

ISSUE 58 | JANUARY 2017

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Founder

Dominic De Sousa (1959-2015)

Printed by

Printwell Printing Press LLC

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Resolutions Resolutions!

Welcome to the January edition of *SatellitePro ME*. I trust everyone had a wonderful New Year filled with fun and festivities. A new year brings with it new resolutions, both for yourself as well as for companies. It's also a time when the satellite industry is coming together; operators are looking to cooperate with other operators to reduce operational costs and gather expertise from each other. I look forward to seeing what this year brings, especially with many operators having already launched their HTS birds.

In other news, the second Global SatShow in Turkey was a well-attended event, where leaders of companies came together to discuss common areas of interest to the community. There were discussions on the growth of broadcasting, mobility, connected vehicles and future needs and requirements. For anyone in the industry it is a must-visit event, where not only can we learn from each other, but also look at ways to work together and make new business contacts. Besides the panel discussions, there was also an exhibition that was held at the venue. Turkey is at the crossroads between the Middle East and Europe, and so it makes a wonderful place to hold a show like this, where visitors across continents can meet and communicate their needs and requirements to like-minded individuals.

I would like to thank our lovely readers and contributors for all the assistance they gave me in the last year. I look forward to working even closer with all of you in the New Year.

Have a wonderful January. Don't forget to keep those resolutions! As always, I'd love to hear your feedback and comments on this issue of the magazine. Please send me an email or call the number in the panel on the left.

Clayton Vallabhan
Editor

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"For economic reasons, the market is shrinking. This means we are going to see a crunch in resources for future investments"

Cenk Şen, CEO, Turksat

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"By using commercial services, the government leverages the infrastructure of commercial enterprises, plus it gains the market to keep costs down"

Greg Caicedo, VP, Kratos

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"Raising more awareness and improving communications is a matter of priority to ensure the success of these initiatives"

Ghassan Murat, VP, Eutelsat MENA

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"I believe there will be a paradigm shift in the saturated broadcast market of MENA, a shift from free TV to pay TV model"

Ali Kuwari, President and CEO, Es'hailSat

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Strength to Strength

Ali Kuwari of Es'hailsat speaks about how the operator has gone from strength to strength in the three years since its launch. It is now manufacturing its new teleport

UAE issues National Space Policy

» The UAE Space Agency has issued the National Space Sector Policy. The document was approved on September 4 by the Council of Ministers, headed by HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister of the UAE and Ruler of Dubai.

The event, held at Jumeirah Etihad Towers, Abu Dhabi, was attended by Dr Khalifa Al Romaithi, Chairman of the UAE Space Agency, board members, Dr Mohammed Al Ahbabi, Director General, as well as several government entities and stakeholders.

Attendees were introduced to the regulatory framework of the space sector in the UAE, in addition to the objectives, enabling capabilities and success factors of the policy. It also explained the roles involved in implementing the Policy, and provided an update on the national space sector strategy to be issued soon and the space activities law being drafted.

The Policy has been prepared in



cooperation with a number of key stakeholders in the government sector, national companies in the private sector, academic foundations and research centres, international companies operating out of the UAE, and international experts from several legislative, legal and scientific areas.

The Policy aims to build a strong and sustainable space sector in the UAE that supports and protects national interests and related vital industries. This includes contributing to economic growth and diversification, strengthening

specialised Emirati skill sets and developing scientific and high-tech capabilities. It also seeks to nurture and grow a culture of innovation and enhance the UAE's status on regional and global levels.

HE Dr Khalifa Al Romaithi, Chairman of the UAE Space Agency, said: "Our National Space Policy stems from the vision of the late Sheikh Zayed Bin Sultan Al Nahyan, the founding father, in addition to the directives of their Excellences, Members of the Federal Supreme Council. This vision enabled us to establish a solid economic foundation and comprehensive infrastructure, thus allowing the UAE to occupy a leading position across numerous fields."

Al Romaithi added: "The Policy is in line with the UAE's vision and strategic plans for all other sectors in support of economic growth and diversity in the country. It is considered as a cornerstone that the UAE space sector is built and developed further."

+ www.space.gov.ae

SPACE EMERGES AS A NEW FRONTIER FOR PRIVATE INVESTORS

Space is emerging as the new frontier for private investors, and individuals can get a slice of the multi-planetary action for as little as \$25,000. Angel investors, including a growing number from the Gulf, are now helping to finance out-of-this-world entrepreneurial projects in

a race reminiscent of the early days of internet and tech start-up funding.

Getting in at the seed stage is vital to fuel an industry which holds out enormous opportunity, according to Chad Anderson, CEO of Space Angels Network, which brings space start-ups together with investors via

online dealing. "There's a lot of business in space which is new," he said, pointing out opportunities in reusable launch technology, small satellite constellations, private in-space habitats, lunar logistics and asteroid mining. And Gulf investors are lining up alongside US and European angels, with their eyes on the potential of orbital returns.

Speaking ahead of his planned January visit to the UAE capital, where he'll join a panel at the Global Space Congress, Anderson said there are now hundreds of companies coming up in the space sphere and looking to angel investors to finance projects. "The Middle East has a role."

Anderson will join a panel at the Global Space Congress, the region's premier space event, which runs at The St. Regis Saadiyat Island Abu Dhabi on January 31 and February 1, to examine Financing Space, addressing a global audience of over 600 space experts, including space agency leaders, C-suite space and aerospace executives and more.

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Hughes EchoStar XIX satellite launches

SSL has announced that the EchoStar XIX satellite, which SSL designed and built for Hughes Network Systems, was launched and is successfully performing post-launch manoeuvres according to plan. The satellite deployed its solar arrays on schedule following its launch aboard a United Launch Alliance Atlas V provided by Lockheed Martin Commercial Launch Services.

EchoStar XIX is the world's highest capacity broadband satellite now on orbit, dramatically increasing capacity for HughesNet high-speed satellite internet service in North America. EchoStar XIX joins EchoStar XVII to help meet the demand for high-speed internet for consumers and small businesses in rural and other communities with limited internet access options.

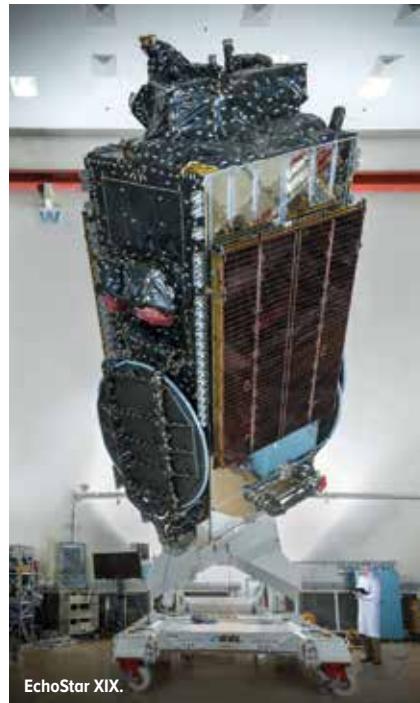
"EchoStar XIX is an exceptionally powerful satellite that underpins the next generation of satellite internet," said John Celli, President of SSL. "It has been an honour to work closely with our long-term colleagues at Hughes,

advancing satellite's capability to improve lives by bringing the benefits of quality, high-speed internet service to homes and small businesses across North America that were previously unserved or underserved by terrestrial broadband services."

EchoStar XIX provides significantly more capacity than EchoStar XVII, which was also built by SSL and launched in 2012. Like EchoStar XVII, EchoStar XIX is a large multi-spot beam Ka-band satellite based on the powerful SSL 1300 platform, which has the capability to support a broad range of applications and technology advances. SSL has built nearly 50 satellites with HTS payloads, including two of the highest capacity broadband satellites in service today, and the world's first true high-throughput satellite, which was launched in 2005.

+ www.sslmda.com

+ www.hughes.com



EUTELSAT APPOINTS GROUP CHIEF HR OFFICER

Eutelsat Communications has announced the appointment of Antoine Mingalon as Group Chief Human Resources Officer and member of the Executive Committee. He will join Eutelsat on 2 January, 2017.

Mingalon is a seasoned professional in human resource leadership, with more than 20 years of experience managing cross-functional teams, articulating Human Resource needs, developing talent and improving business performance through digital transformation.

He joins Eutelsat from Vimpelcom, an international telecom services group, where he was Group Human Resources Director – Technology Function, based in Amsterdam. From 2012 to 2014, as Chief Human Resources Officer, he developed and executed the Human Resources strategy at Criteo, a technology company engaged in digital and personalised performance marketing in France and internationally.

+ www.eutelsat.com

INMARSAT MOVES TO ARIANESPACE LAUNCH VEHICLE

Inmarsat has signed a contract with Arianespace to launch its S-band satellite for the European Aviation Network (EAN) on an Ariane 5 heavy lift launch vehicle. The EAN payload is part of a 'condosat' constructed by Thales Alenia Space, which incorporates a second payload for Hellas-Sat. The consosat was originally scheduled for launch with SpaceX. However, following the delay in SpaceX's launch schedule, Inmarsat and Hellas-Sat took the decision to move the consosat to an Arianespace launch.

+ www.inmarsat.com



EUTELSAT APPOINTS NEW GROUP CFO

Eutelsat has announced the appointment of Sandrine Téran as Group Chief Financial Officer and member of the Executive Committee. She will join Eutelsat on 9 January, 2017.

Sandrine Téran was formerly Managing Director of Louis Dreyfus Holding and has occupied other key executive positions in the Louis Dreyfus Group during the past eight years, notably Global Head of Tax and Corporate Secretary, and subsequently Global CFO of Louis Dreyfus Company. From 2000 to 2008, she was Head of Taxation, Corporate Finance and Internal Audit at Eutelsat, contributing to significant structural changes including the privatisation in 2001 and the IPO in 2005. She began her career at Ipsen as Risk Manager in charge of tax and insurance, before joining Euro Disney, where she was Head of Tax. Sandrine is a finance and tax graduate from Paris Dauphine University.

+ www.eutelsat.com

Inmarsat and Deutsche Telekom conduct flight for EAN

» Inmarsat and Deutsche Telekom, together with technology partners Nokia and Thales, have successfully conducted a programme of test flights in the UK. This is a major milestone in the development of EAN, the world's first integrated satellite and air-to-ground network dedicated to providing a true in-flight broadband experience for the European aviation industry and for millions of passengers travelling across Europe.

EAN is planned for introduction in mid-2017. The flights tested the performance of the EAN system, including the onboard equipment provided by Thales and the ground network provided by Deutsche



Telekom and Nokia. As a precursor to the test flight series, Deutsche Telekom and Nokia jointly achieved the first EAN live over-the-air connection, in Nokia's Stuttgart laboratory.

There, all components of the LTE ground network were thoroughly tested and validated.

The first live connection in the field was accomplished in a broadband video conference with both parties connected via the dedicated EAN LTE mobile network.

+ www.inmarsat.com

+ www.telekom.com

GOTURK 1 LAUNCHES SUCCESSFULLY FROM FRENCH GUIANA

The launch of Goturk 1 was carried out by Arianespace from the European spaceport in Kourou, in French Guiana, with the European VEGA launcher.

After the separation of the satellite from the rocket 57 minutes after launch, the early orbit and satellite testing phase began, managed by the Fucino Space Centre of Telespazio, a joint venture between Leonardo (67%) and Thales (33%). The first telemetry signal was acquired by the Fucino 68 minutes after launch.

The GÖKTÜRK-1 programme was built by Telespazio as prime contractor and Thales Alenia Space, a joint venture between

Thales (67%) and Leonardo-Finmeccanica (33%), for the Undersecretariat for the Turkey Defence Industry (SSM, Savunma Sanayii Müstevarlığı), together with local industrial partners including Tai AS, Aselsan AS, Tubitak Bilgem, Roketsan AS and TR Teknoloji.

The system will be operated by the Turkish Air Force.

Telespazio created the ground segment, including mission control, in-orbit satellite management and the acquisition and data processing systems.

+ www.ssm.gov.tr

ASIASAT ENTERS INTO TRANSPONDER AGREEMENT

AsiaSat has entered into a transponder service agreement with Space Communication Ltd. The agreement is in respect to the use of AsiaSat's in-orbit satellite AsiaSat 8, which will be relocated to an orbital slot, as agreed with Spacecom. Exclusive rights to use all Ku-band transponders on AsiaSat 8 will be granted to Spacecom for a minimum of four years for the provision of commercial satellite communications services. AsiaSat will continue to be responsible for the satellite's tracking, telemetry and control functions.

The service term is expected to commence from the first quarter of 2017, subject to necessary regulatory approvals and satisfactory testing after the relocation.

AsiaSat expects Spacecom to become one of its top customers in terms of revenue contribution once the service term commences.

Andrew Jordan, President and CEO of AsiaSat, said, "We welcome Spacecom as our latest customer. AsiaSat 8's superior performance offers an ideal fit for Spacecom's needs. We look forward to growing this strong partnership in the years to come."

+ www.asiasat.com



An artist's rendering of Goturk 1.

Show News

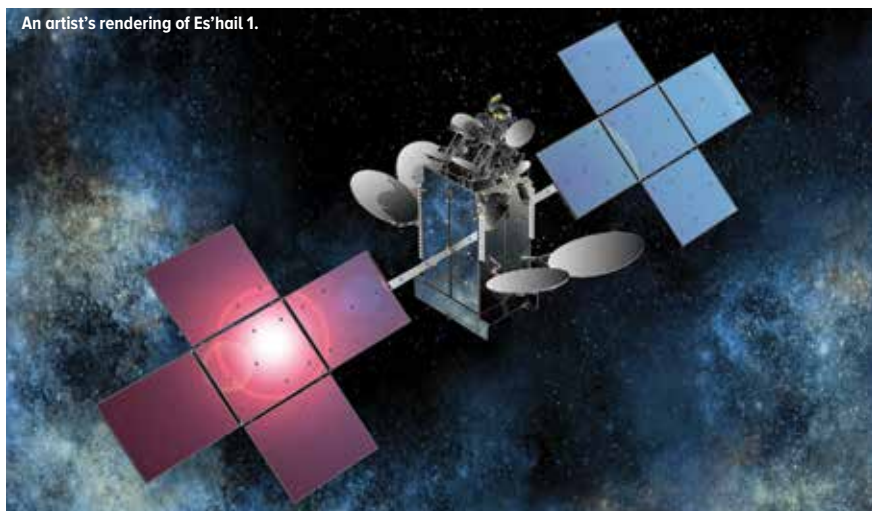
» Es'hailSat showcases Es'hail 2

Es'hailSat, the Qatar Satellite Company, exhibited at the second Global SatShow conference and exhibition, held 29-30 November at Haliç in Istanbul. The company showcased Es'hail-1, currently broadcasting high-quality, premium high definition content from the key MENA broadcast hotspot of 25.5°/26°E. In addition to providing transmission and expansion opportunities for established news and sports channels, a growing number of local and regional Arabic channels have chosen Es'hailSat to launch their services in MENA. Es'hail-1 also supports VSAT and maritime services on its Ka-band payload.

Ali Ahmed Al Kuwari, President and CEO of Es'hailSat, said, "With Es'hail-2 and our new teleport on schedule to become operational in 2017, we are scaling up on our marketing and sales efforts, and Global SatShow is an ideal platform for us to showcase our capabilities and service offerings in MENA and the international arena. We believe we have the optimum solutions to support broadcasters in the MENA and beyond, not only in terms of technical capabilities and performance, but also in terms of security of content."

+ www.eshailsat.qa

An artist's rendering of Es'hail 1.



ARABSAT SPEAKS ABOUT NEW SATELLITES AT THE SHOW

Arabsat participated in the second Global SatShow, 29-30 November 2016. The operator showcased its coverage across three continents and spoke about its sixth-generation satellites.

Khalid ben Ahmed Balkheyour, President and CEO of Arabsat, said: "The conference explored the cooperation between regional and international satellite operators, with the participation of operators from all over the world. During the conference and exhibition, we showcased Arabsat services and its satellites' coverage, which includes the Middle East, Europe, Africa and

large parts of Asia via Arabsat fourth- and fifth-generation satellites, as well as the sixth-generation satellites scheduled to be launched next year. Arabsat's fleet of satellites is linking the three continents where Arabsat has ground stations providing TV, telecommunication and broadband satellite services with full in-orbit back-up."

Arabsat is currently working on several important strategic projects to operate many of its new orbital positions and meet the growing demand of its customers.

+ www.arabsat.com

THURAYA WINS SATELLITE HUMANITARIAN AWARD



Thuraya won the Satellite Humanitarian of the Year, Satellite Industry Leader Award (SILA) at the second Global SatShow in Istanbul. Samer Halawi, CEO of Thuraya, received the award on behalf of the company during a prestigious ceremony at the Haliç Congress Centre. The award was presented by Hakan Kurt, CEO of Global SatShow.

The Satellite Humanitarian of the Year accolade honours the company that makes best use of satellite communications to benefit a nation or region in terms of economy, security, education, knowledge, the environment, healthcare, or disaster rescue and recovery.

Samer Halawi, Thuraya Telecommunications CEO, said: "I am delighted to receive this award on behalf of all my colleagues. This new SILA award has recognised the very reason why we exist as a company: to save and improve lives. That is a humbling responsibility, and one that shapes us as a team and as a company. While attention has focused upon product launches and our next generation plans lately, it is gratifying to be recognised for the power for good that comes from applied satellite technology."

The winners of SILA 2016 were chosen by an independent panel of judges comprising analysts, researchers and journalists.

Halawi confirmed the importance of the award. "At Thuraya, we want to make as positive a difference to the world as possible," he said. "This SILA award raises awareness of the vital contribution satellite communications can make."

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Turkey at the Forefront

The second Global SatShow ran 29-30 November, drawing leading industry heads from the satellite and space sector. The event, held at the Halic Congress Centre in Istanbul, has grown to become a must-visit event for everyone in the sector

The second Global SatShow, held in Istanbul, was a massive success, with leaders in the industry gathering and sharing their thoughts on how they envision the industry evolving and moving forward.

Hosted by the EMEA Satellite Operators Association (ESOA) and organised by Medyacity, the Global SatShow is an annual satellite conference and exhibition that provides a platform to address current market trends and challenges. A host of panel discussions tackled important issues that have long plagued the industry, such as the growing number of new national satellite operators, expansion of satellite TV, connected transport and mobility.

Hakan Kurt, Chairman of Medyacity and CEO of Global SatShow, said: "It is an interesting time for satellite; the industry is evolving and new entrants emerging are increasing the potential for market disruption. While this is promising, the industry must also overcome the challenges that come with these changes. In order to do this, it is imperative that industry players band together to outline solutions and map out the best paths to take."

"This is what the Global SatShow aims to help achieve by offering a platform for discussion, business development and cooperation right in the heart of the world's crossroads. No longer must satellite piggyback on broadcast events; instead, the industry has a satellite-dedicated show in Istanbul, the geostrategic link between the Western and Eastern worlds. It is from here that satellite players will shape the future of the industry," he added.



Hakan Kurt, Chairman of Medyacity and CEO of Global SatShow.

One of the most important panels at the show was the CEO panel, which brought together a mix of FSS and MSS players who discussed strategies to combat over-supply of capacity, shortage of frequency, increasingly more national operators cropping up on the scene and the ever growing demand for more bandwidth at lower costs. All these culminate in whether incumbent operators should cooperate with newer operators, or view them as a threat.

The panel consisted of Ali Ahmed Al Kuwari, President and CEO of Es'hailSat; Cenk Şen, CEO of Turksat; Rupert Pearce, CEO of Inmarsat; Khalid Balkheyour, President and CEO of Arabsat; Christodoulos Protopappas, CEO of Hellas-Sat; and Samer Halawi, CEO of Thuraya. It was moderated

by Aarti Holla, Secretary General of ESOA.

Moderator: We see national satellite operators popping up all over the world. When this happens, it becomes an issue for foreign operators. At the same time, regional players often don't have optimised payload designs and lack access to key orbital resources and spectrum. What has driven the decision to either cooperate or compete in these circumstances?

Cenk Şen, CEO, Turksat: The problems are our problems, and as a community we need to find solutions. As a Turkish operator, we are assigned to use our regional and national resources among other countries. We know that resources are very restricted, especially with frequency. As time passes, the infrastructure needs of other IT components, the importance of satellite operators and the infrastructure is improving.

At Turksat, we know that with these limited resources we have to provide a huge amount of bandwidth to our customers around the world. This is why we stress the need for cooperation, because resources are very limited in this area. For economic reasons, the market is shrinking. This means we are going to see a crunch in resources for future investments. To decrease costs, the first precautions we need to take are to cooperate with each other. Our scope changes from time to time and from requirement to requirement. Cooperation for reduced costs is very important for us. This is why we are cooperating with Inmarsat and sharing our resources throughout the world.

Other Sessions

In today's world of satellite and space business, research ventures, vertical acquisitions and many other joint declarations are signed to cooperate on technology transfer and to bring in innovative and rapid manufacturing methods. In the "Future Cooperations in Satellite Industry" session, satellite industry leaders determined the need to shape the future of satellite industry investments.

Keynote: Suat Hayri Aka, Undersecretary, Ministry of Transport, Maritime Affairs and Communications, Republic of Turkey

Moderator: Martin Jarrold, Chief of International Programme Development, GVF

Panellists:

- Masamitsu Okamura, Executive Officer, Group President of Electronic Systems Group, MELCO
- Lokman Kuzu, President of

Institute, TUBITAK UZAY

- Nicolas Chamussy, Executive Vice-President Space Systems, AIRBUS DEFENCE & SPACE
- Kirk Pysher, President, International Launch Services
- Dr Alime Yanartaş Özyıldırım, Satellite Payload Programs Director, ASELSAN
- İzzet Bayır, Communications and Navigations Satellites Programme Manager, TUSAS – TAI






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We know this will increase assets for both companies, and these resources will help with research for future innovations. We as a community have to support each other, because the shrinking market is really dangerous for us and will cause aggressive competition among companies. The cost has to decrease, and we have to improve quality. This will also speed up research and bring innovation faster to the market. The solution is through cooperation, and using our resources more efficiently. Through this, costs will go down and not endanger future innovation.

Samer Halawi, CEO, Thuraya: This industry has been an industry of egos, where everyone wanted to do their own thing and have their own satellites and services for themselves, but we are lagging behind terrestrial infrastructure. We don't have the scale that they have. We also have big investments and big CAPEX programmes, so the best way is through partnerships.

For our next-generation constellation, our focus is on L-band services, but we

"This industry has been an industry of egos, where everyone wanted to do their own thing and have their own satellites and services for themselves, but we are lagging behind terrestrial infrastructure. We don't have the scale that they have."

SAMER HALAWI, CEO, Thuraya

want to also introduce HTS services aggregated from partners that we work with, rather than capacity we will launch on our own. We believe that partnerships will lead us to the right economics.

There is also a lot of cooperation between

us and the terrestrial world too. Our system is based on GSM and we have a base station that happens to be 36,000km up in space, but the technology is all GSM. SIM cards work in our phones, and vice versa. We have roaming agreements with 371 operators in 175 countries, so it's completely interoperable. The good thing about partnerships is that we can help each other. For GSM operators, they can claim 100% coverage when they have satellite capability, and we complement them when GSM is not available. We benefit from the distribution networks and the reach to consumers that they have.

The important thing is to not just have the technology and integration, but also have the right business model that can satisfy multiple operators. In fact, our latest phone is the first in the world that has dual-mode and dual-SIM cards. One SIM card is for GSM and one is for satellite, and it works interchangeably between one network and the other. These are the types of partnerships that we feel the industry should look at more in the future, between each other and also between different types of operators.



The panellists discussing future cooperation between satellite operators.



Khalid Balkheyour,
President and CEO,
Arabsat.



Samer Halawi, CEO,
Thuraya.

Rupert Pearce, CEO, Inmarsat: Satellite is becoming incredibly relevant to the emerging digital society. Countries, businesses, government and citizens are becoming much more reliant on broadband connectivity to live their lives and run their jobs, like never before. As a result, countries' and governments' need for satellite is increasing, and the choice is whether you build your own satellite programme and control your own operation and infrastructure, or do you use other people's satellites. Long-term, the answer is obvious because space is becoming more congested and contested to a degree around the world, and many developed countries and developing countries are deciding to initiate their own satellite programmes.

So you can see a proliferation of national programmes with a principal business of delivering an incredibly important solution to the emerging digital society in that country. The question is: what should global operators do about this? Do you compete furiously and deny this evolution, or do you engage and make sure that two plus two equals

Other Sessions

The future for mobility is bright and lightning fast. The "Mobility via Satellites" session featured speakers from global mobility leaders, 5G Technologies, M2M Communications to discuss upcoming satellite mobility solutions including those focused on telecommunications, navigation and more based on the current and future requirements by globe, region and verticals.

Moderator: Bryan McGuirk,
COO, Globecomm

Panellists:

- Gediz Sezgin, Senior Vice President Network Technologies, TURKCELL
- Huang Baozhong, Executive Vice President, APSTAR
- Cebail Taşkın, CTO, TURK TELEKOM INTERNATIONAL
- Peter Hall, Managing Director, INTELSAT
- Mallik RAO, CTO, Vodafone
- Samer Halawi, CEO, THURAYA

five, and enjoy the experience of learning from each other, helping people succeed and building something really fantastic?

Inmarsat's perspective is to collaborate, find areas of mutual capability where we can move quicker together, lower the risks of embracing new space innovation together, because it is a very risky business that we're in. We can work together as a community and help each other succeed, and from my perspective what then happens is we, in partnership with our collaboration partner like Turksat, Arabsat and Telenor, we develop in-country a technology ecosystem with skills, jobs and growth that indirectly helps us as a global operator, and which we can help globalise because of your global scale.

The local operator can develop innovation faster and with less risk, and we can then globalise this capability. It truly is a win-win, if you engage with an open mind and with a desire to generate an outcome where everybody wins. It's a new way of doing business. Technology companies in this incredibly fast-paced world of disruption and risk have to learn to collaborate and take problems outside



Attendees at the
Global SatShow.

their organisation, and invite others to come in and help solve problems and share in the fruits of solving those problems.

Ali Kuwari, CEO, Es'hailSat: I believe there are several factors for cooperation with other regional operators. There are opportunities for risk sharing, frequency sharing and know-how and technology transfer, as well as to build end-to-end solutions. At Es'hailSat, we have had two major journeys with partnership. For our first satellite we are in partnership with Eutelsat and share the satellite, and it was a very successful model of partnership. Another major partnership we have is with Arabsat, where we share the 26-degree orbital position. Qatar Satellite was established in 2010, and we admit that we were latecomers to the market and as a result we needed frequency and resources for our business needs. This is why we decided to partner and cooperate so that we can benefit.

Khalid Balkheyour, CEO, Arabsat: I agree with what was said by the other panellists about cooperation and collaboration between

operators. The space industry has very scarce resources both in orbital positions as well as frequency allocation. This is why we need to collaborate, but this is not the only area. We at Arabsat have been engaged in many areas of cooperation, like jamming of satellites, be it intentional or non-intentional. We have also been cooperating in the field of eliminating piracy of content on our satellites. We have had excellent cooperation with Inmarsat, Es'hailSat and many others.

Christodoulos Protopappas, CEO, Hellas-Sat: Hellas-Sat started as the Greek national satellite; however from the very beginning we saw that it would be better to also expand outside Greece. This is why we decided to market our services in the Balkans and Turkey. Now we have developed a market in Central Eastern Europe, in the Middle East and South Africa. From 2013, we became part of Arabsat Group, and this helped us to expand our reach and opportunities. We started cooperating with not just global satellite operators but national operators as well.

We have two satellites that are currently under construction. One of these is being built in cooperation with Inmarsat. This will have the S-band payload of Inmarsat, so we can offer the services in the Arab world. The other satellite we have under construction is in cooperation with the Kingdom of Saudi Arabia. This will have Ku- and Ka-band transponders, with 54 beams of Ka-band covering Africa and Europe. These partnerships are very welcome, because we can share the risk of launch as well as the investment risk of the platform. This lowers the cost per megahertz for each partner in these partnerships, and all partnerships are very welcome in these market conditions. This is because we have to pay up front the costs of this multi-million investment with a lifespan of 15 years, and these partnerships will share risks as well as open up new markets.

Moderator: Our industry is facing challenging times. There are so many satellite operators emerging around the world. There is serious overcapacity, much more than in 2004. There is downward pressure on prices. Fibre is being rolled out

Other Sessions

Will satellite TV beat cable TV? What are the trends for digital broadcasting? Will broadcasting be supplanted by the internet? The "Worldwide Satellite TV Expansion" session attempted to answer such questions, with key players among broadcasters and satellite operators.

Moderator: Hakan Çelik, Journalist, Columnist, Radio and Television Presenter, CNN Turk
Panellists:

- Enis Turan Erdogan, CEO, VESTEL
- Markus Fritz, Vice President, EUTELSAT
- Alper Turken, Regional VP for EMEA South & India and Managing Director, ARRIS
- Mohamed Youssif, COO, ABS Satellite

much faster than we've seen before. Many operators are emerging, because they are the pride of their countries and that means their governments won't allow them to be bought out. If the smaller operators won't be allowed to be bought out, does that mean the larger operators will start shrinking?

Rupert Pearce: It doesn't matter if you are small or big. There are big companies that have some national interest. The reason why consolidation is going to be difficult as a practical matter is very simply more about technology than anything else. If you're going to bring companies together for reasons of overcapacity or slow growth, you need to see serious operational synergies. In our business, that means bringing satellite networks together, compressing them into one and thus building fewer satellites, reducing CAPEX and ideally reducing operational expenditure as well.

The problem we have in this industry is we all build our own bespoke technology; we don't have an industry yet that has common technology standards across the board, and we tend to differentiate and

"The reason why consolidation is going to be difficult as a practical matter is very simply more about technology than anything else. If you're going to bring companies together for reasons of overcapacity or slow growth, you need to see serious operational synergies"

RUPERT PEARCE, CEO, Inmarsat

compete among micro nuances, but most of the time the customer doesn't really care why it works, but just that it does work. We shouldn't be too worried, because it's going to drive the collaboration agenda.

If you can't merge, and there's too much capacity, then what do you do next? The

answer is to focus on the customers and the markets where you can differentiate. We're rapidly moving into that era right now. Customers are becoming more demanding and sophisticated, because services we are providing are changing from something that would be nice to have, to become mission critical. This ultra-sophisticated customer is now going to meet a sophisticated supplier, and that's going to be a good thing in the long term for our industry.

Once these two trends happen, then collaboration goes up. This is because we're no longer across each other – we're finding our niches, and then we can start helping each other by providing those niches to others. The market's overcapacity is a very temporary situation and I think we'll be out of it in about five years. What will emerge from this will be much more powerful, strategic collaborations from satellite operators who have a much sharper focus on what they do and how they differentiate.

Samer Halawi: Within the MSS players, we each operate on totally different networks. Same thing happens with some of the FSS



Rupert Pearce, CEO,
Inmarsat.



Ali Al Kuwari, President
and CEO, Arabsat.

players, and the problem is that there are no economies of scale in anything. Not in the space segment, in the ground segment or even with terminals. Most MSS operators have totally different vendors who supply different equipment, and it's very difficult to get these vendors' phones and IP terminals at costs that are really attractive to end users, because they don't supply the same modules to us or Inmarsat. The lack of standards is definitely an issue. I think consolidation could happen in two different ways: horizontal and vertical. There are probably more possibilities for vertical integration in the future, and it could be in different directions, not necessarily where the bigger buys the smaller or the operator buys the distributor.

Moderator: We're probably not going to see a fall in the number of countries who still have ambitions to launch satellites and have national satellites. There probably isn't room for more operators, but it's not going to stop them. What are your views on this?

Christodoulos Protopappas: This is a

"If you don't have a correct business plan, capacity is irrelevant. Even if you have a lot of capacity, it needs to be sold in order to earn revenue. When pricing decreases, you won't be able to get your cost back. The problem is not about having more capacity, it's about using it more efficiently"

CENK ŞEN, CEO, Turksat

matter of physics, because we cannot have unlimited orbital spots and infinite spectrum to serve satellite operators. In the near future, if more satellite operators enter, they will find it difficult to find Ka- and Ku-band spectrum to operate. On another side, it is

of national pride for operators to launch satellites. We have seen some satellites that a few operators have recently launched. These satellites are suffering from a lack of customers. The initial business plan for the launch of the satellite was not sound. There have been some successes too, like Es'hailSat in Qatar, but others aren't so successful because there wasn't enough national market to sell to. Now, with the economic crisis, a few countries might probably delay any such plans to launch.

Cenk Şen: If you look at this problem, there are two parameters. The first is manageable and the second is not manageable. The technological aspect is manageable, but limited bandwidth of the frequency is unmanageable. If you look at the source of the problem, the business plan is most important. If you don't have a correct business plan, capacity is irrelevant. Even if you have a lot of capacity, it needs to be sold in order to earn revenue. When pricing decreases, you won't be able to get your cost back. The problem is not about having more capacity, it's about using it more efficiently. If not, we are going to need to be more aggressive to sell unrequired capacity.

Another aspect is that ITU regulations force countries to send satellites to orbit. Every nation has a right to send satellites to orbit. In some regulations it is mandatory to send a satellite within three years or you lose your right to launch a satellite – this is why nations feel they have to launch new satellites. This creates more capacity than is needed. They just sell capacity without a proper business plan. This is very harmful, because it hampers cooperation between operators. A side effect of this is that no standards can be established, leading to a decrease in interoperability.

Khalid Balkheyour: We will continue to see national operators flying satellites, maybe not so much so as in the last decade. This can be for national security or pride. They will take some market share from current operators, but hopefully this is cyclical and demand will disrupt again to create more demand for content delivery, and more services to the ground through satellite will use up that capacity in space.





Christodoulos
Protopappas, CEO,
Hellas-Sat.



Cenk Şen, CEO,
Turksat.

Things will return, just like we went through this cycle earlier in this century.

Ali Kuwari: The idea of Qatar Satellite Company was built with a strategic objective in mind, and then it was changed to a commercial objective. Qatar has invested billions of dollars in content, especially buying rights for sport content. With this there was a huge need to secure those broadcasters by having secure satellite transmission. I think the national operators, sovereignty and the pride of countries in having their own satellite will continue. If any country has the opportunity to build and run a satellite company, they will go for it. However, the problem of oversupply will appear more, and again this will help others to collaborate rather than consolidate.

Rupert Pearce: Broadband is one of the greatest enablers of wealth creation we have ever seen. It's driving a new industrial revolution, where it's creating a knowledge-based economy and it's empowering everybody without discrimination. We all know you can put broadband in the middle

Other Sessions

Whether it is a car, aircraft or a ship, the demand for always-on communications has been shaping the investments between the transportation sector and satellite industry. Besides allowing end users to stay connected, connectivity can also improve operations and efficiency. The "Connected Transportations" session presented existing research ventures and upcoming satellite technologies for the transportation sector.

Moderator: Robert Bell, Executive Director, Society of Satellite Professionals International

Panellists:

- Dinçer Çelik, CEO, TEMSA
- Jean Philippe, Vice President, INTELSAT
- Omer Karatas, RVP, EUTELSAT
- Martin Jarrold, Chief of International Programme Development, GVF

of a field in Africa and that person can be just as well connected as someone in Houston in the USA. That, for the first time in history, is revolutionary. This is why national operators are going to invest in their own space technologies, because it's liberating their country, empowering its citizens, and their fiduciary responsibilities to the citizens is going to drive them to say I have to do this.

A lot of people are going to choose to build the technology instead of buying it, because they will want to ensure the satellites are secure, targeting their own citizens, and they will not care whether that satellite makes money directly. That's not the point. It's about building these digital highways in their countries to enrich their people, bring them out of poverty and create the entrepreneurs of tomorrow. I think it's incredibly exciting for our planet, and what people will realise is that they simply cannot get enough of this broadband via satellite and that is where the rest of us come in to support these emerging economies, because we have the additional capacity to bring through very quickly, and we have the capacity to help national operators to globalise very quickly.



Bas Lansdorp, Founder and CEO of Mars One.

The Next Frontier

Another very interesting topic at the second Global SatShow was the visionary speech of Bas Lansdorp, founder and CEO of Mars One. Lansdorp explained his thoughts on Mars being the second most hospitable planet in the solar system after Earth, and why he thinks man will colonise it.

Mars One is organising a manned mission to Mars. I believe that 500 years from now, when children learn in school about the 21st century, maybe all across the solar system, they will learn that it was a time when humans first left our planet to settle on another one. It doesn't matter whether it's Mars One or NASA or the European Space Agency or any other space agency, I am convinced that in the next 84 years people will settle on different planets, and that will be one of the few things that will define this century. Just like a moon landing has defined the century before this one. So if that is one of the things that people will be talking about 500 years from now, then that is one of the things I would really like to work on.

This mission will change our world more

than we can imagine. We are going to Mars not for Mars, but for Earth. Children will be inspired to become engineers, scientists and astronauts. More people will be inspired to pursue further education. There will be more patents, just like after the moon landings. However, maybe most importantly, it will show people how special our Earth is.

Mars is the second best place in the solar

"We are proposing a mission of permanent settlement; it's a one-way trip. The people who are going to Mars will stay there for the rest of their life. Instead of trying to bring people back, we will send crew every two years"

BAS LANSDORP, Founder and CEO of Mars One

system after Earth for humans to live, but Mars is a dry desert planet, and hence it's difficult to survive. Four billion people will be connected to the internet by the time we land. If we can show these people that the second best place in the solar system is this, then we can contribute to making people more aware about how special Earth is and how we need to take care of it. It can contribute to other big problems; for example, it can bring people closer, as there is nothing like a common enemy or a common project to put your shoulders under to make people work together.

Different people and different countries might not always like each other, but as long as you make them work together, they can start believing that a different future is possible. So we are not going to Mars for Mars, but we are going to Mars to make this Earth a better place.

Mars One can make it possible

NASA has been talking about going to Mars for 47 years now, and even they can't do it. They keep saying they want to go in 20 years, but they've never reached any closer. Our company is still small, with barely 10 staff right now, but we are making it possible because our approach is different. We are proposing a mission of permanent settlement; it's a one-way trip. The people who are going to Mars will stay there for the rest of their life. Instead of trying to bring people back, we will send additional crew every two years, and that is what makes our mission feasible. NASA can send things to space and keep humans alive for months. In the International Space Station, NASA astronauts are living for the same time that it takes to go to Mars, seven months. NASA knows how to land equipment on Mars, but it doesn't know how to send equipment or humans from Mars back to Earth.

Difficulty of launching from Mars

It is still difficult to launch something from Earth, and 5% of all rocket launches fail. They don't all explode, but 5% of satellites launched reach the wrong orbit. If it's so difficult to launch things from Earth, imagine how much more difficult it is going to be to launch things from Mars. A rocket on earth is checked by hundreds and thousands of engineers until, at the very last moment, they all give their

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OK! However, sometimes it still explodes. The rocket will be launched from Earth, goes with a crew of four people, through vacuum, vibrations of launch, landing, etc. Then it needs to be relaunched back to Earth, where the same crew of four people have to carry out all the checks and prepare the rocket for launch. I really don't see how that can be done. So a rocket launch is not possible from Mars until there is a decent sized population on Mars to support the launch. In the present condition we can go there, but we can't come back as the risks are too big.

If you don't need to return the rocket, then you don't need a bigger rocket from Earth to launch a return rocket, which means you don't have a lot of rocket development to do, meaning there is much less infrastructure to send to Mars, as every kilogramme is very expensive.

So technologically it is more feasible, it's financially more feasible, and is less risky if you stay on Mars instead of trying to come back. We will keep sending equipment to Mars; we will keep sending crews to Mars, with more redundancy and spare parts to support the crew there. So it's actually even less risky to stay on Mars, e.g. you will get only half the dose of interplanetary radiation if you stay on Mars. You can protect the outpost with layers of sand. So these are the reasons why permanent settlement makes the mission a more achievable one than a return mission.

The mission

Our first crew is supposed to land in 2027, but there will be a number of preparatory missions that go to Mars before the first crew. A demonstration mission is scheduled in 2020. It will demonstrate some of the technologies we need for the human mission – thin film solar panels for energy generation, getting water from the soil and liquefying and making it drinkable. Most importantly, it will demonstrate Mars One.

Before sending humans to Mars, we must demonstrate that we can send equipment to Mars. The first unmanned mission had to have the risks as low as possible. We did this by selecting a platform that has already been used to go to Mars – the NASA Phoenix platform, the platform that NASA used for the Phoenix mission. We contacted the supplier, Lockheed Martin, for a feasibility

“Before sending humans to Mars, we must demonstrate that we can send equipment to Mars. The first unmanned mission had to have the risks as low as possible. We did this by selecting a platform that has already been used to go to Mars – the NASA Phoenix platform, the platform that NASA used for the Phoenix mission. We contacted the supplier, Lockheed Martin, for a feasibility study”

BAS LANSDORP, Founder and CEO of Mars One

study, which is the same supplier NASA used for its Phoenix mission. So it will be built by a company that has built the platform before and a system that has already landed on Mars successfully, so we are lowering our chances of failure as much as possible. It's still risky to send something to Mars, but NASA so far has had an 87% success rate, and if you send something that has successfully reached Mars before, then the chances of success are even higher.

In 2022, a rover will be sent to Mars that will drive around the surface to find the exact location for the settlement. It will make sure that there is enough water in the soil to sustain the human colony, and make sure that it is flat for the construction work to be done.

In 2024, we will send all the hardware for the manned mission, but not the humans. We're sending two life support units, two living units, a second rover and supplies. Everything is in twos for redundancy reasons. The rovers will deploy the solar panels and activate the life support system, so water and breathable air can be produced in the outpost before the crew is leaving.



If all this has been confirmed to be working, in 2026 we are going to send the first crew, first to low-Earth orbit and then on to Mars. Before that, all the systems in Mars will be rechecked, all the systems in the space station in low-Earth orbit will be checked, and then after everything is checked they will depart.

The spaceship consists of a transit habitat, and the landing module will look very similar to previous ones. The reason is we will build a track record with the cargo missions for the manned mission, so we have some track record when the humans land.

They fly to Mars for seven months, and after landing there will be a lot of construction to do, like constructing the hallways between the modules, installation of more solar panels, installation of greenhouse equipment for growing food, which is very important for their psychology but also for keeping the costs of our mission low. If we have to keep sending food every year, it will be much too expensive. Eventually, this will become their new home and they will have time for their original mission, which is to explore their new home.

Mars is only half the size of the Earth

"ADDRESS: COLONY STREET NO: 2025, MARS"



and it has no oceans, so it has the same land area as Earth. Geologists will have no shortage of things to investigate on Mars for a couple of decades, or centuries even.

A few weeks after the first crew lands, the hardware of the second crew will land, because we always send the hardware ahead of the crews and they can install the hardware. Two years later, the second crew will land and the hardware of the third crew will land. That's how we keep sending additional systems and additional teams to Mars, instead of trying to bring people back to Earth.

All these things I described are possible with existing technology. Every single system that we will send to Mars is completely different from the pictures after all the design and testing is done. All these systems need to be purpose-designed and purpose-built, because every kilogramme sent to Mars costs approximately \$104,000. We have to make sure that we send optimal systems. All these systems needed to be designed and built, but we don't need any new inventions to implement this mission. We know how to send things to space, we know how to survive

seven months of transit through space, and we know how to land systems on Mars. All these can be done with existing technology.

Cost and how to pay for it

The cost of our mission is about \$6bn. I started Mars One when I found out what the business case for the mission to Mars was. We could only do this if we could find investors for the mission. The London Olympics made \$4.5bn from broadcasting rights, sponsorships and partnerships. I think we can all agree that if humans go to Mars and we make this a global endeavour where everybody can experience what humans going to Mars experience, it will have a lot more value than one Olympic event. We currently estimate the value of everything we do, from today until the time humans land on Mars, to be in excess of eight Olympic events. \$36bn is the media value of humans going to Mars, according to our calculations with our media partners.

Then there is intellectual property rights. If we are going to build all these systems, we are going to come up with systems that will also have their value on Earth.

For instance, growing food with as little water and energy as possible will also be helpful to a lot of countries. Making lightweight solar panels even lighter will help transport less weight to Mars.

Thirdly, there are donations. Mars One is getting donations from more than 100 countries from all over the world. By the time we set up the first demonstration mission, this is going to contribute significantly to our progress. The most important way to fund our mission is through investments. We had our first round of investments in 2013, and had a very exciting development which we announced three weeks ago. We have made a deal to list Mars One at the Frankfurt stock exchange, such that anyone can buy shares of the mission to Mars. Because we want this to be mankind's mission to Mars, we want people to feel that this is their mission to Mars too.

Selection of the team

Our biggest challenge is finding people that will consider leaving everyone and everything on Earth, and settling on Mars. When we opened the job vacancies for the first settlers on Mars two years ago, we got more than 200,000 initial registrations.

We are looking for a team that can go through all the challenges that will be thrown at them, as nobody is coming to save them. First of all, they need to have a lot of skills to survive all the things that will go wrong on Mars. We need to train them for all the engineering skills, medical skills, dental skills, botanical skills, etc. They should be healthy, they need to be smart in order to learn all these skills, but the most important is the ability to function as a team. We won't be selecting the best individuals to go to Mars, we'll be selecting the best teams.

If one person from a team drops out, the whole team is out, so we are training teams that will stay together until the end of the process. We will train a lot of teams, because we know many will drop out, and we will keep adding additional teams to those in training. We will test them for their ability to stick together as a team under the toughest of conditions. We will train them for ten years and will look at who can deal with all kinds of circumstances. In the end, we will have 10-15 teams and they will be fully qualified. **PRO**



Satellite Schools

For rural areas where connectivity is rare or completely absent, it is crucial that basic education reach the masses. The only route is learning through satellite



Education via satellite is part of numerous public programmes that extend digital teaching materials to schools situated in rural areas where terrestrial infrastructure is lacking. It helps provide equal access to education for all pupils, regardless of access to brick-and-mortar schools.

From a social point of view, new teaching practices based on digitalisation guarantee continuity of education in areas subject to depopulation, and bring obvious benefits in terms of social integration.

Ghassan Murat, Vice President Of Business Development and Strategy at Eutelsat MENA, says: "Several countries have rolled out these types of initiatives. The Mexico Conectado programme is a federal government programme led by the Mexican Ministry of Communication and Transportation that contributes to warrant citizens' constitutional right to internet access. Satellite technology is used to cover 2% of the country's population, namely rural communities in between 500 and 2,500 inhabitants."

"With the support of our partners Elara and Telecom, several Mexican schools are currently leveraging Eutelsat 113 West A and Eutelsat 117 West A's pan-American and regional coverages to bridge the educational digital divide. Another example can be found in Europe. Implemented in 2014 and still active today, the Ecoles Connectées plan in France has connected up to 200 schools so far. It relies on Eutelsat's satellite KA-SAT for the high-speed broadband access provided to schools."

The evolution of education via satellite is closely linked to the diversification of the role of the internet in education. Back in the day, internet usage in classrooms was restricted to web browsing. Today, students make use of thousands of different online education tools and applications, not to mention platforms such as YouTube and streaming websites.

"This educational revolution today reaches areas where broadband connectivity via terrestrial networks is not reliable or not available at all. In these areas, the role of satellite in the education sector becomes increasingly important. In most educational network deployments, Newtec has installed VSAT equipment alongside

"This educational revolution today reaches areas where broadband connectivity via terrestrial networks is not reliable or not available at all. In these areas the role of satellite in the education sector becomes increasingly important"

KOEN WILLEMS, Market Director, Newtec

the Newtec Dialog multiservice platform. Via the Dialog platform, broadband connectivity is delivered to schools in villages, small towns and rural areas, offering new [educational] opportunities to the widest possible audience," says Koen Willems, Market Director for Government and Defense at Newtec.

Even in far-flung areas where it can be difficult to get all students to a central location, e-learning networks for distance learning are set up to provide access to video content, webinars, live streaming and the latest educational packages online. These networks are also used by the schools themselves for administration and internal communication, or to provide teachers with the latest online training and lesson plans, explains Willems.

So how are people getting educated in remote unconnected villages? And what are they being taught?

Murat says each country has its own specificities in terms of education and connectivity needs, depending on how and when its education system was designed



Ghassan Murat, Vice President of Business Development and Strategy at Eutelsat MENA.



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“Another barrier for satellite adoption by schools is poor awareness among schools and local authorities of the benefits that this solution can bring”

GHASSAN MURAT, Vice President,
Eutelsat MENA

and what the country's geography is. One significant challenge shared by remote villages is the need to address multi-level students in one single classroom. Effective solutions can be implemented to overcome the educational limits of multi-classes (also known as multi-age classrooms or composite classes), a situation expected to increase due to the demographic downturn.

“One initiative has been developed in Italy, in the Basilicata region, in the framework of the project ONE CLASS! Open Network for Education carried out by the European Space Agency. Approximately 20 schools in this region have been equipped with satellite reception for video conferencing. The programme allows a student from a multi-class to follow courses of his own level, delivered remotely in a standard class using a 30Mbps connection operated on Eutelsat's KASAT satellite,” explains Murat.

Satellite provides high-speed bi-directional internet connectivity, and in addition TV reception and voice over IP services. Further improvements can be made by creating local electronic libraries that are constantly and regularly updated.

“These could consist of videos, interactive video-based content, e-books, digital textbooks, exercise software, simulation or learning games, interactive maps, software, as well as other educational tools. The system architecture for these local electronic libraries would be based on a broadcast satellite system to distribute the above content using a push approach, combined with a broadband satellite system to ensure the point-to-point interactive connectivity,” explains Willems.

“The multiservice Dialog satellite platform acts as a hub for schools in a designated area and creates a network that brings video, voice and data right into the classroom and the students' homes. The benefits are clear – there is better retention of both educational staff and pupils, higher graduation rates and community-wide support for children's education.”

So what more can be done to further the sector?

Satellite relates to the infrastructure, not the educational content. However, it is important that in broadband plans for schools, the two aspects are duly coordinated. A comprehensive approach including access infrastructure, IT equipment and e-education tools is a key success factor, according to Murat.

“Another barrier for satellite adoption by schools is poor awareness among schools and local authorities of the benefits that this solution can bring, and of possible support and finance sources and capabilities. Raising more awareness and improving communications is a matter of priority to ensure the success of these initiatives and, in turn, to reduce the digital divide among schools.

“In order to address these issues, Eutelsat, jointly with Acreo and Airbus, was awarded by the European Commission, through a competitive call for tender, a study named BROSS (BROAdband connectivity via Satellite for School), which is due to be accomplished by the end of the year.”

Willems believes the development of education through satellite needs continued support from governments and NGOs, as funding will always be an obstacle. However, satellite continues to be a very cost-efficient and effective way of delivering broadband, so the industry needs to do as much as it can to provide value for money to ensure it retains a key role in the future of rural broadband connectivity for both schools and communities. The continued emergence of HTS technology will play an important part, bringing decreased costs and additional opportunities for the market.

Speaking about the work Newtec has done in the field, Willems says Newtec has provided satellite broadband equipment to schools and educational institutions



Brian Jakins, Intelsat's
VP of Sales in Africa.



Koen Willems, Market Director
for Government and Defense at
Newtec.

in a number of underserved areas where terrestrial broadband networks are either impractical or not financially viable.

"In Vanuatu, our Newtec Dialog VSAT platform is being used by satellite operator Kacific to provide an affordable broadband internet connection at speeds of up to 17Mbps to a school in Lambubu. This is delivered via a small VSAT terminal, meaning the benefits of high-speed internet connectivity can also be used by other schools and healthcare facilities in the wider local area.

"The biggest educational deployment, however, for our Newtec Dialog platform, we saw last year in Morocco, where the local service provider Nortis connects 4,000 schools. Nortis, a subsidiary to Quantis, has been awarded this contract by the Morocco Ministry of Education as part of the GENIE project. The service will provide internet access for students, while teachers will be able to benefit from courses through distance learning. The 4,000 schools were installed and connected to the Newtec Dialog platform in a record three-month timeframe," says Willems.

Brian Jakins, Intelsat's VP of Sales in Africa, says: "We have a distant learning

"The widespread success of the VSAT platforms for educational satellite networks such as Newtec Dialog – particularly in rural areas – is reliant on three cornerstones: flexibility, scalability and efficiency"

KOEN WILLEMS, Market Director, Newtec

project with Stellenbosch University, using Intelsat 17. They have about 20 Learning Centres in South Africa and Namibia for their university post-graduate distance learning curriculum. A lecturer in studio goes online and leads correspondence courses for students logging on. Telemedia is supporting them with broadcasting services."

"The university also shares times at the studio with an e-learning programme they developed for schools in remote areas in the Western Cape. They started the schools programmes in 2009 with only 10 schools,

and today they have over 500 schools that tune in weekly for mathematics, science, etc lessons. There are another 191 schools that they are working on connecting, and they are adding a second studio for a second channel, to cater for both the school and university programmes."

With this high uptake of learning via satellite only set to grow, the world tomorrow will be one where not being able to go to school will no longer be an excuse. Satellite operators and educators around the world are keen on bringing schools to the masses that can't afford high tuition fees.

Willems thinks education provides a direct path towards food security and out of poverty. It increases economic development and builds confidence, enabling people to become self-sufficient, fully contributing members of their communities.

"The widespread success of the VSAT platforms for educational satellite networks such as Newtec Dialog – particularly in rural areas – is reliant on three cornerstones: flexibility, scalability and efficiency. This means that the service offered can satisfy the needs of the schools as they change, and do so in a cost-effective manner," concludes Willems. **PRO**



Challenges of **Satellite Interference**

In an exclusive interview with *SatellitePro ME*, Greg Caicedo, Vice President, Network and Data Solutions for Kratos, explains that governments and militaries are beginning to see value in Commercial Partnerships and Managed Services

From misdirected antennas and overlapping HTS spot beams, to a growing cast of actors with malicious designs, the causes of radio frequency interference (RFI) can be numerous and hard to parse and resolve. Whatever the source or intention, degraded satellite operations have a cascading domino effect. While irksome for commercial operators competing to serve customers, those disruptions can be mission-crippling and life-threatening for militaries.

For years, US Defense Department (DoD) leaders have described space as congested, competitive and contested. Recognising the urgency of the matter, it stood up the Air Force Joint Functional Component Command for Space (JFCC Space) in 2006 to protect the space realm, while preventing adversarial use against it. Much has changed over the decade. To be sure, JFCC Space has not stood still. It has stepped up its ability to detect, characterise, and attribute threatening space activities, and counter all manner of benign and intentional RFI activity.

Infact it is doing so with new and stronger ties to the commercial community. It recently awarded a follow-on contract to Kratos that will have the company expand its satellite RF monitoring service to help protect all the commercial Ku-band and C-bandwidth leased by the U.S. combatant commands, as well as helping pinpoint X-band interference in certain locations. As a leading provider of carrier monitoring, interference detection and geolocation solutions, Kratos provides such



services, and more, to a host of commercial and government organisations. In the JFCC example, Kratos utilises a managed services approach, an increasingly important concept in which companies don't sell equipment or software to the military, but instead provide solutions as a service and assume responsibility for operation of key functions, thus enhancing efficiency and flexibility.

The same Kratos' commercial solutions sold to the US government, whether delivered as a service or as products, are available to commercial and other non-US government organisations as well. The fact that the same network and services are leveraged by multiple customer organisations

(both commercial and government) makes the service so cost effective.

The goal of RFI monitoring is to ensure that SATCOM is available to support mission needs, including Intelligence, Surveillance and Reconnaissance (ISR), and communications between commanders and field units. And, that the government can respond accordingly whether someone accidentally interferes or intentionally attempts to jam transmissions. Although the U.S. government has capability in this area, officials found that they needed additional coverage, leading to the agreement.

Currently, Kratos monitors signals, detects, and locates interference for U.S. Central Command and Pacific Command. Under the new contract, it will extend those services to include the U.S. European, Africa, Northern and Southern Commands. The company's ground segment technologies, which also include carrier monitoring, command and Control (C2), and end-to-end service and network management are in use around the globe.

Of course, the threat posed by RFI isn't limited to the US military. Angered by a satellite news network's critical story during the Arab Spring, the Egyptian government jammed satellite transmissions, preventing its citizens from receiving information. When Egyptian officials denied that they were involved, commercial geo-location technology designed to locate interference with satellite communications enabled analysts to show that Egypt was responsible,



and that country quietly dropped its efforts.

The geolocation capability requested by the commercial news organisation was provided by Kratos in the form of a managed SATCOM service. The company's equipment is used by 80% of large satellite operators in 60 countries. It also provides a managed service offering used by organisations to protect their bandwidth. Similarly, the arrangement with JFCC Space shows the growing interest and potential of closer military-industry partnerships in space operations, and how government entities can employ a managed services approach to RFI and other satellite functions.

New Space Models

Commercial-military cooperation has already shown to be successful in commercial launch, with rapid reusable vehicles placing US DoD satellites into orbit, and commercialisation of the US Air Force Wideband Global SATCOM (WGS) system, among other initiatives. The move to commercial RFI services breaks ground, demonstrating the larger strategy outlined in the Space Enterprise Vision (SEV). Under that framework the Air Force Space Command is looking at new ways to restructure space operations, which includes expanded commercial partnerships and transferring missions that don't require a military operator to managed services providers. Entrusting certain functions to commercial partners offers multiple benefits, from technological agility to freeing military personnel to focus on the most vital missions, such as Space Protection and Navigation Warfare. Even so, the SEV makes clear that certain vital functions will always remain directly in military hands.

Kratos is supporting JFCC Space with a global network infrastructure of RF monitoring and interference detection sensors and geolocation systems. The initial configuration of 16 worldwide monitoring sites hosting 40+ antennas with visibility to over 40 satellites and 80 beams will be augmented with seven new monitoring sites that will host more than 60 antennas and provide visibility to over 50 satellites and 100 beams. It is also adding X-band geolocation capability, particularly suited to military requirements, greatly increasing the ability to support geolocation tasking



Greg Caicedo, Vice President, Network and Data Solutions at Kratos.

on commercial and military X-band satellites in key areas of the world.

In addition to expanding geographic coverage and infrastructure, Kratos will provide event and trend analysis of Space Situational Awareness (SSA) information for DoD leased commercial bandwidth.

Taking a page from the playbook of other commercial sectors, the managed services approach to RFI allows the government to more quickly respond to the challenges of new technology, such as those posed by monitoring high-throughput satellites. HTS architectures feature many more numerous and powerful, yet narrow spot beams designed to communicate with small and mobile antennas on the ground.

"As a result, when something is off pointed, or a piece of equipment is broken and putting out a signal at the wrong frequency, the interference challenge is that much greater," says Greg Caicedo, Vice President, Network and Data Solutions at Kratos. Equipment breaks or incorrectly positioned systems can cause operators and/or systems to not be in compliance with regulations. Sometimes broken equipment can put out excessive or misdirected power, creating interference for other users on that transponder.

"All these factors lead to increased likelihood for interference, so understanding the radio frequency environment and managing it becomes essential," he says.

Another problem stems from changes

in the way ground terminals are being installed, with small inexpensive ground antennas often set up around the world by technicians without adequate training, exacerbating the interference problem.

Monitoring as a Service

Where the military or government would typically buy and operate its own RFI equipment, instead they can rely on the commercial partner. In this case, Kratos can more quickly implement new software or features that benefit the customer, installing technology it has developed for the commercial market on its own infrastructure, without the government acquiring and maintaining those systems.

The military also benefits by gaining back manpower that would otherwise need to be dedicated to the task. Uniformed personnel must be trained on RFI systems then typically move on or rotate out after a few years, creating a cycle of talent replacement and training. "In our case, we have Network Operations Center and a dedicated workforce specialised in RF spectrum management without the turnover and repetitive training needs. With the rapid change in the industry, for many commercial and government customers, buying a monitoring and RF management service, instead of standing up their own monitoring operations, is often a more efficient and cost effective option."

To help address the changing RF environment, Kratos is turning to big data and analytics to assess satellite performance and provide enhanced situational awareness of monitored satellites, beams and related collateral signals. "By analysing trends, indications, and warning, we can better predict where you are going to have more problems and when you are not," Caicedo said.

"By using commercial services, the government leverages the infrastructure of commercial enterprises, plus it gains the power of the market to help keep costs down. With the rapid change in the industry, for many commercial and government customers, buying a monitoring and RF management service, instead of standing up their own monitoring operations, is often a more efficient and cost effective option," Caicedo concludes. **PRO**

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Satellite Captures the Wave of Video Growth

Viewers are increasingly demanding to have an unrestricted experience of video services

In the rapidly evolving landscape of video satellites strengthen the distribution ecosystem. Viewers are increasingly demanding to have an unrestricted experience (any place, any time, any device). Enabling such a video service demands a system with holistic capabilities where satellite enabled distribution retains an essential role. Increasing reach, enhancing quality of experience, and delivering unsurpassed economic efficiency are among the key benefits of putting satellite communication at the centre of present and future distribution ecosystems. As the world leading satellite operator SES has the technology, the global footprint, and the full capability based system to deliver an integrated and entirely complementary video experience. SES details this approach herein..

SES: FROM PLAYOUT TO MEDIA PLATFORM CREATION

SES has defined the role of satellite technology in the new video ecosystem by focusing on a set of future oriented technological innovations, built on providing powerful capacity and high quality services. To begin with, SES's ambitious satellite launch plan set out for the future will continue to feed the ever increasing bandwidth requirements of today's video ecosystem.

But well beyond capacity, customers can access a full range of video distribution services within the SES group. From playout services, to media platform creation, the value chain of distributing content has become more and more complex. SES cuts through it all and delivers to exacting standards – for the complete video value chain.

END TO END SERVICE: SPS AND RR MEDIA

Delivering high quality solutions in this complex ecosystem is the focus of SES Platform Services (SPS). This Munich-based

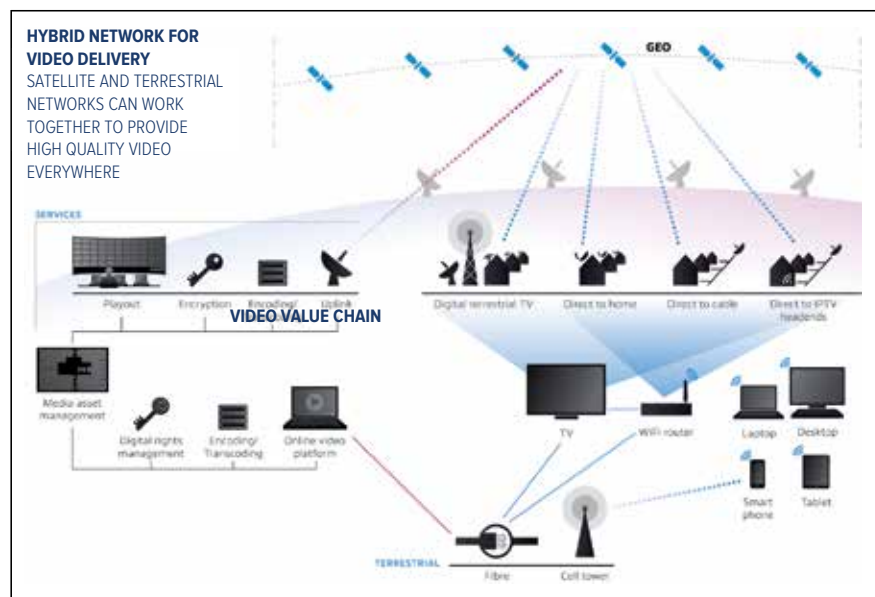
affiliate allows SES to go beyond its role as an infrastructure provider in the form of satellite capacity, and offer tailored distribution solutions for customers across the entire media industry. SPS products streamline the media delivery system for customers, and have a reputation for quality that makes SPS a world leader in video services. Looking to build on this foundation, SES examined ways to scale SPS business even more.

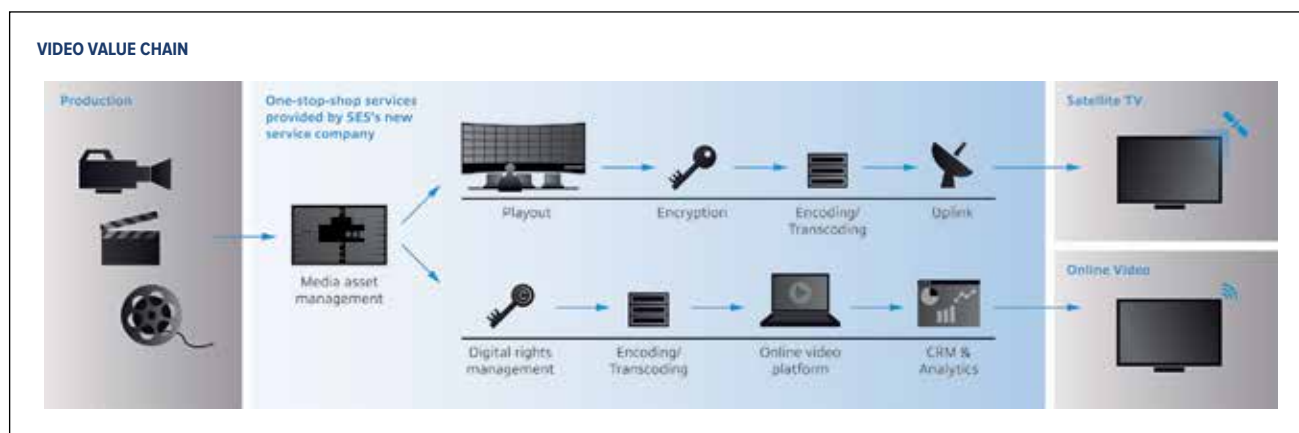
Another company in the digital media services industry, RR Media based in Tel Aviv, is well known for its ability to create value for customers by providing a complete range of digital media services efficiently and cost-effectively. Being deeply complementary with SPS, the two are now set to merge. The new company will create an organisation with a common vision for serving the media industry, and be uniquely positioned at the centre of the international media ecosystem.

The merger will further strengthen SES's capability to go beyond selling satellite capacity and deliver different TV viewing experiences across the world. The new company will develop and deliver solutions along the complete media value chain as an independent media solutions provider, focused on customer needs only.

The new company will support over 900 customers, 440 playout channels, 1,000 TV channels and over 100 VoD platforms including Netflix, Amazon, iTunes, and Hulu. By working with SES's service subsidiary, broadcasters, content owners, distributors, and rights holders will be able to benefit from a one stop shop solution. Technical infrastructure such as data centres, playouts, and teleports will be managed across the globe irrespective of the ownership behind.

The complete range of services the new company has will be delivered in both developed and emerging markets. SPS has





built its success by working with premium brands in the industry to provide unrivalled service that ensures their content is broadcast reliably and in the best quality. Meanwhile RR media has found success by working with both premium and start-up content providers to deliver a service that is responsive and solution oriented. The strengths of the two when merged will create the essential package for content distributors in all markets.

Moving forward the new company will solidify SES's ability to ensure seamless coverage and scalable product designs together with its strategic partners. With the unique SES capabilities in the video market, and the deep operational expertise to match, diverse customers can benefit from simplified work flows for both linear and non-linear content distribution. With SES and the new iteration of SPS customers can simplify their work flows. Instead of customers having to manage each step in the distribution chain themselves, SES will take content straight from production and deliver it directly to screens anywhere, providing a one stop shop service and cutting through the increasing complexity of both today's and tomorrow's video value chain.

HD+ & CO: MANAGED MEDIA PLATFORMS

HD+, founded in 2009, took SES to the next level as a B2C video provider. This media platform provides broadcasters in Germany with a method to deliver their HD content to paying audiences via satellite. HD+ brings the power of satellite into viewer's homes directly with high quality content for the first time, as a managed media

“In West Africa, SES is working with local broadcasters to assist the regional transition from analogue to digital. SES supplies an end-to-end solution to these customers – from capacity in the sky to ground infrastructure, and finally service support”

platform. The quality of the video service is possible because of the ecosystem that was built for this platform, encompassing satellite services, product management, sales and marketing, and customer care.

Customers of HD+ can complement their access to 30 primarily public HD channels with an additional 21 channels from the largest commercial broadcasters in HD quality. This platform currently counts over 1.9 million paying subscribers across Germany and will continue to grow as the demand for HD quality content in this market expands.

SES is now using this expertise as a white label tool box that makes it simple to create media platforms for specific markets across the globe.

While HD+ is a B2C model, SES uses the

white label toolbox to create a unique media platform for its business customers to sell directly to their end customers. This goes beyond pure playout or distribution that customers may already contract through SES. The white label toolbox approach combines all the basic elements of HD+ and SPS solutions together to create an entirely new ecosystem from scratch. As such an ecosystem is built on standard components, it is relatively simple to implement specific ideas from customers and customise the solution accordingly. With this approach SES can include existing features like Sat-IP or develop new features together with customers and technology partners.

The white label toolbox used to implement media platforms can be applied anywhere in the world. As an example, in West Africa SES is working with local broadcasters to assist the regional transition from analogue to digital. SES supplies an end-to-end solution to these customers – from capacity in the sky to ground infrastructure, and finally service support. SES encourages the business of its customers to build up technical reach through installer trainings (known as the 'ELEVATE' program), marketing activities, the measurement of technical reach (Satellite Monitor), and more. Additionally, SES offers an innovative business model to support customer efforts to monetise their content. By combining all these elements SES created a new media platform for West Africa in 2014. This new platform already has an existing technical reach of at least two million in Ghana, and more than two and a half million in the rest of West Africa (primarily Nigeria). This is just the beginning and SES intends to support

digitalisation by starting with the Ghanaian and Nigerian markets and eventually enhancing the television experience for the millions of viewers in all of West Africa.

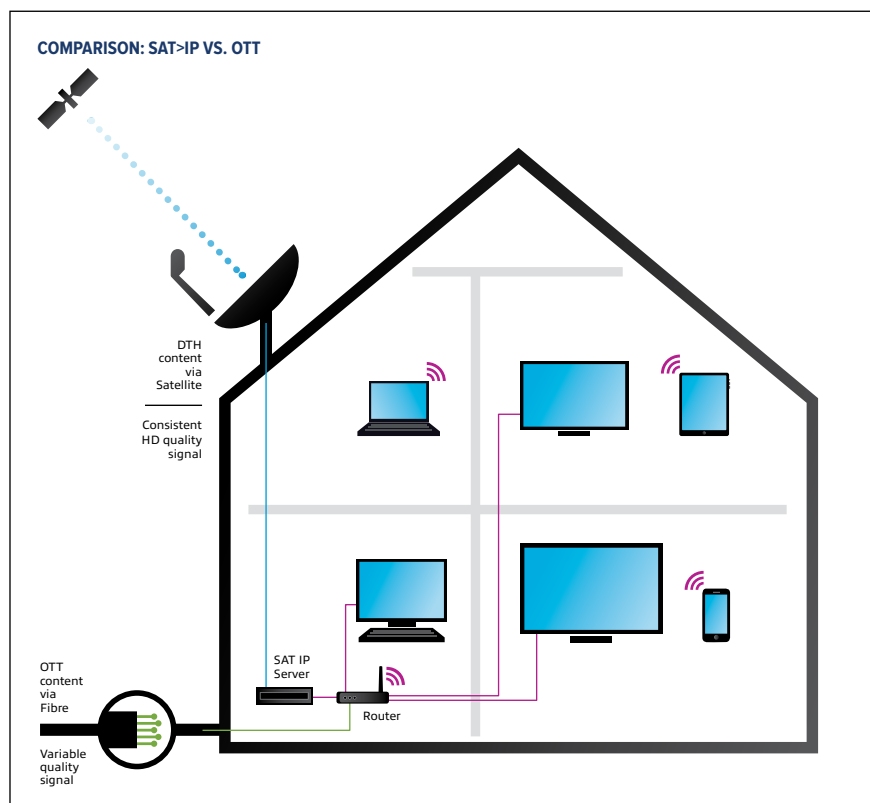
With a white label toolbox ready to build media platforms SES is responding to the changing demands of video markets across the world. Each market has specific needs, and regardless of geography SES is creating customised solutions that are implemented rapidly.

SATELLITE DELIVERS HIGH QUALITY VIDEO

The past twenty years has seen the growth of High Definition (HD) and more recently the dawn of Ultra HD. This high technical quality puts existing video delivery networks under enormous stress that is only increasing. HD took 20 years to get established, and Ultra HD has been adopted at lightening pace in comparison. In 2016, 54 million UHD screens will be sold, up from 31 million in 2015.¹ Additionally, Ultra HD screens are an ideal medium to display High Dynamic Range (HDR), which is a technique that increases the luminosity of video, making it possible to view images that are more realistic. As demand increases infrastructure must rise to the challenge.

SES has been at the forefront of these exciting developments in video, being the first satellite operator to broadcast a commercial UHD channel. Today SES broadcasts 2,352 HD channels and 23 Ultra HD channels. Advances in compression technology are one reason why UHD quality is now possible. The latest compression codec, High Efficiency Video Coding (HEVC), is even more powerful than its predecessor H.264. HEVC reduces bandwidth by half and therefore allows UHD quality, which is four times the size of HD, to be broadcast affordably for customers. In 2016 it is predicted that sales of HEVC set-top boxes will increase to 5 million, further spreading the access to this new and better video experience.

Despite better compression, technologies such as HD and Ultra HD both require increased bandwidth to deliver such high quality to viewers, and in the new video ecosystem this will put increased stress on terrestrial networks. The global average connection speed is 5.6 Mbit/s³ and in the EU only 68% of homes exceed 30 Mbit/s.⁴ In order to deliver a live HD quality broadcast via



“With the surge of connectivity, TV and video are increasingly delivered in Internet Protocol (IP) format, not only in the established Digital Video Broadcasting (DVB) standards”

terrestrial broadband a sustained speed of 10 Mbit/s is required, and therefore higher than the reach and average speed of terrestrial broadband. Additionally, delivering one HD movie via terrestrial broadband to 2,500,000 viewers could cost thousands of euros. This compares to around EUR 10 to deliver one HD movie over satellite to a countless number of viewers, limited only by the boundaries of the satellite footprint. This demand for quality and the delivery methods it requires

is a key factor that makes satellite vital to the success of the future video landscape.

AT HEAD-ENDS AND IN HOMES: SATELLITE CROSSES WITH IP

With the surge of connectivity, TV and video are increasingly delivered in Internet Protocol (IP) format, not only in the established Digital Video Broadcasting (DVB) standards. IP is the technical prerequisite that allows content to be distributed over multiple interfaces, formats and screens.

This is why SES boosts the frequency of crossing satellite with IP systems – at network head-ends as well as in consumers’ homes.

At head-ends, SES plays out its strengths as a primary infrastructure provider, where satellite efficiently feeds into other infrastructure, like cable, and has done so for decades. More recently this has transitioned to digital terrestrial systems where satellite supports the digital switch over and covers remote areas otherwise too costly to be covered by towers and antennas. For IPTV delivery, SES has built itself a similar position. Recent studies have

shown that an overwhelming 91.1% of all IPTV homes in Europe are served indirectly by SES satellites, by delivering content to IPTV and cable head-ends.⁵ This is extremely powerful when it is considered that IPTV subscriptions in Western Europe will climb by nearly 7 million (up by 27%) between 2015 and 2021.⁶ By 2021 IPTV revenues are expected to reach over EUR 10 billion.

The second important hybrid cross is found in the home. SAT>IP, a technology developed through SES leadership, converts satellite signals into IP and broadcasts the converted content wirelessly throughout the home. This allows the entire choice of the satellite offer to be received, in uncompromised quality, on any screen in any room on any device, with several channels transmitting in parallel to multiple devices. Sky Q, developed by the entertainment company Sky, is another example from the industry of a powerful satellite-IP cross breed in the home. Sky Q is a whole package that uses the entire range of Sky technology to create a video ecosystem within the home. It delivers satellite broadcasts in IP to multiple devices in rooms across the home. It acts as a wifi hotspot, allowing viewers to pause content on one device to pick it up on another, and to record content onto their device to watch later. All of the new technology combining satellite with IP reinforces the key role that satellite plays in delivering to video distribution networks, promising a unique range of offers for customers.

CONNECTED BUT NO CORDS TO CUT

The new ecosystem of video OTT is seen as a main disruptor of classical broadcasting. “Cord cutting” – a term alluding to the fact that viewers cut classical TV connections in order to watch video and TV online only – is painted as the way of the future, replacing linear broadcasting entirely.

The reality is more complex – and supports the need for hybrid networks that combine satellite and terrestrial systems for seamless video experiences across the globe.

First OTT, as a main avenue for VOD delivery, does not substitute linear broadcasting, and instead replaces physical video sales and rentals. The UK acts as a good exemplary market for this trend, where consumer spending on physical video

“In the future video landscape the key to success will be to cut through complexity to deliver end to end solutions to all customers within the video value chain”

declined by 14.9% between 2014 and 2015.⁸ Viewers now subscribe to services such as Netflix to watch their favourite movies instead of buying the latest DVD. (Chart 1)

Second, OTT is increasing the total consumption of video as it makes viewing more accessible during the day outside of primetime. According to a global Ericsson study, people now estimate that they watch 6 hours a week of streamed video, a number that has doubled since 2011.⁹ This happens while linear TV viewing continues to dominate in the evening, where in the US TV viewing accounts for at least half of all media use between 6pm and 6am.¹⁰ (Chart 2) **Third**, the complementary effect of OTT and traditional broadcasting is further demonstrated by considering smart phone usage. Viewing is now done in parallel, with 50% of global smartphone users reporting that they watch linear TV while consuming other video on their phones simultaneously. Younger generations across the world, however, clearly go mobile: consumers between 16-34 years watch 53% of all their video on a smartphone, laptop, or tablet.¹²

Fourth, linear TV is retaining 90% of the video revenue globally, with linear DTH Pay TV actually catching up to cable revenues. OTT still lags significantly behind, because the average revenue per user is clearly lower than in a linear pay TV distribution model. Furthermore, revenues cannot be considered without looking at advertising. There is not much data yet on how OTT platforms will monetise their services more fully, but for linear TV advertising is still a main revenue stream. The cost for 30 second slots in Primetime in the US continues to command huge value. This is because linear TV is still able to gather large audiences and therefore

remains an attractive choice for advertisers. Linear TV – especially as the ideal platform for the transmission of large live events – is a main vehicle for advertisers who can rely on high quality distribution, without interruption, to large audiences.

Fifth, focusing in on content, both linear and Over-the-Top distribution have value to add when considering two new factors at play: the expansive choice of content and the amazing rise in technical picture quality. The content selection is getting more diverse because productions continue to rise in quality and cost, while audiences also embrace user generated content. Finding the perfect content in this endless sea is up to data analytics, the main strength of OTT. However, the technical picture quality of video will also continue to be a key success factor. HD is now the de-facto standard in Europe, North America, and Asia and continues to explode across the world, as does Ultra HD and HDR, making the need to satisfy this demand a key concern in the industry, and a challenge for terrestrial networks alone, as explained earlier.^{15,16}

DELIVERING CONTENT BEYOND FRONTIERS

In the future video landscape the key to success will be to cut through complexity to deliver end to end solutions to all customers within the video value chain. To do this cutting edge technology is necessary, and SES is at the forefront of innovation ready to take on new challenges and embrace opportunities. One example of this deep commitment to supporting technical excellence in the video domain is demonstrated by SES Industry Days, a two day conference held annually for the past 9 years. The event gathers experts across subject areas and from around the world for two days to discuss and imagine the future of video.

SES does not discriminate between distribution methods, whether the customer works with IPTV, DTH, or OTT, because it delivers high quality services for the entire video chain. SES does not distinguish between remote and urban areas either, or viewing markets, as satellite reaches everywhere. By using the power of satellite SES is supporting the video landscape and trailblazing the path to the future video ecosystem. **PRO**

Source: SES Whitepaper

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Strength to Strength

Es'hailSat has gone from strength to strength in the three years since its launch. It is now manufacturing its new teleport and will soon launch its second satellite

With the aim to be a truly global satellite operator and service provider, Es'hailSat started operations with Es'hail-1 at 25.5° E in 2013. Es'hail-1 supports broadcasting, telecommunications and critical data services in the region. Having started service on Qatar National Day, 18th December 2013, with Al Jazeera Media Network and BeIN SPORTS, it has gone from strength to strength supporting the Rio Olympics, UEFA Euro 2016, and new niche Arabic channels.

Es'hailSat has had some notable developments and successes in 2016. Es'hail-1 continues to demonstrate the operator's technical capabilities and performance. In addition to providing transmission for established news, sports and entertainment channels, a growing number of new Arabic channels are choosing Es'hailSat to launch in the MENA region. BeIN Sports launched new HD entertainment channels in 2016, seeking to diversify and expand its customer base with movies and entertainment channels. BeIN carried the Rio Olympic games on its sports channels via Es'hail-1 in 4K, which was the first for the region for live sport content on pay TV. Al Jazeera commenced transmission of new bouquet of HD channels on Es'hail-1, and in addition niche channels such as Al Rayyan and Al Araby started transmitting their channels in HD on Es'hail-1, making 25.5°E a hotspot for quality high definition channels.

"I believe there will be a paradigm shift in the saturated broadcast market of MENA, a shift from Free TV to Pay TV model over the next few years, with premium content in HD and 4K driving the change," said Ali Ahmed Al Kuwari, President and CEO, Es'hailSat.

The satellite operator has started construction of its new teleport, at a large facility in the north of Doha, to support satellite Telemetry, Tracking and Commanding (TT&C) facilities, capacity management and a wide range of teleport services such as uplink, downlink, contribution, multiplexing, encoding



"I believe there will be a paradigm shift in the saturated broadcast market of MENA, a shift from Free TV to Pay TV model over the next few years"

ALI KUWARI, President and CEO, Es'hailSat

and payout. The high-tech teleport will provide back-up studios and serve as disaster recovery facility for local and regional broadcasters.

Major development and collaboration agreements with Ooredoo and Qatar Civil Aviation Authority (QCAA) were signed in 2016. Ooredoo's agreement allow both companies to work on a range of new satellite services from Qatar. Demand for VSAT services has risen sharply in recent years, particularly in remote locations such as deserts and offshore. With QCAA, Es'hailSat agreed to cooperate in joint investments in earth observation satellites and dissemination of vital data and information to stakeholders.

Es'hailSat aims to bring a new dimension to Qatar's diversifying economy by building a world-class company and a center of excellence in the region. As well as developing satellite and space systems, the operator is also investing in local infrastructure and talent, ensuring that it nurtures and grow satellite technology for Qatar, a key component to providing a secure and independent communications network to meet the needs of stakeholders. For the commitment to developing core expertise in satellite technology and investing in developing future leaders, Es'hailSat was awarded the Satellite Operator of the Year award at the Global SatShow 2016 held in November 2016 in Istanbul.

Es'hailSat plans to provide additional premium satellite capacity in the MENA region with the expansion of its fleet. The manufacturing of Es'hail-2 is on schedule and is scheduled for launch in 2017. Es'hail-2 will be positioned at the 26°E hotspot with its footprint covering the Middle East and North Africa. It will have Ku-band and Ka-band capabilities to provide TV broadcasting.

Eventually, the operator envisions having a "world-wide footprint" through partnerships with leading regional and international satellite operators around the globe. **PRO**

Extend Your Reach Around The Globe.



Satellite Service Provider of choice
for the Middle East, Asia and Africa.

HorizonSat is recognized as a key provider of satellite communications services in the Middle East, Asia and Africa. Supporting institutional clients in the fields of Telecommunications, Broadband, Corporate Internet and Broadcasting, HorizonSat attributes its success to its dedication in implementing solutions that leverage the latest satellite technologies and support through its 24/7 NOC.

To serve our clients more effectively, we have enhanced our service through our state-of-the-art teleport, Horizon Teleports, strategically located in Munich, Germany covering a look angle from 55 degrees West to 78 degrees East.

Horizon will continue to work closely with its customers, focusing on their objectives and creating solutions that ensure continued success in their mission critical applications.

Es'hailSat سہیل سات

Qatar Satellite Company الشركة القطرية للأقمار الصناعية

Providing high quality broadcast, telecommunication and teleport services

Regional satellite operator based in Doha, Es'hailSat owns and operates satellites to provide television, internet, corporate and government services across the Middle East, North Africa and beyond

Space to deliver your vision

Es'hailSat Key services include:

- TV Broadcasting
- Newsgathering
- Business Communications
- Corporate Networks
- Telecommunications Services
- GSM Backhauling
- IP Trunking Services
- Government Services



Es'hail-2 launching in 2017

Our first satellite, Es'hail-1, was successfully launched in 2013 and our second satellite, Es'hail-2, is expected to be launched in 2017. Both satellites will be co-located at the 25.5°/26° East MENA broadcast hotspot.



www.eshailsat.qa

