ISSUE 47 | JANUARY 2016

SATELLITE PRO MIDDLE EAST

TECHNOLOGY INTELLIGENCE FOR THE SATCOM MARKET

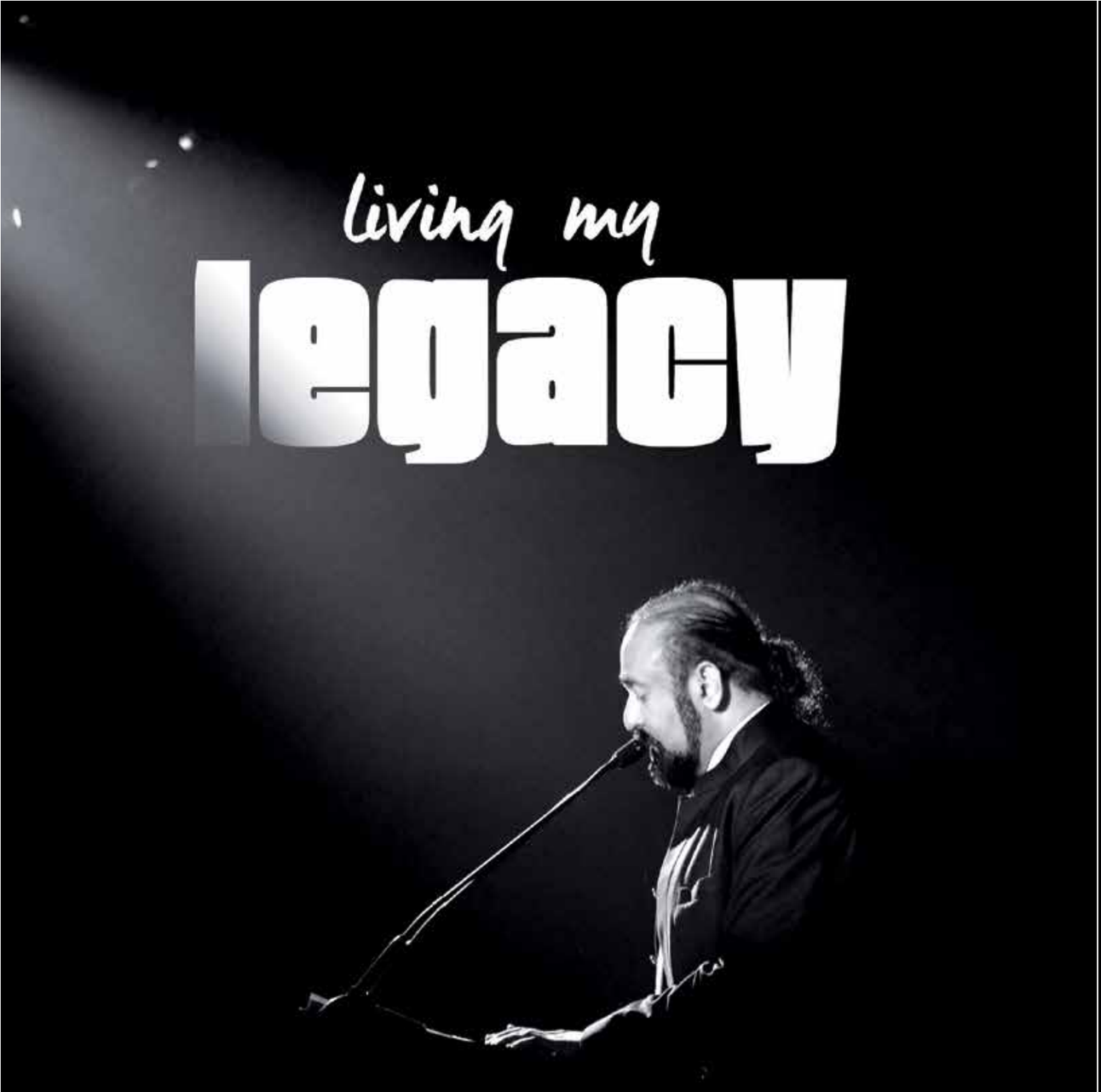
WHAT'S IN STORE
Industry experts speak about their outlook for the year ahead

GETTING A SIGNAL
Improvements in antenna technology are improving efficiency

BRIDGING THE GAP

Satellite broadband is evolving to provide telcos with connectivity to rural areas and regions beyond their reach

living my legacy



Dominic De Sousa
1959-2015

It is never easy to say goodbye to a friend and colleague. When that person is the owner of the company and the driving force behind its growth and success, then the task is almost impossible.

CPI Media Group's founder and publisher, 56-year-old Dominic De Sousa, died doing what he loved best – singing and entertaining people, at the BBC Good Food Middle East Awards on December 16 – which has been postponed until further notice.

His publishing empire with more than 25 magazines, web portals and vertical industry awards, was founded two decades ago.

Born in 1959 in Kenya to Goan parents, he lived what he later recalled as an idyllic childhood, full of sunlight, happy people and nature. A passionate lover of wild animals, it was here that the rebellious and independent streak that made him so successful in business was born.

When he was 11, the family moved to Wimbledon in South London and he encountered two things which he spent the rest of his life fighting: cold, wet weather and racism. The experience of the latter, he later admitted, made him unusually sympathetic as an employer to the problems of his staff, a large number of who have been with CPI for years.

After studying biochemistry at the University of London, De Sousa joined Reed Business Publishing in London as an advertising salesman on Middle East Computing, thus laying the foundations for his future career. He was a sales natural, combining an empathy with his clients with a killer instinct for closing a deal. Soon poached by London-based Alain Charles Publishing, he launched Computer News Middle East, which would form the basis of the CPI empire when he later bought the title and started his own company.

Success followed from a start-up in a small back office. Today, the company ranks as one of the leading B2B players in the region, thanks to his drive, his entrepreneurial spirit and his belief in people.

In sharp contrast to other publishers, De Sousa wanted his staff to succeed, encouraging them to become his business partners rather than employees and the simple CPI start-up is now a web of intertwined companies and relationships that he forged and held together. Never content with the status quo, he would constantly challenge what his staff were doing, encouraging them to seek new opportunities while opening new doors for others.

Although a private man, he seemed happiest when he was on stage performing with a group of musically inclined CPI employees. Early on in his career, he had sung with a semi-professional group and he later reignited that passion by singing at CPI events.

For those of us who remain at CPI, he is – quite simply – irreplaceable. The number of lives he touched across multiple industries in the Middle East and Europe is humbling and we, his colleagues, have been overwhelmed by the messages and memories of those who knew, respected and loved him.

One of a kind to us, he was always, just Dom. He will be missed more than we can express but his legacy lives on in the magazines he helped create and nurture.

CPI MEDIA GROUP
CPIMEDIAGROUP.COM

A New Beginning

It's with a heavy heart that we at CPI Media Group mark the untimely passing of our founder Dominic De Sousa. The world has lost a visionary, friend and true human being. However, the legacy he left behind will be one to cherish for eternity.

With the new year comes the promise of endless possibilities and exciting opportunities. Our vibrant industry has much to celebrate, as this year brings us closer to several HTS satellite launches, resulting in increased capacity and coverage. Several equipment manufacturers are working hard to bring new products on board to take advantage of this technological leap.

We asked industry experts their outlook on the industry, and many are excited about what the future holds. Read more about it on page 26 of the magazine.

In other news, we take a look at how satellite operators help telcos bridge the gap for communications and broadband. Universal Service Obligations require that telcos have to roll out broadband connectivity to any house in the country, even if terrestrial infrastructure is not present. In remote areas, this is very costly, and so telcos join hands with satellite operators to deliver satellite broadband as a complementary service to their own offerings.

Finally, I'd like to take this opportunity to thank everyone in the industry for helping me out and supporting me with the magazine last year. I hope to continue the friendship we share and intend to make many more friends this year. There, that's my resolution for the New Year. Have you made yours?

I wish you a Happy New Year filled will success and prosperity.

Clayton Vallabhan
Editor

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SATELLITEPRO MIDDLE EAST
TECHNOLOGY INTELLIGENCE FOR THE SATCOM MARKET

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Ooredoo and Es'hailSat sign agreement for satcoms

Ooredoo and Es'hailSat have signed a major development and collaboration agreement that will see the two Qatari companies work together on a range of new satellite and world-class communication services for Qatar. Under the terms of the agreement, Es'hailSat will become one of Ooredoo's preferred partners, and will work with Ooredoo to develop a portfolio of VSAT and other satellite services for customers in Qatar.

The two companies will collaborate on designs and specifications for developing world-class VSAT projects for leading enterprises in Qatar. Demand for VSAT services has risen sharply in recent years, particularly from businesses with operations in remote locations such as deserts and coastal areas, and Ooredoo and Es'hailSat believe there is a strong opportunity for Qatar to achieve global leadership in this important area.

Waleed Al-Sayed, CEO, Ooredoo Qatar, said: "Satellite-supported communications are opening new frontiers for businesses in Qatar and across the region. By combining Ooredoo's industry expertise and Es'hailSat's growing fleet of satellites, we can position Qatar as a true leader in this growing field. Ooredoo continues to invest in Qatari-led innovation with our national partners, and we are confident that our work with Es'hailSat will enhance the range of corporate, broadcast and government services available."

eshailsat.qa

L-R: Yousuf Al-Kubaisi, COO, Ooredoo Qatar; Waleed Al-Sayed, CEO, Ooredoo Qatar; Ali Al Kuwari, President and CEO, Es'hailSat; and Saif Al Khaldi, Corporate and Strategy Vice President, Es'hailSat.

AL AHBABI EMPHASISES THE IMPORTANCE OF DATA ANALYSIS

Dr Mohamed Nasser Al Ahbabi, Director General of the UAE Space Agency, underlined the importance of satellite data analysis services related to earth observation, and the need to provide a uniform and systematic approach to monitoring land, sea and air.

This came in a speech delivered by Al Ahbabi at the 5th International Conference on Earth Observation for Global Changes and the 7th International Conference on Geo-information Technologies for Natural Disaster Management organised by United Arab Emirates University (UAEU) in Al Ain, in collaboration with the Waterloo Institute for Disaster Management, held between 8-10 December.

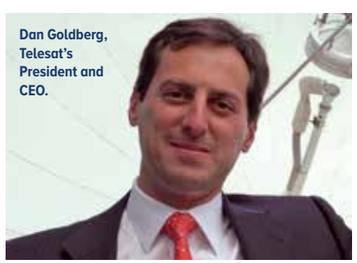
Al Ahbabi said: "Many government and commercial institutions and entities in the state have expressed the need for such services, particularly since they have become a key and indispensable element in geographic information management."

www.space.gov.ae

TELESAT PROCURES TELSTAR 18 VANTAGE FROM SSL; ENTERS INTO AGREEMENT WITH APT SATELLITE COMPANY

Telesat has procured a powerful new spacecraft called Telstar 18 VANTAGE from Space Systems Loral (SSL). The new satellite will operate from 138-degrees East and is expected to be in service in the first half of 2018. Telstar 18 VANTAGE will expand Telesat's coverage of growing satellite service markets in China, Mongolia, Southeast Asia and the Pacific Ocean region.

Telesat has also announced it has entered into an agreement with APT Satellite Company Limited (APSTAR), under which APSTAR will make use of capacity on Telstar 18 VANTAGE to serve its growing base of customers.


Dan Goldberg, Telesat's President and CEO.

Telstar 18 VANTAGE will provide extensive C-band coverage of Asia that reaches from India and Pakistan in the West all the way to Hawaii in the East, enabling direct connectivity from any point in Asia to the Americas.

"Telstar 18 VANTAGE is a high throughput, highly flexible, state-of-the-art satellite that will provide a significant competitive advantage to customers serving the demanding requirements of broadcast, enterprise and government users throughout Asia," said Dan Goldberg, Telesat's President and CEO. "We are pleased to be making this important addition to our global satellite fleet and, moreover, pleased to continue our long and successful relationship with APSTAR, a leading Asian operator with whom we have closely cooperated for over a decade."

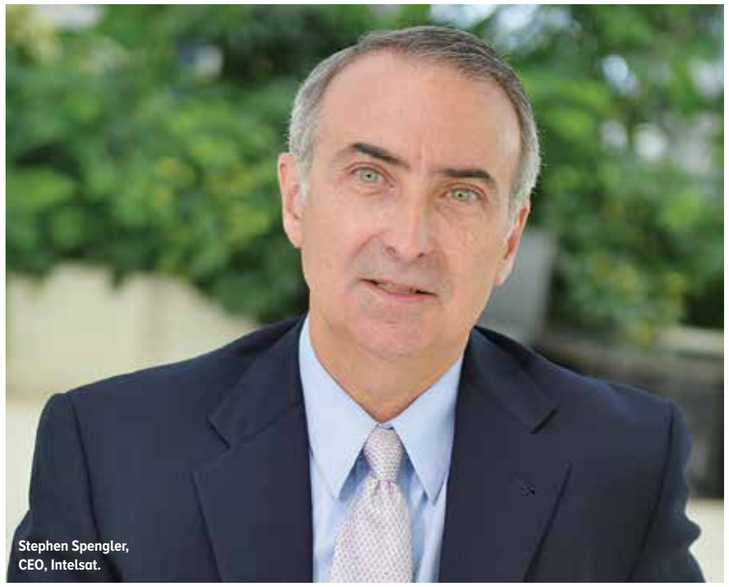
www.telesat.com

Kymeta and Intelsat complete testing of flat-panel antennas

Kymeta Corporation and Intelsat have successfully completed initial testing of the mobility performance of Kymeta's flat-panel antennas on Intelsat's global satellite network for both maritime and automotive applications. Kymeta and Intelsat are the first companies to meet this significant milestone with a flat panel, software-based antenna.

In the automotive portion of the test, the team embedded Kymeta's flat-panel antenna into the roof of an automobile, and over the course of 8,000 miles proved that the company's mTenna technology was able to automatically acquire and track satellite signals while on the move.

The Ku-band antenna was able to both transmit and receive signals with Intelsat satellites. It is designed for Intelsat's current satellites and its next generation high throughput satellites, Intelsat EpicNG, the first of which is expected to launch on January 27, 2016.


Stephen Spengler, CEO, Intelsat.

+ www.intelsat.com

CUBIC CORPORATION TO ACQUIRE GATR TECHNOLOGIES AND TERALOGICS FOR $39 MILLION

Cubic Corporation has announced the acquisition of TeraLogics LLC and the signing of a definitive agreement to acquire GATR Technologies, Inc (GATR). The addition of TeraLogics and GATR will enhance Cubic's stated strategy to expand its defence systems business by investing in a Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) portfolio focused on secure and expeditionary communications and ISR Processing, Exploitation and Dissemination (PED). TeraLogics is a leading provider of real-time full motion video PED for the Department of Defense, the intelligence community and commercial customers based in Ashburn, Virginia. The purchase price is $39 million, including $9 million of contingent consideration, and subject to other customary adjustments per the terms of the stock purchase agreement.


Bradley H. Feldmann, President and CEO, Cubic Corporation.

TeraLogics' ability to develop real-time video analysis and delivery software for full motion video is complementary to Cubic's existing tactical communications portfolio, and establishes

Cubic as a key player in the ISR full motion video market. In addition, TeraLogics' current customer base extends Cubic's customer reach and ability to bid on new contracts and enables access to critical Programs of Record supporting expeditionary warfare. Cubic's established international presence will benefit further from global demand for TeraLogics' products.

+ www.cubic.com

SSL CHOSEN BY NASA TO DEVELOP ON-ORBIT TECHNOLOGY

SSL announced that it has been selected by NASA for a multi-million-dollar contract to develop on-orbit robotic satellite assembly technology. The project is part of NASA's Tipping Point initiative to work with industry to advance the goals for robotic and human exploration of the solar system through the development of critical space technologies. Backed by the robotics expertise and heritage of MDA, SSL will partner with NASA researchers to develop systems that will benefit both government and commercial spacecraft.

"NASA's Tipping Point programme enables SSL to qualify new technologies for the commercial market while at the same time providing advances for future NASA missions," said John Celli, president of SSL. "Satellites assembled on-orbit using our integrated robotics capability will be capable of higher performance than satellites that can be launched. An added benefit will be antennas that can be moved and changed during a satellite's mission life to accommodate changing market requirements."

+ www.sslmda.com

MBRSC's DubaiSat-2 marks second anniversary in space

MBRSC celebrated the second anniversary of the launch of DubaiSat-2, the second Earth observation satellite owned and operated by the Centre.

On this occasion and to mark the anniversary, the satellite took several high-resolution images of Dubai, which were then put together in one high-quality mosaic image. DubaiSat-2 was launched into space from Yasny Launch Base in Russia, using the Russian Dnepr rocket launcher in cooperation with the Russian International Space Company (Kozmotras).

The satellite has been operating accurately and regularly for the second year in a row, capturing pictures of different parts of the world on a daily basis and as per demand. In the course of the last two years, DubaiSat-2 revolved 14 times around Earth, passing over Dubai five times in the process. It also provides satellite imagery to various government agencies and private sector organisations, in addition to non-governmental institutions inside and outside the country.

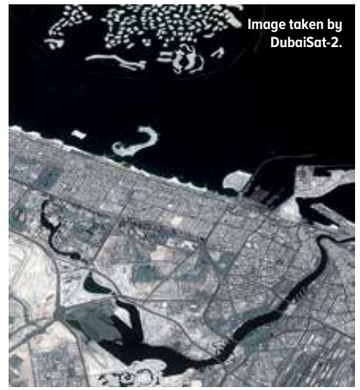


Image taken by DubaiSat-2.

To maximise the use and value of DubaiSat-2's high resolution image output, several satellite applications were created by MBRSC for use in a number of development areas that serve the state and various sectors.

+ www.mbrsc.ae

ARIANESPACE SELECTED TO LAUNCH AZERSPACE-2/INTELSAT 38 TELECOMMUNICATION SATELLITE

Azercosmos and Intelsat have chosen Arianespace to launch the Azerspace-2/ Intelsat 38 telecommunication satellite. The satellite will be launched by an Ariane 5 launch vehicle from the Guiana space centre in Kourou, French Guiana.

"Arianespace is honoured to continue its longstanding partnership with Intelsat and be selected again by Azercosmos for the launch of its second satellite, following the success of Azerspace/Africasat-1A on 7 February, 2013. This contract will give us the opportunity to implement a tailor-made launch solution that complies with both Azercosmos and Intelsat requirements, hence demonstrating our capability to address the needs of both regional and global satellite operators worldwide," said Stephane Israel, Chairman and CEO of Arianespace.

Expected to launch in 2017, Azerspace-2 will expand on the current capacity of Azerspace-1. It will support growing DTH, government and network services in Europe, Central and South Asia, the Middle East and Sub-Saharan Africa.

+ www.arianespace.com

ARQIVA COMMITS TO ADDITIONAL CAPACITY WITH EUTELSAT

Arqiva has announced the signature of a multi-year commitment with Eutelsat Communications for a 15th transponder at the 28° East video neighbourhood to serve the UK DTH (Direct-to-Home) broadcasting market.

This additional transponder underpins Arqiva's strategy to support the significant growth in HD channels operating on the Sky and Freesat platforms in the UK. The combination of Arqiva's teleports and Eutelsat's non-pre-emptible capacity has led to three channels signing up to the new all-HD platform, including Record TV HD and Daystar Television.

David Crawford, Managing Director for Satellite and Media at Arqiva, said: "We listened to our customers who were looking to deliver HD broadcasts to both Sky and Freesat platforms by using the latest technology combined with the highest levels of quality and service. In working with Eutelsat, we will be able to support our customers to help them succeed."

Michel Azibert, Chief Commercial and Development Officer at Eutelsat, added: "As more and more consumers invest in new-generation TV screens, the broadcasting chain must rigorously deliver the improved experience viewers expect. We're proud to be part of Arqiva's commitment."

+ www.eutelsat.com

GATR wins contract for T2C2 terminals

GATR Technologies is known for its round inflatable satellites, which have been in use for a few years now, but a new duo of lightweight, portable satellite terminals, called Transportable Tactical Command Communications (T2C2), will make their way to more soldiers. The lightweight units can be easily packed in a box barely larger than a standard suitcase for quick and easy transportation.

"The ball itself is just the structure we are using. If you look on the inside, the ball itself is a parabolic shaped membrane that is the reflector, and what that does is it just concentrates the energy better coming from a satellite and it allows you to get real high bandwidth signal communications," said Dr Larry Lowe, Vice President of Engineering at GATR, at an AUSA conference in Huntsville.

"Our mission as an Expeditionary Signal Battalion (ESB) in the Pacific is to deploy on short notice anywhere within the course of the Pacific theatre, which is over 50% of the globe," said Lt Colonel Mark Miles, commander of the 307th ESB, via Army press release. "We as an Army fight on the network; every element has a requirement to be a part of the digital effort that enables our military."

+ www.gatr.com

GATR's round inflatable satellites.

AVANTI AND BT SIGN NEW CONTRACT FOR BROADBAND SERVICES

Avanti Communications Group has announced a new contract with BT, to be part of BT's supply of wholesale consumer broadband services which will be sold onwards to consumers in the UK.

Under this plan, directed by Broadband Delivery UK (BDUK), up to 300,000 homes which cannot access greater than 2Mbps from terrestrial networks will be eligible to receive a contribution from government to fund the installation of satellite broadband services, with the consumer then paying monthly service charges.

David Williams, Chief Executive of Avanti, said: "We welcome this significant intervention by government to ensure that the Universal Service Commitment is met and we are pleased to serve the best interests of the UK consumer."

Ed Vaizey MP, Digital Economy Minister, said: "Our rollout of superfast broadband has already reached an additional 3.5 million homes and businesses who would otherwise have missed out. We are making tremendous progress, but it's a massive engineering project and won't happen overnight."

+ www.avantiplc.com

ABS AND BATELCO EXTEND TELEPORT AGREEMENT


Adel Al-Daylami, Chief Global Officer, Batelco.

ABS has extended its agreement for teleport services with Batelco. The agreement, signed in 2011, saw the two companies forming a strong alliance, with ABS gaining a full suite of telecom services provided by Batelco at its teleport.

Batelco's teleport boasts a 30,000sqm operational area with partners gaining access to the telecom's MPLS, SDH national, international networks and internet uplinks. The teleport presents an optimum choice for satellite and VSAT operators around the globe.

The facility also features seamless integration with terrestrial networks and provides full support for satellite and VSAT operators to streamline their operations efficiently. Batelco encourages these operators to diversify their service offerings, as the teleport allows them the ability to offer more services to end-users. Through this, Batelco aims to facilitate the operators' growth.

Batelco Chief Global Officer Adel Al-Daylami said that the extension of the partnership is a testament to the strong relationship between Batelco and ABS: "This is a result of Batelco's reliable connectivity and bespoke solutions that fully support ABS' operations worldwide."

"We are extremely pleased to extend our partnership agreement with Batelco as we continue to build our operations in the Middle East and Africa regions," said ABS CTO, Ken Betaharon.

+ www.absatellite.net

BRIDGING THE GAP

It's well known that terrestrial infrastructure is sometimes impossible to install in rural areas, but that doesn't mean they have to be cut off from civilisation. This feature looks at how the role of satellite broadband is evolving to provide telcos with connectivity to regions beyond their reach

The prohibitive cost of laying fibre and terrestrial infrastructure across vast regions is a major challenge for telcos that provide communication links in specific jurisdictions. Moreover, sometimes the challenges are also geographical, where fibre cannot be laid through mountainous regions and expanses of desert.

Ali Al Kuwari, President and CEO of Es'hailsat, knows this only too well. He explains that telcos not only face challenges in the form of high capital expenditure for laying fibre or setting up terrestrial towers, there are also high costs and risks of operating and maintaining the relay stations and remote sites. More often than not, telcos do not get any return on these high investments.

"With satellites providing instant reach to virtually any part of the country or region with minimal cost compared to terrestrial networks, telcos now rely on satellites to provide rural connectivity. Telcos typically would need a broadband hub and satellite dish for the two-way connectivity. To reduce their costs, telcos now utilise the infrastructure already in place at teleports, such as Es'hailSat's teleport in Doha, to provide broadband services to rural areas," says Al Kuwari.

Geostationary satellite also delivers signals to remote VSATs that the telco operates at the edge of its network. This creates an access point at the edge of the telco network, providing a cost-effective two-way link for low-density regions.

Jean-Philippe Gillet, Vice President, Europe, Middle East and Africa, Intelsat, says that the space segment, consisting of Intelsat's 50 satellites, is integrated with customer site hardware located at the network edge and delivers the connectivity to its customers, who then serve the broadband users. For the use of ground terminals, it was necessary to produce them at a cost that wouldn't be prohibitive to customers. Past usage of VSAT for B2B solutions just could not be employed to the needs of telcos.

Newtec started to develop a consumer broadband via satellite solution back in 2006. It already had vast experience developing VSAT solutions for the B2B market, but in 2006 it developed a consumer solution for SES-Astra, which had to fall within three crucial criteria.

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ALI AL KUWARI, President and CEO of Es'hailsat

Ali Al Kuwari, President and CEO, Es'hailsat.

"We needed to develop a VSAT terminal at a price level that was acceptable for a consumer. Up to that moment, traditional VSAT terminals would be in the range of $2,000-3,000. That was the first challenge, to come up with a more affordable terminal. As a first, Newtec delivered such a terminal below $330.

"The second challenge was that till then, the cost of installation was very high. A VSAT installation was very costly because a VSAT installer had to go on-site, carry on a spectrum analyser in order to align the terminal, and then the NOC had to be called to get the terminal commissioned on the network. Hence it was time-consuming and costly. These installations would easily cost more than $1,000 for a simple installation," says Richard Schaap, Director Sales and Business Development Broadband at Newtec.

Schaap says Newtec was consequently also called upon to develop a tool to enable an end user to install the terminal themselves. Newtec was the first company that developed a device and the associated software, for what is called 'Point&Play', which allowed anyone to do the installation themselves within half an hour. Along with the device, the software also auto-commissioned the terminal with the NOC, so there was no need to call the centre anymore. In the event the consumer didn't want to install the antenna themselves, support could be called upon from a simple handyman or DTH installer.

Ahmed Al Muhaideb, Vice President, Broadcasting and IPTV Services at du.

Jean Philippe Gillet, Vice President, Europe, Middle East and Africa, Intelsat.

"To roll out terrestrial infrastructure in many remote areas is very costly"

RICHARD SCHAAP, Director Sales and Business Development Broadband, Newtec

Thirdly, the cost of monthly recurring satellite based broadband service is mainly based upon the cost of the satellite bandwidth consumed. In order for operators to be able to deliver an acceptable monthly service cost, this new consumer VSAT terminal needed to be far more cost efficient on the bandwidth consumption, hence requiring Newtec to develop more cost effective modulation schemes and specific features which would reduce bandwidth consumption.

Telcos are sitting on quite a well rolled out terrestrial infrastructure, but even in Europe there are millions of houses in rural areas where there is no terrestrial infrastructure. The majority of these incumbent telcos have a Universal Service Obligation.

"This obligation requires the telco to roll out broadband connectivity to any house in the country, even if terrestrial infrastructure is not present. To roll out terrestrial infrastructure in many remote areas is very costly, and so some telcos said that perhaps satellite broadband can be used as a complementary service, which can be added on top of terrestrial infrastructure," adds Schaap.

Hence many telcos went to the satellite operators to present the case for satellite broadband to rural areas that required connectivity. According to Schaap, satellite has always been complementary to terrestrial, especially for broadcasting through DTH, with millions of households watching television through satellite. This is still only 20% of the population.

In terms of infrastructure, the network operator requires a ground station (hub station) and an antenna to uplink to the satellite. There are satellite capacity requirements, as well as a connection to fibre in order to access the internet.

"Other components of a satellite broadband system include a modem which links the user's network with the VSAT and a centralised network operations centre [NOC], such as Es'hailSat's teleport, which controls and monitors the entire network," adds Al Kuwari.

"A broadband gateway is generally configured in a star network topology where all network communications pass through the network's hub processor, which is at the centre of the star. This configuration provides telcos with the opportunity to add a number of remote VSATs at minimal cost."

The big question now is speeds that can be effectively used through satellite broadband. With ever growing data needs, customers seem to constantly ask for more capacity

at lower costs. Can the industry deliver?

Gillet says Intelsat's existing fleet, equipped with a standard 36MHz transponder, can deliver rates of up to 140Mbps to a network operator. With Intelsat EpicNG, more than 600Mbps can be delivered to a network per spot beam. He adds that Intelsat's connectivity is designed to meet a myriad of applications, ranging from enterprise-class speeds for remote offices to direct connections to individual users at home. However, he says the end user experience will be determined by customers and how they operate their network.

Al Kuwari says: "Typically, satellite broadband service providers in a B-to-C environment provide up to 15Mbps on the downlink to the consumer, and 2Mbps on the return path. For corporate and enterprise users, data rates up to 140Mbps on the downlink and 6Mbps on the uplink are possible."

Du has been offering mobile services (2G and 3G) through VSAT connection to the mobile base station in some remote areas. The mobile base station can serve an average radius of 2km for radio coverage to its customers, with a full range of VAS services offered in the other parts of the network. The average speed per user in these areas could reach 0.5Mbps, depending on the number of active users, according to Ahmed Al Muhaideb, Vice President, Broadcasting and IPTV Services at du.

"There are some solutions where the customer can be directly connected through satellites; the speeds that the customer gets with these solutions are typically in the range of 0.512 up to 16Mbps. The requirements are a small reception antenna, usually 2.4m or less, satellite terminal equipment and a modem that connects directly to the customer's equipment. VSAT Network is connected through a satellite hub in Dubai using shared dSCPC and FTDMA architecture for allocating bandwidth based on demand. This solution is valid for enterprise customers who require remote connection for their own connectivity and services, while the same technical solution is usually used for the mobile network connectivity."

Various billing methods can be adopted by the end user. One of the models is a fair user policy model, which provides all users

Satellite broadband is connecting rural populations across the globe.

"The speeds that the customer gets with these solutions are typically in the range of 0.512 up to 16Mbps. The requirements are a small reception antenna, usually 2.4m or less, satellite terminal equipment and a modem"

AHMED AL MUHAIDEB, VP, du

up to the maximum throughput levels in line with the Service Level Agreement offered within the operator's service packages. Achievement of these speeds is subject to the over-booking rules the operator implements as well as to the timely congestion of the network. According to fair user policy, a user should not consume more than the average consumption of the majority of users. If this level is exceeded then the speeds of the consumer are temporarily reduced.

"The second option that some operators use is to provide billing based on data-volume consumption. You pay for only what you use. Some operators would apply such volume accounting, linked to a certain Service Level offering including a data volume package. Once a user reaches their volume allocation, most operators offer the customer to buy additional volume packages," adds Shaap. Prepaid billing options are also used by operators in certain parts of the globe.

Satellite broadband has become a much needed tool and can also be cost-effective, keeping users in even the most remote regions connected. There are also various value added services that allow users in rural regions further control over the functionality we enjoy in connected cities.

Some solutions include email, VPNs and Voice over IP services. The networks deployed for telcos and enterprise are all IP networks, so applications that run on a terrestrial network can be possible over a satellite network. Gillet explains that in South Africa, Vodacom is using a satellite-based network to expand their service region, offering SOHO and SME broadband services in regions where infrastructure is poor.

Al Kuwari adds that with satellite broadband applications including digital media streaming, extranet/intranet/e-commerce, multicasting, video conferencing, distance learning and Wi-Fi hotspots are other value added services.

He also adds that the services provided are supported by a 24/7 network management centre.

Location-based services (LBS) are another value-add proposition. These applications depend on the user's location to provide relevant services, primarily through GPS. Telcos augment the satellite services with small cell transmitters or towers to enhance the quality and precision of the signals and services.

"These services help people with providing information such as locations of hospitals, banks, restaurants, places of interest, shopping outlets, transportation hubs, etc. Other location-based services are also used for mobile and video games, geo-tagging photos applications as well as car pooling and transport services," concludes Al Kuwari. PRO

Getting a Signal

Satellite antennas have evolved to become thinner, more compact and able to handle more satellite bandwidth than ever before. The insatiable demand for communication services will continue to drive improvements in technology

The last decade has seen a transition from bespoke satellite antenna solutions to standardised VSAT antennas harvesting the synergies of mass production. Simultaneously, the adoption of standard internet protocol as standard across satellite antennas means that all normal devices and application can now be applied through ordinary access to the internet while on the move, either in the air, on a vessel or in a vehicle.

"The accessibility to the ordinary internet continuously will drive an increasing demand for communication services, and thus a transition from L-band to Ku- and Ka-band," says Casper Jensen, VP of Business Development at Cobham SATCOM.

The company's SAILOR VSAT antennas are now much easier to install and use, while offering increased reliability and performance of the antennas, according to Jensen. "Furthermore, advanced dynamics enables much more compact SAILOR antennas to be installed on smaller boats with larger on-water movements while still staying within the acceptable 0.2 degrees of deviation towards the satellite 36,000km away. This makes VSAT using standardised antennas far more accessible for a larger segment."

Bart Van Poucke, Product Manager at Newtec, explains that various improvements have been made to traditional VSAT antennas, simplifying the installation process and reducing the risk of interference. This has been driven by applications like broadband access, where due to the number of antennas being installed, the cost of installation needed to be reduced. This, along with more advanced pointing mechanisms, also reduces interference and increases efficiency.

"Newtec has worked closely with manufacturers of antennas on these areas, collaborating closely on antenna design, review and feedback, which has allowed us to influence the specific features of different antennas," says Van Poucke.

The antennas nowadays also offer more advanced pointing mechanisms, like fine-grain pointing, which is a major improvement. The move from single frequency antennas to antennas compatible with Ku-band and Ka-band is also significant, as it means today's terminals running in Ku networks will migrate to tomorrow's Ka HTS networks and the antenna and modem can be reused.

Casper Jensen, VP, Business Development Cobham SATCOM.

Satellite antennas are being used in a lot more applications nowadays. The market caters to everyone that needs to communicate outside the terrestrial network or needs a back-up to an instable terrestrial network.

Jensen says the antennas are used by vehicles or individuals from broadcasters to humanitarian organisations, military, police and firefighters. Furthermore, vessels like container ships and work boats, fishing boats, cruise ships, yachts and oil rigs all avail of satellite antennas for communication and broadband purposes. Finally, both commercial airlines and business aviation are another growing sector with increasing demand for connectivity via satellite antennas.

"Access to the internet supports crew welfare on professional vessels. Likewise, the internet is a must-have for passengers on cruise ships and yacht owners, and their guests/family. Satcom has also become a critical channel for exchange of business relevant and operational data for vessels and vehicles relying on data communication for business optimisation. Examples include media broadcasting stories from war zones, container vessels timing the maturity of fruits for their destinations and airlines optimising fuel and guarding safety on board. The thing that ties all of these and thousands more applications together is reliability and availability of service, and the quality of an antenna has direct impact on this," explains Jensen.

According to Van Poucke, it is important that single antennas be able to support different applications, as the services running on VSAT applications are becoming more diverse. As an industry, manufacturers should be able to offer that as a package through a single antenna.

"This is what Quad iLNB addresses, as it is capable of transmitting and receiving internet data as well as having three independent ports which can be used to receive a DTH reception," says Van Poucke.

Cobham Satcom has a variety of antennas for maritime, says Jensen. They range from the lightweight SAILOR FleetOne, with an antenna diameter of only 28cm used on large yachts in the Mediterranean, to its SeaTel 9711 antenna, weighing around 240kg

"Satcom has also become a critical channel for exchange of business relevant and operational data for vessels and vehicles relying on data communication for business optimisation"

CASPER JENSEN, VP of Business Development, Cobham SATCOM

with a reflector diameter of 2.4m, which is better suited for the extreme communication needs of cruise ships.

"The antennas on land vary from the EXPLORER 510, which is easy to bring along in your hand luggage at 1.4 kg and 20x20cm, to the EXPLORER 8100, which is typically mounted on the top of a car and weighs 63kg with a reflector diameter of 1m. This supports complex live HD video and audio. The aeronautical antennas in the AVIATOR series are omnidirectional and weigh just a few kilogrammes in a 45cm aerodynamic longitudinal shape to reduce drag," continues Jensen.

Newtec's Point&Play technology means installation of the antenna is a fairly simple process, and Van Poucke says developments in the area are continuing to improve the process.

"Traditionally, Point&Play gives an audible sound when in the correct position, but this is still cumbersome to achieve the required accuracy for Ka-band and does not test whether the antenna can withstand wind. So what we are seeing is an evolution towards smartphone-based Point&Play, which can exploit the graphical capabilities of the smartphone to show how the signal goes down and then back up if you move the antenna, similar to the way wind would, for example."

In terms of maintenance, Newtec offers a product which automatically checks if a signal is still being received at the desired level and triggers a call to an engineer to repoint the antenna if it has moved out of position or cross polar interference is moving it out of the acceptable range.

One of the important advantages of standardised antennas is ease of installation and extensive testing and pre-configuration prior to shipment, explains Jensen. This reduces installation time and ensures that antennas are operational when they arrive on-site. Furthermore, he says, all Cobham antennas are built to operate a product lifetime of 10-15 years without planned or annual maintenance. When maintenance is needed, standardisation makes maintenance far easier for technicians, because they know the products and have standardised spare parts at hand for repair.

However, Jensen stresses that although standardisation has done much to help grow satcom at sea and on land, there are still customers with very specific needs who require customised antennas.

"For these customers, we retain a very strong capability to build bespoke solutions that meet the special requirements of their vessels. These solutions are usually based on our state-of-the-art Sea Tel technology platform, which is highly regarded, especially in the cruise and offshore segments," concludes Jensen. PRO

"Traditionally, Point&Play gives an audible sound when in the correct position, but this is still cumbersome to achieve the required accuracy for Ka-band and does not test whether the antenna can withstand wind"

BART VAN POUCKE, Product Manager, Newtec

Bart Van Poucke, Product Manager, Newtec.

Satellite Spectrum for the **Expanding Digital Ecosystem**

In the world of satellite communications, and in the markets of the ever-expanding digital communications solutions ecosystem, new opportunities are evolving at an accelerating rate

It was with the objective of promoting recognition of the centrality and vital importance of the opportunities inherent in having continued access to the advancing technologies and service delivery capabilities of satellite systems that a wide range of international organisations – representing many sectors of human economic and social endeavour – provided their invaluable support as stakeholders in the vital GVF-led campaign, the Satellite Spectrum Initiative (SSI).

The primary task of the SSI was to gather data, present analysis, develop arguments, build stakeholder alliances, and lobby ITU member administration decision-makers for the protection of current satellite service access to spectrum in the C-band frequencies, throughout the period leading up to, and during the almost four weeks duration of, the ITU World Radiocommunications Conference of November 2015 (WRC-15).

At the conclusion of the Conference, the SSI – originally founded in preparation for the World Radiocommunications Conference of 2007, with GVF leading a consortium of other (regional and national) satellite industry associations – was able to announce that WRC-15 had reconfirmed the need to protect critical fixed-satellite service (FSS) services throughout the world in this unique band. (See Figure 1.) Following this governmental re-affirmation of the importance of satellite spectrum, GVF will now continue to coordinate with national administrations and other communications stakeholders to increase global advocacy, continuing to preserve critical spectrum – in all key frequency ranges, such as L, X, Ku, Ka, and V-bands – for use by the satellite communications industry and its end users.

> **"The Maritime industry is currently using approximately 12,000 C-band terminals, providing connectivity for trans-oceanic shipping and cruises"**
>
> MARTIN JARROLD, GVF

It was this defence of C-band for satellite services that lay at the heart of bringing together the wide range of international interests cited above: broadcasters and cable companies; humanitarian and development agencies; the disaster response sector; maritime organisations; the civil aviation industry; the military; banks, stock exchanges and financial services; oil, gas and mining interests; and, consumer groups to oppose a global identification of C-band for International Mobile Telecommunications (IMT). With the support of these sectors for the "No Change" campaign it has now been even-more firmly established and even-more widely recognised that C-band satellite is beyond question a key resource for the world economy – here's a global snapshot:

- Mobile Backhaul for rural networks serving, for example, 2.9 billion people in Africa in Asia, and in Indonesia serving 6-15 million mobile subscribers representing a total market value of up to $558 million, depends upon C-band.
- The Oil and Gas sector relies on C-band, most particularly in high rainfall regions where 6.9 billion barrels per year are extracted, to guarantee reliable connectivity for exploration, extraction, and monitoring operations. Loss of a C-band connection on a single platform for one day can cause financial losses of around $15 million.
- The Maritime industry is currently using approximately 12,000 C-band terminals, providing connectivity for trans-oceanic shipping and cruises, and for 50,000 merchant vessels delivering most of the world's goods. The International Maritime Organisation (IMO) helps to ensure the safety of maritime operations with GMDSS distress communications which relies on C-band for Inmarsat feeder links. The IMO supported the "No Change" position.
- In Aviation networks the very high reliability provided by C-band satellite services is required for the safety of hundreds of millions of airline passengers around the globe. The International Civil Aviation Organisation (ICAO) supported "No Change".
- Broadcasting relies on C-band to distribute programming to terrestrial networks and more than one billion end users, including 372 channels across the African continent. Also in Africa, C-band protects a TV audience of 140 million from service disruption die to rain-fade. The World Broadcasting Unions-International Media Connectivity Group (WBU-IMCG) supported the "No Change" campaign.
- C-band is essential to the Banking and Financial sector industry for connecting branches, ATM networks, and trading platforms. In Asia-Pacific 1.8 billion people are served by 1.1 million satellite-connected ATMs, and in Indonesia alone 75,000 antennas use C-band to dispense $400 million per day.
- Meteorological services depend on C-band for the distribution of operationally and time critical data, particularly in tropical regions where forecast data allows populations to prepare for adverse weather events. The World Meteorological Organisation (WMO), which uses C-band for vital public safety functions and programmes supporting disaster relief, water management, and agricultural development, advocated the "No Change" position.
- Health services and tele-medicine need C-band connectivity for hospitals and medical centres, especially in such geographic contexts as rural Asia where 2.3 billion people have only limited access to healthcare. In India 150,000 people receive treatment each year with the support of C-band.
- Humanitarian agencies need connectivity for field offices, programme deployment, and disaster management in remote and often tropical regions, aiding 70 million people a year. C-band facilitates the delivery of $3.2 billion of humanitarian aid to sub-Saharan Africa. Almost 50 of the world's largest organisations in the sector – members of NetHope, which supported "No

Change" – depend on C-band to support delivery of education, health, and disaster response programmes.
- Government ministries and agencies rely on e-government solutions to facilitate efficient delivery of services to the underserved populations of Africa and Asia. In Nigeria government network projects using C-band are estimated to generate savings of $70 million a year.

In addition to the world's governments having resoundingly affirmed a clear vision for the importance of many vital and irreplaceable services provided over satellite by agreeing to preserve valuable spectrum, they also agreed on a clear framework for future access to satellite spectrum for innovative satellite communications, accomplished by agreeing to create new additional valuable spectrum for fixed and mobile solutions used to support a multitude of video, television and data services, to expand Internet access, and to bridge the 'Digital Divide' for billions of people around the world.

The work of the SSI will continue in the post-WRC-15 period and will feature as one element of the GVF's on-going global initiatives and programmes. SSI activities will comprise part of the Association's work under the heading of Improved Market Access and Regulation through its Regulatory Working Group. The GVF RWG works with governments wherever new reforms are needed to enable a more cost-effective operating environment, and to facilitate expanded market access to affordable satellite-based services.

This area of operations, and several other facets of GVF programmes, will feature as part of the GVF Satellite Hub Summit @ CABSAT 2016. The two-day programme over 9th and 10th March, which will take place within the CABSAT exhibition area, will follow on the widely recognised success of the 2015 Hub Summit, and will include the following themes:
- MENA's Satellite Broadcast and Telecoms: Overview of an Evolving Market Access Environment
- Spectrum and the Future Digital Ecosystem: Satellite after the 2015 ITU World Radiocommunication Conference
- High Throughput Satellites: Leveraging New Technologies for New Services and New Markets
- Constellations for Connectivity: A New Dawn for Low Earth Orbit Solutions?
- Cyber Security: How the Satellite Industry is Addressing the Challenge
- From Niche to Mainstream: New Strategic Markets for VSAT with Communications on the Move
- Ensuring an Interference-Free World of Satellite Services
- Integrating the Digital World: Satellite, Big Data, the Internet of Things and the Cloud
- A New Crisis Connectivity Charter: Satellite and Humanitarian Assistance and Disaster Response

Martin Jarrold, Chief of International Programme Development, GVF.

"Satellite has always worked extremely effectively with other communications technologies, bringing hybrid solutions to best-meet user requirements"

MARTIN JARROLD, GVF

These Hub Summit themes relate to, and inter-relate with, a number of the other ongoing GVF programmes referenced above. These are, in a little more detail:
- Cyber-Security Best Practices: To strengthen defences against growing cyber threats, GVF has been making strides in advancing a 'culture of security', establishing security guidelines for operators and enterprises, and developing processes based on cyber-security best practices for the satellite communications sector.
- Promoting Quality Products: As satellite communications have become increasingly popular, the industry has seen tremendous growth in terminal manufacturing, with a proliferation of product types becoming available. GVF's Quality Products Framework facilitates effective testing and type-approvals processes, while promoting best practices in design and production.
- Disaster Preparedness and Humanitarian Assistance: The satellite sector is systematically part of the first responder team to help support global natural disasters as the industry provides immediate communication links to support the logistics, deployment and coordination of relief efforts. GVF is committed with the United Nations, NGO, and satellite communities to enhance connectivity in emergencies.
- Capacity Building: Improving the skills and knowledge of technicians and operators is a strategic necessity for the industry and its customers. With tremendous gains in the number of earth stations now being installed each month, the need to train and certify technicians is increasing exponentially. GVF's Certification programme has already enrolled more than 11,000 trainees worldwide, and is expanding to provide training for broadcasting, maritime, oil and gas, emergency management, and other user groups.
- Improving Operational Effectiveness: As the satellite industry has grown with unparalleled demand for mobility, high-throughput and other state-of-the-art satellite solutions, GVF has been driving satellite-industry programmes to implement network validation, benchmarking and other interference prevention and mitigation initiatives that are designed to enhance signal quality and operational effectiveness.
- Industry Advocacy and Outreach: From disaster preparedness to community connectivity, and from oil and gas to maritime, mining, military and bridging the 'Digital Divide', the importance of effectively communicating the satellite industry's value and contributions is greater than ever before.

Figure 1: A profile of some of the key decisions made during WRC-15

L-band
WRC-15 avoided identification of the L-band spectrum, which is used by mobile satellite service operators around the world, for IMT. The Conference identified the band 1427-1518 MHz for IMT, requesting the ITU-R to determine the technical measures to ensure compatibility with the mobile-satellite service operations in the adjacent band (1518-1559 MHz).

C-band
The lower 200 MHz of the C-band downlink frequencies (3400-3600 MHz) were identified for IMT in ITU Regions 1 and 2; in Region 3 a handful of countries will sign a footnote allowing potential IMT use of these 200 MHz, while the vast majority of the region will continue satellite use of this band with "No Change". A position of "No Change" was adopted in the band 3600-4200 MHz, and only in Region 2 was a footnote agreed which identified IMT for a few countries in the 3600-3700 MHz band. A "No Change" decision means that administrations have recognised the vital and widespread use of those frequency bands by satellite services. Anywhere that IMT is deployed, it will be subject to adherence to strict protection requirements with neighbouring countries. In addition, the Conference declined to consider a proposal for IMT systems in the C-band uplink frequencies (5925-6425 MHz).

Ku-band
In order to address a spectrum imbalance in Ku-band spectrum, WRC-15 identified additional spectrum for FSS systems between 10-17 GHz. A downlink allocation in the 13.4-13.65 GHz band in Region 1 (EMEA) was approved by the Conference. In addition, an allocation in the 14.5-14.8 GHz was approved in several countries around the world.

Future bands for 5G
The Conference decided that no globally harmonised bands for the fixed satellite service, mobile-satellite service and broadcast-satellite service in C, Ku or Ka band would be included in the scope of a new WRC-19 agenda item, which aims to identify new frequency bands for future IMT/ 5G use. Throughout the deliberations, multiple administrations in every world region expressed strong opposition to studying the Ka band for IMT/5G, again confirming the Conference's confidence in satellite being a key player in the future digital eco-system.

ESIMs
The Conference adopted new regulations to facilitate the operation of "Earth Stations in Motion" (ESIMs) in part of the Ka-band satellite spectrum (19.7-20.2 GHz and 29.5-30 GHz). ESIMs operating in this band provide satellite broadband connectivity to mobile terminals, such as on ships and aircraft. The new regulations adopted by WRC-15 will facilitate the global roaming of such terminals, while protecting other services and applications from interference.

Other
WRC-15 adopted several agenda items for future conferences that will spur growth in the satellite industry. Studies were approved for WRC-19 for additional FSS spectrum in 51.4-52.4 GHz. In addition, the conference adopted a future agenda item for WRC-23 for additional satellite spectrum in the 37.5-39.5 GHz. Also, in a hotly contested debate, the Conference adopted a Resolution which sets the path towards allowing the use of FSS links for Unmanned Aerial Systems (UAS).

I opened this article by observing that the beginning of a new year presents an opportunity to evaluate new opportunities, not only in the satellite communications environment but in the ever-expanding digital communications solutions ecosystem. The agreements reached by national administrations at WRC-15 reflect a comprehensive strategy in which the unique value proposition of satellite-based connectivity is an integral part of a wider portfolio of synergistic technologies across the wireless space. Satellite has always worked extremely effectively with other communications technologies, bringing hybrid solutions to best-meet user requirements, and in the post-WRC-15 world satellite is very firmly positioned to continue to evolve collaborative, synergistic answers to humanity's fixed and mobile communications needs.

For further information about the GVF Satellite Hub Summit @ CABSAT 2016, please contact me at martin.jarrold@gvf.org. For information on any aspect of GVF programmes please contact the members of the GVF Secretariat – David Hartshorn (david.hartshorn@gvf.org), Angie Mar (angie.mar@gvf.org), or myself. PRO

By Martin Jarrold
Chief of International Programme Development, GVF

What to expect in 2016

With the new year rung in, we asked industry experts what they expect in 2016

Tore Morten Olsen,
CEO,
Marlink

"New Ka- and Ku-band HTS services will certainly make it an interesting year. We have integrated these new services into our multi-band network and are ready to deliver as soon as the new services are available. We will continue to choose the best frequency for any particular customer to enable their ICT strategies. We will through active partnerships provide customers better performance in challenging shipping markets, with smart innovations and quality services. So although 2016 will be a year of new satellite services, we will continue our core focus to make our customers more successful."

Eleuterio Fernandes,
Sales Director, Middle East and Africa,
Exterity

"Satellite transmission of 4K content is expected to take off during 2016, driven initially by major sporting events such as the upcoming Olympic Games in Brazil and Euro 2016 in France. The initial integration of 4K content into organisations equipped today for HD video distribution will require extensive use of on-premise transcoding technology. This same technology can be used by organisations to transform and deliver that content to mobile devices to support the trend towards BYOD (bring your own device) in hospitality, healthcare, enterprise and government environments."

Serge van Herck,
CEO,
Newtec

"Looking at the High Throughput Satellite evolution, we see a trend towards multiservice networks across our industry, and the many HTSs on the horizon will bring opportunities for operators and service providers. Although the majority of VSAT terminals are deployed for consumer broadband, much of the revenue comes from high-end applications – mobility, oil & gas, cellular backhaul – so choosing the right ground segment technology is essential in getting the most out of HTS.
"We will see further growth of multiservice, with operators combining many applications on a single platform, maximising economies of scale while diversifying their business."

Riyadh Al Adely,
Managing Director,
SkyStream

"The prosperity of the satellite industry is a reflection of the overall economy of the region. In such region like ours where the majority of the income depends on a single resource which is oil, I would expect the performance of the industry will be heavily impacted by the oil price. Analysts and experts predict that oil price will not recover in the next coming 12 months and I presume the industry in general will slow down in the majority of segments, but Military, Border Control and Security will continue growing. Those verticals will be a game changer in the industry with the new applications and new platforms. L-band and tactical satellites will play a major role in the growth of the industry next year."

Jassem Nasser,
Chief Strategy Officer, MSS,
Thuraya Telecommunications Company

"Looking forward to 2016, we foresee satellite to continue to play a major role, with increased demand for connectivity and communications; however, we should recognise that this spurt in demand depends on the overall dynamics of the global political economy. I don't think we will witness a single major, impactful event next year, however I would not discount the entry of new players in the satellite industry. What is more certain is that we will see the launch of new satellites such as the third addition to the Yahsat fleet in Q4, and most probably announcements on new satellite systems and products with the focus still being high throughout systems, mobility and IOT types of application."

Mather Al Ali,
Regional Sales Director, Middle East,
Newtec

"Broadcasters are faced with increasing pressure on operating margins while also having to retain the high expectations in service availability and reliability. They will need solutions that are flexible and scalable, yet guarantee bandwidth-efficient, OPEX-friendly transmissions, increasing the need to upgrade their infrastructure. These operations need to support very flexible workflows, including multiple video, audio and metadata formats and profiles, as well as both ad-hoc breaking news transmissions and scheduled sports/events exchanges.
"The emergence of single all-IP connectivity for both broadcast and data services can address these complex operations, opening the possibility of using a single multiservice infrastructure for all applications."

Jean Philippe Gillet,
Vice President Europe Middle East Africa Sales,
Intelsat

"In 2016, the satellite sector, and Intelsat especially, has an opportunity to take the sector onto a new trajectory, unlocking new applications and end uses because of higher performance satellites that lower the cost per bit. High-throughput satellites, such as our Intelsat EpicNG platform that will begin operations this year, will deliver a quantum improvement in throughput and better economics. This will be combined with innovative ground technologies to unlock $3 billion in incremental demand for satellite services.

"In MENA, Intelsat will support customers serving the enterprise data, wireless infrastructure, commercial mobility, and government/military sectors, who seek to incorporate HTS solutions into their solutions. This will lead to enable our customers to expand their addressable markets, creating further demand for the next generation of the satellite sector."

Casper Jensen,
VP Business Development,
Cobham Satcom

"Inmarsat Global Xpress will start to make its mark while the current generation of services will continue to grow. Our antenna portfolio covers both wideband and narrowband, so we are well positioned to meet changing needs. Our existing Ku-band VSAT antennas are easily migrated to Ka-band, so users wishing to switch will find it easy. Another interesting area is the potential for M2M growth on land. As M2M becomes more important based on new industrial applications, so will reliability of data transfer. This is why we launched our first pure EXPLORER M2M terminal this year, and will introduce more innovations going forward."

Ahmed Almuhaideb,
Vice President, Broadcasting and IPTV Services,
du

"We are in a prime position to reap the benefits of media growth in the MENA region. Our teleport is the largest in the MENA region and is ranked among the top ten worldwide. The majority of TV channels watched by MENA region households are uplinked through our teleport. We've seen that the industry has been in steady growth in UAE since the year 2001, with the exception of a small and short lasting dip following the 2008 global financial crisis. 2016 will be no exception on the growth story. In fact, the industry may make the highest growth in 2016 compared to previous years. All major broadcasters, e.g. AD Media, DMI, MBC, OSN, BeIn Sports, etc, have launched new TV channels, and more are expected. New partnerships by some of the top TV networks with local talents are launching content tailored for local culture. These growth outlooks are built on robust indicators – the region's high income standards compared to other regions, the state-of-the-art communications technology and high penetration of smartphones. We expect to see large growth in the OTT market during 2016. du has also developed and grown the channel offerings on its own OTT platform duView. On the satellite viewing markets, growth is towards targeted audiences preferences or countries."

Osama Oulabi,
Business Unit Manager ME,
SpeedCast

"SpeedCast has been executing on our global expansion strategy, with five acquisitions so far this year; we've seen growth in 2015 and anticipate further growth in 2016, especially from our Enterprise and Maritime sectors. I anticipate there will be less opportunities in the Energy sector due to the cascading effect of the 50% reduction in the oil price. However, this has created more competition for both price and technology, two areas in which SpeedCast is well positioned to compete, and we have already seen the impact with new business won from companies looking to cut their overall spending on satellite communications."

Satellite **Supply and Demand**

Ever increasing requirements for data and broadcasting capacity are making satellite operators come out with new offerings to satiate this demand and plan for future increases

Speaking last year, Noura al Kaabi, CEO of Abu Dhabi Media Zone, said: "The Middle East and North Africa media industry is undergoing a fascinating transformation. Cultural shifts among the region's young people have spawned a tremendous creative energy, changing the way media is both consumed and created."

This is significant because of the age demographic of the region. According to the CIA World Factbook, the generally accepted authority on demographics, the median age – the centre of the population – is 25 years in Egypt, 28 in Libya, 27 in the Kingdom of Saudi Arabia and 30 in the United Arab Emirates. Compare this with the older populations of the USA (median age 38) and the UK (40).

The younger age spread has a dramatic effect on culture, and this changes the requirements for supporting technology. While there is relatively high television viewing in the region, young people drive new ways to consume media. Television is watched online and on mobiles, and other media like gaming is important.

"Gaming in the region is growing faster than the global average, exceeding even other fast-growing emerging markets like Russia, China and South Korea," said researcher Jayant Bhargava. "Gaming is the fastest growing media segment in the Middle East, expected to nearly triple in size from $1.6 billion in 2014 to $4.4 billion in 2022."

> **"We continue to see rapid increase in customers' demands on telecommunication and broadcasting services across the region, to harness more growth opportunities over the coming years"**
>
> KHALID BALKHEYOUR,
> President and CEO, Arabsat

This growth is coming not from traditional boxed games, but will largely be focused on mobile. According to Bhargava, the size of the gaming market will mirror that of television by the early 2020s.

In turn, this changes the requirements for connectivity, with more emphasis needing to be put on data satellite capacity. Not that broadcast capacity is in any way shrinking, with more channels moving to HD and the first experimental channels announced in Ultra HD, with 4k resolution.

Typical of the changes in satellite provision is the announcement of Jabiru-1 from NewSat, an Australian venture which will provide more than 7.6GHz of new capacity, in the high-powered Ka-band range, boosting data satellite coverage over the MENA region. Jabiru-1 is due for launch in the first half of 2016.

The difference here is that Jabiru is offering raw capacity, not managed services. The open architecture allows customers to have complete control over their own network rather than having to fit their communication requirements into a pre-defined managed service. It means service providers can match their subscribers' expectations more effectively.

The raw data offering is part of a new trend known as high throughput satellites (HTS). As the name suggests, they provide more capacity, typically sold in megahertz not megabits. According to Prashant Butani of Northern Sky Research (NSR), "Here, the more inventory one has available, the better your control on quality of service and user experience.

"The race is to build revenues at a high – or at least healthy – revenue per bit leased. What matters is keeping the revenue per bit leased at a level such that, about halfway into the lifetime of a satellite, an operator has enough cash flow to pay for the next one."

The NSR forecast is that MENA will be the single largest wide-beam Ka-band market in the world, with a gain of close to 80 new transponders between 2012 and 2022. Much of this growth will be around mobile data requirements, both for commercial services and for government and military. While Intesat, YahSat, ArabSat and Eutelsat are supplying current capacity, NSR points to opportunities for new operators, with the first Jabiru likely to be the start of a trend.

Meanwhile, the established operators continue to be highly active, developing new capabilities and services. Nilesat, working with Media Era Technologies (Mera-Tech) as lead integration and technology partner, has announced its next generation satellite platform.

The Nilesat Smart Digital Broadcasting System is designed for the compression, multiplexing and delivery of 360 television and 120 radio services, expandable up to 480 television services over 30 transport streams.

Eutelsat has recently launched a new MENA satellite in the popular 7 -8° West slot also used by Nilesat. The new satellite has 30 Ku-band transponders, giving it capacity for an additional 180 HD channels and providing the capacity for more.

"This satellite accelerates the transition to HD, and will facilitate the rapid deployment of advanced television services such as Ultra HD," said Ali Korur, CEO of Eutelsat Middle East. "High definition is the new normal, and in two years we expect to see the launch of Ultra HD – 4k – television which will take the viewing experience to a new dimension.

"Ultra HD requires much more bandwidth, and so with the launch of Eutelsat 8 West B we are future proofing the broadcast environment. The viewing experience of major sports events, movies and documentary programming will be unlike anything seen previously."

ArabSat also points to strong growth in the future, with continuing plans for expansion. "ArabSat has put in the market a request for proposals for four new satellites at different orbital locations," said Khalid Balkheyour, President and CEO of ArabSat. "Yet we continue to see rapid increase in customers' demands on telecommunication and broadcasting services across the region, to harness more growth opportunities over the coming years."

The first of this new generation is the ABS-3A, with 48 C-band and Ku-band transponders. "ABS-3A is the first time ABS has been able to provide a complete coverage of all of MENA," said Tom Choi, CEO of ABS. "We are proud to announce ArabSat as our strategic partner on this capacity, which will serve the growing needs of their MENA customer base."

While the satellite market is undergoing dramatic changes, the real significance is the continuing growth in demand. That is good for both regional and global players: as Noura al Kaabi said, "The MENA market's evolution is encouraging regional players to revisit their business models and explore investments. With MENA one of the strongest opportunities for media industry growth, these findings should encourage global players to re-evaluate their presence in our region." PRO

Source: CABSAT

Ever Increasing **Demand**

Although we are becoming more accustomed to higher levels of data connectivity, a huge area remains drastically under-connected: the airspace and the oceans. Crisscrossed and cruised by thousands of aircraft and ships every day, these unconnected areas have remained largely uncharted territory for high quality video and data communications until now. It's all about to change. Aeronautical and Maritime connectivity is about to make its quantum leap into the 21st century

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Demand in the skies: Aeronautical

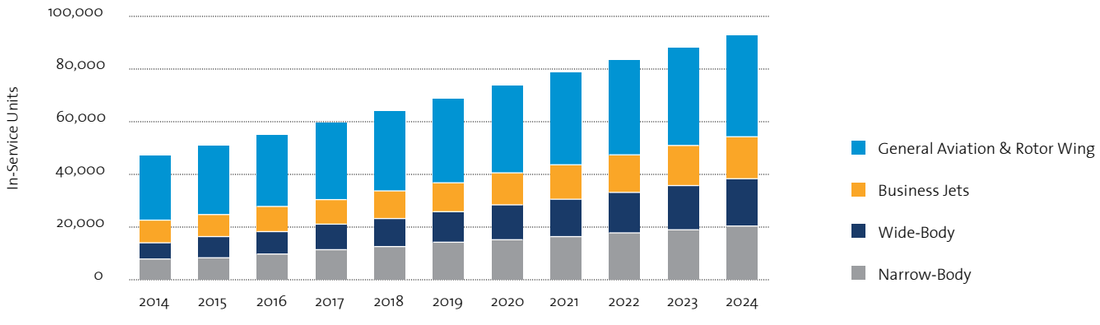
Denser traffic, longer queues and rush hours of people and baggage to board more flights; stacked planes circling above airports already being enlarged and extended, passenger numbers rising substantially every year, massive investments in mega-airports and record orders for new airplanes; a fierce price war and cut-throat competition on services between operators: the air traffic sector is sprouting ever higher and ever faster. Next year, 3.6 billion passengers are expected to fly across countries, continents or oceans. And that number increases every year – by around six percent alone in 2014 and 20151. Boeing and Airbus are both forecasting demand for at least 2,200 new aircraft annually over the next 20 years.

Air travel is now a ubiquitous commodity. To remain competitive, airlines are differentiating themselves through Demand in the skies: Aeronautical price, security or enhanced premium services. One such service feature is becoming pre-eminent: the connected aircraft, enabled for Wireless In-Flight Entertainment (wiFE), an expansion of on-board connectivity that allows audio and video streaming to passengers' handhelds and tablets.

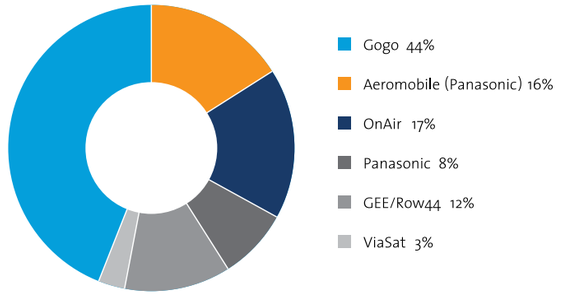
The global aeronautical satellite communications market is forecast to grow from 47,500 units in 2014 to 95,500 in-service units and generate 3.2 billion US dollars in retail revenues by the end of 2024 with North America forecasted to generate most revenue with more than 11,500 units to be added by 20242. The trend in passenger connectivity is pointing to a wider satellite services uptake and more bandwidth to meet pent-up demand.

WORLD AERO ROUTES

AERONAUTICAL SATCOM IN-SERVICE UNITS BY AIRFRAME



GLOBAL COMMERCIAL AIRCRAFT CONNECTIVITY PROVIDERSMARKET SHARE BY REVENUES, 2014



Global beam and market boom

This boom is having unprecedented effects. Satellite operators are putting in place high-performing beams to cover the global flight routes, corridors and geographies. Manufacturers are developing sophisticated yet consumer-friendly on-board technologies and systems. Airlines are configuring their planes for in-flight connectivity and entertainment and equipping even smaller airplanes on regional routes. Rights owners are reviewing their portfolios to exploit profitable new l eisure and entertainment opportunities. Last but not least, aeronautical service providers are competing energetically for market share, with Gogo, Panasonic, OnAir, Global Eagle Entertainment, ViaSat and others jostling for leadership of these exciting new markets.

Personalised entertainment and connectivity choices all depend on the decisions that an airline makes and on the price-value efficiency and customer retention factor that it wants to achieve. The business case concerns the relationship between at least three factors that are all increasing fast: seats, users and bandwidth per user.

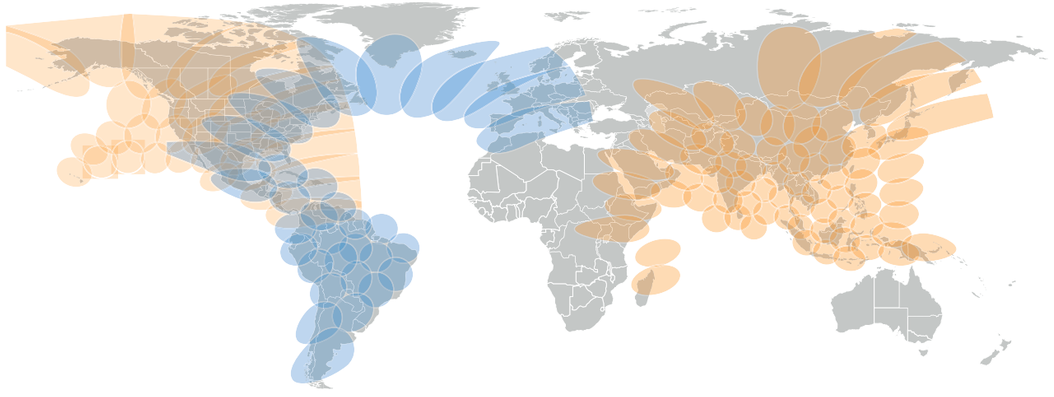
The increasing numbers of passengers will very soon be demanding much more capacity per passenger. They will switch from basic applications such as email and web browsing to more elaborate services such as video streaming, text messaging, voice over IP and even video conferencing. TV-like services and broadcasting could increase this demand still further.

High capacity satellite systems provide the optimally scalable solution for such a wide range of bandwidth-intensive applications anywhere in the world: a combination and concentration of regional and global beams for broadcast/multicast applications serving low-density traffic zones, and narrow spot beams for high-capacity broadband communications serving dense traffic zones.

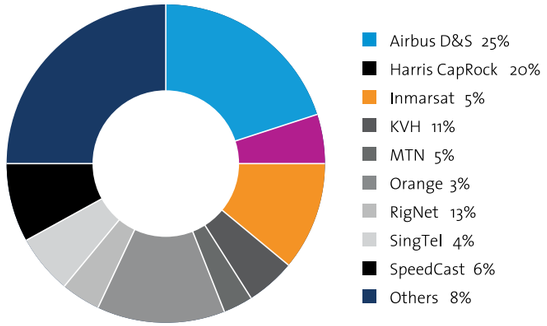
The satellite industry is now investing in high capacity satellite systems that offer the lowest cost per bit, enabling service operators and airlines the leeway to offer customers a broad and attractive range of service packages to fit their different needs, from free and low-price services to more expensive premium packages

SES will be investing some 1 billion Euros in three new Ku-band high throughput satellites in the coming years, and has integrated an airline traffic demand analysis tool into its satellite design software to optimise the satellite configurations and bandwidth allocations specifically for the

AN EXAMPLE OF GLOBAL SATELLITE SPOT BEAM COVERAGE



MAIN MARITIME SERVICE PROVIDERS REVENUES MARKET SHARE, 2014



aeronautical sector. This will generate the best possible performance at the most efficient price according to airline load, passenger consumption behaviour and flight path. The overall aim is a globally consistent service with unbeatable efficiency.

Enhancing the maritime travel experience

The fact that access to high-performance connectivity for high-flying objects is now available on moving sites other than land is one of the most significant elements in the quickly emerging satellite mobility communication market. The quantum leap for airborne craft can also be witnessed in new and better options for maritime connectivity.

The number of maritime vessels in service grew by almost 25 per cent between 2012 and 2013 and revenues increased by more than 15 per cent. Surpassing a rate of increase of 20,000 vessels is seen as a tipping point for the industry and the new target is now an increase to around 50,000 vessels over the next few years4.

Bandwidth demand also continues to rise. This is particularly evident in the high end segments including rigs, cruise lines, ferries, mega yachts and OSVs (Off Shore Vessels). Operators of large vessels, cargos, cruise ships and super yachts are increasingly demanding high-powered and individualised connectivity solutions.

The key sectors within this market are merchant maritime, cruise ships, fishing and offshore platforms. The market is b uoyant, with Airbus D&S, Harris CapRock, KVH, Inmarsat and others competing strongly for market share.

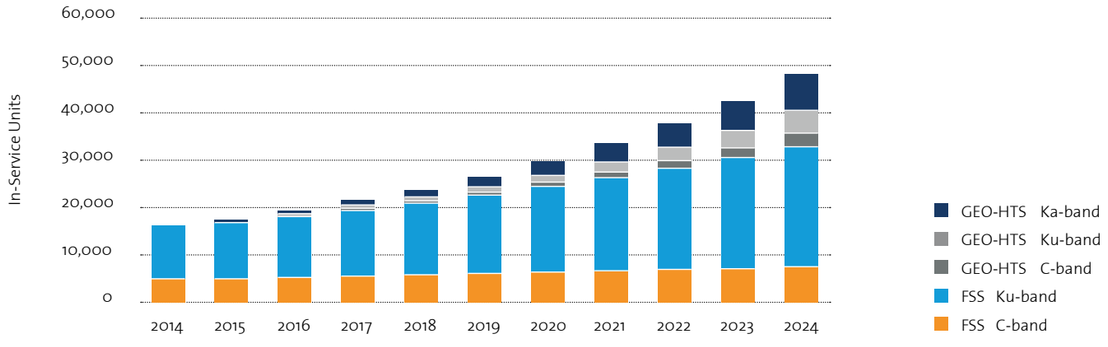
The enabler of this growth is the satellite. The global maritime broadband satellite communication market is expected to reach 50,000 units in service – with almost half of them in merchant shipping – and to generate 2.8 billion US dollars of revenue at the retail level globally by 2024, making it one of the fastest-growing segments of the global satellite services industry.

The most spectacular example of this market growth can be found in the satellite operator O3b's breakthrough beamed coverage that exclusively follows the Royal Caribbean's newest, biggest, and most aptly named cruise ship "Quantum of the Seas", with a tonnage of nearly 170,000 GT, a length of 350m, 18 decks, and a maximum passenger occupancy of nearly 5,000. The Quantum of the Seas, the first of the Royal Caribbean's Quantum class of ships, also represents a quantum leap in mobile communications.

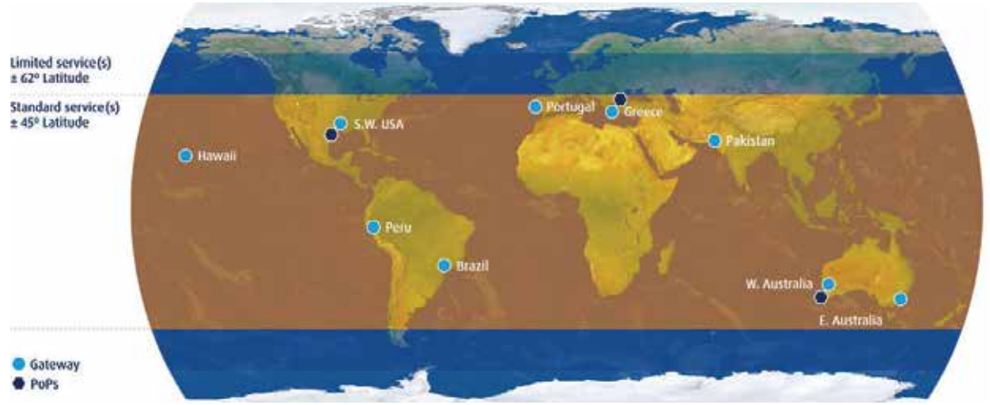
SES is not only investing in its geostationary (GEO) fleet, but also in Medium Earth Orbit (MEO) spacecraft, through its stake in the O3b venture, operating a dozen satellites at a distance of 8000 kilometres from the Earth. This allows low-latency, fibre-like connectivity with steerable beams which can follow a moving site such as a ship.

Billed as the world's first smart ship, Quantum of the Seas offers high performance broadband delivered over O3b and more bandwidth than all other cruise ships in the world combined. Such high-speed connectivity will give passengers as rich an experience as in their own home. The connectivity is possible through O3b providing one gigabit per second (1 Gbps) of low latency capacity via a satellite beam that is constantly tracking the ship. The end result is a completely new, ubiquitously connected travel experience.

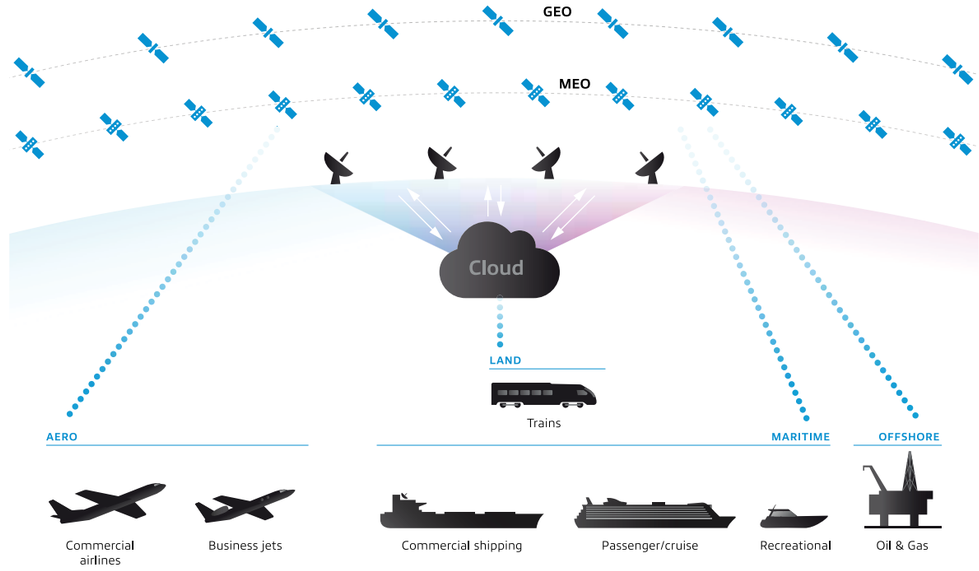
GLOBAL MARITIME IN-SERVICE UNITS FSS & HTS



COVERAGE MAP OF O3B NETWORKS



SES'S UNIQUE GEO-MEO OFFERING



Conclusion

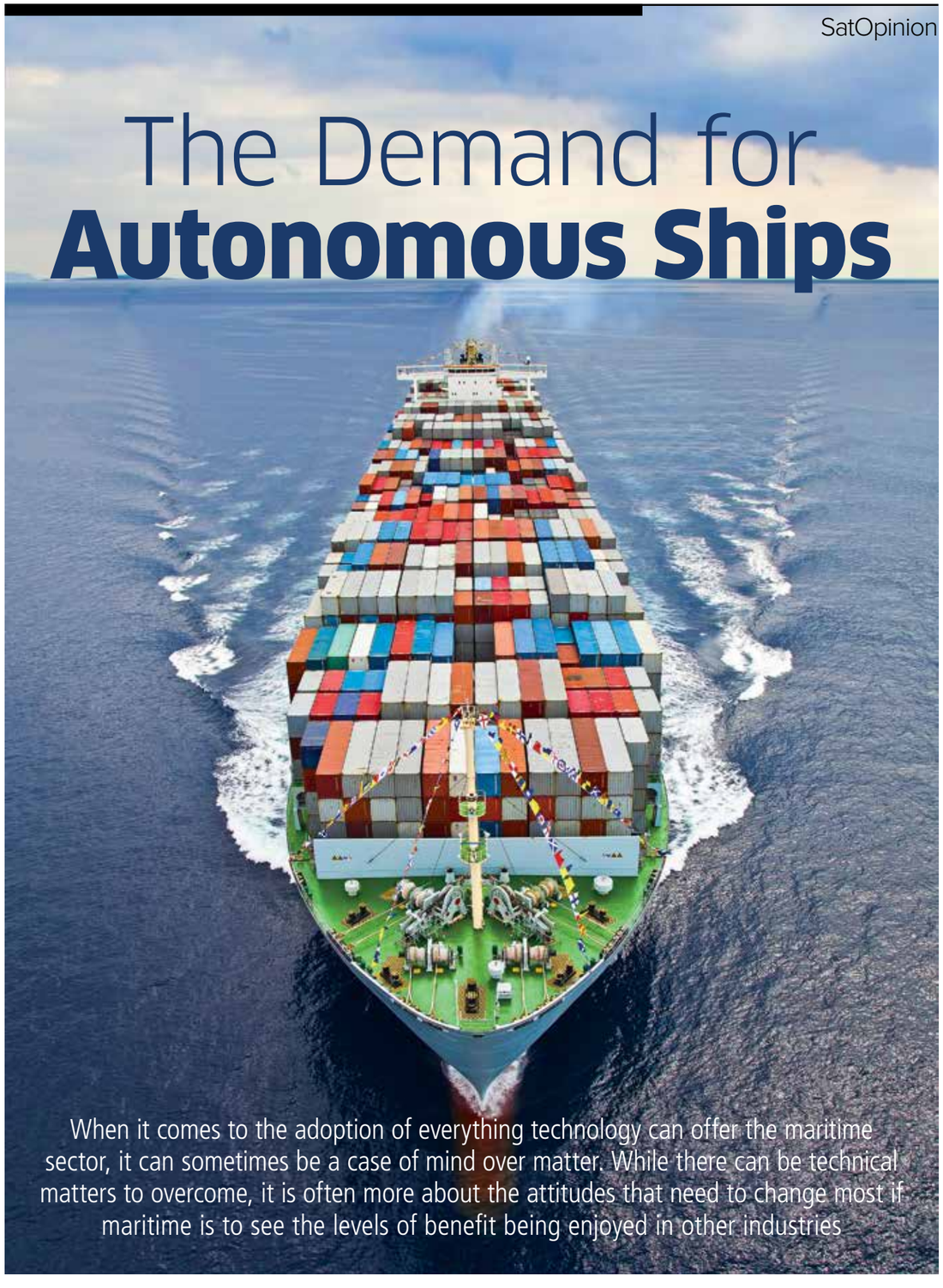
Everyone wants more, better, cheaper data, and everyone wants to be connected always, not just on land in the home and office but when we travel on land or in flight or on the sea.

The global market for data mobility and flexibility is like a flywheel, accelerated by exceptional demand for maritime and aeronautical connectivity. Airplanes and ships need more and better satellite communications for voice, data and broadband services. Meeting the demand from markets – aeronautical and maritime – is vital.

The unique approach of SES is to combine GEO and MEO capacity, to deliver comprehensive mobile coverage for lower cost per bit, massive throughput and low latency fibre-like services to meet all the varying demands for the data requirements of the next generation, including the "open access" model, allowing customers to bring their own device and choose their own connectivity model. In this way the satellite industry is responding to the challenge to use insight, creativity and imagination to ensure that these demands can be met competitively, creatively and effectively. PRO

The Big Beam Boom, SES Whitepaper

The Demand for **Autonomous Ships**



When it comes to the adoption of everything technology can offer the maritime sector, it can sometimes be a case of mind over matter. While there can be technical matters to overcome, it is often more about the attitudes that need to change most if maritime is to see the levels of benefit being enjoyed in other industries

Shipping has already been disrupted by shifts in trade patterns as well as the impact of the financial crisis, and it will continue to be affected both by internal and external forces in the future.

One such force - and it is a force for good - is communications technology, a major contributor in the battle towards crew efficiency, improved safety standards and a secure working environment.

Maritime crews rely on communications tools every day, and for a sector that is the life and soul of the global economy - 90% of all goods are transported by sea – it is imperative that investment in this area is cost effective. Costs can be reduced significantly if thinking is changed, with real alternatives available for those willing to invest in technology.

The maritime sector is worth US$350-400 billion and it boasts more than one million employees. That includes people working at sea, shipyard and dock workers, and equipment manufacturers. Initially, one might expect this sector to be among the first to adopt such ground-breaking technology like autonomous ships.

Yet, the majority of trials and tests related to unmanned vehicles are on drones and driverless cars, while progress with autonomous ships is comparatively slow. Automated systems and interaction with onboard sensors, GPS and satellite communication equipment are already available but why is the industry taking so long to buy into this concept of autonomous ships?

Keith Murray, Product Manager, Maritime, Thuraya Telecommunications

"Automated systems and interaction with onboard sensors, GPS and satellite communication equipment are already available but why is the industry taking so long to buy into this concept of autonomous ships?"

KEITH MURRAY, Product Manager, Maritime, Thuraya Telecommunications

Unmanned Airborne Vehicles (UAVs) operate in a 3D environment in which strict regulations must be observed and weather conditions need to be taken into account. Similarly, driverless cars operate in an environment dominated by humans going about their daily lives. Ships, however, operate in a predominantly 2D environment that is sparsely populated in comparison and could benefit the most from this unmanned concept. However, investments and advancements in technology for maritime appear way down the list of priorities for shipping companies.

Military drones are currently the most developed of the unmanned technological vehicles to date. These are ideal for tackling monotonous, dangerous tasks such as reconnaissance or lethal missions where very little additional frontline support is given. This raises the question of why the transition to using autonomous ships isn't moving full steam ahead when maritime crews also face both monotonous and dangerous tasks.

It is important to consider the positive social impact that autonomous ships could have on countries like the Philippines, a huge provider of crews to the shipping industry. Maritime crew often spend months at sea and can be away from their families for long periods of time. The impact of work-related stress – monotonous routines, harsh and hazardous working environments, a negligible social life, can take its toll on even the most experienced of crew members resulting in both physical and psychological issues.

Unmanned vehicles not only affect those out at sea but also those who supply services and equipment to support them. There is a cause and a reaction to shipping. We know that the more containers that fit on a ship, for example, the cheaper it is to move them, which helps increase efficiency, creates a faster turnaround time and potentially saves the port, the shipping company as well as local manufacturers, money.

Unmanned ships have to be monitored and they need to communicate with a central hub via satellite.

Unmanned ships have to be monitored and need to communicate with a central hub via satellite. This calls into question the various frequencies and bandwidths being used by satellite operators and how this has a knock-on effect on autonomous ships.

Medium frequencies such as C-band provide higher bandwidths (speeds) and are reasonably resilient to rainfall and atmospheric conditions. There are limited new spectrums available to satisfy this type of infrastructure, however, and the potential of interference from other systems such as radars.

Higher frequencies are affected by rainfall either on the ship side or at the satellite ground station. However, the advantage of a higher frequency band is that it allows faster rates to transmit and receive data.

However, frequency bands such as L-band, used by Thuraya, have the advantage of a robust link that can bypass adverse weather. L-band provides lower data rates compared to K-band but offers a more cost-effective solution for asset tracking and fleet management.

Concerns surrounding the implementation of autopilots, anti-collision radars, built-in test and monitoring systems, as well as navigation, could be overcome if these factors are integrated into a reliable and coherent system that allows individual sub-systems to work together with limited human intervention.

Ship owners and managers would also be able to save space and weight by eliminating equipment required to support personnel. This could lead to the reallocation and increase of cargo, driving higher revenues.

Internal and external security threats are also a top line concern. Such threats include the pilfering of cargo and the sale of it on the black market as well the threat of piracy in high risk areas such as the Horn of Africa, Somalia and in the South China Sea. In most cases such threats can be reduced by vessel tracking and video feeds via satellite, transmitted back to HQ. Such tracking and video feeds also provide evidence for prosecution cases and insurance claims. At the most basic level, these vessel tracking and video feeds can act as effective deterrents.

Fortunately, major incidents such as the terrorist attack against the Achille Lauro cruise ship in 1985 are few and far between, but the notion of terrorist organisations seizing financial assets and growing stronger roots in the piracy trade remains a real threat. Crews being kidnapped and used as human shields, or ransomed along with the cargo, could become a thing of the past if autonomous ships become part of our lives.

The shipping industry needs to take a more radical mindset to grasp the benefits of technology opportunities such as autonomous ships. Traditionally, the maritime sector is very conservative when adopting new technology and while 'tried and tested' methods serve as a valuable indicator, what the industry ultimately needs is a fundamental change in how ships are operated.

As with Google cars, Uber, Spotify, and Facebook - today's shipping industry needs to look at the latest technological advancements in communication and navigation - and what they have to offer. Inevitably, this will be driven by economics and it is important to get the economics right. Those that do this will reap the true cost benefits available by investing into this game-changing technology. PRO

By Keith Murray, Product Manager, Maritime, Thuraya Telecommunications

Superfast **Broadband**

With Adaptive Coding Modulation, a better quality of service can be delivered, leading to the development of superfast satellite broadband

With HTS satellites becoming available to us, we can now have complete Adaptive Coding Modulation (ACM). This can help us to improve the quality of service offered. I've been part of the design of spacecraft networks and satellite networks since 1986, and part of the planning community of Intelsat, on behalf of the UK.In that debate, we looked at what's needed with C-band, and the expansion into Ku-band. This was rejected at first because it was too noisy. There were certain areas of the world where Intelsat said they could not use Ku-band, because they needed a certain amount of uplink power control

The situation now is that Ku-band is a global entity. You have Sky TV and MTV using Ku-band, because people realised, and technology agreed, that it was viable. There were parameters within which Ku-band could work.

Now we see Ka-band, which is even higher up the noise flow, and the same debate applies. It is more noisy than we're used to, so we need to think how to make it more usable. This is where ACM comes in. With adaptive modulation and coding, we can make the quality of service to a standard, as long as the area being serviced is the same.

We've taken on a deal with SES and Newtec and are the first company to be given the Newtec 3100 modem for enterprise service. It has been previously deployed to NGOs doing aid work in the field, and has proven to be a valuable tool for them. That was a testing ground, and now we are looking to roll these out to the public because it can offer a superfast service. Fast broadband is up to 24Mbps. The 3100 modem from Newtec offers up to 45Mbps.

We also provide services to ships. The ship will essentially use a roaming oceanic satellite server, where the footprints of the satellites are mapped into the server, and then the strength of signal is assessed. If the strength of the signal falls below a certain level, a transition is made to a second satellite.

"With adaptive modulation and coding, we can make the quality of service to a standard, as long as the area being serviced is the same"

ROGER BODDY, CEO, Global Teleports

This can be done on ships with dual antennas, where the strongest signal from either antenna is used, but if it's being done from a single antenna, then it has to physically point to the satellite, and this is controlled to be seamless. If this is being done with cruise vessels, they have two antennas, so there can always be a seamless switch.

We have also developed a solution when dealing with fleets of vessels. We determine the number of vessels within a cluster.

This can be in one ocean region, or multiple clusters within that region. This is what helps us determine the price of the service.

Customers don't have to pay a different price if they move to another region. This, then, is a global solution at a fixed price. We have now been given proposals to deliver this solution for six fleets of vessels, and this is growing to become a major part of our business.

Roger Boddy is the CEO of Global Teleports. Founded in 1998, Global Teleports owns the site licenses with OFCOM, the lease on their HQ and an IP centric global infrastructure for hub operation in three countries to enable direct access to satellites over the Indian, Pacific and Atlantic Oceans.

It has set up wholesale agreements with SES Astra / Americom / New Skies/ Sirius, Intelsat, Eutelsat, and RRsat and co-operation agreements with sister teleport operators to offer a resilient service. The company has formed strategic alliances with strong partners with whom they can develop their services into new areas. PRO

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