

ASIA-PACIFIC BROADCASTING SPECIAL SUPPLEMENT

systems integration

2017



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2017 saw Singapore pay-TV operator StarHub move its TV headend into its new Hubtricity facility. An IP backbone connects StarHub channels from integrated receiver decoders to the encoder farm, while bypassing the SDI baseband router. As the transition to IP continues to gain pace, expect more real-world deployments of both hybrid IP and full IP systems.

WHY THE RIGHT SI AND TECHNOLOGIES CAN HELP EVOLVE YOUR BROADCAST BUSINESS

The ratification of the SMPTE ST 2110 standard is shaping up to be one of the most significant technology developments in 2017. As the transition to IP continues to gain pace, how is IP, alongside other emerging technologies, helping to re-shape an increasingly disruptive broadcast landscape?

SHAWN LIEW reports.

For many, the seminal moment in the transition to IP may well have arrived. At IBC2017, the Society of Motion Picture and Television Engineers (SMPTE) announced the approval of the first standards within SMPTE ST 2110 for Professional Media over Managed IP Networks.

This is a standards suite that specifies the carriage, synchronisation and description of separate elementary essence streams over professional Internet protocol (IP) networks in real time, for the purposes of live production, playout and other professional media applications.

SMPTE ST 2110 standards go beyond just replacing the SDI with IP, said Matthew

Goldman, president of SMPTE and SVP of technology, TV and media, Ericsson. Instead, these standards will “radically alter” the way professional media streams can be handled, processed and transmitted, and will support the creation of an entirely new set of applications that leverage information technology (IT) protocols and infrastructure, he added.

IP in real-world deployments

While demonstrations such as the IP Showcase at IBC2017 are going a long way towards proving that broadcast IP is a possibility today, can broadcasters truly be convinced that IP can work in real-world deployments?

For many of the systems integrators featured in this special supplement, the answer is a resounding yes. The year 2017 is shaping up to be a seminal one for IP broadcast technologies, declared Fintan Mc Kiernan, CEO, Ideal Systems, South-east Asia. “We are witnessing the talk becoming a reality and seeing the real-world deployment of hybrid IP and full IP systems throughout the broadcast technology spectrum,” he added.

However, Mc Kiernan is quick to stress that as with every technology migration, broadcasters cannot afford to simply replace all of their existing equipment pool, in this case, replacing SDI, with new native IP products.

In Asia-Pacific, as he correctly pointed out, many of today’s SDI products deployed across Asia have several more serviceable years remaining.

While some may advocate a transition to full-IP broadcast systems, the reality is that a hybrid model may work best for many broadcasters in Asia-Pacific. Adopting such an approach allows them to access how IP can best work for them, and formulate a thorough and fail-safe long-term plan to transition to full IP, at a pace that best suits their needs.

In a broader context, the ratification of SMPTE ST 2110 will represent a key stepping stone towards that end-goal, suggested Patrick So, director, sales and operations, Asia, Magna Systems. He acknowledged that in Asia-Pacific, many broadcast organisations are still using baseband as that is what they know, are comfortable with and where their core skill sets lie.

The transformative effect of SMPTE ST 2110, he added, is the confidence it can imbue in broadcasters and content providers to invest in IP, and dispel the uncertainty in the industry’s future direction that is holding off investment.

“As SMPTE ST 2110 gets ratified, these same organisations and the people they employ can, and will, invest their money and resources in building their next facility, which will almost certainly be an IP one,” So predicted.

For GBS Alliance, the systems integrator has been involved in a number of audio-over-IP (AoIP) projects in Asia-Pacific, including with Vietnamese radio broadcaster Voice of Vietnam (VOV).

According to Perry Leong, senior manager for GBS Alliance, a number of reasons are propelling a rising number of IP transitions in Asia-Pacific. These include IT and network economies of scale, increasing user acceptance of technologies, high connection speeds and high-capacity network infrastructures.

Where AoIP is concerned, determining



The IP Show Case at IBC2017 demonstrated IP interoperability based on the SMPTE ST 2110 suite of standards, which has seen its first standards approved by the Society of Motion Picture and Television Engineers (SMPTE). This development should now prompt more broadcasters to start planning for their transition to IP, with a careful analysis of their current and future needs.

which protocol to adopt is a key factor, Leong advised. He also urged broadcasters to revisit existing IT and network infrastructure, and check against factory recommendations and understand the preferred ways on how the network should be configured to support the chosen AoIP protocol.

"The third and last key factor would be network security, and the easiest approach for 100% security is to totally isolate the AoIP network from any other network, be it local area or Internet," Leong continued. "With these three factors carefully considered, I believe broadcasters will have a successful and low stress transition to IP."

While of the firm conviction that IP adoption is on the rise, Jon Flay, managing director, Megahertz, is also quick to point out that the transition from traditional baseband SDI towards IP infrastructures using IT and cloud-based platforms will be even more complex than the switch from SD to HD.

Many common concerns surrounding IP remain valid, he emphasised, including questions such as: Where to use multicast or unicast? How to dynamically route and switch? When signals are put on a network, how do you know where they are going? How is a fault or problem tracked?

"Those embarking on a transition to IP should also be aware that existing broadcast solutions may not communicate well with new IT-based control systems and conversely, there are IT systems that have no concept of broadcasting," Flay said.

It might also be reasonable to suggest that IP is most appropriate for greenfield installations, as highlighted by two recent new broadcast facilities in Singapore.

Earlier this year, pay-TV operator StarHub moved its TV headend into its new Hubtricity innovation centre and converged operations cockpit. The move, Chow Siew Loong, CTO of StarHub, told *APB*, is a culmination of StarHub's embrace of IP as part of its TV headend architecture and delivery platform.

The centrepiece at Hubtricity is the Converged Command Cockpit, where StarHub can monitor how its fixed, mobile and pay-TV networks are performing. "We implemented an IP TV headend architecture that bypasses the traditional SDI baseband system and delivers Transport Stream over IP after the integrated receiver decoders (IRDs) for turnaround linear channels," he explained.

Also operating in a new broadcast and media centre is Singapore terrestrial broadcaster Mediacorp, who earlier this year moved into its new Mediacorp Campus, a 79,500sqm state-of-the-art production and digital facility.

As systems integrator for Mediacorp Campus, Qvest Media was tasked with building a technical infrastructure that can support a new way of content collaboration, production and delivery.

Konstantin Knauf, managing director, Qvest Media Singapore, elaborated: "One of the major challenges was to implement a technical design that allows a versatile combination of IT, AV, hardware and software solutions, despite having various technology standards by different manufacturers in a deeply integrated environment."

In agreement with Mediacorp, Qvest Media chose a vendor-neutral approach,

overseeing and managing 42 different manufacturers for playback, transmission, IT networking, servers, managing application for content, post production, radio and news system, as well as workflow orchestration.

This set-up, Goh Kim Soon, SVP, broadcast engineering, Mediacorp, told *APB*, supports collaborative workflows, and allows Mediacorp to extensively leverage IP technology to interconnect different broadcast systems for the transmission of audio and video content.

In the interim, however, a hybrid approach best suits Mediacorp, as Goh explained: "We are still implementing SDI in some of our workflows, especially for live video, as the standards for IP are still evolving."

Technologies as key enablers in disruptive broadcast landscape

The examples of StarHub and Mediacorp are perhaps indicative that the transition to IP is well and truly under way. The only remaining question, perhaps, is how broadcasters plan their transition to IP, simply because each broadcaster will have their own needs and requirements.

And while IP is currently one of the key discussion points for the broadcast industry, other technologies such as 4K/UHD, 8K, high dynamic range (HDR) and virtual reality (VR) are all grappling for the attention of broadcasters. How then should broadcasters approach the emergence of all these new technologies and all their underlying promises?

The answer, arguably, is to see them as key enablers in fulfilling a key goal: Delivering a compelling and immersive viewing experience at the most cost-effective way possible.

To suggest that change is sweeping the broadcast and media industries is, for all intents and purposes, an understatement. The way viewers consume content has changed, and is unlikely to revert back to the days when broadcasters dictate what viewers watch.

The Netflixs, Hulus and Amazons of the world are not going away; on the contrary, expect more like-minded services to emerge, particularly localised video offerings catering to niche markets and audiences. Connected mobile devices with pixel-rich screens will continue to proliferate, offering viewers a comparable, if not better option, to watch



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their favourite content.

And in the intervening years where technologies continue to mature, will the definition of a broadcaster, in all its traditional sense, continue to be relevant?

Are we already considering Netflix or Amazon as a 'broadcaster'? What about social media platforms such as Facebook and Twitter, who have either announced plans to produce their own original content, or have already acquired rights to stream live sports?

User-generated content is also beginning to grow its niche through platforms such as Facebook Live and live stream apps. In this case, are viewers becoming 'broadcasters' in their own right?

With so many choices to pick from, will viewers really care who provides the content, as long as they get the content they want? Will this portend the erosion of the advantage traditional broadcasters have in being the first outlet viewers turn to, particularly for entertainment content?

The broadcast industry is facing an unprecedented wave of disruption, and it is coming from multiple fronts, suggested Aale Raza, director, Whiteway Systems.

Besides the rise of new technologies, disruption is also being forced upon broadcasters because of consumer behaviour. Raza also questioned whether

broadcasters should be more proactive, instead of reactive, when addressing how they should change in order to cope with changing consumer behaviour.

"In every disruption, there are winners and losers. The winner, of course, will be the one who embraces the new technology quickly and get the first-mover advantage," he concluded.

Embrace change and pick the right technology partner

When APB, in collaboration with Ideal Systems, organised the Broadcast IP Inter-Op Lab at BroadcastAsia2017, we invited broadcasters from around the region to have a hands-on experience of working on an IP ecosystem.

While many of the participants of the IP Inter-Op Lab have yet to begin the transition to IP in their respective organisations, the fact that many of them expressed a genuine interest in finding out how they can more effectively transition to IP is encouraging.

In a broader context, the willingness to embrace not just new technologies, but also change, will be critical as broadcasters prepare to ride the wave of change sweeping the industry.

Despite an uncertain outlook, linear

television is unlikely to become obsolete for many years to come. The more pertinent question is: How can each broadcaster prevent themselves from becoming obsolete to their audiences?

Besides taking advantage of new technologies, broadcasters also need to re-think and re-strategise their business models that will allow them to thrive in a disruptive and transformational environment.

For instance, while retaining and, indeed, building on existing core competencies, broadcasters also need to embrace new platforms; in particular, the over-the-top (OTT) sphere is one which broadcasters can no longer afford to ignore or marginalise.

While the road ahead can be a daunting one, there are opportunities to be found amid the challenges. And as this special supplement has sought to highlight, broadcasters do not have to do this alone.

Experienced systems integrators, who identify trends ahead of time, have first-hand experience of delivering projects involving new technologies, and more importantly, can pin-point exactly what a broadcaster requires, will be key technology partners as the broadcast industry moves towards its next stage of definitive transformation. 📞

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LEADING THE TRANSITION TO IP

The process of transitioning to IP broadcast systems has already begun for many Asian broadcasters. While this transition comes with challenges, it also brings many advantages and enables many new services. The effects of IP are now being seen in many different aspects of the broadcast chain.

BY FINTAN MC KIERNAN

Ideal Systems are at the forefront of the move to IP and 2017 is shaping up to be a seminal year for IP broadcast technologies. We are witnessing the talk becoming a reality and seeing the real-world deployment of hybrid IP and full IP systems throughout the broadcast technology spectrum.

Already this year, we have designed, built and delivered a 16-camera 4K/Ultra HD (UHD) OB truck for Tencent in China, which has an end-to-end IP workflow. In Singapore and Taiwan, we have delivered large broadcast projects using GV's new Node product, which delivers broadcast-centric, real-time, distributed edge routing and IP processing node, and supports hybrid IP and SDI implementations. These new GV Node switches, based on commercial-off-the-shelf (COTS) hardware, offer transparent broadcast-centric operation and processing, supporting SMPTE ST 2022-6 IP inputs and outputs, as well as TICO visually lossless 4:1 compression to support future 4K/UHD applications.

Another driver for IP is as an on-ramp to cloud-based systems. IP is a logical first step towards virtualisation and migrating the video transport in the broadcast facility from SDI to IP. These will bring flexibility, resilience and extensibility into the cloud, which is simply not possible with SDI infrastructure. One area where IP is pushing hard is the replacement of centralised SDI routers with an IT distributed architecture using COTS IP switches. As the IP signal is multicast and can be accessible to any destination in the network, it means the disappearance of the notorious DA (distribution amplifier).

Furthermore, the new SMPTE ST2110 standard is the answer to the elimination of dedicated devices such as audio embedder, de-embedder, audio shuffler and meta data inserters. Yet, it provides the same flexibility that broadcast operators are accustomed to having.

As in every technology migration, broadcasters cannot afford to simply replace all of their existing equipment

pool, in this case replacing SDI with new IP native products. Many of today's SDI products deployed across Asia have several more serviceable years remaining. Hence, using gateways to bridge SDI to IP is an elegant solution to migrate to IP. Numerous legacy broadcast solutions offered on the market today are still card-based and fit into proprietary frames, and that goes against the principle of using COTS equipment.

So how can a broadcaster keep valuable SDI equipment going and migrate to IP? There is an efficient and cost-effective way to do this — by bridging IT and SDI with IP encapsulation and de-encapsulation in Small Form-factor Pluggable (SFP) connectors that fit directly into a COTS IT switch. In the migration to IP, SFP is a key enabling technology allowing many different formats and signal types to be bridged and converted into and out of IP.

Companies such as Embrionix are expanding the range and functionality of their SFPs to support the various SMPTE IP standards from a single SFP cage with multiple I/O options.

Outside of broadcast facilities, we are also seeing IP systems change the way broadcasters work. Again, Ideal is pushing the boundaries with these new technologies. In September this year, Ideal Systems engaged in a field trial of a new live sports production system with Singapore's Eleven Sports Network. The trial took place over two nights at the Jalan Besar football stadium in the republic for a friendly between Singapore and Hong Kong, as well as an Asia Cup qualifier between Singapore and Turkmenistan.

So, what was different about the system? In a four-camera shoot, all of the cameras were JVC Hybrid IP. Two cameras were production grade robotic pan-tilt-zooms (PTZ) from JVC and the other two cameras we used were JVC's HM660, which were the industry's first streaming camcorders and support Zixi, SMPTE 2022, and RTMP Streaming.



“Outside of broadcast facilities, we are also seeing IP systems change the way broadcasters work. Again, Ideal is pushing the boundaries with these new technologies.”

— FINTAN MC KIERNAN
CEO, Ideal Systems, South-east Asia

These all lead back to our hybrid IP production server, which again is a standard COTS workstation running our production software. Our production server supports slo-mo and replay from any of the four cameras, allows complex graphics and scoreboards to be added, and manages the audio from the cameras as well as the two commentators on-site.

The output again provides flexibility, and we could stream directly from the production system to Facebook or YouTube over IP if we wish. What we did was output SDI to a Dejero EnGo encoder, which encoded the live signal to the cloud via bonded cellular and back to an SDI via a Dejero broadcast server at the Eleven Sports Network Studio to feed back into its studio workflow.

With IP and the cloud, we also have other options. For example, once the signal has been bonded and sent over the LTE network to the Dejero cloud, we can send the “international feed” back to the broadcaster, while sending the same feed to Facebook live and YouTube live. Over the two test nights, we had more than 170,000 views on Facebook, which opens new sponsorship opportunities and is indicative of the way that IT technologies are coming into broadcast from every angle. 📡

[DIS-RUPTION]

The advent of the steam engine disrupted the travel industry, the printing press disrupted schools, electricity disrupted a whole range of industries. Today, the internet is disrupting the broadcast industry. Viewer habits have changed, business models are changing, barriers of distance and language are breaking down. New competitors are rising, competing in ways not seen before.



What is a broadcaster supposed to do ? How does one survive (and thrive) in a world that is changing so rapidly ?

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SEAMLESS INTEGRATION — THE KEY TO BROADCAST IT



The ever-changing parameters of the broadcast industry are placing high demands on producers and, in particular, the technology they use. TV and radio broadcasts, outside broadcast (OB) vans, recording and production studios as well as post production are equipped with state-of-the-art technology and extensive technical equipment. Broadcasters must be able to react quickly to changes in production conditions such as short-term changes from the director, changes of staff or the transmission path, or device errors. In addition, traditional broadcasting technology and its infrastructure are increasingly moving towards IT-based studios. **BY JOCHEN BAUER**

CONNECTING G&D SYSTEMS WITH BROADCAST CONTROL SYSTEMS

Guntermann and Drunck (G&D) offers effective technical solutions to respond to the changing working constellations of humans and machines. Keyboard, video and mouse (KVM) systems from G&D can be optimally connected to the broadcast equipment, thus perfectly linking the IT world to the traditional broadcast world.

They also help move powerful computers out of studio and production areas and into air-conditioned equipment rooms. Producers, however, still have full access to all computers, and are able to switch to the right systems at the right time. Therefore, they do not even realise that they operate their systems remotely.

Applying KVM devices reduces the noise level in studios and avoids unnecessary heat emissions. In addition, the peripherals-saving solution allows for more space in OB vans, for example, where space is rare and needs to be used as efficiently as possible. Despite the reduced space, each operator must be able to simultaneously access the central computer technology stored in the technical area. Thanks to the use of a matrix switch, each staff member can log on to any computer and react quickly to changing production conditions.

VERSATILE SIGNALS FOR OPERATORS

G&D matrix switches extend and switch a wide range of signals. In addition to typical signals such as keyboard/mouse, DisplayPort 1.2, DVI, VGA, audio, USB2.0

and RS232, they also support typical broadcast signals such as SDI, MADI or tally information. Thus, broadcast-specific equipment and media controls can also be connected to the matrix switch.

REMOTE CONTROL VIA IP-CONTROL-API

The integrated IP-Control-API lets operators control their G&D matrix systems remotely to send commands via network, for example. This way, external control options can be added to any system-specific operating concept. For an easier start, G&D provides its own remote GUI as graphical user interface. It is also possible to integrate G&D matrix systems into control concepts such as KSC Core or VSM. No matter where they are located, each computer can be connected to the desired projection media and/or operator screens. In the perfect symbiosis between the IT and the broadcast world, the matrix can also automatically follow complex application processes.

VERSATILE FUNCTIONS FOR FLEXIBLE OPERATION

The wide range of user-friendly functionalities such as CrossDisplay-Switching shows how much G&D thinks about the user-friendly operation of their systems. The feature has been specifically designed for multi-monitor workstations that access multiple computers at the same time. The mouse acts as if on a "virtual desktop" and can be moved seamlessly across the connected displays.

When moving the cursor from the


Guntermann & Drunck continues to offer keyboard, video and mouse (KVM) solutions that can be integrated into broadcast workflows and systems.

active to an inactive display, the keyboard-mouse focus automatically switches to the connected computer. This allows users to intuitively operate multiple systems at a time with just one set of keyboard and mouse. Here, special LEDs indicate the active channel. Thus, producers, directors or staff members of post production always see on which computer they are currently working.

'AND WE'RE LIVE!' — WHEN ON-AIR SYSTEMS NEED TO BE INDICATED

For TV productions, in studios or OB vans, multiple users can simultaneously access multiple computers. G&D matrix systems enable operation of different systems and allow for simultaneous access from multiple users. But what happens when one of these computers is used for a live broadcast? For such cases, G&D offers a special function that transmits GPIO status, that is, tally signals. Thus, via a matrix system, the tally information from a remote computer can be provided at any user console.

A connected tally light can inform the producer if a computer is live on-air. The advantage of this is, while operating remote computers and switching to specific CPUs, the current tally information (or any other GPIO information) is available to the user at any time — even before switching to a "live" machine, because the status is available as on-screen display and in the computer selection menu.

When multiple producers are simultaneously working with a system, the "on-air" signal ensures that they will not make any unwanted changes on a live computer. Many national and international TV stations and broadcasters trust in G&D's 30 years of experience as a German manufacturer of KVM systems. G&D's employees and its trained partner network will continue to support broadcasters in developing the best and most integrative KVM solutions. 

Jochen Bauer is Marketing Director, Guntermann & Drunck.

MAGNA OFFERS 'SECURE INNOVATION' IN EVOLVING BROADCAST LANDSCAPE

Patrick So, Director, Sales and Operations, Asia, Magna Systems and Engineering, tells **APB** how the systems integrator is growing with its customers as the broadcast industry continues to adapt to new technologies and content consumption trends.



when you are a commercial organisation charging for targeted advertising. The better and more efficient the compression, the less bandwidth you need and the lower the delivery cost.

As change becomes the only constant, how do you see the role of SIs evolving, and how is Magna continuing to re-invent itself as a trusted technology partner of its broadcast customers?

So: The role of the classic SI is evolving such that a company like Magna Systems & Engineering is now more of a consultancy and trusted resource than ever before. This is particularly the case as we help broadcasters make big projects happen at the same time as many of them are cutting back their in-house engineering resources and departments.

Then, there are other new and non-traditional broadcasters, content creators and distributors who source from Magna broadcast engineering experience they just do not have.

For Magna, this means significantly bolstering our resources and approach towards understanding our customers' core businesses, goals and objectives. This is no mean feat, and it has resulted in ever-growing and developing partnerships — meaning we truly work together to provide the right solution for them to achieve the success they seek.

These partnerships are way beyond the old traditional SI-customer relationship model. We now come into the sales and planning process earlier than ever before, and offer broader and wider help than ever before. We identify trends ahead of time, provide value-added services and support, and are across more technologies, business models and customer habits in order to affect and help grow our customers' business.

Magna is a seasoned company that has been providing a competitive advantage for its customers in the broadcast and telecommunications industries through the timely adoption of innovation with minimal risk of disruption for nearly 50 years. Summed up as 'Secure Innovation', Magna de-risks a first-mover advantage and safely take our customers to where their competitors have not gone yet. **SI**

Digital disruption is continuing to re-shape media consumption habits, and introducing a new wave of 'broadcasters' such as Netflix and Amazon. What are the key challenges facing traditional TV broadcasters?

Patrick So: The key challenges centre around delivery of content as consumers now have so many more choices as to where they watch that content — be it on smartphones, tablets or other mobile devices. They can also watch content wherever they like, so that the long boring journey to work is now an opportunity to catch up on their favourite shows.

Traditional broadcasters need to change their delivery methods as everything is now in a linear format and revolves around using a playlist, whereas companies such as Netflix and Amazon are video-on-demand (VoD) services where the content and when it is played and viewed are chosen by the viewer.

In other words, traditional broadcasters employ a "push" approach, while Netflix and Amazon offer a "pull" approach to viewing content.

There are issues that arise in this new way of broadcasting. For example, does the broadcaster have the rights to offer an IP or streaming delivery of that content? In Australia, this recently arose when the Nine Network purchased the free-to-air TV rights for National Rugby League games, but Telstra had the IP and over-the-top (OTT) rights.

At the end of the day, staying relevant is the key and content is, and will always be, king. We have to ensure that content can be easily consumed anywhere, at any time. This includes making content easy to find, whichever provider has the rights to it.

Netflix and Amazon do not represent the end of traditional broadcasters but they have to adapt and make their content offerings as compulsive as these two newer media giants.

Embracing new technologies would appear to be one option.

For instance, when the SMPTE ST2110 standard is ratified, how will that impact the transition to IP, particularly in Asia-Pacific?

So: Ratifying the SMPTE ST2110 standard will be a good thing for many reasons. Firstly, it will mean that broadcasters and content providers will have the confidence to invest in the technology that will move the industry forward. Currently, many organisations are still holding off investing as they are unsure of the industry's future direction.

When SMPTE ST2110 is ratified this will also speed up the transition to a full IP-based process. Currently, especially across Asia-Pacific, many organisations are still using baseband as that is what they know, are comfortable with and where their core skill sets lie.

As SMPTE ST2110 gets ratified, these same organisations and the people they employ can, and will, invest the money and resources in building their next facility, which will almost certainly be an IP one.

What other technologies do you expect will have the biggest impact on broadcasters in the next two to three years?

So: The technologies that will have the biggest impact will almost certainly be in the compression space. As new compression techniques and algorithms such as HEVC/H.265 become the norm, this will in turn bring down OTT and CDN delivery costs.

Until now content was distributed via satellite or RF tower which constituted one cost for potentially millions of views. With an OTT model the broadcaster gets charged an increased bandwidth delivery cost per each additional viewer — a cost that can be passed down the line

FINDING OPPORTUNITIES IN THE FACE OF DISRUPTION

Disruption has been with us through the millennia. The best known disruption came when early mankind learnt to cook his food over fire. This was perhaps the disruption that separated him from the other species and allowed mankind to progress into where we are today. Subsequent disruptions, such as the wheel, the printing press, the steam engine, electricity, the morse code, the radio, the aeroplane, and, of course, television, all helped to establish mankind as the most intelligent species on this planet. All disruptions have resulted in turmoil for established incumbents and lots of progress for newbies, writes **AALE RAZA**.

Television itself was a disruption in the '50s and the '60s. It disrupted the radio and newspaper industries. Now, after reigning supreme for more than 50 years, it is being disrupted. The disruption is coming from multiple fronts.

Over-the-top (OTT), integrated broadcast broadband (IBB), virtual reality (VR), immersive graphics, 360-degree cameras, virtual digital assistants, wearable cameras, emerging drone technologies, 4K/Ultra HD (UHD) and 8K resolutions, high dynamic range (HDR) technology, social media, Smart TV, subscription TV, 'always on' Internet access via 4G/5G, and so on, are all disruptions to a traditional broadcaster.

The disruption is forced upon broadcasters because of consumer behaviour. The younger generation, to a large extent, and the older generation, to a smaller extent, are consuming TV in far different ways than they used to in the past. The change is irrevocable and irreversible.

Broadcasters are wondering how many times, in how many ways, will they have to change in order to cope up with the changing consumer behaviour. The thing to notice is that all broadcasters are reactive instead of proactive and have gone from denial to acknowledgment to action to bewilderment.

Regardless of this, the disruption moves on, with the latest addition being the "digital assistants" from the likes of Apple, Google and Amazon.

The digital assistant shows the latest news on the Android phone, which does

not come from the TV website; it comes from an Internet website. Does Google make money from it? You bet. The client does not go to the browser; he types his choice of news website. He does not even click on the app on his mobile phone; he just asks the digital assistant to give him the latest news.

In the meantime, our broadcast customers want to know how to tackle this growing threat to their business. What will this disruption lead to? Where does it stop?

While Google, Apple and Facebook continue to bite bigger slices of the cake that used to belong to broadcasters, the disruption becomes bigger. Consider this: telcos are launching 5G soon. The bandwidth speeds are breathtaking and the lack of connectivity, slow downloads, searching for hotspots, asking for passwords and so forth will be a thing of the past.

Broadcasters who get their news from newswires need to do a re-think. By the time they make their own news story, shoot the news segment and transmits it, every one already knows the news. Your best chance is to go with live news. Hence, the key to success as far as news is concerned, lies in OB vans, digital satellite newsgathering, live streaming news and, of course, the backpack with the bonded SIMs — although that may become irrelevant due to the incoming 5G.

Just as banks re-structured and became software power houses instead of counting money, broadcasters will need to become tech-savvy. They will need to



"In a new world, we need to keep moving. The pace may not be set by us, but the rewards will go to the first mover."

— AALE RAZA
Director, Whiteways Systems

set up the architecture to tackle the online world. This means setting up a video-on-demand (VoD) facility, having a full suite of customer relationship management (CRM) system, an intelligent search engine that keeps providing new leads to the viewer, an advertising engine that has the classical overlay, an ad insertion system, banner ad displays and so on.

The system has to have a detailed reporting to get to know the number of people online, what they are watching and indicate the changing trends. And finally, broadcasters have to have a payment gateway — to authenticate and get payment on a pay-per-view basis. Only when they have the full suite of offerings, will they really understand the benefits.

In a new world, we need to keep moving. The pace may not be set by us, but the rewards will go to the first mover.

In time, we will reach a place where the pace of disruption slows and we can settle into a new space. In every disruption, there are winners and losers. The winner will, of course, be the one who embraces the new technology quickly and get the first-mover advantage.

For broadcasters, they have to shed the old ways of dealing with technology suppliers. They have to work closely with the systems integrator and up-end their entire workflow. They have to re-train their staff and hire new ones with skills that were not even known a few years ago. They have to treat this disruption as an opportunity, and find the systems integrators who will take them through to success. 📍

WHAT TO CONSIDER FOR YOUR JOURNEY TO IP

The world of broadcast is undergoing yet another major transformation as it moves from traditional baseband SDI towards IP infrastructures using IT and cloud-based platforms, says **JON FLAY**.

“This imminent transition is even more complex than the switch from SD to HD, because the very nature by which content and data is transported over IP is fundamentally different.”

— JON FLAY
Managing Director, Megahertz



This imminent transition is even more complex than the switch from SD to HD, because the very nature by which content and data is transported over IP is fundamentally different — whereby broadcast-specific systems are replaced with commercial-off-the-shelf (COTS) platforms,

The IP road leads to incredible operational and commercial benefits but the implementation challenges are many, so hiring an experienced and imaginative systems integrator should be top of the priority list for any media organisation considering this journey.

Until recently, the IP revolution has been confined to islands within a facility and tasks that naturally lend themselves readily to the transition. Now, the technology allows the use of the basic three elements — storage, computing (servers) and networking — supporting software solutions that can run in a private or public cloud.

For broadcasters, this offers huge opportunities in the longer term. The old toolbox of standalone hardware is gone and replaced by a richer and more extensive software toolkit, which increases flexibility and workflow efficiencies while reducing operational costs and generating new revenue streams — as long as the implementation is managed properly.

IP ADOPTION ON THE RISE

Just a quick glance at the entries for the IBC Innovation Awards this year shows the progression that has been made towards the adoption of standard IT infrastructures over the past year. The short list was peppered with examples of successful implementations, including virtualised playout and full-IP broadcast trucks.

We at Megahertz recently facilitated a landmark migration to IP of a South-east Asian pay-TV service provider by designing and implementing a media headend at the organisation’s new state-of-the-art

hub, moving across its 280 channels while maintaining 24/7 operations — including the relocation of its media asset management (MAM), traffic scheduling and playout systems.

The customer required a 4K/Ultra HD (UHD)-capable headend that would allow its operators to manage both its traditional SDI video and new IP systems on a single platform. In place of potentially two separate SDI and IP systems, Megahertz was able to utilise a single master control room platform built from an upgradeable technology (to support future 4K/UHD channels and IP-enabled pay-TV services) in line with the future demands of the service provider’s subscribers.

But, taking the first steps into this new environment is not easy and there is much to consider.

COMMON CONCERNS ABOUT IP

For example, a network path — perhaps a single network cable — can now carry tens or even hundreds of compressed video signals, but how do you calculate when it has reached capacity, and what drives that? And other questions include: Where to use multicast or unicast? How to dynamically route and switch? When signals are put on a network, how do you know where they are going? How is a fault/problem tracked?

In the old world, one cable equals one service; in the new, it is not that straightforward.

Monitoring is always of paramount importance. In the new IP environment, tracking the signal path requires more in-depth and dynamic monitoring to keep up with the redundancy built into the network and systems. Software that runs on virtual machines, to specifically identify the hardware culprit that failed, could take vital seconds. So, a mix of open source and proprietary tools need to be presented in a simple, readable form,

preferably on one display.

In the facility hub referenced above, Megahertz deployed a clever bespoke facility monitoring system that correlates information from multiple signals and systems and uses sophisticated alarm management to ensure that the hub’s operators can focus on the big jobs and not on the intricacies that underpin them, including whether a channel is SDI or IP.

Those embarking on a transition to IP should also be aware that existing broadcast solutions may not communicate well with new IT-based control systems and conversely, there are IT systems that have no concept of broadcasting — so your systems integrator should be well-schooled on the possibilities that are presented in a hybrid SDI/IP infrastructure.

Then, there are concerns surrounding security. Any network needs to be protected, but balancing that with the demands of live production, for example, and the ability to deliver immediate responses during mission-critical operations, requires careful planning and design.

DON'T GO IT ALONE

With all of this to consider, preparing your organisation to operate in this new environment can be a daunting task. To avoid the pitfalls, take advantage of the knowledge gained by the early adopters and their technology partners. Finding the expertise can be a challenge; however, the systems integrators who have been involved with the transition from traditional broadcast to an all-IP world are ideally placed to help.

Just as they have supplied support through technology evolutions in broadcasting before, they can provide the foundation of a successful transition into a public or private cloud and help you optimise the use of IP and IT building blocks for your business. **5**

GBS ALLIANCE SHAPES RADIO BROADCASTING WITH AOIP TECHNOLOGY

After exploring extensive proofs-of-concept thoroughly with GBS Alliance, Vietnamese radio broadcaster Voice of Vietnam (VOV) has chosen to adopt the AES67 audio-over-IP (AoIP) standard for its new digital mixing consoles and routing systems.

Using the Axia Livewire+ AoIP system developed by the Telos Alliance, VOV was able to construct a “technologically advanced network” over its existing infrastructure.

Perry Leong, senior manager for GBS Alliance, explained: “With this installation, VOV is able to benefit from cost reduction in installation materials, ease of installation and maintenance. Users can now deliver high reliability, low-latency uncompressed digital audio, logic plus routing control, and programme associated data over Ethernet.”

Additionally, Axia intercom systems were installed to connect all VOV’s studios and master control room over the same network that supports the Axia audio consoles and routers. Ten analogue production studios were also furnished with Axia xNodes, which GBS Alliance described as the building blocks of an Axia system. This, according to Leong, has enabled older studios that are queued for the phase upgrades to enjoy the benefits of Livewire+, including control routing of audio feeds and sources in the distributed Livewire+ AoIP system.

In Singapore, GBS Alliance recently helped the Ngee Ann Polytechnic School

of Humanities and Social Sciences (HMS) to build a new studio with Axia Livewire+ AoIP products. HMS was looking for a long-term solution to address end-of-life equipment, eliminate cumbersome installations, and reduce tedious maintenance work by cutting unnecessary studio equipment.

For this particular project, Leong explained that GBS Alliance had to work with a very tight project deadline, as the studio had to be completed before the commencement of a new semester. “In less than 10 working days, GBS Alliance managed to hand over the project, having completed the installation, commissioning and training,” he added.

The project consists of two studios — on-air and production — powered by Axia IQ and RAQ respectively. With the new studios, HMS can now increase its resources for their students by dividing studio usage, or to combine them as one to simulate a “real” broadcast workflow. Furthermore, the Axia RAQ system is built with a mobile rack, which can easily be used for campus outside broadcasting (OB) projects such as open house events.

Leong continued: “The HMS technical team was also pleased with how much

cabling works was reduced and replaced with the familiar Ethernet infrastructure, and further assured by the five-year standard warranty provided by the Telos Alliance.”

Having built PSB Academy’s first campus radio in Singapore with a digital TDM mixing console system in 2010, GBS Alliance was approached earlier this year to design and build PSB City Campus’ radio in Marina Square, which is located at the heart of Marina Centre’s shopping, dining, entertainment and cultural hub.

As the school wanted a minimalist look in the studio without sacrificing traditional radio studio functions and amenities, GBS Alliance worked with PSB Academy’s design team to equip the campus radio studio with an Axia IQ system, powered by Livewire+.

Leong said: “During training and handover sessions, many users were asking us about the chunk of audio and control cables, and questioning the possibility to play out uncompressed high-quality multiple audio channels from playout software to the mixer. Their doubts were all answered by GBS team’s experiences with AoIP technology, especially with the Telos Alliance Livewire+ protocol.

“The Livewire+ AoIP technology is a scalable system where it can be used for both large broadcasters like VOV, and smaller Internet stations like Singapore’s Hindi station Radio Masti, and AFO Radio in Malaysia. GBS Alliance is the exclusive dealer for the Telos Alliance in Singapore, Thailand, Vietnam, Indonesia and Cambodia.”

For the past 20 years, systems integrator GBS Alliance has been designing, installing and commissioning many professional turnkey radio and TV studios, as well as transmitter projects in the Asia-Pacific region.

With a team of qualified engineers, as well as a wide range of radio, TV and pro audio equipment and solutions, GBS Alliance provides customers with effective and timely proposals for their broadcast needs from all of its eight regional offices located across Asia. The company’s major clients include Singapore terrestrial broadcaster Mediacorp, Indonesian radio network Radio Republik Indonesia, Thai broadcaster MCOT, Malaysian satellite pay-TV operator Astro, among others. 



GBS Alliance has integrated the Axia Livewire+ AoIP system for Vietnamese radio broadcaster Voice of Vietnam’s new digital mixing consoles and routing systems.

PRODUCTION TO DELIVERY: INTEGRATION OF IP

BY DR AMAL PUNCHIHEWA



IP has been in use for broadcasting over many years. However, IP was used in various segments of broadcast production and delivery in an unintegrated fashion. The nature of IP and its limitations, specific to the application of IP in broadcasting, have delayed deployment of IP in live broadcast production.

The traditional live broadcast infrastructure is based on the Serial Digital Interface (SDI) for the interconnection of signals. SMPTE developed and standardised SDI in collaboration with the industry, and led the way with its chipsets and evolved from SD to HD, 3G and, most recently, UHD-1.

Technological advancements and social transformations are changing the broadcast landscape. Broadcasters are under tremendous pressure to create more content at a lower cost. They also need to anticipate future transitions beyond HD to UHD-1 and UHD-2 and high frame rates. These requirements are driving the industry to transition from SDI to IP Live production.

This article attempts to address briefly IP Live technology in the context of broadcaster needs, the emergence of industry standards and inform the overwhelming advantages of IP Live in terms of cost, agility and scalability. IP Live implementation needs to meet the most stringent requirements for broadcast picture quality,

operating simplicity and reliability.

CHALLENGES IN USE OF IP IN BROADCAST PRODUCTION

IP Live production technology is inevitable because the broadcast environment is so competitive. Emerging trends are rapidly transforming the broadcasting business. Post-production facilities at broadcast stations have already deployed non-linear editing equipment, setting up file-based systems and implementing fully networked editing environments. Such editing environments do not have strict requirements regarding signal latency and synchronisation, hence *best-effort* packet delivery is acceptable for such confined broadcast facilities. In these applications, off-the-shelf IP routers suffice and costs are low.

However, in live production, best-effort packet delivery is not



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However, in live production, best-effort packet delivery is not acceptable. Live broadcasting requires low latencies and seamless switching without signal loss or interruption. Networks must not only be fast, but also extremely reliable. As SDI is uncompressed, IP systems require low latency video codecs, delivering high image quality that are acceptable for broadcast service and low latency while using modest computing power.

Switching multiple AV sources requires precise signal synchronisation. Traditional SDI transport or transmission includes a synchronisation signal. In an IP Live production system, the networked media interface needs to perform synchronisation in compliance with SMPTE ST 2059-2, using IEEE 1588 PTP (Precision Time Protocol).

Compared to a traditional SDI infrastructure, IP delivers high efficiency and agility. However, IP does raise security concerns due to network vulnerabilities, which may lead to cyberattacks. This makes network security a major priority, which World Broadcasting Unions (WBU) and the Asia-Pacific Broadcasting Union (ABU) are addressing collaboratively. Such IP live production systems can be protected by securing the control path using transport layer security. In addition, it is possible to deploy standard, proven IT technology against security risks. Among them, the system can mitigate these risks using user authentication and device authentication.

It also can be observed that vendors are developing compatible products with a high level of interoperability using FPGAs (field programmable gate arrays). Leading IP core vendors will introduce products in compliant with standard networked media interface for major FPGA platforms.

STANDARDS

Live IP technologies have been in existence for nearly two decades, but the effort to harness them is far greater today. Interoperability requires an ecosystem of compatible standards, practices and interoperable equipment. Industry players have been participating in the EBU (European Broadcast Union) and SMPTE (Society of Motion Picture and Television Engineers) standardisation processes. The Joint Task group on Networked Media (JT-NM) has prepared a Roadmap of Open Interoperability that was discussed during IBC2017, under the leadership of EBU.

DELIVERY CHALLENGES

Over-the-top (OTT) services have been in use for a number of years. However, as it uses public Internet or the Internet, quality of service (QoS) is not assured. OTT providers, including broadcasters who have introduced Integrated Broadcast Broadband (IBB) services such as HbbTV, have deployed content distribution networks (CDNs) to provide better Quality of Experience (QoE) to audiences. Deploying various metrics derived from Internet traffic, combined with multiple CDNs, can be used to enhance the QoE. This is one of the latest developments in IP delivery that offer media delivery services close to quality assured services such as digital terrestrial television (DTT), direct-to-home (DTH) and IPTV.

Multi-CDN combines a range of existing CDN providers into one large global network. Multi-CDN with monitoring technologies dynamically optimises and unifies leading cloud and network infrastructure providers across the globe to rapidly, securely and reliably accelerate Web content to users wherever they are in the world. By combining multiple CDN providers into one network, OTT service providers can get access to their aggregate power and reach, with a mechanism to fold back to redundant networks in each region. 📍

Dr Amal Punchihewa is Director, Technology & Innovation, Asia-Pacific Broadcasting Union (ABU). He is also a Vice-Chair of the World Broadcasting Union's Technical Committee.

TRANSPARENT. OPEN. FUTURE-FACING: MEDIACORP'S NEW-BUILD BROADCASTING AND MEDIA CENTRE

Taking into consideration changing consumer viewing habits and the rise of over-the-top (OTT) services, Singapore terrestrial broadcaster and media company Mediacorp decided to “fundamentally innovate” its organisational structure.



“The system architecture [in the Mediacorp Campus] enables technologies to be easily integrated, expanded or replaced, thereby reflecting future innovations and market changes as needed.”

— KONSTANTIN KNAUF
Managing Director,
Qvest Media Singapore

Looking to move away from traditional media lines towards a focus on specific consumer segments and target audiences, and to provide them with relevant content regardless of the media platform, Mediacorp was looking for a state-of-the-art technical infrastructure that supports a new way of content collaboration, production and delivery.

As Mediacorp’s consultant and master systems integrator, Qvest Media was commissioned with the overall technological advisory, design and the entire systems integration of the Mediacorp Campus, a new 79,500sqm broadcasting and media centre. In just four years, a state-of-the-art infrastructure for close to 3,000 staff based on the most modern and robust workflows, and best performing solutions available in the media landscape, was built, according to Qvest Media.

Konstantin Knauf, Managing Director, Qvest Media Singapore, elaborated: “One of the major challenges was to implement a technical design that allows a versatile combination of IT, AV, hardware and software solutions, despite having various technology standards by different manufacturers in a deeply integrated environment.



As Mediacorp's consultant and master systems integrator, Qvest Media was commissioned with the overall technological advisory, design and the entire systems integration of the Mediacorp Campus, a new 79,500sqm broadcasting and media centre in Singapore.

"Thanks to the close and efficient collaboration, we achieved our common goal of creating flexible and scalable workflows. The system architecture enables technologies to be easily integrated, expanded or replaced, thereby reflecting future innovations and market changes as needed."

The Mediacorp Campus includes six TV and news studios, as well as a 1,500-seat broadcast-ready theatre, eight TV stations, 12 radio stations, and about 100 editing and post-production stations across various business fields, extensive online distribution and OTT services, integration of OOH (out-of-home) media, as well as the press and publishing departments.

The centrepiece of the Mediacorp Campus is an integrated multilingual newsroom on a single 3,000sqm floor plate. It supports multiple platforms — including digital, TV, radio and print — with three news studios featuring cutting-edge LED video walls and augmented reality (AR)/virtual reality (VR) technology, as well as four additional flashcam positions that are embedded in the newsroom. The newsroom embraces a digital-first culture and is home to more than 600 journalists who break stories on the digital platforms first, in four languages throughout the day while feeding the traditional platforms.

In terms of project management, Mediacorp and Qvest Media decided to follow a vendor-neutral approach, allowing them to select the best-of-breed solutions available on the market. As a result, Qvest Media oversaw and managed 42 different manufacturers from 20 countries worldwide for playout, transmission, IT networking, servers, managing application for content, post production, radio and news system, workflow orchestration and many more. Qvest Media supported Mediacorp to maintain operations during the migration period and at the same time ensured the integration of new assets, as well as reutilisation of technology from Mediacorp's old campus.

Next to the modular integration of IT and broadcast products and solutions of all

business units, Mediacorp was also looking for a highly reliable system architecture and its sub-systems, which can ensure a platform-centric environment.

Today, a Service Orientated Architecture (SOA) design and automated end-to-end file-based workflows ensure "seamless processing" and requires only minimal manual interaction. In addition, format and equipment standardisation and simplified cross-media strategies facilitate the innovative working environment. All former independent

technology silos have been removed and integrated into a common repository by using an orchestration layer, thereby enabling flexible file exchange for all business units.

Through the deep integration of all contribution, production and transmission departments, all Mediacorp employees have the same abilities to use centralised technology, resources and functions. A dedicated, centralised news ingest facilitates close interoperability and increases the speed of production, allowing the newsroom to access material and content very quickly. An enterprise media asset management (MAM) and archive system enables the units to exchange content or use the same workflows to deliver to dedicated or common destinations such as individual channels and OTT platforms.

All systems of the central IT core infrastructure are also unified. User access and restriction is organised at an application level and is no longer limited by the former independent silos. For maximum scalability, a post-production platform has been implemented, where 13 post-production departments are currently working in parallel. 📺



The centrepiece of the Mediacorp Campus is an integrated multilingual newsroom on a single 3,000sqm floor plate. It supports multiple platforms, with three news studios featuring cutting-edge LED video walls and augmented reality/virtual reality technology, as well as four additional flashcam positions that are embedded in the newsroom.

QVEST MEDIA: SYSTEMS ARCHITECT AND ICT INTEGRATOR

Headquartered in Cologne, Germany, Qvest Media is an international leading systems architect and ICT integrator in the fields of broadcasting and media technology. Specifically, the company specialises in the TV, media and telecommunications industries, and offers services consisting of consulting and development, systems integration, as well as service and support.

With its Managed Technology business unit, Qvest Media supports media organisations along their entire digital transformation process by covering everything from technology infrastructures to services and technical operations offered within streamlined and future-oriented payment models.

Qvest Media is also one of Europe's largest trade and distribution houses for technology in the fields of professional A/V, IT and broadcast. The company has a commercial portfolio of around 250,000 products, as well as partnerships with major manufacturers from the media and IT industries. 📺

WHEN MOVIES ARE NO LONGER FILMS

Historically, theatres received shipments of celluloid films for exhibiting movies. These were big, cumbersome, expensive, flammable ... and it was labour-intensive to keep track of all copies. In recent years, digital projectors, which use electronic files, have replaced film-based projectors almost entirely, says **ASHISH MUKHERJEE**.

When theatres were slowly converting from analogue to digital projectors, they received movies in exhibition kits, which included hard disk drives (HDD), adapters and cables, enclosed within a sturdy shipping container. Exhibition kits are now increasingly replaced by satellite delivery for a wider distribution area while providing safe, convenient and cheaper delivery of movie content to cinema halls.

An automated workflow of a Digital Cinema Package (DCP) distribution process through satellite comprises the following:

Ingest: Encryption of all the content, identity and licensing files (including a packing list) into a package, compliant with Digital Cinema Initiatives (DCI) and Society of Motion Pictures and Television Engineers (SMPTE) standards. It also includes an automated copy of the DCP from the exhibition kit into the system, and an automated verification of the received DCP to ensure all referenced files are there with content verified using DCP-specified Secure Hash Algorithm 1 (SHA-1) verification.

Schedule: DCPs are then scheduled for distribution via satellite to theatres. Scheduling provides prioritisation and full addressability, allowing distribution to particular cinema circuits, countries and language groups as required.

Transmit: DCP delivery takes place at high speeds, with Forward Error Correction (FEC) at the transport level. It is typically in the form of Reed Solomon code, with additional redundant data often applied to the file to better allow for correction of

missed packets. Backlink requests over the return path can be used additionally for retransmission of lost packets.

Verify: Received DCPs need checking and file accuracy confirmed through the SHA-1 checksum. Verified DCPs remain on the HDD in a hidden partition until published.

Publish: Upon confirmation of the booking of the movie, the DCPs move to the theatre systems automatically.

The adoption of an automated DCP distribution process enables theatre operators to minimise operator workload and errors. Additionally, it provides SMPTE- and DCP-compliant confirmation and monitoring for every step of the DCP distribution workflow while assuring guaranteed DCP delivery over one-way and hybrid two-way networks.

On the other hand, the headend transmission software should be integrated with functionalities such as flexible theatre equipment configurations for maximum compatibility with Series 2, Sony 4K/Ultra HD (UHD) and legacy D-Cinema systems; IP distribution of DCPs, live 2D and 3D as well as alternative content to the theatre; and application programming interfaces (API) for integrating with third-party systems at the headend and in the theatre.

Other features of the software include FEC and automatic retransmission of missed packets for maximum reliability, and report generation and export of successful DCP distribution jobs to third-party systems which has to be compatible with theatre



Many theatre operators have replaced film-based projectors with digital projectors, enabling them to receive movies in exhibition kits. However, exhibition kits are now increasingly replaced by satellite delivery for a wider distribution area while providing a convenient delivery mode of movie content to cinema halls.

equipment from most vendors.

The software solution, which caters to clients based at the cinemas, is designed for implementation on commercially available servers sourced locally. It is recommended for the solution to support flexible delivery options, via either a terrestrial or satellite-based network; for the latter, the software should support internal or external satellite receiver options.

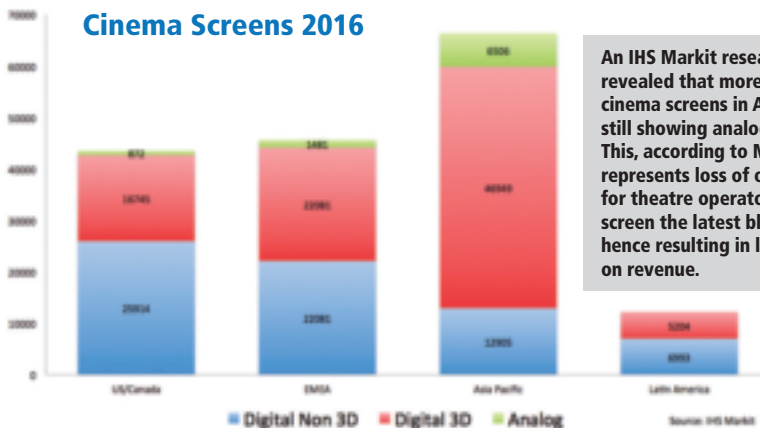
Alongside support for DCP file transfer and reception of live events, the software should also be equipped with the ability to deliver other data, such as digital signage that can be used elsewhere in the theatres. Furthermore, the client software should be 2D- and 3D-compatible, providing operators with low Capex and Opex.

Also, all DCP distribution components need to provide Web Services Description Language (WSDL) interfaces, which include distribution manager to ingest, schedule and distribute DCPs; as well as NOC manager to report, manage receiver DCP content and deliver DCPs to theatre equipment. These interfaces should be integrable with an existing theatre management system. As for reporting and billing, the interface must also be able to provide confirmation of successful DCP distribution and delivery, and reports on transmission including per file statistics.

Most of the theatres in North America, the EMEA and Latin America have already moved to digital format. According to IHS Markit, there are more than 6,500 cinema screens in Asia that are still showing analogue films. Unless these cinemas move over to DCP shortly, they will lose the opportunity to screen the latest blockbusters, thus losing out on revenue. 📌

Ashish Mukherjee is CEO for Benchmark Broadcast Systems.

Cinema Screens 2016



An IHS Markit research revealed that more than 6,500 cinema screens in Asia are still showing analogue films. This, according to Mukherjee, represents loss of opportunity for theatre operators to screen the latest blockbusters, hence resulting in losing out on revenue.

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