



61ST GENERAL ASSEMBLY AND ASSOCIATED MEETINGS
GENEL KURULU VE BAĞLANTILI TOPLANTILARI
18 - 23 OCTOBER 2024 | İSTANBUL, TÜRKİYE



ABU TECHNICAL COMMITTEE MEETING IN İSTANBUL, TÜRKİYE

ALSO INSIDE:

DVB-NATIVE IP: FILLING THE GAP BETWEEN BROADCAST AND BROADBAND NETWORKS

PROOF OF CONCEPT (POC) PUBLIC 5G NETWORK SLICING TECHNOLOGY FOR
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PART 1 - READINESS OF THE TRIAL EXECUTION

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Cover: ABU Technical Committee Meeting in Istanbul, Türkiye

from The Editor

Welcome to another insightful edition of the Technical Review Magazine, your trusted source for in-depth analysis and updates on the dynamic field of broadcast technologies. As we delve deeper into 2024, our commitment to bringing you the latest advancements and thoughtful discussions remains steadfast.

In this issue, we explore significant developments bridging traditional broadcast methods with modern broadband networks. Our lead story on DVB-Native IP examines how this technology fills the crucial gap between broadcast and broadband, promising a seamless media consumption experience.

Highlighting our continuous collaboration with regional broadcasters, we detail the Asia-Pacific Broadcasting Union's partnership with Voice of Vietnam (VOV). This collaboration underscores our commitment to supporting digital transformations in radio broadcasting across the region. During the 16th National Radio Festival in Thanh Hoa, Vietnam, ABU provided pivotal technical advice to VOV.

Continuing with radio innovation, we feature a comprehensive report on our recent DAB+ Digital Radio Technical Workshop. Conducted in collaboration with the Arab States Broadcasting Union (ASBU) and WorldDAB, this webinar series delved into the latest advancements in DAB+ systems. The workshop aimed to equip broadcasters with knowledge about new technical updates, system features, and the intricacies of expanding DAB+ networks.

Furthermore, our coverage extends into the groundbreaking area of 5G technologies. We introduce a Proof of Concept (PoC) for Public 5G Network Slicing, tailored for Radio Televisyen Malaysia's (RTM) broadcast facilities and services. This series begins with a focus on the readiness of the trial execution, paving the way for future discussions on the outcomes and impacts of this technology.

As always, we bring you the latest news from the ABU region, updates on digital broadcasting, and the latest equipment trends. Our regular sections, Personalities & Posts and Calendar of Events continue to feature notable figures and upcoming dates important to our community.

This quarter's magazine is packed with content that not only informs but also inspires. As we present these articles, we encourage you to engage with the material, ponder the technological progress, and consider its broader implications on the broadcasting industry and beyond.

Thank you for your continued support and interest in the Technical Review Magazine. We are excited to journey with you through the evolving landscapes of technology and innovation.

Warm regards,
Dr Veysel Binbay
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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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DVB-NATIVE IP: FILLING THE GAP BETWEEN BROADCAST AND BROADBAND NETWORKS

ABSTRACT:

DVB-Native IP is the next digital television that will bridge the gap between OTT and traditional broadcast services. This new system is coming after broadcast systems like DVB-T/T2 and DVB-S/S2 and adding the features of broadband to these broadcast systems.

DVP-Native IP is a game changer in the broadcast, media, terrestrial, and satellite industries. Combining classic broadcast and broadband to get the best of both worlds will lead to improved operational efficiency, cost savings, and additional revenues for all players

KEY WORDS:

DVB-Native IP(NIP), DVB-I, Broadband, Broadcast, DVB-MABR

1. INTRODUCTION

Native IP is a new broadcast system introduced by DVB with the aim of using the advantages of IP alongside the current broadcast systems. After the ever-increasing expansion of the features of broadband systems and the audience's interest in it, as well as considering the increase in the number of devices connected to the Internet, DVB saw the need to work on a new system that, on the one hand, creates convergence between broadcast and broadband, and on the other hand, it is necessary not to make many changes in the existing broadcast systems. Therefore, a working group called TM-NIP was formed with the presence of broadcasters and various companies to investigate this issue and prepare new technical specifications, and finally the technical specifications of Native IP were completed and published in February 2022.

It was previously attempted by the HbbTV standard to integrate broadband and broadcast. In fact, in the HbbTV, it is possible to provide various interactive services related to the live program being broadcast, and conditions for running web applications on TV platforms are

created in a way that is combined with the traditional broadcast environment.

But in Native IP, the broadcast signal is sent as IP from the beginning (natively), so the system will have more advantages, for example, more flexibility, better integration with terrestrial IP infrastructures, better compatibility with contemporary IP devices, such as smartphones, tablets, PCs, the possibility to re-use streams coming from OTT cloud head-ends rather than having to purposely run a DVB-TS Broadcast Head-end for the sole distribution via traditional DVB broadcast networks, etc.

The Native IP broadcast system is built upon DVB-I for service discovery and program metadata, DVB-AVC and DVB-DASH for source coding and stream formatting and DVB-MABR, DVB-GSE and the physical layer specifications DVB-S2X, DVB-S2, and DVB-T2 for transporting. DVB Native IP facilitates the integration of OTT and Broadcast technologies into an efficient and contemporary IP media distribution solution. The present document is a brief of DVB-Native IP (NIP) specifications (A180 [1]) that specifies an end-to-end Native IP

broadcast system for DVB broadcast bearers.

2. SYSTEM FEATURES

The core features of the Native IP solution are:

1. Carriage of real-time live linear television and radio services
 - ✓ Real-time delivery of assets purely via broadcast.
 - ✓ Real-time delivery of assets in a fully hybrid manner some via broadcast and some via broadband.
2. Professional and consumer use cases:
 - ✓ Delivered directly from the same head-end to consumers' homes or indirectly to CDN Edge Caches.
 - ✓ In professional environments, the possibility to store received content, i.e., "Live to VoD" service.
3. Extended Content Guide
 - ✓ All functionalities provided by DVB-I [7].
4. Multiscreen support
 - ✓ Addresses Native IP devices with or without built-in broadcast tuner.

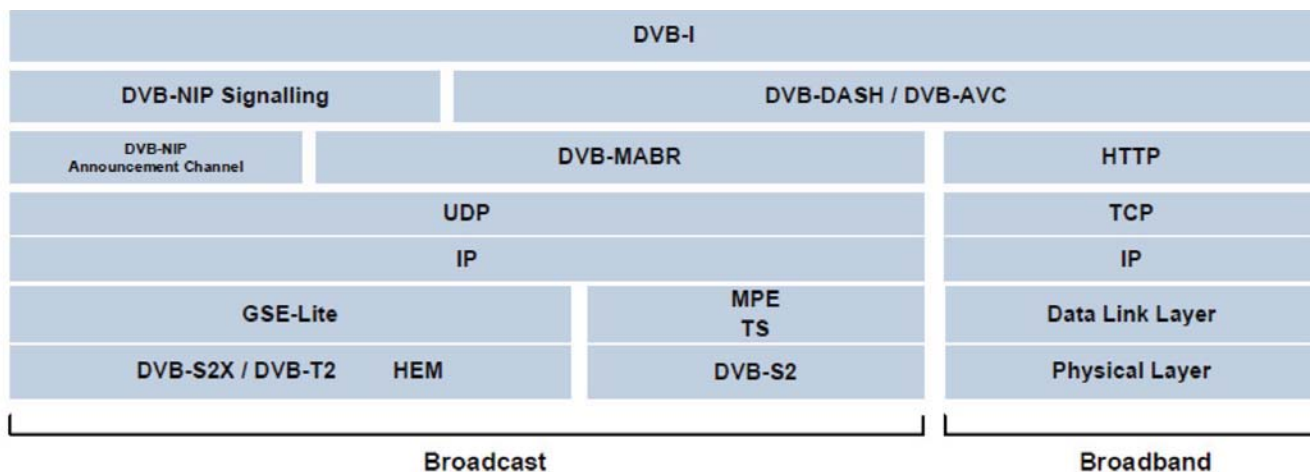


Figure 1: DVB-NIP protocol stack

5. Content protection
 - ✓ Supports content protection with the same DRM solutions that are used on broadband networks (connected cases).
 - ✓ Supports proprietary DRM solutions for unconnected cases.
6. Targeted Advertising
 - ✓ Uses the advantages of ABR for flexible Advertising replacement.
7. Accessibility services
 - ✓ Supports EBU-defined subtitling.

3. OVERALL SYSTEM ARCHITECTURE

3-1 GENERAL:

The DVB-NIP Broadcast System relies on a layered system architecture. NIP protocol stack is shown in the **figure 1**:

- ✓ At the top of the Native IP stack is a **DVB-I** [7] based television service discovery and metadata layer. This layer is responsible for informing receivers about the various services available on the broadcast and broadband networks. DVB-NIP services may be grouped into different DVB-I service lists coming from different technical or commercial operators on the broadcast network. One or more such DVB-I Service List(s) may be present on each broadcast network. The DVB-I service list entry points mechanism is used to announce all the different DVB-I Broadcast Lists available on the network.
- ✓ Included in each DVB-I service list are **DVB-DASH** [9] based services. DVB-NIP only requires a

single mandatory system format for the carriage of audio – visual presentations: MPEG-DASH Profile for Transport of ISO BMFF Based DVB services over IP based networks. Audio video coding and packaging for Native IP Adaptive Bit Rate applications shall be according to DVB-DASH (ETSI TS 103 285).

- ✓ DVB-DASH based services in DVB-NIP can be carried using the **DVB-MABR** [6] defined FLUTE/ROUTE protocols via the DVB broadcast network. DVB-MABR has been specified to be independent from the underlying transport protocol. DVB-MABR (ETSI TS 103 769) specifies two multicast media transport protocols in its annexes.

- The FLUTE protocol is based on 3GPP MBMS FLUTE and may be used for the carriage of NIP Streams.
- The ROUTE-based multicast media transport protocol is based on ATSC 3.0 ROUTE and may be used for the carriage of NIP Streams.
- ✓ Alternatively, a receiver might fetch the same services using standard **HTTP/HTTPS** requests via the broadband network. In addition, some components or representations of the same DASH service may be carried via the broadcast network and others via the broadband network. All this shall happen invisibly to the end-user of such services.

- ✓ DVB-NIP defines an Announcement Channel mechanism and signaling tables called the **NIF** (Network

Information File) and the **SIF** (Service Information File). These two signaling tables enable all the previously mentioned DVB specifications to be run on a broadcast network consisting of several broadcast RF Channels and potentially one or more logical NIP Streams. The NIF provides information about the different Streams and their physical parameters on the broadcast network. The SIF provides information on the location of services and metadata within those streams. NIF plus SIF allow broadcast receivers to dynamically re-tune to the Streams and physical Channels carrying the different broadcast Services.

- ✓ Signaling and A/V Services (using DVB-DASH) are carried on the broadcast RF Channel via IP multicast. DVB-NIP IP multicast sessions are carried using the **GSE-Lite** [5] Profile or **MPE** (Multiple Protocol Encapsulation) [10] at the data link Layer and **DVB-S2X** [3], **DVB-S2** [2] and **DVB-T2** [4] at the Physical Layer. The following mapping of data link layer protocols to physical layer systems applies:

- DVB-S2X: GSE (GSE-Lite profile)
- DVB-S2: MPE
- DVB-T2: GSE (GSE-Lite profile)

3-2 END-TO-END SYSTEM ARCHITECTURE

The DVB-NIP broadcast system is significantly different from traditional Transport Stream based broadcast architectures. Content sourcing in a NIP context is no longer from a

3-4 NIP RECEPTION FUNCTION:

The DVB-NIP Reception is made up of the following high-level functions (each with nested sub-functions):

1. The **DVB-NIP Gateway**: device including one or more broadcast reception frontends plus all functions required to interface with DVB-NIP Clients according to A180.
2. The **DVB-NIP Client**: device or software application featuring DVB-I client functionality as defined in ETSI TS 103 770, including the capability to decode, decrypt and display NIP Services plus depending on the deployment scenario, the NIP defined device discovery methods in clause 11.1 of the A180.

4. RECEIVER DEPLOYMENT MODELS

The present specification targets three receiver Deployment Models (DMs) in particular. This listing is not exhaustive, and industry can come up with other Deployments Models, but this particular logical grouping should help implementations of Native IP receivers. The intention is that the same DVB Native IP media distribution system can feed all three of the Deployment Models presented here with the same identical broadcast streams.

The first Deployment Model (**DM1**) represents a professional business-to-business (B2B) scenario with professional edge cache receivers installed at the edge of provider or telecom networks. The second (**DM2**) and third (**DM3**) deployment models are business-to-consumer (B2C) oriented models.

4-1 PROFESSIONAL EDGE CACHE RECEIVER (DM1)

Professional Edge Cache Receivers according to the present document are deployed at the edge of telecom, CDN or broadcast networks or act as local wireless hotspots. They receive DVB-NIP formatted content from a broadcast network via multicast and make that content available locally to other networks (e.g., CDN, Fixed, Mobile, Wi-Fi Hotspot or DVB networks), which in-turn indirectly feed IP clients wanting to access that content.

Professional Edge Cache Broadcast Receivers are installed when a massive distribution of identical content is required and where the large multiplication effect of broadcast technologies can bring considerable distribution gains. (**Figure 3**)

Professional Edge Cache receivers generally feature multi-tuner frontends for the parallel reception of multiple DVB-NIP Streams and extensive storage space to act as large local data caches. Professional Edge Caches generally act as local http/https web servers with reverse proxy functionality.

4-2 INTEGRATED NATIVE IP TV (DM2)

The same DVB-NIP broadcast streams that are built for feeding professional DM1 receivers can also be used for direct reception at home. The simplest reception solution for consumer applications under the present document is DM2. It refers to a fully integrated smart television set. Television sets according to DM2 might be capable of receiving, in addition to legacy Transport Stream (TS) based television services also, television transmissions that are carried natively in IP over the broadcast network. DM2 receivers may or may not be connected to a broadband network.

DM2 television sets are able to receiving via broadcast the same streams that are potentially made available also via OTT platforms and CDN distribution networks. They implement DVB-I and DVB-DASH defined mechanisms. These television sets are also able to seamlessly blend, in a fully hybrid manner, streams that are received via broadcast with streams that are delivered via OTT. As an example, a given DVB-I service may have some DVB-DASH representations and/or components that are available via broadcast and others that are only available terrestrially. Native IP television sets can indistinguishably present such services to end users as one and the same service. (As **Figure 4**)

4-3 HOME GATEWAY + IP CLIENT (DM3)

Deployment Model 3 (DM3) is a split model in which the NIP Gateway

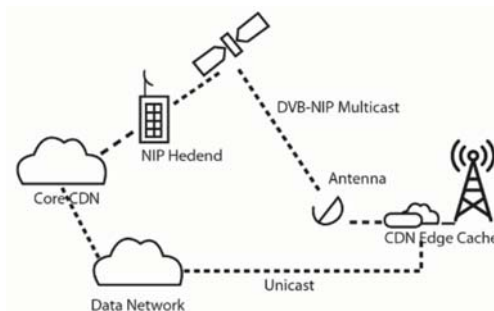


Figure 3: DM1: Professional Edge Cache Receivers

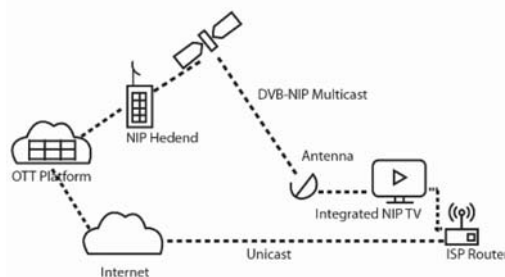


Figure 4: DM2: Integrated Native IP TVs

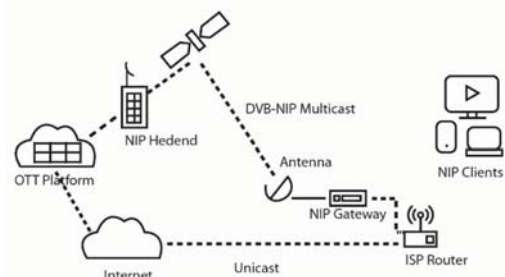


Figure 5: DM3: Home Gateway + IP Client

and the NIP Client functions are implemented in separate devices. The NIP Gateway may be an additional feature of an existing hardware device such as a TV set, a STB, an antenna multi-switch, etc. or may be a dedicated standalone Gateway device located on the local network. NIP Gateways may or may not be connected to a broadband network.

The NIP Client (typically a client implementing DVB-I) is generally a software application or component running on a tuner less smart IP device such as a tablet, smartphone, laptop, PC, IP media player, smart television set. (As **Figure 5**)

In order for a NIP Client and a NIP Gateway to discover themselves on the local network, DM3 implementations according to the present document shall make use of the Network Device Discovery Protocol mechanisms specified in A180.

In DM3 all interactions between the

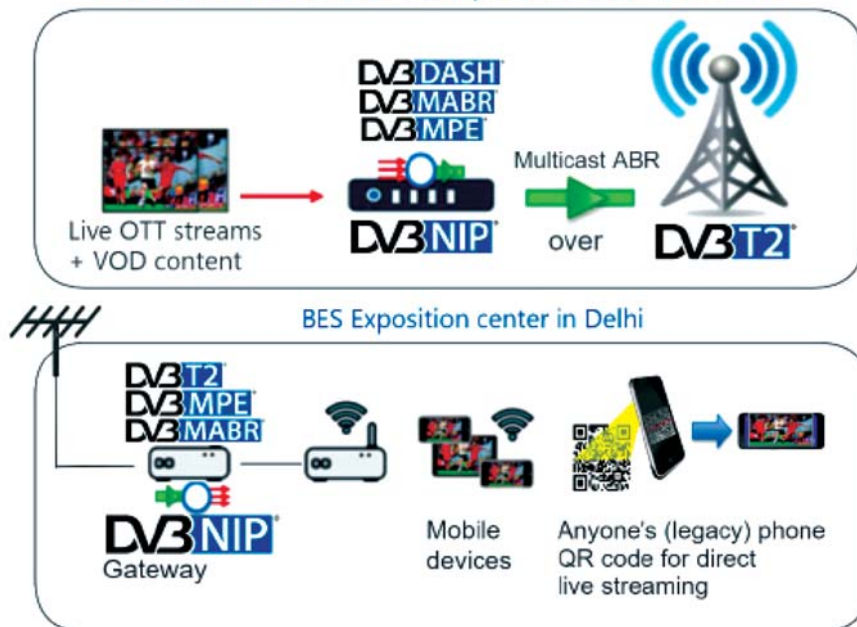


Figure 7: DVB-NIP terrestrial signal transmission and reception path

encapsulation and modulation by Hotbird satellite at 13° East. After receiving the signal, the Enensys eBox product, which hosts the same company's CubeAgent software, was used. By receiving the DVB-NIP signal from the satellite, this product made it possible for all 5G phones to access TV content. eBox delivers 5G in a box (5G-in-a-box). In this way, the successful reception of 5G on phones by the DVB-NIP standard took place in this exhibition. It should be noted

that the development of 5G networks requires a large number of low-power transmitters, and satellite distribution using NIP to provide live content can be very beneficial in this field [14].

At the IBC 2023 exhibition, apart from the above pilot, receiving home NIP was also tested on various devices. In total, various companies in the field of DVB-NIP were active in this exhibition in the field of distribution, processing, reception, and visual

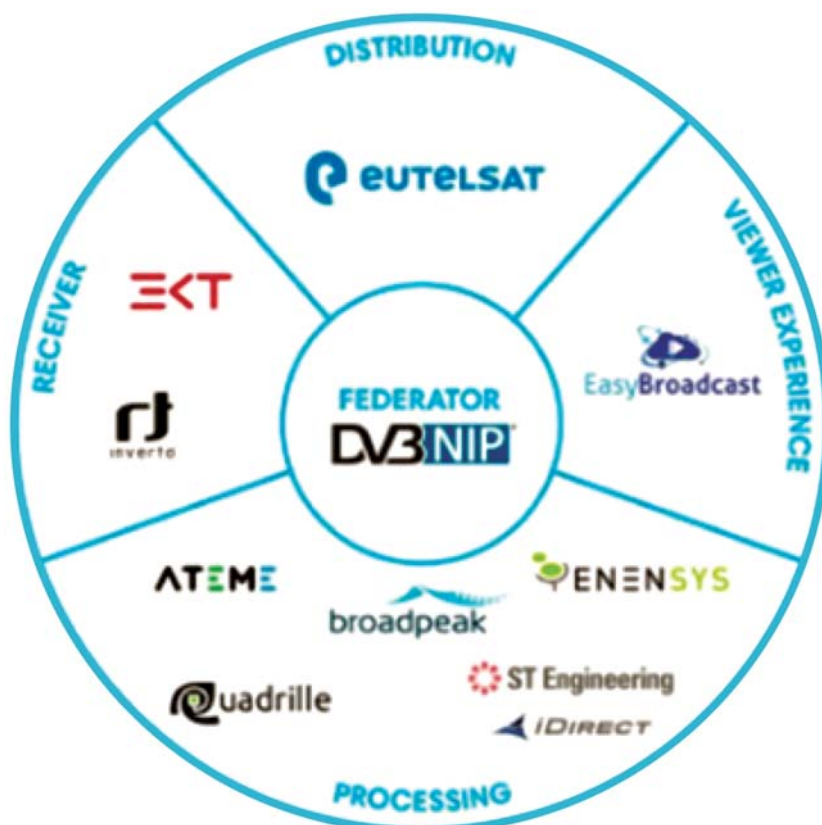


Figure 8: Some companies that were active in the field of DVB-NIP at IBC2023

experiences, whose names are indicated in **figure 8**.

6-5 Another demo was done in the field of combining DVB-NIP and CLOUD, which was shown at Africacom 2023 and IBC 2023. In this demo, which is shown as a block diagram in **figure 9**, production, post-production, editing, compression, and multiplexing operations were performed by AWS CLOUD. MABR was also carried out by Eutelest teleport facilities in France. Finally, the signal in DVB-NIP format was sent through satellite and received at the receiver side with NIP gateways. In fact, in this demo, DVB-NIP is placed next to the flexibility of CLOUD and the strength of the satellite and forms a complete system [15].

Apart from the above test, another test by Inverto in collaboration with Future TV was also shown with a combination of CLOUD and NIP at IBC2023. Inverto's MABR server named Airstream Live can be placed in two ways: a cloud service or an internal server. The block diagram of this test is shown in the **figure 10** [16].

6-6 The use of DVB-NIP is gradually expanding. The European Space Agency (ESA) has proposed a project called 5G-EMERGE (satellite Media delivery micRo edge), whose main goal is to use satellites to transmit data in the 5G network. This project has not yet reached the final stage and is under review. In it, edge computing is used, and in the call for proposals (cfp) of this project, the industry is asked to send audio, video, and data through satellite based on DVB-NIP technical specifications. In 5G Emerge, three categories of use cases are introduced: Direct-to-Home, Direct-to-Vehicle, and Direct-to-Edge. For each of these categories of use cases, test pilots are underway to validate the requirements from a functional and operational perspective. There are five test pilots in Norway, Sweden, Luxembourg,

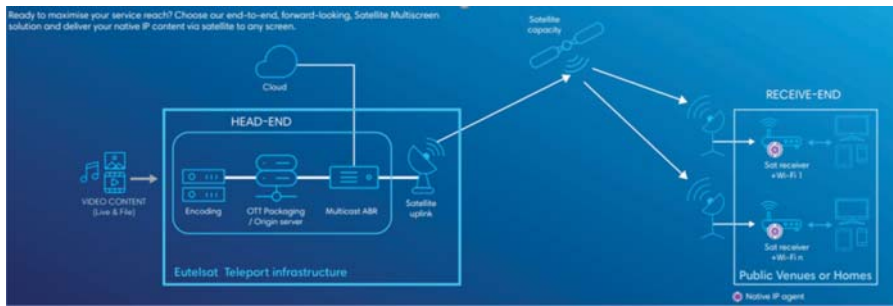


Figure 9: DVB-NIP demo using CLOUD at IBC2023

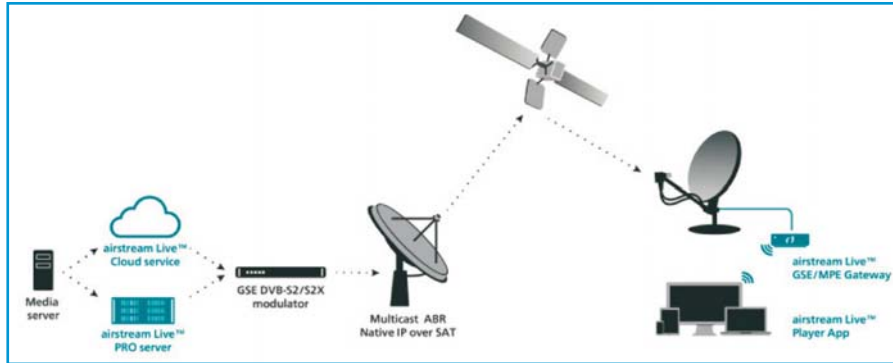


Figure 10: NIP combination with cloud system by Inverto company

Italy and Switzerland. The next goal is to provide suitable solutions for the market in 2026 to strengthen the deployment of the 5G network.[17]

6-7 Using DVB-NIP to solve Internet connection problems in Peru: During the COVID-19 pandemic, the Peruvian government realized that it could not ensure the provision of distance learning

for the approximately 30% of the Peruvian population who do not have an adequate Internet connection. Therefore, in 2022, a tender was held to solve this problem by using DVB-NIP and to be able to deliver appropriate and high-quality content to the majority of the country, thus creating social justice. In early 2024, this project was launched in Peru. The project

was managed by two companies, DIVCAM and ST Engineering. This service for schools includes enough storage capacity to enable the delivery of files and the use of the return channel. In the **figure 11**, you can see a view of the DVB-NIP satellite broadcast system in Peru [18].

7. CONCLUSION

In a world where the advantages of broadband technology have become clear to everyone and the number of connected devices is increasing every day, if broadcasters only use traditional methods to broadcast programs, they will definitely be left behind by competitors. Native IP with changing the game rules in the broadcast, media, and satellite industry, combines classic broadcast systems with OTT, to reach the best of both the broadcast and broadband world, and this new system cause increases efficiency, cost saving, and additional revenues for all players.

Convergence between broadcast and broadband in Native IP and creating an integrated system where the signal enters as IP from the beginning will lead to the user can access live or desired content at any time, any place and with any device. In fact, Native IP has filled the gap between broadcast and broadband networks.

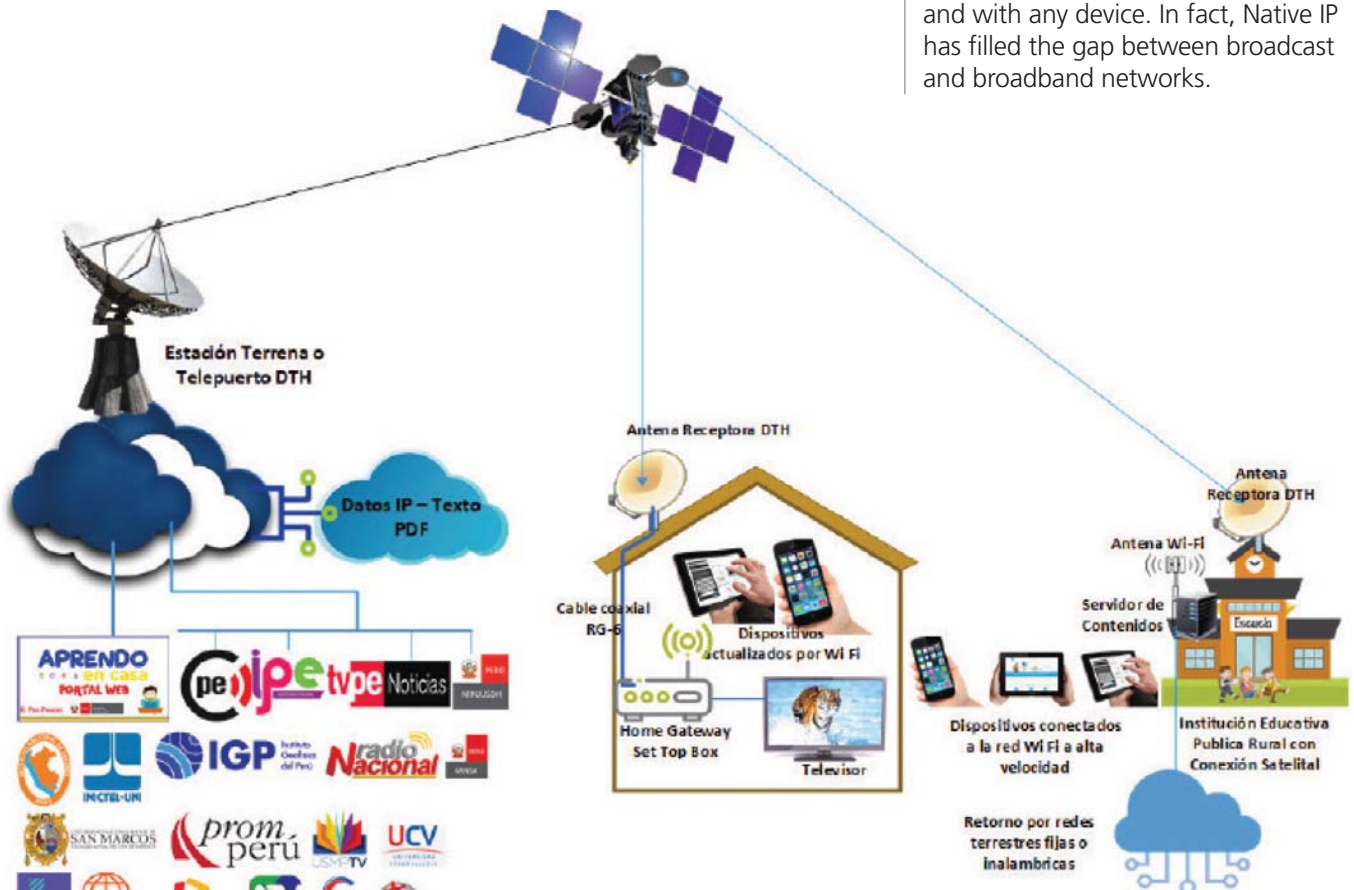


Figure 11: A view of the DVB-NIP satellite broadcast system in Peru

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IRB Research & Development has made remarkable progress in leveraging fundamental research and innovation in media technology. It has created new products and technologies in the broadcast/broadband sectors, paving the way for the advancement of future technologies at IRIB. Core research themes at IRIB R&D encompass deep learning and AI-based services, intelligent OTT services, the Internet of Things, hybrid broadcast-broadband television (HbbTV), cloud-enabled networking, and IP-based content production. Our R&D projects frequently involve collaborations with both public and private entities, including universities, government laboratories, technology start-ups and incubators, research institutes, and partner companies. Furthermore, our R&D scientists collaborate with local universities to share knowledge and resources.



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Omid Technologies Inc. is an Iranian company that designs and manufactures products for the broadcast television industry. These products adhere to international standards and cater to Digital Terrestrial and Satellite TV, IPTV, and interactive TV solutions. One of their offerings is the Integrated Encoder Modulator (MCE-4100). The MCE-4100 encodes audio and video, then modulates the transport stream (TS) to DVB-T/T2 or DVB-S/S2. By employing multicarrier modulation and advanced channel coding techniques in accordance with EN300744 and EN302755 standards, it achieves superior resiliency and robustness in both urban and rural environments. Introducing Omid Technologies Inc.'s revolutionary Video Compression Headend solution—an all-in-one, state-of-the-art device designed to transform video and audio transmission. Their advanced 4K HEVC encoders integrate multi-channel encoding, multiplexing, and sophisticated statistical multiplexing (statmux) into a single, powerful unit. This innovative solution offers unparalleled efficiency, optimized bandwidth utilization, and exceptional video quality, making it perfect for broadcasters and media providers seeking to enhance their video processing workflows.



ABU TECHNOLOGY DRIVES VOV VIETNAM'S RADIO DIGITAL FUTURE



The Asia-Pacific Broadcasting Union (ABU) has partnered with Voice of Vietnam (VOV) to advance digital transformation in radio broadcasting. This collaboration was highlighted by a workshop on 12 July 2024, during the 16th National Radio Festival in Thanh Hoa, Vietnam, where ABU provided technical advice at VOV's request.

ABU showcased its commitment through expert presentations. **Dr Veyssel Binbay**, Director of ABU Technology, led a session on "Technicalities in Content Delivery Platforms", discussing the role of AI and Big Data in modernising content delivery. He highlighted automation, machine learning, and data analytics tools such as Avid, Veritone and TVU for improving audience

engagement and streamlining operations. Demonstrations included AI-powered multilingual capabilities for delivering content in languages such as Italian, French, Japanese and Malay.

Malaysia's RTM, represented by **Mr Ahmad Shafiq Mirza Mansor**, presented the Arkib Digital Berita (ADiB) system. This digital archive manages news content from 14 states and integrates a Media Asset Management (MAM) system with a file-based workflow and Production Asset Management (PAM) system. Launched in 2021, ADiB aims to preserve and enhance the accessibility of news content across platforms using AI services for face and object recognition and audio-to-text transcription.





Australia's ABC, represented by **Mr Matt O'Sullivan**, highlighted their AI-driven converged newsroom strategy. This approach optimises content production and distribution across various platforms, streamlining newsroom operations for more efficient content management and delivery in a fast-paced media environment.

NHK World Media, represented by **Mr Chimaki Shimura**, showcased their AI-powered global services. NHK demonstrated AI-translated multilingual subtitles for live streams in nine languages and AI-generated voice reading services for emergency news and regular broadcasts, supporting up to 19 languages.

VOV Vice President **Mr Vu Hai Quang** emphasised the need to adapt mindsets and management styles for the digital age, praising ABU and its members for their contributions.

The workshop, attended by over 300 media experts, underscored the global shift towards digital transformation in radio broadcasting. ABU reaffirmed its role in supporting broadcasters as they navigate these changes, ensuring the industry's continued relevance and resilience. ■



DAB+ DIGITAL RADIO: TECHNICAL WORKSHOP ON NEW DEVELOPMENTS IN DAB+ SYSTEMS

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DAB+ Digital Radio - Technical Workshop

New developments in DAB+ systems 2024

23rd - 25th July 2024

09:00-10:30 BST/08:00-09:30 UTC/16:00-17:30 MYT
ONLINE - Zoom

Organised in collaboration with
ABU, ASBU and WorldDAB.



The Asia-Pacific Broadcasting Union (ABU), in partnership with the Arab States Broadcasting Union (ASBU) and WorldDAB, organised a Technical Workshop on DAB+ Digital Radio from 23 to 25 July 2024. Conducted as a three-day webinar series, the workshop focused on the latest advancements in DAB+ systems. It aimed to update broadcasters and media professionals on recent developments, covering various topics such as the business case for DAB+, technical updates, system features, headend systems, transmission, and the complexities of building out the DAB+ network.

The workshop was structured into a three-part webinar series:

In day 1, the session commenced by exploring the role of 5G mobile networks in enhancing radio distribution and the development of a new emergency warning system. This was followed by discussions on the capabilities of both existing and new receivers to support the emergency warning system, including the potential for integrating this feature into car receivers.



The focus then shifted to the latest developments in broadcasting, including the launch of the new emergency warning system. Key topics encompassed expertise in virtual solutions, the integration of metadata into the DAB platform, advancements in virtualisation strategies, and the optimisation and monitoring of DAB networks.

The final day addressed the latest advancements in DAB delivery technology, provided regional updates, and discussed ongoing trials in Africa. The workshop examined the challenges and progress of digital radio rollout in the Asia-Pacific region, the integration of DAB+ into car receivers in the Arab region, and the importance of community involvement. The series concluded with an emphasis on the need for incentives for broadcasters, encouraging participants to take actionable insights to advance digital radio in their respective countries.

DAB+ offers enhanced broadcast quality, including surround sound, multimedia support, and a broader range of listening options, making it a superior alternative to both DAB and FM. Its usage has surged, with the audience tripling over the last decade. DAB+ is also more energy-efficient and performs exceptionally well in emergency scenarios, particularly outdoors.



Ms Jacqueline Bierhorst, President of WorldDAB, highlighted that its global expansion is driven by the 5 Cs: Coverage, Content, Consumer Devices, Cars, and Communication, all of which depend on effective policy and regulatory support. Collaboration between the public and private sectors is essential to defining strategy, with WorldDAB ready to assist in developing or enhancing DAB+.

The WorldDAB Technical Committee ensures the ongoing stability and improvement of the DAB system, with the core modulation technology remaining unchanged since 1995. As a result, transmission and receiving equipment have evolved into highly reliable products, with significant advances in energy efficiency – DAB is now four times more efficient than when first introduced. Today, over 100 million DAB receivers are in daily use worldwide, reflecting the system's growing global presence and reliability. DAB digital radio offers numerous advantages over traditional analogue radio. Its spectral efficiency allows for significantly more services to be provided within a given area, all while delivering high audio quality. Moreover, advanced features such as Service and

Programme Information (SPI) and the Emergency Warning System (EWS) have been newly introduced. Over the past decade, several features have been developed, and WorldDAB continues to explore future innovations.

Furthermore, the WorldDAB Technical Committee has been working on several new projects over the past few years, particularly in developing an emergency warning system. This new system makes DAB more targeted and nuanced. Three key innovations have been implemented: a novel location coding system, new signalling specifically tailored for alerting, and receiver synchronisation. The location coding system allows alerts to be targeted specifically to those in the affected area, as the coverage area of a DAB ensemble rarely aligns perfectly with the alert area. The new signalling tailored for alerting identifies the participating ensembles, their importance, and their locations. Finally, to minimise audio loss at the start of an alert, a receiver synchronisation system was developed.



Dr Les Sabel from the WorldDAB Asia-Pacific Technical Group then discussed the capabilities and advantages of 5G mobile networks, emphasising their application in radio distribution. Broadcasters are focused on utilising delivery methods that offer the best return for their businesses. They continuously strive to optimise their distribution strategies to effectively reach their target audiences. The capabilities of 5G, particularly in reducing latency and enabling high data rate transfers, are seen as highly promising for the future of broadcasting. Typically, the latency requirement for 5G is around 1 millisecond, which is crucial for applications like IoT and autonomous vehicles. For radio, this means the ability to deliver high-quality and high-quantity services over mobile networks.

However, challenges remain. In radio applications, there is often a trade-off between reliability and bit rate, with less emphasis on density. Despite these challenges, several potential uses of 5G for radio content distribution exist. These include delivering IP-streamed radio over 5G to mobile phones, using 5G broadcast to transmit radio to mobile devices, and employing 5G-streamed data for hybrid radio, particularly in cars.

5G Broadcast, also known as FeMBMS (Further evolved Multimedia Broadcast Multicast Service) or 5G Multicast Broadcast Services (MBS), was developed to provide

broadcast services over mobile cellular systems. Major companies and organisations, such as Qualcomm, Rohde & Schwarz, and the EBU, are actively pushing 5G MBS through various small-scale trials, beginning with Release 14 and continuing with the latest updates in Release 18. One significant challenge is that the operating frequency for 5G Broadcast needs to be in the UHF band, which could take capacity away from terrestrial broadcast television. Due to this issue, it is unlikely that mobile network operators (MNOs) will promote radio delivery over MBS.

On day 2, the workshop continued with discussions on the DAB Head-End System, the integration of metadata into the DAB platform, and the latest advancements in virtualisation strategies, particularly the transition from VMware to Docker containers to enhance efficiency, security, and flexibility. The challenge of language support in DAB was also addressed, introducing a new standard that allows for two labels: a standard label and an extended one with UTF and UCS support. The importance of ensuring receiver compatibility with the chosen language was also emphasised.



Most DAB multiplexer systems today are delivered as software solutions and are capable of virtualisation. **Mr Lars-Peder Lundgren**, CEO of Paneda, stated that virtualisation offers several advantages, such as hosting multiple multiplexers on the same hardware, enhanced IT security with modern standards, cost efficiency, scalability, flexibility, and more. The latest development involves migrating from VMware to Docker containers. While both approaches share similarities, Docker containers require only one operating system, which hosts isolated container environments. This method improves performance efficiency by 50% and reduces costs.

To enrich the user experience, metadata such as song titles, artist names, programme details, and even images can now be integrated into the DAB platform. One challenge, however, is the synchronisation of metadata, particularly images, due to delays in transmission times, which depend on the bit rate allocated for data services. Typically, this delay can range from 15 to 30 seconds. To address this, a solution was developed where 99% of the image is sent to the multiplexer and broadcast ahead of time, while the remaining 1% is stored in cache memory

and transmitted when the music begins, ensuring perfect synchronisation with the audio.



Advancements in DAB system transmission were also explained by **Mr Oscar Hu** from GatesAir, particularly the introduction of a new multi-carrier transmitter system capable of transmitting multiple ensembles simultaneously. This system uses common amplification technology to multiplex and upconvert RF signals, offering a more compact and cost-effective solution compared to traditional systems. It also enhances signal quality and efficiency, with the potential for future improvements to increase power output. However, some limitations remain, such as the need for a backup system in case of transmitter failure and the inability to cover the full DAB bandpass.



The optimisation of the DAB network in Italy was discussed by **Mr Roberto Di Bari – Aldena**. The same antenna pattern used for the FM radio network was applied, but with lower gain and power. The combined power of all DAB transmitters across 23 sites amounted to 83 kilowatts, covering around 4 million people, or 70% of the population. However, this led to interference with other stations. To resolve this, the effective radiated power (ERP) was reduced by adjusting the antenna patterns and synchronising each transmitter to avoid self-interference. As a result, coverage increased to nearly 5 million people, or 90% of the population, while eliminating interference with other national and international networks.

On the final day of the workshop series, speakers focused on updates regarding DAB delivery technology, the status of DAB implementation across various regions, and ongoing trials in Africa. Key discussions addressed the challenges and advancements of digital radio deployment in several Asia-Pacific countries, the integration of DAB+ specifications into car receivers in the Arab region, and



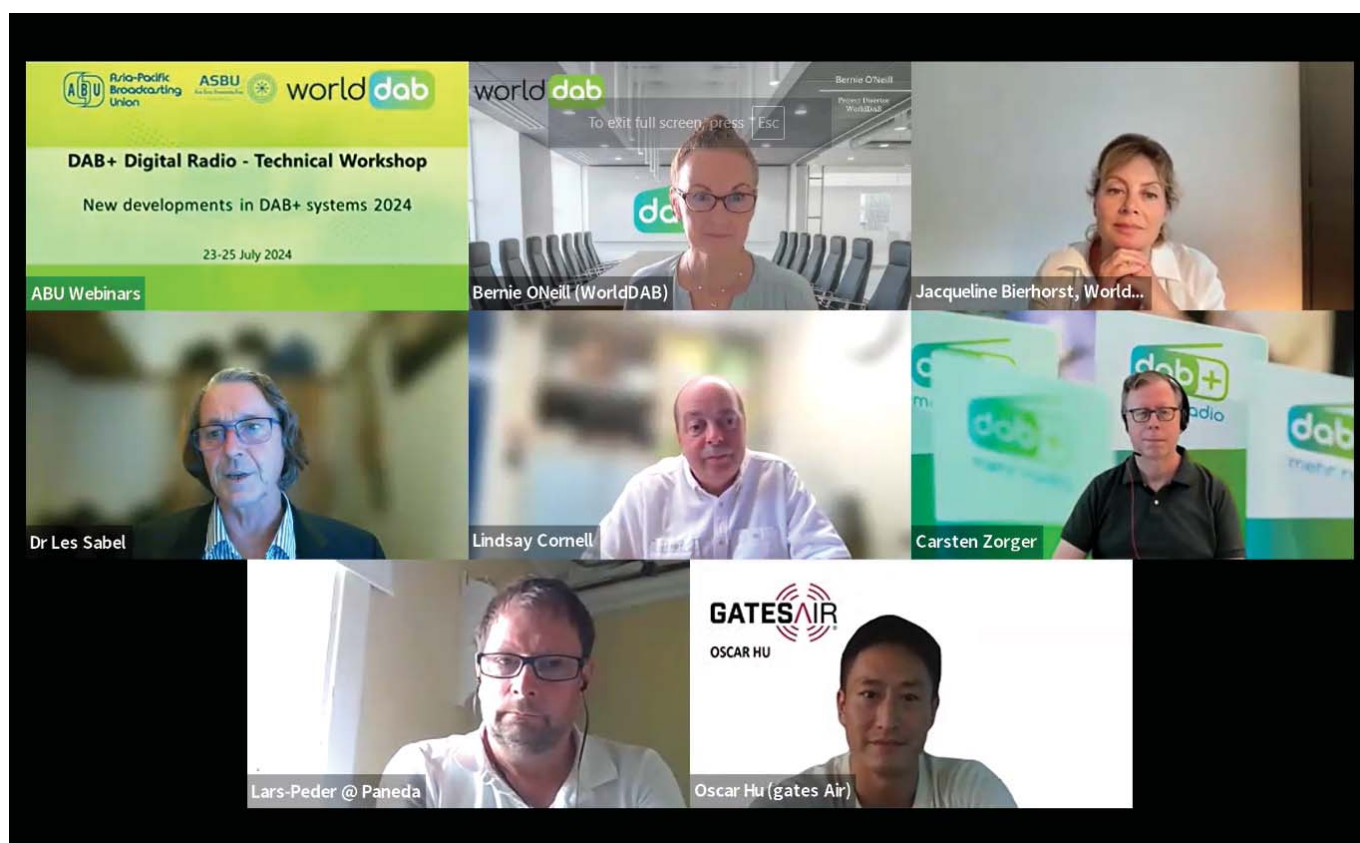
the importance of engaging with local communities. Significant progress has been made in Arab countries, including Saudi Arabia, the UAE, Oman, Tunisia, Algeria, Bahrain, Qatar, and Jordan, where pilot projects have been initiated to test the new technology. **Mr Mohsen Ghommam** from ASBU reported on the integration of the DAB+ specification into car receivers across the Arab region, with a special focus on the Middle East and North Africa. This initiative, recommended by ASBU to the Arab Spectrum Management Group (SMG), aims to improve radio coverage and align with European standards. He also emphasised the need for a solid framework, collaboration between stakeholders, and the implementation of the multiplex concept for DAB+.

An update was also provided on the DAB trial in Ghana by **Mr Gabriel Kwofie**, covering its objectives, technical setup, challenges, and future plans. The discussion included the establishment of a digital terrestrial television (DTT) and DAB site in Ghana, powered by clean, sustainable solar energy, alongside ongoing regulatory efforts. It was noted that the procurement process is

underway, with site deployments anticipated by August and project completion expected by October. Additionally, a signal measurement campaign is planned to commence in October.

Dr Les Sabel, who also led and moderated the workshop, highlighted the progress of the project in Ghana, stressing the importance of community engagement and the expansion of digital radio broadcasting technology, particularly in Africa. The panel and speakers also discussed the necessity of a robust marketing campaign for the successful launch of new radio services. Additionally, the significance of cross-sector collaboration within the ecosystem was emphasised, with Bernie O'Neill highlighting successful partnerships in the UK and the importance of incentives for broadcasters, referencing the Australian government's offer of free spectrum access.

The workshop concluded with a focus on the need for incentives for broadcasters and the importance of participants taking away actionable insights to help progress digital radio in their respective countries.





Ms Bernie O'Neill, Project Director at WorldDAB, shared her reflections on the workshop, praising its empowering effect, which equipped delegates with essential knowledge and skills in DAB transmission.

Dr Veysel Binbay, Director of Technology & Innovation at the Asia-Pacific Broadcasting Union, shared his vision for the workshop, expressing hope that it would serve as a platform for participants to engage with the evolving landscape of radio broadcasting and the latest innovations. He highlighted that the workshop aimed not only to showcase technological advancements but also to emphasise the sharing of practical insights and real-world experiences from industry professionals.

Hosted by the ABU via the Zoom platform, the workshop attracted 259 participants from 70 countries across the Asia-Pacific region and beyond. Among them, 73 participants were from ABU members, representing 30 organisations across 24 countries. Distinguished speakers from various regions shared invaluable insights, contributing to the workshop's great success.

To conclude, the Technical Workshop on DAB+ Digital Radio not only paved the way for advancements in digital broadcasting but also underscored the critical role of collaboration and knowledge sharing in this dynamic field. The collective expertise and insights exchanged over the three days have clearly laid the foundation for the future of digital radio broadcasting. ■



How to contribute to the Technical Review

Would you like to contribute an article to the ABU Technical Review? We welcome submissions from everyone. This is an excellent opportunity to showcase your organisation's work and gain significant exposure.

We are open to a variety of articles, including research papers, details on new technical developments, or any content that will interest TR readers. The Technical Review, our quarterly publication, is distributed to all ABU members, industry partners, and technical staff, as well as international organisations such as the ITU, other broadcasting associations, and universities.

While it primarily targets engineers, it also features general interest news stories. It contains articles on new technologies, developments in broadcasting, member innovations, and other materials of interest to engineers.

Your article can be of any length and written in any style. Should you include photos, please ensure they are high resolution (at least 2 megapixels). Although we cannot offer payment, we do provide a free half-page advertisement for select articles, especially those covering technical research. This advertisement will be placed immediately after your article, giving your organisation extra publicity.

Additionally, articles by ABU members on Case Studies, Research, and Practical Implementations are eligible for the annual ABU Technical Review Prizes, which include a cash prize and a certificate.



You can view previous issues of the Technical Review on the ABU website's main page or directly at: <https://www.abu.org.my/technical-review/>

We look forward to considering your submission. If you need more information, please contact: balqis@abu.org.my

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ABU TECHNICAL COMMITTEE MEETING 2024 HOSTED BY TURKISH RADIO TELEVISION CORPORATION (TRT)

The ABU Technical Committee's annual gathering will take place on 19-20 October 2024 in Türkiye, hosted by the Turkish Radio Television Corporation (TRT) as part of the ABU General Assembly and Associated Meetings. This year's General Assembly (GA2024) is particularly significant as both ABU and TRT celebrate their 60th anniversaries.

During the event, a key agenda focus will be the announcement of the winners of the annual Engineering Award and Technical Review Prizes, which will follow the opening session. This will be succeeded by a keynote address from an industry expert, leading into the ABU Technology Activity Report. Among the administrative matters expected to be discussed at TC2024 are key recommendations from the Technical Bureau regarding Bureau Proposals and the confirmation of newly elected members to fill vacant seats on the Technical Bureau.

The invited presentations at the TC2024 will have a Part 1 and Part 2 where the focus will be around the theme of "Advancements in Broadcasting Technology & Standards". Presenters will provide updates on the latest developments in TV and radio standards and regulations such as DVB and ATSC among others. These invited presenters are experts in their respective

fields, bringing diverse backgrounds that align with the focus of the meeting. These discussions promise to be both enlightening as well as forward-thinking.

Another highlight of the meeting will be the customary "Host Presents" session, organised by the host to showcase key technological projects and developments that have shaped TRT's broadcasting organisation. Over the course of the two-day meeting, the Chairpersons of the Study Topics will report on the latest updates regarding ongoing projects in Production, Transmission, Spectrum, and Training Services.

The meeting will conclude with final member updates, an information exchange, and the appointment of the Honorary Vice-Chairman for the host of ABU General Assembly 2025. The meeting is expected to draw the participation of CTOs, technical heads, and senior engineers from ABU member broadcasters, as well as industry experts from solution providers and partners from the region and beyond. The annual Technical Committee meeting is a crucial platform for sharing experiences, exchanging knowledge, and addressing common challenges within the industry. ■

TECHNICAL COMMITTEE MEETING

19-20 OCTOBER, 09:00-17:00



TRT

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TRT WELCOMES ABU MEMBERS TO GA 2024



A. OVERVIEW

Turkish Radio and Television Corporation (TRT) was established on 1 May 1964 as an autonomous public entity, designed to serve the public by conducting radio and television broadcasts. TRT launched its first scheduled radio broadcast in 1965 and, on 31 January 1968, made history with Türkiye's first television broadcast.

Over the years, TRT has evolved into a broadcaster with significant international influence, promoting ideals and values that resonate globally. The corporation is driven by a clear vision of digitalisation and international impact.

Reflecting its vision, TRT has an international organizational structure in terms of both offices and employees. TRT has 19 foreign offices (Azerbaijan, Belgium, Bosnia and Herzegovina, China, Germany/Berlin, Germany/Cologne, Greece, Iraq, Iran, Jerusalem, Kazakhstan, Kyrgyzstan, North Macedonia, Russia, Turkish Republic of Northern Cyprus, Turkmenistan, United Kingdom, USA, Uzbekistan) and employees from 72 different countries. Currently, TRT is broadcasting in 41 different languages, dialects, and alphabets.

TRT continues its broadcasting journey with 17 channels, 12 of which are national (TRT 1, TRT 2, TRT Çocuk, TRT

Belgesel, TRT Haber, TRT Spor, TRT Spor Yıldız, TRT Müzik, TRT 3 Spor/TBMM TV, TRT 4K, TRT EBA, TRT Diyanet Çocuk) and 5 of which are international (TRT World, TRT Arabi, TRT Türk, TRT Avaz, TRT Kurdî).

In radio broadcasting, TRT operates with 17 radio channels, 11 of which are national (TRT Radyo 1, TRT FM, TRT Radyo 3, TRT Nağme, TRT Türkü, TRT Radyo Haber, TRT Antalya, TRT Çukurova, TRT GAP Diyarbakır, TRT Erzurum, and TRT Trabzon) and 6 of which are international (TRT Radyo Kurdî, TRT Memleketim FM, TRT Türkiye'nin Sesi Radyosu (TSR), TRT Voice of Türkiye (VOT), TRT Radio World, TRT Radio Arabi).

With its focus on digitalization, TRT has launched several digital platforms, ranging from games to video-on-demand (VOD) digital platforms. TRT's international digital platform project "tabii" joined the TRT family on May 3, 2023. With "tabii", TRT has succeeded in standing out among on-demand video platforms with its "Family Oriented" productions. "tabii" provides access to its content anytime and anywhere through its app and website. "tabii" international digital platform, which reached more than 6 million subscribers in just 15 months, offers over 30 original productions and more than 20,000 hours of content in five different languages (Turkish, English, Spanish, Arabic

and Urdu). The platform is currently active in 51 countries and in line with its international expansion strategy, it will continue to be launched in different countries and regions. “tabii” also hosts live sports events, including the UEFA Champions League, UEFA Europa League, and UEFA Conference League matches for three years alongside TRT 1 and TRT Spor channels.

TRT is advancing its vision for digitalisation and international impact by expanding its digital-born news platforms. Among these are TRT World (English), TRT Arabi (Arabic), TRT Deutsch (German), TRT Russian (Russian), TRT Français (French), TRT Balkan (covering Bosnian, Serbian, Croatian, Montenegrin, Macedonian, and Albanian), TRT Africa (in Swahili, Hausa, English, and French), and TRT Español (Spanish).

In addition to its news platforms, TRT offers high-performance mobile games designed for both adults and children. The organisation actively develops digital strategies to enhance the online presence of its brands, projects, and programmes aimed at children. Committed to providing safe and educational content, TRT creates products that are accurate, secure, entertaining, and educational. The TRT Çocuk Kitaplık (TRT Kids Library) application exemplifies this commitment, offering a dedicated library app for children that includes audio, animations, activities, and games. Complementing this app, TRT delivers safe and engaging experiences through the TRT Çocuk (Kids) Mobile App, TRT Çocuk Oyun Dünyası (TRT Kids Game World), and a collection of 36 game applications. For adult audiences, TRT has launched popular games like “TRT Bil Bakalım”, which boasts over 6 million downloads, alongside enriched titles such as TRT Piri: Kelime Macerası, featuring in-game ad integration.

Another notable digital initiative is TRT Dinle, an audio platform accessible via iOS, Android, and the web. This service provides users with free access to an extensive array of content, including music, podcasts, radio dramas, audiobooks, and live radio broadcasts. Continually enriching its offerings, TRT Dinle invites listeners to explore a diverse audio landscape beyond just music. With over 1.5 million users and more than 20 million listeners, it distinguishes itself in the digital content arena by merging complex technical capabilities with a seamless user experience.

Moreover, TRT shares its extensive expertise in media, broadcasting, and communication with audiences eager to enhance their skills in these fields, fostering a culture of learning and professional development. Through its TRT Academy brand, TRT Academy, with its various training opportunities, opens the doors to all areas of broadcasting – from newsrooms to studios, from editing sets to film sets – for those who want to get closer to their professional and personal goals.

Every year, TRT organizes events on both national and international scales, such as the TRT International 23rd April Children’s Festival, TRT World Forum, Next by TRT World Forum, TRT World Citizen Awards, TRT World Citizen Humanitarian Film Festival, International TRT Documentary

Awards, 12 Punto, TRT International Children’s Media Summit, and TRT Future Communicators Competition. These events bring together experts from all over the world in their respective fields.

Through its co-production of movies in the national and international cinema industry, TRT has become the largest producer in Türkiye and one of the most respected producers in the world. In 2023 alone, TRT co-produced films participated in 304 festivals, and won 128 awards.

In 2023, TRT achieved great success with the “Ukraine War Diaries” episode of the “Off the Grid” documentary series. The episode won the 44th International Emmy Award in the “News and Current Affairs” category. This TRT World production made history as the first Turkish production to receive an Emmy Award in the “News and Current Affairs” category.

TRT reaches the entire world with its original, high-production, and high-quality content. Over the past five years, TRT has sold 395 of its content internationally. In 2023, 70 different contents were sold to over 100 countries.

Overall, TRT bases all its past, current and future activities on the strategic pillars of “being at the top in broadcasting”, “corporate development” and “productivity”. TRT continuously develops its internal operations in terms of structural, procedural, and technological components. Organizational operations, corporate structure, administrative and support processes, technology, and competencies are continually improved, thereby indirectly supporting broadcasting activities.

B. FACILITIES AND BUILDINGS

The Turkish Radio and Television Corporation (TRT), which forms the auditory and visual memory of Türkiye, is the country’s first broadcasting institution. Its administrative center and headquarters are located in Ankara, with regional offices in 7 different cities and transmission centers in 81 provinces.

The Oran Campus of TRT in Ankara operates with 17 blocks on a 500,000 square meter area.

Regional Offices

Regional Offices of TRT operate with:

- 2 buildings on a 58,504 square meter area in Istanbul,
- 1 building on an 8,017 square meter area in İzmir,
- 2 buildings on a 5,924 square meter area in Diyarbakır,
- 1 building on a 930 square meter area in Antalya,
- 1 building on a 21,924 square meter area in Trabzon,
- 1 building on a 12,473 square meter area in Çukurova and
- 3 buildings on a 16,001 square meter area in Erzurum.

C. IN-HOUSE PRODUCTIONS

TRT produces a wide range of content and provides production services to both TRT Channels and other external customers. It has technical and creative units to perform production services together with producers and directors.



TRT provides live broadcast services with a total of 18 OBVAN and 9 SNG vehicles in Ankara, Istanbul, Izmir, Diyarbakir, Erzurum, Antalya, Trabzon and Mersin.

TRT has 2 OBVAN trucks with 17 cameras and 16m double extensions that are using Hitachi SK 1000 HD, SK 1500 HD, Sony HDC1450, and Sony HDC 3300 cameras. 64 separate input signals can be used with the 3 M/E Grass Valley K frame switchers. EVS XT3 and EVS XT via replay server systems are used in this vehicle. Through Studer Vista 5 sound console, TRT can provide all kinds of production services such as sports competitions, music shows, etc. with multitrack, Dolby E, stereo sound formats.

There are also 2 OBVAN trucks with 10 cameras (Hitachi SK 1000 HD), Sony MVS 800 and Snell Kula 2 M/E switchers, EVS XT2, EVS GO replay server systems and Studer Vista 5 and Calrec Brio 36 sound consoles.

TRT has 7 OBVAN with 6 cameras (Hitachi SK 1000 HD and Sony HSC 300). There are Snell Kula 2 M/E switchers and EVS GO replay server systems in these vehicles. The sound console is Calrec brio 36. These vehicles have a compact structure with generator and RF systems.

TRT has 7 live broadcast vehicles with 4 cameras (Sony HSC 100R). There are also Snell Kula 1 M/E switchers, Calrec brio 36 sound desk and Avid fast-server replay server. It is ideal for news broadcasts with its compact structure consisting of internal generator and RF systems.



TRT also has SNG vehicles that are used to transmit broadcasts via satellite with an internal generator and double chain RF systems.

TRT closely follows technological innovations such as UHD, HDR, HFR, Dolby Atmos in the field of production and implements necessary improvements. TRT conducts the production operations of its TV studios located throughout Türkiye. Some of these studios serve specific programs, while others can be utilized for all types of programs.



All post-production processes (editing, graphics, color correction and sound design) of productions such as films, TV series and documentaries are carried out in-house.



D. INTERNATIONAL FILM STUDIOS

TRT International Film Studios serves as a premier hub for both international and local productions, and positions Türkiye's state-of-the-art facilities at the forefront of the global film industry.



The studio complex is divided into two distinct campuses, located in Istanbul and Konya.

The **Istanbul campus** spans an impressive 82,000 square meters, encompassing five expansive open areas, two

state-of-the-art soundstages each measuring 2,400 square meters, and diverse terrain featuring both flat and inclined surfaces ideal for various types of filming. In total, the campus offers an extraordinary production environment spread across 453,716 square meters.

Within these open areas, filmmakers can access a rich array of settings, including traditional Turkic tents, castles, gardens, palaces, and cityscapes that authentically reflect 9th to 15th-century European, Central Asian, and Anatolian cultures. Additionally, the campus is equipped with three harbors, a wave pool, and five vessels, providing a versatile backdrop for maritime scenes.



To authentically capture historic sea scenes, TRT International Film Studios has pioneered a groundbreaking mechanism at its Istanbul campus, the first of its kind in the world. This innovative setup is enclosed by three walls, allowing for the creation of more breathtaking and realistic maritime scenes. As a result, numerous productions have sought to utilize this advanced technology to enhance the authenticity of their sea scenes.



The **Konya campus** is home to meticulously recreated historical settings, most notably the Seljuk Palace, emblematic of the 13th century, which covers a vast area of 50,000 square meters. The campus also features reconstructions of Mevlana's home, his lodge, and his madrasah, as well as various mosques and civil structures from that era. Notably, 20 of the 118 sets in Konya are faithfully modeled after their real-life counterparts, offering filmmakers an unparalleled opportunity to capture authentic historical settings.

Since 2020, our studios have supported over 20 productions. Some of the notable projects that we had the privilege of hosting are Kuşlarla Yolculuk, Tozkoparan İskender, Barbaroslar: Akdeniz'in Kılıcı, Tarihin Efsaneleri, Laterna, Mevlânâ Celâleddîn-i Rûmî, Teşkilat-ı Mahsusa Trablus, Alparslan: Büyük Selçuklu, Barbaros Hayreddin: Sultanın Fermanı, Tozkoparan İskender Sır, Aziz Mahmut Hüdayi: Aşkın Yolculuğu, Mehmed: Fetihler Sultanı (currently in production), Kudüs Fatihi Selahaddin Eyyubi (currently in production), and the feature film Tete ve Masal.



It is widely recognized that new technologies will have a profound impact across all sectors, including the film industry. In alignment with this perspective, TRT International Film Studios is actively exploring innovative technologies. One such advancement is the **LED Stage**, a groundbreaking method that allows producers to film numerous scenes within a palace setting with unparalleled efficiency. The LED Stage significantly simplifies the complexities of studio shooting and is regarded by our expert team as a milestone in film production. As we



continue to seek out cutting-edge technologies like the LED Stage, our goal is to establish TRT International Film Studios as a facility that meets international standards.

E. BROADCASTING TECHNOLOGIES

TRT is elevating its production and broadcasting processes with advanced technology. Technologies and resources are continuously reviewed and worked on to improve technical aspects of broadcast quality. The reach and quality of broadcasts are continuously developed from a technical perspective.

TRT operates 9 studios in Ankara which have been used by TRT TV channels. Also, 8 studios in İstanbul, one studio in London, Cologne, Erzurum, Diyarbakır and İzmir each are actively used. All studios have lighting systems, video wall systems, broadcast camera systems, other broadcast devices and control rooms depending on production contents.

1. NEWSROOM COMPUTER SYSTEM – NRCS OF TRT

Since 2012, TRT has been using Octopus as its Newsroom Computer System (NRSC) with 6 TV channels (TRT Haber, TRT Spor, TRT Spor Yıldız, TRT 1, TRT Avaz, TRT Kurdî)



and TRT Radio Channels. Octopus allows all our reporters working in news centers and domestic and foreign offices to write their news, to select clips, sections, KJ and images to be given to the large screens behind the announcer, as well as news texts. It briefly organisms all new processes. We will be updating our NRCS to the Octopus 11 version soon, which will offer many more opportunities for users and administrators.

2. PRODUCTION ASSET MANAGEMENT (PAM) SYSTEM OF TRT

TRT employs a PAM system that is far more advanced than in the past, reflecting the increased complexity and demands of contemporary broadcasting operations. Modern PAM systems have a significant impact on corporations like TRT, which manages production teams and assets across several regions. The ability to have synchronized workflows ensures that content is produced and delivered efficiently, regardless of location. TRT's PAM system is designed to integrate with a wide array of other broadcasting tools. For instance, TRT's PAM setup allows for seamless communication between Dalet, ISOFT and GV Stratus enabling editors to access, modify, and distribute content with minimal friction.

Managing over 8 channels simultaneously, TRT exemplifies the challenges of handling a vast and diverse media library. The complexity of coordinating such

A large operation involves not just technical solutions but also strategic planning. TRT has successfully implemented advanced PAM workflows that ensure all assets are readily accessible and properly managed, addressing the inherent challenges of scale and diversity. The organization's ability to maintain a streamlined operation despite these



challenges is a testament to its effective deployment and customization of PAM technologies.

The PAM system is central to the efficient operation of TRT’s broadcasting environment, also enabling us to manage complex workflows and vast media libraries with ease. TRT’s success in integrating and optimizing these systems across its 8 channels highlights the critical role of PAM in achieving operational excellence.

3. TRANSMITTER OPERATIONS AND STATIONS OF TRT
 TRT provides planning, establishment, inspection, modernization and sparing material supply of the radio and television transmitter network throughout the country. It also participates in domestic and international frequency planning and coordination studies, creates the infrastructure for the creation of institutional policies in the transition to new broadcast technologies, provides services to other institutions from transmitter station infrastructures and regulates the use of organizations.



An example of TRT Transmitter Station



Transmitter Stations Network of TRT

TRT transmitters cover the entire country in terrestrial broadcasting.

Number of TV/FM Transmitter Stations	927
Number of FM Radio Transmitters	1.919
Number of TV Radio Transmitters	2.444
Number of Medium Wave Transmitter Stations	5
Number of Short-Wave Transmitter Stations	1



SW Rotating Antenna



SW Certain Antenna



MW Antenna



Short Wave Transmitter Station

4. DIGITAL-TERRESTRIAL BROADCASTING

TRT continues to broadcast Digital Video Broadcasting-Terrestrial (DVB-T2) as trial broadcasts from 5 metropolitan cities. (Ankara, Istanbul, Izmir, Bursa, Adana) As Digital Terrestrial Radio Broadcasting, Digital Audio Broadcasting (DAB+) test broadcasts are made in order to support the transition to terrestrial digital broadcasting in our country.

DIGITAL TV (DVB-T2) TRANSMITTERS STATUS

Programmes	Transmitter Power (W)	City
6 SD TV / 3 HD TV / 14 Radio	1000	Ankara
6 SD TV / 3 HD TV / 14 Radio	500	Izmir
6 SD TV / 3 HD TV / 14 Radio	250	Istanbul
6 SD TV / 3 HD TV / 14 Radio	250	Bursa
6 SD TV / 3 HD TV / 14 Radio	1000	Adana

DIGITAL RADIO (DAB+) TRANSMITTERS STATUS

Programmes	Transmitter Power (W)	City
TRT Radio 1, TRT FM, TRT Radio 3, TRT Nagme, TRT Turku, TRT Radio News, TRT Radio World, TRT Radio Arabic	250	Ankara
TRT Radio 1, TRT FM, TRT Radio 3, TRT Nagme, TRT Turku, TRT Radio News, TRT Radio World, TRT Radio Arabic	1250	Istanbul
TRT Radio 1, TRT FM, TRT Radio 3, TRT Nagme, TRT Turku, TRT Radio News, TRT Radio World, TRT Radio Arabic	150	Bursa

F. INFORMATION TECHNOLOGIES

1. INFORMATION SECURITY

All assets within TRT (websites, mobile applications, servers, and end-user devices) undergo regular vulnerability scans and penetration tests, and the management processes for identified vulnerabilities are carried out. In digital inventories, all file movements, security logs, and running processes are monitored 24/7 through security products to detect anomalies. In accordance with legal regulations, these logs are recorded and stored. Additionally, ISO 27001: ISMS and KVKK (Personal Data Protection Law) processes are managed.

2. INFORMATION NETWORKS AND SYSTEMS

The network connections for the main campus, 22 domestic locations across various cities in Türkiye, and 5 international offices are planned, supplied, installed, and managed.

Furthermore, by expanding the wireless network system with 800 wireless access points, potential issues in the system's operation are prevented. More than 10,000 data connections and, accordingly, more than 400 network switching devices and router devices are operated throughout the organization.

In the scope of data center operations, the supply, installation, and management of servers, storage units, backup units, load balancers, email, active directories, firewalls, and various security systems required for information systems are carried out. In a pool of over 350 servers, requested server infrastructures are provided. Numerous institutional tasks such as user account management, email allocation, patch distribution, and reporting are performed.

The databases (MSSQL, ORACLE, POSTGRE SQL) for the utilized software are centrally managed. The security and backup of database systems are ensured. The integration of broadcasting systems with IT networks and the coordination of access permissions are managed. Systems that need to be hosted in the cloud are managed on the Microsoft Azure platform.

3. INFORMATION TECHNOLOGIES AND MANAGEMENT INFORMATION SYSTEMS

The development of applications needed within the organization, the use of information technologies in application management, process automation, data management, business analytics, and project management are facilitated through technology, thereby improving the organization's performance and developing applications for digital transformation.

Regarding broadcasting systems, a radio automation system and television broadcast planning software have been developed and have been in use for many years. Systems that record and monitor 24/7 satellite feedback for the post-broadcast tracking of the institution's broadcasts (Radio/TV) are managed. A graphic scene automation system prepared with VizRT has been developed for important items on Türkiye's agenda.

Closely following current technologies, TRT continues its research and development activities on the potential use of artificial intelligence solutions across the organization. An AI-supported help desk application has been launched. Additionally, the Talk2 application, which performs automatic translation from 41 languages to 51 languages, was used in strategic media events.

G. DIGITAL TECHNOLOGIES AND DIGITAL TRANSFORMATION OF TRT

As a public institution, TRT has adopted a vision and strategy characterized by significant strides in digitalization, reinforcing its pioneering position in the media world and rapidly adapting to innovative technologies. In this transformation process, TRT closely follows the latest trends and technologies in the digital media sector, developing comprehensive strategies for the production, strengthening, and sustainability of digital products. TRT's role and responsibility in public broadcasting is one of the most crucial drivers of this transformation. TRT ensures the digital transformation of the organisation by using advanced technologies in its field of expertise to ensure the development, growth and sustainability of its digital assets.

TRT produces original content for its brands in social media, carries out social media communication and maximizes the digital visibility of these brands.

Digital advertising strategies are developed and implemented to strengthen the online presence of the TRT's brands, projects, dramas and programs. Digital advertising campaigns on various platforms are effectively managed by conducting target audience analyses. The success of digital campaigns is increased with technical processes such as targeted media buying, programmatic advertising and social media management. By continuously optimizing campaign performance with a data-driven approach, more than 1 billion access and more than 3 billion impressions are achieved annually.

TRT conducts big data analysis and provides artificial intelligence solutions to strengthen its digital strategies. Using advanced AI and machine learning algorithms, it carries out predictive and forecasting studies. It deeply examines large data sets with advanced data analysis tools like Google Analytics, Power BI, Looker, and GA4, identifying trends through data mining and statistical modeling techniques. These analyses shape the strategic decisions of TRT's digital projects and optimize business processes.

TRT's MAM (Media Asset Management) product operates on a microservice architecture (Kubernetes) developed using private cloud infrastructure and integrating open-source modules. It provides a fully customizable and scalable solution for effective media asset management and is also designed to be used as a powerful video processing infrastructure for VOD platforms. MAM meets complex media management needs simply and efficiently, ensuring effective and efficient management of media platforms.

Universal applications are developed using SwiftUI for Apple platforms, Kotlin Coroutines for Android platforms, and ReactJS for smart TV platforms. The

sustainability of applications is ensured by creating modular coding techniques and reusable components. In addition, TRT has secured an important place in the global sector for video processing and streaming technologies with its media player developments.

TRT designs advanced user interfaces using technologies like HTML, CSS, and JavaScript, maximizing user experience through SPA (Single Page Application) architecture and responsive design principles. It also increases the accessibility of digital assets and enhances user engagement through web performance optimization and SEO (Search Engine Optimization) techniques.

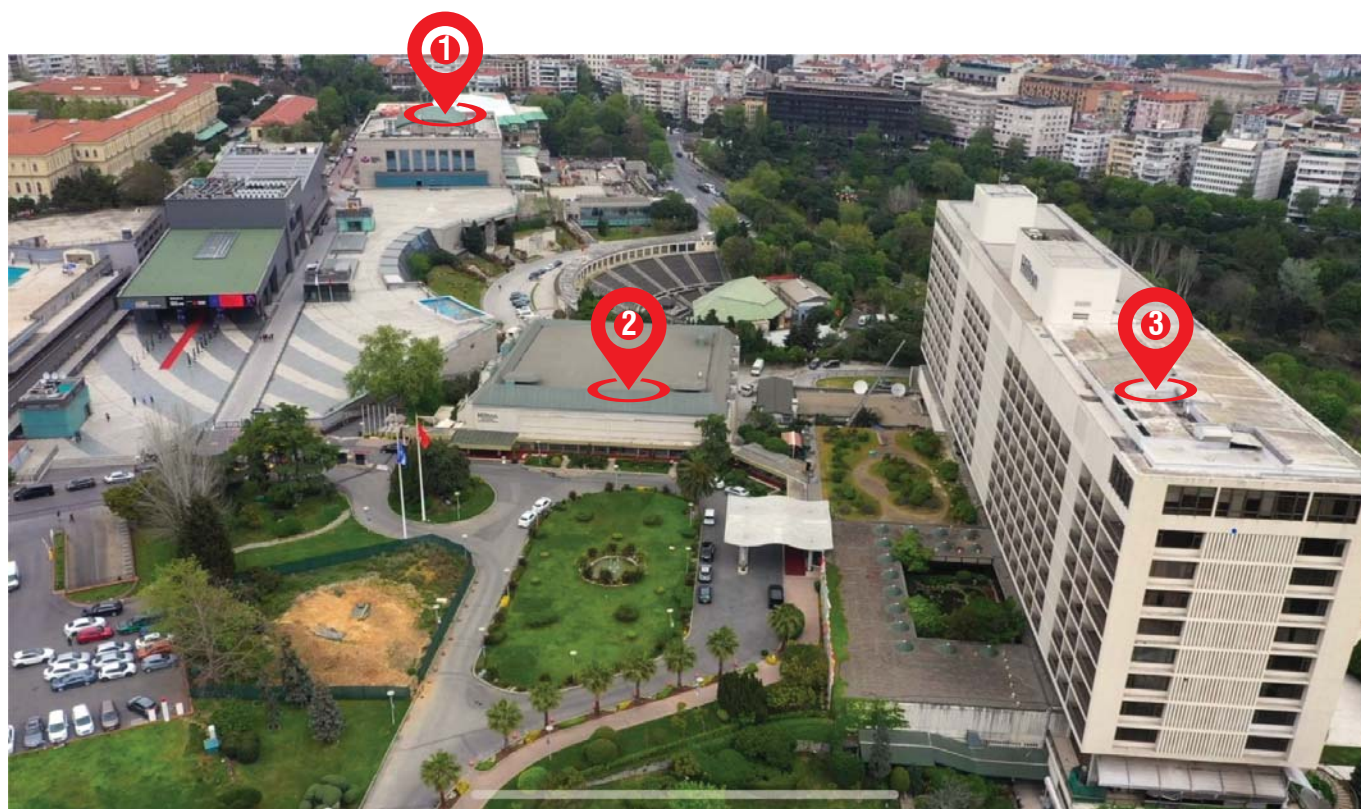
Projects such as TRT Account and CMS (Content Management System) optimized content management and user experience by using modern software development techniques such as microservice architecture and API management. With open-source software tools, the sustainability of projects is ensured and users' digital experiences are enriched.

Over 100 digital products of TRT are managed and forward-looking strategies are formulated with UI/UX design, product management, and growth teams. TRT also develops high-performance mobile games using the Unity game engine, constantly updating and improving game dynamics. It optimizes the gaming experience through user behavior analytics and feedback management.

By developing infrastructures that adhere to modern software production standards and DevOps principles, TRT provides reliable and scalable solutions for its digital platforms. Using advanced cloud technologies such as Kubernetes, Docker, and Terraform, it applies the latest architectural technologies worldwide for TRT's international digital platform, tabii, which has more than 6 million subscribers.



H. ABU 61TH GENERAL ASSEMBLY, ABU TV SONG FESTIVAL, ASSOCIATED MEETINGS AND TRT 60TH ANNIVERSARY RECEPTION VENUES



Location 1 : ABU TV SONG FESTIVAL VENUE

Istanbul Lutfi Kirdar International Convention and Exhibition Center

Location 2 : ABU 61TH GENERAL ASSEMBLY AND ASSOCIATED MEETINGS VENUE

Hilton Ballroom and Conference Center

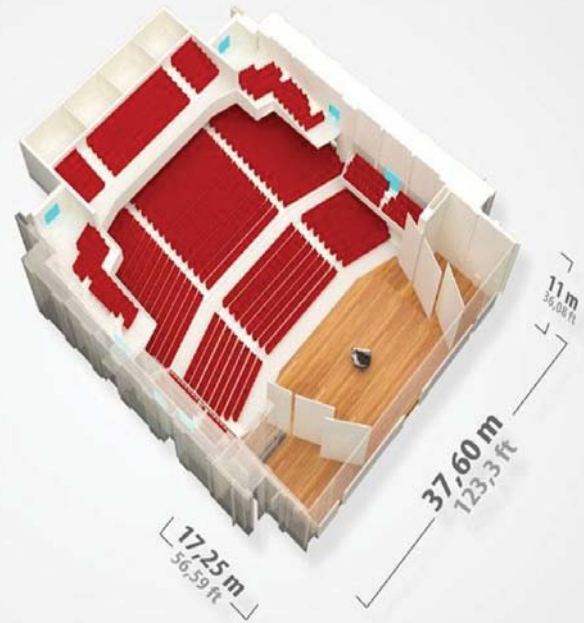
Location 3 : HILTON ISTANBUL BOSPHORUS HOTEL





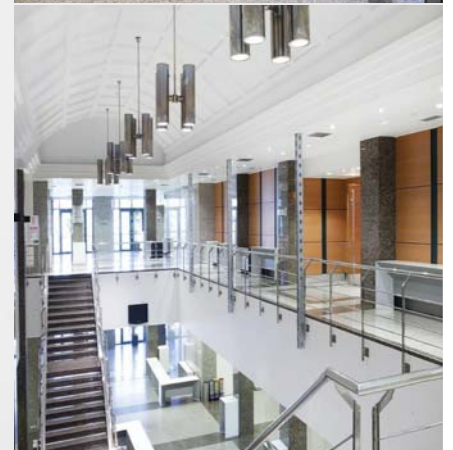
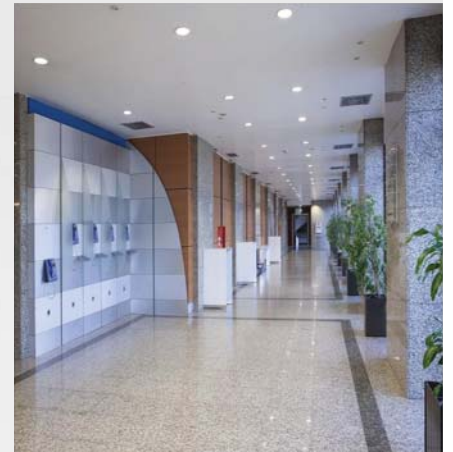
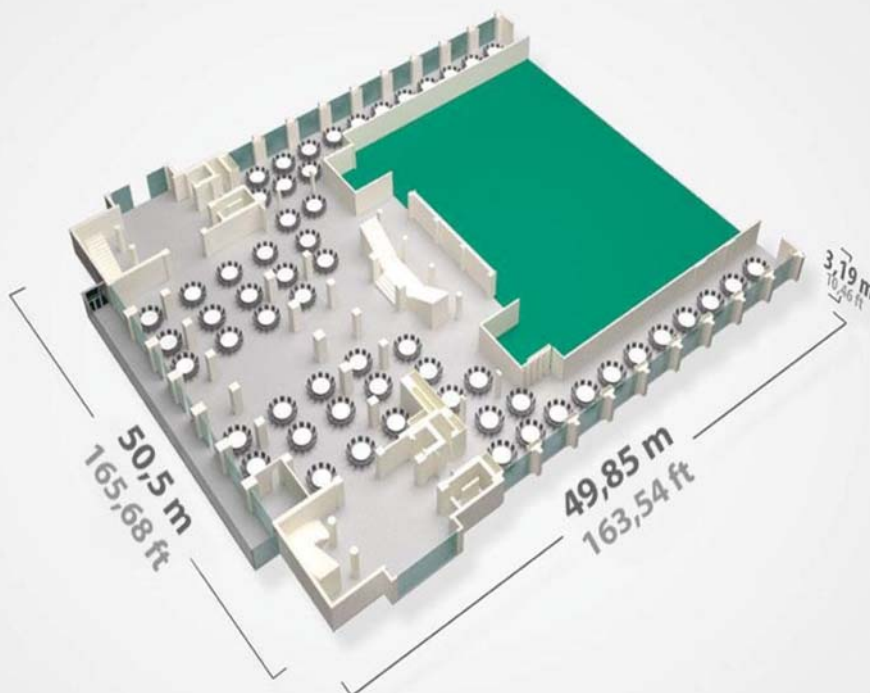
ANADOLU AUDITORIUM

- Full Capacity: 2,000 people
When the stage part is open, capacity decreases to 1.711 people.
- Area: 2,482 m²
- Ceiling Height: 11 m
- 12 entrances on 3 separate floors
- Dolby digital surround system
- Simultaneous cabinets



ANATOLIAN AUDITORIUM FOYER

- Area: 2,980 m²
- Ceiling Height: 3.19 m





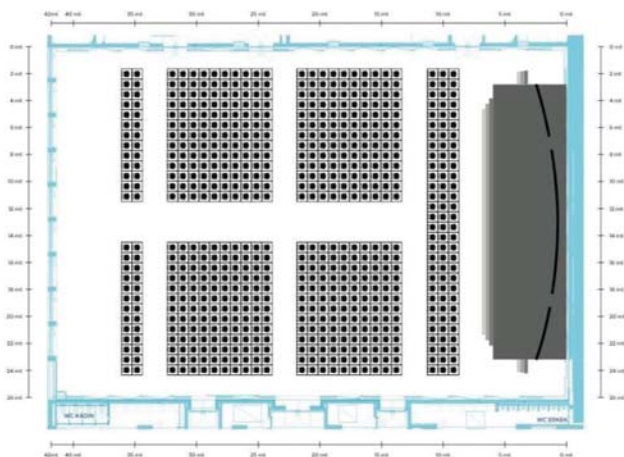
ABU 61ST GENERAL ASSEMBLY AND ASSOCIATED MEETINGS VENUE
HILTON ISTANBUL BOSPHORUS BALLROOM AND CONFERENCE CENTER
HILTON BALLROOM & CONFERENCE CENTER

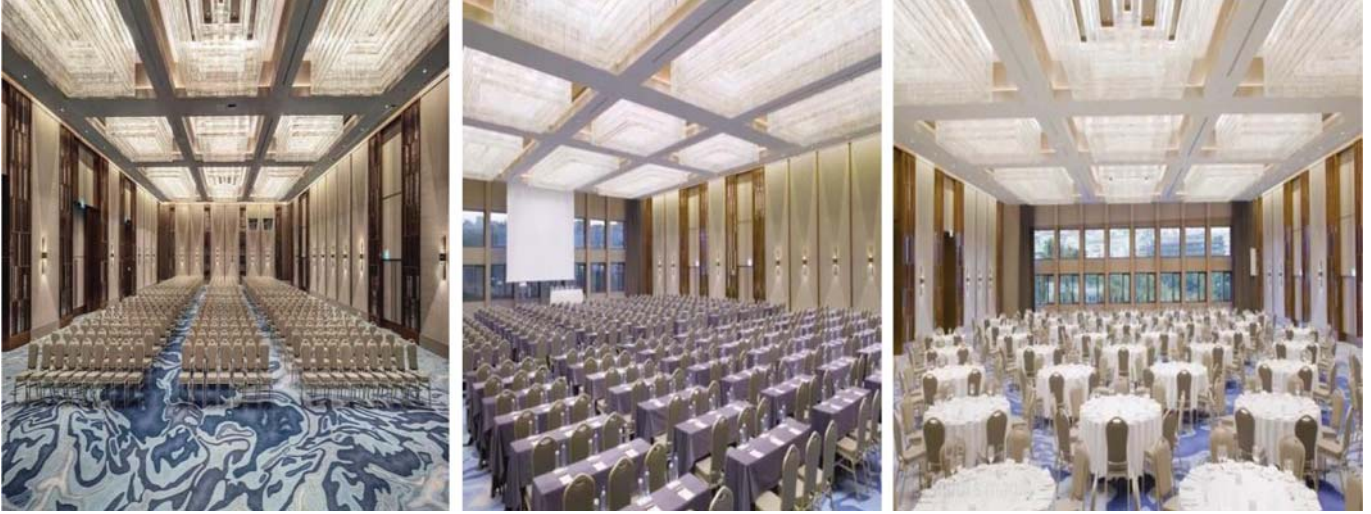


HILTON ISTANBUL BOSPHORUS AMBASSADOR BALLROOM

Official Opening of the General Assembly, General Assembly Meetings, Award Ceremony and Gala Dinner will be held in this ballroom.

- Full capacity: 2,500
- Area: 42x26: 1,092 m²
- Ceiling Height: 5.90



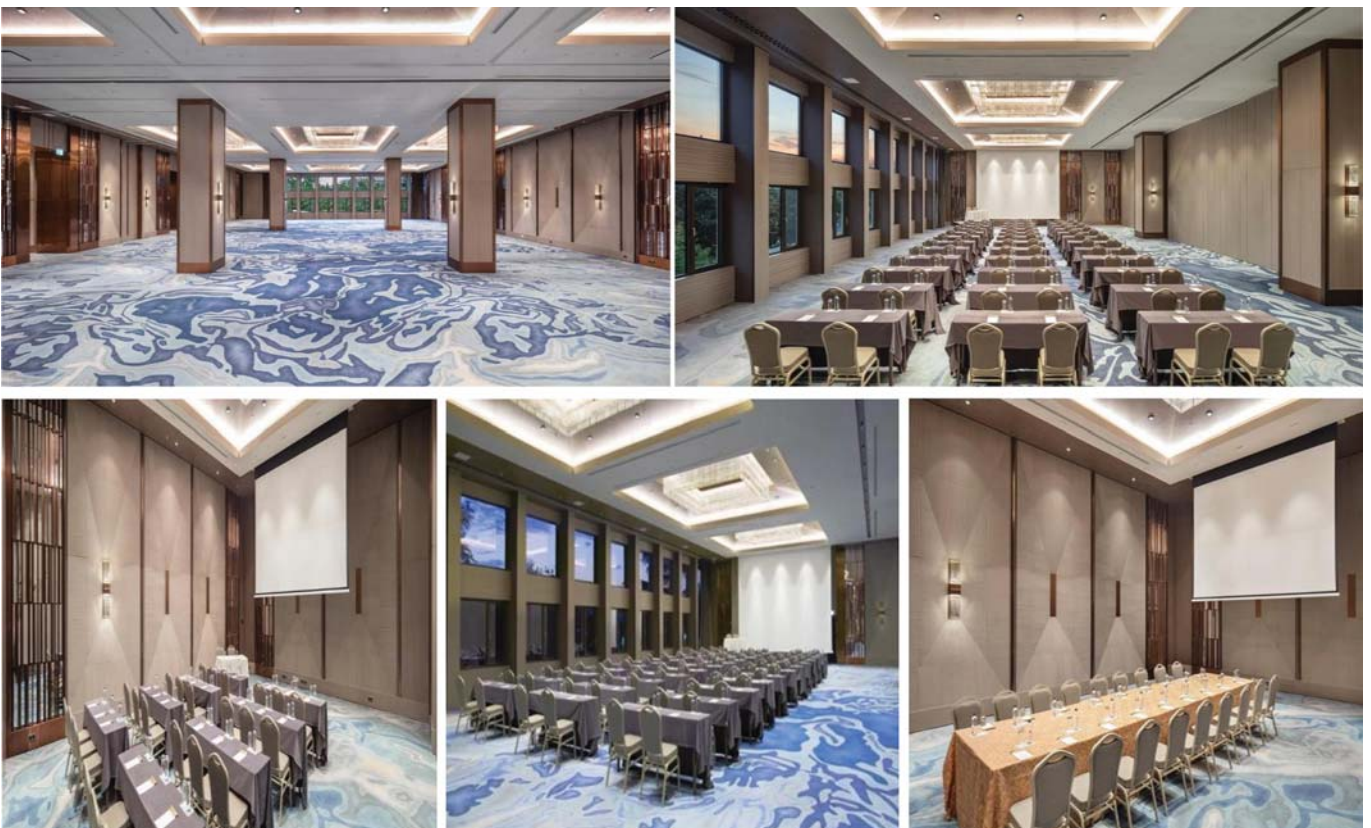


HILTON ISTANBUL BOSPHORUS AMBASSADOR BALLROOM FOYER



THE CONNIE BALLROOM

- ABU Associated Meetings will be held in this ballroom.
- Connie Ballroom is divided into five sections and has its own foyer



PROGRAMME (DRAFT)

VENUE: CONNIE II, HILTON ISTANBUL BOSPHORUS

DAY 1 : 19 OCTOBER 2024 | SATURDAY

TC PROCEEDINGS

- 09:00-09:30 **Welcome address by the Chairman, Technical Committee**
Masashi Kamei, Chairman, ABU Technical Committee and Senior Research Engineer, NHK STRL-Japan
- Welcome address from the Host**
TBC
- Opening Address by ABU Secretary-General**
Ahmed Nadeem, Secretary-General, ABU

ABU ENGINEERING AWARDS 2024

- 09:30-10:30 **Announcement of Winners of the Annual ABU Engineering Award and Technical Review Prizes 2024**

- 10:30-11:00 **TEA, COFFEE & NETWORKING**

KEYNOTE PRESENTATION

- 11:00-11:45 **Michael McEwen**, Media Consultant, Advisor to the ATSC
Topic (TBC)

TC PROCEEDINGS

- 11:45-12:30 **Confirm Agenda and TC-2024 Proceedings and appointment of Rapporteurs**
ABU Technology Activity Report
BUREAU PROPOSALS
- 12:30-14:00 **NETWORKING LUNCH**

INVITED PRESENTATIONS | PART 1

ADVANCEMENTS IN BROADCASTING TECHNOLOGY & STANDARDS

- 14:00-15:00 **Moderator:** (Vice Chair of Technical Committee)
Lindsay Cornell, Principal Systems Architect, BBC and Chairman, WorldDAB Technical Committee
Alexander Zink, Vice Chairman DRM Consortium and Chief Business Development Manager, Fraunhofer IIS
Mei Jianping, Director of the Data Application Department, Technology Bureau of the China Media Group

THE HOST PRESENTS | TRT

- 15:00-16:00 **Dr Ruhi TAŞ**, Deputy Director of Information Technologies (TBC)

END OF TC DAY 1

DAY 2 : 20 OCTOBER 2024 | SUNDAY

TOPIC AREA REPORTS

- 09:00-10:30 **Production**
Kazim Pektaş, Chief Engineer, TRT-Türkiye
- Transmission**
Dr Hirokazu Kamoda, NHK-Japan
- Spectrum**
Dr Li Leilei, Professor, Academy of Broadcasting Planning, NRTA-China
- Training & Services**
NABM, Prasar Bharati-India

- 10:30-11:00 **TEA, COFFEE & NETWORKING**

PANEL: AI IN BROADCASTING WORKFLOWS: SHOULD WE FEAR BEING REPLACED?

- 11:00-12:30 **Panellist:** (TBC)

- 12:30-14:00 **NETWORKING LUNCH**

INVITED PRESENTATIONS | PART 2

ADVANCEMENTS IN BROADCASTING TECHNOLOGY & STANDARDS

- 14:00-15:30 **Moderator:** (Vice Chair of Technical Committee)
Dr Peter Siebert, Adcom Member & VP, IEEE Broadcast Technology Society
Dr Mohieddin Moradi, Director of R&D, IRIB, Ira
Masashi Kamei, Chairman, ABU TC, and Senior Research Engineer, NHK STRL-Japan
Michael McEwen, Media Consultant, Advisor to the ATSC

MEMBERS' UPDATES & CLOSING

- 15:30-16:30 **Members' Updates**
New members and Updates from Sister Unions & Intl Organisations
Information Exchange and Status Reports
- 16:30-17:30 **Future Meetings**
ABU DBS 2025, Whyndham Acmar Klang | 24 – 27 February 2025
Leroy Zhang, Global Marketing Manager, NRTA, China, Introducing CCBN event
Appointment of Honorary Vice-Chairman from the host of the 2025 ABU General Assembly
Closing remarks by TC Chairman
- 18:00-18:45 **Welcome Cocktail Party @ Lütfi Kırdar International Convention and Exhibition Centre (ICEC)**
- 19:00-21:00 **ABU TV Song Festival @ Lütfi Kırdar International Convention and Exhibition Centre (ICEC)**

END

PROOF OF CONCEPT (POC) PUBLIC 5G NETWORK SLICING TECHNOLOGY FOR RADIO TELEVISYEN MALAYSIA (RTM) BROADCAST FACILITIES AND SERVICES: PART 1 - READINESS OF THE TRIAL EXECUTION



INTRODUCTION

The broadcasting industry is on the verge of a major transformation, driven by the introduction of 5G technology. With its unprecedented speed and ultra-low latency, 5G is set to revolutionise the way broadcasters produce and deliver content. Radio Televisyen Malaysia (RTM) is embracing this innovation by conducting a Proof of Concept (PoC) trial that integrates 5G network slicing technology into its broadcast facilities and services. This article outlines the readiness for the PoC trial, focusing on critical broadcasting elements, test locations, event selection, and compliance with

industry standards. Digital National Berhad (DNB) will serve as the 5G network slicing technology provider for the trial.

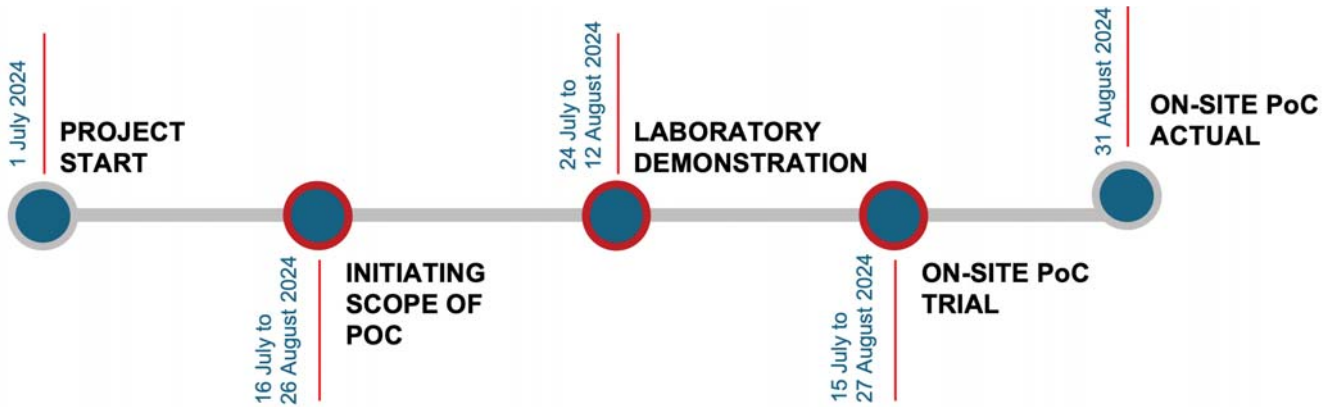
UNDERSTANDING 5G NETWORK SLICING

5G network slicing in a Public Land Mobile Network (PLMN) enables the creation of multiple virtual networks on a shared physical infrastructure. Each “slice” is tailored to meet the specific requirements of different applications, offering optimised performance. This capability is particularly advantageous for broadcasting, where different production elements require distinct

levels of speed, latency, and reliability.

Key Benefits of 5G for Broadcasting:

- **Higher Data Rates:** 5G delivers up to 20 Gbps peak data rates, with average rates exceeding 100 Mbps, which is significantly faster than 4G.
- **Ultra-Low Latency:** With latency as low as 1 millisecond, 5G supports real-time applications with minimal delay.
- **Network Slicing:** This enables the creation of dedicated virtual networks for specific broadcasting functions, ensuring the highest possible quality for each task.



The main objectives of this Proof of Concept (PoC) are:

1. To evaluate the readiness of RTM's broadcast facilities for integrating 5G network slicing technology in 5G mid-band sub-6 GHz.
2. To conduct functionality tests on critical broadcasting components: Audio TV Production, Video TV Production, Duplex Inter-communication, Video Monitoring, and Broadcast Equipment Remote Control.
3. To evaluate the Quality of Service (QoS) of the 5G network slicing in terms of network stability, upload and download speeds, and data transfer efficiency. QoS is important metrics indicating the level of satisfaction of the consumers.
4. To measure the latency and response times between local and remote sites.
5. To ensure compliance with SMPTE, ITU-R standards, and recommended practices by manufacturers.

TRIAL EXECUTION PLAN

Test Phases and Locations for the 5G Network Slicing PoC

The Proof of Concept (PoC) for integrating 5G network slicing into Radio Televisyen Malaysia's (RTM) broadcasting infrastructure will be conducted in three distinct phases, each designed to evaluate specific aspects of the technology's implementation and functionality.

The phases of this Proof of Concept (PoC) are as follows:

1. Phase 1: Laboratory demonstration

The objective of this phase is to demonstrate the use case for remote live production in a

controlled environment with test equipment.

2. Phase 2: On-site PoC trial

This phase aims to demonstrate transmitter coverage and the use case for remote live production from the actual 5G broadcast transmission site. The trial will take place between 15 and 27 August 2024.

3. Phase 3: On-site PoC actual

The final phase will be conducted during the identified event on 31 August 2024, to perform the PoC on use cases for 5G broadcasting.

Test Locations

For this PoC, three primary locations have been identified:

1. Remote Production Studio Floor – Roof Top Wisma Tani Building, Putrajaya

2. Production Control Room (PCR) – Outside Broadcast (OB) Trailer at Palace of Justice Putrajaya

3. Transmission Operation Centre (TOC) – News Ingest Room, Wisma Berita, Kota Media Angkasapuri

Event Selection for the 5G Network Slicing PoC

The Merdeka Day Parade in Putrajaya, scheduled for 31 August 2024, has been selected as the event for this trial. This event presents a challenging environment due to the high network demand caused by



transmission.

- **Audio Quality:** Subjective assessment by audio engineers.

Expected Outcome:

The use of 5G network slicing is anticipated to offer a seamless audio production experience, characterised by minimal latency, jitter, and packet loss, thus ensuring a high-quality audio output.

2. VIDEO TV PRODUCTION

Objective:

This test aims to evaluate the capability of 5G network slicing in managing high-definition video production and transmission for television broadcasting.

Test Procedure:

1. Set up a video production environment with cameras, switchers, and other necessary equipment at the Remote Production Studio.
2. Utilise 5G network slicing to transmit video signals from the studio to the Production Control Room (PCR) and the Transmission Operation Centre (TOC).
3. Monitor the video quality for any latency, frame drops, or signal degradation.
4. Compare the performance of 5G network slicing with traditional broadcasting methods.

Metrics to Measure:

- **Latency:** The time taken for the video signal to travel from the source to the destination.
- **Frame Rate:** The number of frames transmitted per second.
- **Packet Loss:** The percentage of video packets lost during transmission.
- **Video Quality:** Subjective assessment by video engineers.

Expected Outcome:

The application of 5G network slicing should enable smooth and high-definition video production, characterised by minimal latency and packet loss, thereby ensuring superior video output quality.

3. DUPLEX INTER-COMMUNICATION

Objective:

The purpose of this evaluation is to assess the efficiency of 5G network slicing in supporting intercom systems

for real-time communication among production teams.

Test Procedure:

1. Set up intercom systems at the Remote Production Studio, Production Control Room (PCR), and Transmission Operation Centre (TOC).
2. Utilise 5G network slicing to facilitate communication between these systems.
3. Monitor the clarity and latency of the intercom communication.
4. Compare the performance of 5G network slicing with traditional intercom systems.

Metrics to Measure:

- **Latency:** The time taken for the intercom signal to travel from one device to another.
- **Audio Quality:** The clarity and intelligibility of the intercom communication.
- **Reliability:** The consistency of the intercom communication without dropouts.

Expected Outcome:

5G network slicing should offer clear and reliable intercom communication with minimal latency, ensuring effective real-time coordination among production teams.

4. VIDEO MONITORING

Objective:

This assessment aims to evaluate the capability of 5G network slicing in supporting video monitoring for real-time oversight of production activities.

Test Procedure:

1. Set up video monitors at the Remote Production Studio, Production Control Room (PCR), and Transmission Operation Centre (TOC).
2. Utilise 5G network slicing to transmit live video feeds to these monitors.
3. Monitor the quality and latency of the video feeds.
4. Compare the performance of 5G network slicing with traditional video monitoring systems.

Metrics to Measure:

- **Latency:** The time taken for the video feed to be transmitted to the monitor.
- **Frame Rate:** The number of

frames displayed per second on the monitor.

- **Video Quality:** The clarity and resolution of the video feed.
- **Reliability:** The consistency of the video feed without interruptions.

Expected Outcome:

5G network slicing should facilitate real-time video monitoring with high clarity and minimal latency, thereby ensuring effective oversight of production activities.

5. BROADCAST EQUIPMENT REMOTE CONTROL

Objective:

To assess the effectiveness of 5G network slicing in enabling remote control of production equipment.

Test Procedure:

1. Set up remote control interfaces for various production equipment, such as cameras and audio mixers, at the Remote Production Studio.
2. Utilise 5G network slicing to facilitate remote control operations from the Production Control Room (PCR) and Transmission Operation Centre (TOC).
3. Monitor the responsiveness and reliability of the remote control actions.
4. Compare the performance with traditional remote control systems.

Metrics to Measure:

- **Latency:** The time taken for the remote control signal to be executed.
- **Reliability:** The consistency of remote control operations without delays or errors.
- **Control Precision:** The accuracy of remote control actions.

Expected Outcome:

5G network slicing should enable reliable and precise remote control of production equipment with minimal latency, ensuring efficient and accurate operations.

B. NETWORK QUALITY of SERVICE (QoS) MEASUREMENT

The Quality of Service (QoS) of the 5G network slicing is a crucial aspect of the PoC. It involves measuring various network performance parameters to ensure that the 5G network slicing meets the broadcasting requirements.

QoS Parameters to Measure:

- **Network Stability:** Consistency of network performance without significant fluctuations.
- **Upload and Download Speed:** Data transfer rates for uploading and downloading content.
- **Inbound and Outbound Data Transfer:** Efficiency of data transfer in both directions.

Test Procedure:

1. Set up the necessary equipment for measuring QoS parameters at the Remote Production Studio, Production Control Room (PCR), and Transmission Operation Centre (TOC).
2. Utilise 5G network slicing to facilitate data transfer between these sites.
3. Measure network stability, upload and download speeds, and inbound and outbound data transfer rates.
4. Compare the results with traditional network setups.

Expected Outcome:

5G network slicing should provide stable network performance, high upload and download speeds, and efficient data transfer, ensuring high-quality broadcasting services.

C. LATENCY AND RESPONSE TIME MEASUREMENT

One of the critical aspects of the Proof of Concept (PoC) is to measure the latency and response times between

local and remote sites. Latency refers to the delay between the transmission and reception of signals, while response time is the time taken for a system to react to a given input. For RTM's broadcasting needs, low latency and quick response times are crucial to ensure seamless production and broadcasting operations.

Test Procedure:

1. Set up local and remote sites with the necessary equipment for audio TV production, video TV production, duplex inter-communication, video monitoring, and broadcast equipment remote control.
2. Utilise 5G network slicing to facilitate communication and data transfer between these sites.
3. Measure the latency and response times for various operations.
4. Compare the results with traditional network setups.

Metrics to Measure:

- **Round-Trip Time (RTT):** The time taken for a signal to travel from the source to the destination and back.
- **One-Way Delay:** The time taken for a signal to travel from the source to the destination.
- **Response Time:** The time taken for the system to respond to an input.

Expected Outcome:

5G network slicing should provide low latency and quick response times, ensuring efficient and seamless

operations between local and remote sites.

D. COMPLIANCE WITH BROADCAST STANDARDS

The PoC must ensure compliance with relevant standards and recommended practices to guarantee the quality and reliability of the broadcasting services. The primary standards to be considered include:

SMPTE Standards

The Society of Motion Picture and Television Engineers (SMPTE) provides standards for various aspects of broadcasting, including video and audio formats, compression, and transmission. Compliance with SMPTE standards ensures interoperability and high-quality broadcasting.

ITU-R Standards

The International Telecommunication Union Radiocommunication Sector (ITU-R) provides standards for radio communication, including broadcasting. Compliance with ITU-R standards ensures efficient and reliable use of the radio spectrum and high-quality broadcasting services.

Manufacturer's Recommended Practices

Following the recommended practices by equipment manufacturers ensures optimal performance and longevity of the broadcasting equipment.

1. STUDIO FLOOR (Position : CAMERA 20) Bangunan Wisma Tani

Require Network Port Configuration and Functionality Test :-

1. Audio
2. Video
3. Monitoring
4. Intercom
5. Control

A1



Network QoS Pre/Post Report

1. Network Stability
2. Speed UL/DL
3. Packet Data IB/OB
4. Throughput
5. 5G Spectrum Analyzer

A2



2. STUDIO GALERY @ OB TRAILER

Require Network Port Configuration and Functionality Test :-

1. Audio
2. Video
3. Monitoring
4. Intercom
5. Control

A2



Network QoS Pre/Post Report

1. Network Stability
2. Speed UL/DL
3. Packet Data IB/OB
4. Throughput
5. 5G Spectrum Analyzer

B2



Measure Latency of :-

1. Audio
2. Video
3. Monitoring
4. Intercom
5. Control

C2



Measure Baseband HD Video Quality Standard

1. SMPTE
2. ITU-R
3. RP

D2



3. WB ANGKASAPURI

Require Network Port Configuration and Functionality Test :-

1. Audio
2. Video
3. Monitoring
4. Intercom
5. Control

A3



Network QoS Pre/Post Report

1. Network Stability
2. Speed UL/DL
3. Packet Data IB/OB
4. Throughput
5. 5G Spectrum Analyzer

B3



Measure Latency of :-

1. Audio
2. Video
3. Monitoring
4. Intercom
5. Control

C3



Measure Baseband HD Video Quality Standard

1. SMPTE
2. ITU-R
3. RP

D3



Diagram 2: Responsibility of agencies for planning, conducting and executing on field test measurement



ROOF of CONCEPT (PoC)
PUBLIC 5G NETWORK SLICING TECHNOLOGY
FOR RADIO TELEVISYEN MALAYSIA (RTM)
BROADCAST FACILITIES AND SERVICES

TIME: _____
DATE: _____
TEST NO.: _____

FORM 1 | CHECKLIST
5G SLICING NETWORK
TEST PARAMETER

PART A: Functionality Test

NO.	TASK	STATUS		REMARKS
		PASS	FAILED	
1.	Audio Signal (Receive @ Prod. Gallery)			
2.	Video Signal (Receive @ Prod. Gallery)			
3.	Intercom (Duplex Communication @ Prod. Gallery)			
4.	Monitoring SRT (Receive @ Std. Floor Remote Area)			
5.	Monitoring RVF (Receive @ Std. Floor Remote Area)			
6.	Control PTZ Camera (Respond from Prod. Gallery to Std. Floor Remote Area)			
7.	Tally Light Switcher (Respond from Prod. Gallery to Std. Floor Remote Area)			

PART B: Latency Test Network QoS Pre/Post Report

NO.	TASK	STATUS		REMARKS
		PASS	FAILED	
1.	Network Stability			
2.	Speed UL/DL			
3.	Packet Data IB/OB			
4.	Throughput			
5.	5G Signal Interference (5G Spectrum Analyser Report)			

PART C: Latency Test

NO.	TASK	STATUS		REMARKS
		PASS	FAILED	
1.	Video Signal HD Signal 1080/50 Value: Delay 0.3s, 5 Mbps			
2.	Video Signal HD Signal 1080/50 Value: Delay 0.3, 8 Mbps			
3.	Video Signal HD Signal 1080/50 Value: Delay 0.3, 10 Mbps			
4.	Camera Control Respond Value: Delay _____, _____ Mbps			

PART D: Signal Baseband Quality Test

NO.	TASK	STATUS		REMARKS
		PASS	FAILED	
1.	Eye Pattern Video Signal (RTM Live Video Signal Quality Guideline)			
2.	Audio Signal (RTM Live Video Signal Quality Guideline)			
3.	White Balance Camera Line Up (Waveform Monitor: Dual Diamond Result - Master + Additional Camera)			

Note:

Check By	Verify By (1)	Verify By (2)	Approve By

Picture 2: PoC Parameter Measurement check list for overall functionality, performance and quality for broadcast tv production requirement using 5G Network Slicing



Picture 3: Broadcast Video Baseband Quality Measurement Guideline

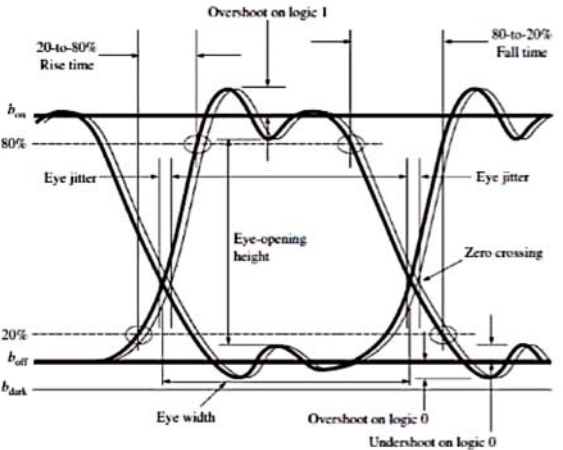
BROADCAST STANDARD GUIDELINE VIDEO SIGNAL				
NO	PARAMETER	STANDARD VALUE	STANDARD	MEASURED VALUE
1	Eye Amplitude	800 mV ± 80 mV	SMPTE 292M (1.5 Gbps, Single-Link) SMPTE 372M (3.0 Gbps, Dual-Link) SMPTE 424M (3.0 Gbps, Single-Link)	
2	Eye Rise Time	≤ 270 ps	SMPTE 292-1	
3	Eye Fall Time	≤ 270 ps	SMPTE 292-1	
4	Eye Overshoot	< 10%	SMPTE 292-1	
5	Undershoot	< 10%	SMPTE 292-1	
6	Jitter	≤ 673.4 ps or 0.1 UI	SMPTE 292-1	
7	RGB Level	700 mV ± 35 mV	SMPTE/EBU N10	
8	YPbPr Level	700 mV ± 35 mV	SMPTE/EBU N10	
9	Video Format	1080 Lines, 50 Hz	ITU-R BT. 601	
10	Y Chan CRC Error	No error	SMPTE 292-1	
11	C Chan CRC Error	No error	SMPTE 292-1	
12	Y Anc Checksum Error	No error	SMPTE 292-1	
13	C Anc Checksum Error	No Error	SMPTE 292-1	

Compliance Check Procedure:

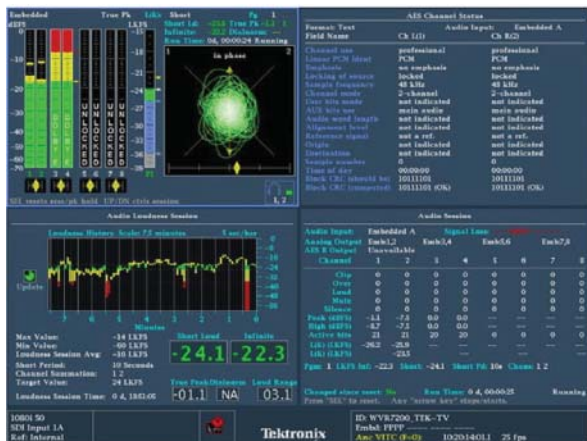
1. Review the relevant SMPTE and ITU-R standards for audio TV production, video TV production, duplex inter-communication, video monitoring, and broadcast equipment remote control.
2. Verify that the 5G network slicing setup meets these standards.
3. Follow the recommended practices by equipment manufacturers for installation, configuration, and operation.
4. Conduct tests to ensure compliance and document the results.

Expected Outcome:

The 5G network slicing setup should meet the relevant standards and recommended practices, ensuring high-quality and reliable broadcasting services.



Picture 4: Broadcast Quality Measure base on SMPTE 292-1, 1.5 Gb/s Signal/Data Serial Interface as minimum baseline baseband signal measurement for HD signal in RTM for production and transmission



BROADCAST STANDARD GUIDELINE | AUDIO SIGNAL



NO	PARAMETER	STANDARD VALUE	STANDARD	MEASURED VALUE
1	Alignment Level	-18dBFS (1kHz)	EBU R68 / Rec. ITU-R BS.645-2	
2	Program Level (PML)	-9dBFS	EBU R68 / Rec. ITU-R BS.645-2	
3	Max. True Peak Level	-1dBTP	EBU R128 / EBU Tech 3343	
5	Loudness Level	-23LUFS	EBU R128 / ITU-R BS.1770	
6	Audio Mode	Mono / Stereo	BASE ON SYSTEM LINE-UP	
7	Sample Rate	44.1kHz / 48kHz	BASE ON SYSTEM LINE-UP	

NO	PARAMETER	EXPECTED RESULT	MEASURED	
			TEST TONE	AUDIO SIGNAL
1	Audio Level (dBFS)	L = -18 dBFS R = -18 dBFS	L = R =	L = R =
2	Audio Phase	In Phase		
3	Audio Cut Left	Ok		
4	Audio Cut Right	Ok		
5	SPL Size	L = -24 LUFS R = -24 LUFS	L = R =	L = R =
6	Sample Rate (kHz)	48 kHz		
7	Block CRC (OK)	Ok		

Picture 5: Broadcast Audio Baseband Quality Measurement Parameter Guideline

CONCLUSION

The PoC for integrating 5G network slicing technology into RTM's broadcast facilities and services is a critical step towards revolutionizing broadcasting. By focusing on key broadcast elements, conducting comprehensive functionality tests, ensuring compliance with standards, and measuring QoS parameters, RTM aims to evaluate the readiness of 5G networks for broadcasting.

The Merdeka Day Parade in Putrajaya provides an ideal environment for this trial, offering insights into the performance and reliability of 5G network slicing under challenging conditions.

Stay tuned for Part 2 of this article, where we will share the results, measurements, and findings of the RTM 5G Network Slicing PoC.

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AUTHORS:



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Ts. Tarmimi bin Sahad holds a BEng in Electronics and Telecommunications Engineering and an MSc in Information and Telecommunications. With 22 years of experience at RTM, including 14 years in TV production, he has developed extensive expertise in the field. Currently, he serves as the Deputy Director of Outside Broadcast TV, where he oversees and manages the operations of live television broadcasts.



Engr. Mazlina binti Mohd Yusoff is the Chief Assistant Director at the Strategic Planning Section, RTM, Malaysia. With a Master's in Engineering (Communication & Computer) from UKM and a BEng (Hons) in Electronics, she has extensive experience in IT, OTT platforms, and broadcasting. Her roles have spanned strategic planning, engineering education, and media technology, with a focus on aligning broadcasting initiatives with national objectives. ■

ABU Engineering Awards

Panel of Judges

- ABU Broadcast Engineering Excellence Award
- ABU Developing Broadcasters' Excellence Award
- ABU Young Engineers' Broadcasting Award

- ABU Engineering Industry Excellence Award
- ABU Broadcast Engineering Award on SDGs Implementation



Mr Masashi Kamei, Senior Research Engineer, **Nippon Hoso Kyokai (NHK-Japan)** and Vice-Chairman ABU Technical Committee. Appointed a member of the panel in March 2019.



Mr Kazim Pektas, Chief Engineer, Studio Planning Department, **Turkish Radio Television Corporation (TRT-Türkiye)** and Vice-Chairman ABU Technical Committee. Appointed a member of the panel in January 2022.



Mr Ashok Kumar Jha, Deputy Director General (Engg), All-India Radio (**Prasar Bharati-India**) and Vice-Chairman ABU Technical Committee. Appointed a member of the panel in July 2024.



Mr Sheng Zifan, CTO of ABS (NRTA-China) and Vice-Chairman ABU Technical Committee. Appointed a member of the panel in July 2024.



Mr Ismail Sulaiman, Director of Technical Services Division, **Radio Television Malaysia (RTM-Malaysia)** and a member of Technical Bureau. Appointed a member of the panel in July 2024.



Mr Peh Beng Yeow, Lead, Content Preparation of **Mediacorp-Singapore** and a member of Technical Bureau. Appointed a member of the panel in July 2024.



Mr Naoki Kashimura, Director of the Board, Managing Director, Product Strategy & Marketing Division, Research & Development, **Ikegami Tsushinki Co Ltd, Japan**. Appointed a member of the panel in 2008.



Mr Fintan Mc Kiernan, Chief Executive Officer - South East Asia, **Ideal Systems, Singapore**. Appointed a member of the panel in June 2014.



Mr Peter Bruce, Sr. Channel Sales Manager, APAC, **Harmonic**. Appointed a member of the panel in June 2018.



Mr Charles Sevier, CTO (APJ), **Dell EMC**, Data Lake Scale Out Storage. Appointed a member of the panel in June 2015.



Mr Alexander Zink, Senior Business Development Manager, Digital Radio, **Fraunhofer**. Appointed a member of the panel in July 2018.



Mr Aale Raza, Director, **Whiteways Systems, Singapore**. Appointed a member of the panel in July 2024.

News from The ABU Region

ABC WELCOMES THE LAUNCH OF THE AUSTRALIAN GOVERNMENT'S INDO-PACIFIC BROADCASTING STRATEGY (IPBS)

The Indo-Pacific Broadcasting Strategy (IPBS) of the Australian government has been accepted by the Australian Broadcasting Corporation (ABC), with ABC International designated as a crucial implementation partner. The federal government responded to the approach by allocating \$32 million in the 2022 budget and an extra \$8.5 million in the 2023 budget to extend ABC International's media development and broadcasting reach throughout the Indo-Pacific region.

With this support, ABC has expanded regional media links, expanded the circulation of Australian material, and started development initiatives to fortify media resilience thanks to this support. While Claire M. Gorman, head of ABC International, highlighted the investment's impact on media projects and broadcasting, ABC Managing Director David Anderson highlighted the broadcaster's unique regional experience.

Notable accomplishments include the introduction of new 24-hour FM services in several Pacific areas, content that is specifically catered to Asian and Pacific audiences, and shows like ABC Radio Australia's Pacific-focused lineup. In addition, ABC International has started media development initiatives, mostly in Indonesia and Timor-Leste, with a focus on digital storytelling, safety, and media education. It has also covered significant regional events including elections and cultural festivals. [\[ABC News\]](#)

NVIDIA AND ADOBE RECOGNIZED AS RECIPIENTS OF THE 76TH ENGINEERING, SCIENCE & TECHNOLOGY EMMY AWARDS

The Television Academy has announced the recipients of the 76th Engineering, Science & Technology Emmy Awards, a distinguished accolade celebrating significant contributions to the progress of broadcast technology. These awards honor individuals, companies, and organizations that have made notable advancements in improving the storytelling process for television production. This year's honourees consist of trailblazers in electro/mechanical camera stabilization systems, groundbreaking software applications, LED volume production technologies, the MDMF standard, and advanced generative artificial intelligence tools.

The awards ceremony, featuring Criminal Minds star Kirsten Vangsness as host, will take place on 23 October 2024 at the Television Academy's Saban Media Center in North Hollywood, California. A highlight of the evening will be the presentation of the Charles F. Jenkins Lifetime Achievement Award presented to Jensen Huang, the visionary founder of NVIDIA, in acknowledgment of his significant contributions to the field. [\[TV Tech\]](#)

RTM EXPANDS AES67 IP-BASED RADIO WORKFLOWS ACROSS MALAYSIA

Radio Televisyen Malaysia (RTM) is moving to an AES67 IP-based workflow at its regional radio stations, following a successful pilot at Perlis FM. This new system, focused on Calrec Audio's Type R fader panels and implemented by JAA Systems, offers RTM improved scalability, flexibility, and audio quality. The infrastructure upgrade facilitates simpler integration of future technologies without requiring additional conversion equipment or interfaces.

The rollout began in 2021, and since then, IP-based systems have been installed in twelve additional regional stations, including Sabah FM, Labuan FM, and Negeri FM. RTM is also engaged in installations at Keningau FM, Sandakan FM, and additional locations, with the goal of equipping around 60% of its regional stations with this advanced infrastructure. In total, the deployment consists of 192 type R panels and 104 type R cores, establishing a standardized and efficient system throughout RTM's entire network.

This large-scale transition aims to ensure uniformity across all stations while allowing for the adaptability to support different station sizes and configurations. The AES67-based system enables RTM to manage various studio configurations, with the number of fader panels and cores customized to meet the specific requirements of each station. This approach facilitates more efficient operations and provides a strong basis for RTM's current and future technological developments. [\[ABU News\]](#)

NEW UN INITIATIVE TO REDUCE DISASTER RISK WITH AI

A new United Nations initiative, led by various prominent UN agencies, seeks to utilize advanced digital technologies, including artificial intelligence (AI), to strengthen resilience to natural hazards and mitigate disaster risks. The global initiative on enhancing resilience to natural hazards through AI solutions is led by the

International Telecommunication Union (ITU), the UN Environment Programme (UNEP), the UN Framework Convention on Climate Change (UNFCCC), the Universal Postal Union (UPU), and the World Meteorological Organization (WMO).

This initiative aims to investigate AI applications, provide expert guidance, and support research, innovation, and the establishment of technical standards to tackle escalating climate volatility and disaster risks. A primary objective is to develop an AI readiness framework to evaluate and enhance national capabilities for utilizing AI in disaster management. The initiative will focus on various natural hazards, such as seismic and hydrometeorological events, as well as compound disasters.

ITU Secretary-General Doreen Bogdan-Martin highlighted the significance of technical standards to ensure the safe and equitable application of AI in disaster management, necessitating rapid and responsible decision-making. The initiative is also in accordance with the “Early Warnings for All” campaign, which aims to safeguard the global population with timely disaster alerts by 2027. Building on the efforts of a focus group initiated in 2021, the initiative utilizes the group’s analysis of 27 AI use cases, which established the groundwork for new international standards. The group’s efforts encompassed examining the role of AI in data collection, hazard modeling, and emergency communications. It also provided a roadmap for standardization, a glossary of terms, and expert guidance on the integration of AI into disaster management tools, including early warning systems, hazard mapping, and decision-support systems. [\[ITU News\]](#)

ETERE ENHANCES MEDIA SEARCH WITH AI AND FACIAL RECOGNITION

Etere MAM has launched an advanced AI-powered facial recognition feature that automatically indexes metadata, greatly enhancing the platform’s search and organization capabilities. This new feature allows users to broaden search criteria through the use of facial recognition technology, significantly enhancing the efficiency of media management operations. For instance, users can now conduct searches using an artist’s profile image saved in personal data, facilitating more intuitive and precise searches within extensive media libraries. This feature is available as an add-on license, with the number of licenses required based on the number of files that need to be scanned simultaneously. Additionally, the solution is offered as an on-premise option that requires no additional hardware, facilitating seamless integration into

existing workflows.

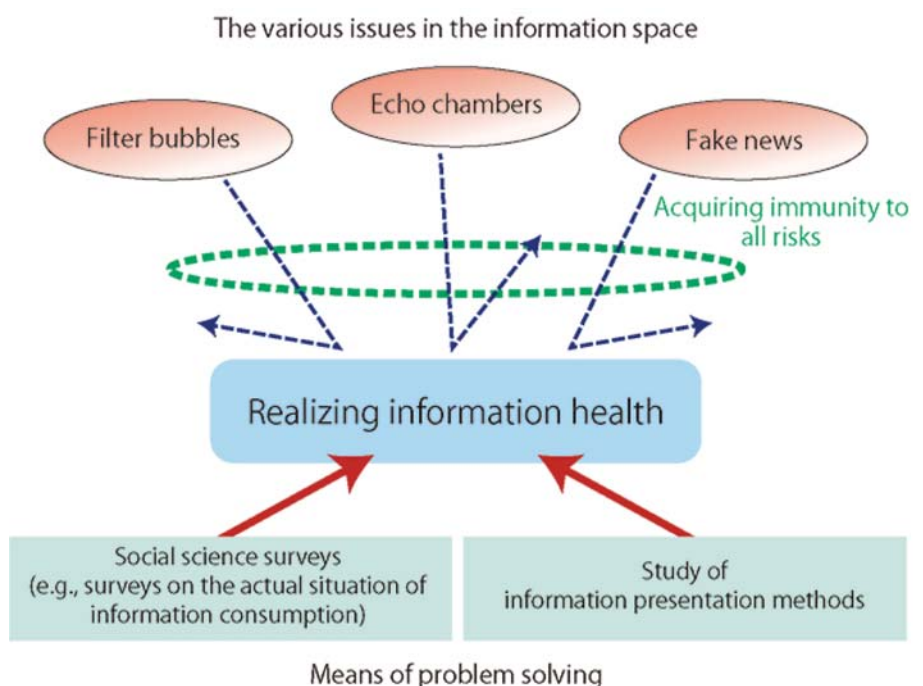
The AI-driven facial recognition technology can analyze individual scenes in media files and provide a list of matching faces within seconds. It is engineered to perform efficiently even in challenging conditions, including low lighting or difficult camera angles, guaranteeing precise outcomes irrespective of media quality. This new functionality enables broadcasters and media professionals to exert greater control over large media libraries, allowing them to swiftly search, find, and repurpose media files for the efficient creation of high-quality content.

Additionally, this integration improves the existing suite of smart features in Etere MAM. These encompass tools that assist users in automating routine tasks, deriving actionable insights from their media libraries, and ultimately enhancing both operational efficiency and the overall quality of their media assets. The integration of AI-powered facial recognition enhances Etere MAM’s status as a complete media asset management solution tailored to the changing requirements of broadcasters and media professionals. [\[Content+Technology\]](#)

WHAT IS THE OPTIMAL METHOD TO CONSUME INFORMATION IN THE AGE OF FAKE NEWS?

With the rise of social media and generative AI, an overwhelming surge of information has emerged, contributing to social challenges such as filter bubbles, echo chambers, and the spread of fake news. In response, the concept of “informational health” has been introduced, and STRL is actively conducting research to promote it.

Informational health refers to a state where individuals are exposed to a balanced range of information and develop resilience against challenges within the digital information landscape. Social media platforms often curate content based on user preferences, which can



limit access to a variety of essential information – much like consuming only preferred foods without considering nutritional balance. The aim of informational health is to help individuals consume information in a more balanced way, akin to following a healthy diet.

STRL's research focuses on analysing the dissemination of information on social media and exploring individuals' information consumption behaviours through surveys and interviews. The objective is to understand the elements of informational health and to develop systems that present media in a manner that promotes balanced information consumption. [\[NHK STRL\]](#)

GLOBALM TO SHOWCASE NEW CLOUD ORCHESTRATION CAPABILITIES AT IBC2024

GlobalM's software-defined video network (SDVN) technology provides dynamic scaling, redundant switching, and efficient resource management, allowing users to adapt to changing demands. Central to GlobalM's technology is an advanced orchestrator that simplifies video delivery through a user-friendly interface that resembles traditional broadcast workflows. This orchestrator enables infrastructure setup and point-to-multipoint content transport at speeds up to 60 times faster, incorporating cloud computing into broadcasting workflows through user-friendly drag-and-drop functionality.

GlobalM optimises cloud resource utilisation by employing multiple cloud providers based on deployment requirements, reducing latency and improving performance. This multi-cloud strategy ensures efficient, reliable, and high-quality video delivery across various platforms. The technology features enhanced network redundancy, guaranteeing uninterrupted service

availability and swift recovery from network failures, ensuring a seamless viewing experience.

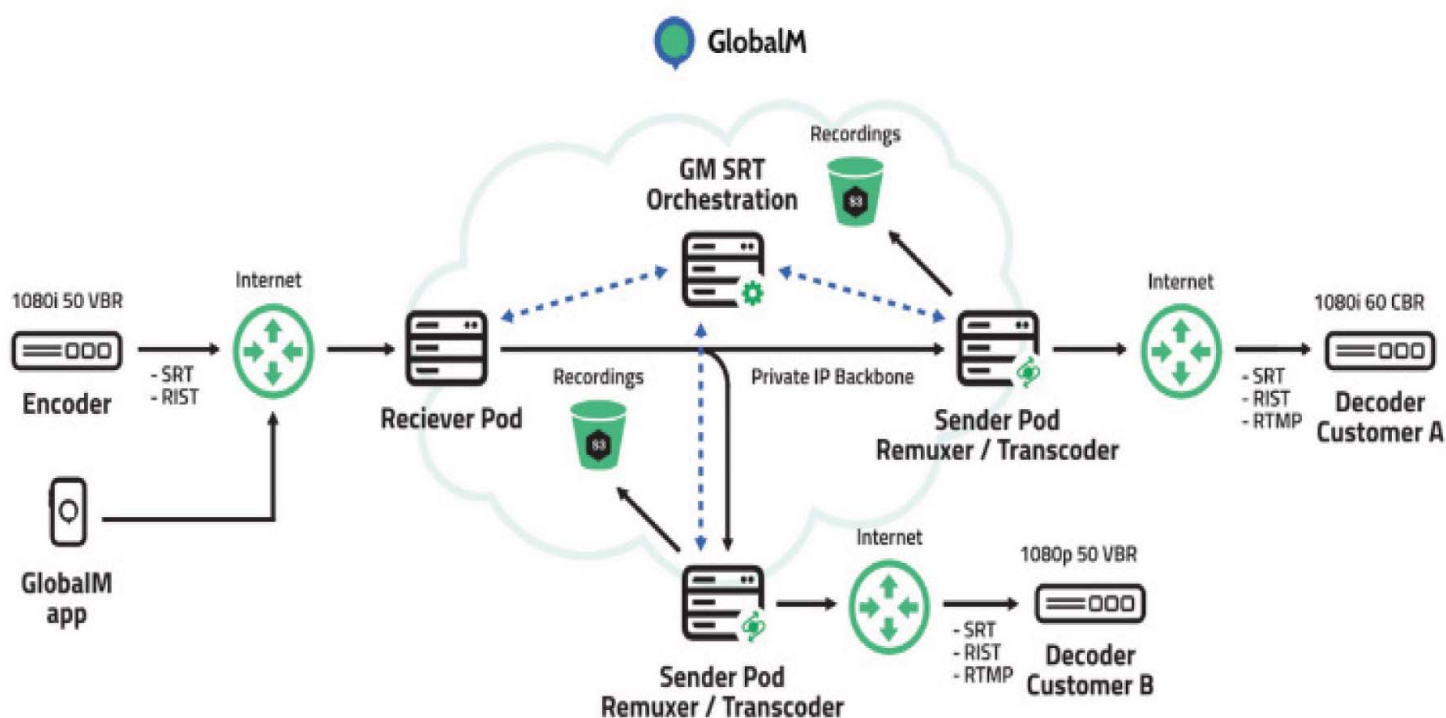
Paul Calleja, CEO of GlobalM, emphasized IBC 2024 as a prime opportunity to demonstrate how GlobalM's SDVN technology is revolutionizing video transport. He highlighted the company's role in bridging broadcast engineering and IT, stating that the orchestrator streamlines complex tasks, allowing users to concentrate on producing outstanding content. [\[APB News\]](#)

NBTC AND PRD PLAN DIGITAL UPGRADES FOR THAILAND'S BROADCASTING

The National Broadcasting and Telecommunications Commission (NBTC) convened with the Public Relations Department (PRD) on 16 August 2024 to discuss enhancing the efficiency of broadcasting and television in the digital age. Gen. Dr. Sayan Sawatsri, accompanied by other high-ranking officials, focused on aligning the operations of Radio Thailand and NBT with contemporary media demands. The Director-General Sudruetai Lertkasem and executives assessed previous performances and considered strategies to improve content delivery across multiple platforms. The collaboration demonstrates a mutual dedication to modernizing Thailand's public broadcasting services through digital innovations. [\[ABU News\]](#)

INDONESIAN MINISTER OF COMMUNICATION AND INFORMATICS ENCOURAGES PUBLIC BROADCASTER RRI TO DIGITIZE

At the beginning of August, Minister of Communication and Informatics Budi Arie Setiadi urged Radio Republik Indonesia (RRI) to adopt digitization in order to utilize advanced technology that enhances interactivity. He emphasized that the broadcasting industry is currently



undergoing significant disruption, presenting a serious challenge that necessitates the radio sector's adaptation to technological advancements. This message was shared during a public discussion titled "Challenges and Opportunities for Radio Broadcasting Digitalization", held in Jakarta.

Minister Budi Arie emphasised the importance of implementing four strategic steps to foster the growth of digital-based radio broadcasting. These steps include coordinated planning to ensure digitalisation aligns with market trends, community needs, and sustainability goals. Additionally, a multistakeholder approach is essential, engaging organisers, regulators, and the public at various stages of development. Optimising the digital radio ecosystem, utilising RRI's infrastructure to support DRM and DAB+ technology standards, as outlined in a 2023 ministerial recommendation, is also a key focus. Finally, introducing more interactive and accessible formats, such as audio on demand and data analytics, is advised to better serve Indonesian audiences.

By implementing these strategies, the minister believes radio broadcasting can seize new opportunities, particularly in programme development and advertising strategies that are responsive to evolving consumer behaviour. [\[DRM\]](#)

IRDETO AND BITMOVIN PARTNER FOR SECURE, LOW-LATENCY STREAMING WITH EXCEPTIONAL USER EXPERIENCE

Irdeto and Bitmovin have announced a strategic partnership to enhance secure video streaming experiences. This collaboration integrates Bitmovin's Player and Analytics suite into Irdeto Experience, a leading streaming platform used by top-tier operators worldwide. The joint offering allows streaming service providers, content owners, and pay-TV operators to benefit from seamless, high-quality streaming, extended device reach, and advanced advertising and security features.

The partnership combines Irdeto's expertise in security with Bitmovin's player technology, providing a comprehensive solution for low-latency streaming across a wide range of devices, including Smart TVs. This ensures an optimal and secure viewer experience, especially for live sports and premium content. Irdeto COO Andrew Bunten highlighted that the collaboration delivers scalability, security, and a superior user experience, enabling faster market entry. Bitmovin's CEO Stefan Lederer expressed excitement about the partnership, noting that it brings a world-class streaming solution that balances quality, security, and innovation.

This partnership strengthens the companies' presence among global tier-1 operators, offering an integrated solution that enhances user experience and accelerates time to market. [\[Irdeto\]](#)

TVU NETWORKS REVOLUTIONIZES BROADCAST WITH UNMATCHED VISIBILITY INTO MEDIA SUPPLY CHAINS

TVU Networks, a leader in IP and cloud-based live video solutions, announced significant advancements in media production infrastructure with its expanded SaaS platform, which provides unparalleled visibility and operational control across cloud, on-premise, and hybrid environments. This platform, which includes the world's first fully integrated virtual Network Operation Center (NOC), allows broadcasters real-time oversight of their entire media pipeline, from contribution to final playout, at no extra cost.

TVU's CEO, Paul Shen, highlighted that their platform breaks traditional cloud limitations by offering complete operational control, ensuring data integrity and workflow reliability. Additionally, the platform enhances workflow agility through tools such as UDX for Up/Down/Cross-Conversion, browser-based video scopes, and both manual and AI-powered color correction for IP sources. With support for multiple standards, it integrates seamlessly into any media production setup.

The cost-effective platform provides unlimited access to features, with additional fees only for active production microservices. Major broadcasters, such as France Télévisions, have saved up to 92% in costs by using TVU's platform for content production and distribution. Shen emphasized that TVU is simplifying and reducing the costs of cloud adoption, empowering media organizations with full control of their media pipelines in today's dynamic production landscape. [\[TVU Networks\]](#)

RTHK WINS ABU AWARD

Radio Television Hong Kong (RTHK) was honoured with an Asia-Pacific Broadcasting Award at the Together for Planet, People, Peace Media Awards (T4P Media Awards), hosted by the Asia-Pacific Broadcasting Union (ABU) in partnership with UNESCO. These awards recognise media content that promotes sustainability, inclusivity, and peace through media and information literacy (MIL). Originally launched in 2021 as the ABU/UNESCO Together for Peace Awards, the revamped T4P Awards received over 100 entries from 30 countries in 2024.

RTHK Radio 5's program "It's a Happy Day" won the "Peace" category in the radio division. The program, comprising 365 one-minute episodes, assisted listeners in managing stress and negative emotions during the COVID-19 pandemic by providing mental health tips. Additionally, RTHK's Chinese news and current affairs team was nominated in the "Planet" category for a report featuring environmental advocate Mok Ho-Kwong, also known as "Wild Man". The winners were announced during the 8th Abu Media Summit on Climate Action and Disaster Prevention in Bali on 7 August 2024.

[\[Radioinfo\]](#) ■

DIGITAL BROADCASTING *Updates*

NEW DVB BLUEBOOKS: TARGETED ADVERTISING IN DASH AND COMMERCIAL REQUIREMENTS FOR CMCD

In the recent DVB Steering Board meeting, updates to the Targeted Advertising (DVB-TA) specifications were approved, along with the establishment of commercial requirements for new CDN-related functionalities in DVB-I and DVB-DASH.

DVB-TA for DASH

The DVB-TA specifications are divided into three parts. Part 1 addresses advert placement in broadcast streams, Part 2 details the interface with advertising servers, and Part 3 focuses on ad placement in DVB-DASH streams. The latest revision of Part 3 includes a vital annex on ad content conditioning, ensuring compatibility between ad content and the main content.

Verification and validation of DVB-TA Part 3 are currently ongoing, and once completed, it will be submitted to ETSI for publication.

CMCD in DVB

DVB is dedicated to developing specifications that facilitate the transition to IP- and internet-based television services, such as DVB-I and DVB-DASH, tailored for connected TVs. Content delivery networks (CDNs) play a crucial role in ensuring reliable, high-quality streams within this ecosystem. A new mechanism, Common Media Client Data (CMCD), standardised in September 2022, enables media players to send playback information back to the CDN for optimisation.

DVB intends to allow broadcasters and other providers of DVB-I-signalled linear services to leverage CMCD technology to enhance service delivery to consumers. The commercial requirements, outlined in BlueBook C109, specify how the CMCD reporting mechanism should be integrated into DASH players for use with DVB-I services.

Other Upcoming Publications

The Steering Board has announced the completion of updates to the DVB-RCS2 specifications for non-geostationary satellite constellations, with publication as BlueBooks expected soon. Updates to related signalling specifications will also be included. Additionally, DVB Native IP Broadcasting (DVB-NIP) is set to be published by ETSI as TS 103 876 V1.1.1 in the near future, with its standardisation nearing completion.

DVB Home Broadcast

The release of DVB-NIP follows ETSI's recent publication of DVB-HB (Home Broadcast), now available as TS 104 025 V1.1.1. Key points include:

- DVB-HB was developed from the Sat>IP specification for distributing broadcast content within homes via IP.
- DVB-NIP supports native IP delivery over broadcast networks, eliminating the need for IP conversion in home gateways and reducing long-term dependence on DVB-HB.
- Despite this, DVB-HB remains relevant for connected devices and is referenced by DVB-NIP for gateway discovery.

[DVB News]

CREATIVE TECHNOLOGY BOOSTS PRODUCTION WITH IMAGINE SNP

Imagine Communications has announced that Creative Technology, a leader in live events and system integration, has implemented Imagine's Selenio Network Processor (SNP) across its key locations in the U.S., U.K., Northern Europe, and the Middle East. This deployment facilitates a smooth transition for Creative Technology from SDI to SMPTE ST 2110 IP, leveraging the SNP platform for consistent IP gateway functionality. The SNP-XL, recently tested at major international sports events such as global golf tournaments and the Paris Games, plays a crucial role in this initiative.

The SNP integrates seamlessly with Creative Technology's preferred vision mixing platform, Panasonic KAIROS, providing a high-density SDI gateway for live video production. Its flexibility allows for reconfiguration for various functions, including multiviewing or JPEG XS conversion, simply by loading different software. This adaptability is considered a significant advantage for live events.

The compact design of the SNP enables easy integration into flypacks, offering high density with up to 64 bidirectional SDI/2110 flows in just 2RU with the SNP-XL. Creative Technology utilises the SNP for various applications, scaling the platform as needed for live events by adding additional units for every 32x32 conversion required.

The SNP platform's use of 100G QSFP connectors facilitates direct connection to KAIROS, featuring a straightforward 1:1 hard-patch to the mixer's inputs and outputs. This setup allows technicians, even those with limited IP engineering experience, to utilise a software-defined IP switcher without the added complexities of network switches, control platforms, or a grandmaster clock – all of which are managed internally by the SNP. Mathias Eckert, Senior Vice President & General Manager EMEA and APAC of Imagine Communications, emphasised the strong partnership with Creative Technology and praised the SNP's flexibility and innovative design, which continue to support successful live event productions worldwide. [TV Tech]



MRTV ENHANCES NEWSROOM EFFICIENCY WITH ETERE NUNZIO UPGRADE

Myanmar Radio and Television (MRTV) has upgraded its newsroom operations by transitioning to Etere's Nunzio system, replacing the previous Octopus Newsroom. This upgrade aims to boost efficiency, streamline processes, and enhance news coverage across the country.

Etere was selected as the preferred choice for MRTV, one of Myanmar's leading free-to-air TV channels, following a thorough technical evaluation. The Etere Nunzio Newsroom, part of the Etere Ecosystem, offers a customisable suite of software solutions that manage end-to-end broadcasting workflows. The system is scalable to adapt to changing business needs.

The Nunzio Newsroom provides an integrated platform for managing news from initial concept to final broadcast. It connects seamlessly with Etere Media Asset Management (MAM) to ensure accurate media delivery. The system can handle complex stories with multiple video elements, including files, live streams, graphics, and secondary media. Key features include automatic indexing, AI-driven facial recognition, and Optical Character Recognition (OCR) for text recognition within images. With a robust database for searchable metadata, Nunzio facilitates the easy creation, customisation, and repurposing of news stories. It supports unlimited MOS integration for incorporating third-party components, such as teleprompters, and includes a MOS Gateway Activity Monitor for tracking MOS device activities.

Furthermore, Nunzio offers tools for social media integration, e-paper and website uploads, audience feedback tracking, and publishing to multiple social media accounts. It integrates with NLE editing systems such as Adobe Premiere Pro and DaVinci Resolve, allowing users to search Etere MAM segments and incorporate them into projects seamlessly. Additionally, Nunzio serves as a central repository for real-time agency wire downloads.

[\[Content+Technology\]](#)

CELCOMDIGI TO PRESENT MALAYSIA'S FIRST LIVE BROADCAST OF SUKMA 2024 USING 5G-ADVANCED TECHNOLOGY

CelcomDigi Berhad, in collaboration with U Mobile Sdn Bhd and ZTE Corporation, successfully delivered Malaysia's first live broadcast powered by 5G-Advanced technology during SUKMA 2024. This landmark event was accessible to viewers nationwide.

The partnership was formalized through a Memorandum of Understanding (MoU) signed at MWC Barcelona 2024. The agreement included the deployment of 5G-A technology for the live broadcast of SUKMA 2024's Opening Ceremony on August 17, 2024, from Stadium Sarawak, facilitated by Radio Televisyen Malaysia (RTM). The broadcast showcased 5G-A's capabilities, such as ultra-

low latency and high throughput, enhancing the efficiency and dynamism of large-scale live broadcasts.

The trial featured ZTE's state-of-the-art mmWave Active Antenna Unit (AAU), known for its wide bandwidth and 1024-antenna array. The technology utilized advanced Carrier Aggregation, Cluster Dynamic Frequency Selection, and native AI Intelligent Radio Access Network (RAN) for superior network and streaming management. These innovations allowed a single cell to achieve over 30 Gbps capacity, with individual users experiencing speeds up to 8.5 Gbps. The strong performance of 5G-A technology proved beneficial for both business-to-business (B2B) and business-to-consumer (B2C) services, ensuring an optimal user experience.

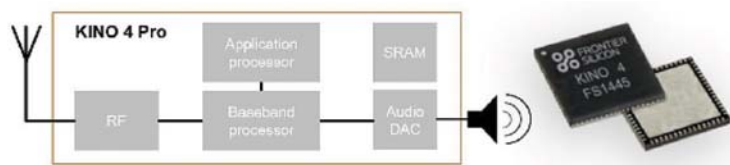
The successful live broadcast of SUKMA 2024 marked a significant milestone in Malaysia's technological advancement, demonstrating the potential of 5G-Advanced technology in revolutionizing live broadcasts and enhancing viewer experiences nationwide. [\[ABU News\]](#)

FRONTIER ENHANCES DAB+ WITH AUTOMATIC SAFETY ALERT FEATURE

As part of a global collaboration with the DAB+ industry, Frontier has been actively working on the development of a new feature aimed at providing significant benefits to digital radio listeners and their communities.

The Automatic Safety Alert (ASA) feature enhances the DAB+ standard by enabling the automatic broadcast of safety alerts via audio, text, and images. This ensures that critical information can be quickly and reliably delivered to large audiences.

ASA will activate on DAB+ radio receivers, even in standby mode, with the device automatically waking up to broadcast critical alerts. Devices are configured with a location code, allowing alerts to be broadcast only to those within a specified region.



Frontier's Kino 4 Pro chip and Siena Pro module, which power over 25 million DAB radios, will support ASA with a new SDK version releasing later this year. Both the chip and module have passed the latest Digital Tick technology test and will be the first to achieve ASA certification in Q4 2024. Mass production of the first products is expected to commence in early 2025.

The ASA functionality will be a distinctive addition to Frontier's SDK, complementing its other proprietary radio technologies like BestTune™, ActiveScan™, and NoiseSkip™, which are integrated into Frontier's DAB solutions. Combined, these features enhance the performance and reliability of Frontier's DAB+ solutions, setting them apart in the industry. [\[Frontier Smart Technology\]](#)

5G BROADCAST RECEIVER PROFILE FOR EUROPE RELEASED FOR REVIEW

The European 5G Broadcast handset taskforce, which includes members from the EBU (European Broadcasting Union) and BNE (Broadcast Networks Europe), has released a 5G Broadcast receiver profile. This profile is designed for companies in the broadcasting sector preparing for the rollout of 5G Broadcast services across Europe. It marks a significant step towards introducing smartphones with 5G Broadcast capabilities in the region.

5G Broadcast has been commercially ready since early 2023, with standardization mostly completed. Leading European broadcasters have been testing the technology for several years, and the first smartphones with key 5G Broadcast features have already been developed.

To support this rollout, the broadcast industry requires harmonized technical standards for mobile devices to ensure compatibility across Europe. This uniformity will help broadcasters and network operators build sustainable business models. Broadcasters and network operators from France (France Télévisions and TDF), Italy (RAI and EITowers), Germany (Media Broadcast), and Austria (ORS), alongside Qualcomm Technologies, Inc., formed a working group to establish this common receiver profile for Europe.

The finalized profile has been submitted to 5G-MAG, the industry body that manages the development of the 5G Broadcast specification (**ETSI TS 103 720**). The profile is publicly available on 5G-MAG's GitHub page for feedback from the broadcast industry. The aim is to incorporate this profile into the next version of the ETSI specification, encouraging chipset and consumer electronics manufacturers to adopt it in their product development plans. [\[EBU News\]](#)

EUROVISION SPORT AND CAMB.AI LAUNCH EUROPE'S FIRST AI-POWERED REAL-TIME COMMENTARY

CAMB.AI, a leader in AI-driven language solutions, successfully provided live sports commentary dubbing from French to Portuguese using cutting-edge AI technology, following trials on the Eurovision Sport platform earlier this summer. In partnership with CAMB.AI, Eurovision Sport advanced its mission of making sports more accessible by offering real-time, accurate, and engaging commentary in fans' native languages, significantly enhancing the overall viewing experience.

Jean-Baptiste Casta, Director of Business Operations at EurovisionSport.com, emphasized the significance of this technological breakthrough, noting that the collaboration with CAMB.AI to bring AI-driven live sports commentary to Europe marked a key achievement. The successful trials during the European Aquatics Championships in June and the European Athletics in July demonstrated a strong demand for commentary in native languages, which led to extending the partnership for the World Athletics U20 Championships.

Akshat Prakash, Chief Technology Officer at CAMB.AI, expressed excitement about working with Eurovision Sport

during the 2024 World Athletics U20. He highlighted that CAMB.AI's AI-powered translation and dubbing solutions created a more inclusive global experience by allowing fans from diverse linguistic backgrounds to follow their favourite competitions in real-time.

This collaboration enabled fans to enjoy the 2024 Lima Championships in Portuguese, alongside English and French, further showcasing the transformative impact of AI on sports broadcasting. [\[EBU News\]](#)

TELOS ALLIANCE® AND SUPER HI-FI PARTNER TO ENHANCE LIVE RADIO EXPERIENCES

Telos Alliance®, a trusted global leader in broadcast audio for over three decades, has teamed up with Super Hi-Fi, a pioneer in AI-powered radio services for broadcast and digital media companies. This technology partnership aims to enhance the listener experience while giving radio broadcasters valuable time back in their day.

At the core of this collaboration is LiveConnect™, a new live-over-IP protocol that connects traditional live radio shows to cloud playout and production systems. This innovation offers remarkable flexibility, high reliability, and built-in security. With LiveConnect, broadcasters can effortlessly go live from any studio – regardless of location – to any radio station at any time. The broadcast studio is no longer confined to a single space.

Leveraging the Power of AI to Make Better Radio

At the heart of the partnership is a shared commitment by both companies to use AI as a tool to help on-air talent, not replace them. "Artificial Intelligence has gotten a bad rap in radio because it's been used to make a very connectational medium less personal", Telos Alliance's Sacks explains. "Broadcasters see it as a threat, and listeners are pushing back because it just feels wrong. LiveConnect is an example of how AI can be used to make radio better, for stations and for listeners".

"LiveConnect will literally empower radio talent to deliver better shows to their listeners", adds Super Hi-Fi's Zalon "AI assistance will enable them to focus on the creative part of their jobs instead of the mechanical part. It's a win-win for radio station operators, managers, and talent alike. We are incredibly excited to be bringing this to the market".

The LiveConnect Workflow

LiveConnect is a high-fidelity audio IP link with advanced control capabilities, creating a seamless connection between the Telos Alliance family of broadcast products, such as the Axia® Quasar and Altus mixing consoles, and Program Director™, Super Hi-Fi's cloud-based Radio Operating System.

Whether used in Live Broadcast mode (for a traditional morning show) or Programmatic mode (to enhance voice-tracked shows), the integration of physical and virtual technologies fosters a more flexible and efficient workflow. This approach reduces complexity and cost, allowing talent to focus on their creative strengths while creating a more engaging experience for listeners. [\[PRWeb\]](#) ■

Equipment Trends



SSL S400: FLAGSHIP CONTROL, COMPACT FORM – POWER IN YOUR HANDS

The S400 is the latest product from Solid State Logic (SSL), a renowned leader in audio technology, and a part of their System T range. Designed to deliver advanced audio control, the S400 offers a compact and cost-effective solution. It's suitable for a variety of environments, from broadcast studios to OB vehicles and event spaces. With flexible configurations of 16, 32, or 48 faders, it provides a premium fader experience while maintaining power, precision, and versatility, ideal for smaller installations or integration into larger systems. The S400 shares the same high-quality faders and operational features found in the **S500**, including dedicated **OLED displays** and **advanced metering** for each channel. Its compact design allows it to be used in **standalone configurations** or integrated into larger **System T** setups.

Key specifications:

- **Fader configurations:** Available in 16, 32, and 48 fader versions
- **OLED displays:** Dedicated for every channel for real-time feedback
- **Touch sense faders:** 100mm with graphical user interface controls
- **Advanced metering:** On-tile LED and on-screen metering for various audio formats, including stereo and surround sound (up to 7.1.4)
- **Touchscreens:** Multi-gesture control with intuitive graphical interfaces
- **960 addressable paths per tile:** 60 fader layouts and 15 layers of four banks for extensive customization
- **Fanless design:** With internal redundant power supplies for reliability
- **Monitor controls:** Dedicated encoders for various outputs and talkback functionality
- **Flexible integration:** Works with Tempest Processing Engines, Network I/O, and other System T consoles for full compatibility

With its full software interoperability, seamless **AoIP routing** and **immersive audio support**, the S400 is a powerful, compact solution for modern production environments looking for both efficiency and performance. <https://solidstatellogic.com/>

THE COMPACT, LIGHTWEIGHT, MULTI-PURPOSE CAMERA REDEFINING FLEXIBILITY

Sony has introduced the HDC-P50A, a new compact and lightweight multi-purpose camera that delivers cutting-edge functionality in a versatile form factor. With its 2/3-inch 3-chip 4K image sensor and global shutter function, this camera is poised to meet the growing demand for high-quality video production, especially in the broadcasting and live production industry.

Key Features:

The HDC-P50A is packed with features and options that provide enhanced flexibility for a wide range of shooting scenarios. Here's an overview of its main highlights:

- **High-Performance Image Sensor:**
Equipped with a 2/3-inch 3-chip 4K image sensor, inherited from Sony's renowned HDC-3500 and HDC-5500 models, ensuring superior color reproduction and image quality.
- **Global Shutter:**
A global shutter function, reducing motion artifacts and

making it ideal for capturing fast-moving subjects.

- **SMPTE ST 2110 IP Transmission:**
The camera supports IP transmission using SMPTE ST 2110, widely adopted in live production environments. It can deliver direct IP output with the optional HZC-SFP5A license, making it ideal for IP-based studios.
- **Compatible Camera Control Units:**
The HDC-P50A is compatible with HDCU-5000 and HDCU-5500 camera control units (CCUs) and the IP camera extension adapter HDCE-TX50, enabling long-distance operation, up to 10 km, via single-mode fiber.
- **Versatility in Installation:**
Thanks to its compact and lightweight design, the camera can be installed in difficult-to-reach places, including aerial shots or crane-based setups. It is highly adaptable for various production setups, from sports broadcasts to live events.
- **Slow-Motion Capabilities:**
When connected to compatible CCUs, the camera supports up to 4x slow-motion in 4K resolution and 8x slow-motion in HD, enhancing its versatility in sports and



dynamic environments.

- **Built-In Variable ND Filter:**

The optional HKC-VND50 variable ND filter unit provides enhanced exposure control, making the camera adaptable to various lighting conditions.

- **Network Integration with CNA-2:**

The HDC-P50A can be seamlessly integrated into Sony's Networked Live ecosystem with centralized monitoring and remote operation through the camera control network adapter CNA-2.

Interoperability and System Integration

Designed for seamless integration, the HDC-P50A uses the same sensor technology as the HDC-5000 and HDC-3000 series. This ensures colour matching and simplifies adding the camera to existing production setups, supporting BT.2020 and S-Gamut3 colour spaces.

Sony's HDC-P50A offers a variety of features aimed at enhancing video production with its compact design, advanced imaging, and IP transmission capabilities. Designed to integrate with existing broadcast systems, it can be utilized in diverse environments, from remote shoots to larger live production setups, providing an adaptable option for professionals working in modern video production. <https://www.sony.com/en/>

TELESTREAM VLS-300 : NEXT-LEVEL PERFORMANCE FOR HIGH-VOLUME MEDIA PROCESSING

Telestream has launched the VLS-300 Vantage Lightspeed server, engineered to deliver significant improvements in transcoding and media processing workflows. As the first model in the next-generation Lightspeed series, the VLS-300 promises a 30% performance boost over its predecessor, making it ideal for environments that demand fast and efficient media processing.

Key Features of the Telestream VLS-300

The VLS-300 is designed to handle the rigorous demands of large-scale media processing in industries like broadcasting, post-production, and media distribution. With cutting-edge hardware, it ensures speed, efficiency, and reliability.

- **Dual NVIDIA A4000 GPUs**

At the heart of the VLS-300 are two NVIDIA A4000 GPUs, providing exceptional processing power to handle even the most complex transcoding tasks. This setup allows for faster media processing, reducing overall production time.

- **High-Speed Solid-State Storage**

Equipped with NVMe 800GB OS drives and dual 1.92TB media storage RAID drive bays, the VLS-300 ensures rapid file access and storage, critical for handling large media files in fast-paced environments.

- **Advanced Cooling and Power Supply**

To ensure smooth operation during heavy workloads, the server features robust cooling systems and dual power supplies, maintaining optimal performance even during prolonged media processing tasks.

- **Versatile Network Connectivity**

The VLS-300 supports 2-Port 1G/10G RJ45 Ethernet, with the option for 25G and 100G network configurations, providing flexibility to suit various infrastructure requirements. This versatility makes it easy to integrate into existing setups and scale as needed.

Ideal for High-Volume Workflows

The VLS-300 is built specifically for high-volume media processing workflows, making it an essential tool for broadcasters, media organizations, and post-production teams. Paired with Telestream's Vantage platform, it accelerates end-to-end media processing tasks, allowing for faster transcoding, seamless workflow integration, and greater overall efficiency.

Whether it's managing large video files, converting media formats, or handling high-volume processing requirements, the VLS-300 delivers the power and speed needed to stay ahead in today's fast-paced media production environment. The Telestream VLS-300 Vantage Lightspeed server delivers high performance for large-scale media processing with its dual GPUs, solid-state storage, and flexible networking, ensuring faster workflows and greater efficiency for media-heavy organizations. <https://www.telestream.net/>

SEACAM SEAFLASH 160D: THE ULTIMATE STROBE FOR WIDE ANGLE PHOTOGRAPHY

Exploring advanced underwater equipment can offer valuable insights into emerging technology trends. In this edition, we take a closer look at the Seacam Seaflash 160D – a powerful strobe tailored for underwater photographers seeking exceptional wide-angle performance. Known for its bright, uniform beam quality, the Seaflash 160D boasts impressive features that set it apart, even within the competitive realm of high-performance strobe lighting.

Key Features of the Seacam Seaflash 160D

Seacam's Seaflash 160D is more than just another underwater strobe; it's a workhorse built to perform under the most demanding shooting conditions. Whether you're capturing expansive underwater landscapes or fast-moving marine life, this strobe delivers stunning lighting precision with a range of customizable options.

- **Unrivaled Wide-Angle Beam Quality**

The Seaflash 160D provides the brightest, widest, and most even beam among the strobes we've reviewed,





with natural edge falloff that produces smooth lighting transitions. It's the strobe of choice for underwater photographers who need superior light coverage in wide-angle shots.

- **Electronic TTL for Canon and Nikon**

One of the standout features is its built-in electronic TTL, which supports both Canon and Nikon cameras in a single model. This eliminates the need for external converters or concerns about compatibility with future camera models, making it a versatile choice for professionals.

- **High-Speed Sync Performance**

With support for high-speed sync, the Seaflash 160D allows for shutter speeds up to 1/8000th, ideal for capturing fast-moving subjects in challenging underwater environments. This feature is compatible with both Canon and Nikon systems, adding to its overall flexibility.

- **Customizable Controls**

The strobe's controls are well-organized, with an easy-to-read LCD screen visible in any lighting condition. However, the infinite control dial with no hard stops at full or minimum power may require extra attention during quick adjustments. The trade-off is the advanced menu options that come with more customizable settings.

- **Snoot Mount for Macro Photography**

The Seaflash 160D also features an integrated bayonet-style snoot mount, making it an option for macro work. Although its size and weight make it less ideal for macro photography, the versatility adds another layer of value for photographers who need both wide-angle and macro capabilities in a single device.

Pros	Cons
Unmatched wide-angle beam quality	The most expensive strobe reviewed
Built-in electronic TTL for Canon and Nikon	Infinite control dial with no hard stops
High-speed sync for fast shutter speeds	
Easy-to-read LCD and customizable settings	
Integrated bayonet-mount snoot for macro	

Who Is the Seaflash 160D For?

For professionals working in high-pressure environments – whether underwater or in broadcast production – reliable, high-performance equipment is crucial. The Seacam Seaflash 160D is an investment for underwater photographers who demand the best in beam quality and control. Its advanced features cater to the most precise lighting needs, making it suitable for those who require both versatility and top-tier performance.

The Seacam Seaflash 160D stands out as a high-end strobe with features that align with the growing demand for precision, speed, and versatility – whether in the water or on land. Though it's positioned at the top of the market, its performance justifies the price tag. It's a clear reflection of where high-performance lighting technology is heading, making it a relevant addition to any equipment trend conversation, even for those accustomed to broadcasting gear. <https://www.seacam.com/en/seaflash/>

SOFTRAIL: THE BEST OF BOTH WORLDS IN ROBOTIC CAMERA CONTROL BY SHOTOKU BROADCAST SYSTEMS

Introducing **SoftRail** from Shotoku Broadcast Systems, an innovative solution that seamlessly merges the precision of a traditional rail system with the flexibility of a fully-robotic, free-roaming camera pedestal. Designed for use with the SmartPed studio pedestal and powered by the latest TR-XT control software, SoftRail offers a new level of adaptability in studio camera movements, eliminating the restrictions associated with physical rail systems.

What Makes SoftRail Revolutionary?

Traditionally, rail systems have been the go-to for precise camera control, providing the ability to follow intricate set layouts and avoid obstacles. However, the use of physical rails can limit a studio's overall flexibility, pose hazards to other equipment or personnel, and make future adjustments to set designs or camera layouts difficult. SoftRail removes these issues by enabling SmartPed to move with the precision of a rail system – without the need for permanent tracks.

SoftRail allows SmartPed to follow virtual paths with the same level of precision as a physical rail system. With the



TR-XT's **StudioView** mode, operators can design and implement limitless virtual rails, giving unprecedented flexibility to the studio setup. The ability to instantly switch between free-roaming and virtual rail modes at the touch of a button means that SmartPed can adapt to the changing needs of any production. This seamless transition can take place in real-time, ensuring that your equipment is always ready to meet the demands of the moment.

The **StudioView** integration within the TR-XT control system provides operators with a complete visual overview of the studio, displaying active virtual rails, exclusion zones, and the overall studio layout. This allows for both safe and precise camera movements, ensuring the studio remains efficient and well-coordinated during live broadcasts or recordings.

Since SoftRail operates using virtual rails, the design possibilities are virtually limitless. Operators can create paths that would be impossible with physical rails, such as intricate loops or overlapping routes, which opens up new possibilities for creative and dynamic camera work. Additionally, the lack of physical tracks on the studio floor ensures greater safety and flexibility, as presenters, guests,

and crew members can move freely without the risk of tripping over rails. It also enables greater adaptability for non-rail cameras and other equipment, enhancing the versatility of the studio layout.

SoftRail, developed by **Shotoku Broadcast Systems**, redefines how camera movements are managed in modern studio environments. By offering the precision of a rail system combined with the freedom of a free-roaming pedestal, this innovative solution provides unparalleled control, safety, and flexibility. Whether in a live broadcast setting or navigating a complex studio layout, SoftRail empowers production teams to push creative boundaries while maintaining efficiency and adaptability. It's a game-changer for studios looking to maximize their camera capabilities without compromising on movement or control. <https://www.shotoku.co.uk/>

UNLOCKING ULTRA-LOW LATENCY: MATROX MONARCH EDGE S1 – THE FUTURE OF REMOTE BROADCASTING

Introduction:

In an age where remote production is more vital than ever, the Matrox Monarch EDGE S1 stands at the forefront,



providing broadcasters with a compact, yet powerful solution for seamless video transport. With the rise of remote and hybrid productions, the need for high-quality, synchronized, and low-latency video streams is crucial. This all-in-one encoder and decoder brings cutting-edge features designed to elevate live broadcasting, remote guest integration, and contribution workflows.

Key Features and Trends:

The Monarch EDGE S1 excels in remote production, offering simultaneous encoding and decoding with ultra-low latency of just 100ms. This ensures real-time interaction between studio personnel and remote participants, which is a game-changer for live shows, sports broadcasts, and large-scale events. Supporting protocols like MPEG-2 TS, RTSP, and SRT, the Monarch EDGE S1 adapts to any network condition. Whether you're streaming over closed networks or congested open ones, this device ensures reliable video delivery. The SRT protocol further adds encryption for secure transmissions, making it perfect for sensitive broadcast environments.

High-quality video encoding is crucial for professional broadcasts, and the Monarch EDGE S1 doesn't disappoint. With the ability to encode up to 1080p60 in 10-bit 4:2:2, it maintains exceptional visual fidelity while optimizing bandwidth. Broadcasters can expect top-tier image quality without the data bloat. Synchronization across multiple video sources is critical for live production. The Monarch EDGE S1 supports multi-stream sync and onboard genlock, ensuring all feeds remain in perfect alignment. This feature is indispensable for multi-camera productions where precision is key.

The Matrox Monarch EDGE S1 is designed for modern broadcast setups, offering easy rack-mounting and reliable performance for demanding productions. It reflects the growing trend of efficient, flexible remote production equipment, providing broadcasters with ultra-low latency and broadcast-quality video. As remote production demands rise, this compact, all-in-one device ensures you're ready for the future of media innovation.

<https://video.matrox.com/en>

MARSHALL CV625 PTZ CAMERA: AI-POWERED PRECISION FOR LARGE-SCALE PRODUCTIONS

Marshall Electronics unveils its latest innovation, the **CV625 PTZ camera**, set to revolutionize video production for large venues. This advanced camera is designed for applications such as broadcast events, stages, lecture halls, and large houses of worship, offering unmatched tracking capabilities and versatility in a compact form.

The CV625 comes equipped with a powerful **25x zoom** and a **high-performance 8-Megapixel 1/1.8-inch sensor**, enabling the capture of high-quality UHD video with resolutions up to **3840 x 2160 at 60 fps**. Its **83-degree horizontal angle-of-view** ensures wide coverage, making it ideal for dynamic, large-scale environments.

Leveraging **AI facial learning technology**, the CV625 can automatically track, follow, and frame presenters

with precision, ensuring smooth, uninterrupted coverage even as multiple people or objects enter the scene. This intelligent tracking capability makes it a game-changer for venues that require high-level automation in their video production.

In terms of connectivity, the CV625 offers a range of versatile output options including **HDMI, 3G-SDI, Ethernet, RTSP streaming** and **USB 3.0**, allowing seamless integration into various production setups. With the added ability to stream in **HEVC** directly over IP or via **USB C**, while simultaneously outputting content through SDI and HDMI, the camera meets the growing demand for **multi-platform streaming**. It can even stream live to popular social channels like **YouTube, Facebook (Meta)** and **Twitch**, making it perfect for hybrid productions that combine traditional broadcasting with live streaming.

Designed with flexibility in mind, the CV625 boasts an impressive **170-degree panning angle, -90 to +90-degree tilt rotation** and **variable pan and tilt speeds**. Users also benefit from a variety of setting controls including **focus, gain, white balance, exposure control** and **Wide Dynamic Range (WDR)** for optimal image quality in any lighting condition.

For easy control, the CV625 offers a range of options, including **RS232, Visca, Visca-over-IP, and Onvif protocols**, along with a handheld IR remote control, ensuring adaptability to a wide range of operational environments.

The **Marshall CV625 PTZ camera** stands out for its ability to deliver precise, AI-powered tracking, high-quality UHD video, and versatile connectivity, making it a vital tool for large-scale video productions and events.

<https://marshall-usa.com/> ■



Personalities & Posts

New Technical Liaison Officer

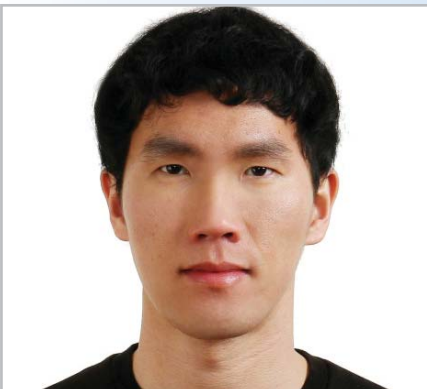


Mr Tatsuya Fujii, Senior Engineer, NHK World Department at NHK (Japan Broadcasting Corporation), has taken over from Mr Kenichiro Nagano as the ABU Technical Liaison Officer.

Mr Fujii joined NHK in 1994 and has mainly been involved in Outside Broadcast Engineering. Between 2015 and 2019, he held the role of Senior Manager in the Outside Broadcast Engineering Division, where he oversaw 4K/8K-HDR production. He produced various 8K programs as the engineer in charge of the 8K OB-Van, both domestically and internationally.

He was engaged in the Athens, Turin, and Tokyo Olympics as a member of the Host Broadcast Organization. Notably, during the Tokyo Olympics, he contributed to producing the international feed in 4K-HDR for the first time in Olympic history as a member of VQC (Vision Quality Control) of OBS (Olympic Broadcasting Services).

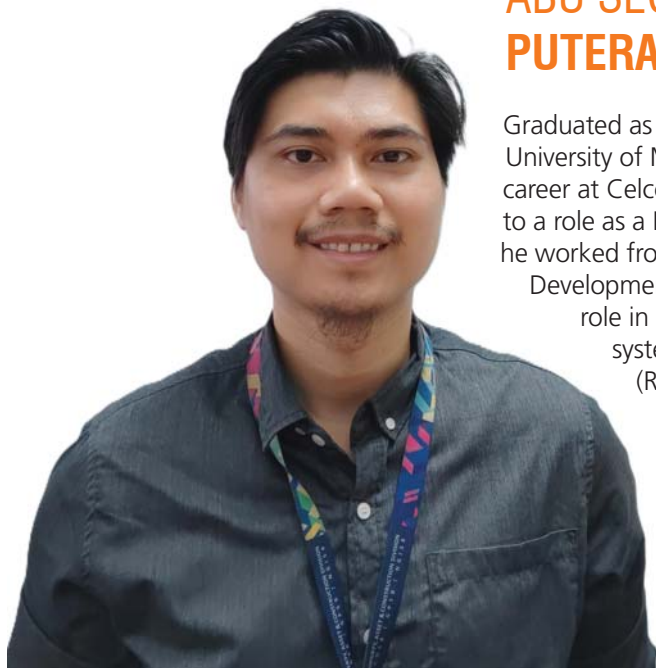
From 2021 to 2024, he served as the Head of Engineering at the NHK Yokohama Broadcasting Station. ■



Mr Minsang Kwon joined KBS in 2012. He has a Bachelor of Engineering in Electronic Engineering from Kyungpook National University in Korea. He have worked in various broadcast Production Technology departments, inspection and certification for broadcast instrument.

Currently as the member of KBS Technology Administration Division, He is in general charge of International Technology Cooperation. By reviewing technology policies, explore and implement new technologies, He aim to lead in broadcast techonology and contribute to the advancement of global broadcast industry in ABU. ■

ABU SECRETARIAT WELCOMES PUTERA AFIQ ZULFAQAR



Graduated as an Electronic Engineer in Telecommunication from the University of Malaysia Sarawak (UNIMAS) in November 2018. Began his career at Celcom Axiata as a Network Operation Engineer. Then, advanced to a role as a Master Control Room Engineer at Astro Holding, where he worked from 2018 to 2022. In October 2022, he joined Mediacity Development Sdn. Bhd. as a Broadcast Support Engineer, playing a pivotal role in supporting and maintaining the broadcast equipment and systems for the national broadcaster, Radio Television Malaysia (RTM). With over 6 years of experience in the broadcast industry, he has developed strong technical expertise in TV broadcasting, IPTV, and OTT platforms, and is proficient in end-to-end broadcast systems, including TV playout automation, Media Asset Management (MAM) systems, and data storage systems. He was involved as a project coordinator for major live events, including the 2020 World Cup and the Summer Olympic Games. ■

ABU TECHNOLOGY CALENDAR *of Events*

2024

15-19 January	HFCC A24 Conference	Kuala Lumpur
7 February	ABU-DRM Webinar on Delivering Emergency Warnings with DRM	Online
15-17 February	28 th BES Conference and Expo	New Delhi, India
4-7 March	ABU Digital Broadcasting Symposium 2024	Kuala Lumpur
9 April	Webinar Series on Member Innovations	Online
23-24 April	ABU Technical Bureau Mid-Year Meeting	Beijing, China
23-26 April	China Content Broadcasting Network show (CCBN)	Beijing, China
21-23 May	CABSAT	Dubai
21-24 May	KOBA Show	Seoul, Korea
29-31 May	BroadcastAsia 2024	Singapore
23-25 July	ABU-ASBU-WorldDAB Technical Workshop	Online
26-30 August	B24 Conference	Tashkent, Uzbekistan
September	Webinar Series on Member Innovations	Online
13-16 September	International Broadcasting Convention 2024	Amsterdam
18 October	ABU Technical Bureau Annual Meeting	Istanbul, Türkiye
19-20 October	ABU Technical Committee Meeting	Istanbul, Türkiye
22-23 October	ABU General Assembly	Istanbul, Türkiye
13-15 November	Inter BEE 2024	Japan
26-28 November	ABU-IPPTAR Technical Workshop	Kuala Lumpur



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