics and fundamentals of broadcasting was organised by ABU Technology, attracting 50 young engineers from across the Asia Pacific region. Participants from seventeen countries represented their respective organisations at the ABU engineering workshop.

Fifty participants from twenty five broadcasters attended the workshop on Engineering Fundamentals for Broadcasters at the IPPTAR Training Centre in Kuala Lumpur from 15-19 December 2014.

ABU Technology Director Dr Amal Punchihewa had been planning to offer this five-day workshop from 2013, for young engineers with only basic exposure to audio and video systems, who would benefit by attending such an

activity. It focused on some of the fundamentals of audio and video systems, engineering techniques and applications that have helped engineering veterans to embrace the technology with confidence. Dr Punchihewa hopes to offer this training and workshop annually to ABU members, preferably in the month of December.

This pressing need for this training for the young engineers of member broadcasting stations was recognised by the Technical Bureau of ABU in May 2013 and despite the many activities which prevented it from being staged earlier ABU Technology was happy that it could commence its first training in December 2014.



The ABU places high importance on capacity-building and similar services will be rendered through DBS held in Kuala Lumpur, PMPC held in Pacific and technical assistance services to be carried out in a number of ABU member countries.

News

from the ABU Region

Australia

Broadcast Australia Chooses Nautel for FM Transmission

Nautel has announced the first deployment of high powered FM transmitters to Broadcast Australia under a new five year supply agreement. The NVLT series was chosen following a successful bid by Nautel and its Australian representative, Innes Corporation for Broadcast Australia's high powered FM transmission requirements. Nautel is the developer of "intelligent broadcast transmitters" and the NVLT series is ranked highly in terms of overall power efficiency.

Nautel's Asia/Pacific Regional Manager, John Abdnour added "Broadcast Australia and Nautel continue a two-decade long relationship with this agreement. We look forward to the future of our relationship with the supply of the Nautel family of transmitters".

(C+T)

China

Conax Establishes Beijing Test Centre

Conax, has announced that it is in the final stages of establishing a Conax test centre in Beijing. The facility will provide authorised Pre-Testing and Conformity Testing services certifying client device conformance for Conax content protection functionality requirements. The new test hub extends the security provider's current offering for 3rd party test facilities in Europe and India and aims to offer cost efficient access for set-top-box manufacturers and partners in Asia Pacific.

The Conax testing facility in Beijing will be available from early May 2015. Conax is available during CCBN 2015, Beijing, at a CCBN event suite at the Beijing Radisson Blu. The Conax team will have information about Conax client device testing ([link to details](#)) and demonstrations of Conax' broad portfolio of security solutions for pay-TV and OTT operators

(DigitalTVNews)

India

FM Services All Over India

All India Radio (AIR), the national public broadcaster has an ambitious plan to provide FM services throughout the

whole country. Priority is to reach rural areas where FM signal is presently not available and the plan aims also at strengthening the coverage in border areas like Jammu & Kashmir and North Eastern States.

Currently, Indians can listen to FM radio in 373 locations throughout the country and AIR has selected 212 new cities to roll out FM in the third phase of FM expansion. 243 private FM radio channels are already broadcasting under Phase-II.

AIR's parent body Prasar Bharati's CEO Jawhar Sircar said that he was conscious that Digital Radio Mondiale (DRM) will ultimately take over, but this process may take some years and the attempt will be to reach out to the people through FM till affordable DRM sets are available.

(ABU News)

Japan

Large-scale Monitors Showing NHK WORLD TV at Airports in Japan

NHK will newly install 25 large-scale monitors in the international departure lobbies at three international airports in Japan that will air NHK WORLD TV, the international broadcast channel of NHK, to promote the channel to overseas visitors. The 55-inch monitors will be set up at Tokyo International Airport, Kansai International Airport, and Chubu International Airport.

The number of foreign visitors who use these international departure lobbies total four million per year. We expect that, by setting the monitors, more people will tune in to NHK WORLD TV back in their home countries.

(NHK World)

New Zealand

TVNZ Upgrades Weather Cam Network

Television New Zealand (TVNZ) wished to upgrade its legacy weather camera and infra-red links in NZ's four main centres – Auckland, Wellington, Christchurch and Dunedin – with more current and reliable technology. The Bridge Network (TBN) proposed 23GHz licenced spectrum Edge microwave links from Aviat Networks, along with installation services provided by a TBN engineer. Licence engineering was included as part of the proposal.

TVNZ sourced HD cameras for the project and arranged pipe mounts and weatherproof enclosures where needed. The live weathercam video currently goes to air seven days a week during the six o'clock evening news and during the weekday Breakfast show. Clear, stable images from the camera locations and reliable remote control functions such as pan, tilt and zoom were needed to give a variety of angles depending on the weather events at the time. Reliable live video over IP and remote camera control to/from TVNZ HQ in Auckland gives the broadcaster the technology it never had before.

(C+T)

Smarter way to watch TV coming with FreeviewPlus

A smarter way to watch TV is heading into Kiwi homes thanks to an extended partnership of New Zealand broadcasters TVNZ, Mediaworks and Māori Television.

The trio, with the support of Radio New Zealand, launched Freeview in May 2007 to help Kiwis transition from free-to-air analogue TV to digital TV. Now eight years later, with that transition complete, another transformation is about to occur with the launch of FreeviewPlus mid-2015.

FreeviewPlus will allow viewers to find, bookmark, watch or stream their favourite shows directly to their TV. The new electronic programme guide (EPG) will bring together all available content from TV One, TV2, TV3, FOUR, Māori Television, The Edge TV, Te Reo and the other 20 plus channels on FreeviewHD as well as TVNZ OnDemand, MediaWorks' 3NOW and Māori Television OnDemand as one consolidated content library. FreeviewPlus is planned for release on the FreeviewHD platform in mid-2015.

(TVNZ News)

Philippines

CNN Philippines Chooses Etere End-to-End Solution

ETERE, has announced that following the partnership deal signed between 9News and CNN, the Philippine group has confirmed ETERE as the end-to-end production and media asset management platform for the company's news content. CNN Philippines was launched in March 2015 as the rebranded channel of 9TV, featuring a newly revamped news studio, a CNN rich programming and in-house quality productions.

The ratification of a MERP solution as the core of the new system is owed to the strong relationship between Etere and 9Media (formerly Solar Television) based on several years of successful management and playout, grating best efficiency and quality expectations. CNN Philippines will be provided with Etere MERP, the robust and flexible framework able to manage the workflows and content for different kinds of operations and services, from ingest through production to playout and archiving.

(C+T)

New Asian VOD Service to Launch in the Philippines

Singapore Telecommunications (SingTel), Sony Pictures

Television and Warner Bros Entertainment have jointly established a video streaming company, HOOQ, in Southeast Asia, launching the service in the Philippines later this month.

The Philippines launch in partnership with Globe Telecom is the first step, with the service to be rolled out across Singtel's network in Indonesia, India and Thailand during the first quarter of 2015.

In the Philippines, subscribers will be able to enjoy unlimited streaming access and offline viewing options to some 10,000 blockbuster movies and TV series. This includes titles from partners Sony and Warner Bros. Local film and TV content will also be available through partnerships with the country's top studios, such as GMA, Viva Communications, Regal Entertainment and ABS-CBN.

(ABS-CBN News)

Singapore

MediaCorp Selects EVS for HD News Production

EVS, announced that MediaCorp, has selected a full end-to-end news production solution from EVS for their new facilities in Mediapolis, which are now under construction.

When fully implemented later this year, the EVS News PAM system will provide infrastructure for 56 HD-SDI channels, 500TB of central storage equivalent to 12,000 hours of HD content (plus 20,000 hours of low resolution), and over 500 journalist editing stations.

The integrated solution from EVS will facilitate all aspects of state-of-the-art news production, from recording to playout, including central shared storage and archiving, high- and low-resolution client browsing, onsite and remote editing, playout and NRCS integration.

(APB-News)

Thailand

DTT subscribers reach more than 14 million in Thailand. The digital terrestrial television subscriber base in Thailand has increased to 14.5 million since the launch of DTT in April 2014, according to a report from National Broadcasting and Telecommunications Commission (NBTC).

Takorn Tantasit, Secretary General of NBTC said the viewer base on the digital terrestrial TV platform was growing, particularly after the distribution of coupons to help cover the cost of digital receivers by the broadcasting regulator, NexTV Asia reports.

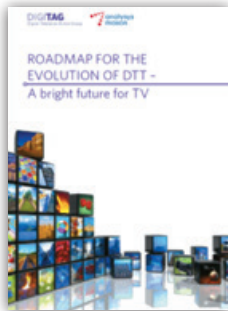
Takorn says that this was mainly the result of new quality programmes aired by major players Workpoint Creative TV, GMM Grammy's One channel and RS Channel 8. He anticipates that the average rate of advertising is likely to increase because of the growing audience base and new quality content. The viewership data excludes Channel 3, Channel 7 and Modernine TV which simulcast analogue TV programmes on the digital platform, added the report.

(ABU News)

Digital Broadcasting Update

1. New DigiTAG Report Defines Roadmap For Evolution of DTT

DigiTAG, in collaboration with Analysys Mason, has issued a new report to help benchmark technology evolutions on the Digital Terrestrial TV (DTT) platform in Europe. While nearly all countries have completed the migration of the terrestrial television platform from analogue to digital, considerations are now underway in many countries to adopt new DTT technologies that can better accommodate changes in viewing habits and spectrum usage.



DTT continues to be the primary television delivery platform for 43% of households across Europe, used by 250 million viewers. Coverage is widespread with most markets making the DTT platform available to 98% of the population. DTT is the only platform that provides a percentage of free-to-air services in all markets, while in many countries there is an extensive free-to-air offering. It ensures public service content to all viewers.

The report asserts that DTT will remain the pre-eminent television viewing platform in Europe for the foreseeable future. Until 2030 and beyond, television will be the leading medium for the majority of viewers to access video content. And, among the television delivery platforms, DTT is the only platform which currently provides universal coverage and free-to-air services. The report concludes that with the continued support of audiences and industry stakeholders, DTT has a bright future.

(DigiTAG)

2. HbbTV 2.0 Spec Released



The HbbTV Association has announced the release of a new HbbTV 2.0 specification. It paves the way for a new wave of consumer TV services based on advances including

companion device support, HTML5 user experiences and support for advanced video delivery features like Ultra HD and HEVC.

The association now expects that manufacturers, broadcasters, and operators will begin introducing a new generation of interactive broadcast and broadband TV services in 2016.

It adds that with HbbTV 2.0 consumers will be able to enjoy a wide range of new services. These include advanced user experiences based on HTML5; seamless viewing of video content across TV, smartphones, PCs and tablets; innovative companion applications that enhance the TV experience with detailed program info, voting, play to screen and other use cases; standardised delivery of Ultra HD content with HEVC; improved accessibility of services with better support for subtitles in multiple languages; access to broadcast content captured to local storage in the receiver; and support for consumer privacy.

(Broadbandtvnews)

3. ETSI Publishes RadioDNS as Technical Standard

RadioDNS Lookup Specification has been published as a European Telecommunications Standards Institute Standard, as of Jan. 19 2015.

RadioDNS called this a "milestone in establishing an open and interoperable ecosystem for hybrid radio globally." ETSI published it as a technical standard (TS 103 270), alongside standards such as DAB digital radio and DVB, thus promoting an "open and interoperable approach to hybrid radio," it said.



The specification for using DNS to link broadcast radio services with IP delivered services is the foundation of all RadioDNS applications and has existed since 2008.

The group said it expects that the functionality of RadioVIS and RadioEPG will also be integrated into ETSI standards

(Radiodns)

4. EBU Identifies Digital Success Factors

The Media Intelligence Service of the European Broadcasting Union has identified key factors for the successful deployment of European radio digitisation. Six months



OPERATING EUROVISION AND EURORADIO

of research concluded with the launch of a digital radio toolkit that illustrates real-life best practices for digital radio deployment in Europe: Norway, Switzerland and the United Kingdom.

The researchers identified 30 success factors ranging from institutional structure, policy and regulation, content and offer, technology, switchover process, public communications, consumer electronics and the car industry.

The report builds on the EBU's recommendation on Digital Radio Distribution in Europe (EBU R 138), which suggests the deployment primarily of DAB+ services and, if DAB coverage is not possible, the use of Digital Radio Mondiale as a broadcasting alternative.

(Radioworld)

5. OTT Video in Emerging Markets: SVoD and Hybrid Models to Lead the Way for Sustainable Growth



According to the report, the market for OTT video services is largely benefitting from rising investments in broadband infrastructure and improving network speed and performance, not only in developed economies, but also in emerging OTT video services markets.

The report indicates that apart from the two premium and widely-funded video feeds featured by OTT video services in emerging regions, there are a few paid models that are also gaining increasing focus. Of these, three content services provided by OTT video service providers are of great importance: transactional video on demand (TVoD), subscription video on demand (SVoD), and audio video on demand (AVoD).

Based on the findings of the report, the segment of SVoD will increase more than five times their current value during the report's forecast period in emerging markets. In China, the proliferation of hybrid models that combine SVoD services with AVoD services will provide a significant boost to the overall OTT video market.

SVoD and TVoD services will generate combined revenues worth US\$18.8 billion for the OTT video market of emerging regions between the years 2015 and 2019, 80% of which come from countries in Latin America and Asia-Pacific. Among the countries analyzed in the report, Russia, China, Mexico, and Brazil offer growth potential of the highest degree.

(prweb)

6. ATSC to Review Audio Proposals for 3.0 Standard

Dolby, DTS, Fraunhofer Alliance Submit Candidates

The Advanced Television Systems Committee announced that it has begun its technical review of three detailed proposals for a comprehensive audio system that will enable immersive audio, both in the home and on mobile devices via the ATSC 3.0 next-gen broadcast standard now in development. The ATSC 3.0 standard—which will not be backward-compatible with previous versions—is designed to take advantage of advances in IP and RF to provide advanced performance, functionality and efficiency.

The three audio proposals were submitted by Dolby, DTA and an alliance consisting of Fraunhofer, Qualcomm and Technicolor. Dolby says its proposal is based on the Dolby AC-4 next-generation emission codec. DTS is basing its proposal on the DTS:X codec. The proposal from the Fraunhofer/Qualcomm/Technicolor alliance is based on the MPEG-H Audio standard.

The three audio standards will be tested this summer with the goal to establish the ATSC 3.0 Audio Systems Candidate Standard by the fall.

(TVTechnology)

7. IEEE to Adopt the HDBaseT Standard for Ultra-High-Definition Digital Connectivity



The HDBaseT Alliance and IEEE announced the HDBaseT standard has been approved by the IEEE Standards Association (IEEE-SA) Standards Board for adoption as part of the organisation's standard portfolio.

HDBaseT is a technology for long-distance ultra-high definition distribution of digital media today, with hundreds of HDBaseT-certified products currently commercialised. It will complement IEEE-SA's portfolio of market-proven communications and technology standards. The HDBaseT standard will become IEEE 1911™ standard, once the adoption process is complete.

HDBaseT enables all-in-one transmission of ultra-high-definition video through a single 100m/328ft Cat6 cable, delivering uncompressed 4K video, audio, USB, Ethernet, control signals, and up to 100 watts of power. HDBaseT simplifies cabling, enhances ease-of-use, and accelerates deployment of ultra-high-definition connectivity solutions. The cost-effective LAN infrastructure and power transmission support also help reduce and simplify installation and electrical costs.

(IEEE)

Equipment Trends

1. Maxiva Compact High-Efficiency Digital TV Solutions



GatesAir displayed two new low-power TV platforms that address two distinct needs. The Maxiva Ultra-Compact series offers standalone low-power translator and on-channel gap filler solutions for UHF and High Band VHF stations across four power levels (30, 50, 80 and 130 watts). Ultra-Compact cuts the rack space requirements of its predecessor by 50 percent, delivering a broadband 1RU solution with exceptional performance and efficiency.

The Maxiva Multi-Compact series comprises high-density, 4RU 19-inch rack-mounted UHF and VHF transmission systems available in several configurations, including N+1, N+2, or N+1+M+1 redundancy. The innovative Multi-Compact series provides a single chassis to house up to eight separate 15 Watt transmitters, translators or on-channel gap fillers, and provides the most compact design available, along with multiple redundancy options and configurations. Maxiva Ultra-Compact and Multi-Compact series' are available for multiple DTV standards, including DVB-T/T2, ISDB-T/Tb and ATSC, with many input interfaces to ensure complete, interoperable solutions for any DTV network.

(GatesAir)

2. Micro-USB TV-Tuner for Android



Phone Not Included

D-Link has announced the availability of their micro-USB based TV Tuner, complete with Android app. Available for \$49.95 from the D-Link online store, the DWM-T100 provides live Digital TV (DVB-T) on your Android device essentially anywhere you go, TV Signal permitting. The dongle comes with a loop antenna allowing you to move around and 'get great reception on the go', but for superior signal reception, where available, you can use the F-Type antenna convertor to hook up to your homes existing antenna.

The provided app – D-Link TV Tuner – which is available free in Google Play, provides drivers for the device, as well as a host of features. The app allows you access to a full Electronic Program Guide, Time-Shift recording with the ability to pause and rewind live TV and record on a schedule or on-demand and Automatic TV Channel search. There is a minimum requirement for the TV-Tuner, with D-Link advising that a 1GHz Dual-Core processor with Android 4.0.3 or greater required to run it.

(D-Link)

3. 4K Ultra-High Definition displays and projectors



NEC Display Solutions Europe is set to deliver the broadest range of 4K Ultra-High Definition (UHD) displays and projectors with several additions to its portfolio. This product strategy reinforces NEC's leading role in creating leading visual applications and to continue the dedication to achieve the best visual experience.

Each boasting an impressive 4K UHD resolution, a new large venue projector (PH1201QL; 4,096x2,160 resolution) as well as an 84-inch (MultiSync® X841UHD) and a 98-inch (MultiSync® X981UHD) large format display with 3,840x2,160 resolution will join NEC's recently launched 4K UHD MultiSync® EA244UHD monitor.

The PH1201QL is the world's first compact 4K laser projector and is ideal for large venue installations. While the X841UHD and X981UHD large format displays set a landmark in image size and quality that is guaranteed to capture the undivided attention of the audience.

(nec-display-solutions)

4. Small to Midsize Digital Video Router

Imagine Communications introduced the Platinum™ VX digital video router at CABSAT 2015. Supporting matrix sizes up to 288x288, the Platinum VX small to midsize routers represents the industry's latest innovation in category-leading density, reliability and fully redundant HD/SDI routing up to 3 Gb/s.



Supporting 24/7 video operations and manufactured with robust mechanical design, straightforward architecture and a small footprint, Platinum VX routers are well-suited to network, local broadcaster, mobile production, cable, telco, military, government and corporate applications – environments that require routing of a large number of signals.

(imaginecommunications)

5. New Ui Series Digital Mixers



Providing the unprecedented ability to mix audio from any Wi-Fi connected device in any location, HARMAN's Soundcraft introduced the new Ui Series of remote-controlled digital mixers. The Ui12 and Ui16 each feature an integrated, onboard Wi-Fi router and can be controlled via a tablet, PC or smartphone.

The Ui Series mixers feature cross-platform compatibility with iOS, Android, Windows, Mac OS, and Linux devices, and can use up to 10 control devices simultaneously. In addition, the Ui12 and Ui16 each feature built-in HARMAN signal processing from dbx, DigiTech and Lexicon, including dbx AFS2, DigiTech Amp Modeling, and more. Both models feature fully recallable and remote-controlled mic gain and phantom power, along with 4-band parametric EQ, high-pass filter, compressor, de-esser and noise gate on input channels.

Both mixers offer 31-band graphic EQ, noise gate and compressor on all outputs, plus real-time frequency analyser (RTA) on inputs and outputs. Built in are three dedicated Lexicon FX busses: Reverb, Delay and Chorus. In addition, mixer controls include Subgroups, Mute groups and View groups, among others. Both mixers also offer independent network interfaces on board for simultaneous control by Wi-Fi and Ethernet, plus a floor-ready rugged chassis for live applications.

(soundcraft)

6. Nautel adds two new transmitters

Nautel has introduced two new NX Series AM transmitters, the NX5 and NX10. Operating at 5 and 10 kW of analogue power, these two transmitters bring high efficiency (86% AC to RF) and a large suite of operational features to mid-power AM operations.

As with other NX Series transmitters, the NX5 and NX10 feature:



- AM precorrection with unmatched linearity
- 1.8 MHz direct digital modulation
- 100% remote web access to the user interface
- RF spectrum analyser displays spectral performance
- Smith chart displays complex antenna impedance under normal modulation in
- MDCL is included for up to 30% additional power savings; 5 algorithms are
- Analogue, HD Radio and DRM models available.

Nautel's signature Advanced User Interface is standard in the NX5 and NX10 and is locally or remotely accessible via a web browser. The AUI's functionality includes built-in commercial grade instrumentation, full remote access; SNMP support; an instrument-grade spectrum analyser and network analyzer; real-time MER (Modulation Error Ratio) measurement; comprehensive monitoring and control including event logging; email and SMS notifications; backup audio via streaming and USB playout; presets and enhanced support services including Nautel Phone Home.

(nautel)

7. "Plug and Play" Camera Control System for Wireless Camera Transmitters



Acorn Technologies have signed a partnership arrangement with Broadcast Electronics Ltd to bring to market a new camera control system for wireless camera transmitters.

The new BEL Z24 system is the first 'plug and play' control system with integrated tally support, just connect the cameras remote output to the camera interface unit, power on and the system is operational. The system works in the license free 2.4GHz band so there are no operating costs involved for a frequency license and no complicated set up for the camera operator. Using FHSS (Frequency Hopping Spread Spectrum) wireless technology the system actively avoids interference resulting in no loss of signal and so delivering an extremely robust connection whatever the environment.

The base unit is equally quick to set up and the unit interfaces with the camera manufactures OCP (Paint) control panel supporting full bidirectional control of the camera as with wired systems. The system is fully compatible with any camera back video transmitter and has been designed to be small enough to be mounted anywhere on the camera or Steadicam rig.

(AcornTechnologies)

Personalities & Post



Kyaw Zaw Lin
Returns to Yangon

The Technology Department has said farewell to Kyaw Zaw Lin, who has completed three years on secondment to the ABU as Specialist Engineer.

Kyaw Zaw Lin joined the ABU Technology in March 2012. During his three years at the Secretariat, he was actively involved in organising Technical Advisory Service missions to several Asian and Pacific countries, and was involved in a number of regional workshops and conferences. These included a Digital Broadcasting Conference for Asian Broadcasters staged by Forever Group and the ABU in Yangon in 2012.

Kyaw's main assignment was organising the Technology Webinar Festivals which he did in 2012, 2013 and 2014. The month-long festival is offered free of charge to anyone interested in broadcast technology.

At the ABU's annual Digital Broadcasting Symposium, Kyaw tackled everything from organising the workshops, seeing to the needs of exhibitors and organising the popular lucky draw programme.

His secondment was due to end on 28 February but he extended it by a week to help with DBS 2015.

He returned to his home organisation, Myanmar's Forever Group, in March 2015.

Throughout his secondment, Kyaw Zaw Lin was a valuable team player and those who worked with him wish him every success in the future.



Doo-Hyung Kang
KBS Appoints New TLO

Mr Doo-Hyung Kang is the new ABU Technical Liaison Officer for KBS-Korea. A Senior Engineer, Mr Kang joined KBS after majoring in Electronic Engineering at university. He worked at the Gimje Transmission Station which specialises in shortwave broadcasting. He was responsible for maintaining shortwave and medium wave transmitters and took charge of a project to construct seven new shortwave transmitters. Mr Kang later moved to a position in the Technology Management Department. The ABU wishes to thank the outgoing TLO, Mr Seon Wong Kim, for his valuable contributions.



Robin Kim
Changes in ABU Technical Bureau

Mr Robin Kim, Myung Nam, Manager, Technology Management Department, Korean Broadcasting System has replaced Mr Seon Wong Kim on the ABU Technical Bureau. Mr Robin Kim has worked at KBS for 23 years. We are grateful for Mr Seon Wong Kim's contributions these past few years and are pleased to welcome Mr Robin Kim to the Bureau.

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