New resolution

Measat Teleport and Broadcasting Centre

Jarod Lopez, Measat

High definition, ultra-high and then even higher definition is seen as a natural evolution. But there's a lot that needs to happen between now and our gazillion-pixel future. Somewhere at the top of every checklist for a high-resolution tomorrow is content, without which there's no magic to draw viewers in. The pressure on the creative industry runs alongside the need for even more sophisticated coding efficiency for these mega-bandwidth-hungry services and the absolute requirement for cost-effective consumer electronics. How long will all this take to happen? It already is, albeit in a small, early adopter way. This will increase in three or four years, but 4K is still not likely to be a mass market play. Some forecasts are that ultra-HD/4K will only become mainstream in the U.S. by 2025; Asia (outside of Japan and Korea) will trail the U.S. although the take-up will be way faster. In whichever way this pans out, satellite operators in Asia say they will be ready, with enough capacity and pre-planning not to be left scrambling. ***ContentAsia*** asks satellite bosses what else they're thinking about 4K/ultra-HD broadcasts, regular HD and 3D in Asia. Here's what they said...

How fast do you think 4K will roll out across Asia... & is there enough satellite capacity to support the ultra-HD format?

Clockwide from bottom: AsiaSat-6 beams; AsiaSat-8; Bill Wade, AsiaSat

"The adoption of Ultra-HD (or 4K) will depend on the availability of 4K content; the development of highly efficient coding technology to reduce the need for high bandwidth; and the affordability of 4K-capable televisions and set-top boxes. Research showed it took America's high-definition broadcasts about a dozen years to go from introduction to mainstream acceptance. Using this benchmark, it could be 2025 before ultra-HD becomes mainstream in America. Whilst Asia (excluding Japan and South Korea) has traditionally lagged America in the adoption of new consumer technology, with the rising level of development across the region, Asia may lead America in this area (with widespread adoption in a shorter time). The development of High Efficiency Video Coding (HEVC) has reduced 4K's capacity requirements, but it is too soon to say with any degree of accuracy whether or not there is enough satellite capacity to support Ultra HD across Asia." *Jarod Lopez, Vice President, Broadcast Sales, Measat*

"We believe it will be two to three years before 4K will roll out in Asia. There is enough satellite capacity to do the primary distribution, even though there is not as much available Ku-band capacity for DTH distribution in Asia as in other regions." *Terry Bleakley, Regional Vice President, Asia-Pacific Sales, Intelsat*

"While some countries in the West and a few in Asia such as Australia and Japan have started to unveil 4K services, it is still a very small niche market. Although we see a limited introduction of more advanced technology and ultra-high definition TV sets to the market, 4K content development is not moving at the same pace. As 4K presents four times the pixels of the regular HD format, more bandwidth is required, making it a much higher cost for delivery for each channel. The issue is not so much on whether there is enough capacity to support the ultra-HD standard, but more if there is a viable and cost efficient business model for 4K in Asia." *William Wade, President and Chief Executive Officer, AsiaSat*

"In Japan, Ultra HD could already start in 2014 as a result of government assistance. It is expected that Japan's Ultra HD channel will broadcast using MPEG-4 (H.264) encoding technology and not the new HEVC standard, which offers up to 50% encoding efficiency improvement compared to MPEG-4. However for Ultra HD to roll out as a mass market service, a lot still has to happen. Similar to the HD timeframe, we assume Ultra HD to become a commercial reality first in Europe or North America in 2015/2016, although this is very much dependent on other factors as well. Asia will probably be one of the next regions to embrace Ultra HD in the following years due to the strength of the growing economies in the region as well as the young and technology-savvy population. Currently, the demand for high-quality satellite capacity suitable for direct-to-home services exceeds the supply in the Asia-Pacific region. SES believes that HD and Ultra HD will be adopted widely in the Asia-Pacific in coming years, which is why we have announced deals to either acquire or build one satellite dedicated to coverage over the region every year for the past three years – SES-7, SES-8 and SES-9 – to support these requirements." *Glen Tindall, Vice President, Sales, Asia-Pacific, SES*

"I will give it another three years from now for the 4K era to pick up in Asia because currently there is not enough transponder capacity to support the ultra-HD standard in Asia." *Chiou Wen-Ful, Deputy Managing Director, Satellite Business Department, International Business Group, Chunghwa Telecom Co Ltd*

"4K or UHDTV is a growing element in the broadcast world. At present, due to pricing, equipment servicing the sector is primarily for early adopters. However, this will change soon and we will see better pricing for emerging markets and new audiences. The business case for satellite operators is improving and it is important for us to be ready with more capacity to engage services that utilise UHDTV." *Eyal Copitt, Senior Vice President Sales Africa and Asia, Marketing, Spacecom*

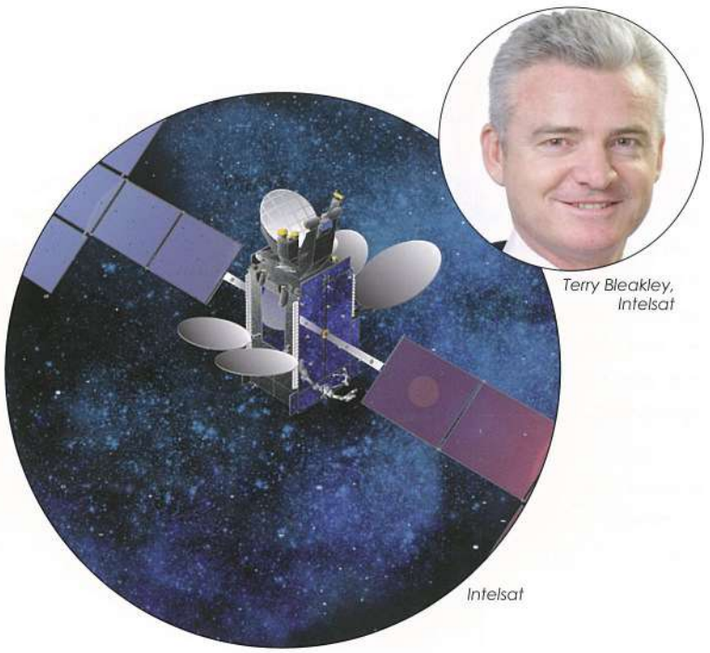
What are you doing to make sure you are prepared for 4K/8K?

"Measat is carefully tracking the development of 4K. We are in discussions with key industry players to form partnerships to develop technical expertise and ensure that we have the infrastructure in place to distribute and broadcast 4K content over satellite in a reliable and robust manner in line with market requirements." *Jarod Lopez, Vice President, Broadcast Sales, Measat*

"We are ready to support the delivery of 4K or any other higher resolution display format with our existing high-power satellites and our upcoming AsiaSat-6 and AsiaSat-8 satellites, targeted for launch in the first half of 2014." *William Wade, President and Chief Executive Officer, AsiaSat*

"Chunghwa Telecom already has its own optical fibre multi-demand platform and infrastructures to support 4K/8K in Taiwan. We are ready for 4K and 8K." *Chiou Wen-Ful, Deputy Managing Director, Satellite Business Department, International Business Group, Chunghwa Telecom Co Ltd*

"Intelsat Epic^{NG}, our next-generation satellite platform, and IntelsatOne, our terrestrial fibre network, will address the primary distribution of 4K and beyond, allowing for cost-efficient, high-throughput transmission of compressed content while providing an open-architecture, backward-compatible network for broadcasters." *Terry Bleakley, Regional Vice President, Asia-Pacific Sales, Intelsat*



Terry Bleakley, Intelsat

Intelsat

"Amos-4 is scheduled to launch to the 65° East orbital position over Asia later this year and our team is ready to work with broadcasters and providers to ensure all of their plans and programmes meet expectations. Our Ku-band and high-power Ka-band transponders will be able to handle UHDTV (4K)." *Eyal Copitt, Senior Vice President Sales Africa and Asia, Marketing, Spacecom*

"Satellite broadcasting remains the cheapest possible way to reach mass TV audiences, offering a ubiquitous experience to all end-users, wherever they are located. With our global fleet of 53 satellites, we are equipped and have the bandwidth required to broadcast Ultra HD channels. As an infrastructure operator and as a neutral partner, we are also working with the industry to develop the required ecosystem. Our goal is to help develop an end-to-end Ultra HD value chain and to allow consumers to experience Ultra HD television as early as possible in real market conditions, such as broadcast via our demo channels. One example is how we pioneered the first Ultra HD transmission in the new HEVC standard live from an SES satellite in April 2013... We also have plans to prepare a demo channel setup using the new HEVC encoding at 20-25 Mbit/s in the next few months. Separately, we have launched the 'SES Ultra HD Experience' that invites all broadcasters and content producers to present their content filmed in Ultra HD. Selected content will be part of the SES Ultra HD experience channel and broadcast via an SES satellite." *Glen Tindall, Vice President, Sales, Asia-Pacific, SES*

Is HD adoption in Asia where you would like it to be?

"HD channels are already available in most of Asia, but mainly in the form of paid premium channels. Regional governments have also committed to the rollout of DTT (Digital Terrestrial Television) in most of Asia, which provides a relatively firm roadmap for the wider adoption of HD content. In Southeast Asia, for example, analogue switch-off dates have been set between 2015 and 2018. However, the DTT infrastructure needs to be further developed, and the sector needs to find ways to fund the consumer set-top boxes and educate the general public on why they should switch to digital, all of which will take time." *Terry Bleakley, Regional Vice President, Asia-Pacific Sales, Intelsat*

"The adoption of HD is growing worldwide. There are more than 5,600 satellite HD channels worldwide now, of which 28% are broadcast on SES satellites. Geographically, Asia is the fastest-growing region to adopt HD following North America and Europe. As you know, Asia may be one region but consists of many differing markets. In the developed markets such as Japan, Malaysia, Australia, and Korea, HD is a standard offering. In the rapidly developing markets such as Thailand, the Philippines and Indonesia, HD channels are increasingly occupying a larger proportion of the channel line-up. In recent years, we see more HD offerings in these markets as the spending power of a growing affluent middle class progresses." *Glen Tindall, Vice President, Sales, Asia-Pacific, SES*

Glen Tindall, SES

"We are seeing demand for HDTV from viewers continuing to grow in the region, which is encouraging for us. The region is also undergoing rapid digital TV conversion especially the emerging markets such as Thailand, Indonesia and the Philippines." *Richard Pak, Chief Development Officer, Asia Broadcast Satellite (ABS)*

"HDTV is picking up in Asia with the prices of HDTV sets continuing to drop, and video compression and modulation technology advancing. With competition among satellite operators, bandwidth costs for the delivery of HDTV content are becoming more affordable for broadcasters, particularly for new and international players seeking a more economical entry into the growing Asia market." *William Wade, President and Chief Executive Officer, AsiaSat*

"Yes, the adoption of HD is meeting our expectations. Measat began offering HD services with one HD channel in 2007. This has increased to 41 now with the growth in the HD segment accelerating. We expect to be distributing 50 HD channels from 91.5 East across Asia by year's end. In anticipation of future HD growth, Measat is readying to launch the Measat-3b and Measat-3c satellites at end 2013 and end 2015 respectively. These satellites will co-locate with Measat-3 and Measat-3a at 91.5 East to create Asia's most robust video neighbourhood to serve Asia's growing HD demands." *Jarod Lopez, Vice President, Broadcast Sales, Measat*

"HD is one of the fastest growing sectors we see in Asia. Mostly, it is expanding due to HD broadcasting of sporting events or via channels that rely upon action and fast paced entertainment like movie channels. Broadcasters are very up-to-date on how to push HD to their customers and viewers are very excited by the high quality they receive on their screens." *Eyal Copitt, Senior Vice President Sales Africa and Asia, Marketing, Spacecom*

"Yes, HD is gaining traction everywhere. I personally like the HD programming on Discovery and ESPN live broadcasting. In Taiwan today, the MOD platform by Chunghwa offers more than 40 HD programmes." *Chiou Wen-Ful, Deputy Managing Director, Satellite Business Department, International Business Group, Chunghwa Telecom Co Ltd*

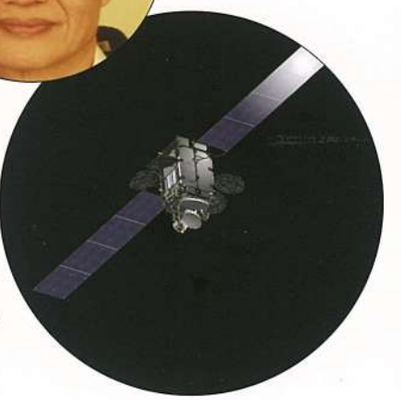
What do you think needs to happen to fast-track HD and then 4K in Asia?

"Whether it's HD or any other higher resolution display format such as ultra-high definition, the development is driven by the availability of content in the right format and the penetration of high-definition television sets. The successful implementation of digitisation for cable systems in some Asian countries will increase the network capacity for distributing HD or even 4K content to consumer homes. In countries such as India, where DTH operators are facing a shortage of satellite capacity from domestic systems to carry more HD channels, bandwidth will be an issue, thus requiring the government to open the domestic market to foreign satellite operators in order to meet local market needs." *William Wade, President and Chief Executive Officer, AsiaSat*

"Asia is already on the fast track towards HD. This is evidenced by the strong consumer uptake of HDTVs, the increase in HD content creation, and the drop in price of offered HD content. There is also a strong push from the channel owners to make available existing SD channel offerings in HD. With regards to the fast-track of 4K, content, coding efficiency and equipment price are likely to be the key drivers. Not just the price of consumer 4K TVs, but also the price of the equipment and technology necessary to produce, manage, store and broadcast 4K content in a cost-effective manner." *Jarod Lopez, Vice President, Broadcast Sales, Measat*

"HD content is highly preferred over SD content, so we anticipate that a greater proportion of pay-TV channel line-ups will be occupied by HD in the future. Today, although broadcasters have started to shoot in Ultra HD resolution (downscaling it for HDTV transmissions), it is still too early to talk about fast tracking Ultra HD in Asia as original Ultra HD productions are still rare. A growing number of Ultra HD TV screens are now available in the market; we can expect more in the second half of 2013. For Ultra HD to become commercially viable, the elements of the value chain need to come together first – particularly the availability of high-quality content, the commercial capability of studios/operators to invest into a 4K production chain and consumers' willingness to improve their TV experience. While we think Ultra HD will see its commercial launch in the premium market segment in 2015/16, it will only reach the masses slightly later as the benefits of Ultra HD become most evident only with larger screen sizes. Having said that, we believe that the mature markets such as Japan, Korea, Australia, and New Zealand will be the first adopters of Ultra HD in the region." *Glen Tindall, Vice President, Sales, Asia-Pacific, SES*

Chiou Wen-Ful, Chunghwa Telecom



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"I think HD is already picking up in Asia. Between HD and 4K, it is a separate and independent issue – just like the mobile phone development situation from 2G to 4G/LTE in some countries. In order to fast-track 4K in Asia, I believe developers should also look at 3D to enhance the 3D viewing experience." *Chiou Wen-Ful, Deputy Managing Director, Satellite Business Department, International Business Group, Chunghwa Telecom Co Ltd*

"For 4k adoption to occur widely, the entire ecosystem of technology and equipment must be available. We need HEVC compression, which will provide 30% to 50% efficiency compared to H.264/MPEG-4 to make the distribution of 4K closer to the distribution of HD. There have to be cable set-top boxes capable of receiving the signal, with televisions available at reasonable prices. To really make 4K meaningful to consumers, the difference can't be really appreciated on the smaller screens, so there must be penetration of the larger screens. 4K content will be a niche for movie or sports channels initially, but as more content becomes available, consumers will demand that it be delivered to their homes. We believe Asian programmers have the opportunity to lead in the introduction of 4K by making sure their network infrastructure is flexible and ready to work with the technologies that content creators and ends users adopt." *Terry Bleakley, Regional Vice President, Asia-Pacific Sales, Intelsat*

"The question of change is based upon a number of factors, including technology, pricing, regulatory environment and satellite capacity... Our experience in Europe and Africa has shown us that 'fast-tracking' of HD is often pushed by international sporting events like the Olympics or World Cup football competitions." *Eyal Copitt, Senior Vice President Sales Africa and Asia, Marketing, Spacecom*

Is 3D happening the way you thought it might?

"It happened exactly the way we thought it would. There are two major 3D networks in the United States on our fleet, but it's a niche type of service and probably as long as glasses have to be used, it's always going to be niche. We believe it will see more popularity in movie theatres or on DVD than on live, linear TV." *Terry Bleakley, Regional Vice President, Asia-Pacific Sales, Intelsat*

"We believed 3D content was always going to be a niche market segment given that home 3D experience is not as immersive as the movie theatres and the need for specialised glasses. Its adoption was further affected by the fact that many consumers had already invested in HDTVs and so were unwilling to upgrade to 3D HDTVs so soon. In some instances the 3D technology was immature, with crosstalk and artifacts appearing when viewing 3D on TVs." *Jarod Lopez, Vice President, Broadcast Sales, Measat*

"Despite the increasing availability of 3D television equipment in Asia over the past few years, the production of 3D content still lags behind the hardware development. We don't expect 3D will develop significantly on its own as market interest in 4K will eventually overtake 3D in terms of development of content and hardware." *William Wade, President and Chief Executive Officer, AsiaSat*

"Since its introduction, we have always believed that 3D content is targeted at a niche market. It has enjoyed and continues to see much success in movies such as *Avatar* and also sporting events. We believe that

Eyal Copitt, Amos

"No, I do not think 3D is happening the way it should be. Developers should look at improving/enhancing 3D together with 4K. With this, I believe when there is an improvement in 3D then the take-up of 4K in Asia will also improve. 3D is not popular in Taiwan because people are complaining that it is a hassle to use glasses to view 3D. It is fine to view in the cinema but definitely not ideal at home. Moreover I think there should be some standardisation in 3D television sets. Currently 3D sets produced by different manufacturers offer different levels of 3D viewing experience." *Chiou Wen-Ful, Deputy Managing Director, Satellite Business Department, International Business Group, Chunghwa Telecom Co Ltd*

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