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Enterprise Storage Archiving System (ESAS) - Why STaaS Is The Way To Go

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Inside

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from the Editor

This is the first edition of the Technical Review of 2021. Together we are all hoping and praying that slowly but steadily things will be returning to normal after the challenges and difficulties of 2020.

Usually, the first quarter edition of the TR is mainly focused on our annual DBS event but this year due to the ongoing pandemic, DBS was delayed and was held in early April as a virtual event. We did not have enough time to put together the detailed reports for the event. DBS2021 will be covered in detail in the next edition.

This edition carries two feature articles which have been contributed by our member IRIB-Iran and our industry partner IPSB Technology-Malaysia. The first feature article with the title "A Novel Approach for Evaluating Multi-Path Adaptive Video Streaming in IP Networks" looks at the possible approach of effectively using telecom networks for video contribution through video streaming technologies. While noting that only dedicated bandwidth links are used for such applications, the article discusses and proposes a multipath approach to evaluate different streaming systems in an unreliable network with a variety of bandwidth and packet loss fluctuations and what parameters need to be monitored for evaluating such links.

The second article by IPSB Technology titled "Enterprise Storage Archiving System (ESAS) - why STaaS is the way to go" discusses one of the most demanding and difficult to choose areas of data storage technologies. It looks at the changing workflows and storage requirements for media applications and why Storage-as-a-service (STaaS) could be the best approach for current media storage needs.

This edition also includes highlights from activities organised by ABU Technology during the last few months. These include the webinars on "OTT and IBB Technologies and Services" and "Satellite Technologies for Broadcasters" which were organised between January and March this year. The edition concludes with our regular highlights from industry news, digital updates and the latest in equipment trends. We hope you will benefit from the information and updates included in this edition. Stay safe and take care.

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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.

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A Novel Approach for Evaluating Multi-Path Adaptive Video Streaming in IP Networks

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ABSTRACT

Sending and receiving live reports from event locations to broadcast centres is generally done via SNG or microwave equipment. The equipment cost, communication infrastructure preparation, and start-up time have led to methods based on Internet streaming as an alternative. The use of dedicated lines with guaranteed bandwidth is considered to be one of the best methods, but access to leased lines is not feasible everywhere; they are used for fixed locations and come with high costs. The development of affordable mobile services, like 4G and 5G wireless networks, propose a huge capacity for video streaming for broadcast application. The use of mobile and Internet services has been a motivator for manufacturing equipment by video communication companies.

Bandwidth sharing by mobile operators, bandwidth fluctuations, and transmission network capacity limitations do not support the proper sending and receiving audio and video. Some parameters affecting end-to-end video streaming are, bandwidth limitations, latency, jitter, buffer performance, congestion and packet re-request, packet loss, and compression ratio. Missing packets can cause freezing of the video. On the other hand, resending of lost packets by the sender can cause bandwidth reduction. There is a reasonable relationship between the QoE in video streaming with QoS. Establishing a good QoS for Live video on heterogeneous networks such as telecom networks remains a challenge.

In this article, an innovative and feasible method is proposed for evaluating the performance of video transmission systems comparatively through several different paths. The proposed method can examine different video transmission systems and determine capabilities of video coding and network management. To investigate the relationship between video quality and packet loss, we define a novel parameter called "Robustness". For DMOS analysis, using different bandwidth and packet loss, total nominal bandwidth and bandwidth consumption are determined too.

Performance appraisal is done using a virtual infrastructure and managed generated disturbance as a simulation of real network conditions. By using network disruption simulator software (Wanulator) and micro controllable switch (Microtek switch) in the video streaming cycle, simulation of typical network traffic conditions is achieved. Parameters such as latency, bandwidth, jitter, and packet loss can be created to the desired extent using the Microtek switch and Wanulator software to investigate the reaction of the streaming system to any stimuli. Then, by calculating the forementioned parameters and criteria such as nominal bandwidth, and bandwidth consumption, two typical systems (Bitcaster and DMNG-pro180) are evaluated and their functionality determined quickly and accurately.

KEYWORDS: Video Transmission Systems, Performance Evaluation, Multi-Path Transmission, Adaptive Video Streaming

INTRODUCTION

Currently, the development of mobile service infrastructure along with cost-effective and portable broadband devices has led to the growth of wireless Internet (4G and 5G networks) for video transmission. According to a prediction by Cisco, 40.5% of worldwide mobile communications are through 5G wireless networks and in 2020, 75% of its traffic will be related to video (1). Issues such as dependence on antenna coverage, Internet sharing between users of mobile operators, constant changes, and limited capacity, do not support stable bandwidth for reliable video communication.

Sending and receiving live reports to the broadcaster is usually done via SNG or Microwave, but the cost of equipment, communication infrastructure preparation, and long-term installation has led to newsgathering using methods based on Internet streaming technology over 4G and 5G networks. One way to guarantee bandwidth is to use dedicated lines, but it is often not possible to access leased lines everywhere, and this method is usually reserved for fixed communications. It is also expensive. Therefore, to solve these problems, various software and hardware solutions have been created with the possibility of aggregating the available bandwidth (including LAN, wireless, and SIM cards of telecom operators. However, due to the impossibility of testing in different network conditions, system evaluation will take a long time. So, providing an evaluation method using virtual infrastructure and, to some extent, creating a managed disruption on it could provide simulation of real network conditions to study and compare different systems with speed and accuracy.

PARAMETERS THAT AFFECT VIDEO STREAM QUALITY

There is a relationship between the QoE[1] and QoS[2] in video streaming. Meanwhile, creating a reasonable QoS for Live video on a heterogeneous network (such as telecom operators' networks) remains a challenging issue. ***Figure 1*** shows the approximate current cycle of live sending and receiving events for broadcasters using IP infrastructure through telecommunication operators' networks.

To reduce the possibility of disconnection between the sender and receiver, multi-path transmission technology and aggregation of the available bandwidth are used to increase the communication speed and save the cost of dedicated lines. In the end-to-end review of this cycle, some factors affecting the quality of video streaming including compression, bandwidth, latency, delay, jitter, buffer and re-buffering, congestion, packet request, packet reordering, and packet loss ratio, etc. (2).

Depending on the type of content, other effective parameters such as the number

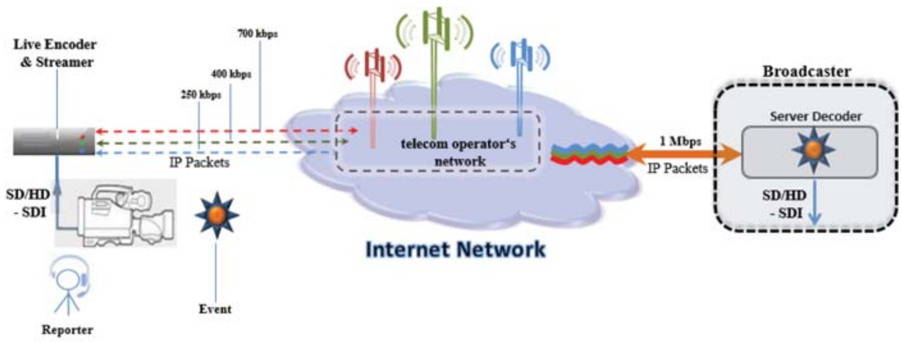

Figure 1*: The live video streaming simulation*

1 Quality of Experience
2 Quality of Service

of frames and GOP affect the QoE (3). Therefore, due to the multiplicity of parameters, our evaluating method for video streaming systems is a subjective, simultaneous comparison of the received video with its original counterpart. The need for a managed virtual network to view and record the impacts of destructive network factors on the received video is also essential. In this method, the results of subjective tests are scored as Differential Mean Opinion Scores, DMOS, according to ***Table 1***. In this table, MOS is the arithmetic mean of all individual scores and can range from 1 (worst) to 5 (best).

Quality	DMOS
worst	1
Poor	2
Fair	3
Good	4
Excellent	5

Table 1: *The content quality scoring*

Packet loss may lead to I-frame loss that can present as a freezing of the received video. On the other hand, to reduce the effect of packet loss, it must be re-ordered by the recipient and sent by the sender, which can appear as a reduction in bandwidth. Therefore, as a way to investigate the relationship between video quality and the amount of packet loss and its side effects, we have defined a parameter called 'robustness'.

To simplify the analysis of the DMOS value by altering bandwidth and packet loss, we will use robustness, total nominal bandwidth, and bandwidth consumption parameters as follows:

In which the nominal bandwidth means the total available bandwidth on different paths; consumption bandwidth means the total consumed bandwidth on different paths.

For simplicity in our evaluations fixed decoder buffer capacity is assumed for each decoding system, to compensate for its effect on the decoding process.

It should be noted that, according to our robustness equation definition, smaller robustness values represent a more robust system.

$$\text{Nominal Bandwidth} = (\text{Nominal Bandwidth}_{\text{Link1}} + \text{Nominal Bandwidth}_{\text{Link2}} + \ldots)$$
$$\text{Consumption Bandwidth} = (\text{Consumption Bandwidth}_{\text{Link1}} + \text{Consumption Bandwidth}_{\text{Link2}} + \ldots)$$

$$\textbf{Robustness} = \frac{(\textbf{Nominal Bandwidth}) - [\%\ \textbf{Packets Loss} \times (\textbf{Nominal Bandwidth})]}{\textbf{Output Bitrate}}$$

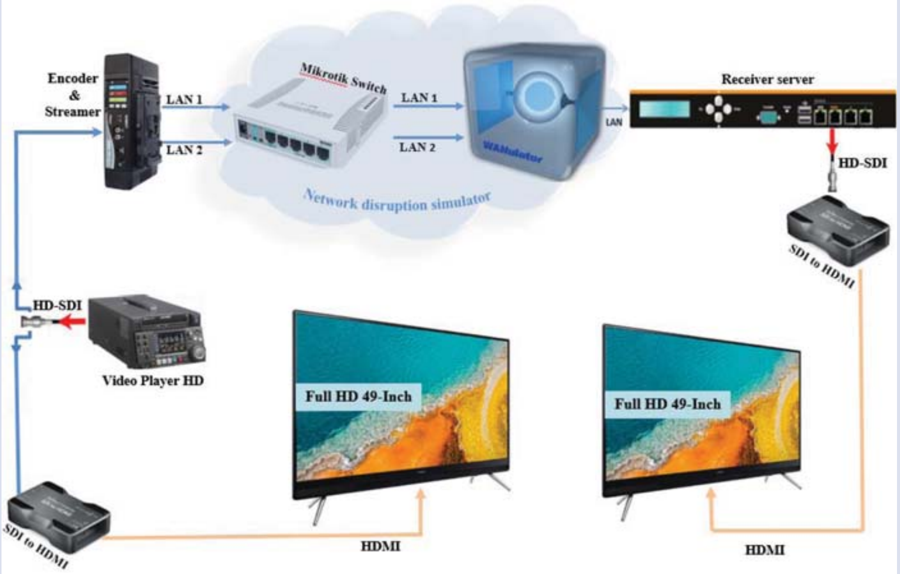

Figure 2: *Video streaming with the presence of Mikrotik switch and Wanulator*

NETWORK DISRUPTOR SIMULATOR IMPLEMENTATION IN THE SEND AND RECEIVE LINKS

Figure 2 shows the test process to simulate possible network problems. Wanulator[3] and Mikrotik controller switches are used for creating traffic and network disruption. Therefore, it is possible to make changes to parameters such as latency, bandwidth, jitter, and packet loss to monitor the reaction of the streaming system for any changes. The Wanulator and switch are placed between the sending and receiving points.

The ParkJoy EBU HD test sequences' are used. The coded Parkjoy video test is sent towards a virtual network to simulate network disruptions. These disruptions are created by Mikrotik and Wanulator and the resultant output is sent to the receiver. At the receiver, the decoded signal is displayed on a TV screen. For comparison purposes, the input video is displayed on a similar TV screen as well.

TEST PROCESS

System 1 (Bitcaster[4]) is a software streamer that can be installed on a laptop with Windows operating system and system 2 (DMNG-pro180[5]) is a hardware streamer that can be installed on a portable camera. The conditions and amount of change in test parameters (such as bandwidth and packet loss) are shown in ***Table 2***. Both streaming systems have been tested with HD test video and H.264 codec as VBR[6]. The maximum bit rate for best quality has been set at 8 Mb in both systems. The total buffer and delay time have been set to 4 seconds, and multi-route conditions streaming protocol is selected. The effect of redundancy parameter[7] is adjusted in a range of 20% to 100%. Packet loss changes for two paths are considered in two modes (i.e. 10% and 15%). For these paths, bandwidth limitations are changed from 4 Mbps to 10 Mbps (from high to low trend and low to high trend) with a step of 1 Mbps. By considering different parameter values (bandwidth, packet loss, redundancy) 34 different test conditions for each system are obtained.

Simultaneous Bandwidth Changes On Both Routes	Simultaneous Packet Loss Changes On Both Routes (%)	Maximum Redundancy (%)	Constant Delay (Second)	
• Maximum Total bandwidth **10 Mb/s** • Minimum Total bandwidth **4 Mb/s** • The bandwidth changes from high to low (and low to high) with a step of 1 Mbps.	**10**	**20**	**4**	**8 Mb/s**
	15	**100**		

Table 2: *The different test conditions*

3 http://wanulator.de/
4 https://www.samimgroup.com/product/68068/BitCaster
5 https://www.aviwest.com/aviwest-references/pro180-2
6 Variable Bit Rate
7 The capabilities and methods in streaming systems to compensate for network problems and errors (such as packet loss)

Figure 3: *The laboratory test of the streaming system*

Figure 3 shows the laboratory setup to test streaming systems with a Mikrotik switch and a Wanulator.

DRAWING DIAGRAMS OF DMOS AGAINST CHANGES IN OTHER PARAMETERS

The input and output video qualities were observed in each streaming system and the DMOS graph was drawn based on the change of parameters (e.g. packet loss, bandwidth, and robustness).

Changing the Nominal Bandwidth Values

Figure 4 shows the graphs of DMOS for different values of total bandwidth (link1+link2) for 10% and 15% packet loss values in system1. It shows that the DMOS is 2.75 for 10% packet loss at 10 Mbps and 1 for 15% packet loss at 10Mbps. Here, independent of total bandwidth value the DMOS is 1 for 15% packet loss, and the resulting decoded video quality is poor.

Figure 5 shows the graphs of DMOS for different values of total bandwidth (link1+link2) for 10% and 15% packet loss values in system 2. It shows that the DMOS is 4 for 10% packet loss at 10 Mbps and 2.67 for 15% packet loss at 10Mbps. It means that system 2 has better performance than system 1 and, for the same total bandwidth and packet loss values, you get better picture quality at the receiver side.

Changing the Robustness Values

In ***Figures 6*** and ***7***, the points marked on the diagram indicate the average value of the robustness parameter related to different packet losses. Figure 6 (system 1) shows that the DMOS value is 3.0 for 10% packet loss and 1.1 robustness. In this figure, the DMOS is only 1 for a packet loss of 15% which means a very poor response.

In ***Figure 7*** (system 2), the DMOS value is 3 with 10% packet loss and 0.64

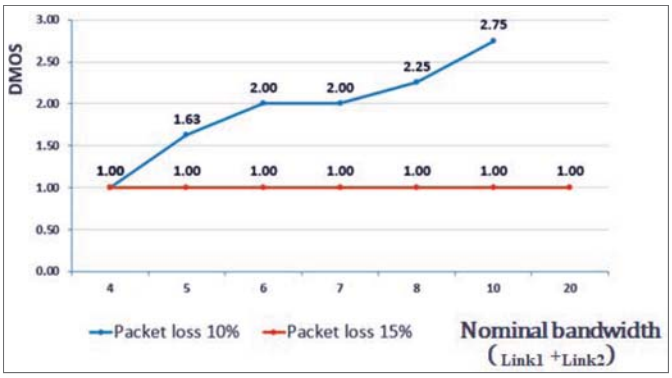

Figure 4: *Graphs of DMOS for different values of total bandwidth (link1+link2) for 10% and 15% packet loss in system 1*

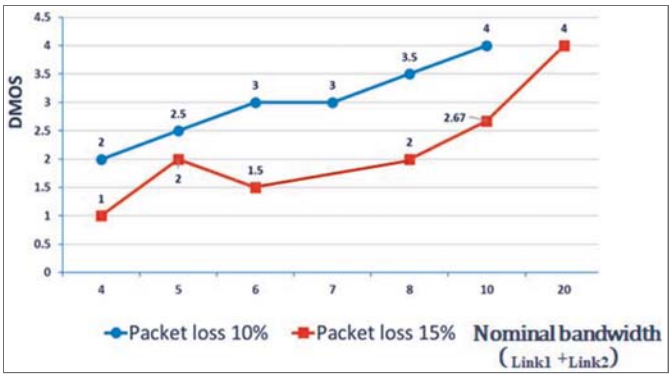

Figure 5: *Graphs of DMOS for different values of total bandwidth (link1+link2) for 10% and 15% packet loss in system 2*

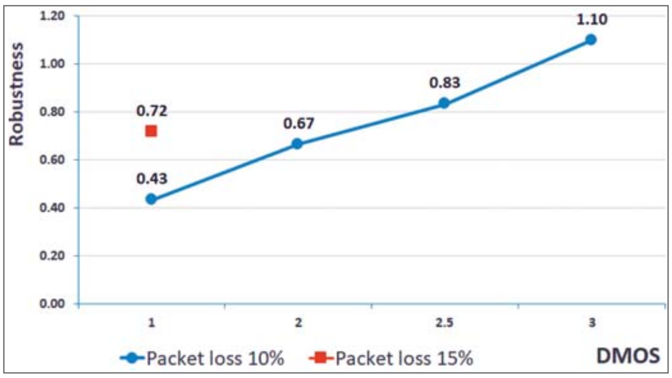

Figure 6: *The DMOS diagram of system 1, by changing of packet loss and robustness*

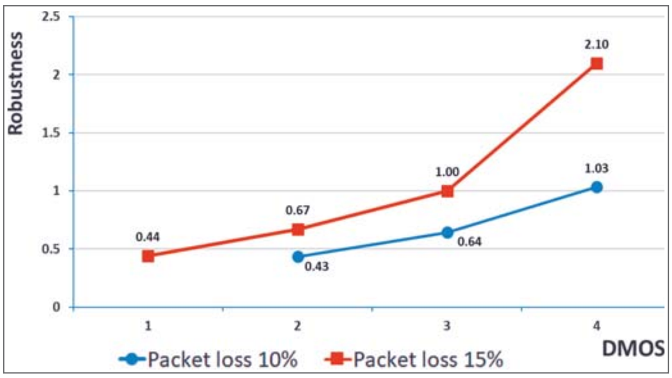

Figure 7: *The DMOS diagram of system 2, by changing of packet loss and robustness*

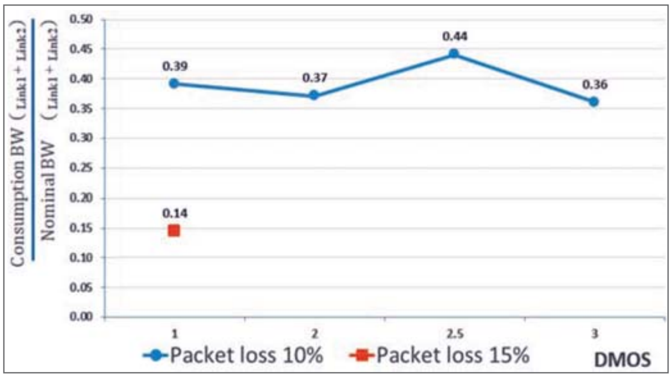

***Figure 8**: The DMOS diagram of system 1 for different values of packet loss values (10% and 15%) and changing the ratio of consumption bandwidth to nominal bandwidth.*

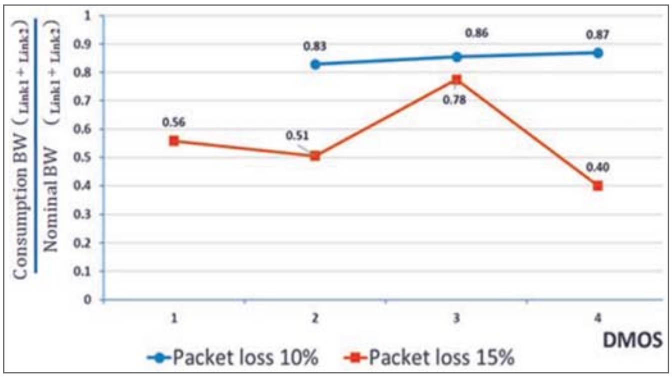

***Figure 9**: The DMOS diagram of system 2 for different values of packet loss values (10% and 15%) and changing the ratio of consumption bandwidth to nominal bandwidth.*

robustness. In this figure, the DMOS value is 4 for 15% packet loss and 2.1 robustness. So in this section, the results of system 2 are better than system 1.

The Effect of Changing the Ratio of Consumption Bandwidth to Nominal Bandwidth

Figure 8 shows the DMOS value is 3 for system 1 when we have 10% packet loss and the ratio of consumption bandwidth to nominal bandwidth is 0.36. Here, independent of the ratio of consumption bandwidth to nominal bandwidth value the DMOS is equal to 1 for a packet loss of 15% and it means that we have got very poor video quality on the receiver side.

Figure 9 shows the DMOS value for system 2 is 3 when we have 10% packet loss and the ratio of consumption bandwidth to nominal bandwidth is 0.86. For a packet loss of 15%, the ratio of consumption bandwidth to nominal bandwidth value impacts the DMOS value, which means that we can get different decoded picture quality with attention to ratio at the receiver side. These results show that system 1 could not use the total capacity of available bandwidth while system 2 can outperform in available bandwidth management. So, the performance of system 2 is better than system 1.

A summary of the results obtained by comparing the output quality of two streaming systems is shown in ***Table 3***.

CONCLUSION

Parameters such as bandwidth limitations, latency, jitter, buffer performance, congestion and packet re-request, packet loss, and compression ratio affect end-to-end video streaming performance. In this article, we proposed a practical and novel approach to evaluate different streaming systems in an unreliable network with a variety of bandwidth and packet loss fluctuations.

Parameters such as latency, bandwidth, jitter, and packet loss can be created to the desired extent using the Microtek switch and Wanulator software to investigate the reaction of the streaming system to any stimuli. For precise evaluation of the video quality, we propose "robustness". Then by analysis parameters such as nominal bandwidth, and bandwidth consumption, the behavior of two typical systems (Bitcaster and DMNG-pro180) are discussed. ***Table 3*** shows the results of these two systems in equal video quality (DMOS=3) as a typical point of our evaluation.

As shown in the table the system 1 robustness value with 10% packet loss of 1.1, while for system 2 it is 0.64. It means that system 2 with more bandwidth percentage consumption (86% of 7 Mbps is used) is more robust in comparison to system 1 with less bandwidth percentage consumption (36% of 10 Mbps used). If we increase the packet loss value to 15% then system 1 reaches unstable and unusable states, while system 2 can perform acceptably with a robustness value equal to 1.

According to this table, it can be seen that the quality of the encoding, decoding, and streaming algorithms of system 2 is better than system 1.

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3. The impact of bitrate and GOP pattern on the video quality. Jinheng Xu IEEE student member, Bei Zhou, Chi Zhang, Nanhai Ke, Weizheng Jin*. 2018.

Also attached is a little note on the IRIB R&D.

DMOS=3		Streaming System 1 (Bitcaster)	Streaming System 2 (DMNG-pro180)
Packet Loss: 10%	Robustness	1.1	0.64
	Nominal bandwidth	10	7
	Consumption bandwidth to nominal bandwidth	36%	86%
Packet Loss: 15%	Robustness	-	1
	Nominal bandwidth	-	13
	Consumption bandwidth to nominal bandwidth	-	0.78

***Table 3:** The content quality scoring*

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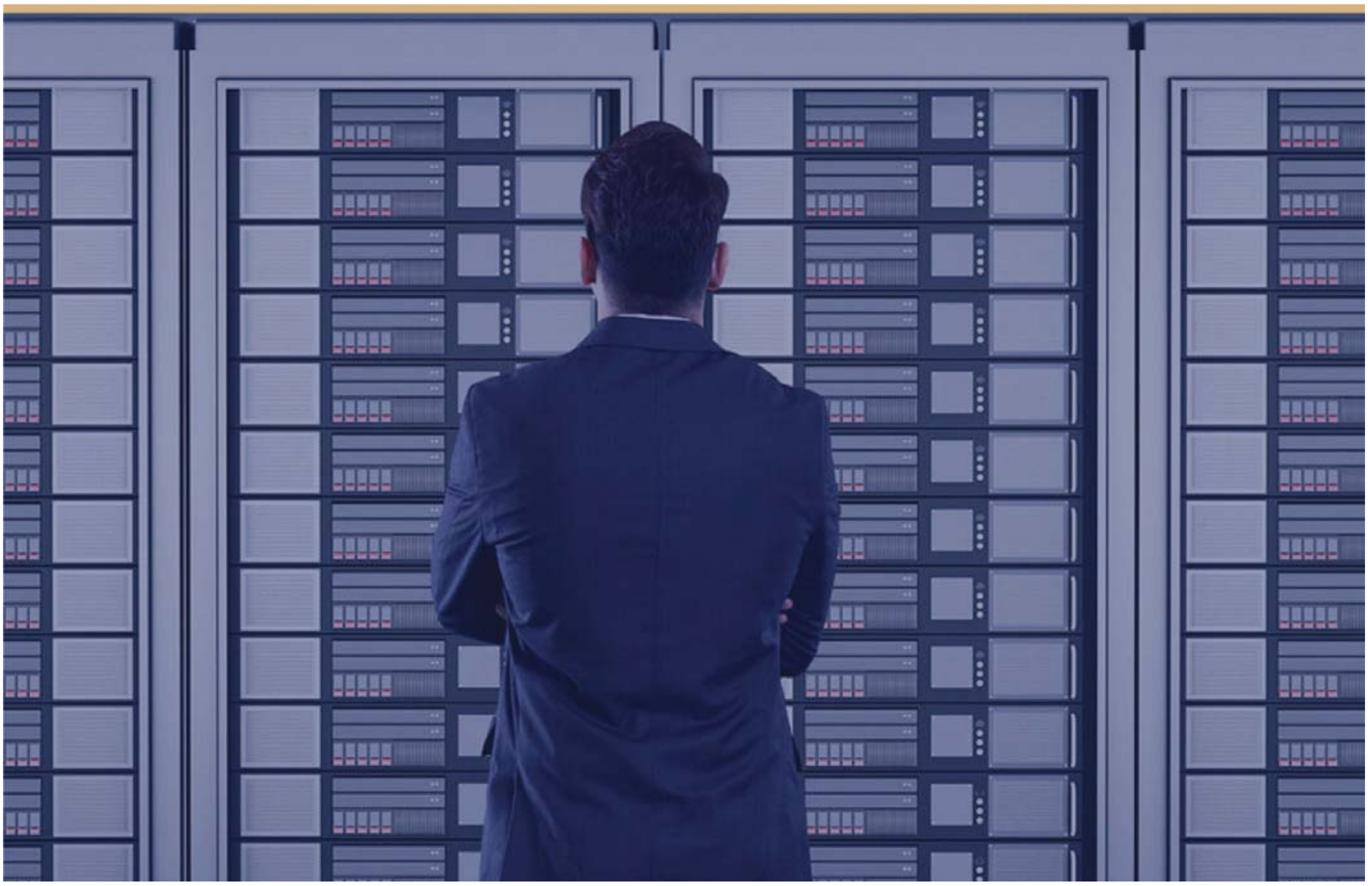
Enterprise Storage Archiving System (ESAS) - why STaaS is the way to go



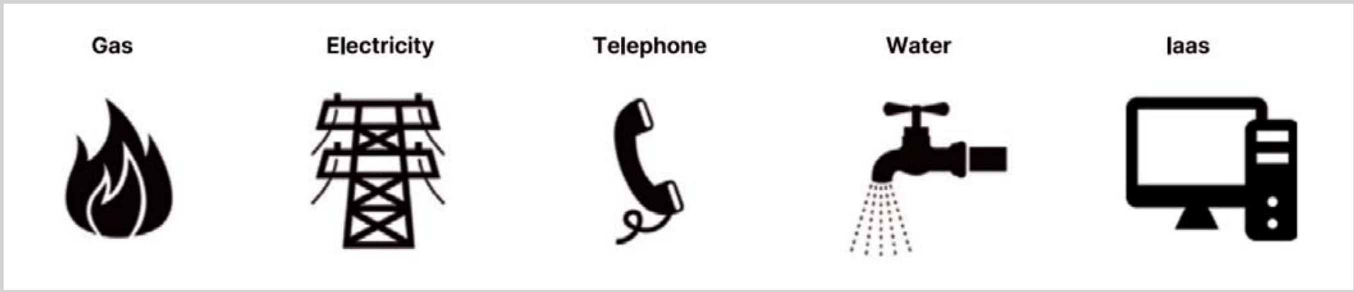
We have witnessed the advancement of various technologies for broadcast data centres, IP Broadcast workflow, explosion of media storage for production and collaborative editing postproduction workflows. On top of those, the multi delivery platforms evolution from analogue to digital, live streaming and video on demand phenomena have transcended our imagination. Hence, our biggest challenge will be the infrastructure capability to handle all these. Why? The demand on performance data centres and the need for speed in media asset collaboration has forced broadcasters and media houses to rethink and redesign their workflow architecture. With never-ending requirements for storage capacity, users need a clear understanding of the overall technology and performance objectives, but with a dizzying array of options available, it is difficult to find the right technology.

Increasing demands for performance, scalability and agility of data centres have never been higher. The success and growth of broadcasters and media houses depend on these. Changes demand lower cost, greater use of cloud resources and reliable services. While there are plenty of ramifications for infrastructure, computing and networking resources, the biggest impact is on storage. In many cases the way organisations have previously purchased, managed and scaled storage just isn't working for them anymore – especially when it comes to meeting demanding service level agreements (SLAs) for performance, scalability, capacity management and agility.

ONCE UPON A TIME...

In the 60 years since the invention of HDDs in the 1960s, enterprise storage systems have been deployed with planned obsolescence. The elaborate and complex ritual of evaluating new enterprise storage systems, forklifting out old systems and deploying new storage has had to be repeated every 3-5 years. The capital expenditures (CapEx) required for an enterprise storage refresh has ranged from tens of thousands of dollars for a small enterprise, to millions for large enterprises, especially for broadcasters with petabytes of media assets growth.

Leasing companies started financing data centre infrastructure to help customers spread their cash flow over the life of the equipment. Unfortunately, leasing did not eliminate the 3-5 year cycle of designing, evaluating and replacing the complex systems. The era ended with broadcasters around the world searching for alternatives. They wanted options to routinely



replace storage systems every 3-5 years without any disruption of their businesses.

5TH UTILITY BILL

Infrastructure-as-a-Service is the 5th Utility technology industry to change forever with the introduction of cloud computing, including Software-as-a -Service, Infrastructure-as-as-Service and Platform-as-a-Service. Amazon Simple Storage Service (AWS S3), a storage offering from Amazon, was the first Infrastructure-as-a-Service (IaaS) and Storage-as-a-Service (STaaS) provision to go hyperscale.

AWS and Amazon S3 public cloud storage services were launched in 2006 and immediately took off, as they provided instant, risk-free infrastructure with a new twist – It became an asset consumed like a 'fifth utility' alongside electricity, gas, telephone and water.

Like electric and gas supply infrastructures, customers don't see or touch IaaS. They just plug into the grid and only need to know about the details of the service agreement. But unlike a lease, which also offers monthly payments, customers pay only for the resources used.

The technology perspective of data centre infrastructure also changes, from hardware and software to a user console.

This new perspective is laser focused on the dashboards to set-up and monitor storage services, and dashboards for billing. Users are completely abstracted from the servers, storage, networks, and software in IaaS data centres.

STORAGE-AS-A- SERVICE (STAAS)

Since 2006, AWS has been joined by a handful of tier-1 STaaS providers, plus thousands of tier 2 and 3 providers around the world. STaaS eliminates the ritual of replacing storage systems every 3-5 years and provides a risk-free financial model, but not all environments and businesses are suitable for the public cloud. Notably the media & entertainment environment - post production, rendering, graphics and many other workflows, require high throughput performance that is only feasible on-site.

Another reason for maintaining an on-premise environment would be data classification and data acts that require the user to host data on site. But ideally, users would like to have a multi cloud environment platform that still allows a client to maintain an on-premise infrastructure while working seamlessly with IaaS in the public cloud.

These storage methods include backup and restore, disaster recovery, block storage, SSD storage, object storage and bulk data transfer. Backup and restore refers to the backing up of data to the cloud, providing protection in case of data loss. Disaster recovery may refer to protecting and replicating data from virtual machines (VMs).

On-Premise Storage-as-a-Service is extraordinary because it is like leasing a car, where customers takes possession of the car (on premises) - but only pay for the distance they drive. Additionally, unlike a lease, the clients' infrastructure never gets old and they can upgrade features, or the entire technology infrastructure, as their needs or desires change.

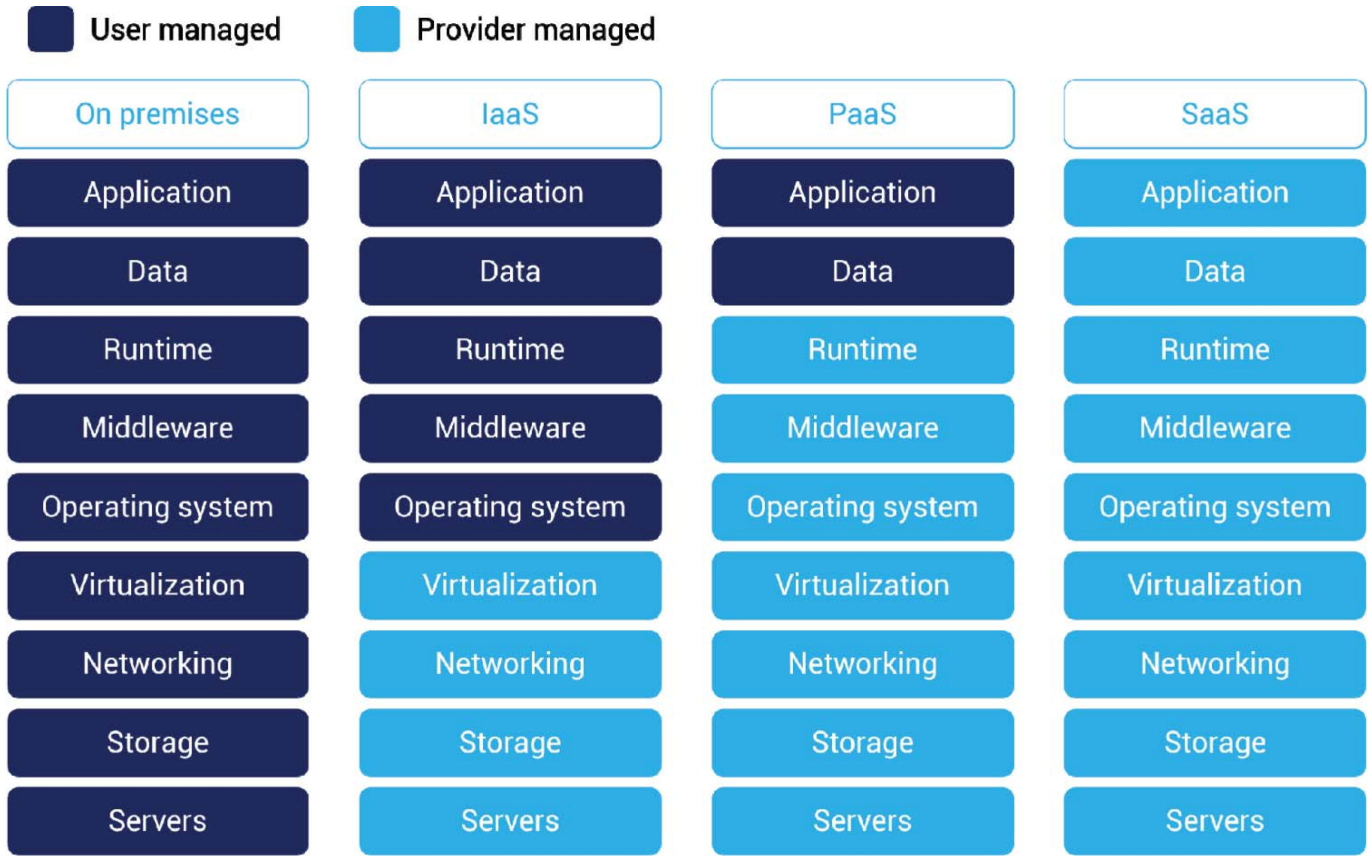
With On-Prem STaaS, broadcasters and media houses can take possession of the storage to ensure their data stays on-site, and the on-premises system can be tuned to the specific needs of their different applications.

Block storage enables customers to provision block storage volumes for lower-latency I/O. SSD storage is another storage type that is typically used for intensive read/write and I/O operations. Object storage systems are used in data analytics, disaster recovery and cloud applications and tend to have high latency. Cold storage is used to create and configure stored data quickly. Bulk data transfers will use disks and other hardware to transfer data.

In addition, instead of maintaining a large tape library and arranging to vault (store) tapes off site, an IT administrator who uses STaaS for backups can specify what data on the network should be backed up and how often.

A service-level agreement (SLA) will be signed, whereby the STaaS managed service provider agrees to rent storage space on a cost-per-gigabyte-stored and/or cost-per-data-transfer basis, and the company's data may then be automatically transferred at a specified time over the storage provider's proprietary wide area network (WAN) or the internet.

The cloud model of STaaS, provides direct connections to both public and private cloud storage. While it is typical to start with the on-premise model, the hybrid model will eventually become the de facto choice.



On the business side, CFOs welcome the way in which STaaS helps them improve cash management by replacing huge capital outlays with monthly payments. This is made possible by reducing the footprint of IT functions that require CapEx and high skilled manpower to manage the infrastructure. CFOs also appreciate how service payments are not liabilities on their balance sheets, like lease payments.

At the same time, a CFO will be happy with a utility model that improves cash management and unleashes the business from long-term commitments.

ENTERPRISE STORAGE ARCHIVING SYSTEM (ESAS)

IPSB Technology defines ESAS as offering:

1. Non-disruptive upgrades of storage capacity and media assets;

2. Upgrades available throughout the life of the product; and

3. Upgrades that are built into the price of the product.

In other words, it is more than a warranty contract for storage capacity services. The concept is simple, but the implementation needs both business and service provider planning, and proper design. Products and programs designed from the ground-up for non-disruptive lifetime upgrades are delivered efficiently and have proven to be wildly successful.

How It Works - ESAS delivers block, file and/or object storage resources to support workloads and charges only for the used capacity. Bills will go up or down, depending on usage. Storage resources are never depleted because ESAS makes sure that there is always greater buffer storage capacity than required. The user is not billed for capacity until it is used. It's that simple.

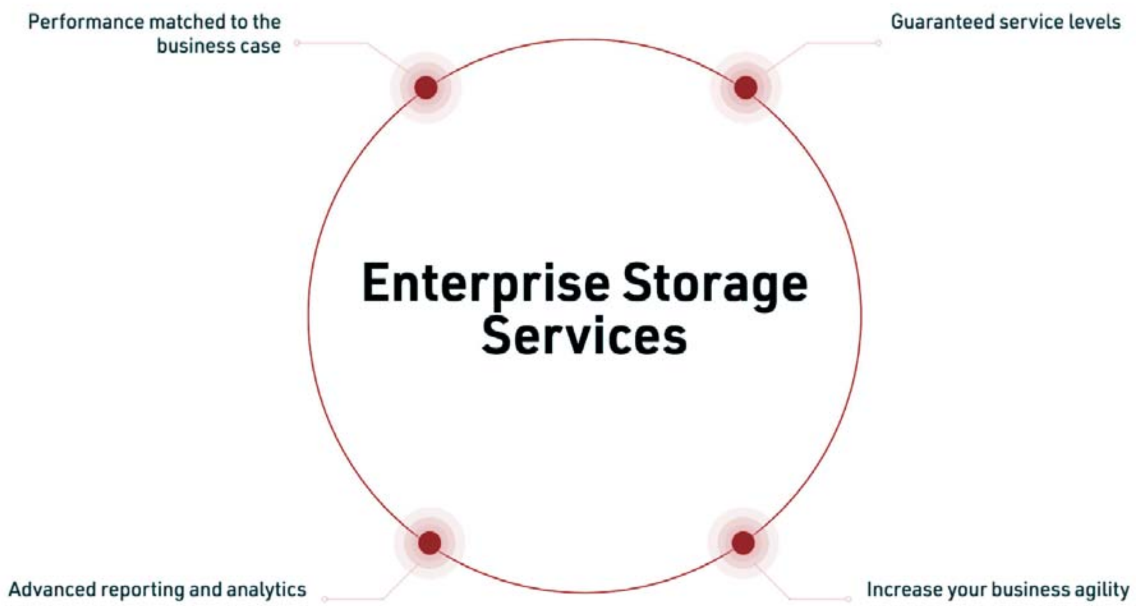
ESAS delivers the flexibility of public cloud, coupled with the resiliency, security, performance, and cost-effectiveness of enterprise-grade private cloud infrastructure. ESAS flexibly delivers storage capacity on demand – backed by industry-leading hardware, software, and white-glove support – on a $/GB per month basis for terms starting as short as 12 months.

Optimising technology infrastructure and agility are the keys to accelerate best performance and flexibility in adopting new technologies. Managed Services offer a holistic roadmap, state-of-the-art infrastructure and round-the-clock support, to turn an organisation into a dynamic business.

Best-of-breed technology can empower a client's platforms with a higher level of speed, collaboration, integration, security and uptime, far beyond the resource limitations.

Under significant pressure to meet the performance, operational expectations, and security needs of the business while trying to keep costs down a user can opt to switch to a predictable cost model with Managed Service, such as that of IPSB, which offers best fit Managed Services with mutual benefits for all stakeholders.

ESAS offers flexibility and scalability for unlimited growth with the ability



to increase and decrease storage capacity on demand and users can seek options of rental, flexible quarterly or monthly billing and Pay Per Use.

ADVANTAGES OF ESAS

Key advantages to ESAS STaaS in the enterprise include the following:

1. Storage costs. Personnel, hardware and physical storage space expenses are reduced;
2. Disaster recovery. Having multiple copies of data stored in different locations can better enable disaster recovery measures;
3. Scalability. With most public cloud services, users only pay for the resources that they use;
4. Syncing. Files can be automatically synced across multiple devices;
5. Sharing – Online storage services allow the users to easily share data with just a few clicks; and
6. Collaboration – Cloud storage services are also ideal for collaboration purposes. They allow multiple people to edit and collaborate on a single file or document. Thus, with this feature, users need not worry about tracking the latest version, or who has made what changes.

CHOOSE THE RIGHT MANAGED SERVICE PROVIDER

For broadcasters experiencing symptoms of being burdened by the many tasks that accompany storage, or looking for ways to refocus the efforts of their IT personnel, ESAS is definitely worth considering.

Storage is a major component of IT operations, and it has the potential to save time and money with the right strategy.

One must start by seeking the assistance of a reliable, proven STaaS partner. Fully supported, fully managed service can eliminate the need to hire additional IT personnel or strain current resources. Specialist providers, like IPSB Technology, can help broadcasters find the right Storage as a Service solution for their business models.

They can offer quick turnaround of secure, resilient, redundant, and encrypted storage. Solutions may physically reside at the clients' existing sites, or colocation facilities to ensure security and compliance.

Mardhiah Nasir
Vice President of Sales
IPSB Technology

Mardhiah is currently the Vice President of Sales at IPSB Technology. Her role at IPSB Technology is managing all Sales related activities of the company including supervising all client's technical requirements.

Mardhiah joined IPSB in 2011 and holds a Bachelor's Degree in Information Technology. She oversees our national and international business plans by analyzing market trends. This results in IPSB's future thinking of products and solutions.

Mardhiah prefers and thrives in an environment that empowers her to make key decisions that ultimately drive success. ■

IRIB's ICT Ecosystem Now and in the Future

IRIB's ICT Center is the heart of IRIB's media IP-based technologies, used within the broadcaster's value chain from content production and management, to transmission delivery and consumer engagement. It manages a vast range of services through its four departments; IT Department, that develops and maintains software-based projects, manages Big Data within its planned future data warehouse and provides IT support to the entire organization; Infrastructure Department, that manages and continuously monitors the infrastructure of IT-based projects as well as managing one of IRIBs largest projects, that being its Tier 4 Data Center, named Imam Ali Data Center, which has the capacity to support over 1000 racks with 99.8% uptime availability and that includes CDN and hybrid cloud based services, including a private cloud for IRIB's archives; Security Department, that certifies, monitors and prevents attacks on IT solutions. Finally, Interactive Media Department, that manages the headend for OTT and HBBTV services as well as developing services for HBBTV and developing artificial intelligent solutions (many designed as micro-services) customised for media applications and for regional and international languages. Others have been in-house, and include face detection, news analytical dashboard, video annotation, speech-to-Arabic text and social media analytics.

The Iranian new year falls on 20th March 2021 and it is hoped that in the coming year the dedicated and specialised teams at the ICT centre can collaborate to design, develop, integrate and support media IP-based secure services under a scalable and robust infrastructure that meet international standards and that, can not only service IRIB, but also other media companies both nationally and internationally. Upcoming projects include, providing infrastructure to big data and providing more analytical solutions including BI, fake data detection, speech-to-text (Persian), management of datasets key to customising intelligent services as well as providing other IT based solutions including AR/VR, super-resolution and so forth.

Managing, developing and maintaining advanced technology in the media industry is challenging, and for this reason the research teams are continuously analysing emerging and state-of-the-art technologies and standards to initiate innovative and applicable projects. Very recently, the teams have been looking into automated intelligent media production through AI technologies from automated script writing to generating characters. As a result of the time and effort spent on developing services, a number of these services have already been showcased in national and international exhibitions including IBC's future zone and it is hoped that remaining services of IRIB will reach the point of being able to service our target clients while being promoted worldwide in the coming year.

Contributed by:
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Head of ICT Center
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World Broadcasting Unions

WBU-TC LOOKS AT CYBERSECURITY, SPECTRUM

Cybersecurity and spectrum issues were high on the agenda when the Technical Committee of the Word Broadcasting Unions (WBU-TC) met online on 9 March 2021.

John Lee of the North American Broadcasters Association, NABA, chaired the two-hour meeting, which took place on Zoom. Participants looked at spectrum issues affecting broadcasters in both the UHF band and C-Band.

Discussing security, they agreed that NABA's recommendations on an Anti-Phishing Program and Social Engineering should be circulated to WBU-TC members to gauge common support for a possible WBU-TC recommendation. ■

On another issue, The ABU's representative, Ahmad Nadeem, referred to two shared links from Japan's public broadcaster, NHK: 'Full Featured 8K Live Production' and 'Transmission Experiment and Adaptive Downmixer for 22.2 Multichannel Sound'.

He said NHK's experts had stressed that in both cases the coherence and loudness controls were unique compared to other downmixing configurations and were individually processed.

The WBU represents all the world's major regional broadcasting unions. ■

MALAYSIA'S RTM TURNS 75

Radio Televisyen Malaysia has turned 75 with a vow to use new media to remain relevant in an age of increasing competition.

The national broadcaster celebrated the anniversary on 1 April. It began life in 1946 as Radio Malaya and introduced its first television channel in 1963.

In an interview marking the event, RTM's Director-General, Datuk Ruzain Idris, said the major challenges facing RTM included how to continue competing with other media and broadcasting platforms.

"The problem is that we are all targeting the same audience, which is around 32.69 million Malaysians," he told Bernama news agency.

"The more broadcasting stations we have, the smaller our audience will be."

He added that RTM had an edge over others as it was the government's broadcasting arm and, as such, had a network of close cooperation with various ministries and agencies.

Datuk Ruzain said digital transformation was crucial in view of the changes that had taken place in broadcasting technology. These had compelled broadcasters, including RTM, to adapt to the new paradigm.

In its endeavour to go fully digital, cost and infrastructure issues were a matter of concern, he said. Another challenge was retraining its nearly 4,000-strong workforce to familiarise them with operating the new and more sophisticated equipment.

Other RTM officials said the benefits of digital broadcasting could be fully tapped only if the quality of its productions and programmes was also improved.

The overall image and content of RTM's TV channels would be rebranded to make them more current and on-trend.

RTM offers 34 FM radio channels and six terrestrial TV channels as well as providing online radio and TV services. ■

*RTM's Director-General, **Datuk Ruzain Idris** (left), said the major challenges facing RTM included how to continue competing with other media and broadcasting platforms. (pic New Straits Times).*

EBU wins 3 Emmy Awards

Three Technology & Engineering Emmy® Award Trophies

The European Broadcasting Union has been awarded three Technology & Engineering Emmy Awards for excellence in engineering creativity. The awards recognise three key technologies collaboratively developed by the EBU that have shaped or underpin systems widely used by the broadcast industry today.

The first Emmy Award honours the EBU's role in the creation of the Advanced Authoring Format (AAF), an interchange file format that paved the way for cross-platform post-production workflows. The award is shared with AMWA (formerly AAF Association Inc), Avid Technology and BBC Research & Development.
The second award recognises the standardisation and commercialisation of broadcast, hybrid electrical and fibre optic camera cable and connectors. The EBU shares this award with SMPTE, The Association of Radio Industries and Businesses (ARIB), LEMO, Belden and NEMAL.

The third award rewards the work on Common Encryption, a fundamental technology design that separates the encryption function from the content contribution or distribution system and can accommodate the presence of multiple encryption or conditional access system in parallel. The EBU shares this Award with DVB.

"These three Emmy Awards confirm our conviction that collaboration between organisations is key to successful innovation, and we will continue on this path," EBU Director of Technology & Innovation Antonio Arcidiacono said.

EBU Technology & Innovation experts coordinate working groups and develop innovative solutions on behalf of the EBU membership represented by the EBU Technical Committee. ■

G&D wins innovation award

G&D CEOs Roland Ollek and Nils Strauch are excited about the TOP 100 Award.

KVM manufacturer Guntermann & Drunck GmbH (G&D) has received a TOP 100 award 2021.

The German company compamedia gives the awards each year to particularly innovative medium-sized companies.

More than 120 criteria from five categories were used to evaluate the submissions: innovation-friendly top management, innovative climate, innovative processes and organisation, external orientation/ open innovation, and innovation success.

Because of the ongoing pandemic, this time the study also examined how flexibly companies are responding to the coronavoris crisis and how fast they are adapting their strategies to the new situation.

"The Top 100 Award is the most important award for innovative companies in the SME sector, and we are delighted that it recognises the creativity and problem-solving skills of our entire team," the G&D Managing Director, Rolland Ollek, said.

The company develops and produces KVM products for extending and switching computer signals, and operates on a global scale.

KVM systems from G&D are installed in numerous control rooms around the globe, including in air traffic control centres and airports, on ships, in TV & film production studios, in the chemical and petrochemical industry and in the energy sector.

Compamedia has been presenting the TOP 100 awards to innovative medium-sized companies since 1993. ■

Webinar on OTT and IBB Technologies and Services 25-27 January 2021

ABU Technology organised and hosted a 3-part webinar on OTT and IBB Technologies and Services from 25-27 January 2021. The webinar sessions explored and addressed some of the main issues that broadcasters face when implementing OTT and IBB services within their workflows and delivery portfolios. The Webinar also highlighted the advancements in technological aspects and the impact on business. Over 120 participants registered and the 3-part webinar recorded a daily average audience of 70 attendees from the Asia-Pacific region and elsewhere, over the three days.

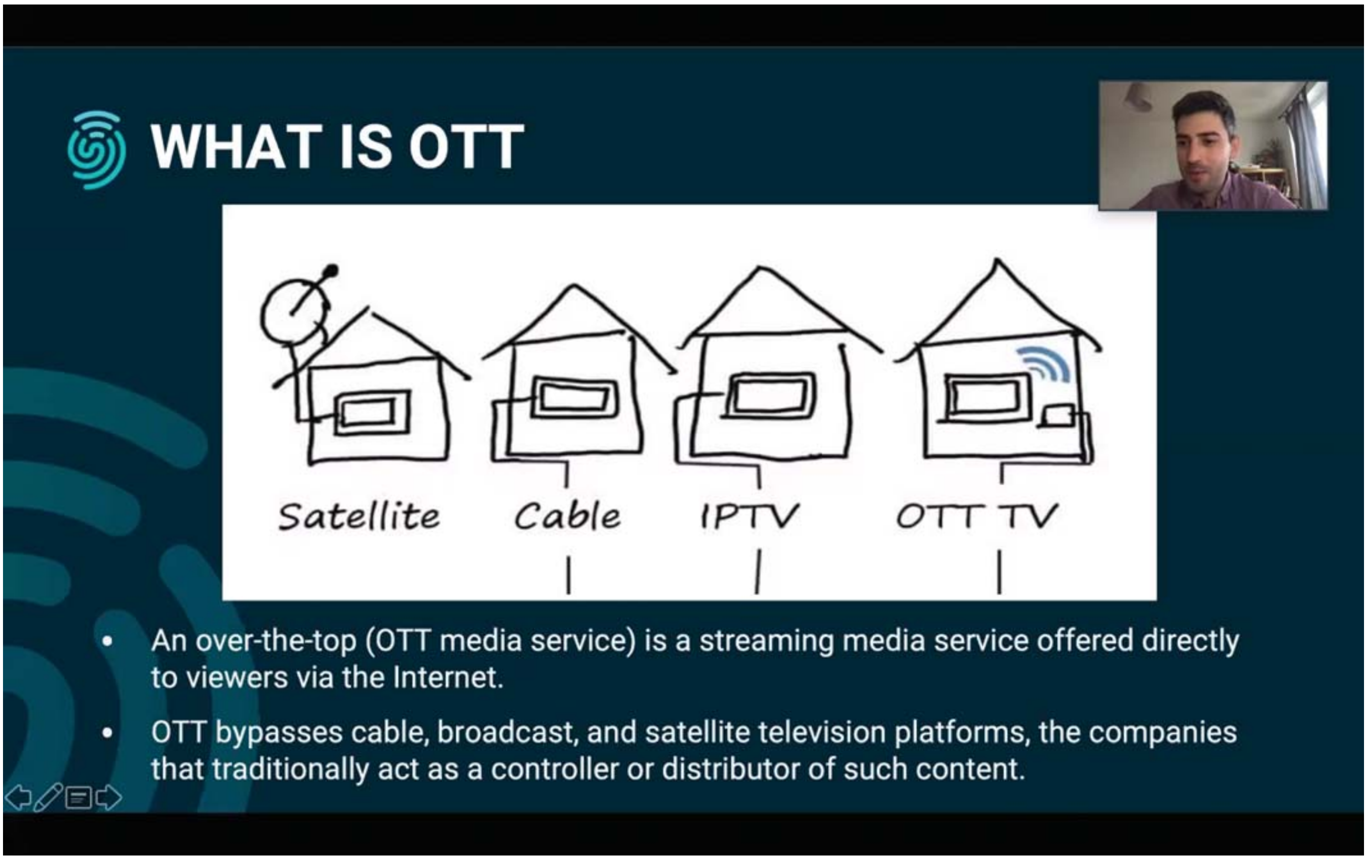
The webinar session topics included:

- Building OTT /IPTV Turnkey Solutions for Broadcasters,
- Implementation of DVB-I in Iran,
- Impact of Digital Transformation on Viewership, Broadcast, and Distribution,
- How the latest Hybridcast is built on basics of an IBB system, and
- HbbTV Services and latest progress in Europe

The first presentation topic concerned building an OTT/IPTV turnkey solution for broadcasters. It covered mostly the implementation aspects and use cases of different OTT/IPTV services from an operator viewpoint. The session discussed problems faced while setting up a service and included a live online demonstration showcasing what a typical interactive TV service offers. In general, an over-the-top (OTT) media service is a streaming media service, offered directly to viewers via the Internet. OTT bypasses cable, broadcast, and satellite television platforms that traditionally act as controllers or distributors of such content. It is a more open platform and offers interactive TV, comprising linear TV, catchup TV, VOD services etc. It is also a subscription-based VOD service, like Netflix, Disney plus or Amazon Prime.

Nowadays, OTT/IPTV features Live TV, Catch Up / Time Shift, VOD, network PVR, EPG functions and services with multiscreen support for smartTV/STB, mobile phones and PCs. The prominent additional feature of multitenancy services is also available which third party players may use as a virtual platform to offer services to their own list of clients using the same or different delivery infrastructure. In addition, DVB Hybrid service is supported on the same box, for viewing different content offered via DVB-T, DVB-C, DVB-S. Latest devices and SmartTVs with built-in apps & TV store, allowing other tools apart from playing games and TV streaming. A recent survey projects an increasing trend in adoption of OTT/IPTV with an annual revenue growth rate (CAGR) of 10.0% in the period 2021-2025. Of all payTV platform subscriptions between 2014 and 2020, this segment only had about 30% subscribers, though growth has accelerated during Covid era. So, the projection forecasts user penetration up from 30% in 2020 to 35% in 2025. Services enable new revenue models such as subscription based, Freemium models with advertising, and on-demand based.

Currently, there is a lot of competition in the payTV sector with more operators vying for the market's subscriber base. To run a service, different technology components need to be considered in the delivery phase, such as video head-end, encoders, content delivery system, software applications, user devices, encryption, system level integrations, a vast array of project related services etc. There are a number of challenges that broadcasters and OTT operators face when initiating and regularising a service. They experience lower profit margins in their traditional business due to disruptive new technologies and must find new ways to utilise their large legacy networks.



WEBINARS

IPTV/OTT technology is increasingly complex and fragmented; therefore, operators are looking for a "one stop shop" with guidance and support for adapting the technology. High entry costs and long time to market are steering operators away from adopting IPTV/OTT technology. Operators lack experience and knowledge in obtaining and monetising content. For the benefit of the participants, the expert from Uniqcast walked through a live demonstration of a typical OTT TV platform and showcased various services and features on TV, Mobile phone and via web portals.

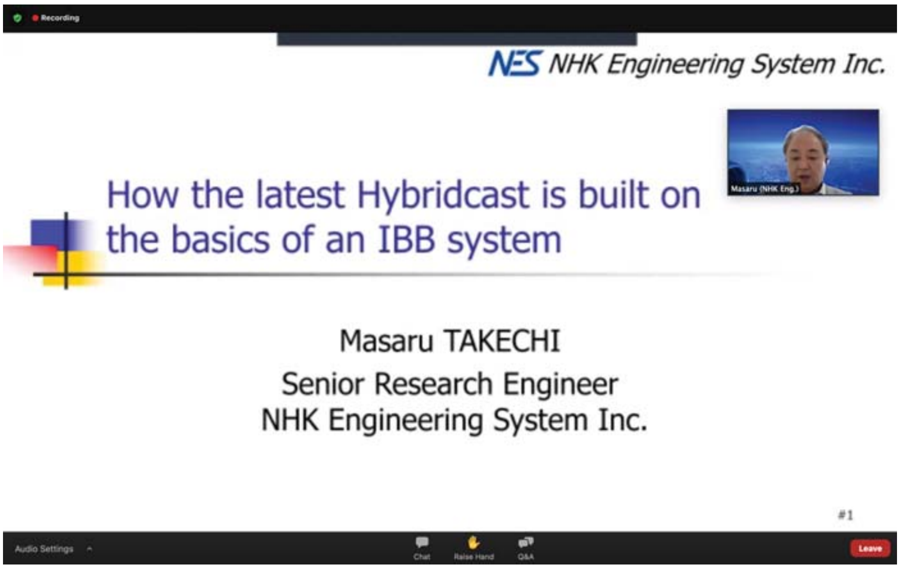
The second day session, on implementation of DVB-I in Iran, covered the fundamental concepts and updates of DVB-I and its deployment in Iran. DVB-I is a new platform to deliver linear television over the internet in a form that is as user friendly and robust as traditional broadcast television. Here the content providers, including broadcasters, steaming service providers and OTT players deliver and distribute the audiovisual content the audience over different media, such as Fiber, 4G/5G, Cable, CDN. Internet connected devices receive the signal without a RF tuner and through OTT or IP managed networks, or otherwise to be received via an app. Services could be broadcast like linear TV, pay and free TV etc., and IP- based (e.g. VOD). Users experience quality similar to DVB- T, DVB-C or DVB-S signals.

In November 2019, DVB released a standard bluebook A-177 on Digital Video Broadcasting (DVB): Service Discovery and Programme Metadata for DVB-I Services that specifies a number of requirements and services.

These include:

- signalling of linear TV or radio services and content that are delivered over broadband.
- access to linear TV services that are delivered by broadband in a way that is consistent with their access to linear TV services delivered by RF based DVB technologies.
- the metadata and mechanisms to present electronic programme guides.
- the integration of linear services delivered by the RF based DVB tuner and linear services delivered by broadband into a single coherent offering that is accessed through a single consistent UI; and
- a method for national TV regulators or their representatives, operators and trademark licensors to offer a list of trusted/legitimate/authorised/regulated services.

Later in March 2020, a DVB-I reference client was specified to encourage the adoption of DVB-I specifications in industry solutions for delivering linear television over the internet. DVB-I Services are now available over DVB-DASH, delivered over non managed or managed IP networks. Such services are received by DVB-T/S/C/IPTV devices and by non-TV devices such as mobile phone



and PC. Other features include access services, on demand/ linear programmes, provision of audio-visuals with subtitles and associated application. A programme service list is published by the service list provider and is made available using HTTP at a service list URL. Service List Registry is an HTTP endpoint made available at a known URL that can return a list of service lists and their service list URLs. It is thus easy to find relevant services among many thousands of channels.

DVB-I implementation in Iran started with laboratory tests in March 2020 and the start of a pilot phase in August 2020. The Iranian service list includes national TV channels in DVB-T, provincial TV channels in DVB-T or DVB-DASH. Receiver devices used in the country are HbbTV receivers, android phones, android TVs. Client application is the localised DVB-I reference application. If a service has been received by an RF tuner and has been listed by TV channels, then delivery to the client takes place through DVB-T/ DASH and plays according to priority. If otherwise i.e. service list received without RF tuner, the client device shows the services received via DASH delivery only.

Future plans in Iran includes creating a new service list, including creating DASH stream, for IRIB's new HD/HEVC channel and new UHD channels. Also they are adding HbbTV application to the services as related material and integrating IRIB EPG server into the client application. In the EU region, the HbbTV & DVB-I interoperability group works to improve the interoperability of HbbTV in the markets covered by the EBU membership. It also works to facilitate the integration of the DVB-I specification and facilitate the findability and use of linear television services on internet connected devices.

The DVB steering board has tasked another group with the capture of commercial requirements for the use of DVB-I as a 5G media service layer. The end goal would be an integrated solution that permits the distribution of a DVB-I service over multiple distribution means, but not limited to 5G delivery.

Another presentation on digital transformation for broadcasters outlined the advantages, challenges, and impact on viewership related to an OTT TV platform. The need for transformation arises lately due to a downward trend in cable subscribers and the growth of streaming subscriptions. Global survey also supported theevidence of such a transformation into OTT domain.

However, to build a full-fledged OTT platform, the challenge remains in place to broadcasters. This could concern different aspects, such as technology, content and monetisation from day one of the service start-up. Content and programme materials need to be produced in-house and even aggregated from 3rd party providers to keep offering new and appealing contents to audience. This has to be delivered to the niche and localised market. Monetising the new venture and selecting suitable business model is a key.

Technology allows ad-insert and customer management to support relevant business models. Reaching audiences in different parts of the continent, with content originated from elsewhere, is also key to expanding the business.

The solution is a multi-channel OTT platform with transcoding options and distribution via different apps and devices. Web-based solutions will ease access to audiovisual content and analysis of real time audience data. Viewership data, audience viewing duration/timing and viewed content type are important data to be analysed. Daily, weekly or monthly viewing habits help in projecting trending contents. If media editing and other tools are available this will make multi-format and multi-platform content selection possible. Other features for migration and import/export of audio video contents with metadata from 3rd party content providers like YouTube are of added advantage.

Modules for social streaming and AI-driven content management gives more value to both the broadcasters and their audiences. The Impact of such a solution is a full end-to-end OTT platform with multi-purpose audio video content. It escalates monetising opportunities with AVOD, SVOD, TVOD models that are integrated to any payment gateway including billing and CRM. The expert from Mangomolo, a solutions provider, screened a demo on a typical web-based OTT platform, illustrating analytics and CRM back-end, before displaying the playout portal on the front-end interface.

The third day of the webinar commenced with the matter of how the latest Hybridcast is built on the basics of an IBB system. Building on the feedback from 8 years of experience, Hybridcast has undergone many improvements and introduced technologies such as broadcast-independent application, CMAF support, Hybridcast Connect X etc. It is an HTML5 based IBB system, launched early in 2013 in Japan. More than 13 million TVs and STBs have been shipped, as of July 2020 and 31 broadcasters are offering services. Deployments include both terrestrial and satellite modes. Companion screens have been available from the beginning.

When offering IBB services associated with a programme or channel, a broadcaster needs to launch and terminate the app. Viewers may launch the app regardless of what is being broadcast. Broadcast content is interfaced with the app and the app communicates with servers to enhance the services, including streaming. The main application types in Hybridcast are broadcast-oriented managed, non-broadcast-oriented managed, broadcast-independent managed and unmanaged. These apps are authenticated and allowed access to broadcast resources specified by the system.

For service-associated application, the broadcaster controls the application life cycle, typically via the broadcast signal. When app signalling is missing the app is terminated e.g., channel change, broadcast suspension. On the other hand, with service-independent application, the viewer controls the app life cycle, typically via a menu on the receiver. The app is independent of broadcast status e.g.,

channel selection or non-existence of a broadcast signal.

A companion device can be used to enhance service-associated services and this will also be another thread to the services broadcasters may offer. Hybridcast Connect X is a specification that offers a new service paradigm – Smartphone First. In conventional Hybridcast-ready TV, it is started first at the TV set and then the companion app is launched on second screen. Thereafter, both devices are linked and connected to each other. But in Hybridcast Connect X mode, it is a smartphone-first approach, where TV control is launched first at the companion app and then connected to main Hybridcast TV. Broadcast independent apps can be started from Hybridcast Connect X with easy introduction of new apps. A companion device can be an alternative menu of a TV. A menu is not always required as the app on a TV can be launched by a web app directly on a companion device. All the IBB services including both service-associated and broadcast-independent can be built on a single platform in addition to the OTT service.

Work is in progress to enhance the streaming capability of Hybridcast, to make use of IoT enabled devices as the tools for presentation or sensors/input devices, to set-up target advertisements for seamless switching across broadcast and broadband and verification of usefulness of audience measurement in the IBB system is also underway. Senior Research Engineer from NHK Engineering Systems, Mr Masaru Takechi, illustrated and demonstrated the advances and features of the Japanese IBB system, using video clips.

The 3-day webinar series concluded with a session on HBB status updates around the world. The presentation included HbbTV deployment examples with focus on Finland, Spain, Germany and Live demo in HbbTV TV. Hybrid broadcast broadband TV 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. HbbTV, which started with the HbbTV 1.0 standard in 2010, is now in its 11th year. The current version is the HbbTV 2.0.3 and other major deployments associated are HbbTV-OpApp and HbbTV-TA.It has been adopted mostly in the European region as well as countries such as Turkey, Iran, Malaysia, Singapore, New Zealand.

HbbTV 2.0.3 is based on a 2018 version of web standards with additional features such as CMAF and low latency live services with DASH. Operator apps feature in HbbTV enables TV platforms to directly bring their services to Smart TVs without the need for external set top boxes. Research shows that, in Germany, 15.3 million households had at least one HbbTV-enabled device connected to the Internet by 2020. With the increase in Smart TV availability, and internet connection rates it is expected that the number of HbbTV households may rise to 21.5 million in 2023. The share of HbbTV 2.0 sets among the total stock of all HbbTV receivers is set to increase from 5% in 2019 to 24% in 2023.

In Spain , LOVEStv, available in TV sets with HbbTV 1.5 or higher technology, is present in some models from key manufacturers like LG, Panasonic, Philips, Samsung, and Sony. In a total of 39M TV sets in Spain, 9M devices can connect to LOVEStv.

In Finland, HbbTV services carry free to air TV and new way to receive Pay TV. Linear HD quality PayTV channels are exclusive to HbbTV users. The service includes TV guide, catch-up TV, OTT video apps, start over service, interactive advertisement, voting and participation TV, number of event based applications. HbbTV services reach up to 600.000 TV sets or households in Finland. HbbTV combines the advantages of TV, Internet and social media in a new hybrid experience. However, even after many years of regular HbbTV availability, a survey shows 50% of the potential Finnish audience does not know about it.

To conclude, the speaker from Sofia Digital took the online audience through the features and functions of the Finnish TV platform and Spain's LOVEStv. ■

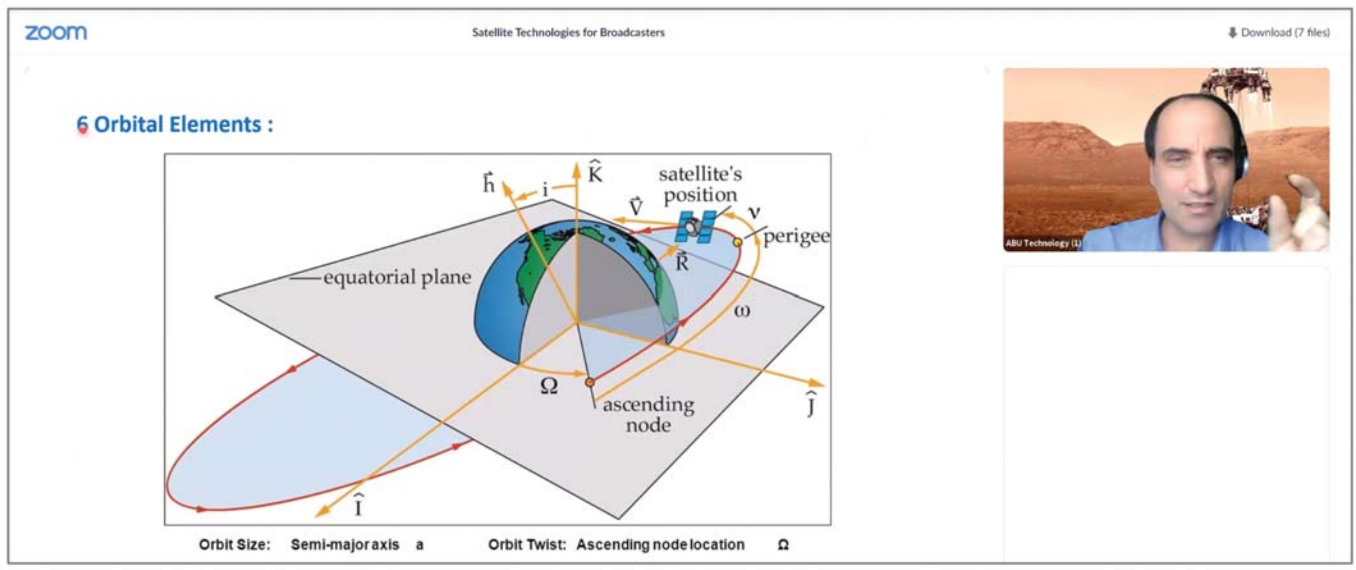
Webinar participants from Nepal and Samoa

WEBINARS

Satellite Technologies for Broadcasters

(4 Day Webinar Series 1-4 March 2021)

HISTORICAL BACKGROUND AND SATELLITE ORBITS



by ***Dr. Veysel Binbay***, *Specialist Engineer,* ***ABU***

An orbit is a curved path of a celestial object or spacecraft around a star, planet, or moon, especially a periodic elliptical revolution. When the orbital radius gets smaller, ie. a satellite gets closer to the Earth, it has to move faster, according to the physical rules, in order to stay stable in that orbit. Hence, there is one and only one orbital path that satellites move in at exact synchronisation with earth rotational speed, and it lies in equatorial plane, 35,786 km above from the earth surface, and is called GEOSTATIONARY ORBIT (GEO).

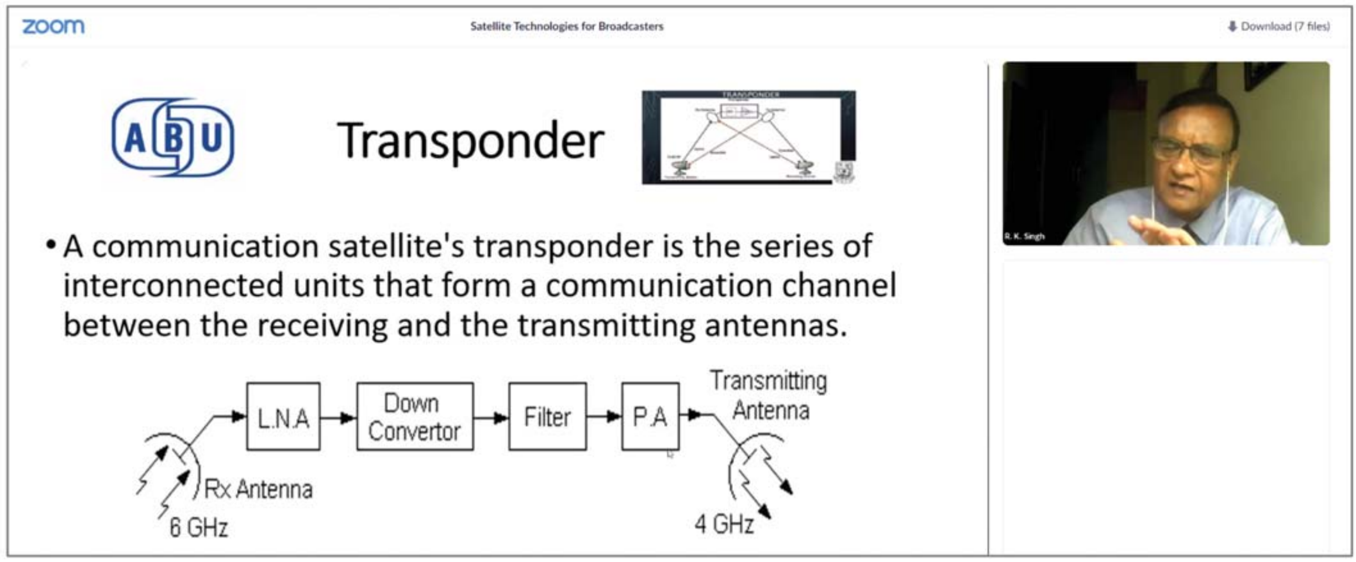
The idea of using satellites placed in this unique orbit was proposed for the first time by the famous Arthur C Clarke in 1945. Below GEO, closer to the Earth, there is an orbital range, between 160 and 2000 km, in which satellites have to move faster than Earth, called Low Earth Orbit (LEO). The radius range between LEO and GEO (2000 to 35,786 km), is called as Middle Earth Orbit (MEO). And above GEO, there is a range called High Earth Orbit (HEO).

There are six orbital elements that completely define the orbital motion of a satellite:

i. Semi major axis
ii. Eccentricity
iii. Orbit inclination angle
iv. Mean anomaly angle
v. Argument of perigee
vi. Right ascension of ascending node

The satellite industry has more than 50 years of on-orbit experience. Companies from more than 50 countries operate satellites.

SATELLITE COMMUNICATION FUNDAMENTALS



by ***R. K. Singh***, *Former Engineer-in-Chief,* ***Doordarshan***

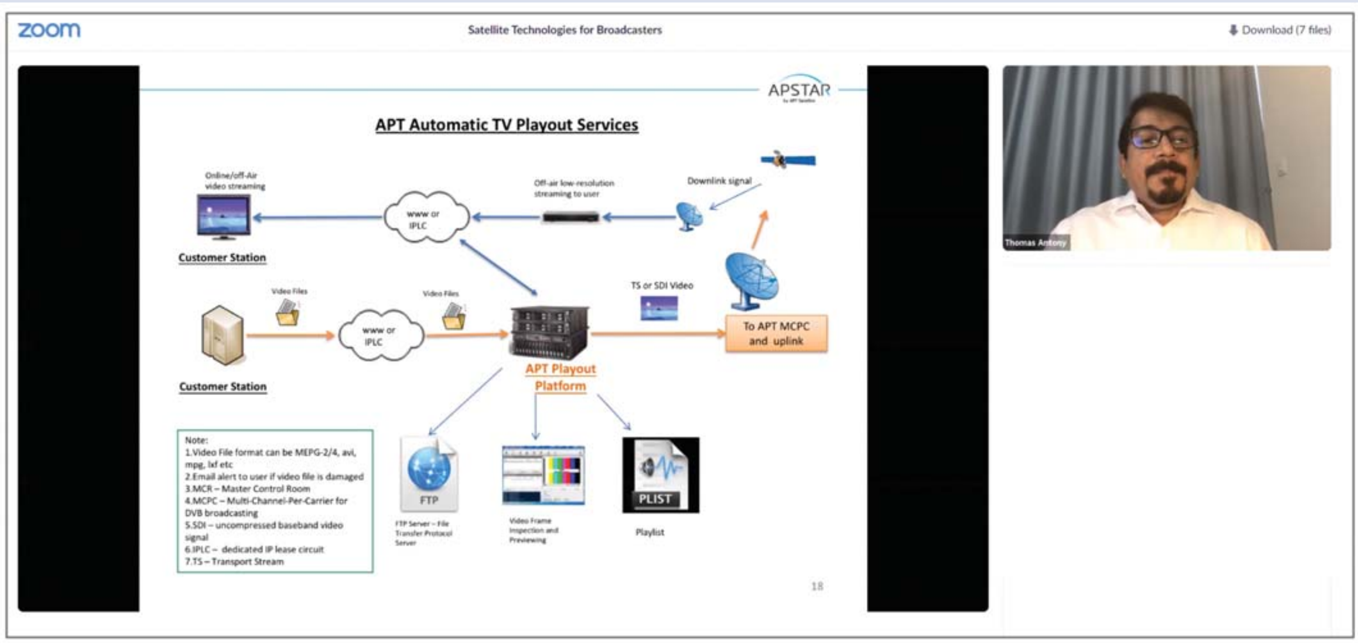
A communication satellite's transponder is the series of interconnected units that form a communication channel between the receiving and the transmitting antennas. The transponder is mainly used in satellite communication to transfer the received signals. There are many transponders on a typical satellite, each capable of supporting one or more communication channels. In a communications satellite, a transponder gathers signals over a range of uplink frequencies and re-transmits them on a different set of downlink frequencies to receivers on Earth, often without changing the content of the received signal or signals. Satellite communications use the very high frequency range of 1-50 gigahertz to transmit and receive signals. The frequency ranges or bands are identified by letters: (in order from low to high frequency) L-, S-, C-, X-, Ku-, Ka-, and V bands.

Effective, or Equivalent, Isotropically Radiated Power (EIRP) is the maximum amount of power that could be radiated from an antenna, given its antenna gain and the transmitter power of the RF system. EIRP is most commonly given in decibels over isotropic, dBi. A link budget is an accounting of all of the power gains and losses that a communication signal experiences in a telecommunication system; from a transmitter, through a medium (free space, cable, waveguide, fibre, etc.) to the receiver.

The direction of oscillation of the electric field component, when a radio wave is propagating in a medium, is called the polarization of the radio wave. When the electric field is oscillating in the horizontal or vertical direction, the radio wave is said to be linearly polarized. The polarization modulation provides an additional degree of freedom for the modulation of the carrier waves. Furthermore, the polarization modulation is suitable to realize simple transceivers using RF signal processing. Antennas are the most important key parts of the polarization modulation systems.

Fixed-satellite service (FSS), also called fixed satellite radiocommunication service, is defined as a radiocommunication service between earth stations at given positions, when one or more satellites are used. FSS systems are advantageous because they provide guaranteed reception in the area that they are placed. Since FSS systems are permanently installed, they collectively provide users with reliable cell phone reception across the majority of a country. Broadcasting-satellite service, on the other hand is defined as a radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public. The second-generation Digital Video Broadcasting by Satellite (DVB-S2) is defined in European Standard EN 302 307-1, which details these improved modulations and coding schemes, enhancing the efficiency of the space segment and giving the basis for providing interactive services.

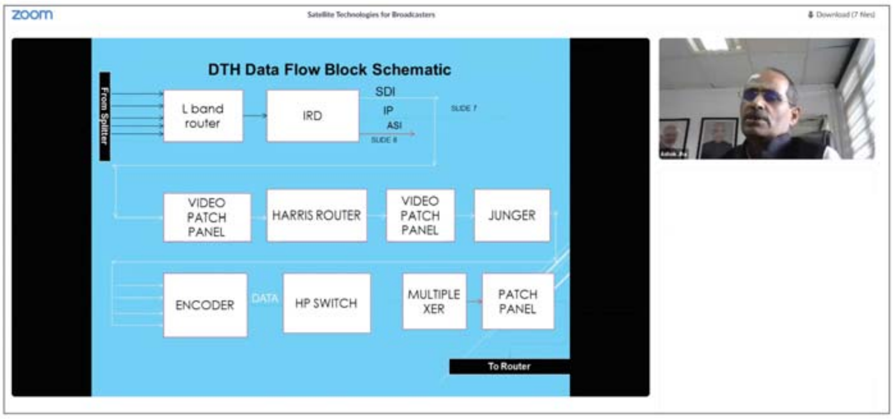
BROADCASTING OVER SATELLITE USING C-BAND, KU-BAND, AND APSTAR TV OTT PLATFORM



*by **Thomas Antony**, Director Sales, **APSTAR***

APT is operating five satellites which can be reached from nearly 75 percent of the world. They are using both MCPC (Multi Channels Per Carrier) and SCPC (Single Channel Per Carrier) schemes for delivering this satellite service. APSTAR TV" is the OTT platform designed by APT satellite; its app is downloadable from Apple Store and Play store. The app has four formats, namely iPhone, iPad, Android phone and Android pad. Through the app, you can view channels from all over the world. Most of the channels are the existing channels on APSTAR satellite. This is a total solution that APT Satellite provides to the media customers. It enables their TV content to be broadcast both on satellites and OTT mobile devices simultaneously in a cost-effective manner. Their hub system includes: a VSAT TDMA Platform, and a billing system – manage remote IP access usage. Each remote system includes: a VSAT TDMA terminal with antenna facilities; a Proxy and Access Management Server; and a Wi-Fi Access Point. APSTAR TV is a complementary service to TV channels on APSTAR broadcast on the APSTAR TV app. To contribute content to the OTT platform, a TV channel can choose to send it to APT Satellite IDC by terrestrial fibre-link, or the APT satellite can simply download the content from the satellite, do transcoding, then add to OTT platform. Digital Right Management (DRM) is a built-in function of the APSTAR TV app. In the content licensing agreement, TV channel states clearly which region or country is not allowed to broadcast the content. Through GEO-block functions in the server side, the content will be blacked out or overlaid with ads.

DIRECT TO HOME (DTH) OVER SATELLITE



by ***Ashok Kuma Jha****, Deputy Director General (platforms & innovations),* ***PRASAR BHARATI***

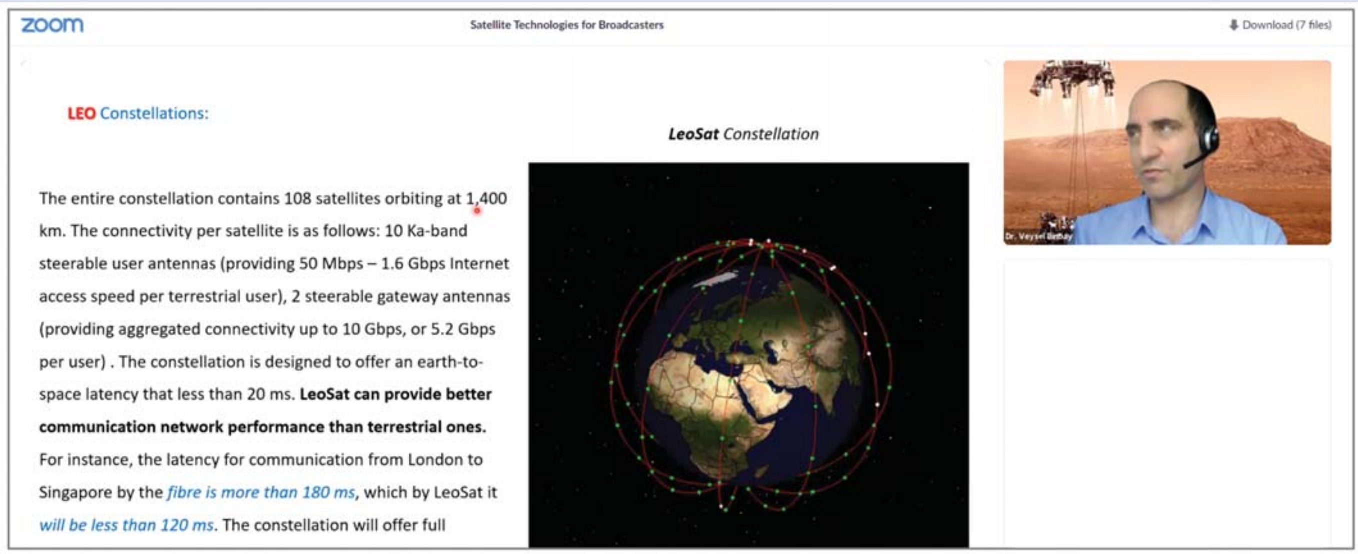
The reasons for operating a DTH platform can be listed as follows:

- Reach of television to uncovered areas comprising mostly hilly, inaccessible and remote terrains,
- Expansion by terrestrial mode is not economically viable,
- Alternate technology for cost-effective and quick expansion of television coverage for individual reception,
- Television coverage to uncovered areas should be provided with a multi-channel bouquet in free-to-air mode in the Ku band through satellite distribution systems,
- Multi-channel individual reception possible with a small-sized dish antenna system,
- No dependency on cable operator.

One of the properties of higher frequency (Ku-band) in satellite communication is that for a given power, it enables use of a smaller size antenna compared to lower frequency (C-Band). Due to this, Ku-Band is preferred in DTH services in India, which needs smaller size antenna in individual homes to facilitate ease of mounting etc.

In DD FREE DISH service, channels are multiplexed and modulated at 70 MHz; these modulated streams are up-converted to Ku-Band and further amplified by HPA (High Power Amplifier) and transmitted by 9 metre Ku-Band antenna. Redundancy is provided at various stages to improve the system availability and reliability. DTH basically comprises some of the major modules which are as follows: receive segment, compression equipment, transmission equipment and monitoring equipment. The DTH broadcasting scenario in India includes 912 private satellite TV channels; 579 free to air TV channels; four private DTH operators; and approximately 200 million TV households.

SATELLITE TECHNOLOGY TRENDS & APPLICATIONS



by ***Dr. Veysel Binbay****, Specialist Engineer,* ***ABU***

There are several GEO (Geostationary Earth Orbit), MEO (Middle Earth Orbit) and LEO (Low Earth Orbit) satellite constellations aimed at covering the globe with a satellite network. For instance, Inmarsat, Intelsat and Eutelsat have GEO constellations. O3b has a MEO constellation which contains 12 satellites. And Iridium, LeoSat, OneWeb, Starlink, and Hongyun Project are LEO constellation examples. LEO satellites are operating at much lower altitudes comparing to MEO and GEO satellites; such a characteristic brings unique advantages to LEO constellations:

- ✓ Low latency: Even for the upper-most orbit of LEO (2,000 km), the round-trip transmission time is only 13.3 ms;
- ✓ High bandwidth: Since many more satellites are needed to provide global coverage, the overall network capacity of an LEO constellation is usually much higher than MEO and GEO constellations, therefore each user can be allocated more network resources;
- ✓ Less signal transmission loss: signal travel length is much shorter compared to MEO and GEO.

On the other hand, the main drawback of LEO constellations is the high satellite mobility, which would result in frequent handovers among satellites when communicating with earth terminals. For a steady earth user, the communication time length with a satellite is shorter than 20 minutes.

It seems the way of delivering broadband will be shaped or affected by mega LEO satellite constellations within our near future. And the capacity and usability of this broadband connection will possibly change the ways of broadcasting too. ■

DAB ADOPTION PROCESS GUIDE
INVESTIGATIONS AND TRIALS

Dr. Les Sabel
Chair of the WorldDAB APAC Technical Group

INTRODUCTION

The process of adopting and deploying a new digital radio standard is complex and includes wide ranging activities and stakeholders. In this series of articles, we view the overall goal of rolling out DAB digital radio as a set of interacting processes to allow stakeholders to better understand the complexities of the activities which are required. We intend this guide to be primarily used as an introduction to the overall process.

Every country is different and consequently the order and duration of the steps described can vary considerably, however this article provides an overview of the process as well as details of the early activities, which will be of interest to broadcasters, regulators and network providers.

OVERVIEW

DAB adoption is a process for the formal adoption and establishment of DAB+ digital radio. It has seven distinct phases, which have some overlap and often significant interaction. DAB+ adoption requires a broad range of skills in a multi-disciplinary team environment – the key to success is collaboration between stakeholders and the different teams which all help deliver the process. The seven phases can be summarised as follows:

1. Initial investigations and research
    a. Gain understanding of what DAB+ provides, features, business case, design, construction (theory)
    b. Ongoing education and research as the process unfolds
2. Technical trials
    a. Experiment with DAB+ trial transmissions to get "hands on" experience to expand knowledge for system planning and design
    b. Can also be used as a pre-permanent services to help establish initial listeners
3. Formal adoption
    a. Establish DAB+ as an approved digital radio broadcasting standard through stakeholder discussions
4. Planning
    a. Plan the DAB+ network – services, allotments, coverage and interference
    b. Design the system needed to deliver the services
5. Rollout
    a. Construct the DAB system from studio to transmission
    b. Develop additional content
    c. Receiver provisioning – home/portable and automotive
    d. Marketing
6. Operations
    a. Technical systems operations and maintenance
    b. Content production
        i. Audio
        ii. Metadata
    c. Marketing
    d. On-going cross industry support
7. ASO
    a. Through cross industry stakeholder discussions establish a methodology to transition to DAB+ and switch off analogue systems

The overall timeline is summarised in the Gantt chart in ***Figure 1***. The period for the full process is typically over 15 years.

Today that process can be shortened due to the maturity of the DAB standard and the availability of low-cost infrastructure and receivers. One of the most important aspects to the overall process is the vision of the driving stakeholders and their long-term belief in the benefits of DAB to society and business.

Norway is a good example where the stakeholders were faced with either refreshing a very large fleet of FM transmitters or moving the entire country to digital radio. Their leadership was visionary and they now enjoy significant improvements in the overall radio ecosystem with much more content availability, lower operating costs and the ability

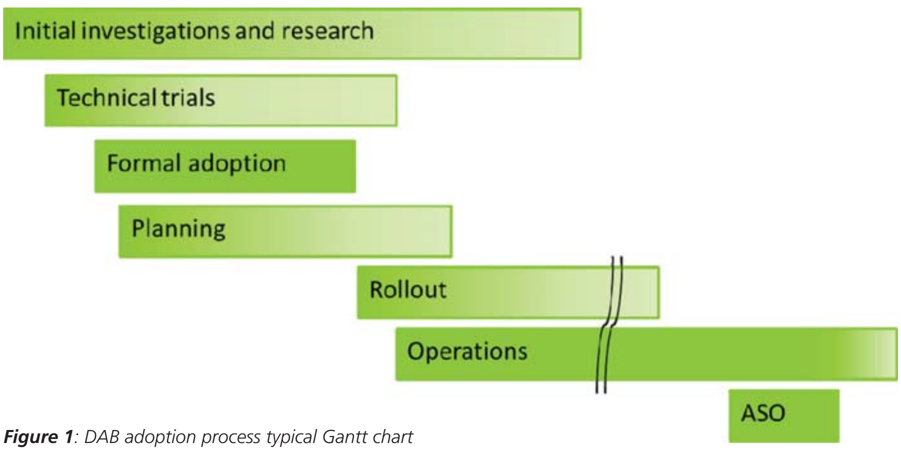


Figure 1: *DAB adoption process typical Gantt chart*

to incrementally add new digital features to ensure the ongoing viability of the medium.

A word of warning! Some stakeholders have difficulty seeing the long-term benefits and struggle to commit citing reasons such as "DAB will not add listeners", "the cost is too high" or "the payback period is too long".

The future is bleak for such a view with multiple digital platforms already capturing market share of listeners (or content consumers) from existing analogue base. This maybe through multi-national offerings such as Spotify, Apple Music and others, podcasts or simple streaming.

The long-term evolution of digital delivery will ensure that analogue radio is virtually dead in many developed countries in the next 10 to 20 years, another generation, due to the demand for 'modern' features, multiple content types and genres and low costs. Non-DAB adopters will face the need to transition to mobile IP delivery in that timeframe and pay the price that is demanded by 3rd party (telecommunications) network providers to do so, effectively limiting their control of the delivery of the content they produce.

Countries with the long-term vision and the courage to commit to digital radio will benefit the most with the most cost effective and vibrant radio industry. We see evidence of this approach in Switzerland with their planned ASO having a target completion date of 2023 and increasing discussions in countries like the UK, Italy and Germany.

INITIAL INVESTIGATIONS AND RESEARCH

The following activities are generally undertaken to establish a good understanding of what DAB+ can provide and how it is planned across the various stakeholder sectors.

1. Interest established

Stakeholders become interested in DAB+ as an alternative to analogue broadcast services. In this instance the stakeholders may simply be the Public Service Broadcaster (PSB), or in other cases it could be a combination of the PSB, commercial broadcasters and the regulator.

2. Stakeholder education

The educational program shown below is indicative only but does cover the key aspects of DAB to allow an in-country study to provide guidance on the benefits, costs and next steps. Such workshops can be tailored to the needs of the participants.

a. Workshop / webinar 1 – general capabilities and business case
   i. What is digital audio broadcasting?
   ii. The features provided and advantages gained
   iii. Commercial and technical business cases
   iv. The overall adoption process
b. Workshop / webinar 2 – implementation components
   i. Overall system operation
   ii. Head end systems and options
   iii. Transmission systems and options
c. Workshop / webinar 3 – services and receivers
   i. Service implementation – bit rates, metadata, hybrid operation
   ii. Content and metadata sources
   iii. Home and portable receivers
   iv. Automotive receivers
   v. Whole of industry approach

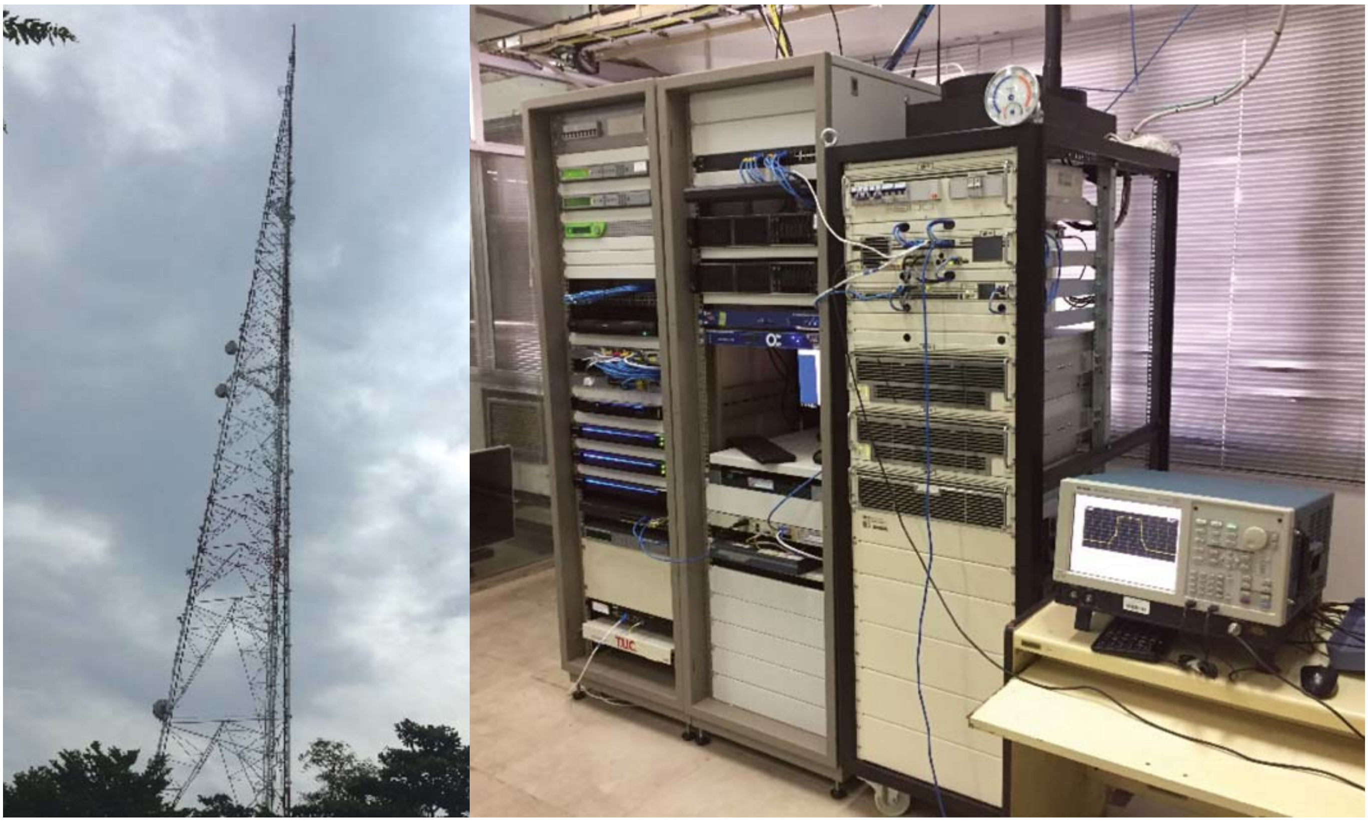


***Figure 2**: Example high power DAB+ trial system*

d. Workshop / webinar 4 – system design and allotment and transmission planning
   i. Overall system design and requirements, number of services and their location
   ii. Allotment planning methodologies
   iii. Transmission planning – coverage and interference

3. Stakeholder discussions

This is often a critical point which has vested interests, e.g. Public Service Broadcasters may wish to increase their service offerings to the general public while some commercial radio operators may be opposed to new services introduction as they may feel commercially threated. It is important to ensure that all stakeholders are heard and that a clear plan of action to decide how to move forward is developed which includes how to deal with any issues identified.

4. Ongoing education programme

It is very likely that the initial training programme will need to be followed up with further activities as the stakeholder group expands.

Ongoing education is usually provided when the demand is established, e.g. once trials have been at least started or planned and decisions to move forward are made.

TECHNICAL TRIALS

Trials involve the physical design, implementation and testing of DAB, usually undertaken by the local broadcasters / stakeholders with the assistance of international experts and equipment providers. Trials are usually undertaken over an extended period, often years, and may precede full time or permanent operation. The following steps are required:

1. System requirements

This involves discussions between the stakeholders to determine the details of the trial including:

a. When it can be done given spectrum availability?
b. What funding is available from what sources?
c. Where it will be done?
d. What audio services will be included?
e. What trial tests, and demonstrations will be included?
f. Specific objectives and decision-making points

2. System design

This covers the complete system from audio and metadata inputs, the multiplex system setup and the transmission system including the transmitter, filters and antenna system.

The coverage requirements are usually to either provide an indicative coverage of a city or town or a low power limited area transmission for demonstration purposes only.

3. Equipment sourcing

The amount and type of equipment depends on the scale of the trial. Small trials of less than 1 kW ERP can be undertaken using demonstration equipment with only some ancillary equipment and the antenna systems being the primary expense.

Larger trials which involve significant transmitter powers, e.g. over 1 kW Tx power, usually require more significant antenna, feeder and filter systems as well as headend and transmitter equipment and hence are more expensive. Higher power trials provide more opportunities to test reception under different conditions and to obtain more test measurements.

4. Trial activities and testing

Trial activities are usually undertaken in two groups – field strength coverage testing and feature testing.

Field strength coverage is usually predicted using modern propagation prediction tools which take into account accurate digital terrain maps and building and foliage clutter.

Field testing is used to check the prediction and tune the models used – particularly for cities with significant high-rise buildings which can cause areas of low field strength due to shadowing effects. This is a very important aspect of the trials as prediction is often used to help design the power and antenna patterns for permanent services.

In the case of cities with many high-rise buildings, a Single Frequency Network (SFN) of a number of transmission sites may be required to achieve the necessary coverage. It is sometimes also useful to do trials in multiple different terrain types. Indoor testing is also useful to check in-building field strengths and building entry loss values and the consequent field strength reference levels for different classes of

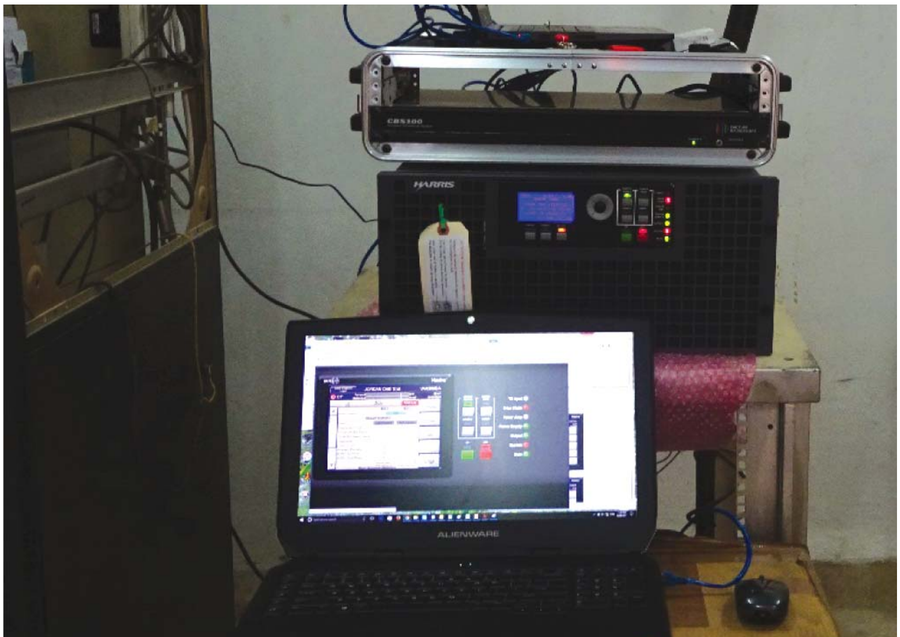


***Figure 3**: Example low power DAB+ trial system*

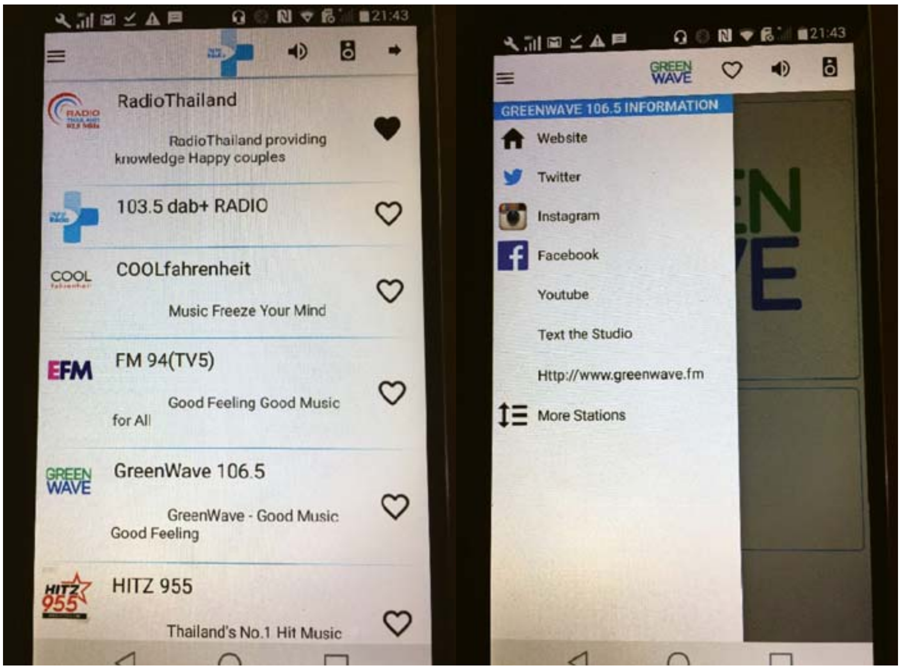


***Figure 4**: Example hybrid radio metadata*

coverage, e.g. rural/open, suburban, urban and dense urban. The values used differ from country to country due to differences in terrain, building structures and urban densities.

Feature testing demonstrates the capabilities of the system and can include testing of multiple receiver types including car receivers and the demonstration of audio quality for different content types, metadata delivery and features such as announcements, emergency warning and service following. Hybrid radio is also now becoming common place and should also be demonstrated.

5. Reporting

The results of the testing are usually compiled into a report for all stakeholders to review. The report will also include recommendations regarding different aspects on the system such as coverage deficiencies, the use of features and the availability of receiver types. The report is usually accompanied by a seminar presentation which allows stakeholders to enquire about particular aspects of the trial and the system performance.

The results of the education programme and the technical field trials are critical inputs to the next steps in the process – formal standards adoption and system planning.

The trial transmissions will often continue after the initial reporting and the decision to proceed to the next steps to allow further testing and demonstrations and in some cases help to 'seed' the market with early adopters acquiring receivers. Early adopters are very important as broadcasters can try out new service concepts and music genres and get feedback.

An example Gantt chart of the Initial investigations and Technical trials phases is shown below in ***Figure 5***.

The next stages of the DAB adoption process, formal adoption and planning, will be discussed in a forthcoming article in the ABU Technical Review. ■

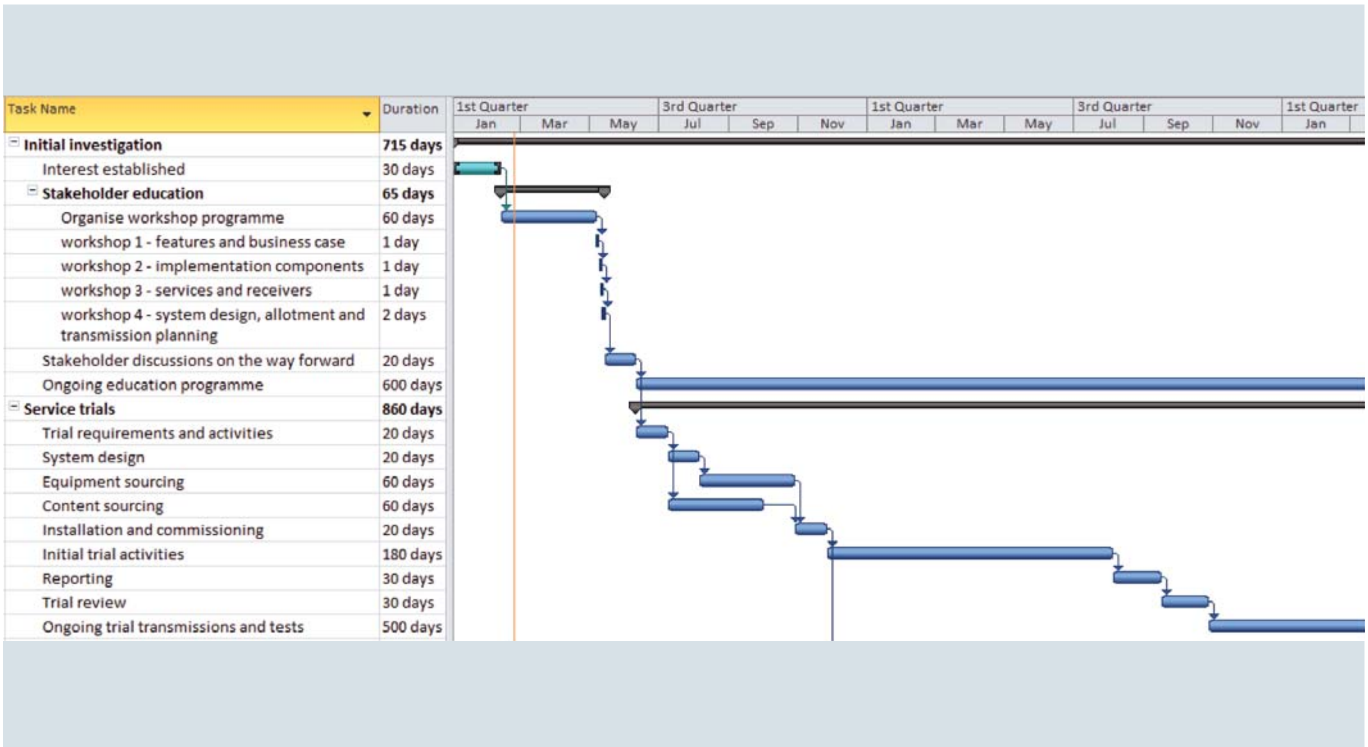


***Figure 5**: Example Gantt chart for Phases 1 and 2*

News from the ABU Region

IDEAL SYSTEMS TEAMS UP WITH SARAWAK'S TVS

TVS, a regional TV broadcaster based in the Malaysian state of Sarawak, has selected cloud and broadcast systems integration company Ideal Systems to design and build its next generation News Studios and Newsroom Computer Systems (NRCS).

In a first of its kind, the state-of-the-art news studios and master control room will run on a redundant hybrid SDI/NDI (IP) infrastructure designed by Ideal Systems as part of a larger system that will deliver TVS' vision of creating a new digital media hub in Sarawak.

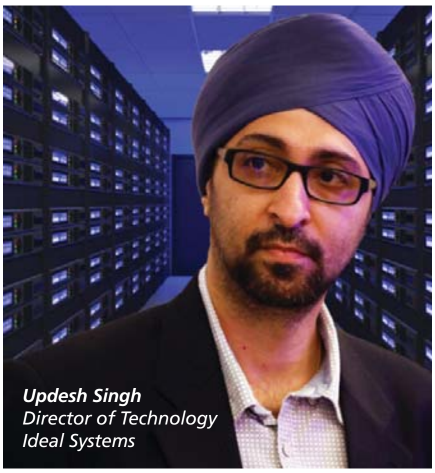
The cloud-enabled NDI infrastructure includes NewtekTM TC1 and TC2 Elite NDI integrated switchers for the news studio and multi-purpose studio, with Kiloview NDI converters.

The baseband infrastructure, signal processing and routing will utilise the latest state of art software defined Ultrix routing and multi-viewing solution from Ross Video.

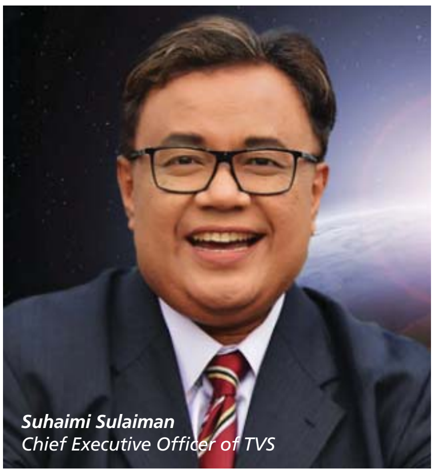
TVS is the first Sarawak state-owned TV channel. Launched in October 2020, it provides news and programming from Sarawak to the state itself and to other parts of Malaysia. It is owned by the Sarawak Media Group (SMG).

The Director of Technology at Ideal Systems, **Updesh Singh**, said: "Our robust hybrid system architecture has an NDI signal for every signal baseband path. All signals are active, and TVS can use any signal they want when they want it."

The Chief Executive Officer of TVS, **Suhaimi Sulaiman**, said: "For TVS, the most important thing is the quality of our production. Of course, we also want glitch free broadcast and a reliable system."



Updesh Singh
Director of Technology
Ideal Systems



Suhaimi Sulaiman
Chief Executive Officer of TVS

VIETNAM OFFICIALLY CEASES ANALOGUE TV

Minister of Information and Communications Nguyen Manh Hung announced the completion of the scheme 'Digitization of Terrestrial Television Broadcasting by 2020'. Beginning from December 28, 2020, Vietnam formally stopped providing analogue television nationwide.

The scheme 'Digitization of Terrestrial Television Broadcasting by 2020' observes Decision No.2451/QD-TTg signed on December 27, 2011 by the Prime Minister. At that time, 90 percent of Vietnamese households owned a TV, yet the vast majority of the population had no experience of digital television. However, until 2020, 16 million families in the country could enjoy cable TV, Internet Protocol TV (IPTV) and free satellite TV.

To carry out the scheme, since 2014, Vietnam has requested that all TVs on the market must include the function of Digital Video Broadcasting – Second Generation Terrestrial (DVB-T2). Meanwhile, the Government support around 1.9 million poor households with a suitable set top box from 2015 to 2020.

Therefore, including 20 percent of satellite TV coverage, 100 percent of the Vietnamese population was able to access digital television in 2020.

In a press conference, Minister Nguyen Manh Hung enthusiastically reported that the scheme had been successfully completed, fulfilling all 4 major assigned goals. [ABU News]

TELSTRA INFRACO LIGHTS UP DARK FIBRE

Access to Telstra InfraCo's nation-wide fibre optic network is opening up with the launch of Dark Fibre which the company is touting as "a significant milestone in Telstra's T22 transformation". Dark Fibre is Telstra InfraCo's first product since it was established as a standalone business unit to manage the majority of Telstra' infrastructure assets.

Catering to network operators and service providers, such as global carriers, data centre operators, internet service providers (ISPs) and over the top providers, Telstra InfraCo Dark Fibre gives customers control over their network – allowing them to self-manage bandwidth as well as add network protocols and features they want to create specialised offerings. As the fibre pairs are not shared, data is also completely private. [Content+Technology]

NHK WORLD EXTENDS MULTI-YEAR CONTRACT WITH SES

Japan International Broadcasting Inc. (JIB), a subsidiary of Japanese public broadcaster NHK and official distributor of NHK WORLD-JAPAN, has renewed its multi-year contract with SES for satellite capacity.

The agreement will permit NHK's free-to-air, English-language news and information channel in High Definition (HD) to continue to be distributed in SES's prime orbital neighbourhood at 19.2 degrees East to over 45 million satellite TV-equipped homes across Europe.

NHK WORLD-JAPAN provides the latest information on Japan and Asia through television, radio and online to a global audience. During the COVID-19 pandemic, NHK WORLD-JAPAN has observed a growing interest in its news and other programming as viewers seek trustworthy sources of updates as well as compelling new entertainment, underscoring the importance of satellite-delivered content. [SES]

DIGITAL RADIO MONDIALE (DRM) IN FM-BAND LIVE ON-AIR IN DELHI

As of mid-February 2021, a full-featured DRM digital radio transmission with 3 audio services and Journaline advanced text information is live on-air in Delhi in the FM band, alongside the existing analogue FM radio transmissions.

The transmission is part of an extensive trial and demonstration of DRM conducted by Prasar Bharati and its radio arm, All India Radio (AIR), with the help of the DRM Consortium and its local and international members.

The test was officially launched on February 24th and 25th at the Headquarters of All India Radio in New Delhi. The test was requested by the regulator TRAI and the Ministry of Information & Broadcasting as part of their deliberations that will lead to the recommendation of the most suitable radio standard to digitise the FM band in India.

The current Indian trial is to be carried out in two locations. The first phase, in Delhi, will demonstrate and test the key features of DRM, its efficient coverage potential and flexible on-air signal configurations.

The second phase will take place in Jaipur and is designed to prove the compatibility with the FM band channelisation in India, where DRM fills the gaps between existing analogue FM services that are not otherwise usable, as well as the existing CTI (shared FM transmitter infrastructure).

DRM for FM is now part of official policies in Russia, Pakistan, and South Africa and is recommended by the Southern African Development Community (SADC) for its sixteen Southern African countries. [DRM]

CCTV PREPS FOR 8K WINTER OLYMPICS WITH TELESTREAM

China Central TV (CCTV) - supported by China Mobile, China Telecom, China Unicom, and China Radio and Television - has carried out its first live 8K UHD broadcast test signals over a 5G network as it prepares for the Beijing Winter Olympics in 2022.

The Beijing Winter Olympics are due to take place from 4 to 20 February 2022 and in preparation, CCTV will start broadcasting 8K UHD channels in the run-up to the Beijing Winter Olympics and plans to implement 8K UHD as the standard production format for the Games, including full-time comprehensive 8K Telestream live monitoring from content production to editing and broadcasting.

More than 30 UHD large screens and China's first consignment of 8K TVs transmitted the images in public places across nine cities, including Shanghai, Guangzhou, Shenzhen, Chengdu, Hangzhou, Jinan, Haikou, and Qingdao. CCTV intends to broadcast the Chinese New Year's Eve celebrations live, using its 8K UHD TV channel, as part of its Spring Festival Gala.

The test broadcast used Telestream's full 2110 IP solution, including its Inspect 2110 IP monitoring system, PRISM waveform monitor and SPG8000A precision multi-format video signal generator, suitable for master synchronisation and reference applications. The Telestream monitoring solution was used throughout the production and distribution workflows.

Telestream's technology also saw use in helping CCTV to monitor the 8K signals in real-time around the clock. Telestream provides CCTV with IP 2110 network health protection and automatic alarm functions and checks the consistency of the main and backup channels.

Inspect 2110 probes monitor and record multiple RTP indicators in real-time - even the smallest amount of packet loss and disorder that cannot be detected by the naked eye, to provide early warning and record of IP network problems. It also compares the main and backup signals and can identify any inconsistency in audio and video content and auxiliary data, alerting operational staff. [Rapid TV News]

HONG KONG DTV CHANNELS TO MAKE WAY FOR 5G

Hong-Kong regulator OFCA has announced that six of the SAR's existing digital TV programme channels will move to new transmitting frequencies from 1 December 2021.

The six digital TV programme channels involved are Jade 81 of Television Broadcasts Limited, ViuTVsix 96 and ViuTV 99 of HK Television Entertainment Company Limited, and RTHK TV 31, RTHK TV 32 and RTHK TV 33 of Radio Television Hong Kong.

The digital TV channels are currently using transmission frequencies in the 600/700 MHz bands. After the switching off of analogue television services on 30 November 2020, transmissions on these frequencies will cease and be migrated to the 500 MHz band so as to vacate spectrum for high value-added mobile telecommunications services, including 5G, enhancing network capacity and coverage, and relieving currently congested indoor mobile telecommunications hotspots. The Government plans to assign the relevant spectrum by the end of this year to support Hong Kong's overall telecommunications services and smart city development.

OFCA has appealed to the HK public to make preparations for the continued reception of the six channels with regard to antenna reception systems in use (common antenna broadcast distribution (CABD) systems or self-provided TV antennae), paying attention to notices and arrangements promulgated by their buildings and contractors, and performing rescanning where necessary. To raise the public's understanding of the channel migration and the preparatory work required, OFCA will launch a series of publicity programmes.

The publicity programmes cover issuing letters to building management offices, incorporated owners of buildings and other parties maintaining/operating CABD systems; putting up posters and distributing flyers at public housing estates and private residential buildings/estates; and launching TV and radio announcements in the public interest. OFCA will also provide further information and assistance to households using self-provided antennae, in the second half of this year. [ofca.gov.hk]

CAMBODIA TO GO DIGITAL BY 2023

The government held an inter-ministerial meeting on December 28, 2020 to discuss setting up a digital television platform as part of the Kingdom's shift away from analogue. Held at the Ministry of Economy and Finance, the meeting discussed the would-be platform operator's models of management and financing (public, private or mixed) and shutting off analogue signals before 2023.

Also, on the agenda, said the finance ministry in a press release, were management of internet and mobile audiovisual services in the 700MHz frequency band, medium and long-term digital infrastructure and their implications for channels and progress updates, as well as business models for investment.

Minister Aun Pornmoniroth, who is also chairman of the ministry's Economic and Financial Policy Committee, stressed the importance of the successful development and management of the audiovisual system to the Kingdom's overall development. He said modern technology will not only promote economic growth and increase competitiveness and economic diversification, but can also improve the mechanism of data management and propaganda system in the country in order to ensure highly-effective national and socio-economic security. [ABU News]

MEDIAKIND INTEGRATES DOLBY VISION INTO ENCODING PORTFOLIO

MediaKind has integrated Dolby Vision technology within its encoding portfolio. Dolby Vision will be supported within MediaKind Packaging and MediaKind Encoding Live products as well as its Aquila Streaming and Aquila Broadcast solutions, providing any resolution from standard definition (SD) to Ultra High Definition (UHD).

This will enable users of MediaKind's encoding solutions to deliver content in Dolby Vision, providing the highest possible quality of video experience for broadcast, operator, streaming and cloud-based services across a wide range of consumer devices and form factors, from main screen TVs to smartphones.

Dolby Vision is an advanced imaging technology that combines high dynamic range (with wide colour gamut capabilities to deliver ultra-vivid picture quality. [IBC]

AUSTRALIAN RADIO NETWORK TAPS STREAMGUYS FOR MANAGED SERVICES

Australian Radio Network (ARN) has opted for managed services from cloud-based streaming provider StreamGuys. The broadcaster, which operates 12 radio stations nationwide plus

digital entertainment platform iHeartRadio and podcast publisher the iHeartPodcast Network, wanted to simplify its streaming operations and prepare for growth.
To accommodate evolving technology, ARN had worked with several major streaming and cloud vendors, but found day-to-day operations becoming too cumbersome. ARN decided to migrate its services to a hybrid hosting environment and considered moving its streaming infrastructure to its private cloud, but wanted to explore using a managed service that had previous experience with dynamic audio. Its first goal for the transition was to simplify its streaming infrastructure to prepare for the future.

StreamGuys now manages live streaming with midstream ad replacement for ARN's brands KIIS, Pure Gold, and The Edge, which are all integrated into the iHeartRadio Platform.

StreamGuys handles the broadcaster's full audio payload, including radio simulcasts, DAB+ simulcasts, iHeartRadio stations and an expanding array of audio partnerships. Audio streams are hosted through StreamGuys' Australian datacentre, giving 100% uptime to ARN's listeners. [Rapid TV News]

APAC PAY TV REVENUES TO FALL BY US$1 BILLION OVER NEXT FIVE YEARS

Pay TV revenues in the Asia-Pacific region are set to drop by almost US$1 billion by 2025. A new report from Global Data stated that the APAC market will decrease from US$61.6 billion in 2020 to US$60.8 billion in 2025, largely due to continued decline in cable TV subscriptions and fall in average spend per pay TV account in the region.

As a part of this decline will be a slowdown in some of the most advanced markets in the region, including Hong Kong, Singapore, Australia and Vietnam. This will come as a result of cord-cutting, with users trading traditional pay TV solutions for OTT alternatives. Cable TV, which is the leading pay TV platform in the region by subscriptions, will see its market share decrease while DTH alternatives will experience growth.

IPTV services will see a significant rise to take up the majority of pay TV subscriptions, increasing from 42.5% in 2020 to 53.5% by the end of 2025. The increase in demand for IPTV will fail to reverse the declining trend for pay TV services overall. The report also notes that China will go on to account for 80.2% of pay TV subscriptions in the region by the end of 2025. [digitaltveurope]

MALAYSIAN CONTENT INDUSTRY UNITES AGAINST PIRACY

Leading players of the local content industry in Malaysia have lauded the country's authorities for the recent action against digital piracy in Malaysia. Industry players say they are of the opinion that the current penalty for committing acts of digital piracy is not commensurate with the huge economic losses suffered by the content providers.

The annual loss due to digital piracy is estimated at RM3 billion to the entertainment and media industry, RM500 million in taxes and puts thousands of jobs at risk. Piracy has become so pervasive that many have forgotten it is theft. Piracy is the biggest scourge of the industry, stealing from every single person in the creative ecosystem from actors, writers, producers, directors and cameraman, thus hampering development.

The industry players appeal to the government of Malaysia to carry out a thorough review of the existing regulations, which currently do not fully enforce, convict or deter infringements; nor does it provide copyright holders with sufficient protection for their creative works against digital piracy.

Eradication of digital piracy to ensure that only responsible content is streamed requires collaborative efforts of all parties from content providers, broadcasters, regulators, authorities and consumers, to telcos, internet service and ecommerce providers. [Content+Technology]

FEARS OVER STREAMING CONTENT AS INDIAN SUPREME COURT RULES IN FAVOUR OF SCREENING MECHANISM

India is heading towards increased scrutiny of content on streaming services, with the country's Supreme Court ruling in favour of a screening mechanism. Foreign streaming services have been in the crosshairs of the government for some time due to their ability to air free of censorship.

The Indian government had already ruled to place streaming platforms under the regulatory supervision of the country's ministry of information and broadcasting, but this latest move shows the government exerting even greater control.

Currently, content on streaming platforms is not subject to vetting, but operators must classify shows and movies into five categories based on appropriate age groups.

As a result of this ongoing scrutiny, Reuters has reported that the likes of Amazon and Netflix are inspecting planned shows and scripts and deleting scenes that could be controversial in the country. [digitaltveurope] ■

DIGITAL BROADCASTING *Updates*

MEDIACORP RADIO SEES GROWTH IN AUDIENCE

Mediacorp's radio network has seen a growth in listenership, reaching 3.4 million people weekly, which is close to 80% of total adults, with more than 13 hours of engagement recorded weekly. These findings are based on the latest Nielsen Radio Survey conducted from September to November 2020, which tracked radio listenership via diary recordings by 2,000 adults aged 15 and above, with the results weighted by age, sex and race to be representative of the Singapore population.

This represents a 1.8% increase in listeners from the last survey findings in 2019. Mediacorp also continues to be the top radio network in Singapore, with eight of its radio stations appearing in the top 10 spots – including the top four positions – according to the latest survey results. Beyond the airwaves, the survey also found that more than four in five digital listeners tune in to Mediacorp's digital radio stations weekly, reinforcing its ability to reach audiences across multiple platforms amidst evolving media consumption preferences. More than four out of five digital radio listeners tune in to Mediacorp's digital radio network. [asiaradiotoday]

NEW TEST PACKAGE TO HELP IMPLEMENTERS OF DVB-S2X BEAM HOPPING

The most recent update to the DVB-S2X specification added support for beam hopping, a technique that enables more efficient use of satellite resources. DVB has now published a set of materials for "Verification & Validation" of DVB-S2X beam hopping implementations. This V&V package facilitates the production of interoperable, standards-compliant equipment. Satellite beam hopping works by grouping the cells covering a given territory in clusters; the cells of each cluster are visited by the satellite beam in successive illumination periods. This enables efficient and flexible use of satellite resources for applications such as VoIP, cellular backhaul, Internet of Things, maritime and in-flight connectivity, and government applications.

For satellite operators, the higher utilisation and increased capacity provided by beam hopping enables lowering the cost-per-Mbit offered to their customers. Having a standardised air interface opens the market for a variety of suppliers, service providers and equipment manufacturers, thus lowering the effective cost of the ground segment and enabling a viable business model. By developing a standards-based approach, DVB has helped to ensure that modern satellite terminals using beam hopping will be more affordable for end users. Interoperability also enables a wider market by providing access to a variety of services over different modern satellite systems.

The V&V package for DVB-S2X beam hopping utilises simulation, in which computer files describing the waveforms are used to assess standard compliance. The objectives are to ensure the unambiguous description of use cases, protocols and formats, to facilitate the standard implementation process and to ease interoperability between implementations from different manufacturers.The latest version of the implementation guidelines for DVB-S2X, TR 102 376-2 V1.2.1, was published by ETSI at the end of January. Finally, an editorial revision of the DVB-S2X standard itself has been published as DVB BlueBook A083-2r2 and will be forwarded to ETSI. It includes some improvements to the text arising from the process of developing the V&V materials. [DVB]

ITU LAUNCHES OPEN RESEARCH GROUP ON AUTONOMOUS NETWORKS

The International Telecommunication Union (ITU) – the United Nations specialised agency for information and communication technologies (ICTs) – has launched a new Focus Group to support the emergence of ICT networks able to control their behaviour autonomously in the interests of efficiency. The ITU Focus Group on 'autonomous networks' will lead an exploratory 'pre-standardisation' study to determine how ITU standards will support the realisation of autonomous networks and their evolution in years to come.

Networks are growing in sophistication to enable highly interactive new communication experiences and innovations in fields such as digital health and intelligent transport systems. IMT-2020/5G and future networks will be versatile all-round players able to meet the requirements of a very diverse set of ICT applications. This versatility is made possible by major advances in cloud computing and network virtualisation – the software revolution reshaping the networking business – but this versatility also introduces significant network complexity.

Artificial intelligence (AI) and machine learning are expected to play a key part in managing this complexity, especially in meeting new demands on network management and control as these demands exceed the capabilities of humans as well as pre-defined automated processes. The complexity of the latest network architectures has created the motivations for autonomous networks, but these architectures also create the conditions necessary to integrate 'creative intelligence' techniques into 5G and future networks.

The Focus Group will study the creative intelligence techniques that leverage this online experimentation, elaborating foundational concepts such as 'exploratory evolution', 'emergent behaviour', and 'real-time responsive experimentation'. It will study the meaning and characteristics of autonomous networks, providing definitions and terminology to build clarity around the concepts underpinning creativity in autonomous networks. It will propose technical enablers for evolution in autonomous networks to support networks' dynamic adaptation to future ICT environments and use cases. And it will demonstrate architecture concepts and develop associated guidelines to enable higher levels of autonomy through real-time responsive experimentation. [ITU]

ESSENTIAL VIDEO CODING (EVC) VERIFICATION TEST FINALISED

A verification testing assessment of the Essential Video Coding (EVC) standard (ISO/IEC 23094-1; MPEG-5 Part 1) was completed at the 133rd MPEG meeting in January 2021. The first part of the EVC verification test using high dynamic range (HDR) and wide color gamut (WCG) was completed at the 132nd MPEG meeting. A subjective quality evaluation was conducted comparing the EVC Main profile to the HEVC Main 10 profile and the EVC Baseline profile to AVC High 10 profile, respectively.

Analysis of the subjective test results showed that the average bit rate savings for EVC Main profile are approximately 40% compared to HEVC Main 10 profile, using UHD and HD SDR content encoded in both random access and low delay configurations. The average bit rate savings for the EVC Baseline profile compared to the AVC High 10 profile is approximately 40% using UHD SDR content encoded in the random-access configuration and approximately 35% using HD SDR content encoded in the low delay configuration. Verification test results using HDR content had shown average bit rate savings for EVC Main profile of approximately 35% compared to HEVC Main 10 profile. By providing significantly improved compression efficiency compared to HEVC and earlier video coding standards while encouraging the timely publication of licensing terms, the MPEG-5 EVC standard is expected to meet the market needs of emerging delivery protocols and networks, such as 5G, enabling the delivery of high-quality video services to an ever-growing audience. [MPEG]

FCC MODIFIES DTS RULES FOR ATSC 3.0 FLEXIBILITY

The FCC released an update to its DTS (distributed transmission system) coverage rules to expand the permissible range of signal spillover and replace the subjective "minimal amount" language used to describe spillovers as a way to promote ATSC 3.0 reaching its full potential. The change gives broadcasters more flexibility in placement of DTS transmitters. For UHF stations, the rule change mandates that the 41 dBu F(50,50) contour for each DTS transmitter in use does not exceed the reference station's 41 dBu F(50,50) contour. The corresponding values for low VHF are now 28 dBu and for high VHF 36 dBu.

The Report and Order, adopted Jan. 13, explained that the agency's actions are intended to afford "broadcasters greater flexibility in the placement of DTS transmitters..." that will "allow them to enhance signal capabilities and fill coverage gaps, improve indoor and mobile reception, and increase spectrum efficiency by reducing the need for television translator stations operating on separate channels." [ATSC]

6G PROJECT UNDERWAY IN THE EU

The European Commission has launched Hexa-X, a 6G flagship initiative for research, into the next generation of wireless networks. Headed by Nokia, Hexa-X project goals include creating unique 6G use cases and scenarios, developing fundamental 6G technologies and defining a new architecture for an intelligent fabric that integrates key 6G technology enablers.

The Hexa-X project was awarded funding from the European Commission under the European Union's Horizon 2020 research and innovation programme. Stakeholders represent the full value-chain of future connectivity solutions ranging from network vendors, communication service providers, verticals, and technology providers, as well as the most prominent European communications research institutes, including Nokia, Ericsson, Atos, Intel, Orange, and Siemens. Nokia has been at the forefront in commercialising every generation of wireless technology, from the first GSM call to the best performing 4G networks and the world's fastest 5G speeds.

Nokia Bell Labs, the industrial research arm of Nokia, pioneered many of the fundamental technology innovations that are being used to develop 5G standards. These include Massive MIMO, mmWave access, coding, and 5G radio stack design, which enabled 3GPP Release 15 initial deployments. Nokia Bell Labs is also developing enablers for the upcoming 3GPP Release 16 and 17 that are key for the digital transformation of industrial verticals, such as 5G New Radio (NR) in unlicensed spectrum bands, NR-Light to support massive IoT with medium-rate sensors and localisation. Building on this strong heritage, Nokia is leading the 6G joint research and pre-standardisation process and Nokia Bell Labs is already researching the fundamental technologies that will comprise 6G. Nokia expects 6G systems to launch commercially by 2030, following the typical 10-year cycle between generations. [Content-Technology]

SMPTE AND OSA DEVELOPING FIRST MICROSERVICES STANDARDS FOR THE MEDIA INDUSTRY

The global society of media professionals, technologists, and engineers working in the digital entertainment industry (SMPTE) and the Open Services Alliance (OSA) a member-supported organisation focused on improving interoperability among microservice-based media systems have come together to create the first two microservices standards for the broadcast and media industry.

The two organisations have published a new public Committee Draft (public CD) (SMPTE ST 2125) that documents a standardised IMF Registration API and a second public CD (SMPTE ST 2126) that standardises status reporting and logging for media microservices. And as public CD document types, they are available for public review and feedback. Recognising the value of the Interoperable Mastering Format (IMF) in bringing efficiencies to content distribution, both SMPTE and OSA began work on a standardised IMF Registration API about six months ago. [APB News]

5G-MAG BRINGS AUDIO-VISUAL MEDIA INTO FOCUS FOR 3GPP

The Organisational Partners (OPs) of 3GPP have approved 5G Media Action Group (5G-MAG) as a Market Representation Partner (MRP) in the project. 5G-MAG represents major stakeholders in the production and distribution of audio-visual media content and services, driving their collaboration on the implementation of 5G solutions, aligned to 3GPP standards. In his letter to 3GPP OP, Antonio Arcidiacono – Chair 5G-MAG – signaled that the members of 5G-MAG will "jointly contribute to ensure that their interests in the media industry domain are considered adequately in 3GPP standardisation, that the solutions are able to create added value across the entire value chain and that appropriate regulatory frameworks are in place to foster technology deployment and implementation."

5G-MAG gathers stakeholders across the media sector, including:

- Content and service providers
- Network operators
- Suppliers & equipment manufacturers
- R&D
- Regulators and policy makers

5G-MAG's MRP status was validated by correspondence, in the absence of a physical 3GPP OP#45 meeting. [3GPP]

EBU RECEIVES THREE TECHNOLOGY & ENGINEERING EMMY® AWARDS

The European Broadcasting Union has been awarded three Technology & Engineering Emmy® Awards for excellence in engineering creativity, recognizing three key technologies collaboratively developed by the EBU that have shaped or underpin systems widely used by the broadcast industry. The Technology & Engineering Award is given annually by the US-based National Academy of Television and Arts & Science (NATAS) to individuals or organisations that have materially affected the Television viewing experience.

The formal Award ceremony is scheduled to be held in autumn and in partnership with the National Association of Broadcasters (NAB) Show, held 9-13 October in Las Vegas.

The first Emmy® Award recognises the EBU's role in the creation of the Advanced Authoring Format (AAF), an interchange file format that paved the way for cross-platform post-production workflows, the benefits of which are still enjoyed by the sector. The Award is shared with AMWA (formerly AAF Association Inc), Avid Technology and BBC Research & Development.

The second Emmy® Award honours the standardisation and commercialisation of broadcast, hybrid electrical and fibre optic camera cable and connectors, a design for physical interconnect solutions that helped to accommodate the growing bandwidth requirements in digital media production systems and has since come to be relied on by vendors, broadcasters and media creators around the world. The EBU shares this award with SMPTE, The Association of Radio Industries and Businesses (ARIB), LEMO, Belden and NEMAL.

The final of the three Emmy® Awards rewards the work on Common Encryption, a fundamental technology design that separates the encryption function from the content contribution or distribution system and can accommodate the presence of multiple encryption or conditional access system in parallel. The technology allowed industry participants to deploy successive generations of increasingly sophisticated conditional access systems as part of new services on satellite and cable. The EBU shares this Award with DVB. [EBU]

TOP CLOUD PROVIDERS IN 2021: AWS, MICROSOFT AZURE, AND GOOGLE CLOUD, HYBRID, SAAS PLAYERS

Cloud computing in 2021 has become the de facto choice of IT due to digital transformation shifts accelerated by remote work and the COVID-19 pandemic. It has been the go-to model for information technology as companies prioritise as-a-service providers over traditional vendors, accelerate digital transformation projects, and enable the new normal of work following the COVID-19 pandemic. And while enterprises are deploying more multicloud arrangements the IT budgets are increasingly going to cloud giants.

According to a recent survey from Flexera on IT budgets for 2021, money is flowing toward Microsoft Azure and its software-as-service offerings as well as Amazon Web Services. Google Cloud Platform is also garnering interest for big data and analytics workloads. But hybrid cloud and traditional data center vendors such as IBM, Dell Technologies, Hewlett-Packard Enterprise, and VMware have a role too. Meanwhile, Salesforce, ServiceNow, Adobe, and Workday are battling SAP and Oracle for more wallet and corporate data share. Salesforce and ServiceNow launched successful back-to-work enablement suites and cemented positions as major platforms. [zdnet.com] ■

Equipment *Trends*

IKEGAMI ANNOUNCES UHK-X700 4K-NATIVE GLOBAL SHUTTER 3-CMOS SENSOR SYSTEM CAMERA

Ikegami announces a major addition to its UNICAM XE 4K system camera series. The UHK-X700 incorporates three newly developed 2/3-inch CMOS 4K sensors with global shutters to eliminate rolling shutter distortion and flash-banding artefacts.

Designed for broadcast-quality video production and online streaming applications, the UHK-X700 looks set to become the flagship of the UNICAM series. It provides the high signal quality, versatile connectivity and robust build that are essential in today's multi-resolution media world. That includes full support for high dynamic range imagery with HLG or standard dynamic range, as well as the possibility to independently choose between BT.2020 and BT.709 colour spaces. High frame-rate shooting at up to 2x speed in 4K or up to 8x speed in HD via the base station is possible as an option, for applications such as capturing fast motion in sport or stage events.

Core of the UHK-X700 electronics is an ASIC chip which encapsulates a wide range of high-grade video processing functions into ultra-compact component dimensions. When combined with the Ikegami BSX-100 base station, the camera optionally supports simultaneous output in 4K/HD video formats, including mixed sources. 4K video is available as a 12G-SDI feed directly from the camera head, allowing the UHK-X700 to be integrated into a wireless system.

Measuring 340 x 243 x 149 mm and weighing 5 kg, the UHK-X700 comes with a B4 lens mount and has an optical sensitivity of F11 when operating at 4K/50p. The camera is designed for use at -20 to +45 °C operating temperature and 30% to 90% non-condensing humidity.

The UHK-X700 camera is uniformly balanced and has a low centre of gravity to ensure easy operation on a pedestal, tripod or shoulder. Peripheral options include the OCP-300 control panel and SE-U430 system expander. Ikegami also offers a choice of three types of viewfinder for this model: VFL201D 2-inch LCD, VFL701D 7-inch full HD LCD, VFE741D 7.4-inch OLED.

The UHK-X700 is scheduled for delivery from Q2 2021. [Ikegami]

MATROX INTRODUCES KVM CONTROL OVER INTERNET

Matrox® Video has announced KVM-over-internet support with its Matrox Extio™ 3 IP KVM extenders. This new mode of operation allows organisations to expand work-from-home remote programmes by enabling off-site employees with secure access to their powerful workstations and specialised equipment. Featuring 4K and multi-monitor KVM extension and switching support with secure network connectivity, users can now connect to and control, share, and manage systems and applications as they would on-premises for an optimised remote working experience.

Extio over internet is ideal for a wide range of mission- and time-critical industries, including electric utilities, broadcast, post-production, oil and gas, medical, military and defence, transportation, and more.

The first 4Kp60 IP KVM to support LAN, WAN, and internet over a standard Gigabit Ethernet network, Extio over internet provides power users, knowledge workers, and broadcast operators and directors with instant, high-quality 4Kp60 and quad 1080p60 4:4:4 video, audio, and USB 2.0 signal extension. Extio 3's Aggregator Mode feature further streamlines remote workflows by providing control of multiple systems – users can simultaneously view, control, and switch between multiple systems from a single 4K display or multi-monitor setup, using only a single keyboard and mouse set.

Extio 3 integrates advanced security features – such as IPSec VPN, multi-factor authentication, and AES 128-bit hardware encryption – ensuring secure and safe transmission and communication of all audio, video, and USB signals over the network. In addition, Extio 3 is a discreet solution eliminating the need for software installation on the source system, minimizing validation and deployment times. Extio 3 over internet also carries zero licensing fees, further saving on costs.

Extio 3 allows users to take advantage

of their workstations or specialised equipment from a distance, and our integrated VPN client gives them a secure and private connection over internet. [Matrox]

ARRI INTRODUCES ORBITER, THE ULTRA-BRIGHT LED POINT SOURCE WITH A VARIETY OF OPTICS

ARRI introduces "Orbiter", a new LED luminaire. An ultra-bright, tunable, and directional LED fixture. Orbiter's new six-colour light engine delivers a wide-colour gamut and outstanding colour rendition across all colour temperatures from 100 to 0%. With its changeable optics, Orbiter can transform into many different types of lampheads including projection (profile), open face, and soft light.

Changeable optics is the core innovation in Orbiter. The Quick Lighting Mount (QLM) in Orbiter allows for optics with vastly different properties to be attached to the fixture. The high-output, directional beam of the open face optic is ideal for throwing light long distances. The high precision of the projection optics creates a perfect circle of light that can be shaped with cutters, focus, and gobos. The dome optic provides omnidirectional, soft light, great for illuminating large spaces, and a universal QLM adapter creates a direct mounting point for Orbiter-specific Chimera and DoPchoice products.

Its new high output, yet tunable, ARRI Spectra light engine can create hard shadows with defined edges. Including a red, green, blue, amber, cyan, and lime LED, the ARRI Spectra six-colour light engine translates into a wider colour gamut, more accurate colours, and most importantly, higher colour rendition across the entire CCT range. Orbiter has a larger CCT range of 2,000 to 20,000 K with ultra-high colour rendition across all colour temperatures. Using a combination of three dimming techniques, Orbiter's cutting-edge electronics provide smooth dimming down to zero without colour changes or jumps.
Its new software called LiOS (Lighting Operating System) includes all features of the SkyPanel plus others, making Orbiter one of the most fully-featured luminaires on the market. LiOS's eight-colour modes include CCT, HSI, individual colour, x/y coordinates, gel and source matching, lighting effects, and the new colour sensor mode that measures ambient light and recreates it through Orbiter's output. With a 4" full-colour display, quick navigation buttons, and integrated sensors, the Orbiter control panel allows for easy use with a graphic user interface.
In addition, the control panel is removable and can be used handheld with the aid of a 5 or 15 m (16.4 or 49.2 ft) control panel cable.

Ethernet daisy chaining is now possible with two EtherCON ports supporting Art-Net 4, sACN, and TCP/IP. Two USB-A ports are used for LiOS updates and connection of third-party peripherals such as Wi-Fi USB dongles. LumenRadio's CRMX solution is included, allowing for wireless DMX. Two 5-pin XLR DMX ports used for conventional DMX & RDM communication in and through, and a 3-pin XLR DC input for 48 V power station. An SD Card slot enables future expansion of the software. Finally, a USB-C port is available for computer communication and servicing. A new weatherproof housing enables outdoor application by using an aluminium cast body with bumpers made of reinforced plastic. [ARRI]

GRASS VALLEY ADDS CONNECTED SWITCHER PANELS TO ITS CLOUD-BASED LIVE PRODUCTION

Grass Valley announces the next step in cloud-first production solutions with the introduction of GV K-Frame on AMPP, Grass Valley's newly launched application suite for its Agile Media Processing Platform. The solution delivers a SaaS version of the K-Frame switcher engine – running on AMPP. Kayenne, Karrera, Korona, and KSP control surfaces maintain their well-known performance regardless of whether they are tied to a physical frame or to GV K-Frame on AMPP. GV K-Frame on AMPP is the latest in a range of AMPP-connected solutions that provide a seamless transition to cloud-based video production while extending the flexibility of existing solutions.

GV K-Frame on AMPP further expands the recently introduced GV Media Universe ecosystem, providing operators with the creative resources needed for professional media production in the cloud. With three M/Es and four keyers with 2D DPM per M/E, the solution uses the same UI and control surfaces as any other K-Frame solution. Stills and animations with fill/key including

transparency also provide a polished production look that is easy to create, store and recall at the touch of a button from the hundreds of E-MEMs and Macros available.

AMPP-connected solutions can scale to as many instances as required without upfront buildout and deliver flexible I/O with access to any source on the AMPP fabric. Users also benefit from highly responsive and frame-accurate cloud-hosted performance – even when connected via typical residential Internet – even half a world away. The open ecosystem of connected devices, services, media content and applications give creatives familiar interfaces to comprehensive cloud-enabled solutions. The operator experience is also standardised, with application user interfaces all organised into common dashboards and controls.The GV AMPP platform is cloud native and cloud-agnostic, while supporting the secure processing of video/audio in the public cloud on any of the major platforms, in a private, on-premises data centre, or in hybrid topologies. This flexibility and power will bring about a significant paradigm shift in live content production, allowing shows to be produced on any engine from any location. [Grass Valley]

AVID LAUNCHES EDIT ON DEMAND CLOUD-BASED EDITOR, STORAGE

Avid launched its new Avid | Edit On Demand subscription service, which puts Avid Media Composer editing software and Avid Nexis cloud storage into the hands of broadcast, production house and post facility teams regardless of where they are. Edit On Demand delivers the editing experience and workflow that, users have come to expect on premises, even though it's hosted entirely in the cloud. Shaped by deployments during the company's Early Access Programme when more than 60 production facilities, post houses and broadcasters used the solution, Avid | Edit On Demand optimises the user experience so that it is virtually indistinguishable from on-premise editing. Post production teams can quickly spin up virtualised Media Composer systems with Avid NEXIS cloud workspaces, access their workflows from anywhere and shut them down fast when

projects are complete.

To use Avid | Edit On Demand, Avid customers log on to their my.avid.com account to configure an Edit On Demand subscription that meets their unique needs. They can start working on their project the same day. Editors can use their Windows or Mac laptops or mobile devices to connect to a fully configured, virtualised Media Composer system and an Avid NEXIS workspace in the cloud.

Avid | Edit On Demand is available as a straightforward subscription without overage fees or hidden costs, the company said. Users can configure it to meet the specific needs of each production. They can start small and scale up to dozens of editing seats and hundreds of terabytes of storage if needed, it said. Each subscription includes:

- ✓ Teradici's Cloud Access Software PCoIP secure remote desktop solution;
- ✓ FileCatalyst for fast, reliable transfers of large media files;
- ✓ Avid Media Composer editing seats; and
- ✓ Avid Nexis Cloud storage hosted on Microsoft Azure [Avid]

EVERTZ UNVEILS XPS SERIES UHD, 3G, HD STREAMING PLATFORM

Evertz has introduced the XPS Series, a software-defined HEVC and H.264 10-bit 4:2:2 real-time encoding/decoding platform for streaming of UHD/3G/HD contributions via IP networks. Well-suited for live or cloud-based applications where security, high quality and low-latency are essential, the XPS can be used for live sports and entertainment events. It provides reliable, cost-effective contribution encoding over private IP networks. For breaking news events and Esports competitions, the XPS provides reliable, low-latency encoding over public networks using the Secure Reliable Transport (SRT) or Reliable Internet Stream Transport (RIST) protocols. For remote or stay-at-home operations that are becoming common during the COVID-19 pandemic, the XPS provides low-latency remote monitoring of broadcast facilities or can be used as an extension to production control room environments. The XPS platform also can be used as the on-ramp and contribution encoder for cloud production or playout hosted by public cloud providers.

The XPS is available in several form factors, including:

- ✓ 5782XPS, a module blade that fits into an Evertz 570FR for high-density encoding and decoding up to 60 3G/HD or 15 UHD in 3RU;
- ✓ XPS-EDGE, a standalone appliance that supports up to four encodes, decodes or bi-directional based on the software license; and
- ✓ MIO-XPS, a module that fits into Evertz' Scorpion Smart Media Processing Platform

The new streaming platform seamlessly integrates into Evertz' Software Define Video Networking (SDVN) orchestration, monitoring and analysis software. The XPS is discoverable and can be added to IP networks where operators can visualise and route data flows using the company's VUE interface. Advanced data monitoring is available to engineering staff, providing remote access to resolve issues from a central location. [Evertz] ■

ABU sets up mini-studio

The ABU Secretariat has set up a small studio with recording and editing facilities to meet the challenges of the global pandemic.

Built in an existing meeting room, the mini-studio is being used by ABU departments to make audio and video recordings and hold video conference calls and webinar sessions.

The Technology Department worked hard to bring it to fruition using the equipment acquired for the 2020 ABU General Assembly and associated meetings, which were held online for the first time late last year.

The system is installed with Davinci Resolve software for video editing and Audacity for audio editing. It has a green screen setup for webinars and video calls.

While the room acoustics and camera quality do not yet allow studio level recordings, the studio gives the Secretariat something it has wanted for a long time – the ability to produce simple recordings and edit audio and video clips.

It's a good start and the Technology Department plans to improve it as time goes by. ■

How to contribute to the Technical Review

Would you like to contribute an article to the ABU Technical Review? Anybody is welcome to do so.

It's an excellent way to highlight the work your organisation is doing and bring it to wide attention.

We will be happy to consider publishing any article you contribute. This could be a paper on research your organisation is conducting, details of any new technical developments, or any other article you feel will be of general interest to TR readers.

As you may be aware, the Technical Review is a quarterly publication distributed to all ABU members and industry partners.

It is available to the technical staff in each member organisation and in international organisations such as the ITU, Intelsat, and other broadcasting associations, as well as in universities.

The Technical Review is aimed at engineers but also carries general interest news stories. It contains articles on new technologies, developments in broadcasting, innovations by members and other material of interest to engineers.

An article can be any length and written in any style you like. if you have photos to accompany it, they should be high resolution (at least 2 megapixels).

Although we cannot offer payment, we will offer a free half-page advertisement for some articles, particularly those covering technical research. This will be placed after your article, bringing publicity for your organisation.

In addition, articles written by ABU members on Case Studies, Research and Practical Implementation will be considered for the annual ABU Technical Review Prizes which consist of a cash prize and certificate.

Previous issues of the Technical Review can be viewed at the ABU website main page and at: https://www.abu.org.my/technical-review/

If you need more information, please contact nadeem@abu.org.my ■

Personalities & Posts

NEW TECHNICAL LIAISON OFFICERS

JSC "KHABAR AGENCY"

Ms Akilbayeva Balbubi is the new ABU Technical Liaison Offer for JSC "Khabar Agency" of Kazakhstan.

Ms Akilbayeva is the Senior Manager of the Development and International Cooperation Division of the media company's Department for International Cooperation and Distribution. She has held the post since September 2020. From May 2016 to December 2019, she held the positions of Secretary and Expert in the Ministry of Information and Communication. Working as an expert in the Department of Strategic Planning, she helped develop a strategic plan for the ministry, as well as its operational plans.

Ms Akilbayeva was also involved in the development of a project to provide broadband access to rural settlements in Kazakhstan using fiber-optic communication lines technology. In December 2019, JSC "Khabar Agency" hired her as a manager for the distribution of the Qazaq TV channel, a national satellite channel.

Ms Akilbayeva is a graduate of Turan University with a degree in translation studies (2013), and of the Eurasian Institute for the Humanities with a degree in Law (2018). She is studying for a master's degree at Peter the Great St. Petersburg Polytechnic University. ■

JAPAN COMMERCIAL BROADCASTERS ASSOCIATION

Mr Haruki Motohashi has been appointed the ABU Technical Liaison Officer for the Japan Commercial Broadcasters Association, JBA. Mr Motohashi has over 30 years' experience in JBA. His experience includes broadcast standards & ethics, TV & radio business promotion, and sports event broadcasting operations. He is currently acting as Deputy Secretary General & Director of Planning Division at JBA handling issues on law & regulation policies, as well as broadcast technologies. ■

ABU TECHNICAL BUREAU MEMBER FOR KBS-KOREA

Mr Dae Hoon Choi, Project Manager, International Relations at KBS, has been appointed the new ABU Technical Bureau Member representing KBS.

Mr Choi will also play the role of Technical Liaison Officer for KBS.

Mr Choi joined the KBS Broadcasting Technology Research Institute in 2011, where he conducted research on IT-based broadcasting services such as Open Hybrid TV and 2nd screen TV until 2016.

He then moved to the KBS Digital Service Development Department and was put into the KBS homepage and application reorganisation project. He conducted KBS digital service planning, development and operation until December 2019.

Currently, Mr Choi is International Event Project Manager in the KBS International Relations Department.
We extend a warm welcome to Mr Choi.

We would like to take this opportunity to thank **Ms Hong, Young Kyung (Augustine)** for her support to the ABU Technical Bureau these past several years. We will miss her energy, enthusiasm, support and contributions to the ABU Technology Department and the Bureau. ■

PERSONALITIES & POSTS

ABU TECHNICAL BUREAU MEMBER FOR ALL INDIA RADIO

N Thiyagarajan

C B S Maurya

Mr N Thiyagarajan, Additional Director General (Engg) at All India Radio, has been appointed AIR's new ABU Technical Bureau member.

He replaces **Mr C B S Maurya**, Engineer-in-Chief at AIR.

Mr Thiyagarajan will also serve as the ABU Technical Liaison Officer.

We warmly welcome Mr Thiyagarajan to the Bureau and thank Mr Maurya for his excellent service. ■

New Member

Additional Full Member

METRO TV

Knowledge to Elevate

PT. Media Televisi Indonesia - METRO TV

PT. Media Televisi Indonesia (METRO TV) was granted a broadcasting license on October 25, 1999. It is a subsidiary of the Media Group, headed by Surya Paloh, the Chairman, who was a wealth of experience in the local media industry and is the publisher of Indonesia's third largest national newspaper. Media Indonesia. From a start up work force of 280 employees the company now employs more than 1600 people, mostly in the newsroom and production areas.

On November 25, 2000, Metro TV went on air for the first time in a trial series of broadcasts to seven cities. At first it was aired for only twelve hours a day until April 1, 2001, when 24-hour broadcasting began. ■

ABU TECHNOLOGY CALENDAR *of Events*

5-8 APRIL
ABU DBS 2021 | Virtual Symposium
ONLINE

MAY
Workshop on IP Infrastructure & Applications | Webinar
ONLINE

JUNE
Training Course on Engineering Fundamentals for Broadcasters
ONLINE

JUNE
ABU Technical Bureau mid-year Meeting
ONLINE

JULY
Workshop on Archiving and Media Management
ONLINE

AUGUST-SEPTEMBER
Annual Webinar Series 2021 | Webinar
ONLINE

OCTOBER
ABU Technical Bureau Annual Meeting
HANOI

ABU Technical Committee Meeting
HANOI

ABU General Assembly
HANOI

ABU CEOs discuss pandemic challenges

The challenges of operating in the face of a pandemic was a key topic when ABU CEOs took part in a forum on Zoom on 30 March.

Ten high-level broadcasters from Asia, the Pacific and Europe took part in the two-hour forum, with the theme "Moving Ahead: Media Lessons for Future Challenges."

It featured two hour-long sessions, each with five speakers. The Secretary-General, Dr Javad Mottaghi, chaired the forum.

The Technology Department worked behind the scenes to ensure everything went smoothly. ■

ABU
ENGINEERING AWARDS
2021

CALL FOR NOMINATIONS

- **ABU Broadcast Engineering Excellence Award**
  For outstanding contributions in broadcasting engineering and related disciplines.

    - **ABU Green Broadcast Engineering Award**
      For outstanding contributions in developing, implementing and/or promoting green technology in the broadcasting industry.

- **ABU Engineering Industry Excellence Award**
  For outstanding engineering contributions made by an individual to the broadcasting industry.

    - **ABU Developing Broadcasters' Excellence Award**
      For contributions of an outstanding nature in broadcast engineering made by an individual in a developing broadcasting organisation.

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KOBA

April 2021	Call for nominations
31 July 2021	Deadline to submit your entry
August 2021	Judging
23 November 2021	Announcement of Winners ABU Technical Committee Meeting

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