



Technology Webinars: Reaching out to members through Online Activities



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Wishing that everyone is well and safe during this difficult time. The pandemic has derailed a lot of our activities, as it has for many others. Given the difficulties and assessing the situation we have decided to publish only an e-version of this magazine until next year. So you will not be receiving a printed copy of the TR for this year. We will assess the situation early next year again and decide on how we proceed.

With the kind support of our members we are able to bring to you two feature articles in this edition. The first one titled “Standardization Activities for Next-Generation Video Coding” has been contributed by NHK’s Research Laboratory and looks into the progress on the next generation video coding system called Versatile Video Coding (VVC) Technology. It describes the R&D activities and contributions by NHK labs in this effort and the technical details. The second article titled “Indigenous News Automation Software at DDK Chennai”, contributed by DD India, discusses their approach to developing an in-house NRCS, its workflow and automation system.

Most of our activities have now been converted to online sessions. ABU Technology have organised over 25 webinar sessions on multiple topics since April this year. You will see reports on most of these webinar sessions within the pages inside. We have had a very good response to these sessions and will be holding more in the coming months. We would like to thank all our contributors and partners for their immense support in organising these.

This edition concludes with our regular highlights on industry news, digital updates and the latest in equipment trends. We hope you will benefit from the information and materials included herein. Stay safe and take care.

Ahmed Nadeem
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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.

The ABU Technical Review is published in March, June, September and December of each year.

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Subscription rates (annual, 4 issues): Asia-Pacific US\$40.00; the rest of the world US\$45.00. Advertising and Editorial offices at Kuala Lumpur.

Published by
Ahmed Nadeem
ABU Technology

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Design & Layout by: **The Vermillion Trading**
Printed by: **Kinta Premier Print Sdn Bhd**
30 Jalan Nadchatiram, Taman Taynton View Cheras, 56000 Kuala Lumpur, Malaysia
Tel: (60-3) 9133 2828 Fax: (60-3) 9133 2323

Standardization Activities for Next-Generation Video Coding

by Atsuro Ichigaya, NHK-STRL

Video coding technology has evolved and progressed along with the development of video signal recording media and video transmission technology. To achieve efficient coding of 4K/8K ultra-high definition TV (UHDTV) video, the new High-Efficiency Video Coding (HEVC) international video coding system was standardized by the International Organization for Standardization (ISO), the Joint Technology Committee of the International Electrotechnical Commission (IEC), and the International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) in 2013. Our laboratories have also been participating in those standardization activities and moving forward with R&D on implementing UHDTV, which we call Super Hi-Vision Broadcasting. The world's first 4K/8K Super Hi-Vision satellite broadcasting service began in December 2018. Even further improvement of coding efficiency is required to implement Super Hi-Vision terrestrial broadcasting, which provides limited transmission capacity compared with satellite broadcasting. In addition to advancing R&D aimed at improving coding efficiency, our laboratories are participating in international standardization activities and promoting standardization of the next-generation video coding system. This report describes our efforts and explains the technical trends in Versatile Video Coding (VVC) technology, for which standardization as a higher-performance video coding system has begun by international standardization organizations.

1. Super Hi-Vision broadcasting and video coding systems

We have been conducting R&D on video coding systems for implementing 8K Super Hi-Vision broadcasting. Because the 8K Super Hi-Vision (referred to simply as 8K below) video signal carries an extremely large amount of information (16 times the number of pixels as the conventional high-definition TV), it has been difficult to implement 8K broadcasting with conventional coding methods. In response to the development of the UHDTV video system, we developed a coding system based on MPEG2 (ISO/IEC 13818-2|Rec. ITU-T H.262) and Advanced Video Coding (AVC) (ISO/IEC 14496-10|Rec. ITU-T H.264). However, both MPEG-2 and AVC were developed for high-definition video (2K), so we began the development of a coding system for 8K in 2009.

At that time, the international standardization organizations were also studying the development of a video coding system that greatly exceeded the existing coding systems out of concern for network congestion that was associated with the widespread use of network video distribution services. For that reason, we participated in the standardization of HEVC as a step toward implementing the first video coding system that supports 8K, including our work on a system that covers up to 8K (120 Hz frame frequency) as a target coding format.

Standardization of the basic HEVC coding system was completed

as ISO/IEC 23008-2 and ITU-T Rec. H.265. HEVC has been confirmed to have at least twice the compression performance of AVC for 4K video, and was one of key technologies for success of the new 4K/8K satellite broadcasting service that began in December 2018. In that service, HEVC features a “time-scalable” function to provide backward compatibility for broadcasting at high frame frequencies in addition to excellent video compression performance. The time-scalable function enables video playback at a low frame frequency by extracting only parts of a signal that was encoded at a high frame frequency. Although the maximum frame frequency of 8K is 120 Hz (120 images displayed per second), the frame rate for many of the ordinary video signals that are currently in use, including the new 4K/8K satellite broadcasting, is 60 Hz. For that reason, TV receivers that are currently in wide use generally support 60 Hz display, but do not support 120 Hz display. Without the time-scalable function, receivers that support only 60 Hz signals will not be able to display future broadcasting at 120 Hz unless an external converter is used.

When HEVC is used, however, the time-scalable function makes it possible to display extracted 60 Hz video out of 120 Hz program without problem, even on a receiver that supports only 60 Hz display. In that way, future high-performance 120 Hz broadcasting services can be viewed at 120 Hz by users that have high-performance receivers and at 60 Hz without

additional equipment by viewers who do not have such receivers.

HEVC is thus a coding system that is suitable for 4K/8K broadcasting. For the new 4K/8K satellite broadcasting, a system that has a time-scalable function that provides compatibility with 120 Hz broadcasting has been adopted, and we have developed a codec system that enables reception of both 120 Hz and 60 Hz signals for the first time in the world.

In addition to the video compression performance and time-scalable function provided by HEVC, implementation of the new 4K/8K satellite broadcasting requires the ability to transmit large volumes of data. In future work, further improvement of video compression efficiency is required to implement Super Hi-Vision for terrestrial broadcasting, which provides limited radio resources.

2. Trends in standardization of the next-generation video coding system

2.1 Requirements of the new coding system

Since standardization in 2013, the extension of HEVC for computer graphics (CG) video signals, e.g. games, graphical user interfaces (GUIs) and so on, known as screen contents has advanced in response to demand from industry. That process required extension of the video format to include high dynamic range (HDR) and 360° video because of the standardized new video format for HDR and widespread use of head-mounted displays (HMD). Because basic HEVC had already been standardized and already had good compression ability, only the additional technologies based on the signals for identifying the video format and supplemental enhancement information and the straight forward extension due to file format difference, e.g. from 4:2:0 to 4:2:2 and/or 4:4:4, from

YCbCr to RGB and so on, was standardized at that point, and the coding processing related to the extension was left as an issue for the next-generation video coding system.

The fifth-generation mobile communication system (5G) is attracting attention as a technical innovation that involves video media. 5G extends beyond smart phones to include transmission between various types of devices over network connections. It is capable of achieving transmission speeds that are 10 or 20 times as fast as the current mainstream 4G system. Practical use of 5G in Japan is scheduled to begin in about 2020, and distribution of 4K/8K video is assumed to be grown as a main service. Although 5G can provide excellent transmission quality, it is assumed that transmission capacity will be shared among multiple users and multiple items of content will be transmitted, so transmission of 4K/8K video will require even greater video compression performance than that provided by HEVC.

In response to the situation described above, the Joint Video Exploration Team (JVET) was established in 2015 to investigate the requirements of the next-generation video coding system and explore technical support issues.

Assuming application of the next-generation video encoding system in around 2020, about 10 years after the standardization of HEVC, JVET has solicited requirements for the future coding system from a wide range of industrial concerns. In addition to the functions required of previous coding methods, the functions listed below were requested.

- Further optimization for high-definition video, including HDR
- Suitability for streaming applications with non-

realtime coding as well as for broadcasting, where real-time performance is important

- Accommodation of new video systems that use 360° video, augmented reality (AR), and virtual reality (VR)
- Improvement of encoding efficiency by at least 30% relative to HEVC (50% for special applications such as CG)

We are also participating in the planning of the next-generation video coding system for implementing Super Hi-Vision terrestrial broadcasting, beginning with the stage of formulating requirements. In addition to reporting improvements on HEVC and proposing technology for improvements, we are also actively contributing to the standardization process by providing videos in the Hybrid Log-Gamma HDR format for evaluating technologies used to support HDR, which is one of the issues for the next-generation coding system. We are also making technical contributions such as evaluation testing related to HDR in response to Calls for Evidence (CfE) put forth to determine the technical feasibility of a system that satisfies the requirements. The feasibility of a new-generation video coding system that satisfies the requirements described above was confirmed by a CfE in July 2017.

As a result, MPEG and VCEG decided to begin collaboration on the standardization of the next-generation video coding system in April 2018.

Prior to that, a call for proposals (CfP) had been issued in October 2017, and technical proposals for the next-generation video coding system were widely solicited.

2.2 Versatile Video Coding (VVC) standardization process and schedule

With the shifting of standardization activities from the exploration

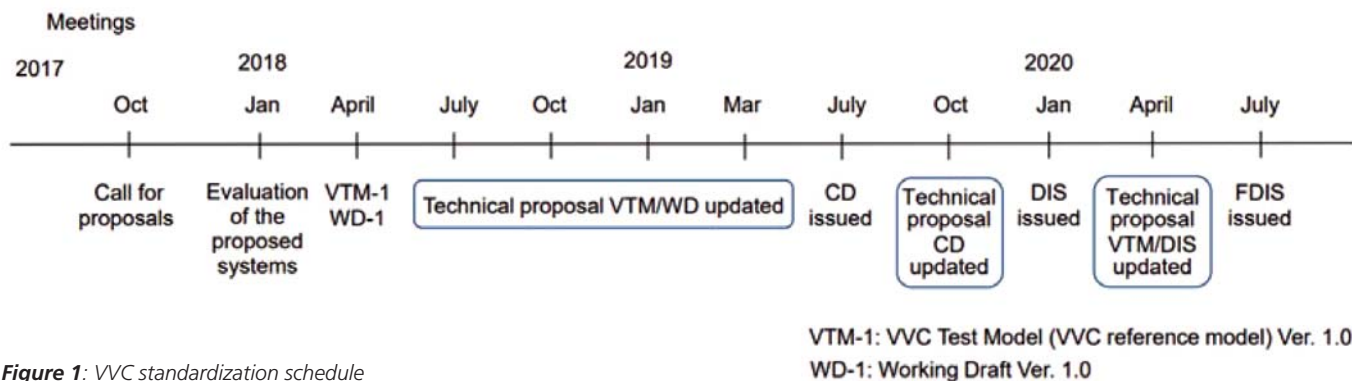


Figure 1: VVC standardization schedule

phase to the standardization phase, the Joint Video Exploration Team (JVET) was renamed the Joint Video Experts Team, and collaboration by a team of experts to standardize the next-generation video coding system was begun. Along with the transition to the standardization phase, the name for the next-generation coding system was named Versatile Video Coding (VVC).

Standardization by MPEG, an organization under ISO/ IEC, generally involves a number of voting processes before an international standard is issued, thus raising the quality of standard systems. At the beginning of the standardization process, the Working Group (e.g. MPEG (WG11)) starts work on preparing a Working Draft (WD) to serve as the draft of the standard. After several meetings have been held to produce a mature draft, a Committee Draft (CD) is subjected to a vote by the members of the Subcommittee (SC 29). If approved, the CD is registered as a Draft International Standard (DIS). The DIS is then subjected to a vote by all members who are participating in ISO/IEC (DIS vote). If approved, the DIS is registered as a Final Draft International Standard (FDIS). If the FDIS is then approved in an FDIS vote, it is issued as an International Standard (IS). A major difference between the FDIS vote and the other votes is that the FDIS cannot be modified. For that reason, the FDIS vote can be omitted if the result of the DIS vote

is approved without modification comments.

Taking those processes into account, the schedule is to complete the standardization of VVC within the 5G diffusion period, with the goals of issuing a CD in July 2019, a DIS in October 2019, and an FDIS in July 2020 (*Fig. 1*).

At the time of this writing, the working draft (WDA) is being revised and the VTM (VVC Test Model) standard reference software model is being revised to the seven edition.

2.3 Overview of VVC

The basic configuration of VVC was based on 22 proposed schemes that were submitted in response to the call for proposals, including our proposal. Analysis of the proposals revealed that all of the 22 proposals were based on conventional coding systems such as HEVC, but differed in the degree of improvement of elemental techniques classified as the structure of the coding block and intra-image prediction, inter-image prediction (motion compensation), orthogonal transformation, quantization, loop filter, and entropy coding/decoding.

Because nearly all of the proposals achieved much higher performance than that provided by HEVC, it was decided to retain the basic configuration of the existing coding system for VVC

and to improve the constituent techniques. The characteristic technical improvements of each elemental technique are described below.

(1) Coding block

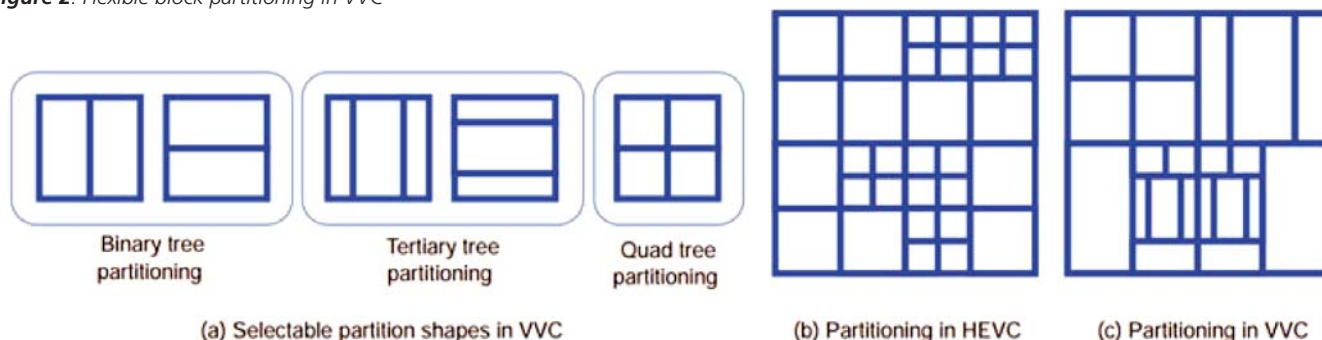
Conventional coding methods divide the image into rectangles to serve as coding blocks. That enables coding processing that is suitable for local pattern features, thus improving coding efficiency. The HEVC coding block is configured with hierarchical quad tree partitioning (division into four parts vertically and horizontally), and flexible coding processing is achieved by using coding blocks of different sizes.

In VVC, it is possible to hierarchically choose either binary tree partitioning that divides the block horizontally or vertically into two partitions or ternary tree partitioning that divides the block horizontally or vertically into three partitions (*Fig. 2a*) in addition to quad tree partitioning. That provides the advantage of more flexibility in the block division shape (*Fig. 2c*). The maximum block has also been increased to 128 by 128 pixels from the 64 by 64 pixel size of HEVC, thus improving coding efficiency, particularly for high-resolution video.

(2) Intra-image prediction

As described in item (1) above, video coding involves division of the original image into units of coding blocks on which the coding processing is applied. Basically,

Figure 2: Flexible block partitioning in VVC



processing begins with the coding block in the upper left corner of the image and proceeds through the blocks in order to the block in the lower right corner. When the coding processing for one block is completed, the result is used in the processing of the next block, so that the block is sequentially decoded. Thus, the blocks that are located to the left and above the block that is currently being encoded are decoded and used in the encoding of the current block. Intra-image prediction is the process of predicting the signal of the block being encoded from the signal of the decoded blocks (referred to as the reference signal). HEVC provides 35 signal prediction modes, and the optimal prediction mode is selected for each block.

VVC increases the number of prediction modes to 67 to achieve even higher prediction accuracy. Another feature is that VVC uses color component prediction for general application, whereas HEVC uses it as a prediction method only for special applications.

In color component prediction, the luminance signal is encoded before the color difference signal is encoded so that the decoded luminance signal is used for linear prediction of the color difference signal for the same region (**Fig. 3**). In **Fig. 3**, $RecY'$ is the decoded luminance signal, $PredCb$ is the color difference signal Cb predicted from $RecY'$, and $PredCr$ is the color signal Cr predicted from $RecY'$.

Prediction is effective when the correlation of the luminance signal and the color difference signal is high.

(3) Inter-image prediction (motion compensation)

Video that is continuous in the time direction is encoded in units of frames. The process of using the decoded frame signal to predict the block to be encoded is referred to as inter-image prediction. Assuming translation motion of the subject (parallel motion), frames that are near in time distance contain areas that can predict the block to be encoded

with high probability, so a vector that indicates the location of the region (referred to as the motion vector) is encoded. HEVC applies the property that the movements of adjacent regions are similar and uses the motion vectors of multiple blocks that have been decoded as the predicted motion vectors of blocks that are to be encoded. Efficient transmission of motion vector information is then achieved by encoding only the difference between the actual motion vector and predicted motion vector.

When the motion of a subject is rotation, however, it is difficult to predict locomotion within a block with a single motion vector, and the difficulty of efficient coding with existing coding methods is a known problem. To address that problem, VVC adds a mode for using the motion vectors of surrounding blocks to calculate a motion vector for each small region (sub-block) of the target block (**Fig. 4**). That approach enables the accurate prediction of motions such as rotation and

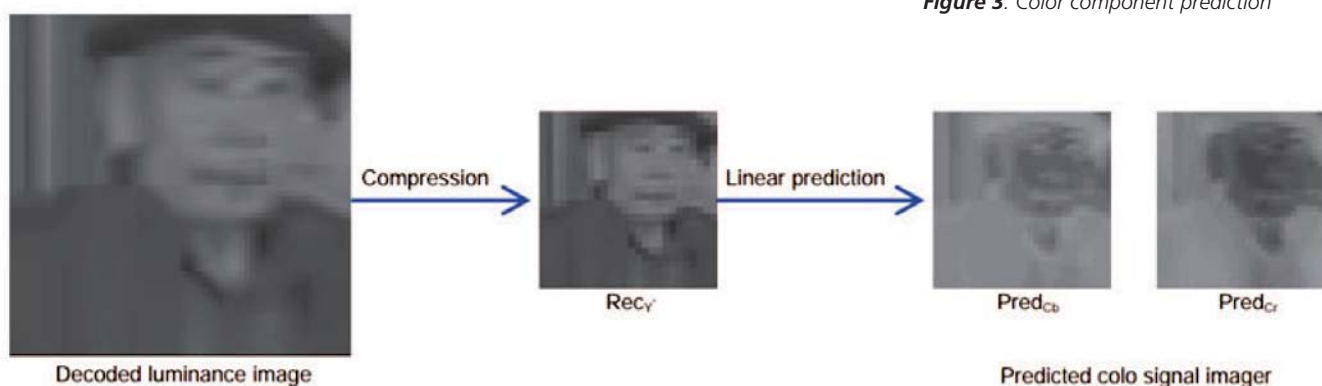


Figure 3: Color component prediction

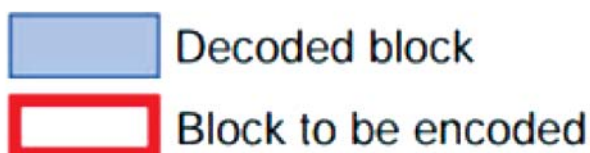
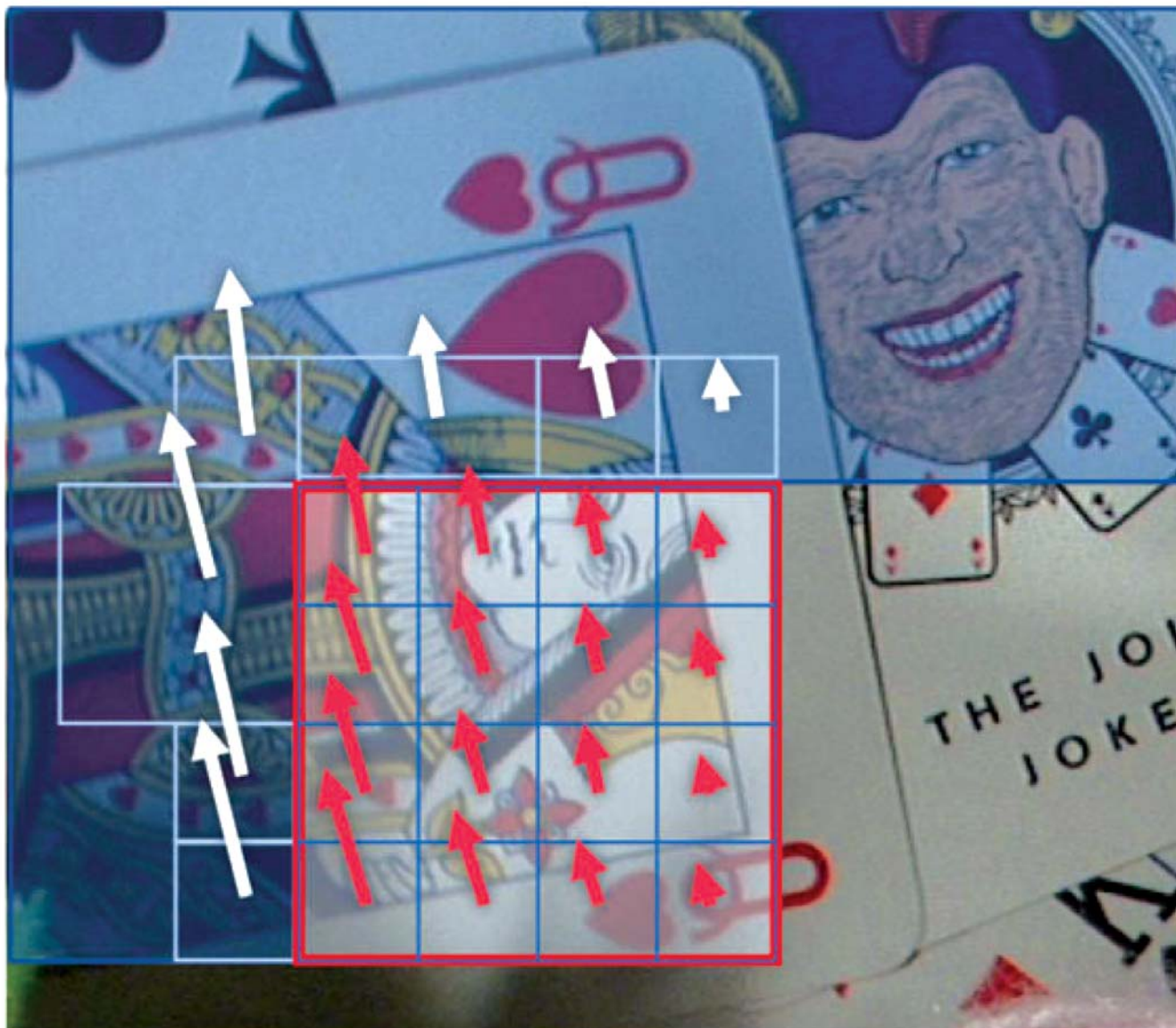


Figure 4: Calculation of small-region motion vector in VVC

zoom, which cannot be predicted by conventional inter-image prediction with the translation motion assumption. It is called affine motion prediction.

As described above, efficient prediction using decoded frames that are near in time distance is possible in images where subjects move with translation motion. With bidirectional prediction, the block to be encoded is predicted from two decoded frames (reference images), and the correlation between the two decoded regions used for predictive image generation is high. In actual practice, however, strict translation motion is rare, and

there are often slight differences in the motion in the local regions of the coding block. To deal with that phenomenon, VVC uses gradients of surrounding pixel values to correct the motion vectors for regions of low correlation and improve the accuracy of inter-image prediction.

(4) Orthogonal transformation

Efficient signal prediction can be achieved with the intra-image and inter-image prediction methods described above, but a residual signal error remains. Multiple two-dimensional orthogonal transform are used for encoding the residual signal. Orthogonal transformation is used for the

frequency transformation of the residue between the signals predicted by intra-image and inter-image prediction in the original signal. That improves coding efficiency by focusing on the orthogonal transform coefficient that characterizes the signal.

Most existing methods use a single type of orthogonal transform, but HEVC allows a selection of transforms that have up to two types of transform or no orthogonal transform at all. VVC, on the other hand, provides three types of orthogonal transforms that can be selected according to the distribution characteristics of the residual signal and no orthogonal

transform. This selectability further improves coding efficiency.

(5) Quantization

Coefficient quantization is performed to reduce the coefficient information that is obtained by orthogonal transformation. In conventional coding methods, the degree of quantization can be changed for each coefficient position of the two-dimensional orthogonal transform, and a quantizer that has a single type of input/output characteristic is used. VVC, on the other hand, allows adaptive switching of quantizers that have two types of input/output characteristics according to the values of adjacent coefficients. The result is adaptive quantization with little quantization error and no increase in the amount of code.

(6) Loop filter

A loop filter improves the subjective quality of the decoded signal by reducing the characteristic signal degradation produced by the encoding process. It is called a loop filter because it is reused in the processing loop for encoding the filtered signal.

In video coding systems where encoding is processed in units of blocks, the encoding quality is set for each block. The difference in quality between blocks may be visually noticeable at block boundaries, so a deblocking filter is used to reduce the quality difference at block boundaries. In HEVC, subjective quality is improved by controlling the strength of the filter according to the differences in the prediction mode and the quantization parameters of surrounding blocks.

Control of the filter according to the luminance signal value was added in VVC, because the noticeability of visual degradation depends on the difference in luminance values named as Luma adaptive filter. Also, post-processing filters for edge features and pixel value

trends for each small region are provided, and filter sets that are suitable for improving image quality can be selected.

Previously, such post-processing filters have been applied only to the final output image, but, because the filtering improves prediction efficiency to a remarkable extent, it is adopted as a loop filter in the encoding processing in VVC named as sample adaptive offset (SAO) and adaptive loop filter (ALF). (SAO is also used in HEVC.)

(7) Entropy coding/decoding

Context Adaptive Binary Arithmetic Coding (CABAC) is used for the lossless encoding of the prediction mode and transform coefficients, etc. In CABAC, a state transition model is used to estimate the probability distribution of the value of the next signal based on the value of the current signal being encoded. HEVC uses a single simple state transition model for estimating the probability distribution, but VVC adopts two types of state transition models to improve estimation accuracy and increase coding efficiency.

The description of elemental technologies presented above is based on the WD that was current at the time of this writing. Whether or not it is adopted as the final standard depends on future standardization trends.

Also, unlike academic research, the process of standardizing coding methods strongly emphasizes practical application. In addition to performance, whether or not the technology is suitable for implementation is an important factor for technical proposals for standardization.

2.4 Coding performance

The standardization of VVC is advancing toward the goal of issuing FDIS in 2020. Ideally, products are expected to appear on the market at the time a standard

is established, and issues related to the implementation of the actual architecture are considered very carefully in the discussions that are part of the standardization process. Also, evaluation of VVC coding performance includes the processing load of the encoder and the decoder in addition to the compression ratio. In the same way as for TV receivers, important requirements for decoders are low cost, low power consumption, and suitability for mass production.

For the evaluation of those performance aspects, JVET solicits test video material from a wide range of sources and defines Common Test Sequences (CTS) for technical proposals. Common Test Conditions (CTC) that define coding conditions (standard VTM parameter settings) to serve as uniform condition for the evaluation of coding performance are also defined.

Our laboratories contribute to the development of common test conditions by providing test videos for improving VVC performance in broadcasting applications. Technical proposals are required to show performance improvement relative to existing techniques with objective criterion using the CTS and CTC, and confirmation with subjective image tests may also be required as needed.

At the time of this writing, revision of the VTM and WD had advanced to the fourth edition. Evaluation based on VTM-4 revealed a 30% or more improvement in encoding efficiency relative to HEVC and an increase in decoder processing load of 70% or less, so early entry of products to the market is expected.

2.5 Plans for the future

The technical specifications of the next-generation video coding system that are being promoted by JVET have been outlined in the CD of July 2019.

Future improvements will focus on practical improvements rather than new technical proposals. Further discussion will center around a "profile" that defines a set of elemental encoding techniques based on application and "levels" that define the calculation performance required of receivers.

Our laboratories will continue to contribute to standardization by confirming the performance of each elemental technology with broadcast video materials and analyzing the effects on processing load to establish provisions that are suitable for broadcasting applications.

3. Conclusion

We have described trends in the standardization activities at the stage of WD-4 for the VVC next-generation coding method being conducted jointly by the

MPEG and VCEG international standardization organizations.

At the time of this writing, coding efficiency has been improved by more than 30% relative to HEVC, and the increase in processing load of the decoder has been suppressed to less than twice that of HEVC. The standardization process is steadily moving forward for VVC as a practical coding system. That is because JVET has participants from organizations in many fields, and there is a stringent combination of requirements from coding system users and manufacturers of coding devices and receivers.

As a user participant, our laboratories will also continue to contribute to the standardization of a practical system towards the implementation of Super Hi-Vision terrestrial broadcasting.



Atsuro Ichigaya received the B.E. degree in engineering systems, and the M.E. degree in science and engineering from the University of Tsukuba, Japan, in 1996 and 1998, respectively. In 1998, he joined NHK and has been with NHK Science and Technology Research Laboratories, since 2000. He is in charge of research and development of video monitoring systems and UHDTV video coding. He is a member of VRSJ, IEICE, and ITE Japan. ■

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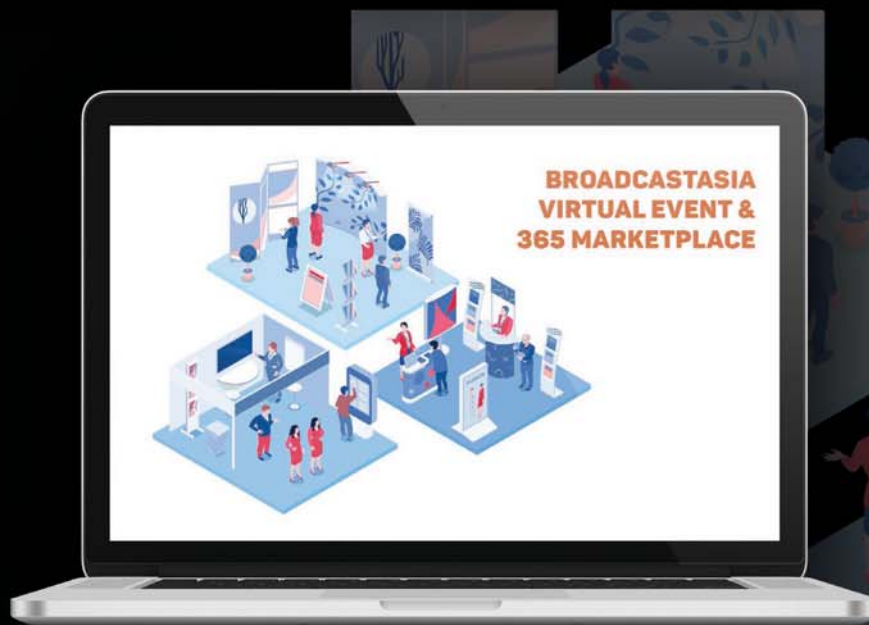
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Indigenous News Automation Software at DDK Chennai

The need for indigenous news automation software had been felt strongly at DDK Chennai since 2016, due to the age old news scripting software which only ran on WinXP with no support available from the OEM.

With our previous experience of developing a video server and sports application, we decided to develop a full-fledged News Automation software in-house.

The modules of News Automation are:

1. NRCS Software
 - News ID or Run Order Manager
 - Script Archive and Search
 - Slug and Script Editor in Clients
 - Video Tagging
 - Graphics Overlay on Visuals
 - News Scroll
 - Wire Services Clients (PTI, UNI)
 - User Managements
2. Prompter Software
 - Main Prompter Software
 - Scroll interface
3. News Playback Software
4. Graphics Play out Software
5. Data base and IIS server with redundancy

NRCS (News Room Computer System)

The NRCS, meant for managing the entire news process from writing the script to prompter presentation level, was completely integrated into our software. It has features of users/ privileges etc.

Users	Rights
News Editor	Scripting of News and Graphics overlay, Script Correction / Deletion/ Dropping, News ordering, Preview of visuals / Graphics, etc.
News writer	Scripting of News and Graphics overlay, Script Correction/ Deletion, News ordering, Preview of visuals, etc.
News Producer	Script Viewing, News Dropping, Preview of visuals, etc.
News Video Editor	Script Viewing, Video Tagging, Preview of visuals, etc.

The entire NRCS software developed with asp.net, jquery, and open source My SQL. Redundancy and backup are hallmarks of our news automation system.

As all the modules were developed indigenously, there is no limitation of license and any number of clients/ prompters can be added to the system.

News ID or Run Order Manager

The functional requirement of any newsroom is to schedule and manage the number of bulletins. In this manager, one can add or delete the News ID or change its order. This will facilitate the calculation and management the script length and time requirement, so that the bulletin ends on-time.

Script Archive and Search

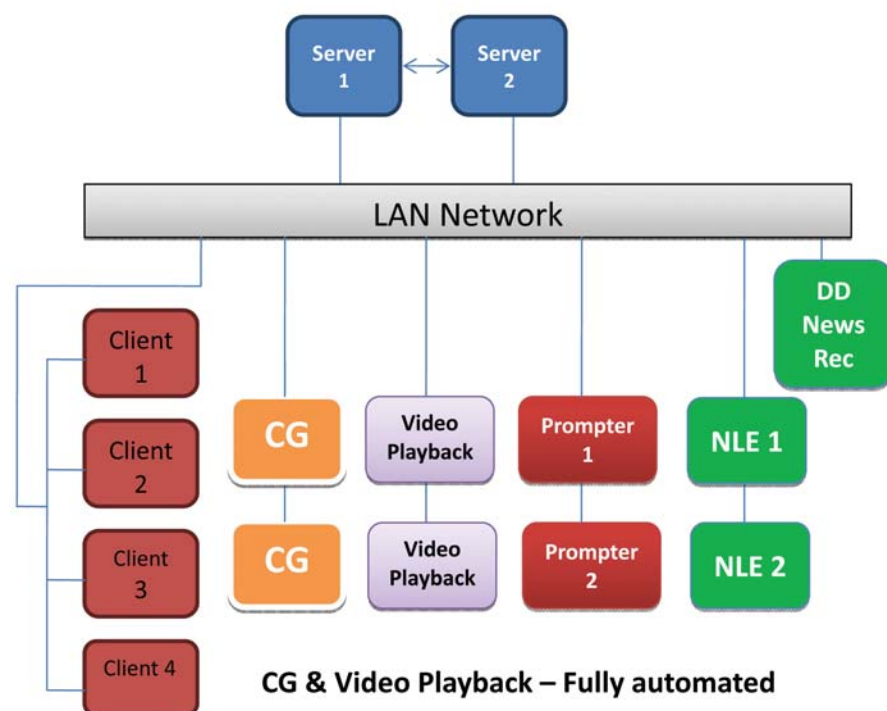
This will facilitate the archiving of the script at the end of the bulletin for future reference. The archived scripts are stored in a MySQL database in the Unicode format.

The search facility also provides several parameters. One can search the archived scripts using any word by date or by bulletin etc.

Slug and Script Editor in Clients

Slug editor used for making new/ modifying/delete slugs for every bulletin.

Script editor is used for scripting the detailed story on each slug. Word Count and read time is instantaneously displayed. A printing facility with word count and last update time is available within the editor. Undo and Redo functions are also available.



The screenshot displays the DD Script NewsApp interface. The top navigation bar includes links for DD Script, Home, NEWS, Video, and Wire Services. The main content area is divided into two sections. On the left, a table lists news items with columns for RO, Slug Name, Source, Insert, Video Dur, Lock, On Air, Typing, Script, and Word Count. The table contains 20 rows of news items, including 'OPENING MONTAGE', 'HEAD LINES', 'PM ADDRESSES', 'MALDIVES CONFER', 'PM & MALDIVIAN PREZ', 'INDIA-MALDIVES MOU's', 'PM TO VISIT SRI LANKA', 'MIN. JAVADEKAR', 'VP CONCERNED', 'GOVT. NOTIFIES', 'IAF ANNOUNCES REWARD', 'NEWS SNIPPETS', 'VELICHAM PROMO', 'FOREIGN MONTAGE', 'TRUMP DEFERS', 'US AGREES TO SELL', 'US GIVES TURKEY', 'TALIBAN ATTACKS', 'SRI LANKA', and 'SPORTS MONTAGE'. On the right, a video player shows a news segment with a Tamil overlay. The overlay text reads: 'மனித குலத்திற்கு பெரும் அச்சுறுத்தலாக உள்ள பயங்கரவாதத்தை ஒழிக்க சர்வதேச அளவில் ஒப்பந்தம் மேற்கொள்ளப்பட வேண்டுமென பிரதமர் மோதி வலியுறுத்தியுள்ளார். அண்மையில் நடைபெற்று முடிந்த மக்களவைத் தேர்தலில் அமோக வெற்றி பெற்று இரண்டாவது முறையாக பிரதமராக பொறுப்பேற்றுள்ள பிரதமர் நரேந்திர மோதி, முதல் வெளிநாட்டுப் பயணமாக நேற்று மாலத்தீவுக்கு சென்றார். அவருக்கு அங்கு சிறப்பான வரவேற்பு அளிக்கப்பட்டது. அந்நாட்டு தலைநகர் மாலியில் உள்ள சர்வதேச விமான நிலையத்தில் பிரதமர் மோதியை மாலத்தீவு வெளியுறவு அமைச்சர் அப்துல்லா ஷாஹித் வரவேற்றார். பின்னர் குடியரசு மாளிகைக்கு சென்ற பிரதமரை மாலத்தீவு அதிபர் இப்ராஹிம் முகமது சோலி அன்போடு வரவேற்றார். தொடர்ந்து அந்நாட்டு பாதுகாப்புப் படை வரர்களின் அணியை மரியாதையை பிரதமர் மோதி ஏற்றுக்கொண்டார். இதையடுத்து மாலத்தீவு நாடாளுமன்றத்தில் உரையாற்றிய பிரதமர் மோதி, பருவநிலை மாற்றம், பயங்கரவாதம் போன்றவற்றை எதிர்கொள்ள உலக நாடுகள் ஒன்றிணைந்து மாநாடு ஒன்றை நடத்த வேண்டும் என்றும், அதில் இதனை எதிர்கொள்வதற்கான விரிவான திட்டங்களை வகுக்க வேண்டும் என்றும், வலியுறுத்தினார். இந்திய பசிபிக் பிராந்தியத்தில் அமைதியை மற்றும் வளர்ச்சியை மேம்படுத்தவும், பயங்கரவாதத்தை ஒழிக்கவும், மாலத்தீவு இந்தியாவுடன் இணைந்து செயல்பட வேண்டுமென பிரதமர் மோதி கேட்டுக்கொண்டார். மேலும் கல்வி, சுகாதாரம் உள்ளிட்ட பல்வேறு துறைகளில் இருநாடுகளும் இணைந்து செயல்பட வேண்டும் என தெரிவித்த பிரதமர், இந்தியாவில் மேற்கொள்ளப்படும் நல்புரட்சியில் மாலத்தீவு இணைந்து செயல்பட வேண்டும் என்றார். (வெயிட் அப் ஆடியோ) பின்னர் இருநாட்டு உறவுகள் குறித்து அதிபர் சோலியுடன் பிரதமர் விரிவான பேச்சுவார்த்தை'.

Video Tagging

One can log in as video editor in the NRCS client for video tagging a story. Also, the video editor can see the scripts in guest user mode in the NLE itself, to edit the visuals according to the script. Once the visuals are edited they can be tagged immediately, so that all in the news desk can preview the visuals.

Graphics Overlay on Visuals

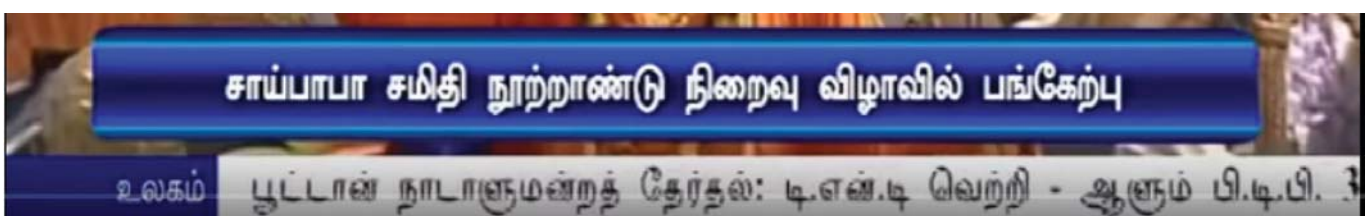
The graphic overlay content can be scripted in the script editor itself. Three lines of graphics overlay facility with looping are provided.

The graphics can be inserted over visuals automatically while playing back.

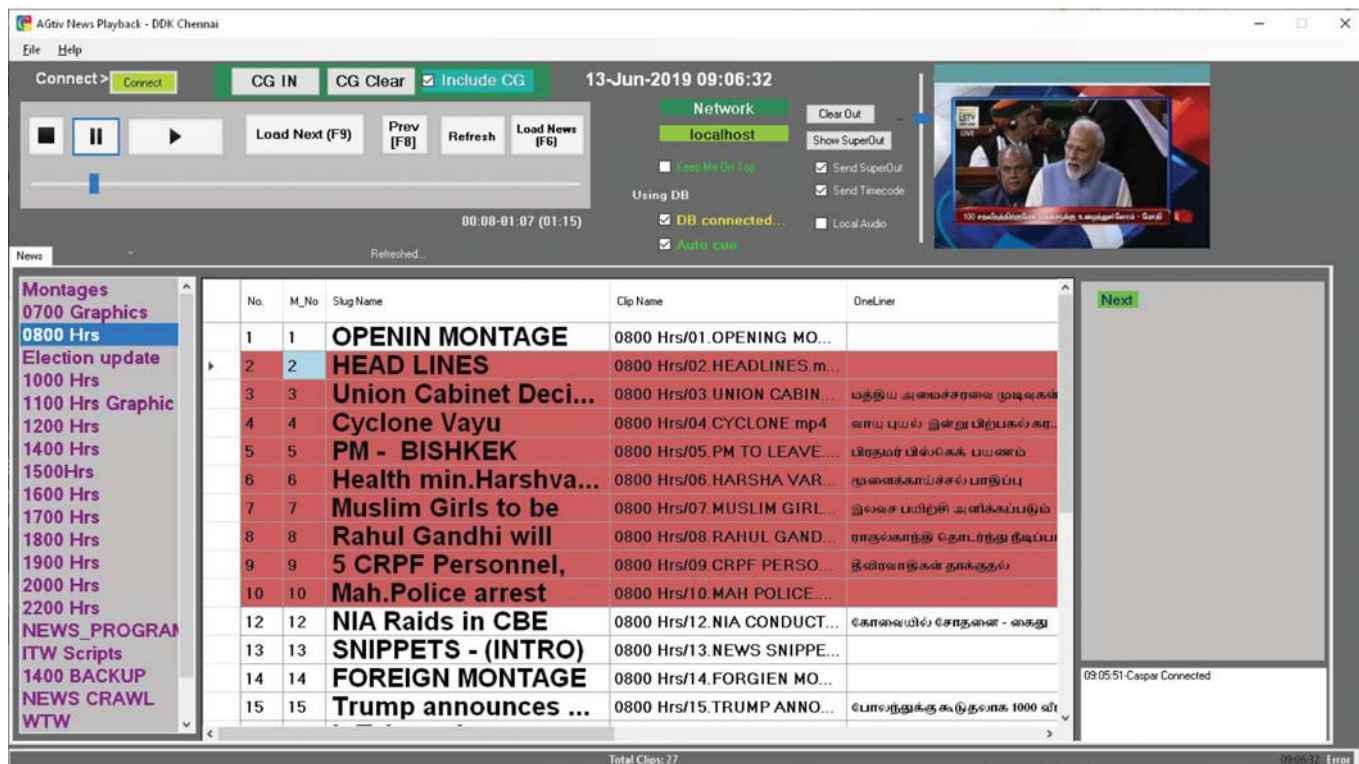
News Scroll

The news scroll is an essential part of any news broadcast. Managing the news scroll items from the news desk itself is a much needed facility. This requirement is fully met in the News Scroll module. Topic related scrolls can be maintained and scroll content is fired automatically from the graphics.

The screenshot displays the DD Script NewsApp interface. The top navigation bar includes links for DD Script, Home, NEWS, Video, and Wire Services. The main content area is divided into two sections. On the left, a table lists news items with columns for RO, Slug Name, Source, Insert, Video Dur, Media, On Air, and Typing. The table contains 25 rows of news items, including 'OPENING MONTAGE', 'HEAD LINES', 'PM ADDRESSES', 'MALDIVES CONFER', 'PM & MALDIVIAN PREZ', 'INDIA-MALDIVES MOU's', 'PM TO VISIT SRI LANKA', 'MIN. JAVADEKAR', 'VP CONCERNED', 'GOVT. NOTIFIES', 'IAF ANNOUNCES REWARD', 'NEWS SNIPPETS', 'VELICHAM PROMO', 'FOREIGN MONTAGE', 'TRUMP DEFERS', 'US AGREES TO SELL', 'US GIVES TURKEY', 'TALIBAN ATTACKS', 'SRI LANKA', 'SPORTS MONTAGE', 'W. CUP CRICKET', 'FRENCH OPEN TEN', 'INDIAN WOMEN'S HOCKEY', 'INDIAN NATIONAL MOTOR', 'WEATHER MONTAGE', and 'MOONSOON BEGINS-KERA'. On the right, a video player shows a news segment with a Tamil overlay. The overlay text reads: 'ஹிரோஷிமா சென்றது இந்திய மகளிர் ஹாக்கி அணி'. Below the video player, a list of video files is shown, including '19.FRANCH OPEN.mp4', '22.WORLD CUP.mp4', '0700 Hrs', '0800 Hrs', '1000 Hrs', '1100 Hrs', '1200 Hrs', '1400 Hrs', '1600 Hrs', '1700 Hrs', '1800 Hrs', '1900 Hrs Fast News', and '2000 Hrs'.







VIDEO PLAYBACK

A separate video playback application was developed in VB.NET which connects to the main database. The video editors edit and associate a video with a story. The video clip from the NLE is then exported to the playback folder and the data is updated in the database automatically.

The video playback application retrieves the information from the main application and presents the list of videos to be played as per the run order of the main bulletin. As and when the stories are re-ordered the application automatically also re-orders the associated videos. This provides convenience in ensuring the relevant

video playback.

For the benefit of the production control room, a separate video is played in another channel, in which the information such as clip length and the elapsed time are shown in a progress bar.

Main features of the Video Playback Application:

- All the stories in a bulletin are associated with their videos. Any future story re-ordering will change their associated videos also.
- Autocue facility. As soon as a story becomes the current in the prompter, the associated video is cued automatically in the application, ready

to be played. If the previous video is still playing, this feature is disabled.

- Just as with the videos, the lower third graphics are also associated with the stories.
- Lower third graphics are automatically fired when the videos are played back.
- The application can be used for any video playback from the media drive without referencing the database.

DATA BASE AND IIS SERVER WITH REDUNDANCY

MySQL is an open and free source of relational database. It is a fast and platform independent system. It has client/server architecture. It supports standard SQL language as well as a plethora of programming languages.





R. ARUL,
Assistant Engineer,
currently working
at DDK Aizawl.

Mr Arul has shown keen interest in developing

software solutions since 1998. He has tremendous experience in interfacing CGs like TypeDeko, MoveCG, Wasp3D, CasparCG etc. In association with Shri. S. Gurumanickam, he has developed CasparCG based Video server solutions and a lot of sports software for National Games, Cricket, Hockey, Football, Tennis, Badminton, Basketball etc. He has participated and developed Graphics software for many international OB events like the Commonwealth Games, Asian Games (Guangzhou 2010), International Military Games etc.

Has the ability to provide on-demand software support for any programme related events at DDK Chennai and other kendras.

He is the chief and principal contributor for the current NRCS application. This NRCS application has been the direct fallout of the training that he underwent in ASP.NET at NABM New Delhi.



S. GURUMANICKAM,
Assistant Director (E),
currently working at
DDK Aizawl.

Mr Gurumanickam has shown keen interest in developing

software solutions since 2005. He has tremendous experience in interfacing CGs like TypeDeko, MoveCG, Wasp3D, CasparCG etc.

In association with Shri. R. Arul, he developed CasparCG based Video server solutions and a lot of sports software for National Games, Cricket, Hockey, Football, Tennis, Badminton, Basketball etc. He has participated and contributed in many international OB events like Commonwealth Games (Melbourne, 2006) etc.

He is the principal contributor in CasparCG based solutions in NRCS, CG as well as the Video Playback Server.

He developed mobile software for the award winning SPORTS QUIZ, a weekly live programme for DDK Chennai, currently nearing its 1000th episode.



K. BALAJI,
Assistant Director (E),
currently working
at DDK Chennai.

In the recently held 2019 Parliamentary elections, **Mr Balaji**

fully developed the graphics templates, front-end application (in C#) for showing live results. He has gained tremendous experiences in video editing and video production techniques for over 25 years.

Database maintenance has been his forte. He provides software support to other kendras, especially for live voting for reality shows.

Currently he manages and maintains the IT section of DDK Chennai.

The **three authors** are based at DDK Chennai and in different roles. When working together at DDK Chennai, they jointly contributed to the creation and development of the IT section. They have provided IT consultation and support for many kendras. ■



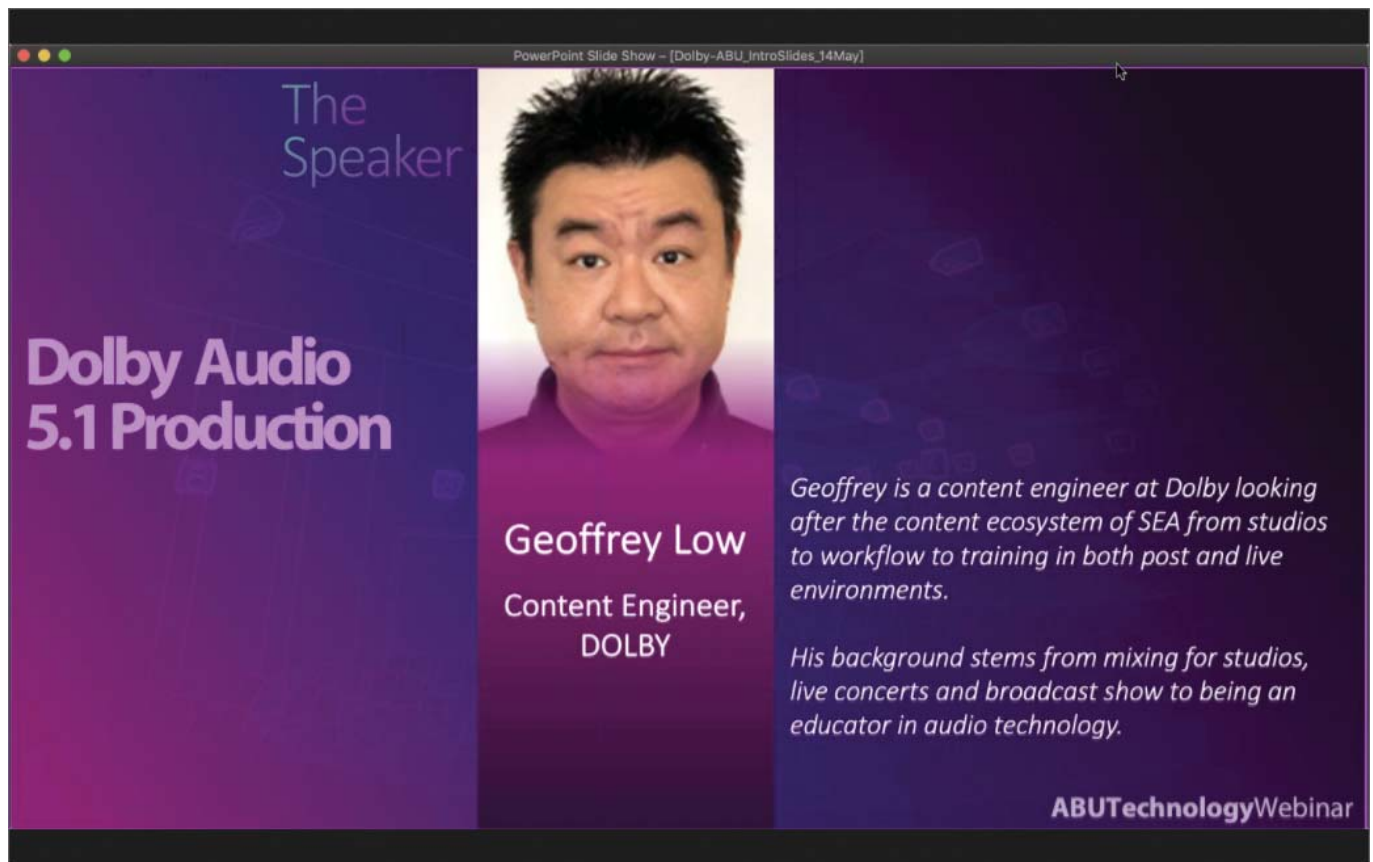
**Asia-Pacific
Broadcasting
Union**

**To submit articles
on technological
developments in
your broadcasting
organisation, write to
Mr Ahmed Nadeem,
nadeem@abu.org.my**



Audio Technologies for Broadcasting

A two-part Webinar conducted by **Geoffrey Low**, Content Engineer, DOLBY, and Dr Veysel Binbay, ABU Technology



PowerPoint Slide Show - [Dolby-ABU_IntroSlides_14May]

The Speaker

Dolby Audio 5.1 Production

Geoffrey Low
Content Engineer,
DOLBY

Geoffrey is a content engineer at Dolby looking after the content ecosystem of SEA from studios to workflow to training in both post and live environments.

His background stems from mixing for studios, live concerts and broadcast show to being an educator in audio technology.

ABUTechnologyWebinar

In order to understand audio technologies deeply, it is first necessary to understand sound, and how the human ear works. Sound is a physical pressure wave, which is created by any moving object in any non-empty or non-vacuum medium (i.e. air, water, steel, soil...). There are two types of waves in general; a) transverse waves; b) longitudinal waves. In transverse waves, the vibration direction and the propagation direction of the wave are perpendicular to each other. In longitudinal waves, vibration direction and the propagation direction of the wave are parallel. Regular sea waves or light are typical examples of transverse waves. Sound, on the other hand, is a longitudinal wave. Typically, transverse waves propagate faster in lighter (low density) media, while longitudinal waves propagate faster in denser media. Therefore the velocity of sound in air is lower than its velocity in water. Also sound moves even faster in any solid medium than it does in water. At the extreme, sound cannot propagate in a vacuum.

Sound is created by any moving object and the frequency of sound is determined by the speed of vibration of an object; faster vibration creates a higher frequency. The amplitude of the sound

is determined by the range of pressure difference created by the vibration.

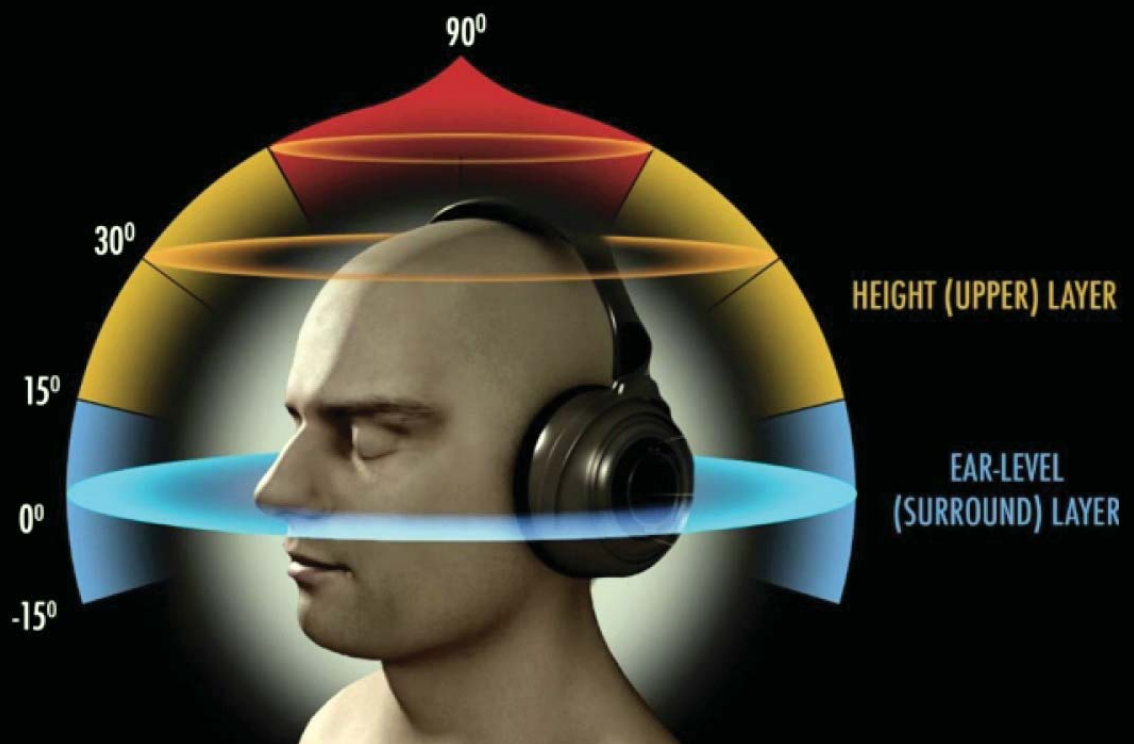
The human ear cannot hear every sound. Humans can only hear frequencies between 20 Hz and 20 kHz. Sound in a frequency range above 20 kHz is called ultrasound. Below 20 Hz and above 20 kHz are not audible frequencies for humans. Hence, any microphone or any speaker that designed to use in broadcasting, has to work in a bandwidth between 20 Hz and 20 kHz.

As sound waves are actually pressure difference waves, and pressure can be measured in Pascal, the amplitude of sound waves can be measured in Pascal. The human hearing threshold starts at 20 micro-Pascal, so below 20 μ Pa is not audible to the human ear. Typically, the sensitivity of a microphone is given in millivolts per Pascal (mV/Pa). The human ear is not a linear device, meaning that the human perception of sound waves with the same amplitude but different frequencies is not same. Of course, there is a strong relationship between the physical amplitude of the sound wave (i.e. measurable actual pressure level of the sound wave) and the human perception of the 'loudness' of that wave. Higher amplitude creates

higher loudness for same wave. So, amplitude is not only parameter that affect loudness, it is also highly and non-linearly dependent on the frequency of the sound wave. Hence, the actual amplitude (pressure variation) of any sound wave and the perceived loudness of that wave, are not the same, in general. Humans are most sensitive to frequencies in a range between 2000-5000Hz. Plots of equal loudness curves are available which are typically valid for almost everyone.

The amplitude of the human hearing range starts from 20 μ Pa and rises to over 1000 Pa. It is a huge range to manage and it is un-scalable linearly. To cover this huge audible range, a logarithmic scale using the decibel (dB) is used to measure sound amplitude. In this case 20 μ Pa is defined as 0dB; 1mPa is represented by 34dB; 1Pa is represented by 94dB; and 100 Pa is represented by 134dB.

The human hearing system consists of a combination of ears and brain. The ear works as a mechanical sensor, while the brain processes the 'electrical' stimulus produced by the ears, creating complex auditory perception. This combinational hearing system can perform much more than simply detecting the frequency and



amplitude of an incoming sound wave. The human hearing system can also localise a sound source in 3 dimensions very accurately. In order to do this, our hearing system uses the phase difference between two ears for low frequencies (below 1000 kHz) and intensity difference for high frequencies (above 4000 kHz). Modern audio technologies attempt to stimulate these effects and create an immersive 3D audio effect by high level processing of the audio signal.

There are three main types of microphones; dynamic microphones, capacitive (or condenser) microphones, and ribbon microphones.

Dynamic microphones do not need any power source to operate. They simply use the sound wave to move a diaphragm attached to a simple coil that can move with it. When the diaphragm moves, the

coil moves and as it is located within a static magnet system, the movement of the coil creates a motion-dependent voltage at the output of the microphone. As dynamic microphones depend on the sound energy to create the output voltage, they are the least sensitive microphone type and their output levels are usually lower than other types of microphones.

Capacitive microphones on the other hand, need a polarising voltage or 'phantom power' (usually 48Volts) to operate. They use a capacitor, one plate of which is designed as diaphragm which can move freely with incoming sound, connected to an internal circuit. These types of microphone can be highly sensitive, much more sensitive than a dynamic microphone. However they are also more expensive.

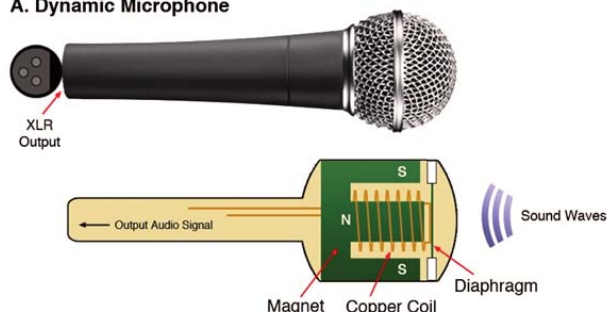
The third type of microphones is the ribbon microphone. It is like the dynamic microphone in principle (a moving conductor in a magnetic field), but they use a small ribbon rather than a diaphragm and coil. They are more sensitive than dynamic microphones but they are also highly fragile. Typically, they are preferred for use outside the studio.

Sound field generation is an important part of the evolution of sound systems. As is well known, the technology started with monophonic (mono or single channel) sound. Then it was extended to stereo, with two channels and then to surround systems (5.1, 7.1, 7.2.4, 22.2, etc.) Nowadays we are being introduced to new technologies, like 360 reality audio, next generation audio, immersive audio, spatial sound encoding and object-based audio. Audio is still improving and evolving... ■

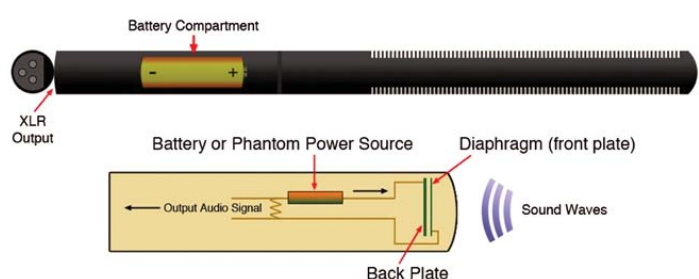
A) A dynamic microphone is **less sensitive to sound** because the transducer is self-powered by the sound of the subject's voice.

B) A condenser microphone is **more sensitive to sound** because the transducer is powered by a battery or phantom power source.

A. Dynamic Microphone



B. Condenser Microphone



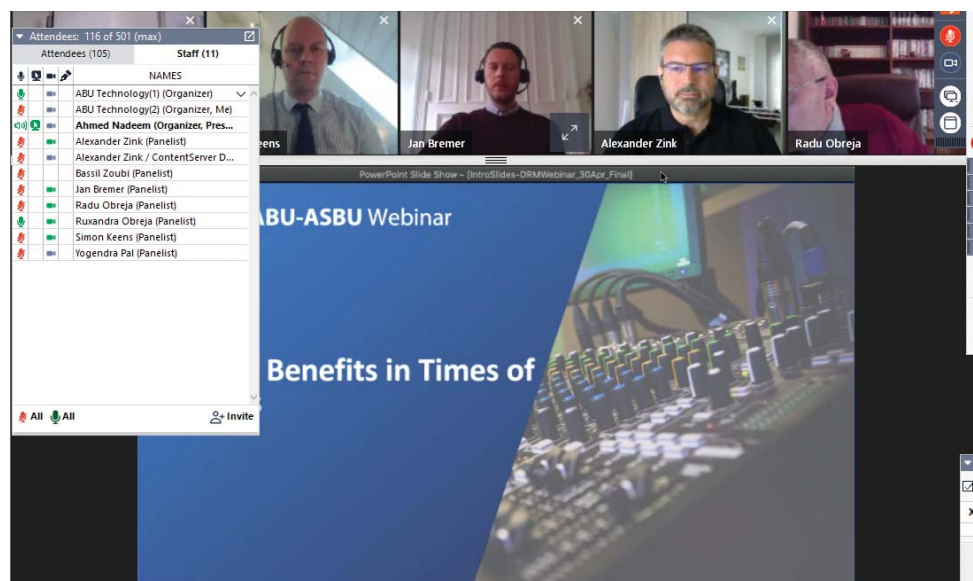
DRM-ABU-ASBU Webinar

on DRM Benefits in Times of Crisis

ABU Technology hosted a two-part webinar on 'DRM Benefits in Times of Crisis' on 23 and 30 April 2020. The speakers from DRM Consortium presented different topics covering features of the DRM standard, its emergency warning functionality, and content monitoring. Beneficial aspects of local, regional and national coverage with DRM were considered, with respect to energy consumption and coverage area and the deployment of SFN and simulcast networks. Participants also got a brief update on DRM receivers in cars, on desktops and on mobile phones.

DRM is the global ITU standard for terrestrial digital radio that enables coverage for local, regional, national and international services and operates in AM & FM/VHF broadcast bands. On a single AM/FM frequency up to three audio services and multimedia content can be carried. Both digital-only or simulcast operation with AM or FM analogue signal are possible. Existing AM/FM infrastructures are eligible for DRM upgrades. Unlike a multiplex multi-operator solution, each broadcaster is able to be in full control of their transmission and content. Some key features stated are, more choice for listeners, excellent audio quality with stereo and 5.1 surround sound, multimedia applications comprising DRM Text Messages, Journaline, slideshow, EPG/SPI, TPEG for traffic information. Good coverage area and robust signal with the support of SFN (single frequency networks), automatic tuning by station name, and emergency warning, are in the features list.

Journaline is specifically designed for digital broadcast services with a 200bps, low bitrate requirement. This is strongly personalized over broadcast medium with language/region /topic of interest selection. The feature enables simple user interactivity e.g. with radio station or advertisement partners. The emergency warning feature in a DRM digital radio receiver enables it to switch on and/or re-tune automatically. Visual or acoustic signaling and alarm announcement is provided, with multi-lingual look-up text instructions via Journaline to serve non-native speakers and hearing-impaired populations. When the alarm signal is triggered by authorities, all running DRM receivers pick up the alarm signal from



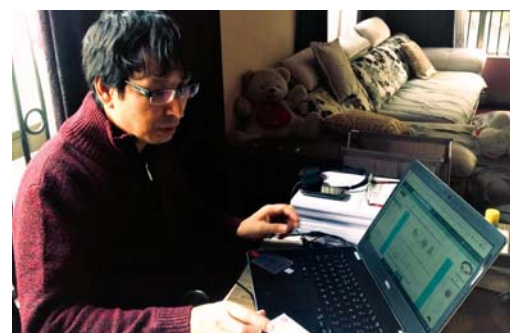
the currently received DRM service and switch to emergency broadcast. Turned-off receivers may switch on automatically. All DRM receivers present the audio content of the emergency programme together with a text screen, in addition to information and instructions. The advanced text application enables to instant service to non-native speakers and the hearing impaired, with full instructions. Fraunhofer IIS and RFmondial demonstrated emergency warnings during the BES Conference and Expo in Delhi in February 2020.

The DRM consortium started a public signage service based on Journaline which is a standard DRM feature with text content accessible to every suitable DRM receiver. The feature supports file download e.g. article images, CSS styles and background graphics. It has developed an online tool to quickly find DRM shortwave transmissions, broadcasters and target areas. Also developed is a live online service to monitor the content of DRM broadcasts. This service allows management, engineering and most importantly, editorial staff, to have direct access to and feedback, even from remote transmissions. It is accessible to any HTML 5 web browser from PCs, tablets and even mobile phones.

For transmissions, radiated power is adaptable to the desired coverage so that more than one DRM service block can be transmitted from a single DRM transmitter. It allows multiple

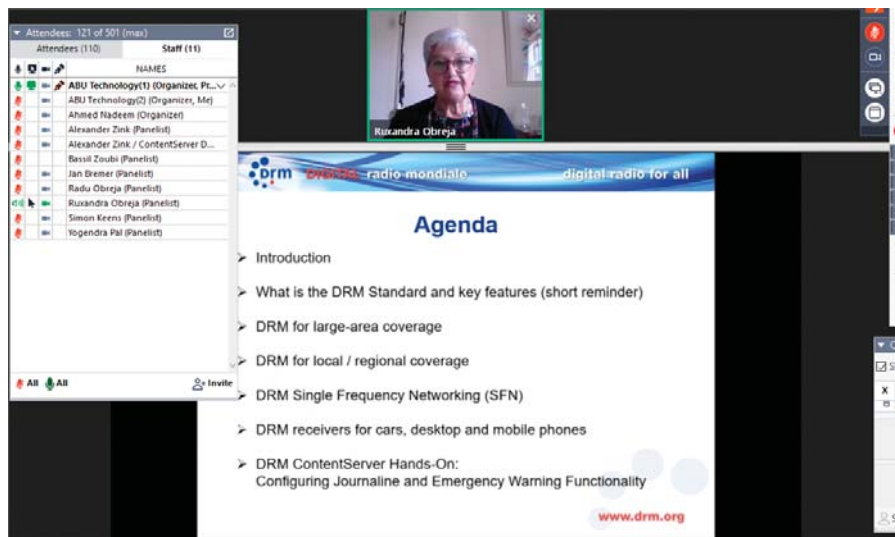


Edi Setiadi, RRI-Indonesia



Udaya Shrestha, Radio Nepal

broadcasters to share a single transmitter while remaining in full control of their own broadcast content & configuration. On single frequency networking (SFN), signals from multiple transmissions no longer destroy signals as in analogue FM but rather improve reception. This allows the option to migrate from high power single transmitter to lower power distributed coverage. Thus, it offers cost savings, better coverage and gap filling for broadcast operators. Overlapping areas are served with enhanced signals due to COFDM digital modulation



being produced with advanced audio processing & routing features.

More international car brands are adding DRM receivers in their vehicles and most of the Indian car manufacturers are either already installing DRM receivers or have plans to do it. Likewise, desktop and other car receiver solutions with DRM only and DRM multi standard are ready for mass market production based on substantial orders. The DRM receiver solutions include an automotive segment in AM bands, a desktop radio segment in AM and FM bands and a smart phone segment in FM bands. A company is looking into a prototype of a low cost low power DRM design, addressing the vital need for information of the global population that doesn't have internet or TV. Another is working on a DRM receiver solution with a built in Wi-Fi hotspot to serve tablets and mobiles. ■

which eliminates any distortions due to appropriate guard interval.

NXP has developed software-defined radio solutions by a simple firmware upgrade. Existing DRM solutions in

AM bands can be upgraded to support DRM in AM and FM bands without any hardware change. Low end versions with a low cost & low footprint radio tuner platform are available and middle to high performance dual tuner platforms are

This webinar series received more than 300 registrations, representing organisations from about 50 countries in the Asia-Pacific, Middle East, Africa and Europe. ABU Technology hosted the two-part webinar jointly with the Arab States Broadcasting Union (ASBU) and the DRM consortium. The DRM consortium was founded in 1998 by international organisations to promote the adoption and take-up of the DRM standard worldwide.

Welcome to the
DRM Webinar for ABU & ASBU
23 April 2020

DRM Benefits in Times of Crisis



5-8 May 2020



ABU Technology Webinar

Modern Radio Studio Automation Systems

a four-part webinar series, meets 5 - 8 May 2020 @3pm KL/SIN time

supported by:



MOVING FROM THE TRADITIONAL TO THE MODERN AUTOMATED SYSTEMS

The four-day webinar series on Modern Radio Studio Automation Systems began with an introductory session presented by Mr Steve Ahern, who is the CEO of Ahern Media and Training, with the title "Moving from the Traditional to the Modern Automated Systems".

Steve focused on the need for automation systems and how traditional workflows have been enhanced with the use

of automated computerised systems to improve efficiency and productivity.

The session looked at a breakdown of the functions and processes taking place in a radio station and how some of these processes, which required human initiation and intervention, have slowly changed to computer-assisted and automated routines.

Steve described how the

developments in digital technologies and solutions have been incorporated into the radio station operations.

Different kinds of studio setups and how they differ from each other were discussed with examples of studio layouts and how they have changed from traditional to using automated systems. This included a look at complete virtual studios where everything is controlled on a

computerised system with a touch screen.

Some of these technologies have allowed not only benefits in operational efficiency but cost savings with respect to space requirements and energy consumption compared to traditional systems.

Automation systems are not just about playout systems, where you have a computer system within a studio where you can control the schedule of playback items with a piece of purpose-built software.

Such systems within a radio station go much further in terms of functionality and integration. They cover the whole radio station operations these days.

The newsrooms are automated with news room automation systems, the production system similarly has its own software, and the scheduling system with advertisements is connected to the traffic and sales system.

The engineering switching and monitoring is also integrated within the system, which includes support for multiple delivery methods and so on.

The whole system and processes within a radio station can now be completely automated with minimal intervention. This of course does not cover the creative part of content development and curation, which also has been made simpler with the use of digital devices and tools.

Steve gave a breakdown of the processes and how they work in an automated environment for each of these operations within the radio station. The session provided a comprehensive look at how these tools function within the radio studio operations, highlighting some of the key benefits they bring to the processes.

Finally, the presentation provided a quick rundown on the most commonly used software

automation systems currently available in the market. These range from top of range products with multiple modules to cover the full range of radio studio operations to some simpler and minimal systems which provide just playout automation and scheduling in a standalone or networked environment.

Steve also discussed the key functions and features available in these systems addressing what kind of environments or radio stations, big or small, they will be most appropriate and applicable for. The session concluded with a Q&A where participants were able to interact with the presenter.

The session provided a good background and foundation on how automation systems have made their way into modern radio studio environments and how they are currently used within the radio operations, making it a good introduction to the sessions that followed in this Radio Studio Automation webinar series. ■

The
Speaker

Day1

Moving from the
Traditional to the
Modern Automated
Systems



Steve Ahern

CEO,
Ahern Media & Training

Steve Ahern is an international radio and TV trainer and the proprietor of the trade publications www.radioinfo.com.au and www.asiaradiotoday.com.

He is a former senior executive at Australia's national broadcaster ABC and was previously the Director of Radio at the Australian Film Television and Radio School (AFTRS).

Steve is the author of a textbook on radio (Making Radio) and a sought-after conference speaker.

ABUTechnologyWebinar

5-8 May 2020

RADIO STUDIO & SYSTEM DESIGN FOR THE FUTURE



Under the theme of 'Modern Radio Studio Automation Systems', a session on radio studio & system design for the future was presented at the ABU technology webinar session, organized on 6th May 2020 and joined by 95 participants from the Asia-Pacific region and elsewhere.

The speaker, Mr Bala Subramaney from Astro Radio, walked through his case study and gave an overview of radio studio systems with respect to technology adopted, construction issues and equipment. The session was mainly focused on radio studio consoles, central routers, telephone systems and social media setup, audio processing, studio acoustics, and electrical systems. Most common problems faced in any broadcast facility, by broadcast engineers and planners, were succinctly covered, along with the expert's recommendations. Some photographs of the broadcast facilities,

showing structural parts and installed equipment, were illustrated to the participants.

Before building a radio studio, understanding the user/audience requirements are essential. Also crucial is to gather the expectations of producers/announcers, content managers and technical staff. For determining the size of the studios, one needs to decide potential numbers of studio guests at any given time and the area a producer needs for managing audio/video/social media content. Next important is the number of on-air studios, production or voice booths and news studios. Generally, large broadcasters have separate functional studios such as news studios, production studios, drama studios etc., while the smaller broadcasters may have fewer studios with integrated functions like news anchor reading news from the live

studio rather than from a separate news studio. Along with these, deciding on future requirements in 3, 5, or 10 years to come, will be even more critical. The speaker observed that in some broadcast facilities the design was shortsighted, with focus on a few years only, and in cases of future upgrading they faced huge costs to start anew.

From a technology perspective, an emphasis for the future radio station will be in delivering 'watchable' radio content. Broadcasters need to think beyond just delivering audio content only and let their audiences view the content they have to offer. In addition to conventional anchoring of radio programmes, this will help the talent to be both heard and seen on multiple social media platforms. A second issue is to create and produce multimedia video content from the on-air studio so as to schedule its package and deliver

those entertainment and news items to the desired audience.

Supporting and controlling the studio facilities and hardware remotely should be done via telemetering and interconnecting of all the studios. Contributors or engineers should be able to run and control their programmes remotely from any location, or from home. Such a case has been widely recognised during the current pandemic situation and, as an example, Astro Radio has been allowing its anchors and producers to get remote access to its broadcast facilities and deliver programming from home.

With regard to equipment, the heart of the studio operation is the mixing console. Available in the market are digital audio consoles, analogue audio consoles, and hybrid versions with features of both digital and analogue audio consoles. The console is used to ingest, select, pre-process and route multiple audio sources that are mixed as per requirements of the packaged content. It is imperative that all engineering staff should have a thorough understanding of the console operations. It is advisable that engineers should understand the details of features and functions of products before purchasing from the market and not blindly submit to pressure to purchase any specific brand.

Digital and analogue audio consoles need to be provisioned for IP audio and GPI functionality. These should be well integrated with new protocols like Livewire, Dante, Ravenna and other AES67 formats. The future console needs to be compact and yet intelligent & easy to use; something like a virtual console, for less human interaction, with fewer buttons, faders and full automation, so that it will free up time for the announcers to focus on delivering compelling content. The connected consoles will have built-in 'smarts' for better auto-mix of voice and intro/outro/bed for voice tracks and live shows. Normally the latest consoles will feature built-in voice DSP & EFX buttons in the console for anticipated processing and mixing different background effects. Different live shows and drama productions will require such elements and features to be accessed via touch button screens.

These days, studios are driven by radio automation software. The

automation system comprises a music scheduling system, audio player and, through its backend system, should allow linking to commercials & jingles. The automation feature will have integration to social media elements and video elements. Such functionality will enable the achievement of multi-task workflows and operations for live-shows, voice tracks, OB contributions, simulcasts and web interviews. One needs to integrate social media – Facebook, Twitter, Linked-in, Instagram etc. into the radio studio seamlessly.

The next piece of hardware critical for processing, monitoring and routing of content is the router. It should be scalable and expandable to accommodate requirements for multiple transmission, distribution and contribution paths that may arise in future. Routers enable technical staff to plan for redundant connections to multiple interconnecting points. Station managers and engineers will have to consider these points to tap appropriate signals in and out in the production and transmission chain.

Audio should be tapped out for monitoring and audio level measurements. Audio level measurement and monitoring has been more critical these days to ensure consistent loudness and volume levels. Other elements to consider during emergency and disaster situations are provisions for alarm reporting and alerts via SMS or SNMP or both. Telephone hybrid, VOIP system, 4G and 5G data-based hybrids will add to the hardware list in the studios.

Another dimension of the studio facility is the electrical system for non-essential or essential services. Engineers should take account of the total power required for studio facilities and sources of the supply. Non-essential services are lighting, fan, and other general loads. Best practice for connecting essential loads to studio facilities is through the UPS to allow for uninterrupted services, with UPS being charged via generators, even if the city supply fails. Specifications of the electrical cables should be such that they are reliably used with some allowance for future. All cable termination must be checked before commissioning and operation. Different types of circuit breakers are required for protecting the studio equipment and circuits. For safety, individual RCCB breakers need to be installed separately in each rack and in the studios.

For radio studio construction, Studio acoustics is another important consideration that broadcast engineers should have enough understanding of. Noise criteria and reverb settings should be customised for on-air, production, news studios etc. For an acceptable acoustic environment, the noise level should be as low as possible and typical figures are Noise Criteria (NC) 20-25 for on-air and production studios and NC 25-30 for news studios. Normally two or three layers of cement board, each with an air gap and rockwool will contribute to good studio acoustics. In some structures, the studio floor level is floated and raised on rubber blocks.

There are often challenges and shortcomings observed in broadcast facilities. The speaker shared his experiences of overseeing and consulting on a few studio development projects in Malaysia and elsewhere. Most cases were that building drawing were not available in the studios. Secondly, even if the drawings were available, its documentation and marking may not be an up-to-date and accurate representation of the actual physical layout. It normally happened that the contractor did not provide any drawings and documentation was not kept on site. The presenter laid out some action plans in this regard; that technical staff should be able to understand the connectivity and prepare diagrams and documentation. Once prepared and completed, they should be inspected and checked by a third person. If that third person understands it, the documentation is 'good-to-go' and if not, one should re-write and revise it.

Last but not the least, station managers and engineers must keep in mind some strategic steps. They should plan and select the best fit for every operation/facility. They should always give emphasis to the provision of after sales support and service from suppliers before choosing the right equipment and facilities. One should challenge conventional settings in design and drawing of the studio facility and even be prepared to vet third party advice in taking such decisions. To allow room for expansion in every installation would be wise, to avoid any limitation in the future. ■

MODERN DAY RADIO – NEW INFRASTRUCTURE



Even though modern communication technology gives a variety of alternatives, radio was, is, and always will be a reliable avenue to inform, to entertain and to inspire people. There are hundreds of millions of people who tune into radio every day and target listeners are millennials. Listener statistics show that the number of listeners has increased during the pandemic. 52% of people hear radio, influenced by presenters and influenced by opinion on topics; 65% of people agree that they listen to radio because it makes them feel connected; 2 out of 3 listeners have engaged with radio via other platforms (social media, podcasts, apps, etc.); 1 out of 5 have engaged with radio stations across three or more different platforms (phone, WhatsApp, websites or apps) in a typical week.

In the light of the evolving technology, the business model of radio stations also needs to evolve. This necessity, requires some questions to be answered: How

to build a modern radio system?; which technologies are required to do that?; what should be changed in conventional workflow.

Some common facts need to be considered in evolving modern radio systems. The world is embracing digital audio transformation. A transition to IP may be inevitable. Reflecting on user experience and engaging users, generates more targeted ad generation. Revamping the old, or building a new studio or technology infrastructure is needed. Technology upgrade for seamless playout, automated on air, latest AoIP mixers, and also virtualization are necessities for modern radio studios. New technologies like DAB can help the radio broadcasters generate more listeners. Furniture design can improve the quality of the on-air content because the layout and look set the mood (and interaction) in the room. Social media integrations are required to put a Skype, Zoom, WhatsApp or mobile app on the

air easily and reliably and It is required to equip the setup with proper security systems giving more emphasis on IT security and framework. It is necessary to define facility robustness with no central point of failure which could affect all operations at once.

To manage this demanding modern radio workflow, one should be sufficiently equipped for IP audio. IP audio fits in as a cost-effective solution helping the users in many ways. Nowadays with many types of broadcast audio equipment, codecs, mixing boards, STL links, telephone hybrids, audio processors, intercoms, monitors, automation systems and even microphones, natively using audio with IP connectivity, the audio network and the ability to interoperate all these pieces of equipment, becomes central to the function of the modern radio studio. Functions of AoIP can be listed as: routing, control, connectivity, discovery, interpolation, robustness,

and redundancy. Based on these functionalities there are multiple AoIP Protocols available in the modern radio industry. We can take a look over these technologies in brief:

DANTE: Dante, a layer-3 AoIP protocol made by Audinate is as modern high-performance digital media transport system that runs over standard IP networks. Dante allows many channels of low-latency audio to be transmitted and received over a single Ethernet cable.

AES 67: AES67 is an Interoperability standard for audio transport only. AES 67 is a feature or option in a wider audio system, which can fulfil tasks such as routing, monitoring, discovery or system control.

RAVENNA: RAVENNA is a layer-3 (IP-based), based on existing standards. It can operate on most existing network infrastructures, it offers full bit transparency with all media formats (i.e. it can pass uncompressed audio), with low latency and full network redundancy support and most importantly it is open. It involves no proprietary "black box" design. It is Designed to work on existing networks with -no new network equipment required. With no proprietary licensing policy -no "cost per channel", it suits all performance needs.

(RAVENNA was actually named after the Italian town where the poet Dante died.)

LIVEWIRE+: Originally known as just 'Livewire', was created by Telos Alliance, as a means of transmitting low-latency, high-reliability audio over switched Ethernet is an Interoperability standard for high-performance AoIP transport over IP audio networking products. This allows devices to seamlessly connect directly to Livewire+ networks for connecting audio streams, regardless of device type or manufacturer. Livewire+ AES67 also offers the flexibility to incorporate and comply with future AES and SMPTE standards as they are approved and released, while simultaneously offering backward compatibility with the RAVENNA networking protocol.

QLAN: Q-LAN is a third-generation networked media distribution technology providing higher quality, lower latency and greater scalability, this was developed by QSC technologies. Q-LAN operates over gigabit and higher rate ethernet variants works on Layer 3 networking. Q-LAN is a central component of QSC's comprehensive Q-Sys integrated system platform.

Interactive integration with Q-Sys means that Q-LAN can be configured and monitored using the graphical and scripting tools available on the Q-Sys platform. This protocol has also come out with an AES-67 interoperability approach to be connected to different networks.

Wheatnet-IP: WheatNet-IP is a network system that utilises Internet Protocol to enable audio to be intelligently distributed to devices across scalable networks. WheatNet-IP is AES67 compatible. It enables all audio sources to be available to all devices (such as mixing consoles, control surfaces, software controllers, automation devices, etc) and controlled from any and all devices. AES67 compatibility for interoperability with other AES67-compliant devices and signals into the Wheat Net-IP Intelligent Network. Access any audio, anywhere, ingest any audio format into the WheatNet-IP, and convert to any audio output analogue to digital, AES to IP, microphone to AoIP or MADI to AES67.

A modern automation system is usually expected to do following:

Provide the ability to access the system remotely via a smartphone; real-time integration, mobile capability; content management features mainly for streaming audio or on-demand features; control of studio lights, audio consoles triggering cameras like the visual radio automation; maximum intuitive "social media" functions; cloud-based applications, disaster recovery etc.; highly redundant and flexible architecture that is future proof.

There are several possible workflows and integrations. Such as: integrating traffic and music scheduling with real time sync; or integrating content library and media asset management (on premises and via cloud). Integration of traffic, weather and other sources into a single activation screen. Integration with news room control systems via MOS and API. Integration with Deep Archive systems and HSM systems. Integration with asset management systems via internet so content can be seamlessly spread across different areas. The capability for legacy content archive and migrations. Integration with cloud-based systems, to manage operations from anywhere.

There are several particular advantages of cloud and virtualisation. An important one is reduction of costs and reduced cost of real estate investments. Also, there will always be the best state-of-the-art hardware in use. You can be always on the latest Version. Adding

new channels and adding hardware can be on the fly and subscription based. You can operate your system from anywhere /MAC /PC /Smartphone. There will always be real-time data integrity and redundancy. Also, talent can work from where they are.

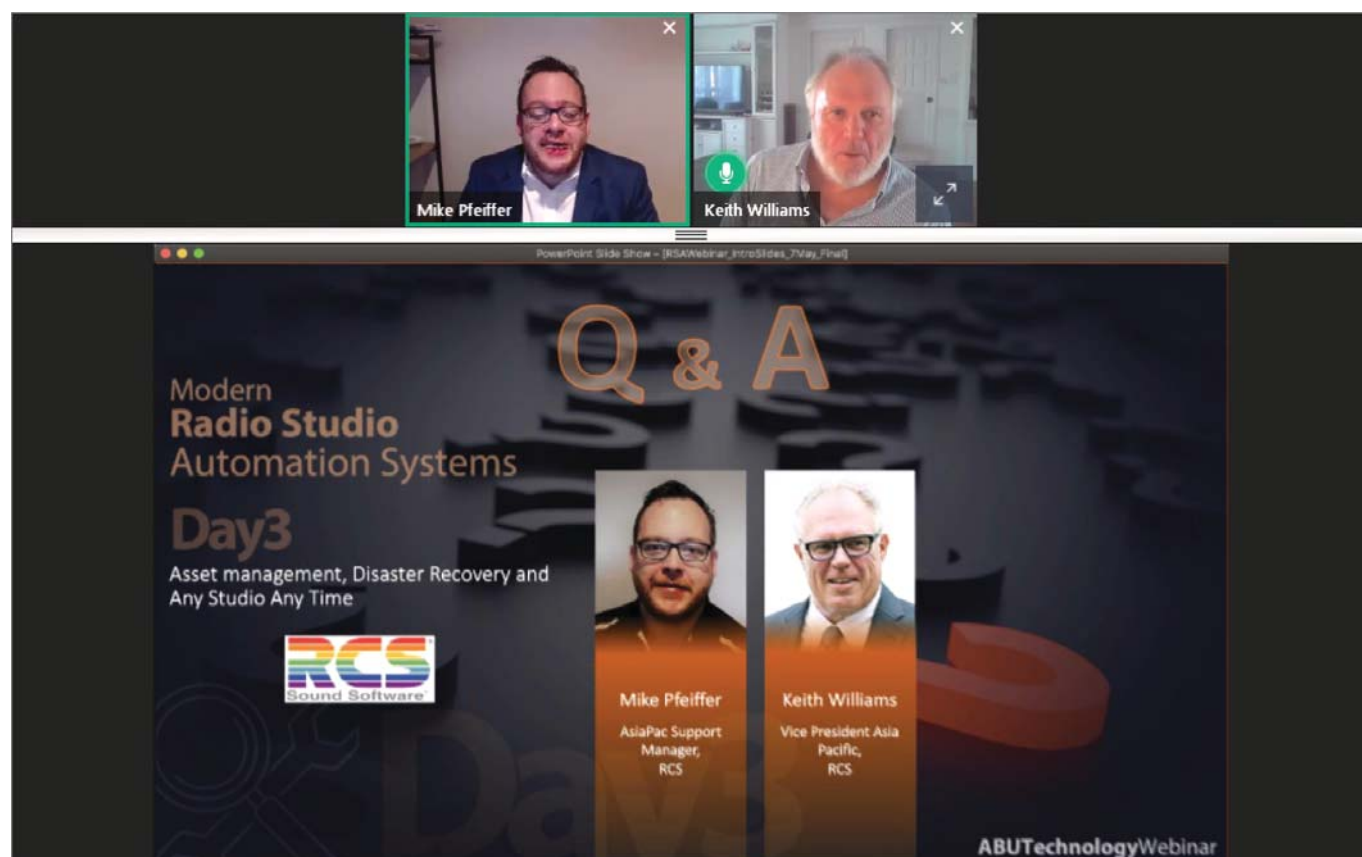
Another particularly beneficial concept is Visual Radio. Visual Radio is an add-on to your radio production set-up that does not require extra staff. Take your radio show to the next level by giving your audience the chance to experience unique radio moments - as they happen. Visual Radio turns your listeners into viewers. It's a plug and play solution, customisable for any radio station. Visual Radio is a fully-automated software solution that automatically switches cameras and plays graphics by analysing audio signals and data feeds from the radio station's automation system. Visual Radio mimics a real director, leaving the radio presenters to do what they are good at, which is making radio. The solution is designed for web, mobile and TV platforms. Visual Radio is an add-on to your radio production that does not require extra staff. Take your radio show to the next level by giving your audience the chance to experience unique radio moments as they happen. Visual Radio can be used fully automated without the need for extra staff. Visual Radio is a true add-on to the current radio operation. It empowers radio stations to do more with the same resources (staff, equipment, current production). Visual Radio is a solution for radio stations to adapt to the increasingly mobile, web and screen-based media consumption of their audiences. With Visual Radio, radio stations can promote their brand identity. By entering the mobile, web and TV domain you can use different advertising models, transform radio commercials to video advertisement banners and you can use social media marketing and can start branding your station. It is easy to use: the system can operate automatically or manually and provide a smart interface that allows the presenter to easily control audio, video, logo and graphics, cameras, etc. It is possible to broadcast external sources and feeds, such as incoming video calls from Skype, video from YouTube, content from windows desktop (browser, PDF, XLS, DOC, images, streams, etc.). Regardless of whether it must fit into a solid analogue environment, a high-tech MADI environment or virtual ASIO sound card (DANTE), it blends in perfectly with old and new workflows. ■

5-8 May 2020

A SESSION ON ASSET MANAGEMENT, DISASTER RECOVERY AND ANY STUDIO ANY TIME

Keith Williams, Vice President Asia Pacific, RCS;

Mike Pfeiffer, AsiaPac Support Manager, RCS



For the ABU Webinar session on Modern Radio Studio Automation Systems, RCS presented a high-level look at Asset management, Disaster Recovery and Any Studio Any Time. Its core product, the Zetta Playout system, is more than an automation system. It is sophisticated with high level features and it's all about Asset Management, which is in increasing demand as media businesses consolidate around the world, including the Asia-Pacific. It is called Zetta Site

Replication, and it allows broadcasting from any studio, anywhere, anytime, across a group with content sharing.

The webinar also covered Zetta 2GO, a remote version of Zetta itself, which can manage LIVE playout on any device with a browser. There has been a remarkable take up of this feature in recent weeks, as radio stations worldwide have isolated and gone REMOTE due to Covid-19. The newest product, Zetta

Cloud, was also presented. It is a complete playout system built on the latest cloud technologies. It is a true SaaS solution and a radio station playout system playing audio from the cloud. It is a real living thing which is currently providing Disaster Recovery for RCS clients around the world. RCS have been in the business of radio, for over 40 years and we are the world's largest broadcast software company. ■

5-8 May 2020

A SESSION ON WINMEDIA RADIO AND TV SOFTWARE SUITE

Stephane Tesoriere, General Manager, winMedia;

Marie Mbow, Sales Representative, winMedia Africa;

Jesus Vazquez Miguel, International Sales Manager, winMedia



In this unprecedented period the world is currently going through, the media world will have to change its practices in order to be able to adapt to changes. These include mobility to work from anywhere anytime while keeping full control over its broadcast, and progressively moving away from traditional methods towards digital consumption habits. Against this background, WinMedia presented a session on WinMedia Automation Solutions on the 3rd day of the ABU Technology Webinar between 5-8 May 2020.

WinMedia playout, which is still at the heart of the group's solutions, is getting stronger and more secure, providing a turnkey solution for radio, television and other digital platforms, such as

applications or websites. In addition, the system has acquired new key tools allowing it to go even further in the management of its media with an always fluid use of the different production and programming tools. However, the WinMedia experience is not limited to playout only. Thanks to the web-based solutions of the WinMedia suite, being in the studio is no longer necessary to ensure the efficient functioning of media houses.

WinMam is the remote control that allows one to manage entire database, production tools and playlists for remote broadcasting. With a few clicks, users can import content into the database, add production elements such as voice-tracks and add their files to the

broadcast playlist. WinSales is used to manage a station's CRM efficiently, to schedule advertising campaigns, to edit sales and performance reports, to manage and optimise business activity as well as a company's financial and accounting tools. Audiences will get additional interaction with another product, WinCam, a new automated radio system which adds a visual dimension to a radio station.

WinMedia has been providing reliable, scalable and full-featured automation solutions to broadcasters worldwide since 1995. Versatile and evolutive, the range of WinMedia products are constantly improved to meet the growing needs of the media around the world. ■

5-8 May 2020

HOW TO RUN YOUR RADIO FROM HOME

Peter Howarth, AEQ; **Antonio Peres**, APAC Sales, AEQ; **Roberto Tejero**, AEQ; **Sergio Sanchez**, AEQ



The situation of radio stations is very different from one country to others, because technological levels are not the same, and the terrible Covid-19 pandemic is not affecting all in the same way. In general terms it can be seen that there is a massive movement to remote broadcasting and, in most of the cases, to home broadcasting. It's also clear that radio stations can very quickly adapt their normal operation to remote operations; usually with excellent results. In these days of coronavirus crisis, information is very important for everyone. Radio stations in one way or the other never stop working to provide information and entertainment. When the pandemic started, AEQ received a large number of requests, mainly for portable codecs, e.g. ALIO units, or rack mounted ones, such as VENUS.

Against this background, AEQ recently conducted a webinar on Radio Studio

Automation with the ABU's support. On the 4th day of the ABU Technology Webinar, 5-8 May 2020, AEQ presented a session, entitled "How to run your Radio from Home". The webinar mainly discussed AEQ products such as audio mixers, automation software and audio codecs. Today, most of these are 100% IP compatible, and this technology is the key to the current situation. Most of the broadcasters are connecting their talent from home, using IP audio codecs over regular Internet, with excellent audio quality, or are even remotely operating their audio mixers using IP control applications like VIRTUALFORUM.

Two radio stations which captured attention in in this time are, curiously, both from Spain and were used as real examples in the webinar. The first one was COPE, a very big private radio company, with over a hundred associated

local and regional radio stations. They moved very quickly to protect employees' health with protocols, protections, etc. In parallel, they designed a plan to move as much as possible of their normal operation to remote operation, keeping most of the staff working from home. COPE continues to do a great job in this complicated situation. The second radio station that impressed was Cadena Ser Guadix. They didn't need to worry about typical problems that happen when a station moves its radio operations to remote as they already worked 90% of the time from home, and the pandemic crisis only meant changing minor details of their regular style. These changes proved that another way to run radio is possible, as are other ways to create, edit, mix and broadcast. Some of the changes have showed excellent results and will become the new standard in the market, for remote operation or contributions. ■

DOLBY-ABU Webinar Series on Audio and Visual Technologies

ABU Technology together with our member and industry partner Dolby organised a 4-part webinar series on Audio and Visual Technologies which ran weekly from 14 May to 3 June.

These webinars covered basic to advanced topics in audio-video technologies and their applications in the broadcast and production environment. The series covered four topics, as summarised below. The presentations were made by Mr Geoffrey Low and Mr Jerry Gui, both experts from Dolby.



Dolby Audio 5.1 Production

Dolby & ABU Webinar Series 2020

Geoffrey Low
Staff Content Engineer
Dolby Laboratories

Dolby Audio 5.1 Production

The first of the four topics was 5.1 Audio Production technology. The session provided an introduction to 5.1 Audio Technology, the basis for its development and the need for surround sound experience.

It introduced the techniques, the equipment requirements and the workflow for both live and postproduction. The session addressed the steps required for 5.1 capture including the placement of microphones, what type of microphones are better for the purpose and how to overcome any difficulties in case the best is not available.

In addition to the microphone one would also need a 5.1 capable mixing console or digital audio workstation, a calibrated monitoring or speaker system and some way of metering the 5.1 capture



Dolby & ABU Webinar Series on Audio and Visual Technologies

Organizer: ABU Technology | Presenter: ABU Technology

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Jerry Gui
Senior Staff Solutions
Engineer
DOLBY

including phase coherence and loudness. These requirements were discussed in detail during the session.

The process of 5.1 capture and production is very similar to stereo production as long as you have the specific and proper tools needed for the process. It is better to do the complete mixing using the surround sound tools which can then be used to easily downmix to get the stereo and mono content if required; this will produce better quality output in the end.

It has now become common to have 5.1 and higher requirements for broadcast audio production, contribution and delivery too on supported platforms. This is becoming a standard requirement when it comes to HD and 4K productions especially online delivery systems.

Next Generation Audio – Dolby ATMOS Production

The second session focused on next generation audio production systems, specifically the Dolby ATMOS technology and production workflow.

The session introduced the immersive format Dolby ATMOS which is available and used by broadcasters around the world and how it can be experienced at the user end in their living rooms. It discussed the different workflow and component requirements for both live and postproduction environment.

Dolby ATMOS goes beyond the limitations of channel-based audio like stereo, 5.1 and similar. It looks at audio as objects within the surrounding space based on available speakers enabling one to place audio anywhere in the room, free from the constraints of a predefined



Dolby 5.1 and Dolby Atmos Transmission Workflows

Jerry Gui
Senior Staff Solutions Engineer

channel count, creating an immersive environment for an extraordinary experience with moving audio.

The different speaker configurations for home entertainment were discussed with the inclusion of upward firing speakers in addition to the regular surround speakers. Typical configurations are 5.1.2, 7.1.2, 7.1.4, 9.1.2 etc. where the first digit represents the simulated surround speakers, the second digit the subwoofer and the third the upward-firing speakers.

These speaker configurations supporting Atmos are now available in the market from major manufacturers including sound bars that can simulate the same environment.

The session also presented the typical live and post-production workflow highlighting the three main components that are required: Dolby ATMOS Renderer; Audio Console or Workstation; and a monitoring setup. Many advanced broadcasters, content developers and streaming providers now support Dolby ATMOS giving the home viewers the cinematic and immersive experience.

Dolby 5.1 and Dolby Atmos Transmission Workflow

This session focused more on the delivery formats and codecs for the different Dolby technologies like 5.1 and ATMOS.

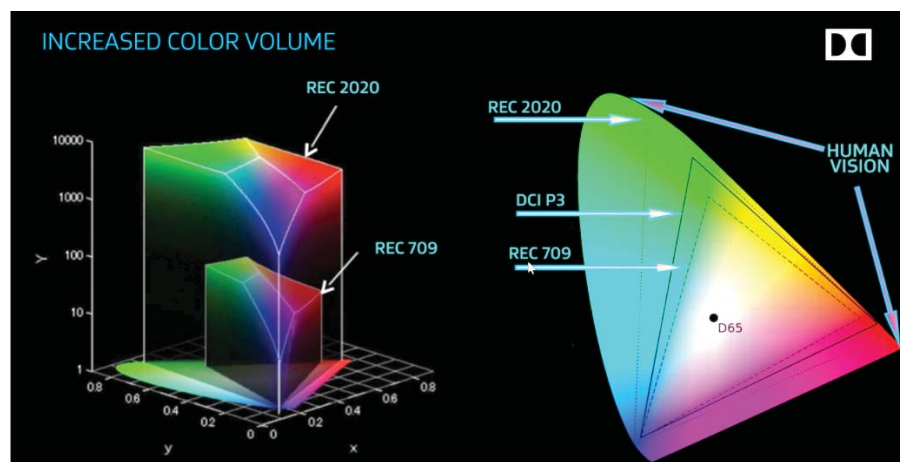
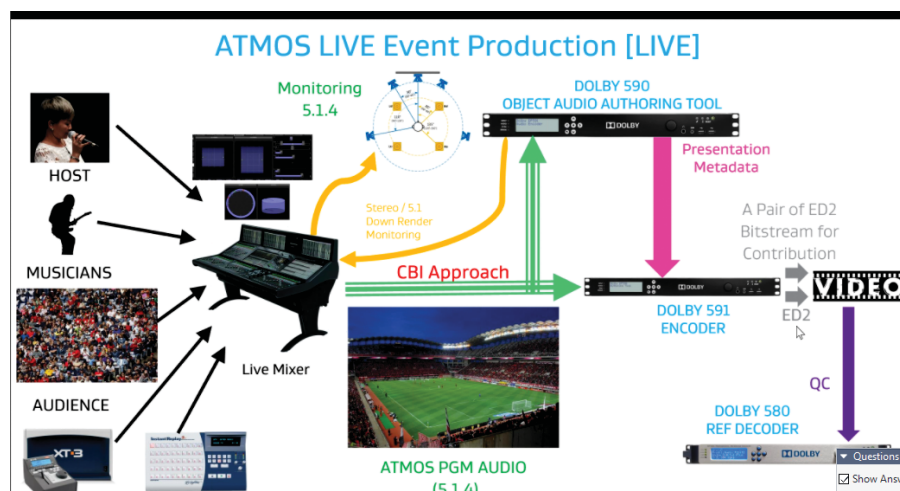
It is important to understand the various codecs and technologies used at different stages and their applications to provide the best experience for the user. For example, the encoding tools and technologies used for contribution can differ from those used for delivery to consumer devices.

At the same time, it is important that the consumer equipment used also supports the necessary Dolby decoder technologies.

The session discussed the Dolby Digital Plus standard for delivery, its features and capabilities. The Dolby Digital plus is an extension and enhancement to the legacy Dolby Digital codec which was developed in 1992 and is able to support up to 13.1 channels.

Dolby Digital Plus Atmos is the enhancement to DD+ to support Dolby Atmos. It carries additional metadata to enable support for Atmos which allows decoding if the device supports it, basically adding the height channels to provide the immersive effect, making it backward compatible.

The session also discussed end-to-end workflows including encoding for delivery on VOD, OTT and streaming applications. It also introduced and discussed different Dolby encoder and decoders including some Dolby partner products available in the market.



The session concluded with a look at how HbbTV, as a standard, supports Dolby Digital Plus and Atmos in its delivery system.

HDR Fundamentals

The final part of the webinar series focused on HDR Technology and implementation of Dolby Vision. High Dynamic Range (HDR) technology is one of the many picture quality enhancements which is part of the next generation video.

While Ultra High Definition brings more pixels creating higher resolution images, HDR brings better pixels making the image more vibrant and produces smoother colour variations. HDR technology along with others is an effort to bring the picture quality as close as possible to human vision when it comes to colour gradation and contrast variations.

Current technologies allow processing and transmission of more data in the channel,

enabling more of the picture information to be retained, making it possible to reproduce more vibrant pictures as close as possible to human vision.

HDR has many formats and implementation methods used within the industry with some applicable in the broadcast environment.

One such implementation of HDR technology is Dolby Vision, which uses metadata to manage colour mapping on the target display. It dynamic metadata allows control of the settings for individual frames rather than having one set of metadata for the whole video sequence. This provides more realistic and accurate colour mapping on target displays.

Dolby Vision provides an end-to-end ecosystem that carries metadata all the way from content creation to distribution and playback. Dolby Vision is widely used within the industry. ■



Q & A

Dolby & ABU Webinar Series on Audio and Visual Technologies

Dolby 5.1 and Dolby ATMOS Transmission workflow – for VOD and HbbTV

Jerry Gui

Senior Staff Solutions Engineer, DOLBY

Questions

☒ Show Answers

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Is there a st...

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Webinar on SDI to IP Transition

ABU Technology Webinar

SDI to IP Transition

The Speaker



Dr Mohieddin Moradi
Senior Researcher,
IRIB R&D

Dr Mohieddin Moradi received his Ph.D. degree in Electronic engineering and is currently working in the production technology affairs of the IRIB R&D department. His specialty is designing studios and OB systems, video and digital image processing, video coding, artificial intelligence, and fuzzy control systems.

ABU Technology organised a webinar on Serial Digital Interface (SDI) to Internet Protocol (IP) Transition on 22 May 2020. The webinar session looked at the key areas and points to be considered by broadcasters when moving from SDI to IP infrastructure. Through a case study the session addressed areas such as selecting the right switching and equipment for IP design with different methods of communication and connection with routing systems. Other areas discussed included the infrastructure for monitoring and orchestration of processes within the connected devices with focus on standards, protocols, redundancy and cost considerations.

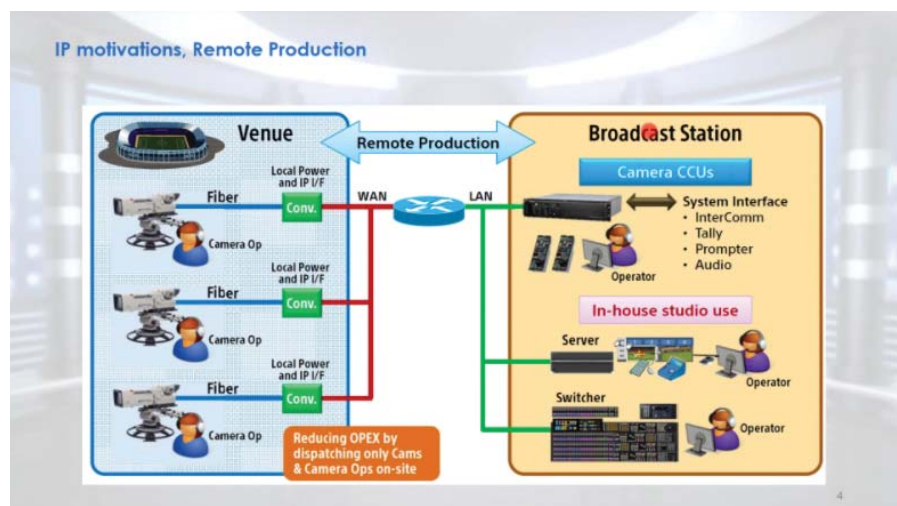
The motivations for adopting IP systems are mostly in remote production and live production environments. The SMPTE and other organisations such as AMWA and AIMS are working for faster adoption of the ST2110 Suite of Standards and for IP interoperability. The SMPTE ST 2110 suite enables a route for, and work on, video, audio and data streams independently, provide flexible workflows, maximum efficiency, increase resource utilisation via efficient distribution of dedicated workflows and reduced bandwidth besides transporting uncompressed video with format-agnostic technology and assured interoperability.

The case study included selection and design of systems for a 12G SDI or Full IP OB truck equipment. It covered a general design consideration of SDI systems first and then moved on to a full IP system. Different equipment, such as audio mixers, audio player/recorders and converters, character generators (CG), live production servers (with SloMo), video production switchers, measurement equipment, test signal generators, audio and video processors, multiviewers, have to be selected as appropriate to different areas of production space. Additionally, an all IP infrastructure includes IP audio and video routers with fixed and modular switches, orchestrator and broadcast controller. The orchestrator

and broadcast controller glue the entire operation together and set up the workflows as required.

The speaker from IRIB R&D department reviewed and suggested some of the features of networking and IT equipment needed to design an OB-Truck according to the SMPTE 2110 standard. Also reviewed were the issues and features of SDI and IP platforms such as cost, complexity, lack of mature standards and lack of IP superiority to SDI in many applications and formats.

Out of 182 registrations, 107 attendees joined the session representing organisations from about 40 countries. ■



Webinar on Implementing Interactive TV

A webinar on Implementing Interactive TV-HbbTV, DVB-I & Targeted Advertising was organised by ABU Technology on 10-11 June 2020. The 2-part webinar series explored implementing interactive TV with HbbTV and implementing TV without limitation using DVB-I.

HbbTV is a global initiative aimed at harmonising the broadcast and broadband delivery of entertainment services to consumers through connected TVs, set-top boxes and multiscreen devices. It mixes linear with non-linear TV content

in an OTT style and leverages the power of linear content and data, and introduces addressable advertising. HbbTV 1.5 was selected by leading countries, who now are switching to HbbTV 2.0. The full range of services are accessible via the red button through Hybrid TV, to allow easy and quick return to watching the programme. Different types of HbbTV service available include VOD, catchup, EPG, news, weather, game, subtitles, advertisement and shopping, voting etc. HbbTV also enables broadcasters to measure their TV reach in real-time.

System architecture supports running web apps on TV platforms in a way that is tightly integrated with the broadcast environment. Deploying an HbbTV service requires a few steps, such as developing the HbbTV applications, DVB broadcast signaling, preparing needed infrastructures for online video services, and ensuring availability of HbbTV compliant receivers in the market. Application delivery may be via both broadband and broadcast.

Another dimension of interactive TV, DVB-I, is making linear television over the internet as user friendly and robust as traditional broadcast television. DVB-I service includes access services, on-demand/linear content, AV/subtitling, and associated applications.

The services are delivered over non-managed or managed IP channels and received by any DVB- T/S/C or IPTV devices or by

Outline

- Why do broadcasters need HbbTV?
- HbbTV introduction
- HbbTV services?
- How do you make it real?
- Application development
- DVB Broadcast signaling
- Ensure availability of HbbTV compliant receivers in the market
- HbbTV success factors





Implementing Interactive TV with HbbTV

Session1 , 10 June 2020

Speaker:

Fatemeh Fallahi Vishkaei, Senior Project Manager, IRIB R&D, IRAN



TV without Limitation with DVB-I

Session2, 11 June 2020

Part1:DVB-I standard and implementation

Fatemeh Fallahi Vishkaei, Senior Project Manager, IRIB R&D, IRAN

Part2:DVB-I and Guide Manager , DVB-I and HbbTV OpApp implementation, New Targeted Advertising Specification

Juha Joki, Director Broadcast And Testing, Sofia digital ltd, Finland

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non-TV devices. A receiver finds relevant services using service list discovery via built-in service list URLs in the client, DVB-SI signaling or URLs, and using a service list registry. Client apps in receivers and mobiles execute several functions, like service discovery, displaying the service list on the receiver, zapping between channels, playing the Dash stream, displaying a content guide and displaying other related material.

For standardisation, DVB published the first DVB-I specification, Digital Video Broadcasting: Service Discovery and Program Metadata for DVB I Services, available as BlueBook A177.

In Iran, Service list's URL has been registered in the TV Service list as national TV channels in DVB-T/ DASH, provincial TV channels in DVB-T/DASH, UHD TV Channels in DASH, and Internet TV Channels in DASH. The receiving

devices available are HbbTV receiver, smart phone, Android TV etc.

Broadcasters, can thus deploy common services across a wide range of devices for e.g. smart TV, smart phone, tablet and PC. They can integrate broadcast and broadband services in one TV service list.

The HbbTV operator, Sofia, has developed Backstage Guide Manager for DVB-I. This software provides unified TV/radio channel line-up management, harmonises the service and guides data in all DVB and OTT apps, aggregates EPG and distributes to all platforms e.g DVB-T/S/C and HbbTV/SmartTV, OTT/Web and supports DVB-I service list and service guide output. The DVB-I Client, as an OpApp, is a special application running on an HbbTV terminal and requires specific support from the HbbTV Terminal. Another feature of HbbTV is advertising content as pre-,

mid-, or after roll advertising. The yellow button on a remote activates microsites, coupons and Banner advertising in applications and application branding.

The next feature was addressable advertising and its ability to show different ads to different households while they are watching the same programme.

With the help of addressable advertising, advertisers can move beyond large scale traditional TV ad buys, to focus on relevance and impact. Addressable advertising is normal video advertising that is typically streamed over the IP during commercial breaks.

Over the two days, the webinars gathered an audience of 64 and 52 attendees respectively. Experts from IRIB-Iran and Sofia Digital from Finland presented the sessions. ■

Webinar on Video Quality Assessment, Fundamentals and Approaches

Another webinar, on video quality assessment, fundamentals, and approaches, was hosted by ABU Technology on 12 June 2020. It explored objective and subjective assessment of compressed video signal artifacts introduced in a video encoder. Video quality assessment (VQA) plays a significant role in image and video processing as it can directly predict the impact of distortions on the video in the quality of experience (QoE) of the user. The webinar looked at different artifacts in the compressed video, at first, and then new methods for video quality assessment were discussed.

The artifacts introduced in compressed video are perceptual artifacts and are blockiness, bluriness, exposure, interlace, noisiness, framing & pillar-/letter-boxing, flickering, blackout, ghosting etc. We can see the artifacts when the video is paused or while the video plays. There are different approaches to quality assessment and they are subjective metrics done by human eye and objective metrics carried with the help of machines. A type of objective assessment is the full reference method where quality measurement makes a comparison between a reference video signal at the input of the system and the

processed video signal at the output of the system.

Subjective assessment takes place in different ways such as non-expert viewing, expert viewing and by test patterns. In expert viewing, a panel of human observers, expert in the domain of study, are given the task to rate the quality of image or video sequences. Viewing the same experiment may be conducted at the same location or repeated in more than one location. Subjective assessment by Visualizer is carried out with SDR/HDR+WCG digital video test pattern matched against different parameters.

The webinar session attracted an audience of 88 attendees and was presented by an expert from IRIB-Iran. ■



The screenshot shows a webinar interface. At the top, there is a video feed of Dr. Mohieddin Moradi, a man with glasses and a dark shirt. Below the video feed, the name "Dr. Mohieddin Moradi" is displayed. The main part of the interface shows a presentation slide. The slide has the ABU logo and the text "ABU Technology Webinar" at the top. The title of the slide is "Video Quality Assessment Fundamentals and Approaches" in large, bold, red letters. Below the title, there is a smaller photo of Dr. Mohieddin Moradi, his name, his email address "mohieddin.moradi@gmail.com", and the date "Friday, Jun 12, 2020".

News from the ABU Region



Malaysia's MYTV uses DataMiner for expansion project

MYTV Broadcasting has adopted Skyline Communications' DataMiner platform for a large-scale expansion project.

MYTV is a company that owns and solely operates the Malaysian Digital Terrestrial Television network that provides free-to-air transmission to the country's population, as an initiative from the government.

At the end of October last year, the company successfully completed a full nationwide switchover from analogue to digital TV.

MYTV began using DataMiner at the start of the Malaysian DVB-T2

network deployment. With the expansion, DataMiner will now be given more responsibilities in terms of the management of their Digital Media Broadcast Hub (DMBH), the backup Disaster Recovery Center (DRC) and their entire nationwide T2 transmitter stations.

"MYTV has the huge responsibility to carry out the national agenda, which is to provide uninterrupted free-to-air digital TV services to the Malaysian viewers, free of charge," MYTV's CEO, Mazlan Mahdi, said.

"But to do so in an effective and future-proof manner, we needed a reliable and advanced remote management and control system that connects to all our sites and

other network elements. And that's exactly why we turned to Skyline and their DataMiner platform again."

Naveendran Murthy, Sales Manager for the APAC region at Skyline, said: "We're very happy with the fact that MYTV chose to expand DataMiner, enabling us to be more involved in this historical milestone of Malaysian broadcasting."

Skyline also announced that MEASAT Satellite Systems, a Malaysian-based satellite operator, has deployed the DataMiner system for a major new project.

NHK's High-resolution 3D Display System with HDTV

NHK is developing Aktina Vision, a unique 3D TV system for viewing natural 3D video without special glasses. Aktina Vision reproduces the light rays from the object to display 3D images. NHK has achieved higher-resolution 3D video system with high-definition television (HDTV) equivalent resolution (about 2 million pixels). The object is captured from different viewpoints (horizontal and vertical locations) to obtain multi-viewpoint images, which are used to reproduce the light rays from the object. By increasing the number of the multi-viewpoint images and resolution of each image, natural high-resolution 3D video display can be achieved even when the viewer moves around horizontally and vertically in the viewing area.

The developed system accommodates 72 multi-viewpoint images, and video resolution is increased by using an 8K projector with a pixel-offset method. A special optical system shifts and multiplexes the light rays of the 72 high-resolution multi-viewpoint images. The



resulting display is a leap in resolution from about 300,000 pixels produced by NHK's previous system to about 2,000,000 pixels on the level of HDTV. [\[NHK STRL\]](#)

Mediacorp airs radio-to-TV shows

Singapore's Mediacorp is supporting the government's heightened safe-distancing measures by ramping up its "whole-of-Mediacorp" offering of quality content for its audiences while they stay home during this critical "circuit breaker" period. Five of Mediacorp's radio stations are now airing a special segment on TV in a unique radio-to-screen adaption. The 30-min programme will also go LIVE on respective stations' Facebook pages. Also, listeners can catch a special podcast series in dialect Hokkien on meLISTEN. [\[asiaradiotoday\]](#)

SBS Korea Delivers Elections with 5G Live Streaming Using LiveU

SBS (Seoul Broadcasting System), a leading national South Korean television and radio network, turned to LiveU's integrated 5G technology for its live election day coverage in South Korea in April, utilizing the advantages of KT's (Korea Telecom's) premium live broadcasting solution with its 5G network.

SBS chose LiveU for its field-proven video transmission quality and reliability, provided by its core HEVC hardware encoding. SBS deployed LiveU's 5G-integrated high-end LU600 HEVC units in the most congested areas, representing the first broadcaster to leverage KT's 5G-Premium QoS solution. Live streaming provided by the MNG (mobile newsgathering) units reached the highest performance levels. SBS was able to secure the new network path, guaranteeing fast

and reliable connection without any interruptions. In other congested areas, SBS used LiveU's compact LU300 HEVC units together with the LiveU Xtender integrated antenna solution to maximize the network capture, ensuring high-quality streams. LiveU's devices were used to cover the polling stations, major candidates' offices and reactions to the election results under the strict safe distancing measures in place due to the COVID-19 pandemic. All the live feeds were streamed to a single server and completely synched, operating as part of a cost-effective, remote at-home production model.

The success of SBS's broadcast-quality coverage helped to drive a higher viewership rate and ratings. SBS is now looking to integrate the LiveU system not only in its news broadcasting workflow, but as another layer in its live content delivery solutions. [\[liveu.tv\]](#)

Enhanced virtualisation and remote access solutions across Australia and New Zealand

Leostream, renowned for managing complex remote workflows from single-pane-of-glass admin consoles, has announced a reseller agreement with Digistor for the ANZ region. This will allow Digistor to provide customers with enhanced virtualisation and remote access solutions across Australia and New Zealand.

Leostream pioneered technologies such as a patented physical-to-virtual machine converter and a virtual machine controller, which evolved into the enterprise Leostream Connection Broker. It is a central component of thousands of enterprise IT environments around the globe. Launched in 2018, Leostream 9 embodies over 15 years of Leostream

research and development in supporting customers with hosted desktop environments including VDI, hybrid cloud, and high-performance workstations. With native support for vSphere, AWS, Azure, Google Cloud Platform, HPE Moonshot System, and the world's most robust connection management and remote access feature set, Leostream customers can manage their entire IT environment all from within the web-based Leostream 9 platform.

Digistor is a respected provider of technology solutions to a plethora of industries, providing product, solutions design, installation and technical support to notable companies including the ABC, Disney, Foxtel, Warner Brothers and Endemol Shine across Australia and New Zealand. Remote working is an area of great growth and potential and is applicable to any industry and any organisation that needs to support remote workers and infrastructure. [\[Content-Technology\]](#)

Archiware Offers Free P5 Desktop LTO Edition License During COVID-19

The COVID-19 Coronavirus crisis has introduced unprecedented challenges for all industries. Recognizing the critical importance of data management and security during the pandemic, Archiware is supporting customers with a free license for the P5 Desktop LTO Edition.

The P5 Desktop LTO Edition is Archiware's professional data management solution for small workgroups. The bundle consists of the products P5 Archive and P5 Backup for use with a single LTO tape drive. The combination of backup and archive provides a solution for maximum data protection. Features include automatic backup and archive,

with a catalogue including metadata, proxies and previews. Supported platforms include Mac, Win, Linux, QNAP, and FreeNAS. Additionally, users benefit from advantages of archive and backup to LTO tape, including offsite storage, the lowest cost per TB and a shelf life of up to 30 years.

Archiware's limited-time offer provides one license per customer. The P5 Desktop LTO Edition, which usually costs 1,200 EUR, is now free. Three months of support and maintenance are included based on the date of activation. After expiration, maintenance and support can easily be renewed via Archiware's channel partners.

The deadline to register for a free P5 LTO Desktop Edition license is 31 July 2020. The P5 Desktop LTO Edition is compatible with single LTO tape drives from MagStor, mLogic, Overland-Tandberg, IBM, Quantum, HPE and others. [\[Archiware\]](#)

Philippines' ABS-CBN Turns to Digital Platforms After Govt Orders Shut-Down

With 42 television stations, 10 digital broadcast channels, 18 FM stations, 5 AM stations, and 11,000 jobs at stake, Filipino broadcaster ABS-CBN has turned to Internet delivery after being ordered by the country's National Telecommunications Commission to cease broadcasting. After a March expiry date of ABS-CBN's franchise, several legislative bills for its renewal were stalled in the country's Congress and House of Representatives. These lapses prompted the NTC to order the immediate shutdown of the broadcaster.

The network has also come under criticism from Filipino President Rodrigo Duterte who has accused it of failing to air his political

ads during the 2016 election campaign. According to ABS-CBN reports, Filipino House Speaker Alan Peter Cayetano stated that regulators appeared to have "succumbed to pressure" from the government's lead lawyer when it forced ABS-CBN off air over its stalled franchise renewal.

The NTC ordered the cessation of ABS-CBN broadcasts on May 5, forcing the media company to go off the air for the first time since the Marcos dictatorship.

Meanwhile, ABS-CBN has taken to alternative platforms, continuing to publish news via its website and to distribute programming via Facebook and YouTube, as well as its international channel The Filipino Channel (TFC), the iWant OTT platform, the ANC pay TV news channel, and the TeleRadyopay television channel that broadcasts ABS-CBN's flagship AM radio station DZMM 630. In a statement, the media company said, ABS-CBN's digital platforms are not covered by the cease and desist order of the National Telecommunications Commission that prohibits ABS-CBN from continuing its broadcast operations on television and radio. [\[Content-Technology\]](#)

IBC2020 cancelled due to Covid-19

IBC2020 has been cancelled due to concerns for exhibitor and attendee safety and the ability to deliver an event of the quality expected of IBC. IBC2020 is due to take place 11-14 September in Amsterdam, but with many countries in Europe still in lockdown, IBC chief executive Michael Crimp said there were many unknowns. As a result, Crimp said it would not be possible to guarantee that IBC would be able to deliver a safe and valuable event to the

quality expected of IBC. And while the decision was hugely disappointing, the IBC CEO said an early decision was best for the broadcast and media industry.

For more than 50 years, IBC has provided the central annual meeting place for the Media, Entertainment & Technology community. For example, over the coming months IBC will continue to engage with the industry through its digital platform IBC365. [\[IBC\]](#)

EBS adopts AJA HELO to engage students on YouTube

As Covid-19 pandemic forces schools and organisations to go digital, the demand for virtual learning programmes across media channels has increased exponentially. With the support of AJA HELO, the Educational Broadcasting System (EBS), an affiliate of Korean Broadcasting System (KBS) responsible for delivering educational content to the public, has transformed the classroom digitally and accelerated the output of its instructional programming video for K-12 students across the country. To engage students, EBS allows its content to be available on its YouTube Channel and each live stream is powered by AJA HELO H.264 streaming and recording device.

Having benefited from AJA HELO's reliability and high-quality output since 2019, EBS expanded its HELO integration to 10 of its e-learning studios, to support live streaming to its website and YouTube Channel. In each studio sits a Sony PMW-EX3 camera with a wireless micro mux connected to an AJA HELO, which is used to quickly and easily stream live camera feeds to YouTube. [\[APB news\]](#) ■

DIGITAL BROADCASTING *Updates*

Linear TV viewership in North Asia up but ad spends down

Linear TV consumption is bucking the trend and growing amongst viewers in North Asia as more people are staying home as COVID-19 rages on. In Taiwan and South Korea, linear TV viewership grew as well as viewing time. According to a report by Nielsen Media, during the first three weeks of February, Taiwan's TV audience grew by one million viewers to about 21 million. However, despite the higher media consumption, a significant number of advertisers have pulled back their advertising campaigns and others deferred their ad campaigns in an effort to bring investment in line with consumer consumption and sentiment. Citing results by its Chinese research partner CC Data, Nielsen said TV consumption also expanded considerably in China as well as Hong Kong. While increased TV viewing each day was expected, the size of the increase was unprecedented, rising by 70 minutes to 7 hours and 40 minutes per day among current TV viewers, with news and drama genres experiencing the most viewership growth. In Hong Kong, TV viewership increased by 43% in February compared with February 2019, while primetime ratings during the same period increased by 44%. Nielsen noted that there is a clear correlation between time at home and media consumption and believes the pull-back in advertising is a misstep, with the increased media time becoming a new prime time for brands to build and interact with a captive audience. In both Taiwan and South Korea, news channels and children's programming were the primary beneficiaries of the increased viewership. Many children, home from school and forced to stay indoors, quickly gravitated to their TV screens while their parents were constantly monitoring news reports on the spread of the coronavirus and its impact on the world's economies, particularly how lockdowns were impacting their lives and livelihoods. North Asian countries were highlighted by Nielsen as they were the first region to be affected by the COVID-19 outbreaks and one of the first to feel the effects of social distancing and lockdowns. Nielsen hopes the insights from the early days of the global pandemic can help the

industry to think ahead and respond to market needs and consumer behaviour in preparation for the release of pent-up need for retail therapy. [\[APB\]](#)

SVOD services continue local content push

Research from Ampere Analysis has found that the global streaming giants such as Netflix and Amazon Prime Video are continuing to beef up their local content in international markets with an increasing focus on Asian markets such as Japan and India where localisation is key. The study found that the 15 markets spending the most on original TV content also represented 88% of the world's SVOD revenue. For international players looking to compete in these territories, Ampere said that more extensive localised production was crucial in order to be able to compete with well-programmed local rivals. Surprisingly, the study showed that the US remained by far the biggest driver of original content expenditure, with local broadcasters and OTT services spending \$36.5 billion on original content in 2019. US-based entities with global TV services – such as Netflix, Amazon and Apple – accounting for a further \$4 billion in original content spend.

Ampere noted that Netflix alone has comparable original content expenditure to a market such as France or Brazil and its cash outlay on new productions would likely mean that within a few years, its amortised spend on original film and TV would overtake that of markets such as the UK and Germany. In total, 15 countries drive just over 90% of all global content expenditure. And while such a high percentage of original content spend originated from these markets, so too did 88% of global SVOD revenues. The conclusion was that viewers like consuming content that is culturally relatable and they're willing to pay for it. Along with the US, China and India were found by the report to have had the highest proportion of respondents regularly watching local content, with over 70% of Internet users watching local content very often in all three markets. Although US SVOD platforms have the largest proportion of local titles, with over 50% of content, countries in the Asia Pacific region follow closely. China, Japan and India also have relatively high coverage of local content, at over 40% of catalogues. When examining content type, local preferences tend to skew towards films in India and Italy, but in other markets, consumers favour local TV series. This skew was highest in the UK, where Internet respondents watched local TV series 18% more than local films. In such TV-focused markets, popular local content can outperform even some of the largest and most successful international titles. Looking at Netflix's most viewed titles globally throughout March 2020, the proportion which are

local varied across markets. Just over two-thirds of Netflix's top titles in Japan were locally-produced. In Europe, Spain was the most localised Netflix market, and 25% of the catalogue was now locally-originated. The research highlighted that Netflix has been increasing its investment in Spanish content, helping it boost appeal to its growing Latin American audience, which together with Spain, makes up around one third of international subscriptions. When considering language, 43% of Spain's top titles on Netflix throughout March were Spanish, and 28% of the most-viewed titles in Mexico were Spanish. In Japan, even though the absolute volume of Japanese content on Netflix in Japan has declined slightly over the last two years, the number of hours of local original or exclusive content has doubled, reflecting Netflix's strategy of tailoring Japanese content to be more exclusive. Netflix's Japanese catalogue represents the most localised catalogue of any of its international territories. Japan was also one of Amazon Prime Video's biggest markets, with over 10 million subscribers in 2019. And as English is not widely spoken in the country, local content is key. [\[Rapidtvnews\]](#)

SiriusXM Will Debut New Hybrid Radio System in Audi Cars

Satellite radio is about to get an important boost in capability. U.S. car buyers will soon get their first look at Audi's use of the new 360L hybrid radio system from SiriusXM. The company announced that the platform will debut in ten 2021 model year Audi vehicles that will be in showrooms this fall. Hybrid radio systems combine over-the-air reception, via satellite, with online connectivity including streaming content. Combining OTA service with two-way connectivity has been a dream of many in the radio industry, and there are several initiatives underway to bring that kind of capability to broadcast radio as well. In that context, the launch of 360L seems an important differentiator for satellite radio in the dash. Selling points include 10,000 hours of recorded on-demand content such as interviews, shows and live performances; more live channels; and personalized "For You" recommendations and the ability to search for related content. SiriusXM with 360L will be standard on A6, A7, A8, Q7 and Q8 models, and standard in most trim packages for the A4, A5, Q3, Q5 and all-road models. Those should be in showrooms by fall; other models are expected to be added. [\[RadioWorld\]](#)

Radio World Announces Winners of Best of Show Special Edition

Radio World announced winners of the 2020- Best of Show Awards, Special Edition. Recipients were Angry Audio Bluetooth Audio Gadget; DEVA Broadcast DB4005 SDR-Based FM Radio Modulation

Monitor; Digigram IQOYA CONNECT Codec Manager; ENCO Systems WebDAD Mobile Radio Automation; Nautel LookingGlass; and Wheatstone GSX Programmable Console.

A special edition of the program was created this year in the absence of a physical spring NAB Show. The program honors and helps promote outstanding new, recently introduced and pending products and services. Paul McLane, managing director of content in Future's B2B media technology group thanked many companies that participated in this year's program under such unusual circumstances and said that despite the current health crisis, technology innovation remains strong in our industry. Winners are selected by panels of professional users and magazine and site editors. Companies pay a fee to participate; not all entries are chosen. Winners and nominees will be featured in a program guide to 95,000 broadcast and media readers across Future's media brands. [\[Radio World\]](#)

DVB releases free reference client for DVB-I services

Developed in collaboration with Sofia Digital, the reference client and related materials are released under the open source MIT license and will help to accelerate deployments of the DVB-I specification. Anyone interested in DVB-I can look at the source code and potentially reuse parts of it in their own experiments, trials, and developments.

The release of the first version of an open source reference client for DVB-I completes the first phase of the work undertaken by Sofia Digital on behalf of the DVB Project. This reference implementation consists of a back end, allowing the generation and editing of DVB-I service lists, plus a front end. The client side is available as an HbbTV OpApp, as well as a separate client for Android devices via a progressive web application. The latter application can be simply tested on anyone's Android phone or tablet. The second phase of development for the DVB-I reference client is now underway. During the second phase, additional features that consumers expect as part of a TV experience will be added. Examples include support for accessibility and parental access control. DVB-I has been gaining momentum over the past year, with the first public demonstrations at IBC2019 and the publication of the first complete specification in November 2019. The specification defines DVB-I Service Lists, a means for internet-connected devices to find curated sets of linear television services that may be delivered through broadband or broadcast mechanisms. It also defines the methods to retrieve electronic programme data for those services, which

can be integrated into a broadband-based television experience accessed through a consistent user interface. [\[DVB\]](#)

FCC Proposes Relaxing Ownership Rules for Broadcasters to Deliver Internet Services

FCC Commissioner has revealed a plan to loosen media ownership rules to allow broadcasters to provide "Broadcast Internet" services via ATSC 3.0 (aka "NextGen TV"). The new standard, currently being deployed nationwide by broadcasters, combines traditional terrestrial broadcasting with an "IP pipe," to deliver a range of internet services over the same broadcast TV spectrum that is already deployed. He first described the new service as a "new and competitive broadband pipe," when the industry announced a plan to deploy ATSC3.0 in 40 markets by the end of 2020. The concept of using broadcast as a one-to-many service that could deliver high-speed broadband, up to 25 Mbps, has been touted as an advantage over cellular's one-to-one scenario. The FCC is expected to vote on a Declaratory Ruling and Notice of Proposed Rulemaking. The Declaratory Ruling would ensure that Broadcast Internet is not subject to legacy media regulations, clarifying that FCC's broadcast TV station ownership rules don't apply to leasing agreements between broadcasters and third parties for Broadcast Internet services. [\[ATSC\]](#)

EBU publishes Technical Report on Measuring Techniques for DAB Coverage Performance

There are several reasons why the measurement of a DAB network and its coverage need to be performed. For a broadcaster, regulatory requirements and costs are major goals. DAB's quality of coverage must be ensured while maintaining the network's cost efficiency. The EBU Tech working group is responsible for producing this EBU report which offers detailed advice and guidance to broadcasters and network providers on DAB coverage measurement, including the reasons why measurements may be necessary and the technical prerequisites required before these measurements are made. Various use cases for measuring DAB network coverage are presented and the techniques, measuring parameters

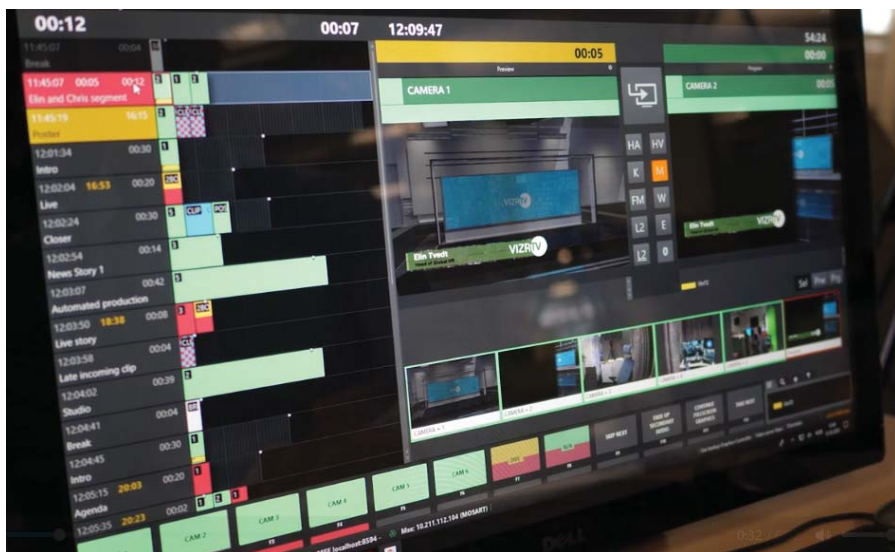
and requirements for each use case are described. Requirements for measuring equipment and its operation are also discussed. Details about the relevant parameters for DAB are given, along with the results of some measurements that have been made, with a view to identifying a possible method for objective network and reception quality assessment for the DAB system. The report confirms the relevance of assessing the quality of DAB services and networks and addresses the major use cases for DAB quality measurements. For each use case the report has described the goal, the measuring techniques, the relevant measuring parameters and the requirements for the measurement setup. With the functional reference model the report defines reference points for radio parameters and quality measurements. The report explains how to reference the measurement setup to a specific use case. Planning a measurement campaign in detail and designing the optimal approach is often a challenging task for broadcasters and could be described in a future version of the report, and close collaboration with the measurements equipment industry would be beneficial in developing the findings of that report. [\[WorldDAB\]](#)

ATSC 3.0 goes live in Vegas

The launch marks the first full-power, multi-station commercial deployment of ATSC3.0 in the US. Sinclair Broadcast Group, Nexstar Media Group and The E.W. Scripps Co. began broadcasting ATSC3.0 powered NextGen TV services at their Las Vegas stations: Sinclair's KSNV (NBC) and KVCW (CW), Nexstar's KLAS (CBS) and Scripps' KTNV (ABC). BitPath, which is developing new data broadcasting services, led the planning and coordinated efforts across the three media companies. BitPath and industry consortium Pearl TV are working together to accelerate the rollout of NextGen TV across the country. NextGen TV can support 4K video and immersive audio and will allow broadcasters to deliver high-quality service to mobile users with an increased level of security and privacy. ATSC3.0 will also power an advanced emergency alert system currently in development, enhancing the ability of local broadcasters to deliver critical safety information to viewers. [\[CSI Magazine\]](#) ■



Equipment Trends



Viz Mosart 4 changes studio production dynamic in touch interface

Viz Mosart 4 changes the studio production dynamic by adding live IP video support directly within the touch-based user interface, opening the door to entirely new workflows and allowing producers to build shows that can be run more easily, from a wide variety of locations. Further improvements to usability also mean that anyone in the organization is able to execute a pre-built show, reducing dependencies on limited resources.

Live sources in the interface: Viz Mosart 4 features a fully customizable interface with interactive live sources. Viz Mosart integrates video over IP directly to the monitor to give an unrivaled view of the show – displaying any video source, program and preview directly in the user interface. Building on the software-based and IP leadership within Vizrt Group and NDI®, this setup can be deployed to an existing network environment and does not require radical infrastructure or monitoring changes.

Breaking news tools: Viz Mosart was made for breaking news. New functionality gives instant and unscripted access to assets including templates, show openers, and much more. The new graphics panel lets one access all Vizrt graphics, preview them and then put them directly on-air. When combined, these tools offer true innovation and access to on-air news production in ways that have previously just not been possible.

Template management: The template organization capability introduced in Viz Mosart 4 significantly reduces the time spent on creation and maintenance of automation templates, allowing one to focus on the show and not the tools

needed to create and bring vision to life. [Vizrt]

MediaKind offers one-stop streaming service on Google Cloud

To enable media processing capabilities everywhere and optimise the distribution of OTT services, MediaKind has launched its one-stop streaming services on the Google Cloud Platform. With the ability to deliver broadcast-quality level and premium experiences across all networks, Aquila Streaming provides significant video bandwidth savings, end-to-end low latency and large storage reduction, thus, offering support for all qualities of live video service up to Ultra-HD. Angel Ruiz, CEO, MediaKind, said that as consumer demand for live streamed content reaches an all-time high, service providers must find ever more creative methods to deliver quicker and more affordable OTT services at scale. MediaKind's cloud-native Aquila Streaming solution can be deployed on bare metal, private cloud, or in any cloud service provider. Through its integration into the Google Cloud ecosystem, the company can also provide access to a broader range of media applications and workloads through the cloud, in areas such as containerisation, artificial intelligence (AI), machine learning and the growing network of Android TV and Google Ad Insertion solutions, whilst offering a fully-managed solution. Thus, MediaKind customers will be able to scale quicker, rapidly spin channels up with ease and respond to multi-format requirements with minimum or no delay at all. Furthermore, MediaKind's disaster recovery in Google Cloud removes the need for a second headend system – the combination of Aquila Streaming and Google Cloud enables local headend services and applications to be backed up and can be restarted rapidly when required. By

leveraging the Google Cloud Platform Marketplace, MediaKind plans to further extend its Aquila Streaming solution capabilities later this summer, offering self-provisioning availability. [APB news]

Solid State Logic Introduces S300 Broadcast Audio Console

The S300 is the most powerful, versatile and user-friendly audio console in its class. It offers a compelling combination of extremely powerful features, hugely versatile installation options and outstanding value. S300 is a compact control surface that can be combined with the complete portfolio of SSL's System T control, processing and I/O options. It can be specified as part of a larger System T installation or in stand-alone configurations for smaller broadcast facilities or OB vehicles. S300 comes in 3 versions: 16+1 faders, 32+1 faders and 48+1 faders. It can connect to either a T25 (256 paths @ 48kHz) or a T80 (800 paths @ 48kHz) Processor Engine and runs the same software as larger System T S500 consoles. S300 presents the extraordinary power and versatility of SSL's System T audio production environment in a streamlined console layout that remains intuitive for operators with a wide range of skill levels. A smaller scale S300 based System T installation offers the simplicity of a console + processor + I/O configuration with the benefit of compatibility with the family of additional fully networked System T control interfaces as required. Within larger facilities S300 is a superb additional or backup console. Complete showfile compatibility between control interfaces means production can easily move between consoles and control rooms within a facility. Where processing engines are of different sizes SSL's unique compatibility mode allows the pre selection of channel, busses and effects resources that will be inactive on the smaller processing engine. Settings from the larger device are never lost and resources can be reassigned at any point during the show, even with audio passing. Its features are:

S300 Hardware Interface

S300 presents the extraordinary power and versatility of System T in a streamlined console layout that remains intuitive for operators with a wide range of skill levels.

Touch Screen World

At the heart of the S300 and System T is an exceptionally elegant software environment accessed and controlled using touchscreens. Channel View and Overview GUI's present a comprehensive bigger picture view of the entire system and immediate screen tap access to a Channel Detail view. System configuration, routing and surface layout are all done using simple, intuitive screen actions. Organising



even large scale showfiles is made simple and straightforward. An HDMI output and optional screen arm facilitate use of an external overview screen.

Hands On Hardware

System T's excellent screen interface combines with robust, responsive hardware. The S300 Fader Tile has fifteen layers with four banks per layer, giving rapid access to 960 paths via dedicated Layer & Bank buttons. Each fader strip has a 100mm motorised fader and a PFL Solo key plus back stop fader PFL. There are additional keys for Mute, AFL, Select, and a 'Q' key that accesses SSL's unique Super Q system. Each strip also features a set of Quick Controls (a push switch encoder and three assignable keys) that work in combination with vertically correspondent aspects of the screen interface above. Colour flag LEDs visually indicate selected functions.

Slimline Master Section

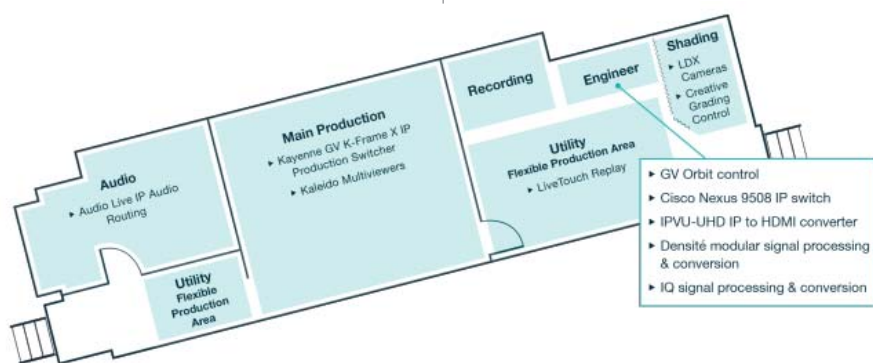
S300 features a powerful, condensed Master Section. In the lower right area of the console a single tile combines a Monitor Section, a Focus Fader and a set of User Keys. The Monitor Section consists of main and misc monitor encoders (with displays), accompanied by DIM, CUT, and External source selection keys. The Focus Fader is a channel strip with a fader and a full set of function keys that can be set to follow the currently selected channel or locked to a specific function. In the upper right is a tile containing a five-inch touchscreen that provides an FX rack meterviewer. Inbuilt Loudness, True Peak and Phasescope metering removes the need for external metering. The master section includes 21 physical user keys, providing immediate control of features most relevant for each production. [\[Solid State Logic\]](#)

All Mobile Video partnered up with Grass Valley to design a full IP outside broadcast unit

The live mobile production environments need infrastructures that are agile and scalable in order to meet the ever-increasing consumer appetite for high-quality content. As a full-service broadcast facilities company, clients look to AMV to provide innovative solutions, including the newest tools to help them enhance their production capabilities and meet demands. To do this, AMV needed to transition to IP, so partnered up with Grass Valley to design a full IP outside broadcast (OB) unit, Eclipse.

Adding IP to portfolio: AMV had been planning for years to build an OB unit with IP technology at its core. It wanted to future-proof offering as IP can handle much higher bandwidth than legacy SDI environments, supporting more live streams from a live event and opening up new, smarter approaches to content creation. Grass Valley is at the forefront of IP technology development, so it was an easy decision to choose them as a partner to design a fully end-to-end IP truck. The unit comes fully loaded with Grass Valley's new LDX 100 IP camera platform, delivering three-times high-speed UHD capture and full HD and UHD HDR. Also purchased was Grass Valley's Creative Grading solution bringing unparalleled creative control to camera shaders. Simplifying the IP workflow is the GV Orbit dynamic system orchestrator; using the interface, operators can easily configure and change systems on the fly. The IP workflow is supported by an IP fabric built with Nexus 9000 Series Switches from Cisco Systems, which support the latest SMPTE 2110 suite of standards. The unit also includes Grass Valley's K-Frame XP video production engine, with Kayenne switcher control panel; Kaleido SD, HD and 4K UHD IP multiviewers; IPVU IP to HDMI monitoring gateways; Densité and IQ Modular signal processing and conversion; and the Audio Live router for live multistream IP audio. Eclipse gives the ability to handle everything from HD to 4K UHD and HDR, plus the capability to scale up to 8K when needed. AMV clients get much more operator space, more firepower and greater production capability all in one unit. This added free space will allow for greater distancing options for show personnel in a post-COVID production environment. What's more, IP gives customers the ability to stay ahead of a fast-evolving mediascape and support clients on that journey to leveraging the full potential of IP.

A TRUE PARTNERSHIP: The biggest challenge with IP is getting control and diagnostics right. We needed a partner with great switching capabilities and tight diagnostics, and Grass Valley delivers the best solutions in those areas. That technology leadership combined with a track record of reliability and true industry expertise made Grass Valley the obvious choice for the job. Another key factor in choosing Grass Valley was to find a partner that values a long term, ongoing collaboration. [\[tvtechnology\]](#)



Test instruments equipped with the new 1.35 mm E-band coaxial connector

Rohde & Schwarz releases the very first test and measurement instruments in the market to support the novel, robust 1.35 mm precision coaxial connector. The connector covers frequencies up to 90 GHz and shall be included in the next releases of both IEEE and IEC relevant standards. Rohde & Schwarz has been a partner in the 1.35 mm E connector development project since its beginning in 2017. An expert group with collective knowledge of microwave signal transmission initiated the joint project to develop and implement a new coaxial connector optimized for E-band frequencies. Emerging applications in particular for automotive radar from 76 to 81 GHz, plus the WiGig extension IEEE 802.11ay operating up to 71 GHz, highlighted the need for a novel, robust coaxial cable connector suitable for industrial applications at frequencies up to 90 GHz. The group consists of Germany's national metrology institute, the Physikalisch-Technische-Bundesanstalt (PTB), Rohde & Schwarz GmbH & Co. KG, Rosenberger Hochfrequenztechnik GmbH & Co. KG and SPINNER GmbH. The result is the 1.35 mm E connector, with a precise metric fine thread, a reliable pin-gap, and an integrated groove for optional push-pull locking. The design was accepted in 2019 for the next edition of the IEEE 287-2007 for precision coaxial connectors, and also by the IEC, which will publish it as the IEC 61169-65. Rohde & Schwarz has implemented the E connector for the first time in a test and measurement instrument. The R&S NRP90T and R&S NRP90TN for frequencies up to 90 GHz are the latest additions to the thermal power sensor family. Like all other members of the family, the new models feature both the highest accuracy and fastest speed of measurement available for thermal power measurements. The R&S NRPxxT power sensors operate locally, connected to a PC, selected Rohde & Schwarz instruments, or an R&S NRX base unit. The R&S NRPxxTN sensors can also be operated remotely via a LAN. The E connector closes the gap between the well-established 1.85 mm connector (the V-band connector) and the 1.00 mm connector (the W-band connector). The V-band connector, introduced more than 30 years ago, is suitably robust for industrial applications, but is restricted to a maximum frequency of 70 GHz. The W-band connector, on the other hand, supports a maximum frequency of 110 GHz, but requires a fine-mechanical accuracy during assembly, and frequently loosens in use. [\[rohde-schwarz\]](#)

Personalities & Posts



Promotion for NTV journalist and moderator

A prominent Nepalese moderator and MC, **Ms Shivane Thapa Basnyat**, has been promoted to Senior News Editor at the national broadcaster, Nepal Television.

Shivane has more than 15 years' experience in broadcast journalism with issues relating to politics and international relations being her areas of interest.

Her experience also includes production of news & current affairs programmes, documentaries and public service announcements.

In addition, Shivane is also a well-known moderator and master of ceremony for national and international events in Nepal. She was MC for the opening of the ABU Media Summit on Climate Action and Disaster Preparedness in Kathmandu on 25-26 April 2019. ■



DVB appoints new Head of Technology

Ms Emily Dubs has taken up the position as Head of Technology at Digital Video Broadcasting (DVB) and as ABU Technical Liaison Officer.

Emily has more than 20 years' experience in the digital television industry.

Previously she worked with Thomson Video Networks (now Harmonic), TeamCast (now ENENSYS) and SmarDTV/Neotion, in roles covering both traditional broadcast technologies and those emerging from the broadband world.

She succeeds Dr Peter Siebert, who retired after working at the DVB Project Office from 2009.

DVB is a set of international open standards for digital television. DVB standards are maintained by the DVB Project, an international industry consortium. ■



Amir Khairul Anuar, Systems Support Officer

ABU IT's Systems Support Officer, **Amir Khairul Anuar**, has left the ABU for a new job opportunity.

Amir joined the ABU in August 2017 and worked very well with all ABU colleagues and members. He was quick to solve all our IT issues and did so quietly and efficiently.

Amir was diligent, hardworking, organised, soft spoken and showed great skill in carrying out his duties. He made friends very quickly with everyone and was highly regarded by all.

We will miss him and wish Amir great success in his new adventure. ■



Nitesh Chand leaves ABU Secretariat

Nitesh Chand has left the ABU Secretariat after serving as Finance and Administration Officer for almost four years.

A Fijian national, Nitesh joined the ABU in September 2016 after working for Fiji Television as Finance Manager for three years. He has now joined his family in Sydney.

Nitesh was well regarded by his colleagues at the ABU. We wish him every success in the next stage of his career. ■

CALENDAR *of Events*

SEPTEMBER

THU	FRI	SAT	SUN	MON	TUE	WED
10	11	12	13	14	15	16
	International Broadcasting Convention Virtual Event  Amsterdam					

SEPTEMBER

OCTOBER

TUE	WED	THU	FRI	SAT	SUN	MON
29	30	1	2	3	4	5
BroadcastAsia2020 Virtual Event  Singapore						

OCTOBER

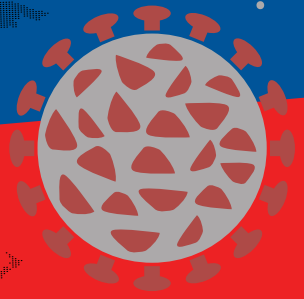
MON	TUE	WED	THU	FRI	SAT	SUN
5	6	7	8	9	10	11
	EBU Technical Assembly Online Event  Geneva					

NOVEMBER

MON	TUE	WED	THU	FRI	SAT	SUN
16	17	18	19	20	21	22
		InterBEE 2020 Online Event  Japan				

DECEMBER

FRI	SAT	SUN	MON	TUE	WED	THU
11	12	13	14	15	16	17
ABU Technical Bureau Meeting  Hanoi	ABU Technical Committee Meeting  Hanoi			ABU General Assembly  Hanoi		



ABU to share COVID-19 content

The ABU is developing a database of content related to COVID-19 to be shared among members and partners.

The aim is to enable members to benefit from the experiences of other countries on reporting on the coronavirus and efforts to prevent its spread.

The ABU is inviting all its broadcast members to contribute any material they have produced – advisories, graphics, interviews, and educational and entertainment content.

“Many of our members have informed us that they have developed and are continuing to develop content that provides information and guidelines on COVID-19, and they are happy to share this content with other members and colleagues if these can be of help in their work,” the ABU Secretary-General, Dr Javad Mottaghi, said.

The ABU has set up the online exchange network and content distribution platform, Asia-Pacific View (APV). The ABU COVID 19 content database will be placed on APV for members’ use and reference.

The link to register for APV is <http://www.abu.org.my/apv> ■

Broadmedia & Entertainment

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E-mail: contact2020@inter-bee.com

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