

# APB



## ASIA-PACIFIC BROADCASTING

News You Can Use

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# 2018 – a transformational year for the M&E industry

### WORLD IN BRIEF

#### Positive growth outlook for pay-TV in APAC

**SINGAPORE** – Pay-TV revenues in APAC have grown by 5% in 2018, taking region-wide industry revenue past the US\$56-billion mark, according to the *Asia-Pacific Pay-TV Distribution* report by Media Partners Asia (MPA). The report predicted that continued growth will see revenues exceeding US\$66 billion by 2023, a 3% CAGR.

#### 45% of Thai viewers use illicit streaming devices

**BANGKOK** – A study commissioned by Asia Video Industry Association's (AVIA) Coalition Against Piracy (CAP) revealed that 45% of consumers in Thailand use Illicit Streaming Devices (ISDs) to stream pirated TV and video content. Of the 45% of consumers who purchased the ISDs, more than 69% stated that they cancelled all or some of their subscriptions to legal pay-TV services.

#### FCC launches 5G spectrum auction

**WASHINGTON** – The Federal Communications Commission (FCC) has commenced its first high-band 5G spectrum auction. The FCC will be making 1.55GHz of spectrum available through the auction of spectrums in the 28GHz and 24GHz bands.

BY SHAWN LIEW

**SINGAPORE** – To suggest that 2018 has been a transformational year for the broadcast and media (M&E) industry is perhaps an understatement.

Television, as we know it in the most traditional sense — pre-programmed content transmitted over a linear platform — has been irrevocably changed. Consumers, in increasing numbers, are embracing their personal connected devices as the main medium in which to consume content.

Non-traditional content providers continue to thrive and flourish, as epitomised by the fact that Netflix is expected to spend up to US\$8 billion on 700 original series this year. Sports, traditionally a stronghold of pay-TV, is shifting

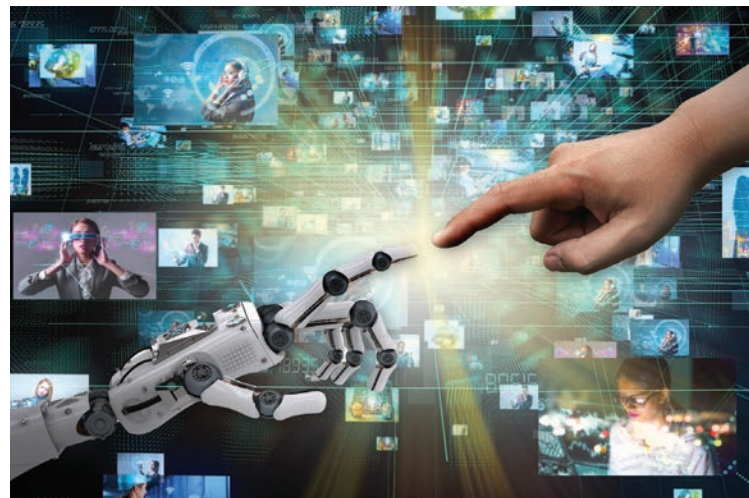


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From a technological perspective, 2018 has seen broadcasters and media companies explore various technologies as key enablers that will allow them to redefine key broadcast workflows with more efficiency and cost-effectiveness.

seismically towards the over-the-top (OTT) and video-on-demand (VoD) domains — the likes of Ama-

zon and Facebook have acquired live streaming rights to some of the most sought after sports content

in the world, including the hugely popular English Premier League.

How then are media companies adapting to these changes?

Consolidation of resources appears to be one way to go — Comcast's takeover of the UK's Sky and AT&T's acquisition of Time Warner are just some of the high-profile examples that reflect a wave of merger and acquisitions that is likely to continue.

From a technological perspective, 2018 has seen broadcasters and media companies explore various technologies as key enablers that will allow them to redefine key broadcast workflows with more efficiency and cost-effectiveness.

Of these technologies, IP has arguably, been the most keenly discussed, particularly with the

▶▶ 8

## Singapore first in SE Asia to go fully digital

**SINGAPORE** – The next chapter in Singapore's broadcast TV history is ready to be written, as the republic prepares to shut down all analogue TV transmission on 1 January 2019.

This, according to Goh Kim Soon, head, broadcast engineering, Mediacorp, is the culmination of a journey that began in September 2014, when the Info-communications Media Development Authority of Singapore (IMDA) launched the Digital TV Assistance Scheme to help low-income households make the switch

to digital TV (DTV).

"To help more Singaporeans transition to DTV, the scheme was expanded in April 2018 to all Singaporean households that do not subscribe to pay-TV, through the Digital Starter Kit," Goh added.

To further raise awareness about the digital switchover (DSO), IMDA organised weekly DTV carnivals and pop-up counters at various community centres, where residents can get their DTV-related queries answered and book

appointments for free installations. Reminders about the analogue switch-off date were also displayed on the TV screens of analogue TV viewers, to remind these households to switch over as soon as possible

Reflecting on a journey nearing its conclusion, Goh said: "Seamless migration to DTV requires a national effort involving all stakeholders in the industry — from the government to the broadcasters, retailers, TV manufacturers and

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# APB disrupting, reinventing & relaunching ITself in April

Digital technologies have affected almost all aspects of our lives and, for better or for worse, the publishing industry needs to disrupt itself and reinvent its business models. And this is exactly what APB is quietly doing in the past few months ... We will be launching a brand-new, easy-to-navigate digital platform this Christmas and suspending our print for the time being.

With effect from January 2019, you can follow the news, views and interviews of broadcasters in Asia-Pacific as well latest trends and technologies impacting the media industry in the region on our responsive digital platform [www.apb-news.com](http://www.apb-news.com).

As many of us are suffering from an overload of information as well as receiving inaccurate and fake news, our new electronic *APB eNews Weekly* will be carefully curated, with reports short and sharp, except for Trending and other analytical reports. This is to ensure our byte-sized news bulletin is easily assimilated and yet contains nuggets of useful information about what's happening in the industry in Asia and beyond.

Subscription to *APB eNews Weekly* is free.

We do welcome feedback from you as to what kind of news you like to receive, be it requests for latest mergers & acquisitions, new government regulations, best-of-breed hybrid equipment, best practices in running an all-IP workflow or other cost-effective software-based systems.

Do you want APB to keep an eye on technology giants Facebook, Apple, Amazon, Netflix and

Google — or collectively known as FAANG — as they continue to consolidate their positions in the media and entertainment space?

These tech giants, who boast high growth and deep pockets, have been investing heavily in original video content to attract and retain viewers to their respective platforms. Notably, Amazon and Facebook have even won the streaming rights to some of the world's biggest sports events, a content niche that traditionally was dominated by the pay-TV industry.

FAANG — friend or foe? You are welcome to share your views on FAANG or any other issues that are impacting the broadcast industry.

We love to hear from you ... Your opinions and feedback will help us to curate more accurately reports so as to provide you with *News You Can Use* — that's our abiding commitment to professionals in the industry.

*Andrew Yeo*  
ANDREW YEO  
PUBLISHER



## EDITORIAL

managing editor  
**Shawn Liew**, [shawn@editecintl.com](mailto:shawn@editecintl.com)  
contributing editor (technology)  
**Karl K Rossiter**, [karl@editecintl.com](mailto:karl@editecintl.com)  
news editor  
**Josephine Tan**, [josephine@editecintl.com](mailto:josephine@editecintl.com)

## CORRESPONDENTS

■ India  
**Shirish Nadkarni**, [shinads@yahoo.co.uk](mailto:shinads@yahoo.co.uk)  
■ USA  
**Mike Feazel**, [mfeazel@gmail.com](mailto:mfeazel@gmail.com)

## PRODUCTION

production editor  
**Zuraini Ridzwan**, [zuraini@editecintl.com](mailto:zuraini@editecintl.com)  
senior multimedia designer  
**Raymund Jaudian**, [raymund@editecintl.com](mailto:raymund@editecintl.com)  
ad administrator  
**Akram Saheed**, [akram@editecintl.com](mailto:akram@editecintl.com)  
accounts manager  
**Tan Hui Min**, [huimin@editecintl.com](mailto:huimin@editecintl.com)

## MARKETING

chief marketing officer  
**Kylie Chua**, [kylie@editecintl.com](mailto:kylie@editecintl.com)  
director - sales & marketing  
**Jessie Tan**, [jessie@editecintl.com](mailto:jessie@editecintl.com)  
manager - sales & marketing  
**Mark Ng**, [mark@editecintl.com](mailto:mark@editecintl.com)  
senior executive - sales & marketing  
**Joey Moh**, [joey@editecintl.com](mailto:joey@editecintl.com)  
executive - marketing & promotions  
**Akram Saheed**, [akram@editecintl.com](mailto:akram@editecintl.com)

## CIRCULATION

**Kylie Chua**, [kylie@editecintl.com](mailto:kylie@editecintl.com)  
**Joey Moh**, [joey@editecintl.com](mailto:joey@editecintl.com)

## PUBLISHING

**publisher/editorial director**  
**Andrew Yeo**, [andrew@editecintl.com](mailto:andrew@editecintl.com)

## MEDIA REPRESENTATIVES

■ China  
**Yang Ou**  
BEIJING BUNCH EXHIBITION SERVICES LTD  
Room 501/B1, Thunis Development Building, No. 11 Huixin East Street, Chaoyang District, Beijing 100029  
Tel: +86-10-6482 3808-106  
Fax: +86-10-6482 3670  
E-mail: [yangou@bbes.com.cn](mailto:yangou@bbes.com.cn)

## ■ Japan

**Mikio Tsuchiya**  
WORLD MEDIA SERVICES INC  
3-35-1-302, Hongodai, Sakae-Ku, Yokohama 247-0008  
Tel/Fax: +81-45-891-1852  
E-mail: [mikio.tsuchiya@worldmedia.jp](mailto:mikio.tsuchiya@worldmedia.jp)

## ■ USA & Canada

**Gary L Rhodes**  
SEDDOR MEDIA INC  
45 Florence Avenue, Leonardo, NJ 07737, USA  
Tel: 1-848-757-2930  
E-mail: [sedorusa@comcast.net](mailto:sedorusa@comcast.net)

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## APB PANELLISTS



**Dr Peter Siebert**  
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The DVB Project



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CTO  
IABM



**Andrew Anderson**  
Head of Broadcast  
Operations  
Seven Network  
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# Season's Greetings



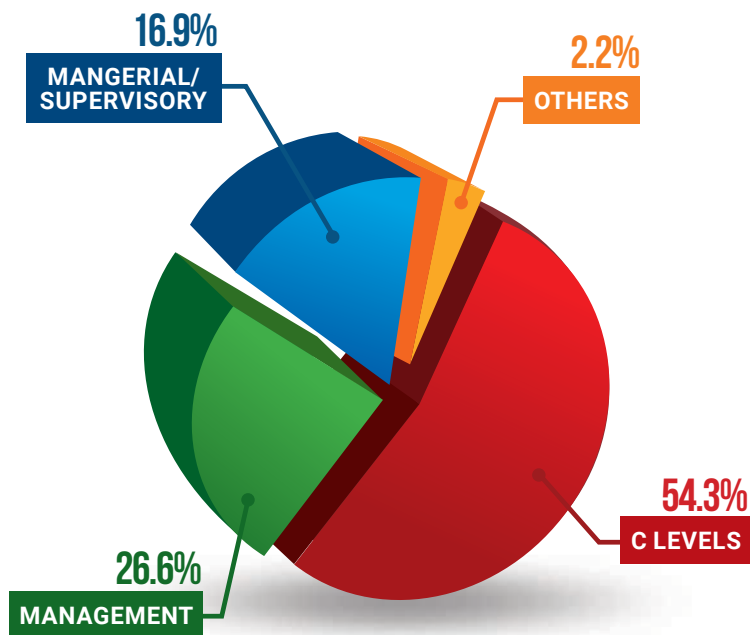
As the holiday season approaches,  
we'd like to take this opportunity to thank you  
for your continued support and we look forward  
to working with you in the coming year.

From all of us here at APB ...

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# IP and its impact on broadcast – now and the future

BY MIKE CRONK

For the past years, Internet Protocol (IP) for broadcast has been highlighted as a key technology in many industry surveys. It promises to transform how broadcasters and other media companies use and access live video, audio and data within production, playout and delivery workflows. As we close 2018, where are we? I submit we can definitively say that IP is beginning to have the positive transformational impact we have envisioned.

The broadcast industry has come together to support a common set of standards for IP transport, the SMPTE ST 2110 standards suite. Many broadcasters, including CCTV in China, KBS in South Korea, CNN, Fox Networks and others in the US, NEP in Australia and multiple facilities in Europe have implemented SMPTE ST 2110-based systems.

The technology has been used on such high-profile events as the soccer World Cup earlier this year in Russia, the UK Royal Wedding and Wimbledon tennis, and adoption continues to grow. At IBC2018 in September, the IP Showcase featured 58 vendors with a total of 168 products, not just interoperating, but demonstrating the clear benefits of IP-based systems.

It is precisely these benefits that are transformational, and which deliver on the promise of IP. As part of our preparation for the IP Showcase events

which we sponsor, AIMS reaches out to broadcasters who have deployed IP systems to get a sense of the benefits these systems bring.

The most often cited benefit is that IP allows broadcasters to build a plant infrastructure which is capable of handling any format. Given the proliferation of formats such as the various flavours of high dynamic range (HDR), 1080p, UHD-1 and UHD-2, no one has the perfect crystal ball to predict which of these must be handled within their facility.

In this environment, IP is the perfect choice for a new infrastructure build. Today, IP switches with 100G ports are commonplace and announcements of 400G switches have recently been made. With port speeds like these and a SMPTE ST 2110 standard that can handle the transport of any of these formats, a broadcaster can build an infrastructure that can accommodate any of the above formats, and that infrastructure can be easily expanded.

Those of us who remember the transition from SD to HD know that an SDI router upgrade of that magnitude is a big change. With today's proliferation of formats and rapidly

**“Now, with the foundational protocols of the SMPTE ST 2110 suite well established, we look to the future. IP can be used today very successfully as the multitude of successful installations attest to. With additional specifications, IP can also provide even greater benefits to our industry.”**

changing environment, a technology like IP allows one to make an investment that is flexible enough to last far into the future.

Another often cited advantage of IP from those broadcasters who are on air with SMPTE ST 2110 is scale. Technologically speaking, based on the design of modern SDI crosspoint chips, a 1152 x 1152 HD/3G router is the limit for a practical router design, and that router would take up about one full rack. If one were to try to build a 4K/Ultra HD (UHD) router with the same technology, a router that supported 1152 x 1152 signals would take four racks!

So how then does one build a network facility with signal routing requirements larger than this? How does one build a 4K/UHD outside broadcast (OB) truck that does not sacrifice on the number of cameras or vision mixer ports it can support? How does one provide sufficient multiviewing capability for medium to large-scale systems? The answer is IP.

A great example is Arena TV. The UK-based OB production company now has four IP-based OB trucks in operation involved in the broadcast of such iconic UK sporting events such as Premier League football.

As it sets out to build its first 4K/UHD truck, OB-X, the company wanted to be able to support 32 4K/UHD cameras and has the largest 4K/UHD vision mixer the market offered. When Arena TV looked at building this with SDI, there was not a 12G-SDI router on the market large enough (and there still is not), and if it used 3G routing technology (to transport 4K/UHD as four 2SI streams), the SDI routing system would take up four full racks.

By contrast, the IP switch which supports OB-X is a mere 10 rack units, and it has bandwidth to spare! Literally, the



signal scale that can be achieved with IP routing cannot be matched with SDI.

The third most often cited benefit of IP is the ability to share resources. As IP signals can be transmitted over long distances, either in a facility or over continents via a wide area network (WAN), equipment does not have to be co-located. This in turn enables the ability to share resources that are not co-located. An example of this is what NEP has done in Australia.

NEP has connected 29 venues to two central production hubs, one in Sydney and the other in Melbourne. This allows NEP to connect cameras at the venues to the network while sharing key production equipment centrally. Production crews in Sydney and Melbourne can produce the events and often the same crew can produce more than one event in the same day because they need not travel from venue to venue.

Other broadcasters are taking advantage of IP's long-distance transmission capabilities to locate the bulk of their broadcast equipment in an area with cheaper real estate, leaving only their studios and talent in a higher rent city area. These are variations on a common theme: with IP, one has more free-

dom to locate equipment and people where it makes the best business sense.

As the above examples show, the promise of IP for broadcasters is now becoming quite tangible. Now, with the foundational protocols of the SMPTE ST 2110 suite well established, we look to the future. IP can be used today very successfully as the multitude of successful installations attest to. With additional specifications, IP can also provide even greater benefits to our industry.

As I write this, key industry organizations involved in the development of standards and open specifications are seeking to build on the strong foundation of SMPTE ST 2110. With future specifications and common approaches to compressed video transport, discovery, registration, channel grouping, tally and reliable transport over the Internet, our industry will be able to build more agile, more flexible and more powerful systems, and do so faster than ever before. For this reason, the positive impact of IP on our industry is only just beginning. **APB**

*Mike Cronk is Chairman of the Board, Alliance for IP Media Solutions (AIMS). He is also an APB Panellist.*

**VIEW  
FROM THE  
TOP**

## APB PANELLISTS



**Graham Stephens**  
CTO  
Media City  
Development, Malaysia



**Goh Kim Soon**  
Senior Vice-President  
Broadcast Engineering  
Mediacorp



**Shad Hashmi**  
Vice-President,  
Digital Development,  
Global Markets & Operations,  
BBC Worldwide Asia



**What's on Screen**

Co-produced by Viu and Globe Studio, *Hello K-Idol* is a Viu Original reality talent show that follows 10 K-Idol finalists on their quest for stardom.



**Viu premieres Hello K-Idol**

**HONG KONG** – Viu is bringing the K-pop wave closer to Filipinos with the premiere of *Hello K-Idol*, the first Viu Original reality show of its kind in the Philippines.

The webisodes follow the 10 male K-Idol finalists as they undertake the seven-week challenge, where they will hone their talents in singing, dancing, performing, styling and teamwork. A star-studded cast — including Yook Sung-Jae from K-drama *Goblin* and Jung Joon-Young from variety show *2 Days & 1 Night* — will serve as inspirations for the K-Idol finalists, accessing their performances while providing them with guidance on their quest for stardom.

*Hello K-Idol* is co-produced

by Viu and Globe Studio, the entertainment division of Philippine telco Globe Telecom, and is available on Viu platform, as well as on ABS CBN's music channel, MYX Channel.

**HBO Asian Original's Grisse to hit foreign shores**

**MANILA** – Set in the mid 1800s within the colonial period of the Dutch East Indies, *Grisse*, HBO Asia's new original period drama, chronicles the story of a group of individuals who lead a rebellion against a brutal governor and suddenly find themselves in control of a Dutch garrison town called Grisse.

The story revolves around a number of characters from diverse backgrounds and creeds who unite for the chance to break the yoke of tyranny and write their own destiny.

The network has announced that some HBO Asian Original productions, including *Grisse*, will



*Grisse*, an eight-part hour-long series that is set in the mid 1800s within the colonial period of the Dutch East Indies, is developed and produced by HBO Asia alongside Singapore-based Infinite Studios.

be available to audiences in HBO Europe's territories. *Grisse* will also be available to HBO US subscribers across the channel's platforms,

including HBO Go, HBO Now, HBO On Demand, as well as participating TV and streaming partner platforms.



PHOTO CREDIT: KARL FERGUSON

**Netflix to produce Wyclef Jean-inspired musical film**

**HOLLYWOOD** – Netflix is collaborating with musical visionary Wyclef Jean on a CG animated feature film, which is inspired by the real-life story of Jean's childhood in Haiti. Stampede, an entertainment

**Musical visionary Wyclef Jean will be working with Netflix and Stampede to produce a CG animated film based on his childhood in Haiti.**

media company founded by Greg Silverman, is partnering Jean to produce the feature film, which will be written by Justin Marks.

Jean commented: "I grew up in extreme poverty but I was rich with imagination. Now to see that imagination turn into reality with Netflix and my producing partners makes me want to tell the kids from

the slums around the world to never stop dreaming."

Born in Haiti and raised in New Jersey, USA, Jean has written, performed and produced — as a solo and as founder and guiding member of the Fugees — some of the most enduring popular music of the current era and has been a strong force in the pop culture for over two decades.

OB VAN

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# China Mobile and Huawei tap 5G for 8K VR broadcast

**WUZHEN** – At the fifth World Internet Conference in China last month, Chinese telco China Mobile and Huawei jointly unveiled what they claimed as the first 5G network-based 8K virtual reality (VR) live broadcast.

The 8K VR live broadcast demonstration is delivered via Zhejiang Mobile's 5G network, which comprises of Huawei-developed 5G C-band sites and the core network.

Leveraging the uplink and downlink transmission conditions of bandwidth over 100MHz in the 5G network, the 8K VR 360-degree camera captured views of the picturesque South Lake in Jiaying. The compiled videos were then uploaded for cloud rendering in real time, while the scenery videos were then downloaded at a 5G speed to VR headsets.

The result was a panorama of islands scattered throughout the lake, combined with red boats and gardens featuring "vividly accurate colours and rich details" that allow audiences to enjoy a "fully immersive and mesmerising sightseeing experience".

In a joint statement, the companies pointed out that VR is "destined to become a popular future application", and is already



China Mobile and Huawei collaboratively demonstrated an 8K VR live broadcast, which was delivered over 5G network.

increasingly being recognised throughout the industry as one of the top 5G services. Viewers are able to not only enjoy scenic spots, concerts and sports events, but also gain access to gaming, entertainment videos, healthcare, real estate, retail, distance learning and engineering, among others.

Compared with 4K/Ultra HD (UHD) VR live broadcast, which requires 50-80Mbps, 8K VR services require a higher data rate of 100-160Mbps and wider bandwidth, the companies added. The faster network speed and increased dis-

play resolution will also allow users to benefit from a "more detailed, true-to-life, and immersive experience".

China Mobile and Huawei have also jointly verified multiple 5G key solutions in terms of cell throughput, single-user peak data rate, and user experience data rate. In addition to the demonstration of 5G 8K VR live broadcast, the two companies also took the opportunity to launch another two 5G services with 100Mbps data rate — 8K live broadcast, and in-ambulance telemedicine.

## IMDA, Mediacorp employ tiered approach to help households make the digital switch

1 >>

DTV equipment suppliers

"Since the first announcement of Singapore's decision to switch to DTV in December 2013, a joint IMDA-Mediacorp taskforce has been set up to look into a tiered approach in the nationwide #Switch2DTV marketing campaign — firstly, to create awareness of the DSO date and secondly, education on the benefits of DTV and the different ways to switch. This is followed by last-mile above-the-line, below-the-line and direct outreach

efforts to drive conversion."

Particularly for Mediacorp, the broadcaster adopted a 360-degree approach by leveraging its multiple platforms — out-of-home (OOH), print, radio, TV, digital — and utilising on its strengths to amplify direct-to-home (DTH) messages. These include star appeal via artistes' presence at heartland roadshows and shoutouts during drama promotions, as well as curated content, including DTV messages in Mediacorp's variety programmes, dramas and news coverage.

"Direct outreach efforts via

house visits by staff are also ongoing to help Singaporeans in this last lap of the nation's journey in DTV conversion," said Goh.

As to any transformational changes that Mediacorp can expect to enjoy after the DSO has been completed, he is keen to point out that Mediacorp's internal broadcast facility has been converted to digital for many years.

"With DSO and more people receiving DTV, Mediacorp will be able to leverage the digital transmission to introduce and experiment on services like Hybrid Broadcast Broadband TV (HbbTV) and 4K/Ultra HD (UHD)," Goh added.

"HbbTV uses both broadcast and broadband to allow a seamless experience for viewers to go from offline to online and vice versa.

"We have already launched the Toggle Red Button service in 2016 and will continue to develop the service."

Singapore will be the first country in South-east Asia to complete the DSO, with ASEAN having mandated a 2020 deadline for all countries in the region to complete the transition to DTV.

## M&E industry making 'bigger' transitional change this year

1 >>

ratification of the SMPTE ST 2110 standards suite. Writing in this issue of APB, Mike Cronk, chairman of the board, Alliance for IP Media Solutions (AIMS), suggested: "I submit we can definitively say that IP is beginning to have the positive transformational impact we have envisioned."

And IP can perhaps no longer be considered a pipe dream, with Cronk pointing out that the likes of China's CCTV, South Korea's KBS, CNN, Fox Networks and NEP in Australia have already implemented SMPTE ST 2110-based systems. (Read more on page 6.)

Recognising the importance of Asian broadcasters beginning to understand how they can make IP work for them, APB, in conjunction with partners Ideal Systems, Arista Networks, Dejero, Dell EMC, Embrionix and AJA Systems, organised an IP Master Class in Singapore in June this year.

Converting to IP is not just about replacing SDI; instead, there is a "bigger transition" at play, emphasised Michel Proulx, media industry advisor and former CTO of Miranda Technologies. Speaking as the keynote presenter at the APB IP Master Class, Proulx referred the "bigger transition" to the move from hardware-based, fixed-function solutions towards software-based solutions.

He explained: "The software-defined world needs IP because the real deal of flexibility comes from software, which will allow fixed tools to be more agile.

"Moreover, the benefits of moving to software is greater, as it will eventually lead to virtualisation and the cloud."

Other technologies that have taken their turns in the spotlight include virtual reality (VR) and artificial intelligence (AI). For the former, its aesthetic appeal and potential should not be dismissed out of hand; however, the fledgling technology would do well not to follow in the footsteps of 3D, which for varying reasons — the biggest of which, arguably, was those cumbersome eyewear — failed to sustain consumer interest.

The latter, in the age of digitisation and the Internet of Things, is perhaps an inevitable development. Alongside machine learning (ML), AI can potentially offer broadcasters a more in-depth understanding of their audiences, and thus to cater specific content to specific segments of audiences.

In Asia-Pacific, countries such as Japan and South Korea have already begun 4K/Ultra HD (UHD) broadcasts and in the case of the former, 8K will be its technical precursor to the 2020 Tokyo Olympics.

While the emergence of high dynamic range (HDR) is continuing to encourage broadcasters to embrace 4K/UHD, it remains to be seen if adoption will peak in the region, particularly when so many countries have yet to complete the transition to digital TV.

Take South-east Asia as an example — ASEAN having mandated that all countries in the bloc complete their digital transition by 2020 and the clock is ticking rapidly. Singapore is on track to be the first country in the region to complete the digital switchover (DSO), with all analogue TV signals to be permanently switched off by 1 January 2019.

And the DSO, perhaps, will be the most immediate challenge and priority for many broadcasters in Asia-Pacific. In order to enjoy the full benefits of many of the technologies mentioned above, it is imperative that broadcasters complete the DSO as speedily as possible.

What about emerging technologies whose potential impact on the broadcast and media industry remains uncertain?

Having been brought into the public consciousness by bitcoin, or cryptocurrency, what exactly can blockchain bring to the broadcast and media industry?

With blockchain technology, the digitisation of assets can be decentralised, trustful, traceable, highly transparent and free of intermediaries, said Mock Pak Lum, senior advisor at Tembusu Partners, a Singapore-based private equity firm.

Mock, former CTO of Singapore pay-TV operator StarHub, added: "Given that all media assets will be digitised, the distribution and consumption of media content is well suited for blockchain adoption.

"With the adoption of digital identity on blockchain by incorporating biometric verification, we can determine the person in the family who is consuming the content."

Less certain, perhaps, is how the broadcast and media landscape will evolve in 2019. Will consumers continue to strengthen their love affair with the consumption of video content over mobile platforms and devices? Will we see more broadcasters and media companies re-inventing themselves as OTT and VoD service providers — and will linear TV's role as the primary content consumption platform continue to diminish?

Come 2019 which technologies will emerge as the key enablers that will allow broadcasters to thrive in these increasingly uncertain times? The New Year promises to bring both answers, and questions, in equal measure.



Are you ready for digital TV? As part of a outreach programme, Mediacorp staff have been visiting households in Singapore to advise residents on how to switch to digital TV.



# Vidfish brings blockchain to entertainment



*With the rapid development of China's economy and society, the country's film and TV industry has*

*become increasingly prosperous and active on the international stage. Vidfish, a content streaming platform, claims to offer the largest Chinese content library outside China, and is aiming to leverage blockchain technology to create a collaborative ecosystem that unites content providers and producers with end-users. APB prompts Amie Hu, co-founder and CEO of Vidfish, on how the company's VUO Coin blockchain initiative can potentially transform the video entertainment industry.*

**Can you first give us an overview of Vidfish — who is your target audience, and what can viewers expect from Vidfish?**

**Amie Hu:** Vidfish is a video streaming over-the-top (OTT) platform, which has the world's largest licensed Chinese content library, outside mainland China. Although Vidfish does not operate in China, the video platform is similar to a Chinese-language Netflix, which operates as a subscription video-on-demand (SVoD) model, and provides 12,000 hours of premium uninterrupted online content — watched anytime, anywhere on the Vidfish app.

Our target audiences include viewers of Chinese-language video content outside of China. South-east Asia is currently our largest market, but we are aiming to attract a global audience across the world. Anyone who is yearning to watch Chinese-language content outside China is our target viewer. With more than 50 million viewers of Chinese content outside China, we aim to have a user base of one million by 2019. Our content library is diverse, and provides high-quality licensed Chinese content in HD with smooth video streaming capabilities and an advertising-free experience. The Vidfish app is available in more than 190 countries, and can be downloaded via iOS and Android.

We have partnered with top content providers in the Chinese film and TV industry — Hunan Broadcasting Network Mango TV, Jetsen Huashi, Zhejiang Hua Ce Film & TV, New Classics Media, and more. Currently, the popular shows on our platform are *Mr Swimmer*, *The Evolution of Our Love*, and *Step Into The Past*.

We have English subtitles available for about 10 TV series and 10 movies, and we are also adding Bahasa subtitling this November.

**The media industry is now not only seeing an explosion of content, but also increasing competition between traditional broadcast networks and new players on the Internet streaming space. Hence, what are the strategies you have established for Vidfish in journeying through this competitive media landscape?**

**Hu:** We will leverage blockchain technology to create a collaborative ecosystem for our viewers, content providers, celebrities and content partners. Our cryptocurrency, VUO Coin, will be used as a digital asset to support the interactions between all the stakeholders including viewers, content providers and celebrities, on the Vidfish platform.

VUO Coin will also integrate blockchain-supported reward programmes in the Vidfish platform for users by allowing them to comment, share and rate videos, thus encouraging collaboration and transparency. With



*Mr Swimmer and The Evolution of Love are some of the popular Chinese content available on Vidfish.*

this combination of Vidfish and VUO Coin, everyone — from users, content providers to celebrities — will benefit from our platform's video streaming model, celebrity engagement, and peer-to-peer engagement services.

**Can you explain the concept behind VUO Coin? What value does this blockchain initiative have to offer to Vidfish, content creators as well as viewers, and how do you see blockchain technology impacting the wider broadcast and media industry?**

**Hu:** Traditionally, content partners have always sold their video content rights to content aggregators. There is a long chain of resellers before they receive their cash, which is very little of the total revenue as it trickles down a long cycle of reseller supply chain.

VUO Coin provides a simple means to allow content providers to enjoy transparent, real-time, direct payment from viewers through its digital asset, allowing original content providers to earn up to three times more while empowering them to provide better content. With fair compensation for content partners, transparency to both content providers and viewers, an international platform for showcasing content, and minimising content piracy, Vidfish, powered by VUO Coin, will change the way video content is provided, watched and monetised.

Blockchain technology has the potential to revolutionise the content and entertainment industry in several ways — through advertising, content distribution, content



**“Blockchain technology has the potential to revolutionise the content and entertainment industry in several ways — through advertising, content distribution, content creation, verification and payments.”**

— Amie Hu, Co-founder and CEO, Vidfish

creation, verification and payments. For example, content distribution, content consumption and payments can all be done through blockchain, which will disrupt the current fragmented business model and will ultimately benefit the content creator. It will bring together all the stakeholders of the content and entertainment industry, providing transparency and collaboration for viewers, content providers and producers.

Simplify your workflow

**IHSE GmbH**  
info@ihse.de  
Tel: +49 (7546) 9248-0

**IHSE ASIA**  
info@ihseapac.com  
Tel: +65 (6841) 4707

**IHSE USA**  
info@ihseusa.com  
Tel: +1 (732) 738 8780

www.ihse.com

## 2018 Calendar of Events

### DECEMBER

December 6 - 7  
**IABM ANNUAL INTERNATIONAL BUSINESS CONFERENCE & AWARDS 2018**  
Hilton Metropole, Birmingham, UK  
[www.theiabm.org](http://www.theiabm.org)

### 2019

### MARCH

March 4 - 7  
**ABU DIGITAL BROADCASTING SYMPOSIUM 2019**  
Royale Chulan Kuala Lumpur, Malaysia  
[www.abu.org.my](http://www.abu.org.my)

### March 12 - 14

**CABSAT 2019**  
Dubai World Trade Centre  
The UAE  
[www.cabsat.com](http://www.cabsat.com)

### APRIL

April 3 - 5  
**VIETNAM INT'L BROADCAST & AV SHOW (VIBA 2019)**  
Hanoi International Exhibition Centre, Vietnam  
[www.vibashow.com](http://www.vibashow.com)

### April 6 - 11

**NAB SHOW 2019**  
Las Vegas Convention Center, Nevada, USA  
[www.nabshow.com](http://www.nabshow.com)

### MAY

May 22 - 25  
**KOBA 2019**  
COEX Exhibition Centre, Seoul, South Korea  
[www.kobashow.com](http://www.kobashow.com)

### JUNE

June 18 - 20  
**CONNECTECHASIA2019**  
**BROADCASTASIA2019**  
Suntec Singapore  
**COMMUNICASIA2019**  
Marina Bay Sands, Singapore  
[www.connectechasia.com/](http://www.connectechasia.com/)  
**CONNECTECHASIA2019**  
**BROADCASTASIA2019**  
Suntec Singapore  
**COMMUNICASIA2019**  
Marina Bay Sands, Singapore  
[www.connectechasia.com/](http://www.connectechasia.com/)



# APB CREATION

## Cooke Speed Panchros creates vintage-look *Bohemian Rhapsody*



Cinematographer Tom Sigel chose a full range of Cooke Speed Panchros, with a new housing and updated mechanics from

ARRI Rental UK, to shoot the early years of rock group Queen documented in the production of *Bohemian Rhapsody*. To capture the “idealistic energy” of Freddie Mercury (in red T-shirt) and his “future bandmates” in the 1970, Sigel made use of a vintage set of Cooke Speed Panchros, with a light net at the back of the lens and a LUT for the Alexa SXT that was specifically designed for the period. This set-up was used for the entire first act of the film, with Sigel relying mostly on the 40mm lens, with the 25mm, 32mm and 50mm as secondary lenses.

## LMG adds Artist and Bolero to rental portfolio

The Show Technology division of LMG, a provider of audio-visual equipment in the US, has added Riedel Communications' Artist 64 digital matrix intercom frame and Bolero DECT-based wireless intercom to its rental equipment inventory. LMG will deploy its initial purchase of 10 Bolero belt packs in standalone mode for smaller live events, and will integrate the wireless intercom with an Artist 64 mainframe for larger corporate projects and live productions, such as awards broadcasts. Shane Smith, director of audio services, LMG, said: “We know we can count on quality products from Riedel, so it was an easy decision to bring in Bolero and an additional Artist frame.”

## PANELLISTS



**Dr Ahmad Zaki Mohd Salleh**  
Director Technical Operations  
TV Networks  
Media Prima



**Phan Tien Dung**  
CTO  
Vietnam Digital Television



**Mike Whittaker**  
Executive Vice-President  
and CTO, Asia-Pacific and  
the Middle East,  
Fox Networks Group Asia

# Merging real world with virtual

Graphics creation is bound by no rules. Marrying that with digital technologies, it unleashes a whole new world of interactive graphics and experiences. **Josephine Tan** writes more.

In recent years, interactive experiences — such as augmented reality (AR), virtual reality (VR), or even mixed reality (MR), which combines virtual and real environments — have drawn great awareness in the gaming industry. In 2016, the launch of Pokémon Go, an AR mobile game developed by Niantic, showcased to the world how computer-generated graphics can be merged with real-world surroundings. It was also in the same year that Sony launched PlayStation VR, a VR system for its PlayStation 4 console that aimed to take gaming to the next level of immersion and transport players into the virtual world of their games.

Electronic gaming and eSports are part of the media convergence that is taking place right now with respect to both content and technology, declares Brian Olson, vice-president of product management, at NewTek.

He tells *APB*: “In many ways, eSports is paralleling traditional sports with the formation of leagues and arenas, along with investments to fuel the expansion of this new industry. At the same time, video games are starting to look more like movies with photorealistic rendering and complex storylines.

“Media and entertainment producers now look at a much bigger landscape when they bring creative content to market. There is a lot of crossover in the execution and marketing of movies, TV and video games. That same crossover is occurring with professional sports teams and their eSports corollaries.

“As audiences are shrinking for linear live sports, broadcast TV and theatrical release motion pictures, media companies can recover those viewers by accessing the growing number of gamers and eSports aficionados.”

RV Krishnan, vice-president graphics for Asia-Pacific, Vizrt, similarly identifies eSports and the gaming industry as a “new opportunity” for media companies to tap into, with gamers targeted as a new pool of audience. He elaborates: “In addressing this opportunity, eSports is helping to shape some of the technologies and workflows in traditional broadcasting as well. These changes are seen in creative, as well as productions and operations.

“Billions of dollars are poured into creating games with intensive plots and strategies, excellent graphics and animation that are interactive and highly addictive in terms of great visual quality, and using of tools like AR, VR and MR to enrich the user experience. Visual appeal is enhanced with sophistication in creative tools like photorealism, lighting techniques and sophisticated shaders to create real world look and feel.”

He highlights that broadcasters have begun to consider some of these tools that were originally intended for gamers and eSports for use within programming of news, sports and general entertainment. This, in turn, is helping to bring about a “big change” in visual quality, and enhance viewer experiences, he adds. “Designers have

more powerful tools now to work with, including better modelling and animation tools, and higher realism in creating virtual environments. What this represents for producers is better storytelling tools, where visualisation is more impactful and pleasing.”

On the other hand, he explains that broadcasters are looking to extend their reach beyond the traditional viewership while using the new tools that originate and appeal to younger audiences, which has not been part of its viewer base earlier. For instance, some broadcasters are increasingly covering eSports, and even building dedicated eSports channels to cater to this new viewership.

Furthermore, they are bringing “a new level of professionalism and production quality standards and operational efficiencies” to live eSports productions, thus enabling and broadening the appeal of eSports in general.

Krishnan continues: “Visual impact of photorealism is very significant. This is driving developers of graphics hardware and software developers to bring high dynamic range (HDR), high-quality physically based rendering (PBR) of textures, global illumination, reflections and drop shadows to create ‘real world materials’. Character modelling and animations are being used with telling effects in entertainment and sports.

“VR and 360 videos have been slow to take off so far, largely on account of the limitations of the technologies themselves. The challenge for broadcasters and broadcast vendors, as always, is to marry technological advancements with workflow efficiencies and ease of use. This will continue to be the focus among broadcasters as they strive to balance between audience engagement and production efficiencies.”

While content is moving into new realms, the technology behind video games and eSports is “slowly moving into traditional media production”, NewTek’s Olson highlights, adding more horsepower and lowering costs for producers who want to push the envelope or create environments that will draw non-traditional audiences. However, regardless how immersive or realistic these interactive video games have to offer, it all involves the creation of graphics and combining them with video images — and that can all be done via graphic systems and virtual sets, which have been around in video production for several decades.

In an attempt to fuel production opportunities and content crea-



“Billions of dollars are poured into creating games with intensive plots and strategies, excellent graphics and animation that are interactive and highly addictive in terms of great visual quality, and using of tools like AR, VR and MR to enrich the user experience.”

— **RV Krishnan, Vice-President Graphics, Asia-Pacific, Vizrt**





Using NewTek TriCaster allows live editing between animation and live action angles and ISO-recording of all feeds as well as outputting the programme feed to a thumb drive for sharing.



Bringing a Turtle to life requires Adobe Character Animator streaming into the Unreal Engine via NDI in real time.

tion, Nickelodeon launched its Nickelodeon Entertainment Lab, which will spearhead research and development efforts around new technologies for the network and its audience. At this year's Comic-Con Convention in San Diego, Nickelodeon Entertainment Lab brought the new world of *Rise of the Teenage Mutant Ninja Turtles* to life.

Chris Young, senior vice-president of the Nickelodeon Entertainment Lab, headed up this VR project, which is designed to create a PR splash to publicise the reboot of the *Teenage Mutant Ninja Turtles* franchise. By creating a virtual press junket, Young was hoping to be able to immerse journalists into the Turtles' new world.

"We wanted journalists and superfans at Comic-Con to have this opportunity to step inside the Turtles' art-directed world," Young says. "We wanted them to get a first-hand look at the new show, and be able to interview Mikey and Donnie in VR. Our plan was to film the interview using live-action cameras composited with gaming footage in mixed reality."

The project is completed using Adobe Character Animator, Epic Games' Unreal Engine — which supports NDI, NewTek's IP video protocol — and NewTek TriCaster. Young elaborates: "It all starts with

the Adobe Character Animator. We stream that into Unreal Engine using NDI technology to get it into the game. So, the person wearing the VR headset in the game is seeing the animated Turtles streaming over NDI in the game. From there, we're also streaming NDI into live compositing software, where we're compositing the footage together — both virtual camera shots of the Turtles, and live action footage of the journalists.

"All of those signals were then live-streamed back over NDI to the NewTek TriCaster system. Using TriCaster, we were able to live edit between all the animated and live-action camera angles, as well as record ISO-feeds of all the different angles, in addition to the programme edit. Then, once the interview was over, we were able to throw the programme feed on a thumb drive to give to the journalists."

Besides creating new viewing experiences, these graphic systems and virtual sets have already been used in TV broadcasting for applications like news and elections coverage. For instance, during elections coverage, presenters can have the election data displayed along with them, in context and in real time, simplifying the complex election data within graphics for audiences' ease of understanding.



Miguel Churruga, marketing and communications director of Brainstorm: "The integration of live graphics into real images or virtual sets is both a challenge and an opportunity; a challenge because designers need to think on how to integrate live images along with their creations, and an opportunity because the result is normally far more compelling to the audience."

Miguel Churruga, marketing and communications director of Brainstorm, comments: "AR, in its vast variety of flavours, is a great tool for enhancing the information displayed in a broadcast programme while adding spectacular content. Raw data can be displayed more attractively when placed in context with the presenter or by adding interactivity. Also, today's availability of enormous amount of data requires visually attractive ways to present these data to the audience at home.

"In this sense, data-driven graphics can enhance TV shows when added to real shots in context as AR content, and also the latest 3D and photorealistic virtual studio technologies can provide even better results for engaging the audience. Therefore, the audience at home can see how presenters can interact with complex graphics or information, making storytelling a lot more visually attractive."

While this technology is increasingly being applied in news, sports and entertainment programmes, he points out the key in creating "good" AR content encompasses the integration between the real and virtual objects with the environment. Photorealism is "one of the toughest challenges", he identifies, because what really makes the difference for the viewers is to be unable to tell whether the images they are watching are real videos or digital renders.

To make graphics "an integral part" of the broadcast content, some key considerations when designing and creating these virtual graphics require the close collaboration between graphic designers and other departments, such as virtual studio operators.

This is largely due to the need for additional hardware and software solutions, because during live shows where it involves virtual

sets, it often requires complex installations such as tracked cameras and cranes, Churruga says. "From a designer's perspective, the integration of live graphics into real images or virtual sets is both a challenge and an opportunity; a challenge because designers need to think on how to integrate live images along with their creations, and an opportunity because the result is normally far more compelling to the audience."

Brainstorm has developed Aston, a motion graphics creation, CG and playout system. Aston is designed for robust on-air operations, allowing designers to create, manipulate, animate and perform changes even when on-air. Using Aston with InfinitySet, Brainstorm's virtual set and AR solution, users can create "complex and realistic" AR environments, joining together live characters, virtual or real environments, data-driven graphics, and other design elements to create the live experience for viewers.

For Vizrt, its AR graphics solutions have been used by broadcast and media companies worldwide

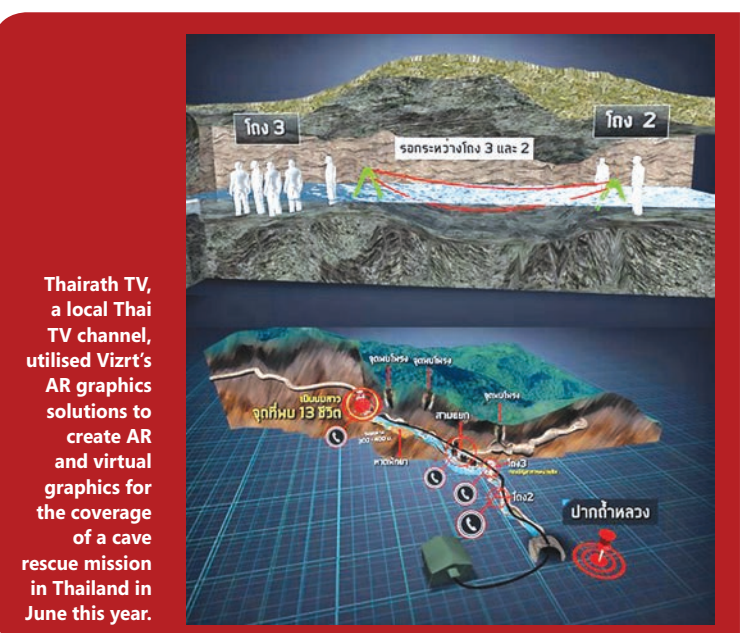
for sports and special events coverage. In the recent case of the two-week long cave rescue mission in Thailand, Thairath TV, a local Thai TV channel, utilised Vizrt's solutions to create AR and virtual graphics surrounding the story. With almost no access to live footage from the scene, audiences were able to understand and share the experiences of the stranded boys as well as efforts by the rescue teams using virtual graphics, AR and MR.

"There was an almost complete ban on live coverage from the ground with very little visuals of the cave, and the mission was available to the audience, creating great anxiety and interest surrounding the story," Vizrt's Krishnan explains. "Virtual graphics and AR were used almost by all channels who were actively covering this story, and having the story put together from various reports.

"Some very impressive renderings of the graphics with presenter interactions helped to bring context to the severity and danger of the mission, simulate the rescue attempts, while some others help to visualise and present the internal structure and challenges of the cave itself"

Over the course of the coverage of the rescue mission, Thairath TV received "great reviews and improved viewership", according to Krishnan, with the target rating point (TRP) of their news programming surging up to the top with an improvement of over eight points from this story production.

"Virtual graphics is a powerful medium to help with storytelling," he concludes. "Good storytelling is fundamental to any broadcast production, and it all starts with good planning. Visual graphics, animations, and any other form of graphics or visualisation have to serve a basic purpose of enriching the storyline while helping to enhance the ability to convert and communicate with the audience." APB



Thairath TV, a local Thai TV channel, utilised Vizrt's AR graphics solutions to create AR and virtual graphics for the coverage of a cave rescue mission in Thailand in June this year.



# APB MANAGEMENT

## Nagra adds Amazon Cloudfront CDN to its NexGuard watermarking

Nagra, a Kudelski Group company, has integrated its NexGuard watermarking solution with the Amazon Cloudfront content delivery network (CDN). The combined solution has been deployed by a Hollywood studio, enabling the content owner to stream its video content to viewers worldwide while securing robust security and traceability of its assets. Harrie Tholen, vice-president of sales, Nagra Anti-Piracy and NexGuard, commented: "With Cloudfront and its Lambda@Edge component, Nagra is able to offer session-based forensic watermarking to content owners in a scalable and secure way. Using secure processing at the edge, we can now service millions of users globally with a reduction in end-to-end latency."

## AJA unveils firmware upgrade for IPR-10G-HDMI



AJA Video Systems has released v1.1 firmware for its IPR-10G-HDMI Mini-Converter, which enables

SMPTE ST 2110 IP video and audio to HDMI. Available as a free download, the update adds support for 4K/Ultra HD (UHD) up to 30p, and is integrated with enhancements for discovery, registration and control. The IPR-10G-HDMI Mini-Converter is also capable of receiving SMPTE ST 2110 over 10GbE connectivity, and formats the data for output as video and audio on an HDMI interface, with analogue audio output via an RCA interface.

## PANELLISTS



**Fintan Mc Kiernan**  
CEO  
Ideal Systems  
South-east Asia



**Patrick So**  
Regional Manager  
Asia Pacific  
Magna Systems & Engineering



**Craig Johnson**  
Managing Director -  
Media  
Nielsen

# What turns a TV station into a successful brand?

Regardless if it is to contain market share, create awareness or retain loyalty, the brand of a channel is every TV network's identity for viewers to recognise and distinguish in a crowded media landscape. **Josephine Tan** discovers more.

In a media industry inundated with so much content, a brand is an identity that sets TV stations apart. Yet, the mediascape is fragmented and evolving rapidly, and attracting and retaining viewers is arguably the biggest challenge facing media organisations today. Moreover, consumers today curate their content from a growing, diverse range of sources — from online and on-demand services to social media platforms.

To make an impact, broadcasters and content providers need to stay relevant to their target audience, and the key to this lies in having a brand identity that resonates with them, suggests Karl Mehring, director of product management for playout, at Grass Valley.

He tells *APB*: "When it comes to live linear playout, high-quality graphics and live rendering capability are integral to creating an engaging and compelling viewing experience, which, in turn, can help a broadcaster's brand identity shine through. Graphics can deliver an extra layer of entertaining information, so audiences can get a more holistic viewer experience, whether that is from a live, rolling Twitter feed, or match scores from other ongoing games and player statistics."

As audiences demand access to content on more platforms, it is critical for broadcasters and content providers to maintain a "distinct, consistent brand identity". Moreover, with strong competition for viewer eyeballs from channel brands, as well as digital players such as Netflix, Mehring emphasises that the challenge is to avoid getting lost in the crowd. "Broadcasters need to ensure that there is a consistent look and feel across all platforms to keep the brand identity strong. While some platforms — such as on-demand — may require adjustments to branding, it is vital that the brand identity remains clear and undiluted," he explains.

From VSN's perspective, the main factor that allows a TV station to become a successful brand is about knowing its audiences in terms of the content they are looking for, as well as



For Imagen Television, VSN has enabled the network's programming and broadcasting signals to be segmented and targeted per region during certain time slots of the day for electoral purposes.



A media asset management system, alongside a traffic and scheduling platform as well as a system for multi-platform content delivery are the three technological aspects which Patricia Corral (above), marketing director at VSN, considers "fundamental" in turning a TV station into a successful brand.

where and when they want to consume it, says Patricia Corral, marketing director at VSN.

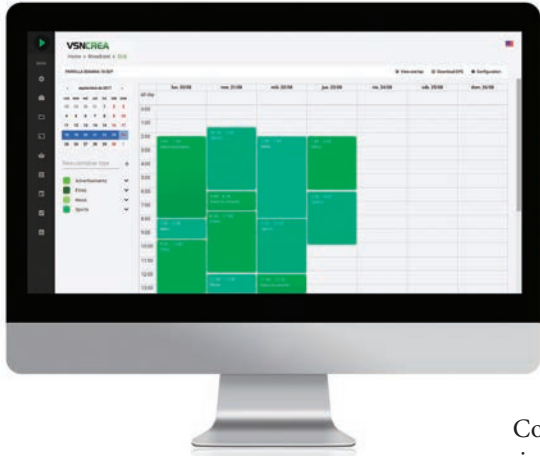
"Channel branding cannot rely anymore on just having sophisticated and impressive graphics," she claims. "Nowadays, the content offered by a TV station is intrinsically its own brand. Programming, advertising and graphics branding should be treated as a single entity transmitting a unified message on all screens while providing value to the audience, in whatever format. Content should always be useful and interesting to the public, relate to personal tastes and to consumer habits."

There are also three technological

aspects that Corral considers "fundamental" when turning a TV station into a successful brand. She first recommends media companies to have a media asset management (MAM) system for content management and automation, which has been made increasingly "smarter" by services like artificial intelligence (AI). After which is acquiring advanced software for traffic and scheduling, integrated with support for multi-platform content delivery, to allow the network to offer audiences targeted advertising and customised content according to their preference and consumption habits. And finally, it is about having an analytics platform to analyse the return-on-investment (ROI) and the content performance, regardless of the channel through which the content has been broadcasted.

Corral continues: "The more devices, screens and media files that we need to deal with, the more necessary these technologies are needed when managing, producing and delivering A/V content, advertising and graphics on all screens and devices equally. I believe that more automation and, specifically, more 'smart' automation is needed in the industry, in order to help users concentrate on creativity and content creation. A greater automation of tasks allows users to become agile when creating and delivering content, and





VSNCREA is an HTML5, cloud-based software designed for TV, radio and second-screen traffic and scheduling.

thus companies can be more competitive in the market and stand out. This is without a doubt what we are giving more importance to in terms of software development — to make the content supply and creation chain as efficient as possible.”

One VSN technology user is Imagen Television, a Mexican TV network owned by Grupo Imagen. The project saw the implementation of a complete master control room (MCR) automation workflow, integrated with third-party equipment, to provide Imagen Television with “reliable transmission”. To this end, VSN and Teletec launched two VSNMulticom systems that are responsible for ensuring an “uninterrupted” broadcast daily, through the installation of an automation solution with redundancy configuration in parallel.

In order to establish an end-to-end automation workflow, VSN developed a complete integration of both VSNMulticom and VSNExplorer MAM to manage files. This was deployed along with Harmonic’s Spectrum video servers, the Icon Master mixer from Imagine Communications, and Orad graphic systems from Avid. The end-result of this project has enabled Imagen Television to

have an MCR automation workflow to export files and video clips to broadcast servers, allowing the system to alert video servers when a clip or scheduled programme in the rundown is not ready to be aired. This process, according to VSN, grants the network of both safety and efficiency within its processes.

Corral explains: “Media companies are delivering content across multiple platforms to different audiences at different times. Ideally, a unified message across all platforms could support the main channel branding.

“However, TV stations are already moving towards targeted programming and advertising as well as content segmentation, which responds to the interests of different audiences, their consumption habits, and of course, their preferred platform for content fruition.

“In the case of Imagen Television, we have enabled the network’s programming and broadcasting signals to be segmented and targeted per region during certain time slots of the day for electoral purposes. This is an area with a lot of potential and needed development. Content can be specifically created and adapted for multiple screens. Targeted programming and advertising can be even more segmented and reach out to groups and individuals.”

She further reveals that the company has been investing even more resources into AI, which, together with IP, is poised to improve the management and delivery of content. Stressing that AI is a “fundamental tool” in the development of media management, Corral adds that VSN has integrated its MAM system with several AI services such as IBM Watson, Google Cloud, Microsoft

Azure, and Etiqmedia, to enable users to automatically extract and detect metadata, both for quick cataloguing and advanced search purposes.

For instance, users of VSN-Explorer MAM are able to perform searches of specific content, such as all the red cards shown during a football match, or the recent public appearances of personalities, all in a matter of seconds, she says. “We are determined to make AI gain a greater relevance in our platform, enabling, for example, the self-segmentation of content or chapters of a programme, and the automatic creation of video editing with ready-to-use graphics for promos and advertising, or even recommending the user about including ad cuts in the programming for a greater ROI.”

In addition to VSN-Explorer MAM, VSN has also been working on VSN-Crea, another tool which Corral labels as critical for channel branding. Designed for TV, radio and second-screen traffic and scheduling, VSNCREA enables the management of a network’s content production catalogue, either owned or acquired from third parties, as well as its advertising, production workflows, programming and broadcast planning — all from a single user interface. The HTML5-based software can also be operated in the cloud to enhance the ability of users and departments to work together on a collaborative basis.

Other features of VSNCREA include the ability to change language within the user interface, the consolidation of the final broadcast, and the analysis of the programming and content ROI through analytical reports.

Corral concludes: “Overall, VSNCREA is being designed to improve the efficiency and flex-



“Ultimately, the challenge for broadcasters and content providers is to deliver an experience that consumers find exciting, compelling and relevant — branding is just one part of this overall strategy.”

— Karl Mehring,

Director Product Management - Payout, Grass Valley



Grass Valley’s iTX integrated payout platform features real-time rendering using Vertigo XG graphics processor, and HD/SD character generator that allow the payout of layers of animated and dynamically updated text.

ibility of broadcast professionals, allowing them to organise and control their channel’s programming at all times, regardless of the device or screen with which the content is broadcasted. That is why VSNCREA can play a key role in channel branding, when it comes to delivering a unified message across all TV channels and online platforms, or social feeds.”

For Grass Valley, its payout solutions provide channel branding support to suit a range of user needs — from smaller automated payout operations to large, cloud-based multi-channel environments. For instance, its iTX integrated payout platform delivers graphics rendering while

supporting the payout of “virtually unlimited” layers of animated and dynamically updated text. Other features of iTX include automated ingest, quality control and transcoding, as well as support for 4K/HD/SD multi-format performance.

Grass Valley’s automated payout portfolio also include Morphus and ICE, which provide us-

ers access to advanced 3D graphics capability for channel branding. GV Flex, the company’s cloud orchestrated payout solution, also enables users to import graphics from third-party graphics engines, layer graphics and manage pre-rendered graphics sequences to provide “high quality” branding.

Grass Valley’s Mehring concludes: “Regardless of the resolution, audiences still expect the brands they engage with to be relevant to them. AI has the potential to take this to the next level with tools such as hyper personalisation, using machine learning to create content experiences that are highly tailored to individual viewers.

“Ultimately, the challenge for broadcasters and content providers is to deliver an experience that consumers find exciting, compelling and relevant — branding is just one part of this overall strategy.” APB

## Pebble Beach Systems supports Pro TV’s payout upgrade

Based in Bucharest, Romanian broadcaster Pro TV operates seven channels including a main channel, five thematic offerings, and one international feed. Already a user of Pebble Beach Systems’ Neptune automation system, the broadcaster decided to reaffirm its relationship with Pebble Beach Systems by employing the company’s solutions for the upgrade of its entire payout operations.

Bodgan Andreescu, CTO of Pro TV, explained: “We found [Pebble Beach Systems] to be flexible and responsive to our needs, and we have trust in their ability to solve problems. Our new system brings Pro TV’s payout infrastructure up to date, making our facility 4K/

Ultra HD (UHD)-ready.”

The project will see the installation of the Marina payout automation, Dolphin integrated channel devices, and Lighthouse browser-based, remote management, control and monitoring product. The system is to be commissioned this December, with a planned on-air date during Q1 2019.

Configured in a fully redundant architecture with mirrored payout chains, the system features Marina controlling multiple Dolphin integrated channel solutions. These replicate, in a software-defined payout chain, much of the functionality conventionally managed by discrete payout devices. Dolphin also allows for flexible



Tamas Vass, senior vice-president of global sales, Pebble Beach Systems, explained that the primary objective was to upgrade Pro TV to the new technology, and the partnership with the Romanian broadcaster demonstrated a “true partnership” between vendor and customer, where challenges were embraced and solved together.

In addition to utilising Dolphin’s internal storage, Pro TV will also employ EditShare’s shared storage solution, giving the broadcaster the flexibility to manage access both central and local storage for enhanced availability.

The incorporation of Lighthouse within the system also enables operators to load playlists, edit and delete events, and moni-

tor payout as needed from any location.

Tamas Vass, senior vice-president of global sales at Pebble Beach Systems, concluded: “Our primary objective was to upgrade Pro TV to the new technology with minimal disruption. We are proud of how both our pre-sales and projects teams have helped us to turn around this extensive project in a very short timescale.

“Pro TV’s technical team have been exceptionally agile and responsive throughout, and very engaged with the process. This is a fine example of a true partnership between vendor and customer, where challenges were embraced and solved together.”

hybrid pipeline designs when best-of-breed devices are mandated and need to be architected into the payout chain. This includes a graphics workflow, where multiple Dolphin devices will share access to Vizrt graphics engines.





## Arabsat, Forsway roll out satellite broadband services across Africa

Under the Arabsat Broadband package, Arabsat and Forsway have deployed “affordable satellite broadband services” across Africa. Tobias Forsell, CEO of Forsway, commented: “We are excited to be working with Arabsat, a leading satellite operator, to create a new way of delivering highly cost-effective broadband services in Africa. “Tapping Forsway’s hybrid technology, we are helping Arabsat Broadband Services enable rapid deployment of robust, satellite-based Internet services and eliminate the need to deploy costly additional infrastructure. The Forsway Odin F-50 technology is furnishing Arabsat Broadband Services with a competitive, low-cost alternative to VSAT for the new Arabsat Broadband service model and offering.”

## Feel the power of point-to-point transmitter



Just Add Power (J+P), a provider of 4K/ Ultra HD (UHD)-over-IP video distribution, has released the 709P2P 3G point-to-point transmitter. According to J+P, the Power-Over-Ethernet (PoE) transmitter allows integrators to utilise a single-power input to distribute video, audio, power and control to all downstream devices over Cat-5e cable. Integrators can also pair the 709P2P with any model of J+P receiver to create a simple point-to-point connection, or combine it with the company’s PoE daisy-chain receiver for installations of up to four screens.

## PANELLISTS



**Martin Coleman**  
Executive Director  
The Satcoms  
Innovation Group



**Amitabh Kumar**  
Director, Corporate  
Zee Network



**Louis Boswell**  
CEO  
AVIA  
(Asia Video Industry  
Association)

# Broadcast satellite draws on new technologies for efficiency gains

While content delivery over satellite is being faced with a number of challenges, technologies exist to make the process more efficient.

**A**s uncertainty continues to mark the satellite industry, broadcasters need solutions that will help boost efficiency, performance and business potential as a new era of broadcast looms, suggests Hans Massart, market director, broadcast, Newtec.

He tells *APB*: “The broadcast industry is facing a host of challenges that are only set to increase. Today’s audiences expect to see and hear about newsworthy events immediately, as it is happening. This means that newsrooms have to take this fresh from the scene, and straight to the viewer with little lag time.”

As a result, broadcasters choosing to deliver this content over satellite are seeing increasing pressure placed on their bandwidth and profit margins. Due to the use of 4K/Ultra HD (UHD) and high dynamic range (HDR), these next-generation TV broadcasts require higher bitrates and significantly more bandwidth, Massart observes.

Thus, new technologies that provide broadcasters with efficiency gains are incredibly important to ensure effective space segment usage, he adds. “DVB-S2X and technologies such as High Efficiency Video Coding (HEVC)/H.265 are examples of new technologies and techniques that enable broadcasters, satellite operators and service providers to become more efficient as uptake of 4K/UHD gathers pace.”

Besides offering a fully DVB-S2X-enabled modem and modulator portfolio, Newtec has also developed a range of its own technologies to provide maximum throughput under all satellite link conditions, including Equalink, FlexACM, Multistream and Clean Channel Technology.

Designed to compensate for the effects of imperfections in the filters and amplifiers of the satellite, Equalink 3 is a



Newtec’s MCX7000 multi-carrier satellite gateway splits a large transport stream into two or three parts over the satellite, circumventing the bandwidth limitation of a standard Ku-band transponder.



“Because today’s audiences expect to see and hear about newsworthy events immediately, broadcasters choosing to deliver this content over satellite are seeing increasing pressure placed on their bandwidth and profit margin.”

— **Hans Massart,**  
Market Director, Broadcast,  
Newtec

“revolutionary” linear and non-linear pre-distortion technology, which provides breakthrough performance gains on direct-to-home (DTH) satellite links, according to Massart.

Alongside this, FlexACM combines a range of technologies to optimise IP Trunking and IP Backbone satellite links in the most efficient way, while Multistream allows users to aggregate a number of independent transport streams or IP streams into one satellite carrier in a fully transparent manner, maintaining the integrity of the original content. Finally, Clean Channel Technology further improves satellite

efficiency by up to 15% compared to the current DVB-S2 standard for IP trunking, backhauling and government networks, as well as broadcast contribution.

Massart continues: “We are also pioneering the use of Channel Bonding. Our MXC7000, for example, is paving the way to providing customers with the 4K/UHD programming they demand, in a cost-effective and efficient way.

“Using DVB-S2X, this technique splits a large transport stream into two or three parts over the satellite, circumventing the bandwidth limitation





To maximise service delivery, Harmonic offers solutions such as the ViBE CP3000 DSNB encoder, which combines an efficient SD/HD encoder and a DVB-S2X modulator.

of a standard Ku-band transponder. It then recomposes it on the receiver side, combining multiple carriers into one, making it large enough to maintain the efficiency gain of statistical multiplexers on a bouquet of 4K/UHD channels.”

DVB-S2X is the latest standard modulation evolution and in comparison with DVB-S2, its predecessor, DVB-S2X can improve spectrum efficiency by 20% for DTH applications and 50% for contribution, David Mouen, senior market manager, broadcast, Harmonic, points out. “RF channel bonding can bring additional gain to a 4K/UHD statmux, improving the 4K/UHD density by 22%,” he adds. “On the compression side, new standards are released on a regular basis, offering more tools and increased efficiency.”

Mouen cites the example of the MPEG compression standard, where each generation provides twice the boost in efficiency, compared with the previous one. He also charts the evolution of the MPEG standard, which began with MPEG-2 in 1995 at the start of digital TV delivered in SD.

This continued on with MPEG-4/AVC in 2004, which was initiated by HD, and then HEVC/H.265, which was developed between 2013 and 2016, in part due to 4K/UHD. The next iteration of the MPEG standard is VVC, which is expected to be released in 2020.

“Given that there are a wide range of legacy TVs and set-top boxes (STBs) in the field, all generations of the MPEG standard have to be supported,” Mouen explains. “For a given standard, the compression implementation is specific to each technology provider and can be continuously improved. Software-based encoders are easier to upgrade.”

Leveraging the Human Visual System, Harmonic developed the EyeQ content-aware encoding technology. By reducing video traffic by up to 50%, the EyeQ solution delivers “significant” Opex and Capex savings. The next big step for Harmonic will be the implementation of artificial intelligence (AI) and machine learning (ML) algorithms in the encoders. Based on offline deep learning, the encoder will automatically detect the scene type and apply optimised compression parameters. The incremental expected gain is 20%, according to Mouen.

He also highlights how

complementary tools, such as statistical multiplexing, can be used to optimise bandwidth. This in turn provides better video quality while increasing the number of channels by 25% in a DTH, digital terrestrial television (DTT) or cable pipe. “Statmux can be optimised by dynamically allocating the bandwidth left free by bursty data components to the video pool,” Mouen elaborates. “While getting the benefits of statmux, it is also possible to fix an average bitrate to each channel, which is important when the service of broadcasting is based on the bitrate.”

To maximise service delivery, Harmonic offers contribution encoders with embedded DVB-S2X modulators. For instance, the ViBE CP6000 contribution platform can encode and multiplex up to six SD/HD channels in a single stream and then modulate it in DVB-S2X.

Harmonic also offers a ViBE CP3000 DSNB encoder that combines an efficient SD/HD encoder and a DVB-S2X modulator. Mouen describes: “Our 4K/UHD HEVC/H.265 contribution solution is based on the ViBE CP9000 dual encoder and the RD9000 decoder, and our distribution encoders and solutions feature compression technology optimised for broadcast and over-the-top (OTT) applications.

“Harmonic’s Electra X media processor family supports SD, HD and 4K/UHD formats, and MPEG-2, MPEG-4/AVC and HEVC/H.265 codecs for broadcast and OTT multi-screen delivery.”

Completing the line-up is the VOS media processing platform, which allows content and service providers — of any size and on any platform — to leverage the latest advancements in software and cloud technology.

VOSSW Cluster is a comprehensive software solution for hybrid cloud operations that supports an entire range of market-leading microservices, including ingest, playout, compression, encryption, packaging, origin server. VOS360, on the other hand, is a video software-as-a-service (SaaS) that covers the entire media processing chain, enabling simple playout and delivery of live, time-shift, cloud DVR and video-on-demand (VoD) streaming services.

Both Harmonic and Newtec also place a heavy emphasis on Carrier ID, or as Newtec’s Massart



“On the compression side, new standards are released on a regular basis, offering more tools and increased efficiency.”

— David Mouen,  
Senior Market Manager,  
Broadcast, Harmonic

says, prevention is better than cure. “Although interference only affects a fraction of Satcom operations, when it happens, it can be catastrophic, potentially putting the company’s reputation at stake and causing economic damage.”

This, he explains, is the reason why Newtec has implemented Carrier ID to fight interference. “DVB-CID Carrier Identification (CID) is a signal embedded into a video or data transmission path. It allows satellite operators and end-users to identify the source of an interfering carrier in minutes, rather than in weeks,” Massart highlights. “Whenever faced with an instance of interference, embedding a Carrier Identifier (CID)

into the single channel per carrier (SCPC) will help to pinpoint the source of interference quickly to resolve the issue.”

DVB-CID is standardised by the European Telecommunications Standards Institute (ETSI) as TS 103 129 and is endorsed by the US Federal Communications Commission (FCC), making it a requirement of newly manufactured modulators since September 2017. Newtec was an active member of the DVB Working Group in the definition of the Carrier ID standard, and was one of the first companies to have it implemented on all of its SCPC modems.

Interference between radio frequency signals is a big issue for satellite transmissions, cautions Harmonic’s Mouen, who identifies causes to be bad equipment configuration, failure or malicious intentional jamming. The goal of the DVB-CID standard, thus, is to help operators quickly identify the emitters involved in the interference.

Mouen continues: “CID is a robust code included in the RF signal delivered by the modulator that contains data, enabling the satellite operators to quickly and easily identify the source of an interfering transmission.

“The CID includes a Global Unique Identifier, GPS coordinates, latitude and longitude coordinates, phone and additional data. DVB-CID is supported by Harmonic’s ViBE CP3000 single-channel contribution encoder and modulator, as well as ViBE CP6000 multi-channel contribution encoder and modulator.”

For ARRIS, the company offers its Modular Uplink System to enable global operators to deliver modern satellite services. Specifically, the Modular Uplink System comprises a broadcast network controller, transport

multiplexer, satellite smartstream encryptor modular, and event manager for secure uplink transmission.

Together with the ARRIS ME-7000 encoder platform, the Modular Uplink System provides “complete security” across a full range of satellite service formats, informs Mark Schaffer, senior director, product management. “The ME-7000 multi-channel platform achieves new levels of video compression efficiency to improve video quality while lowering cost and power usage per channel.

“These advantages effectively reduce total cost of ownership for operators. Meanwhile, the platform remains scalable and future-ready, enabling a simple upgrade path to new codecs, such as HEVC/H.265, to assist in advanced 4K/UHD deployments.”

One of ARRIS’ key goals is also to continue improving encoding technologies to address the evolving needs of global operators, adds Mark Cabrales, director, product management, ARRIS. The company’s technologies, he adds, leverage the latest techniques to support a variety of current, future and legacy video formats while improving overall efficiency. “For example, our ME-7000 platform provides HEVC/H.265 encoding capabilities, which can offer up to 50% improved efficiency over MPEG-4/AVC.

“Formats like DVB-S2X 16APSK modulation can provide up to 30% improved efficiency over DVB-S2 8PSK. And transcoding in the Integrated Receiver Decoder enables the correct compression format to be delivered to each multi-channel video programming (MVPD) operator.”

Emphasising how ARRIS’ innovation centres on the ease and efficiency of catering to a modern range of satellite delivery paths, Cabrales further describes the ME-7000 as a multi-codec, multi-channel and multi-format encoding platform designed to support the many permutations of satellite services and formats — today and in the future.

The platform enables multi-channel support for MPEG-2, MPEG-4 and HEVC/H.265, as well as new techniques such as multi-bitrate profile outputs for use in OTT or adaptive bitrate (ABR) set-top environments — both simultaneously and in a single RU. In the case of HEVC/H.265, the ME-7000 not only supports HD and SD channels, but provides a high-density (up to 24 4Kp60 channels in 1RU) capability for 4K/UHD support. It also supports high HDR across formats (HLG, HDR10 and Dolby Vision) within the platform. **APB**



**ARRIS’ Modular Uplink System is designed to enable global operators to deliver modern satellite services. Specifically, the Modular Uplink System comprises a broadcast network controller, transport multiplexer, satellite smartstream encryptor modular, and event manager for secure uplink transmission.**



# APB

## X-PLATFORM

### Ooyala joins SRT Alliance

Ooyala is the newest member to the SRT Alliance, a collaboration to continuously develop the Secure Reliable Transport (SRT) protocol and technology stack for low-latency video streaming across any network. Belasar Lepe, founder and CTO of Ooyala, said: "Ooyala fully supports the SRT Alliance's goals; we are all about driving innovation and collaboration to overcome the challenges to achieving consistently low-latency video streaming. Providing the best digital video experience is a major part of our mission, and we're fully committed to delivering just that — reliable video quality unfettered by latency issues, stuttering and dropouts. This industry-wide collaboration is a key step in giving viewers TV-grade performance, with the added benefits unique to online."

### More affordable way to create high-quality EAS alert crawls

Digital Alert Systems/Monroe Electronics, global providers of emergency communications solutions for video service providers, has partnered with DigIT Signage Technologies to interface the ChyTV. ChyTV is a version of the ChyTV video graphics system for TV, information displays and digital signage, with the DASDEC series of Emergency Alert System/Common Alerting Protocol (EAS/CAP) flexible emergency communications devices. The integration, said the companies, brings to the marketplace a better, lower-cost solution for creating selective, high-quality crawls for EAS alerts on SD and HD channels.

## PANELLISTS



**Chong Siew Loong**  
CTO  
StarHub



**Michael Cronk**  
Chairman,  
Alliance for IP Media  
Solutions (AIMS)



**Peter Bithos**  
CEO, HOOQ

# NFV and SDN at the core of IP transition

The road to IP involves much more than just replacing SDI. What exactly lies at the heart of this transition?

**T**he move to IP has been one of the most keenly discussed topics in the broadcast and media industry in recent years.

However, while broadcasters and media owners continue to plan their own paths to IP, it would be too simplistic to see the conversion to IP as just replacing SDI. Instead, there is a "bigger transition" at play, emphasised Michel Proulx, media industry advisor and former CTO of Miranda Technologies.

Speaking as the keynote presenter during the APB IP Master Class held in June this year in Singapore, Proulx referred to the "bigger transition" to the move from hardware-based, fixed-function solutions towards software-based solutions. He explained: "The software-defined world needs IP because the real deal of flexibility comes from software, which will allow fixed tools to be more agile. Moreover, the benefits of moving to software is greater, as it will eventually lead to virtualisation and the cloud."

This is an assessment that found resonance with John Maillhot, CTO, network-



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While broadly described as the transition to IP, network function virtualisation (NFV) and software-defined networking (SDN) are perhaps the most important underlying elements broadcasters and media companies need to embrace.

ing, Imagine Communications, who told APB: "Network function virtualisation (NFV) and software-defined networking (SDN) go hand-in-hand with IP."

He describes NFV as the networking part of the move from dedicated/purpose-built broadcast equipment to software/virtualised functions that can run on commercial-off-the-shelf (COTS) hardware. SDN, meanwhile, can be seen as the control and management methodology that applies equally to NFV and to the physical

underlying networks, depending on the implementation scale and bandwidth requirements.

"In the future, we foresee a flexible combination of physical and virtual, depending on the specifics of the implementation," Maillhot continues. "Management of networked, virtualised functionality includes the tools needed to define and orchestrate the virtual functions, and to orchestrate the underlying connectivity — the network between them, including managing load balancing, bandwidth and scaling — that is, starting new services when needed or requested."

When it comes to the transition to IP, nobody in the broadcast industry will be getting an award from their CEOs for replacing all the SDI cables and routers with an IP network deploying SMPTE ST-2110 technology, suggests Charles Sevier, CTO of Dell EMC. The actual business benefits, he highlights, is not from the IP technology itself, but from moving to a more agile, flexible infrastructure that can support new content types, without having to go through a major rip and having to go through expensive upgrades every few years.

Sevier elaborates: "If you compare the past transitions of analogue to digital, or SD to HD, the latest technology transition is essentially to abstract the media services and functions themselves away from the specific hardware. "So the transition of NFV that the



Dell EMC's software infrastructure helps broadcasters to manage their platforms like a cloud, and to leverage an intelligent mix of public and private cloud services to get the most efficient, secure and cost-effective operation.



“So the transition of NFV that the telecom industry went through over the past two decades is now a reality for broadcast and media companies. We call it ‘MFV’ — Media Function Virtualisation.”

— Charles Sevier,  
CTO, Dell EMC





Imagine Communications says it is “leading the way” to software-based workflow elements that can be fully deployed on COTS networks and COTS processing. For example, the company offers solutions such as the Versio cloud playout solution and the EPIC MV multiviewer.

telecom industry went through over the past two decades is now a reality for broadcast and media companies. We call it ‘MFV’ — Media Function Virtualisation. It describes the process of creating service layers, using virtualisation and software technologies to provide hardware-independent operations.”

Another phrase Sevier likes to bring forth is “media workflow”. He ruminates a time past when, like many of his broadcast engineering colleagues, he used to draw line diagrams that show how a media process goes through various boxes from left to right in a fixed architecture.

“Now, all that changes, where everything can be interconnected, and the workflow becomes virtualised,” says Sevier. “So the function of ingesting new content, preview, annotation, metadata enrichment, editing, audio sweetening, versioning, transcoding, publishing and distribution is really leveraging a central shared storage environment with in-place file management.”

The workflow thus is now a series of new files that is created after each step, with corresponding metadata to track and manage all of those files. They then become linked to the overall project; if users need to go back and make one small change earlier in the sequence, that can be automatically cascaded through the other steps.

The benefits to production efficiency, according to Sevier, “are

“The real situation is that broadcasters want to change their workflows to be more efficient and more agile, with typically fewer human operational steps needed ... NFV, SDN and the related process virtualisation technologies enable these new agile workflows.”



— John Mailhot, CTO, Networking, Imagine Communications

enormous”, and the final content quality is maintained at a pristine level. “For Asia-Pacific broadcasters, what becomes relatively easy now is being able to take the power and flexibility of what you can achieve today inside a high-performance workstation, into a connected media enterprise where users can collaborate and have a view across the entire content creation, management and delivery process,” he added.

As for the suggestion the NFV and SDN can cause potential disruption to long-entrenched broadcast workflows, Imagine Communications’ Mailhot believes this is a misguided concept. “It is perfectly possible for a broadcaster to re-create their exact current

workflow using the new technologies,” he counters. “But the real situation is that broadcasters want to change their workflows to be more efficient and more agile, with typically fewer human operational steps needed.”

NFV, SDN, and the related process virtualisation technologies, he highlights, enable these new agile workflows — so the infrastructure is no longer the constraint. Instead, the technology supports the desired workflow.

In Asia-Pacific, Imagine Communications sees the need for more dynamic/agile workflows as especially prevalent, because there is a “very high” demand for unique new multilingual content with rich graphics and fast turnarounds,

often also with geographically dispersed operations.

Mailhot adds: “With any new technology comes the need to manage and monitor it, providing a robust layer of operational supporting systems to ensure operational stability of the infrastructure.”

“Thankfully, the IT industry has produced a wide variety of network monitoring and management technologies that can be brought to bear on these deployments, the same technologies that are used in global banking and telecommunications networks to ensure service availability.”

In support of this ongoing transition, Imagine Communications is “leading the way” to software-based workflow elements that can be fully deployed on COTS networks and COTS processing. For instance, the Magellan Software-Defined Network Orchestrator (SDNO) provides operators with broadcast-familiar signal management across these COTS networks, keeping the appearance of traditional signal routing.

Similarly, the company’s IP-enabled EPIC MV multiviewer delivers a traditional broadcast mosaic look-and-feel, even as it consumes dozens of uncompressed video signals and hundreds of related audio and metadata streams to create the monitoring view.

The Versio platform, meanwhile, is a cloud-native, modular playout solution designed from

the ground up for geo-dispersed environments. It is also based on COTS hardware and provides high-quality TV programming composition including playout, automation, live signal integration, dynamic branding and channel finishing.

Versio’s dynamically instantiable software/virtual environment enables users to customise their workflows and to scale both in terms of the number of channels and features as these are needed. This allows customers to easily work at their pace and to address market dynamics as these change and evolve. Versio Platform also allows for agility and efficiencies across the workflow which help to reduce broadcasters’ overall total cost of ownership.

Last but not least, the Selenio Network Processor (SNP) enables the deployment of a future-ready, standards-based IP production or playout system. It provides a crucial integration element that bridges together the software/virtual world and traditional infrastructure where needed, as well as being an IP-to-IP processing platform for high-density conversion and processing.

As for Dell EMC, the company is focused on providing the infrastructure platform that makes the IP transition possible — from end to end. This includes precision workstations, servers and hyper-converged appliances running virtualised applications, shared scale-out file and object storage, as well as high-performance networking going from 10GbE, 25GbE, 40GbE to 100GbE.

Sevier concludes: “Our software infrastructure helps broadcasters to manage this platform like a cloud — and in fact to leverage an intelligent mix of public and private cloud services to get the most efficient, secure and cost-effective operation.”

“We also work closely with the leading media and entertainment ecosystem partners to provide a seamless solution, as well as high-quality service and support.” APB

## TV and video market to remain robust in 2019

BY RASHMI PAUL

As we look ahead towards 2019, TV and video will continue to grow. While mobile is increasing its market share in the Asia-Pacific region, this does not mean that traditional broadcasting is in decline. Figures show that from 2013 to 2018, the number of TV households has increased by approximately 10%, demonstrating that many consumers are still opting for the traditional living room viewing.

Over-the-top (OTT) delivered via the TV set will be a major global trend next year. This has not yet fully come into effect in the Asia-Pacific region, where OTT via apps is more common. But, changes in consumption and viewing habits around TV and video mean that OTT through the TV set is the future.

This does not mean viewing via mobile will diminish, however. Improvements in Internet strength — the biggest barrier to the market in recent

years — will mean it is also easier to watch content on the move.

Another key area of development will be the continued convergence of TV and video advertising. Broadcasters should be looking at new ways to trade, and establish and implement holistic solutions. Bridging the gap between linear TV and digital video to convey professionally produced, transparent and brand-safe content across the Asia-Pacific region is key to success, and to stand out from competitors.

“Over-the-top (OTT) delivered via the TV set will be a major global trend next year ... This does not mean viewing via mobile will diminish, however. But, changes in consumption and viewing habits around TV and video mean that OTT through the TV set is the future.”

— Rashmi Paul, Commercial Director, Asia Pacific, FreeWheel, a Comcast company





# The fast pace of change in the satcoms industry

The satellite industry is undergoing a major period of change right now. Challenged with increasing competition from other connection methods and consumer demand for a continual and perfect feed, the industry is standing its ground thanks to a very important “I” word: “innovation”. This is just one reason we felt we need to change the “I” word in our group’s name from the very negative “interference” to the wholly positive “innovation”.

## Evolving demand

Broadcasters are currently one of the biggest users of satellite spectrum. However, things are undoubtedly shifting, driven mainly by increasing competition in the broadcast space. With so many services launching across multiple platforms, consumers have more content choices than ever before. Broadcasters need to maximise efficiency while keeping costs down; simultaneously, they need a reliable and high-quality feed as so much choices means consumers will not tolerate downtime or poor quality.

At the same time, video-over-IP has been steadily gaining ground, with broadcasters looking for ways to reduce costs. This is naturally a potential threat for satellite operators, although it is also an opportunity as satellite communications can enable that.

We are also just on the cusp of the

Internet of Things (IoT) revolution, where consumers are becoming all the more connected, whether that be smart home devices, connected fridges, or even connected cars. As this trend continues, satellite will be an important enabler of both the large volumes of data and the on-the-move connections needed for connected cars, for example. However, it has to be able to ensure constant connectivity — so reliability will be key.

This evolving demand has led to a need for innovation in the satellite industry to increase efficiency and reduce costs in order to better compete with other connection methods.

## Innovating

That said, the industry has been innovating and there are a couple of interesting innovations to watch right now.

One of those is Digital IF (intermediate frequency). The basic concept can be summarised in the ability to give an IP address to the physical antenna and make it part of the IT infrastructure. This enables you to implement a software-based infrastructure, which dramatically reduces costs while increasing efficiency. Satellite operators are realising the potential of this technology and there are a number of applications where Digital IF is being deployed worldwide

already. That includes site diversity, antenna combining, disaster recovery, broadcast and multicast operations, and doppler removal. Eventually, Digital IF will become an industry standard — the question is simply when that will happen.

Another interesting trend is the use of big data and machine learning. There is no doubt that this has massive potential for the industry to greatly increase efficiency. I am reassured to hear a lot of discussions about how this could be applied, and finding new ways to apply big data will be a big focus for the Satcoms Innovation Group. However, some tools are already available and having a big impact.

For example, technology is available that can correlate data coming from the different elements of the satellite system (such as telemetry, RF monitoring, monitoring and control, and so on). It can not only troubleshoot events and correlate a complex set of outputs into a single dashboard, but could also prevent degradations and anomalies by analysing trends. The same technology is applied to optimising the available bandwidth on complex satellites, such as HTS and VHTS (very high throughput satellite).

There has also been a great deal of innovation when it comes to set-up. Auto-pointing antennas and tools to ensure proper set-up without the need

for highly trained installers not only increase accuracy, but also reduce costs associated with set-up. However, it needs to be precise and repeatable to be compliant with SOMAP or any satellite operators approval requirements to stop incidents before they happen.

## The future of satellite

Satellite will continue to play a crucial role for connectivity across the world. As the consumer demand evolves, the industry needs to evolve to address new challenges and consumption habits. That is already happening and I look forward to the Satcoms Innovation Group helping to drive that further. □

**MARTIN COLEMAN**  
Executive Director,  
The Satcoms  
Innovation  
Group, and an  
APB Panellist



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# broadcast technology

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# Success depends on well-defined IP network

The life of a modern broadcaster has never been more complex or fraught with challenges.

Broadcasters can look back with fond nostalgia to the days when they were not only the main content creators but also owned the key linear TV transmission pipelines; they basically controlled the content the average viewer consumes on a daily basis.

The introduction of the Internet and, latterly, the iPhone — directly or otherwise — has changed the landscape forever. The Internet, serving as a content distribution pipeline, spawned the birth of Netflix, quite possibly the biggest disruptor to the content consumption business model.

Consider this startling fact: Netflix is expected to spend up to US\$8 billion on 700 original series in 2018 alone. Joined by an increasingly growing brethren not afraid of splashing their cash in order to grow their online audience, this is encouraging a thriving video-on-demand (VoD) market that is continuing to pull viewers away from traditional linear TV.

Whether this is a bubble that is primed to burst from overload is an argument better served for another day — the most immediate concern for broadcasters is the continued relinquishing of control. Viewers today have multiple choices to choose their content from; besides VoD services such as Netflix, platforms such as Facebook, Twitter and YouTube have all continued to grow in popularity as content destinations, particularly for short-form content.

The main challenge for broadcasters today, according to David Blackett, group GM, Magna Systems and Engineering Group, is how to serve more and more people who want to watch whatever they

While it may be premature to conclude that traditional linear TV is on an irreversible downward spiral, broadcasters need to re-evaluate how they can survive — and thrive — in the digital age.



Broadcasters are likely to continue to face multiple challenges in 2019. Embracing new technologies is one way with which they could possibly gain more flexibility and agility in remaining relevant to their audiences. However, in order to gain the full benefits of these technologies, broadcasters need to first complete the transition to digital.

want, on whatever device they wish, whenever they choose.

“We now live in an almost completely on-demand world, and this has its challenges for broadcasters,” he continued. “Not the least of which is how to monetise and raise revenue in this OTT environment as opposed to in the old, traditional linear world, where revenue

generation was well-established and profitable.”

In essence, broadcasters need to continue to create compelling content and deliver the content to viewers in the way they want, all in the most cost-effective manner.

## Embracing technologies as key enablers

While traditional business models, practices and mindsets need to evolve in order for broadcasters to stay relevant today, embracing technologies could provide the flexibility and agility for broadcasters to move forward with their businesses

Where IP is concerned, 2018 could well prove to be a seminal year. The ratification of the SMPTE ST 2110 standards suite, while not completely eradicating all issues, should provide a greater level of confidence to broadcasters

contemplating IP.

While acknowledging that switching to IP is one of the biggest challenges facing the broadcast industry because it demands “such revolutionary and radical changes” in technology, Peter Schut, CTO, Axon Digital Design, suggested: “After five years of debating this issue, more people now agree that IP is a logical step forward, and are willing to countenance a move towards a fully IP future.”

He, however, raised one concern: How will broadcasters overcome the problems that arise when trying to integrate and control increasingly complex technology layers while still providing guaranteed bandwidth performance for new formats such as 4K/Ultra HD (UHD)?

Schut credited organisations such as the Alliance for IP Media Solutions (AIMS) for working towards creating final standards that address the needs of broadcasters who are heading towards a pure native IP infrastructure, as well as those who want a hybrid environment that allows them to mix old technology with new.

When ST 2110 was first introduced, early adopters have had to use gateway products to bridge gaps between IP and SDI. As the standard enters its second year however, broadcasters are beginning to enjoy the full benefits of IP, as companies build end-to-end systems, noted Mark Davis, director of products and technology, TSL Systems.

However, he cautioned: “The level of benefits an organisation receives will depend on their business goals: some organisations will see no significant improvement because after you add in the overhead and cost of conversion, the differentials can be small.”

The transition to IP is also providing clear opportunities for keyboard, video and mouse (KVM) companies like Guntermann & Drunck (G&D) to make their mark in the broadcast business. The IP revolution is providing media professionals and IT administrators with many advantages, according to Jochen



Earlier this year, APB organised an IP Master Class in Singapore, hoping to help broadcasters in the region bridge the game to IP. Since then, the ratification of the SMPTE ST 2110 suite standards has provided further impetus for the adoption of IP across the broadcast and media industry.

**Where IP is concerned, 2018 could well prove to be a seminal year. The ratification of the SMPTE ST 2110 standards suite, while not completely eradicating all issues, should provide a greater level of confidence to broadcasters contemplating IP.**



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Traditional linear TV could be at the threshold of a critical crossroads, as more and more viewers turn to video-on-demand services for their content fix.

**As 2019 slowly but surely nudges 2018 out of the way, broadcasters will continue to consider and evaluate how technologies like IP and 4K/UHD can potentially transform their business. This, without having even mentioning VR, AR, AI, ML and a host of other technologies looking to leave their mark.**

Bauer, head of marketing, G&D.

"Today, planners and technicians often look for solutions for standardising their network technology and integrating KVM components into the existing infrastructure."

Describing the demand for IP solutions as "high", Bauer also predicted that this demand will dominate the KVM market in years to come.

There should no longer be any doubt that KVM is sitting at the centre of the broadcast workflow, declared Terence Teng, managing director, IHSE APAC. In fact, he went as far as to state that without KVM, broadcast facilities today will simply not be able to function.

Teng explained: "KVM provides immense benefits to production, editing, engineering and operational staff, allowing them to reach and operate broadcast devices from their own workstations, or indeed, from any convenient workstation in the building.

"They can access each and every device in the broadcast workflow without having to move around the facility, which is welcomed by many, especially those who work in the cramped and busy confines of a live TV studio or outside broadcast (OB) van."

For broadcasters who are looking to adopt higher resolutions such as 4K/UHD — Japan, for example, is commencing 4K/UHD broadcasts this month — IP is also a viable option to address the issue of bandwidth requirements.

However, while countries like Japan are leading the way when it comes to 4K/UHD and, indeed, 8K deployments, are other countries in the Asia-Pacific region ready to follow suit? And if they are, how can they ensure successful implementations?

High dynamic range (HDR) and wide colour gamut (WCG) have "made a big splash" on the broadcasting world, said Aale Raza, founder and CEO of systems integrator Whiteways Systems.

While he was keen to highlight

that HDR and WCG are "great enhancements" to the image quality, and will provide a "huge advantage" to broadcasters, he also advised their implementation only after the entire process has been thought through carefully. "Implementing only 4K or UD without HDR and WCG is obviously not the way forward. [But], we are sure that as things move forward and HDR and WCG become integral parts of the broadcasting infrastructure, the missing gaps will be filled up and things will become easier," Raza concluded.

#### All roads start with digital

As 2019 slowly but surely nudges 2018 out of the way, broadcasters will continue to consider and evaluate how technologies like IP and 4K/UHD can potentially transform their business. This, without having even mentioning virtual reality (VR), augmented reality (AR), artificial intelligence (AI), machine learning (ML) and a host of other technologies looking to leave their mark.

But, before broadcasters can truly enjoy the full benefits of these technologies, a bigger and more important transition is in place, particularly in the Asia-Pacific region.

By the time you are reading this, Singapore is preparing to be the first country in South-east Asia to complete the digital switchover (DSO). On 1 January 2019, all analogue TV signals in the country will be permanently switched off, as Singapore prepares to write the next chapter in its TV history.

For other countries in the region, the race is on to meet the 2020 deadline set by ASEAN for the regional bloc to complete the DSO by 2020.

As the traditional custodians of linear TV, broadcasters need to embrace technologies and complete the DSO as speedily as possible. Then, and then only, will they be better equipped to halt, and reverse, the relative decline of linear TV in recent years. **APB**

# Understanding how technology and operations go hand in hand

BY ANDREW ANDERSON

Everyone is talking about an IP infrastructure for TV operations. Many vendors spruik their product lines with catchy slogans like "do more with less" or "endless flexibility".

I, like most, am a newcomer, having spent the past 40 years watching the various technological transitions with each one becoming more and more complex. My recent experience is that although this technology promises a lot, there are some overheads that need to be dealt with when designing and building a new plant based on this technology. Do not get me wrong, it is the way to go but the pitfalls remain for the uninitiated. There are also further developments that will eventually create an ecology that is indeed able to do more with less and is endlessly flexible.

Take routing around a TV playout and transmission operation, for instance. In the SDI world, if an encoder was to be fed by a router, it was as simple as defining a destination, plugging in the cable and you are done; in the IP world, the route happens in reverse. The control application has to tell the encoder to subscribe to a multicast that is available.

So now you need either an API in the encoding system or the encoding system needs to talk the same control protocol and "know" all the multicast addresses. In the planning and configuration stage you need to plan for the route to be possible in a completely differently way, considering what the overarching control system is and whether all sources and destinations talk the same language. But when you get it right, the flexibility is endless.

Choice of format is also an important factor. In an SDI world, it was because of the bandwidth of the individual signal path. In an IP world, however, this is significantly multiplied because in an IP world, a design can truly expect that all sources are available and therefore all are occupying IP bandwidth.

So, an IP backbone suddenly becomes exponentially large. Thus, the interconnect and switching between a channel playout systems and the headend platform is a significant consideration, which can force a design to lower format choice to reduce cost.

There is another consideration and this must be foremost in the approach to an IP-based plant, and that is the people who will operate it, both from a technical standpoint as well as daily operational workflows and supervision. You would think that the IP underlying infrastructure should not make a difference if the various software-defined "equipment" choices are correct. However, the fundamental

decisions that make that backbone needs to be based on the predicted workflows and expected operational functionality. If this is not done together, the infrastructure will have roadblocks or complexity that will frustrate the operation.

Our current and incoming broadcast and IT technicians have the challenge of understanding and maintaining a system every day long after the vendor experts have left the site. Tools for the configuration of software-defined equipment need to be understandable and 100% reliable. A TV playout system (in one box) can be configured in many ways, and the modification or replacement of a configuration must work every time and not be a procedure that requires several attempts, restarts or reverts to work.

This area in this new world, along with the finalisation of a way for software-defined equipment to "announce itself" when added to the network to all other devices, is ultimately necessary for the plant to be configurable and maintainable.

I reflect on the amazing operations that are possible in the future using this still evolving technology. Those possibilities are endless and I also consider the severe impact that a poorly designed IP network architecture could bring. I have seen many networking failures that take entire back offices down for hours, leaving network experts and consultants scratching their heads, pinging IP addresses and looking at switch configurations until someone finds that "ah ha" moment where the routing has been interrupted or some memory has run out or, worse still, the switch has a bug in the software that did not present itself for two years.

This is where expert focus in design and deployment is paramount, along with a high level of training for the people who will continue to operate the system in the years beyond.

Technology and operations always go hand in hand and this has never been more important as we embark on this new and exciting development. **APB**



Andrew Anderson is Head of Broadcast Operations, Seven Network (Operations). He is also an APB panellist.



# Magna Systems provides secure innovation in evolving broadcast industry

David Blackett, group GM, Magna Systems and Engineering Group, tells **APB** how the systems integrator is helping its customers gain a competitive advantage in an ever-changing broadcast and media landscape.

**What do you think are some of the key technologies that have emerged for the broadcast and media industry in 2018, and what is the impact these technologies have brought forth for broadcasters?**

**David Blackett:** The fact that SMPTE 2110 is now a fully ratified standard has made a significant impact in the broadcast industry; it is really pushing everyone, particularly broadcasters, into the world of IP.

Then, there is the emergence of technologies like Crystal Connect, which draws on Crystal's long experience with the monitoring and controlling of the broadcast workflow. Understanding that all the information needed to automate over-the-top (OTT) production exists already in playlist, traffic, scheduling and media asset management (MAM) data sets, Crystal Connect accesses this data, generates SCTE 104, SCTE 35, SCTE 224 and/or proprietary-format messages required by each distributor, and places them with frame-accurate precision at the beginning and end of each content segment in a programme.

This means broadcasters can now target specific viewers and send them tailored and customised ads at exactly the right time during a programme or broadcast in conjunction with their social media activity — something that previously has been very complex to achieve, and which is extremely valuable.

This in turn opens up a whole new playing field in the OTT ad world. More ads, especially more targeted ads, mean more revenue and at the end of the day, that is what everyone is chasing.

4K/Ultra HD (UHD) and high dynamic range (HDR) have obviously been around for a while but in 2018 they have really made their mark. HDR brings another step forward in terms of quality. It also gives more of a 3D impression without losing the social viewing aspect that 3D does when you are using glasses or a headset. HDR also changes the way productions are made as higher dynamic range means more depth in the blacks and whiter whites, along with a wider colour gamut, which in turn results in more lighting options.

To make it work for you, make sure you do your pre-shoot planning properly and fully take into account all of the extra 'angles' that HDR brings, such as more

detail, definition and focus, and how these will affect you and your production.

Finally virtualisation and putting more and more things in the cloud has gone through the roof — pardon the pun. It is now about how much commercial off-the-shelf (COTS) software you can use, and obviously a good MAM system is going to play a big part with all that data that needs to be managed and moved around.

**Particularly in Asia-Pacific, many broadcasters need to complete the transition to digital in order to enjoy the full benefits of technologies such as IP, virtualisation and artificial intelligence (AI). Would you agree with this statement, and what advice would you offer for a successful digital transition?**

**Blackett:** Well, if you want to fully play in the digital worlds of IP, virtualisation and AI, then you have to be digital. It is as simple as that.

The question of 'completing the transition' is not quite black and white though. With such a game-changing move, you have to pick an approach, a path that you are going to be able to follow logistically and financially.

You can go the hybrid route and complete the transition bit by bit, which is cheaper and less risky but slower. Or you can go all in and totally greenfield which then means choosing and using your own cloud or a public one — both very big decisions with big ramifications. At that point, you have to make your own databases, workflows and commercial decisions, ones you will have to live with for years. So the best and most real advice is plan, plan, research and plan. If you are not 100% ready, do not start.

Rushing in before you are ready can be a very costly mistake.

**Looking ahead to 2019, what do you think are some of the key challenges facing broadcasters, and how do you see the broadcast and media industry continuing to evolve?**

**Blackett:** The main challenge continues to be how to serve more and more people who want to watch whatever they want, on whatever device they wish, whenever they choose. We now live in an almost completely on-demand world and this has its challenges for broadcasters.

Not the least of which is how to

**"The evolution of the industry will be firmly in the OTT and B2C space ... Broadcasters have to not only be across this, but also be very much a part of it in the future."**

— **David Blackett**  
Group GM,  
Magna Systems and  
Engineering Group



monetise and raise revenue in this OTT environment as opposed to in the old, traditional linear world, where revenue generation was well established and profitable.

With that in mind, the evolution of the industry will be firmly in the OTT and B2C space. There will be more content owners becoming content aggregators and distributors by default as they are able to communicate directly with consumers. Either that or they will use new and different distribution channels and paths. Sports rights owners are now tying up key contracts with telcos and this will continue in other areas too. Broadcasters have to not only be across this, but also be very much a part of it in the future.

**In the context of continuing change, how is Magna positioning itself as a key technology partner for broadcasters, particularly those in the Asia-Pacific region?**

**Blackett:** Magna's philosophy has always been to identify trends in advance, then find the technology and solutions that best suit those trends and help our customers adopt and implement them. And that is exactly what we are doing across the Asia-Pacific region.

In this burgeoning OTT world, we now have a raft of incredible, cutting-edge technologies from companies such as HeadSpin and Witbe.

Witbe helps broadcasters wanting to investigate quality of experience (QoE), end-device testing and how to maximise the efficiency of apps. As a company dedicated to helping developers accelerate the mobile movement around the world through their Mobile Testing Platform,

this is a conversation worth having.

Another leading innovator in the QoE industry is Witbe, with its award-winning approach to monitoring the QoE actually being delivered to the end-users of any interactive service, on any device, and over any type of network. Combining hardware and software, Witbe's state-of-the-art technology has already been adopted by more than 300 clients in 45 countries, including broadcasters, telecom operators and app developers.

We also have partners who provide quality of service (QoS) products for video quality and audience behavioural intelligence solutions, with proactive video quality monitoring that verifies video content is continuously available, in every bitrate and format.

Then, there's Mellanox Technologies, which is a leading supplier of end-to-end InfiniBand and Ethernet interconnect solutions and services for servers and storage — crucial in this evolving OTT world.

Nevion, commonly known as the architects of virtualised media production, is another key partner and solutions provider for Magna in an increasingly IP-based broadcast environment.

The list continues to grow with the common theme being Magna's 50 years in the broadcast industry and our history of providing a competitive advantage for our customers through the timely adoption of innovation with minimal risk of disruption. We truly offer our customers the comfort of secure innovation and in today's ever-evolving broadcast industry, that is something our customers value above all else from us as their technology partner. **APB**



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# Original KVM or KVM-over-IP — where is the broadcast industry headed?

Will the technology used in broadcasting solely consist of IP devices? Or, an “IP-only world”, so to speak? For years, IP has been entering all areas of life. This is especially true in control room applications as it is typically deployed in broadcasting, which is benefiting from the IP revolution in many ways. But an “IP-only broadcast world” is not yet here. Nevertheless, the trend is clearly moving towards IP transmission, even though a large part of content production still uses traditional transmission paths. And therefore, we continue to live in a hybrid world, using both traditional and IP-based technologies. Keyboard, video and mouse (KVM) experts Guntermann und Druck (G&D) still rely on both original KVM and KVM-over-IP to be able to offer their customers the best of both worlds. **BY JOCHEN BAUER**

Are there any recommendations for when to choose classic KVM over KVM-over-IP? Unfortunately, this question has no universal answer as an answer would always depend on individual project parameters and customer wishes.

Classic KVM is based on dedicated cabling. Therefore, a dedicated network is usually set up for the systems. This has the great advantage that the available bandwidth can be used optimally without having to add further network-compatible devices consuming bandwidth. The producers enjoy optimum performance with the best possible image quality and the best possible user experience. One should also keep in mind that thanks to the standard connection technology, existing cable structures can still be used or even be expanded. Last but not least, classic KVM systems offer maximum access security thanks to the total control of the medium.

G&D recently announced an expansion of its portfolio of classic KVM matrix systems in order to better meet customer requirements. The German KVM manufacturer launched six new expansion stages of the compact ControlCenter-Compact matrix series. With this portfolio expansion, the company will be able to always offer its customers a suitable and tailor-made solution according to project requirements.

## KVM-over-IP: Does everything now revolve around IP?

The IP revolution provides media professionals and IT administrators with many advantages. Today, planners and technicians often look for solutions for standardising their network technology and integrating KVM components into the existing infrastructure. The use of existing cabling, switches and routers does not only save costs, but, above all, provides flexibility and simplification through central administration. Standard

network components ensure that existing IT installations can be scaled more easily, flexibly and cost-effectively. Under certain circumstances, existing structures can even be shared.

The demand for IP solutions is high and will increasingly dominate the KVM market in the coming years. Today, G&D is already building the technology of tomorrow and therefore presented a new matrix for KVM-over-IP at the beginning of the year. Together with a series of IP extenders, the ControlCenter-IP forms a powerful matrix system with which every connected workstation can access every remote computer. In a conventional network, KVM-over-IP packets are



**“The trend is clearly moving towards IP transmission, even though a large part of content production still uses traditional transmission paths.”**

— Jochen Bauer  
Head of Marketing,  
Guntermann & Drunck



Together with a series of IP extenders, G&D's ControlCenter-IP forms a powerful matrix system with which every connected workstation can access every remote computer.

transported by network switches and routers, with the ControlCenter-IP contributing the switching logic. Transmission takes place compressed with CAT cabling or optical fibres via standard IP-based Layer 3 networks, with a data transmission rate of up to 1Gbps per line.

## Powerful and flexible

Today's networks are becoming increasingly powerful. Networks with 40Gbps or even 100Gbps bandwidth are no longer considered a major technological breakthrough. This creates opportunities for technologies outside the content chain.

The big advantage: system administrators are familiar with IP, and KVM-over-IP seems to be the next logical step for IT-supported structures in broadcasting. The new ControlCenter-IP captures the spirit of the times and combines all advantages of G&D's classic matrix systems with the flexibility of IP networks.

Another advantage of IP-supported structures are duplex-capable IP networks. In such networks, the cabling can be used to transmit KVM packets in both directions. This provides maximum flexibility, so that under certain circumstances — for example, in broadcast houses in which two company buildings are to be connected — cabling can be saved.

The new IP systems certainly do not generally replace the classic systems

**“The demand for IP solutions is high and will increasingly dominate the KVM market in the coming years.”**

as they have their own advantages and are still often used in many projects. Whether IP or classic, the more important point is: In order to have a future-proof installation, systems must be adaptable so that they can still be used even with changing requirements and can be retrofitted as the system architecture grows.

G&D are therefore particularly proud to offer the largest compatible and combinable KVM portfolio on the market. This ensures that our customers' installations are future-proof and expandable.

However, even after a lot of thought, it is still not possible to give a general recommendation for IP or for original KVM systems, as each project can be designed very individually on the basis of the project requirements and framework conditions. In addition to project parameters, which play a significant role when deciding between classic or IP, subjective factors are extremely important too.

With their many years of experience, G&D's KVM experts are happy to always assist our customers with their projects. **APB**



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# TSL Products makes an IP business case

Mark Davies, Director of Products and Technology, TSL Products, explains to **APB** how format-agnostic IP technology future-proofs broadcasters' migration to higher resolution and new production approaches.

**2018 saw a number of mergers and acquisitions, not only from traditional media players but also among manufacturers. How would you summarise these changes that the broadcast and media industry is going through?**

**Mark Davies:** As the customer base merges to create larger and more demanding customers, it makes sense for the medium and large companies on the supply side to consolidate, so they can better serve their customers. However, there will always be the need, from customers of all sizes, for small and agile suppliers, who are better placed to serve niches and react in a timely manner to the fast-changing world of media production.

**This year also marks the first anniversary of the approval of the first standards within SMPTE ST 2110. How has this ratification been received by broadcasters, and should there still be any other reasons for broadcasters to hold back their IP transition plan?**

**Davies:** Many early adopters of SMPTE ST 2110 had to use gateway products to bridge gaps between IP and SDI. Now that the standard is entering its second year, broadcasters can get the full benefits of IP, as companies are building end-to-end IP systems. The level of benefits an

organisation receives will depend on their business goals: some organisations will see no significant improvement because after you add in the overhead and cost of conversion, the differentials can be small.

Since the time broadcasters went from black and white to colour, every time a new production format standard was introduced, broadcasters had to completely rebuild facilities. An obvious advantage of IP is that upgrading to the next video standard no longer means a system rebuild, it could just be a software tweak. With SDI, when a new production standard came along, we had to rebuild infrastructure — take out an HD router and put in a 3G router, or take out the 3Gbps router and put in a 4K/Ultra HD (UHD) one.

Thanks to IP, those days are behind us because IP is format-agnostic. However, just because we now have 4K/UHD, it doesn't mean there won't be new standards arriving to improve image and audio quality that will require facility upgrades. We will never be done with format and standard changes. On the horizon is high dynamic range (HDR), high frame rate, and even 8K and virtual reality (VR). But once you have your video in all those IP packets, it does not matter if the



**“Simplified IP solutions will continue to evolve and impact the media industry, and this plays to the strengths of what we offer at TSL Products.”**

— **Mark Davies**  
Director of Products and Technology, TSL Products

format is 4K/UHD or 8K, the fundamental architecture remains unchanged.

However, as the current excitement around uncompressed IP, virtualisation, cloud and remote production continues, many of our other customers are not working at the cutting edge. There are just not the drivers in their business model to take risks or invest in retraining needed for the move to IP. Therefore, TSL Products will continue to support existing standards while providing future-proofed solutions. We recently introduced two new analogue audio monitors to allow customers working in traditional formats to benefit from the latest technology and price points.

**One production approach that has been gaining traction, especially for live events, is remote production. Hence, how do you see the development of remote production in Asia-Pacific, and what are the challenges broadcasters have to overcome to successfully implement this production approach?**

**Davies:** We are seeing a continued pressure on production budgets globally, which has therefore accelerated the deployment of remote production solutions. From a control perspective, this is a maturing technology with many deployments for requirements such as remote news production. For news, especially in scenarios where it is lower cost, or it is just safer to have engineering and production staff remote from the news studio, this is an attractive solution.

Also, with the increasing demands on resources, the rapid adoption of IP and remote production requires interconnected solutions that can hide underlying system complexities so that operators can remain focused on making great content. At BroadcastAsia2018, we partnered Ideal Systems and our US-based control systems partner, DNF, as part of a successful SMPTE ST 2110, ST 2022-6 and broadcast control systems interoperability solution by providing a simple and intuitive virtual panel interface that translate IP workflows to retain the familiarity of SDI routing

using our TallyMan control platform.

In the Asia-Pacific region specifically, we have provided the China Central Television Network with our PAM2-IP audio monitoring units during the Winter Games to assist with coverage. In addition to being used in the control room, the units were also utilised by the field team and we expect that they will become increasingly more popular for remote production, especially as control protocols, such as Ember+, are added. TSL's FlashBoard, a technical information and display system, has also been used by China Sports Media to design tailored displays that are located outside each studio, in the control rooms and other areas.

**Moving ahead into 2019, what other technologies do you foresee having an impact in the media industry, and how is TSL Products helping its clients to address these issues?**

**Davies:** Simplified IP solutions will continue to evolve and impact the media industry, and this plays to the strengths of what we offer at TSL Products. Combining our deep understanding of controlling third-party equipment with our TallyMan Advanced Control Platform and our audio and video monitoring solutions, we are well positioned to provide complete solutions with our own products but will also easily integrate with a third-party kit. With a view to this connected IP future, we have already added advanced control protocols to many of our products, including Ember+, SNMP and API, with AMWA NMOS IS04 to follow. We will continue to track the Alliance for IP Media Solutions (AIMS) roadmap and keep our products up to date with the emerging IP workflows.

Strong partnerships with systems integrators and technical partners are also vital. TSL recently announced its partnership with Professional Audio and Television (PAT), and intends to continue expanding and bringing innovating technologies to remote production in the Asia-Pacific region. **APB**





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# Incorporating HDR/WCG in the broadcast workflow

BY A. RAZA

High dynamic range (HDR) and wide colour gamut (WCG) have made a big splash on the broadcasting world. Numerous manufacturers have lined up to show the spectacular colours with their cameras, monitors and projectors. The challenge, then, is to incorporate these new standards into broadcast workflows.

Before we go forward, let us understand what is HDR and WCG. SMPTE defines HDR as system specified and designed for capturing, processing and reproducing a scene — conveying the full range of perceptible shadow and highlight detail, with sufficient precision and acceptable artifacts, including sufficient separation of diffuse white and specular highlights.

HDR is specified and designed for capturing, processing and reproducing scene imagery, with increased shadow and highlight details beyond current standard dynamic range (SDR) video and cinema systems capabilities.

Human vision has a wide latitude for scene brightness, and has multiple adaptation mechanisms that provide an automatic 'gain' to the visual system. The brightness range that people can see is much greater than the available simultaneous contrast range of current displays. HDR systems are intended to present more perceptible details in shadows and highlights, thus better matching human visual system capabilities under the several image viewing conditions typically found in consumer environments.

In particular, HDR allows distinguishing bright details in highlights that are often compressed in traditional video systems, including allowing separation of colour details in diffuse near-white colours, and in strongly chromatic parts of the image.

SMPTE defines WCG as chromaticity gamut significantly larger than the chromaticity gamut defined by Recommendation ITU-R BT.709.

Before we move forward and discuss the workflow issues related to HDR and WCG, let me mention that there are at least three standards of HDR :

- Dolby has developed a standard known as Dolby Vision.
- HLG (Hybrid Log Gamma) has been developed by the BBC and NHK.
- HDR10 is the standard for Blu-ray.

The first problem is, which HDR standard will be used by broadcasters? The second problem is, lack of related equipment that can read HDR content, such as reference monitors, consumer displays, and video links capable of higher

bandwidth required to transfer HDR content.

The third problem is, for the most part, HDR/WCG interfaces are compatible with HDTV and 4K/Ultra HD (UHD) TV 10-bit and 12-bit signals, and can be carried over existing 3Gps-12Gbps interfaces. If, however, high frame rate (HFR) signals such as 100Hz and 120Hz are to become part of an implementation, new interfaces and infrastructure will be required. The existence of HDR signals and different display colourimetry can put new demands on systems interoperation. Displays, image processors, up/down colour converters will all need to detect the HDR encoding and colourimetry in use to correctly process and display the signal.

HDR and WCG are emerging technologies that are still undergoing much development, and there are various approaches needed to create, transport, distribute and display HDR/WCG content. This is an implementation challenge for broadcast workflows that are complex in nature, highly automated and expensive to build. Broadcast networks rely on standards to ensure interoperability and to build cost-effective workflows.

HDR/WCG with frame rates limited to a max of 50/60Hz can be accommodated by existing multi-link 1.5Gbps, or multi-link 3Gbps interfaces, or 10Gbps optical links. HDR/WCG signals will require that displays be changed to correctly display the images. The use of frame rates beyond 60Hz that also include pixel matrixes at 4K/UHD and 8K will require building new infrastructures.

## There are numerous problems related to production

Displays capable of showing the entire captured image might not initially be available to production staff. Postium, Eizo and some other manufacturers have announced HDR displays recently, so that may solve the problem.

Both HDR and SDR monitoring systems and processing equipment for on set and in-studio are required to measure and view the full signal range that is recorded or transmitted.

New lighting systems may be required for HDR and WCG, taking advantage of the greater dynamic range in HDR. There will be a need for more flexible and artistic requirements for lighting systems in the studio and on set.

The characteristics of the image dynamic range must be preserved, yet not all of the range coming from a camera can be seen with monitors. Additional metadata created at capture may need to be defined — describing viewing equipment and conditions, and methods must be created to deliver it to later users.

It is expected that systems in a CER control room that switch, record, measure, display, process overlay graphics or playback HDR/WCG content will need upgrading or replacement to support new features. Multiple output signals for HDR and SDR may be created automatically from an HDR signal and these all need to be monitored.

Existing interface metadata tables need to be adjusted to reflect the addition of HDR/WCG content types, and messaging protocols need to be extended to cover these new content types. Broadcast workflows for terrestrial, satellite, cable and IP distribution rely heavily on automated processing system workflows. To enable HDR/WCG processing, as well as conversion between HDR/WCG and traditional SDR content in these workflows, dynamic-, scene- or frame-based metadata may be needed.

There is uncertainty on how such metadata can be bound to content and transported through automated workflows in a persistent manner. Processing and conversion systems such as video mixers, encoding systems, and graphics systems might delete the metadata. Other processing systems might alter the image content in a way that the associated metadata no longer reflects the image content.

Metadata would need to be updated to

reflect the new image parameters, as well as a history on how the image was altered.

If large number of audio channels are present in the video, it is possible that the interface may not be able to carry all the channels. This could be the case when dealing with HFR signals being converted to lower frame rates — there may be lip sync issues or other audio issues.

Real-time conversion will also be a problem. Many broadcasters convert content and broadcast in multiple content types. It is possible that HDR and WCG content will be delivered in a variety of HDR/WCG combinations of colourimetry, peak luminance, maximum dynamic range and transfer function. It is further expected that some content will be conveyed in both HDR and SDR versions and with different colour spaces.

These different HDR/WCG content types may need to be converted to conform to an in-house specification to allow seamless processing and distribution of content, and to conform to content delivery/transmission standards.

Graphic overlays, tickers and logos will have to be accommodated in such a way that HDR presentations when converted to SDR presentations produce acceptable results without complex conversions.

Ingest, storage, playout systems may need upgrades or replacement to support HDR/WCG file formats, codecs and metadata. Media asset management systems may need updates to support storage, processing and distribution of metadata about HDR/WCG content, Web service messages and user interfaces. It is expected that at least 10-bit representation will generally be required for support of HDR/WCG content in codecs, signal paths, file formats and in applications, as well as metadata to flag the presence of such content.

In the case of file formats, most file formats such as MXF are already 10-bit capable. Interfaces for broadcast playout will need to be upgraded to allow signalling for HDR/WCG content and, if applicable, the synchronised transport of content-dependent metadata.

## Conclusion

While HDR and WCG are great enhancements to the image quality and will provide a huge advantage to the broadcaster, they need to be implemented after the entire process has been thought through carefully. Implementing only 4K or UHD (higher resolution) — without HDR and WCG — is obviously not the way forward. We are sure that as things move forward and HDR and WCG become a necessary part of the broadcasting infrastructure, the missing gaps will be filled up and things will become easier. **APB**



**“Implementing only 4K or UHD (higher resolution) — without HDR and WCG — is obviously not the way forward.”**

— A. Raza  
Founder and CEO,  
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# Hybrid approach – the model to modernise broadcast workflows and facilities

Rainer Kampe, CTO at Broadcast Solutions, tells **APB** how systems integrator can help bridge the gap between legacy equipment and new technologies without a complete overhaul.

**2018 has been a big year for Broadcast Solutions, including the introduction of *hi*, the human interface for media applications. Can you explain the concept behind this development, and how *hi* can be applied to enhance broadcast workflow efficiency?**

**Rainer Kampe:** Broadcast and media technology has experienced several revolutions in recent years: from SD/HD to 4K/Ultra HD (UHD), from baseband to IP, and from monolithic core systems to modular and software-based platforms. These networked and software-driven systems offer unprecedented flexibility for broadcast and media environments, but require special caution. It is the user's responsibility to define functionalities, workflows and control mechanisms for all the new devices.

These configuration processes can take a lot of time and effort — and, in the worst case, need to be redefined each time a piece of the system has changed. Misconfigurations in an IP-based system have dramatic effects on the whole infrastructure so the need to provide a fail-safe environment increases dramatically. This is why Broadcast Solutions created *hi*.

*hi* makes the configuration process smart and easy, detects new devices automatically, and protects the user from

false-configurations.

Built on decentralised software architecture, the *hi* system can run on almost any platform — a laptop, dedicated servers, server clusters and also in data centres or on cloud services such as Amazon Web Services (AWS) or Microsoft Azure. This architecture ensures uninterrupted availability, even if hardware, power or protocol failures happen. Self-healing algorithms ensure that all parts of the system are up and running properly — even if they are distributed over different hardware platforms, or working from different locations.

Reliability and ease-of-use are keys to a successful interaction between the system and the operators, driving the main development focus to be on the user and how workflows can be simplified.

**Several sports event took place this year, and some of which were broadcast live in 4K/UHD high dynamic range (HDR). Can you share with us your views on live programming in 4K/UHD HDR, and what are some of the projects Broadcast Solutions has completed in this area?**

**Kampe:** Within the broadcast industry, 4K/UHD is increasingly being accepted, and production companies and content

**“It is safe to say IP is here and, depending on the production, can be beneficial for the production company or the broadcaster — financially and efficiently.”**

— Rainer Kampe  
CTO,  
Broadcast Solutions



producers have to meet the viewer's demands for better quality pictures. To some of our customers, producing in 4K/UHD is a normal daily business. With the rise of HDR, a further enhancement in terms of picture quality comes into play. It is an area which our customers have to address, and that has a direct impact on the production workflow.

In 2018, we have realised several projects with 4K/UHD and/or HDR, or even HD with standard dynamic range (SDR) technology working side by side in a single production tool. The projects we design — whether it might be an outside broadcast (OB) van or a studio — are equipped with hybrid solutions capable of delivering different formats and resolutions at the same time.

Our customers need production tools that are able to deliver all different feeds with the same infrastructure — and we give them solutions that can handle all formats that are currently used and are future-proof investments for upcoming developments.

One project we have completed is for Polish broadcaster Ekstraklasa Live Park, which needed a new OB van to produce the Polish football league in 4K/UHD HDR, starting January 2019. We designed an OB van to accommodate 4K/UHD HDR and HD SDR signal workflows at the same time. To find these solutions, we are in direct contact with the manufacturers to find the best solutions, and organise seminars and workshops to teach the industry how they can benefit from these solutions.

**Specially in Asia-Pacific, Broadcast Solutions has also sealed a number of distribution deals. Can you elaborate on this, and what opportunities do you see in this region?**

**Kampe:** Acting as a global systems integration company and solutions provider, our aim is always to make the

best technology and products available to our customers. We partner with several manufacturers to promote their products in the Asia-Pacific region, on a project or exclusivity basis.

With partners such as Mobile Viewpoint or Simplylive, which we introduced to the Asia-Pacific market at BroadcastAsia, we have some strong brands we believe adhere to the challenges of our customers.

But distribution works in two ways. We are always interested in manufacturers that offer a new technology and a new approach, not only to distribute in the Asian market, but to introduce them to Europe. A good example is the LaON wireless intercom system produced in South Korea which, thanks to us, entered new markets in Europe.

**What other technological challenges are media companies facing today, and as a systems integrator, how is Broadcast Solutions helping them to address these issues?**

**Kampe:** With topics like IP or remote production still on everyone's lips, fundamental changes in the broadcast industry are still gaining momentum, and will be implemented alongside legacy equipment and workflows. It is safe to say IP is here and, depending on the production, can be beneficial for the production company or the broadcaster — financially and efficiently.

Again for Broadcast Solutions' customers, it is critical to have mobile or fixed broadcast facilities at command that can work with legacy equipment, and at the same time, embrace the newest technology when IP-based technology or remote production workflows are needed. Working on a partner base with our clients, our goal is to find the best solution for the customer, and to give them the production tools they need.

We recently implemented large remote production facilities that show our approach perfectly. One project was the new remote production hub and studio for Finnish company Streamteam Nordic, the largest broadcast investment in Finland in this millennium. The company produces the Finnish ice hockey league with over 450 matches per season, and with up to seven games simultaneously.

The need to cover all matches simultaneously (in both HD and 4K/UHD) while adding studio production to the programme required Streamteam Nordic to build a centralised production hub. The overall system design Broadcast Solutions developed takes a hybrid approach, leveraging IP workflows for interconnecting the venues and hub, while production within the hub and the studio uses 3G baseband format. **APB**



With a need to produce the Polish football league in 4K/UHD HDR, Polish broadcaster Ekstraklasa Live Park has tasked Broadcast Solutions to design an OB van that is able to accommodate 4K/UHD HDR and HD SDR signal workflows.



Broadcast Solutions has designed a remote production hub for Streamteam Nordic, a Finnish broadcast production company that produces the country's ice hockey league.



# DVB extends its focus

BY DR PETER SIEBERT

As we marked our 25th anniversary during 2018, there was plenty to be proud of, but also considerable work still to be done. Our most recently published suite of broadcast-related specifications covers the full range of Ultra HD (UHD) elements: 4K resolution, high dynamic range (HDR), high frame rate (HFR), wide colour gamut (WCG) and next-generation audio (NGA). We do not anticipate developing new broadcast specifications anytime soon — it is up to broadcasters, network operators and manufacturers to implement our specifications and give the end-user the best TV experience.

Instead, DVB's focus is now on interactive hybrid broadband/broadcast applications and delivery. On this, we cooperate closely with our sister organisation HbbTV, which provides specifications for interactive applications and services relying on bi-directional IP connectivity.

One area where we work together is on specifying a targeted advertising (TA) solution. The system will focus on the necessary interfaces between the broadcaster, network operator and

end-user device. The specification work is in full flow, having brought several new members to DVB. We expect the specification to be available in 2019.

Another major focus for DVB is our work towards making over-the-top (OTT) Internet-based delivery of audio-visual content as user-friendly as our classical delivery solutions, DVB-T2, DVB-S2, DVB-C, and more. A new suite of specifications, DVB-I (where the I stands for Internet), will offer a similar user experience to linear broadcast TV and will provide an additional deployment option for broadcasters and operators. The focus of new specification work will be on service discovery and the necessary signalling.

We are expecting the DVB-I specification for service discovery to be available later in 2019. This will be a major milestone for DVB.

The starting point for locating DVB-I service offerings in different locations, territories and access networks, including cross-border service access, is the bootstrap mechanism. As one potential solution, the commercial requirements propose that a centralised registry and/or infrastructure would be set up. Of course, this is only one approach to tackle the challenge of bootstrapping.

When it comes to the other building blocks of DVB-I, the underlying technology is either already well advanced and implemented, or in the final phases of standardisation. The first version of DVB-DASH was published in 2015. It defines a profile of the MPEG-DASH specification dedicated to OTT delivery of broadcast content. As compared to the quite comprehensive MPEG specification, the profile of DVB-DASH facilitates implementation and conformance testing. Recently, DVB published an updated version of its DASH profile, adding UHD and related advanced features, including XML-based subtitles.

One annoying aspect of DASH delivery today is the extensive delay experienced when viewing live content, especially when key moments in sports events arrive later than the broadcast signal received by a neighbour. Here, DVB is working on a low-latency DASH solution. The approved commercial requirements for this specify a maximum delay of 3.5 seconds for encoder to screen latency, which restricts the maximum segment size. The technical group is charged with identifying the sweet spot between the maximum delay and related increases in the data rate needed while still guaranteeing reasonable

**“DVB's focus is now on interactive hybrid broadband/broadcast applications and delivery.”**

— Dr Peter Siebert  
Head of Technology, The DVB Project  
& an APB Panellist



throughput and scalability of the content delivery network (CDN).

Another building block for DVB-I will be adaptive media streaming over IP multicast. The technical specification will address managed networks in the first edition, before considering possible extension to OTT Internet delivery. This work aims to provide broadcast-like scalability, without requiring existing clients — set-top boxes, smart TVs, and so on — to be replaced or modified.

Specifications for both low-latency DASH and adaptive media streaming over IP multicast are on track to be approved for publication when our Steering Board meets in the middle of 2019. **APB**

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# KVM switching systems in the broadcast workflow: Specify and install early in the integration process

BY TERENCE TENG

## The complex task of broadcast systems integration

Planning and integrating a major broadcast facility, whether in a fixed studio or mobile outside broadcast (OB) vehicle, is an enormous undertaking and one that requires significant and highly detailed planning. The whole process — from initial concept to final delivery and going live — often spans several months, if not years, and often involves dozens of people. Several different organisations will be involved in the project, each with their own specific expertise and who are reliant on others to help schedule and complete their own tasks.

System schematics can span dozens of pages. The parts list usually stretches to thousands of items and covers a wide range of components, from the smallest plug and cable to the large switching systems and network devices. All these individual items have to be connected correctly and need to work with other subsystems in the broadcast workflow, many of which will need individual configuration and bespoke software design. This results in a complex integration workplan comprising hundreds of individual tasks, with significant inter-dependence between them.

With an integration process that takes months of sustained and concentrated effort, it is essential that all elements within the design are correctly specified, ordered and received in a timely fashion. As we are all too aware of, a delay in almost any item can adversely affect final completion of the system, with the associated knock-on effects of delayed launch and additional cost.

## Don't forget the KVM switch

It is worrying that we sometimes receive calls from integrators who have delayed

the specification of the keyboard, video and mouse (KVM) switch system until the end of the project. That is a situation often brought about by the sheer complexity of the total project but sometimes, in the very worst cases, simply because it has been forgotten. Naturally, we do all we can to help, by assisting in the specification of the required system and encouraging our production department to pull out all the stops to deliver the products and solutions as quickly as possible. While the extra overtime is welcome, any suggestion of curtailing long-awaited holidays does not go down well!

## KVM at the centre of the broadcast workflow

The KVM system sits at the heart of every broadcast installation — without it, the facility will not work. It provides immense benefits to production, editing, engineering and operational staff, allowing them to reach and operate remote broadcast devices from their own workstations on their own desks, or indeed, from any convenient workstation in the building. They can access each and every device in the broadcast workflow without having to move around the

facility, which is welcomed by many, especially those who work in the cramped and busy confines of a live TV studio or OB van.

Not only does a KVM switching system aid operators, but it can also save costs by enabling expensive hardware and software to be shared among users and employed as needed, rather than requiring that each individual operator is supplied with their own set of tools.

IHSE is one of the leading vendors of KVM extenders and switches used throughout the broadcast sector: from small satellite newsgathering (SNG) vans to the largest OB trucks and broadcast installations, and across all sizes and types of audio and video production, post and editing studios — including some of the most well-known in the industry. We work closely with major component vendors, including market-leaders in the industry such as Avid, EVS and Vizrt, to ensure that the combined systems work well together.

## Use the KVM switch to aid the integration programme and reduce timescales

The features that improve the working environment of the broadcast installation can be used to make it easier for integrators to carry out the system integration programme. A useful benefit to the integrator is that the KVM system is highly flexible and can be operated and expanded as devices and users are added. It can be used as soon as it is installed, well before the full broadcast system is up and running.

That means it can help greatly in the systems integration process by enabling engineers to easily manage and control devices as soon as they are connected through the KVM switch. They can then undertake the configuration and integration of those devices from any location, no matter how remote, without having to wait for a local workstation to be installed or become usable.

This makes the process more efficient — there is no need to wait until a dedicated workstation is fully operational and the area around it cleared. An engineer can access a remote device for configuration and set-up from anywhere, allowing installation and set-up tasks to be carried out and completed in parallel with others, thereby reducing the overall project time.

## Adding to the flexibility

The key element of a KVM switch is that



**“The KVM system sits at the heart of every broadcast installation — without it, the facility will not work.”**

— Terence Teng  
Managing Director, IHSE APAC

it enables every operator to instantly connect to any device. Consequently, connections between individual workstations and remote computing devices do not have to be defined prior to integration and wired accordingly. Nor do they have to remain fixed over time. This adds greatly to the flexibility within a broadcast installation. Studios and OB vans can be quickly re-configured to match the type of programme they are dealing with at any time. It also allows new devices to be added and integrated into the working environment with minimum disruption and maximum effect.

And during integration, the proposed system can be adapted and changed to overcome changes in requirements or to overcome problems in machine-to-machine connectivity.

## KVM in the broadcast environment - consider early and use to maximum effect

With the enormous capability and flexibility offered by KVM switches and extenders, it makes sense to take advantage of these highly useful solutions when designing, integrating and operating complex broadcast systems.

KVM systems should, therefore, be considered at the earliest stage of design and be installed at the earliest opportunity. That way, the job of the systems integrator can be less stressful and more productive. And the workflow can be easily and quickly enhanced, adapted and improved to meet the requirements of tomorrow's broadcast industry. **APB**



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# The evolution of connected TVs: Beginning of a new saga for broadcasters?

BY AMITABH KUMAR

The evolution of the connected TVs and their enhancing capabilities have been increasingly evident to any industry watcher over the past five years. However, it took an announcement by the US Federal Communications Commission (FCC) in Jan 2017 to bring the truth home. The FCC abandoned its previous proposal to ask cable companies to open their set-top boxes (STBs) to Internet companies such as Google and Amazon so that they could push their content to TVs. The FCC reasoning was simple — the days of the STB were over. In the words of the FCC chairman: “We must embrace the technology of the future rather than cling to the hardware of the past. I don’t believe the American people want more set-top boxes in their homes.”

The evolution of connected TVs, along with their ecosystem of smart devices including smartphones and Internet of Things (IoT) capabilities with intelligent voice assist, over-the-top (OTT) and media search, have now progressed way

beyond the original vision of the TV sets being related to only television. What it has enabled onboard is a number of so called “outliers” offering video, music or social media TV apps to the mainstream. These OTT and media applications now have the same prominence as the so called “mainstream television”, a title which TV companies continue to believe they are entitled to retain.

In another theatre of operations, in October this year, the 3GPP, a standards body for mobile applications, revealed startling progress on the new standards of “television delivery” possible via mobile networks, via 3GPP releases 15 and 16, more often referred to as 5G. It did not help traditional broadcasters to realise that the 5G releases include virtual reality from day 1. The capability to create spaces by rendering of images and sound, and their mapping over mobile or wired networks to Dynamic and Adaptive HTTP Streaming (DASH) are now a part of the first release.

For the first time, it was evident that the delivery networks and the end-devices

could become more capable of displaying myriad types of content, which the “broadcasters” of traditional TV” had not been producing, at least so far.

To the dismay of those broadcasters to whom these (5G) launches looked distant, in September this year, T-Mobile started to detail its “In-home 5G goals”, setting it up in direct competition with the Goliaths of the cable TV industry — Comcast and Charter. In his statement to the FCC, the chairman of T-Mobile, said: “New T-Mobile will also enable consumers to use their mobile services as a substitute for in-home broadband”.

In the same month, Telefonica also demonstrated a new immersive real-time video experience around the ninth stage of the “Vuelta a Espana” cycling race as part of its 5G Technology Cities Initiative.

In yet a third theatre of operations, NexGenTV, based on implementations of ATSC 3.0 standard, has been gaining momentum with respect to the possibilities of direct to mobile IP delivery. These transmissions, being “broadcast” in

“... Where the aliens may be as realistic as an unseen landscape ahead.”

— Amitabh Kumar  
Director, Corporate, Zee Network  
& an APB Panellist



a traditional manner, are a practical way of multicasting content without overloading the Internet networks. With ATSC 3.0 stations already operational in the US, the next frontier of integration with mobile is not far behind.

Traditional “broadcasters” are quickly ramping up their capabilities as they see the new ecosystems evolving. New forms of targeted and immersive broadcasting are moving from being buzzwords to being standards on production sets. But with a diverse range of providers of content, a new saga may be beginning for broadcasters as they cope to come to grips with a rapidly evolving landscape where the “traditional” may only be fighting a losing battle against an enemy yet unseen.

It is the beginning of an epic saga — where the aliens may be as realistic as an unseen landscape ahead, and traditional revenue models will tend to become ever more elusive. **APB**

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# Broadcasters are becoming 'softer'

BY DR AHMAD ZAKI  
MOHD SALLEH

The title may be catchy, but it has no relation to femininity or gender issues.

Technology has indeed taken a more software-based approach to offer various solutions. Video encoders, decoders, converters, multiviewers and so on are now being implemented in software running on common hardware platforms. During my last visit to BroadcastAsia, I witnessed many broadcast equipment manufacturers becoming nothing more than software houses. Manufacturers such as Embrionix and Lynx Technik, to name but a few, have shown that today software is the name of the game.

Virtualisation of various processing functions within the broadcast value chain is made possible namely due to the development of affordable, tremendously fast and efficient processors. The increased usage of field programmable gate arrays (FPGAs) and other powerful microcontrollers in the market today are making product development much quicker and less costly. I have even witnessed devices implemented using a 'Raspberry Pi'<sup>1</sup>.

There are, of course, advantages and disadvantages to this approach.

Advantages include reduction in production costs. Just imagine if various equipment functionalities are able to run on a common hardware. Servers from particular manufacturers can perform various tasks, depending on the software running on it. Manufacturers no longer have to commission new hardware designs for every new equipment in their product line. Hardware customisation costs and time may be drastically reduced. It is quite common nowadays to see the same mother-board inside

different machines. This is exactly why the migration to IP (Internet Protocol) is generating huge savings for broadcasters.

A survey published by IABM and Davencroft Partners, *Global Market Valuation and Strategy Report (GMVR)*, in 2017 stated that while the production sector grew 0.3% between 2016 and 2017, services went up by 3.3% within the same period<sup>2</sup>. The growth in the services sector points to the fact that the sector is making a shift from hardware to software. From an industry perspective, the move towards a software approach is an economic one. Profit margins for software products are significantly higher than hardware!

Manufacturers and solutions providers are also heavily investing in software resources such as programmers. Our latest system upgrades in Media Prima are largely attended by software engineers.

Gone were the days when systems integrators (SIs) come with large tool boxes filled with screw drivers, wire-cutters, crimpers, multi-meters and the good old WD-40. Most of them now come with nothing more than a laptop, and the first thing they ask for before starting work is the Wi-Fi password. SIs are now leaner and operate at much lower overheads.

Equipment manufacturers no longer have 'production lines'; instead, they have people sitting in front of their laptops and their microcontroller programming devices attached. The last few visits I made to some known manufacturers at their respective premises were actually filled with programmers.

The ability of broadcast manufacturers to write algorithms that perform according to the requirements will increase the speed of production. Enhancements made on specific equipment can be done quickly and upgrades can be done merely

by downloading onto the hardware over the network at a flick of a button. If implemented as a system, changes to the software architecture in order to suit customised solutions can also be made possible. This is important especially for broadcasters who implement unique and specially tailored workflows designed in order to conform to local regulatory requirements. I do remember many years ago, certain professional monitors were made for SD but may be upgraded to HD by just paying the licence and nothing more.

There is a downside though. The almost unlimited control over equipment sold has enabled manufacturers to exert huge maintenance contracts with each purchase. In many ways, manufacturers now feel more empowered through the control they have on their products even after they have been sold. Manufacturers and solutions providers tend to attach expensive service level agreements (SLAs) to these products. Because it is predominantly software, bug-fixes, upgrades, customisations and adaptations to new technologies will result in regular improvements. These SLAs can become a huge burden to the broadcaster whose operational expenditures now become a major component of the P and L (Profit and Loss account).

This is in contrast to the old days, when broadcast equipment were made to last. I still remember the last Sony BVP-30P cameras endured for more than 20 years before we discontinued its usage about five years ago. These robust and 'built-to-last' cameras seems to be totally

detached from its manufacturers once it is in the hands of broadcasters (if well maintained). Spare parts were available virtually from anywhere. SLAs were unheard of during those days.

Therefore, the excitement experienced by broadcasters is unfortunately short-lived. The advantages and cost savings offered by the shift from hardware-based solutions to more software-based solutions do not offer the promised economic advantage.

Incidentally, the gradual move to software-configured devices are not limited to the broadcasting industry, but is also observed in the telecommunications industry with the advent of software-defined radio (SDR) and related devices.

The race for faster processors is still alive and kicking. And I think, it will not stop anytime soon. Talks within the semiconductor fraternity seems to agree that Moore's Law seems to be slowing down<sup>3</sup>. However, silicon device scaling is becoming smaller, which in turn leads to lesser power dissipation. As for the broadcaster, these hardware advancements will encourage more software-based products, which will flood the industry in the future. Whether this will be good for the broadcasting industry is yet to be seen. **APB**

Dr Ahmad Zaki  
Mohd Salleh is  
Director, Technical  
Operations,  
TV Networks,  
Media Prima and  
an APB Panellist



<sup>1</sup> The 'Raspberry Pi' is a single-board computer meant for developers and programmers to develop various projects by writing appropriate software and downloading it onto its internal memory. Its latest version comes with a 1.4GHz quad-core processor together with most commonly used interfaces such as high-speed USB, on-chip Graphic Processing Unit (GPU) and several GPIO outputs.

<sup>2</sup> <http://blog.devencroft.com/broadcast-industry-market-sizing/>

<sup>3</sup> <https://semiengineering.com/how-small-will-transistors-go/>

## TV measurement enhancements producing winning marketing strategies

BY BRETT GILLETT

The Asia-Pacific region is a highly complex TV advertising market, and is subjected to varied levels of maturity and fluctuations in ad spend. In South Asian and South-east Asian markets, TV dominates ad spend, while Japan, Malaysia and Singapore are seeing TV holding strong under pressure from rapidly growing digital revenues.

To support TV's continued growth trajectory across Asia-Pacific, marketers must ensure budgets are justified and TV campaigns are working effectively. Thanks to advancements, the technology now exists to not only measure TV in real time but also optimise slots with this key insight. Having previously measured TV by gross rating points (GRPs), cost per



**"The brands that focus on making their budgets work smarter, not harder, by turning to brand-specific, performance-based metrics will see their marketing strategies win and their TV campaigns thrive in 2019."**

— Brett Gillett  
Global Strategic Business Development Director,  
TVSquared

mile (CPMs), and ratings, brands can utilise same-day audience response data — such as search activity, Web traffic and app installs — leveraging data analytics to determine which regions, genres, programmes, channels, days, day parts, and spots are most effective

at driving engagement.

This data can be used to tie a specific spot to an immediate action like an online sale, subscription or registration, as well as determine short- and long-term impact. Ad waste can also be identified and shrunk, as marketers are increasingly

under pressure to prove that TV drives revenue.

These crucial insights must be used to optimise TV campaign strategies, making in-flight changes to ensure budgets are working effectively, brand key performance indicators (KPIs) are met, and the best possible return-on-investment (ROI) delivered on every single campaign. By reaching these goals, marketers will support the Asia-Pacific advertising market, enabling it to continue to grow and allowing the power of TV to be fully utilised by brands.

The brands that focus on making their budgets work smarter, not harder, by turning to brand-specific, performance-based metrics will see their marketing strategies win and their TV campaigns thrive in 2019. **APB**



# A NAP is essential in the move to IP: Introducing Networked Attached Processing

BY PETER SCHUT

Switching to IP is undoubtedly one of the biggest challenges faced by today's broadcast industry because it demands such revolutionary and radical changes in technology. After five years of debating this issue, most people now agree that IP is a logical step forward and are willing to countenance a move towards a fully IP future. However, one burning issue remains — how will broadcasters overcome the problems that arise when trying to integrate and control increasingly complex technology layers while still providing guaranteed bandwidth performance for new formats such as 4K/Ultra HD (UHD)?

When the IP debate started there were some differences in standards and, as an industry, we certainly underestimated the complexities this caused. The gap between new and old technologies was confusing and the issue of standardisation was not at all clear. No wonder, then, that people were running in numerous directions

as they tried to find a workable path through this maze. Thanks to the sterling work carried out by the Alliance for IP Media Solutions (AIMS), final standards have been agreed and we do now have a way forward that ensures we are all moving in the same direction. This is a big help because it addresses the needs of broadcasters who are heading towards a pure native IP infrastructure, as well as those who want a hybrid environment that allows them to mix old technology with new.

We spent several years migrating Synapse, our existing glue equipment, into an IP infrastructure before we realised that moving to 25 Gig and 100 Gig environments needed an entirely different type of infrastructure, so we set about developing just that. The result of our R&D effort is an entirely new concept known as a Network Attached Processor, or NAP. Rather than building a broadcast infrastructure out of small, independent pieces of hardware that you would historically call 'glue', NAP allows you to adopt a larger, more centralised (or decentralised) processing unit that performs all the tasks undertaken by smaller 'glue' products and combines them into one larger and highly configurable design.

Axon's first NAP product is Neuron, which was successfully launched at IBC2018. Developed to address the needs of complex IP and hybrid environments,



Axon's Network Attached Processor (NAP) allows broadcasters to adopt a larger, more centralised (or decentralised) processing unit that performs all the tasks undertaken by smaller 'glue' products and combines them into one larger and highly configurable design.

this next-generation signal processing platform not only sets the standard for the industry but it also packs a powerful punch by supporting 200Gbps and 64 channels, or 16 4K/UHD channels in a single rack unit.

Field programmable gate array (FPGA) semiconductor devices have always been at the heart of Axon's development — indeed, you could call them our specialty. I am confident that, for at least the next five years, the industry will be using them to reach the next level. Doing what we do on an FPGA is not very efficient for a central processing unit (CPU) and I would not expect an off-the-shelf CPU-based server to be capable of performing the task of a NAP. The FPGA we use in Neuron is the biggest we could find because that is what was needed to provide such impressive processing power and efficient connectivity to legacy SDI/IO. Do not worry, we will fill it up — and once we do, it will do a lot!

As media production increasingly moves from a hardware-centric to an application-based approach, and mixed Capex/Opex business models are adopted, the scalability and performance offered by Neuron will enable the flexible delivery of different types of productions, thus opening up further opportunities for broadcasters and delivering significant savings, both in terms of space and budgets. This ability to do more with less space is really the main difference between a new-generation processing platform like NAP and traditional glue systems.

For broadcasters heading to a pure native IP infrastructure, Neuron is extremely efficient 'modular glue' in a centralised and virtual environment, with no requirement to physically cascade products. All processing tasks needed in a live and baseband video domain are virtualised inside the box, giving customers the option of interconnecting processors in any order they want, without running different cables. Some 90% of the processing — for example, up/down-conversion, frame syncs, logo inserters and so on — is the same as before, and that all stays. The only difference is that it is now being carried out across multiple channels in one single device.

Another key reason why we

developed NAP and Neuron is to assist those broadcasters who are not yet ready to commit fully to IP and want to get there via a hybrid path. It is clear that deployment of commercial off-the-shelf (COTS) switches and CPU-based hardware has failed to provide the functionality present in SDI routers such as embedding, de-embedding, up/down/cross-frame synchronisation and multi-viewers. Neuron seamlessly bridges that gap by providing impressive processing power with efficient connection to legacy SDI I/O.

By bundling SDI technology into an IP platform, all audio and video processing tasks are managed with ultra-high bandwidth. Up to 80 SDI connectors can be added in that same 1RU, making it one of the most space-efficient, cost-effective and energy-efficient processing devices available today.

We envisage that Neuron will initially be used as a pure network processing device or as a bridging processing device, connecting the legacy SDI world to the new world. Looking to the future, Axon's next step is to add a multiviewer, audio processing in various standards such as DANTE, AES67 and MADI, compressed signals and analysis tools for the entire IP infrastructure. This gives us a growth path that allows us to meet all the processing needs of the new IP environment.

Since launching Neuron at IBC2018, we have been overwhelmed with support from clients, many of whom are pioneers in IP production. Euro Media Group (EMG), a leading provider of broadcasting and audiovisual services, announced at the show that it was adopting Neuron as part of its strategic move towards harmonised IP media production and immediately ordered 10 systems to manage IP signal processing and provide SDI to IP gateways in new outside broadcast trucks that are set for roll-out in 2019.

This supports EMG's Objective 2020 strategy: a programme focused on the design and delivery of modular, scalable IP-based media production across its European group. Endorsements like this make us very confident that in Neuron we have found a solution to both ease and accelerate the move to IP — particularly in sports production where its guaranteed bandwidth performance will support the roll-out of new formats, including 8K. **APB**



Peter Schut is CTO of Axon Digital Design.



**“Consumers do not want to have 10 different content apps with 10 different billing relationships. And so there is a question as to whom the aggregators of the future will be.”**

— **Louis Boswell**  
CEO, Asia Video Industry Association (AVIA) & an APB Panellist



## Fragmentation of video industry calls for aggregation of service

BY LOUIS BOSWELL

The video industry today is an incredibly exciting place to be. But it is also a challenging one, as video continues to grow as the world's pre-eminent form of entertainment. Over recent years, it has burst out of the confines of television, and television has now become a device rather than a service. The adoption of 4G mobile services was a huge catalyst for this and we now wait for the age of 5G, for which video, to my mind at least, will be the primary application.

There has never been a better time to be a consumer as companies race to create the next blockbuster series which you can watch on the way to work, during your lunch break or in the evening at home with loved ones.

The challenge is this technology-enabled shift in consumer behaviour is creating havoc with business models that have developed over the past 30-odd years. On one level, nothing much has changed in that monetisation still revolves around subscription and advertising, but with so much ad spend now going to social media platforms, and streaming subscription services charging far less than traditional pay-TV bundles, the industry has bigger questions to answer than at any time in recent memory.

Linear television is far from dead but 2018 has been the year in which we have seen growth stall in many markets, and in some cases there has been significant decline. The biggest challenge though is not one of linear versus streaming, it is one of content.

Content creators and owners need to work out how to best monetise their content, and while this will still be an equation involving subscription and/or advertising, exactly what that equation is remains far from clear, and the equation will be different for different genres of content.

Ratings and viewership have always

been important, but with pay-TV bundles there was an ecosystem where channels which served different niches could make a good business without being a ratings powerhouse. As streaming sees the balance shift from curated channels to curated content, there is a bigger emphasis than ever before on creating the most desired content, and not everyone can win.

That is why, despite the fragmentation we are seeing, there are also growing signs of a need to aggregate again. Consumers do not want to have 10 different content apps with 10 different billing relationships. And so there is a question as to whom the aggregators of the future will be. Streaming services like Netflix, iFlix or HOOQ are all attempting to bring scale to their content propositions, but the telcos are also in a strong position to be that new aggregator, providing data and a curated selection of content offerings.

But while the industry grapples with these changes, we face one existential problem — video piracy. As companies tackle the issue of changing business models, the problem of piracy is like trying to fly an aeroplane with a gaping hole in the fuselage.

Our society does not allow people to walk into a shop, help themselves to whatever they want and then walk out without paying. Neither should it allow video signals to be stolen and streamed for the profit of criminal cartels. Piracy is not petty crime. It is organised crime and accounts for losses to the industry and profits to the criminals of hundreds of millions of dollars.

The problem is far from a lost cause though, and with industry coming together through AVIA to fight it, with successes in enforcement actions in Hong Kong, site blocking in Singapore, and the increasing cooperation of payment gateways and e-commerce retailers, there is more optimism than ever before that significant progress in this fight can be made. **APB**

## Maximising the digital thematic content environment

BY GRAEME STANLEY

There has been a lot of media coverage — including in last month's issue of *APB* — regarding the rise (and recent fall) of the collective stock of FAANG (Facebook, Apple, Amazon, Netflix and Google), and how these tech giants have impacted the TV industry. Netflix, in particular, took many broadcasters by surprise by developing an on-demand service globally that not only goes directly to the consumer but also considers consumer interest at the programming level.

The trend for dropping whole seasons of shows at once has fundamentally changed viewing habits and as a result, broadcasters large and small are re-evaluating how they maintain relevance and consumer interest as these new services enter the market.

This direct-to-consumer proposition means that companies in the media industry that traditionally had a business-to-business model are having to re-orient their business and learn how to talk to consumers. This is difficult for smaller broadcasters that do not have the same resources or global reach that the large social media or FAANG group of companies are able to command.

Insight TV is in a fortunate position as we produce all of our own content and thereby own all of the rights. This enables us to deliver our content everywhere and anywhere, and by that I mean regionally as well as by different routes to market — including our linear channel, subscription video-on-demand (SVoD), advertising video-on-demand (AVoD)

and transactional video-on-demand (TVoD) services.

This means we can be fast and flexible, and are not hampered by the territorial restrictions that a

regional broadcaster, for example, might have. The question we ask ourselves is: Are we trying to compete with FAANG in a scripted, general entertainment multi-genre environment? Or, are we going to compete within what we call the 'digital thematically focused' content environment?

We think it is the latter. Worldwide, we know that there is a target audience for which we create our content and programming. Our audience is abundant and because we can control, trade and deliver our content across relevant groups to market via our linear and digital platforms, we are able to create the size, scale and customer base that makes our proposition a going concern.

How do we reach across those different routes to market?

With linear, it is relatively straightforward: There is a mature market with satellite distribution, cable TV platforms and subscriber bases who understand the value proposition that is offered to them by those operators. We operate within that environment and we continue to enjoy growing distribution across them.

With digital, there is a significant shift. Although not one of us has a crystal ball, what we do know is that streaming is where consumers are moving their subscriptions and their money and their interests. Working with partners, our SVoD and AVoD services deliver transactional opportunities that meet global consumer demand.

In 2019, new over-the-top (OTT) services will be launched that draw on the resources and deep content libraries of companies such as Disney and AT&T-Warner. These new services will further disrupt the market, challenging Netflix and increasing the rate of cord-cutting in mature markets. At Insight TV, we will continue to educate consumers to use SVoD as a way to find and experience authentic content featuring global influencers which is of interest to them.

It is our belief that 2019 is going to be even more exciting and disruptive than the past two years have been. **APB**



**“In 2019, new over-the-top (OTT) services will be launched that draw on the resources and deep content libraries of companies such as Disney and AT&T-Warner.”**

— **Graeme Stanley**  
COO, Insight TV



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**“Our hope is that, as an industry, we are able to move away from simply offering what’s worked elsewhere to offering more nimble, tailored models that are more befitting of the myriad needs and wants of the 1.8 billion viewers in Asia.”**



— Peter Bithos  
CEO, HOOQ, & an APB Panellist

## Asia demands more than just ‘on-demand’

BY PETER BITHOS

The explosive growth of Asia’s middle class and rapid increases in Internet penetration offer significant opportunities for over-the-top (OTT) service providers, but these factors alone will not drive growth in the industry. Media consumers in Asia need OTT services that are as diverse as the region itself, and this means catering to a wide range of socio-economic, cultural and linguistic needs.

“Build it and they will come” may have worked for a fictional baseball field, but it is probably not going to cut it for OTT. In an age where media consumers have more choice and control than ever over what is in front of their eyeballs, decision makers at these kinds of companies (full disclosure: I am one of these decision makers) need to reckon with the fact that our critical competitor is not really FTA TV — it is the Internet. Where previously Internet access was governed entirely by who had access to a computer and the requisite networking facilities, today, consumers from virtually every socio-economic bracket in Asia are going online using their smartphones.

Now consider this: in Indonesia, the minimum daily wage is under US\$10. In Thailand, it’s about \$15. You get the picture. To afford some of the subscription and transactional video-on-demand services out there, a substantial number of users in Asia would have to pay roughly a day’s worth of wages in order to gain access to content.

Many viewers in these markets simply are not looking to spend weeknights bingeing their favourite shows. Often, they simply want access for a day here and there, for example, when they transit from their hometown to the city they work in or on public holidays.

For us at HOOQ, it was with these kinds of situations in mind that we introduced nearly all of the FTA stations in Indonesia on one’s mobile phone for free, all the time, or, for premium content, one-day ‘sachets’, which for US\$0.25 per day, provide a 24-hour block of time where customers have access to our full range of on-demand premium content and pay-TV channels. No longer is premium content restricted to those few who can afford (or have the payment mechanisms for) a monthly subscription. This dramatically

changes the entertainment landscape for 90% of Indonesians (instead of just the 10%!) who can now watch what they want (even premium local and Hollywood content), where they want and at a price that is affordable.

We conceptualised this daily pricing approach in response to the consumption patterns we see in South-east Asian countries, where consumers purchase household essentials such as shampoo and detergent in single-use sachets. At the same time, we saw similar mobile data consumption patterns in South-east Asia’s pre-paid mobile market, where 80% of the population prefer to top up credit on a daily or weekly basis, rather than subscribe to a post-paid mobile plan.

But it is not just economic factors that need to be taken into consideration for the OTT market here. The other area where we believe OTT providers need to be more flexible is in the content they deliver.

It goes without saying that there is a market for Hollywood blockbusters just about everywhere, but we need to ask ourselves: are we delivering these big-name films in ways that take into account not only regional diversity, but also intra-market diversity? Recently at HOOQ, we have been focusing on not just localising content, but “ultra-localising” content, which means doing things like developing Kannada- or Telugu-dubbed versions of the Hollywood movies we distribute in India (languages that have 44 million and 81 million speakers respectively — not exactly a niche offering!).

Outside of localising Hollywood content, more support for local films and shows is needed to better tell the stories of the peoples and cultures in the region. Sure, *The Big Bang Theory* is undoubtedly a hit show, but we believe it is important to deliver popular series like this alongside content that speaks directly to audiences’ day-to-day experiences and interests. An Indonesian horror series, anyone?

It is an exciting time to be growing the OTT industry in Asia, and it is great to see consumers here being given more options in the genres of entertainment they consume. Our hope is that, as an industry, we are able to move away from simply offering what’s worked elsewhere to offering more nimble, tailored models that are more befitting of the myriad needs and wants of the 1.8 billion viewers in Asia. **APB**

## Mixology and the content rabbit hole

BY SHAD HASHMI

I was in a trendy, new-age mixology bar. There were no menus, no rigidly defined drinks and your imagination was the limit to the experience.

You told the waiter what spirit you fancied, what tastes you liked and then the producer behind the bar concocted some madness. I specified whisky and chocolate and was duly presented my custom lubricant: a variant on an Old Fashioned — with German chocolate, instead of the predictable, Angostura bitters.

It tasted great — familiar yet different. Old yet new. The perfect gift — unexpectedly getting exactly what you wanted, without knowing you wanted it.

While I sipped on my ‘new’ Old-Fashioned, I thought about TV. In the world of linear TV, serendipitous discovery was the norm: a function of the platform. You used to stay tuned, not turn the dial, on a channel. After the programme you had tuned into ended, you were automatically exposed to something new. In a branded channels world, you got that different but still the same feeling.

We also got the same ‘box of chocolates’ sensation when we flipped across channels. You never knew what you were going to get. Yes, I concede, it was not always good and sometimes you just kept flippin’ but, on hindsight, I have mostly positive memories about these experiences.

Back to the present: I log onto a subscription video-on-demand (SvOD) platform and I feel like I am holding onto a freezing-cold metallic drink shaker as the icy, rational logic of artificial intelligence (AI) via a recommendation engine curates my view.

Every recommendation I am presented with is largely a result of some shaken but not stirred combination of two algorithms. The base ingredients (the algorithms) are ‘Content-Based Filtering’ and ‘Collaborative Filtering’. I will focus mostly on Collaborative Filtering as Content-Based Filtering uses metadata about the content to recommend similar titles.

Collaborative Filtering looks to build a picture of you — and it wants to get to know you intimately. Unfortunately, our preferences are not as simple as whisky, chocolate, gin and juice. People are more nuanced and collaborative filtering takes time to build a picture of us.

The machine-learning algorithm scrapes through our activities to scrounge for information on the shows we have watched. Did we finish the episode? Did we abandon the series? It then attempts to be even more explicit asking us for ratings, a thumbs-up or down, and may even ask a series of questions to refine its view of us.

For example, when we are asked to rate a show on a video-on-demand (VoD) service, it is not so that other subscribers get a number to determine the quality of the programme but the rating is a direct representation of what we like.

As systems get more advanced the recommendation engine also looks at implicit signals beyond what we watched. To build a picture of us, the engine looks at implicit signals like what we are browsing, whether we stopped and read a synopsis and what items we scrolled to.

All this learning, questioning and analysing takes time but, in the end, the AI knows you and your tastes as *you are now*. Extrapolating the algorithm, it also knows similar information about everybody else on the platform. The AI then makes the following core assumptions: (1) I like what people like me, like; and (2) the past predicts the future.

Then, the AI bartender comes in and you are presented with a collaborative filtering curated world that can be described in these phrases visible on the user interfaces of most SvOD platforms:

*People who watched ‘Show X’ also watched ...*  
*People like you watched ...*

Or, to be specific: “Our algorithms predict, with 90% (say) accuracy, that people who like James Bond also like Mission Impossible.”

Over time, these are self-reinforcing or self-perpetuating as we are shown (and hence watch) more and more content that people like us like, and as past behaviour is used to predict future behaviour we end up in this zone where we are never shown anything really different, or new, from what we have seen before. The platform closes our window of new experiences.

A recommendation engine can take you down a content rabbit hole as each action re-enforces your existing taste profile and embeds you even deeper within your taste cohorts. It is thus a self-fulfilling prophecy you cannot break out of. You are who you are tightly defined to be and your tastes never mature or change. You are who you are once, for all, forever.

That is a dire, depressing and sad reality. It almost eliminates the human characteristic to learn, change and grow. It instinctively seems wrong and does not really work with something that is supposed to be uplifting, fun and imaginative like content.

Our world is changing and we may not be ‘linear’ for much longer and our futures are inextricably tied to AI, pattern matching and the rise of machine learning but we simply must find a way to mix in the human. We have to rediscover that human element that adds variety, spice, variance and randomness, and that magic mixology of ingredients that makes content and its discovery so special. **APB**

**“As systems get more advanced the recommendation engine also looks at implicit signals beyond what we watched.”**

— Shad Hashmi  
SVP, Digital Development Global Markets, BBC Studios  
& an APB Panellist





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