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SATELLITE PRO

TECHNOLOGY INTELLIGE MARKET

MIDDLE EAST

READY TO BEAM

Hellas Sat preps new satellite for commercial operations

SATELLITEPRO MIDDLE EAST

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WELCOME

Now that we have polluted our waters, fogged up the atmosphere and made a wasteland of the earth, our eyes have turned heavenward and we have started creating space debris before even a thousand men have set foot there.

But this time, we are given to understand that there is greater accountability, with the International Telecommunications Union (ITU) and several bodies ensuring that satellite operators comply with regulations that ensure their satellites are decommissioned successfully without leaving debris behind.

Some of this was discussed in detail last month at the Satellite show in Washington, DC, which I had the opportunity to attend for the first time.

The ITU guidelines are applicable during launch, at the operational phase of a satellite, and when it is decommissioned. Typically, companies will have to demonstrate that their satellites are stable during their operational tenure and have enough fuel to burn up in space along with the materials used to build the satellite components.

The ITU also determines the frequencies and orbits an operator can potentially use, how many satellites they can place in their allocated orbit, and so on. There are also bodies like the FCC that have guidelines of their own, to ensure for example that no satellite hits the International Space Station (ISS).

Of course, this is not new information but with so many regulatory bodies in place, one would assume that all is well in space – but there are so many unanswered questions. Will non-compliance lead to consequences? Is that limited to satellite companies, or also to governments that do not comply?

Space debris is an ongoing discussion, and I'm sure it will be tackled further at CommunicAsia this month, along with the many benefits of space. We are heading to Singapore for the show. See you there.

VIJAYA CHERIAN
Editor
SatellitePro ME

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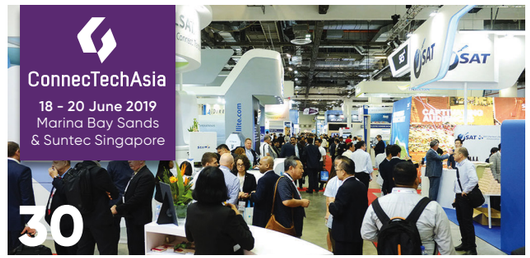


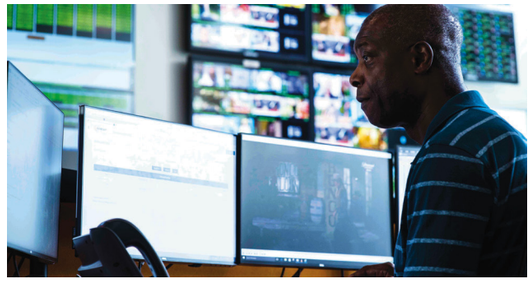
Arabsat & Globecast tie to air Canal Algérie in Africa

BROADCAST

Arabsat has announced that Canal Algérie will now be available on Arabsat-5C, the Arabic satellite platform for DTH services over Africa. Globecast will provide the technical broadcast solutions required to deliver Canal Algérie across Africa.

Arabsat-5C at 20° East is equipped with a C-band beam which covers 100% of African satellite TV households and depends on the minimum required dish size to receive its channels.

Canal Algérie is an Algerian French-language public television channel. This new broadcast is part of the commercial contract between Télédiffusion d'Algérie, the Algerian public TV and radio broadcasting operator, and Globecast.



Khalid Balkheyour, Arabsat President & CEO, said: "The launch of Canal Algérie on Arabsat-5C comes as part of our core mission to connect Arabic societies across the world; we provide African, Arab and Islamic communities with the largest possible choice of free-to-air TV channels in Africa. Broadcasting Canal Algérie via Arabsat-5C highlights the continued successful Arabsat and Globecast partnership."

Turkish Aerospace and INVAP announce JV

NEW LAUNCH

Turkish Aerospace Industries Inc and INVAP have partnered to establish a joint venture company, GSATCOM Space Technologies, which has initiated its first programme to develop, manufacture and market small geostationary telecommunication satellites.

The new satellite family will offer a range of telecommunication solutions, implemented on a full electric platform in the small-size GEO satellite concept. The shaped beams and onboard digital processing capabilities will enable the GSATCOM satellite family to provide fixed satellite services (FSS) or adaptive HTS services with an affordable operational budget.

Commenting on the joint venture, Vicente Campenni, PhD INVAP CEO, said: "We are very proud to establish this strategic partnership with Turkish Aerospace. Together we expect to accelerate the time-to-market process of a small GEO telecommunications satellite with a range of payload solutions to be offered globally."

The two companies announced the JV at the Satellite 2019 show.

NIGCOMSAT & CGWIC to launch satellite DTH platform

BROADCAST

Nigerian Communication Satellite Ltd (NIGCOMSAT) and China Great Wall Industry Corporation (CGWIC) have partnered to inaugurate NextTV, a new satellite direct-to-home platform.

CGWIC previously served as the prime contractor for the development of NIGCOMSAT's communication satellites, both NIGCOMSAT-1 and the replacement, NIGCOMSAT-1R.

CGWIC and NIGCOMSAT have partnered on several projects since the launch of NIGCOMSAT-1R on 20 December, 2011.

Bimbos Alale, Managing Director of NIGCOMSAT, said that the partnership, which began in 2018, aims to improve internally generated revenue as part of a plan to fully commercialise the company's assets and operations without depending on government funding.

NextTV will offer more than 140 channels and promises to deliver Nigerian entertainment to the rest of the world.

Yahsat and Hughes in JV to deliver satellite broadband in Brazil

JV IN BRAZIL

UAE satellite operator, Yahsat, and Hughes Network Systems, LLC, a subsidiary of EchoStar Corporation, have entered into a joint venture to provide commercial Ka-band satellite broadband services in Brazil.

This new venture combines Hughes' experience delivering satellite networks and services in Brazil with Yahsat's strong position and capabilities in the region. Hughes will hold the majority interest in the joint venture.

The new entity will combine Hughes in Brazil with Yahsat's consumer broadband company in the same country to serve the growing market demand for a wide range of broadband services.

The venture will bring together 65Gbps of combined Ka-band satellite capacity on Hughes 65 West, Hughes 63 West and Al-Yah 3 high-throughput satellites (HTS), reaching more than 95% of Brazil's population. In addition to the combined existing capacity, the new entity will also leverage the capacity on Hughes' next-generation JUPITER 3 ultra-high-density satellite (UHDS), designated EchoStar XXIV, planned for launch in 2021.

Completion of the transaction is subject to customary regulatory approvals and closing conditions, and is expected to occur later this year.

From left: Pradman Kaul, President of Hughes and Masood M. Sharif Mahmood, CEO of Yahsat at the signing ceremony.

Eutelsat selects ground infrastructure providers

PARTNERSHIP

Eutelsat has selected high-performance ground infrastructure providers to operate its future Konnect satellite and associated broadband services. General Dynamics SATCOM Technologies will offer and deploy seven antennas, while Hughes Network Systems (Hughes) will provide its Jupiter ground network system. With 75Gbps of capacity, Konnect is a new-generation multi-beam satellite scheduled for launch at the end of this year. Once in service in 2020, the all-electric satellite will serve the broadband internet market on a large scale throughout Western Europe and Africa.

General Dynamics SATCOM Technologies' solution will provide seven 9m antennas to support traffic exchange between the satellite and its ground network system, ensuring a best-in-class performance and speed of deployment on a cost-efficient basis.

Hughes will supply its Jupiter platform for KONNECT's ground network system, including baseband equipment and new-generation user terminals.

Kymeta and Türksat tie to provide connectivity to EMEA

From left: Türksat VP Hasan Hüseyin Ertokt and Neville Meijers, CCO of Kymeta.

CONNECTIVITY

Kymeta and Türksat have partnered to bring land and sea connectivity to Europe, the Middle East and Africa. With this partnership, Kymeta will enable Turkey's single satellite operator to take connectivity in new markets and provide customers with voice, data, internet, TV and radio broadcasting services.

Neville Meijers, CCO of Kymeta, said: "Partnering with Türksat allows Kymeta to provide coverage through their satellite communications with our end-to-end solutions on both land and sea."

Türksat VP Hasan Hüseyin Ertokt added: "Kymeta's antenna technology will allow us to pursue previously untapped markets and applications in satellite communications. As the only satellite operator in Turkey, this is critical to enhancing the service offerings in our nation and beyond."

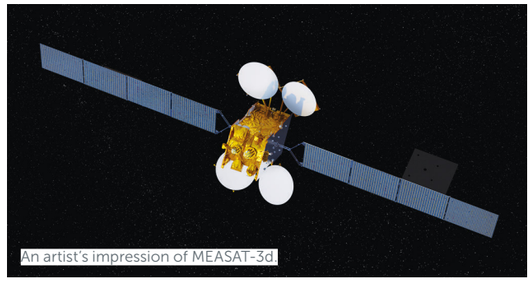
MEASAT selects Airbus to build multi-mission telecoms satellite

SATELLITE IN ASIA

MEASAT Global Berhad (MEASAT) has selected Airbus to build MEASAT-3d, a multi-mission telecommunications satellite that will replace capacity and augment its core business in Malaysia, Asia, Middle East and Africa.

Positioned at 91.5°E collocated with MEASAT-3b, also built by Airbus, MEASAT-3d will deliver improved performances to progressively replace MEASAT-3 and MEASAT-3a, supporting Asia's premium DTH (direct to home) video distribution.

Planned to be launched in 2021, MEASAT-3d will provide C and Ku-bands capacity for DTH, video distribution and telecommunication services. The new HTS Ka-band mission features multiple user spot beams optimised to deliver high-speed broadband communications over Malaysia to bridge the digital divide in the country.


An artist's impression of MEASAT-3d.

It will also carry an L-band navigation hosted payload for the Korea Augmentation Satellite System (KASS) for KTSAT.

MEASAT-3d is based on Airbus' Eurostar E3000 satellite platform. Planned for more than 15 years of operation, MEASAT-3d is designed to have an electrical power of 12kW.

Dr Edmund Kong, MEASAT's Chief Technology Officer said: "Collocated with MEASAT-3a and MEASAT-3b at 91.5°E, MEASAT-3d will serve the growth requirements of 4G and 5G mobile networks in Malaysia while continuing to provide redundancy and additional distribution capacity for video in HD, 4K and ultimately 8K in the Asia-Pacific region. Furthermore, MEASAT-3d will aid in bridging the digital divide in Malaysia by enabling 100% coverage for high speed consumer broadband services to all Malaysian households."

Arnaud de Rosnay, Head of Telecom Satellites at Airbus added: "MEASAT's new multimission satellite will be based on our Eurostar E3000 product. There are already 46 E3000 satellites operating successfully in orbit and Airbus is committed to providing innovative and best-in-class satellite solutions to enable MEASAT to be the operator of choice in the region. The mission also builds on Airbus' heritage in the field of SBAS (Satellite Based Augmentation System) navigation payloads."

Hope Probe 85% complete: UAE officials

SPACE PROGRAMME

The UAE Space Agency and Mohammed bin Rashid Space Centre (MBRSC) have confirmed that 85% of the Hope Probe has been completed.

The probe has entered an intensive testing phase to ensure its readiness before the launch date, which is in less than 500 days from now. It is planned to reach Mars by 2021, coinciding with the 50th anniversary of the founding of the UAE.

So far, the probe's systems and components, as well as its ability to communicate with the ground station have been checked by the team.

The probe has succeeded in all the tests it has been subject to so far, as a prelude to the five environmental tests to be conducted on the probe from June to December 2019.

Omran Sharaf, Project Manager of EMM at Hope Probe said: "We have managed to develop several solutions for many technical and scientific challenges that we faced in the past years in the design and manufacture of the Hope Probe. Through our research, the team has been able to reach solutions that will change scientific concepts."

IN FIGURES

$2bn

Commercial agreements signed by Leosat ahead of launching the world's fastest, most secure and widest coverage data network delivered over a constellation of low-earth-orbit satellites

Rwanda preps for first satellite launch in July

SATELLITE LAUNCH

Rwanda will launch its first satellite into lower orbit space in collaboration with a team from Japan. The launch of the RWASAT cube satellite signals another milestone in the country's progress toward its National Space Research Agenda.

The CubeSat, developed by local engineers in partnership with Tokyo University, is expected to provide crucial data streams relating to the country's environment, agriculture and other sectors.

The new satellite comes installed with two cameras for monitoring agriculture status and an antenna for data collection. Information from the ground is transmitted to the satellite and later beamed back to control areas. In this way, sensors can be installed on the ground to monitor water resources in disaster-prone areas.

According to Risk Atlas for Rwanda, a combined assault by disasters could cost the country $132m. Therefore, the installation of such CubeSats will be instrumental in providing substantial data to help the government in disaster management.

Paula Ingabire, Minister for ICT & Innovation, officially received the satellite as part of the Japan-Rwanda partnership on space ambitions presented at the Transform Africa Summit.

Commenting on the partnership, she said: "When we started shaping and designing our national space programme, we knew building capacities were going to be a foundation. We have been working with different partners, specifically the government of Japan and the University of Tokyo. This is the beginning of the broader space programme Rwanda has ventured in, and we look forward to the launch in the next two months."

Qualitynet to provide satellite services in Iraq

SATELLITE IN IRAQ

Kuwait-based ICT & Data Communications services provider Qualitynet has secured the license to provide internet, telecommunications and satellite services in Iraq. Mohammed Nizar Al-Nusif, CEO of Qualitynet commented that the service was planned after extensive research in the country.

Sudatel CEO wins at East Africa Com awards

AWARD WINNER

Tarig Hamza Zain Elabdein, President and CEO of the Sudatel Group, was named East African CXO of the Year at the annual East Africa Com awards, which celebrates the achievements of the people and organisations improving connectivity and accelerating digital transformation in East Africa. The award ceremony is part of the East Africa Com show for telecoms, media, broadcasting and technology leaders in East Africa.

Zain Elabdein has been President and CEO of the Sudatel Group since 2014. During this time, he has expanded Sudatel's operations across northern, central and western Africa. Internet capacity in Sudan will increase eightfold during 2019 as a result of Sudatel's recent investment in its 4G network, while inter-country connectivity has been improved through the connection of Sudatel's fibre to the bordering countries of Chad, Ethiopia and Egypt.

YahClick and Zodsat announce long-term partnership

SATCOM IN AFRICA

YahClick and Hughes Network Systems have partnered with Zimbabwe's satellite and terrestrial network operator, Zodsat. Under the deal, Zodsat is committed to capacity on Yahsat's Al Yah 3 satellite.

Zodsat CEO Arnold Chimambo said: "The partnership is aimed at providing Zodsat's customers with a tightly integrated offering and a tailor-made solution to accommodate changing demands and market trends. It extends our infrastructure and network operations, enabling the delivery of reliable, protected and secure communications to our clients."

YahClick CEO Farhad Khan added: "This deal gives Zodsat access to YahClick's latest VNO services. Having full control and management over their own capacity delivers flexibility while providing them with high-speed and economical Ka-band capacity."

Mahd Group offers connectivity in Oman with Marlink

VSAT IN OMAN

Marlink has installed a new Terralink Hub and RF uplink station at Mahd Satellite's HQ in Muscat, Oman. This fully-managed network operator service enables Mahd Satellite to offer a comprehensive range of VSAT communications capabilities to its customers while controlling the infrastructure to function within the country's regulatory framework.

The Terralink Hub service supplies complete end-to-end VSAT connectivity, which features 24/7 Level 2 monitoring and control plus full marketing and engineering support, with value-added IP services.

For Mahd Satellite, the breadth and adaptability of the managed service translates into an efficient and cost-effective means of meeting network capacity requirements and providing internet access for end users to access diverse applications, from business-critical email and video streaming to web browsing and support of internet apps. The service is specially adapted to sectors including defence, oil and gas, security, telecoms and IT, construction and utilities.

"The installation of our Terralink Hub in Oman signifies a very promising development in the continuing alliance between our two companies," stated Kevin Thorley, Head of Sales Middle East, Marlink.

"By providing Mahd Satellite with the ability to manage its own infrastructure, we have been instrumental in repositioning the company as a satellite operator, as opposed to a reseller, and we look forward to expediting many more partnerships in the future with the group."

A Marlink RF uplink station in Oman.

Angola inks deal with Airbus to build $179m AngoSat-3

SATELLITE IN AFRICA

Angola has signed an agreement with Airbus to build AngoSat-3, an Earth Observation satellite that will be used for military reconnaissance, territory monitoring, meteorology, natural resource inventory, climate studies and modelling, natural disaster prevention and monitoring.

The $179m deal was signed in Paris by Angola's Foreign Affairs Minister Manuel Augusto and his French counterpart Jean-Yves le Drian.

Airbus will handle the construction and orbital launch of the satellite which, when completed, will be Angola's third operational satellite.

Prior to this, Angola's President Joao Lourenço signed a presidential decree contracting Airbus for the construction and implementation of AngoSat-3, according to the Angolan Official Gazette.

Once successfully launched into orbit, AngoSat-3 will have a lifespan of 10 years, during which it will be managed by the Funda Centre.

SatSure startup wins USD 10,000 at Venture Launchpad in Abu Dhabi

The SatSure team receives award from Walid El Hindi (c), CEO of IMKAN Properties.

UAE SPACE

SatSure, a geospatial data analytics company, which leverages advances in satellites, machine learning, and big data analytics, has won the IMKAN Innovation Award worth USD 10,000 at startAD's Venture Launchpad.

Organised by startAD, an Abu Dhabi-based global accelerator powered by Tamkeen, the 10-day Venture Launchpad sprint accelerator helps local corporations innovate through global tech startups. It also supports startups to validate their business model and enter the UAE market through pilot projects (PoCs) with leading local corporations.

SatSure integrates trends derived from satellite imagery with public datasets to develop decision making insights for planning and monitoring assets and estimating their underlying value.

SATELLITE'S ROLE IN THE RISE OF OTT SERVICES

The rise of OTT services in MENA brings with it numerous challenges but efficient satellite distribution can guarantee quality transmission while keeping costs consistent and reasonable, says Hans Massart

According to a report by Research and Markets, over-the-top (OTT) services will dominate the messaging space in the near future in the Middle East and North Africa (MENA). While this presents a sizable opportunity for players working in the space, highly capable and readily available provision of services will be needed to facilitate such a shift.

In the MENA region alone, the subscription video-on-demand (SVOD) space is growing rapidly, with Starz Play currently dominating, and Shahid and Netflix in second and third places. The revenue expected to be generated by the surge in OTT services is also high – this is expected to reach $2.13bn by 2024, largely due to the ongoing trend for more and more OTT channels, with SVOD services being added.

As consumers demand constant access to streaming options wherever they are, via any number of devices, requirements for the right kinds of connectivity are crucial.

Highly tuned and effective technologies must be in place, and for broadcasters with complex and demanding content to deliver, the technical capabilities to be able to produce the highest possible quality transmissions are required – even in complex and challenging geographies.

UHD Delivery Built to Serve

With services now going far beyond traditional voice messaging, telecom operators, by using the most effective technologies at their disposal, can offer a wider range of OTT services than before. The Middle East is a huge market for both global operators and OTT players, and the region is becoming increasingly savvy in its ability to capture opportunities when they arise.

As demand increases, so too does the expectation for ever higher levels of transmission quality. UHD requires greater bandwidth than broadcasting in SD or HD, but it is vital that services be optimised for it to be able to reach the required quality for mass-market services. UHD also has the capability to deliver UHD direct-to-home (DTH), in addition to retransmission on other platforms. With the implementation of the latest technologies, including DVB-S2X and high efficiency video coding (HEVC), broadcasters, satellite operators and service providers will become more efficient as the pace of UHD uptake increases.

Easing Congestion

The diverse landscape of the MENA region can benefit from satellite, which can efficiently and cost-effectively cover huge swathes of the area. Satellite is recognised as a strong contender to work alongside and dramatically enhance mainstream connectivity. When used to deliver high-quality content to DTH customer premises equipment (CPE), it can offload congested terrestrial components for the delivery of live content or be used as a contributor to a content distribution network (CDN). It can also be cost-effectively scaled to a growing population of receivers and addresses increased depths of content.

The MENA terrain lends itself perfectly to satellite technologies, with extremes in environment including desert-like and mountainous in equal measure. Even in areas that can be physically reached and connected by terrestrial networks, the use of satellite is hugely valuable as a back-up to ease congestion for applications.

The possibilities with satellite are seemingly endless, and there is in fact nothing you cannot achieve with its strategic application when it comes to OTT services.

The satellite return channel provided by an efficient VSAT network can be used effectively for both CDN analytics feedback and support of centralised digital rights management (DRM).

Priorities

In line with the rise in demand for OTT services, it is critical that quality content be distributed along with the ability to cover substantial and growing markets such as the MENA region. This is achieved with the application of the forward pipe, to transfer live content and feed the edge CDN storage servers with popular content. Following this, the return channel then feeds back CDN analytics to make cloud-based DRM possible. This can be seen in many use cases where no other terrestrial return channel exists.

> When used to deliver high-quality content to DTH customer premises equipment (CPE), [satellite solutions] can help offload congested terrestrial components for the delivery of live content or be used as a contributor to a CDN"
>
> **Hans Massart, Market Director Broadcast, Newtec**

High-throughput satellite (HTS) architectures continue to be a key area of growth for many operators, with offerings being made to provide equal services via satellite both on the ground and in the sky. This is especially the case in high-value markets such as mobility, which requires exceptionally high levels of throughput. This fine tuning of applications is set to grow as new technologies such as 5G arrive, taking the mobile space into more complex realms in terms of bandwidth allocation. In the mobile space, satellite is an attractive proposition for service providers, as its cellular backhaul capabilities can efficiently satisfy demand.

Striving for more

Although many challenges lie ahead for OTT services in the MENA region, efficient transmission can be guaranteed, keeping costs consistent and reasonable. Efficient satellite distribution technologies such as the DVB-S2X standard have been developed by the industry. As broadcasters look to rationalise operations and stand out from competitors when it comes to quality of service (QoS) and quality of experience (QoE), CDN analytics is a valuable tool, as it provides an acute vantage point to assess and maximise operations.

The focus of solution providers should be on ensuring our solutions stay relevant and incorporate the very latest technologies at every step. With so much rapid change taking place in OTT, delivering relevant and flexible solutions to customers is key. The future holds advances in multi-screen devices, especially in growing populations across the MENA region. For digital satellite news gathering (DSNG) service providers that rely on a resilient and easy-to-use system, the amalgamation of satellite and terrestrial communication links will enable a significant and rewarding growth in pay-per-event billing, adding a welcome enhanced revenue stream in the process. PRO

Hans Massart is Market Director Broadcast at Newtec.

REACHING FOR THE STARS

Hellas Sat is disrupting the satellite communications industry with its newest satellite, which is undergoing in-orbit testing and will be fully operational for commercial use in June this year. The company shares its future plans and growth strategy with **SatellitePro ME**

Hellas Sat operates out of facilities in both Cyprus and Greece

Satellite connectivity in the MENA region received a major boost, when satellite operator Hellas Sat launched Hellas Sat 4 in February this year. In-orbit testing is in process as we go to press, with the satellites scheduled to go into operation for commercial use starting June 2019.

Founded in 2001, Hellas Sat is a licensed entity from Greece and Cyprus and present at the orbital slot of 39 degrees East. Tucked away in idyllic Kakoratzia in Cyprus, near a village called Kofinou in Larnaca municipality, is the Hellas Sat headquarters. It also operates a subsidiary in Koropi, Greece, which is outside Athens near the main Greek airport of Eleftherios Venizelos.

"What makes these two locations truly special is that together, they allow Hellas Sat immense reach," explains Dr Omar Olaian R Alaidda, Chairman of the Hellas Sat Board. "The location of its space centres in Cyprus and Greece lets Hellas Sat transmit to and receive from any satellite in the 105.5°E to 37.5°W and 93.5°E to 47.5°W arc respectively, covering satellites for Europe, the Middle East and South Africa."

From its humble beginnings, Hellas Sat has come a long way. The company was acquired by Arabsat in 2013 and since then, Hellas Sat has expanded in the region, with new satellite launches and a fortified on-the-ground presence. The company also opened a new office in Johannesburg, South Africa, in 2017.

Alaidda discusses the infrastructural prowess of Hellas Sat with *SatellitePro ME*: "In our Greece and Cyprus premises, we host the primary and secondary Satellite Control Centres (SCCs), High-speed Satellite Internet Hubs, our Network Operation Centre (NOC) and, in Cyprus, the DTH

TV headends. Both facilities are fully owned by Hellas Sat and offer both teleport and a wide range of managed services to our customers. Being located in Greece and Cyprus means we can offer teleport services to the Indian Ocean, European and Atlantic Ocean satellites, so this has slowly evolved into one of the major satellite telecom hubs in the region. Between the two facilities, we have close to 50 employees."

With a focus on expanding and improving its core business, Hellas Sat has been investing in its facilities in the last few years, explains Christodoulos Protopapas, CEO of Hellas Sat. "We have made significant investments in recent years to develop our facilities, our DTH headend, antennae and network infrastructure, to ensure state-of-the-art managed services for our customers from our teleports in Greece and Cyprus."

The most recent milestone for Hellas Sat was the launch of Hellas Sat 4, which together with Hellas Sat 3, operating in the same orbital slot, will enable the company "to enter the DTH and TV markets in Europe and Sub-Saharan Africa, offering very competitive and reliable satellite services", according to Protopapas.

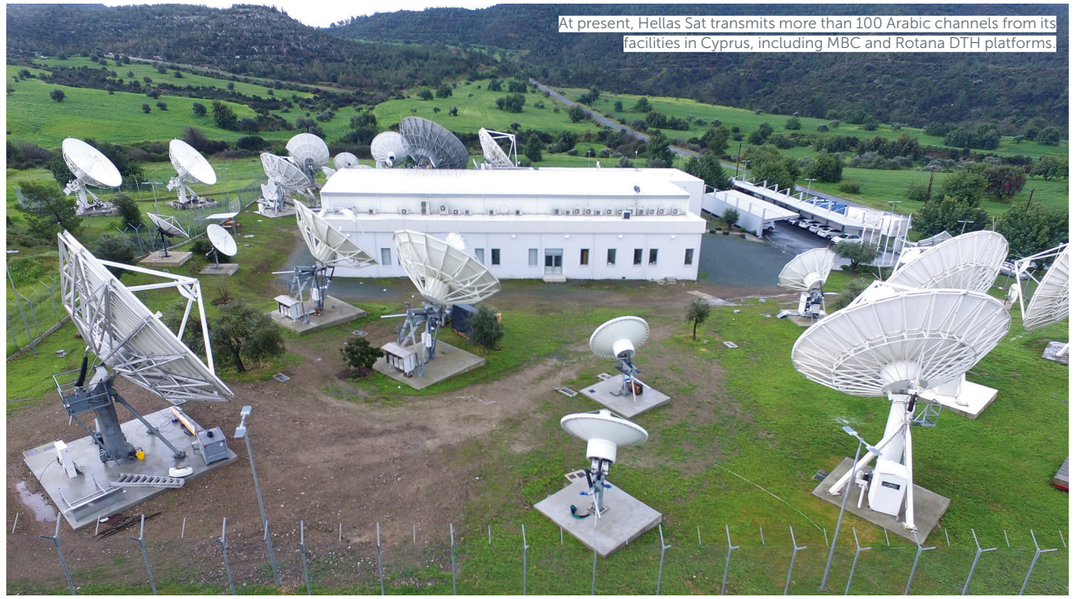
Hellas Sat 4 successfully launched into space through an Ariane 5 launch vehicle from the Guiana Space Centre in Kourou, French Guiana early this year. It is reportedly the largest commercial satellite ever manufactured by Lockheed Martin.

Sharing the technical specifications and reach of the Hellas Sat network, Thomas Kalamaris, Technical Director at Hellas Sat, says: "Hellas Sat 3 has been built on the Spacebus 4000 C4 platform by Thales Alenia Space and delivers a multi-beam mission with a powerful Ku-/Ka-band mission of 44 Ku and 1 Ka transponders. The satellite was launched in 2017.

"Hellas Sat 4 has electric propulsion with special high-performance electric propellers powered by Xenon, and features flexible 20kW sunburners and a mass of more than six tons when launched, achieving a lifetime of 23 years. Together, Hellas Sat 3 and Hellas Sat 4 will provide fixed satellite services (FSS) and broadcast satellite services (BSS)."

The Hellas Sat fleet will deliver in-orbit, backed-up DTH and telecom services in its designated coverage area, maintaining and expanding the satellite operator's business reach with additional

From left: Christodoulos Protopapas, CEO of Hellas Sat; Dr Omar Olaian R Alaidda, Chairman of the Hellas Sat Board and Thomas Kalamaris, Technical Director at Hellas Sat.


At present, Hellas Sat transmits more than 100 Arabic channels from its facilities in Cyprus, including MBC and Rotana DTH platforms.

> "The location of its space centres in Cyprus and Greece lets Hellas Sat transmit to and receive from any satellite in the 105.5°E to 37.5°W and 93.5ºE to 47.5ºW arc respectively, covering satellites for Europe, the Middle East, Africa and most of Asia"
>
> **Dr Omar Olaian R Alaidda, Chairman of the Hellas Sat Board**

capacities, such as HD and UHD video content, to the regions covered. The FSS/BSS coverage zones are Europe, the Middle East and SADC (Southern African Development Community) countries, including a cross-trap service between Europe and southern Africa beams.

Chairman Alaidda comments that Hellas Sat is expecting a fill rate of more than 80% in the next two years on the newly launched satellites, which also ensure "full in-orbit satellite redundancy".

"Our constellation of two satellites in the same orbital slot offers us a significant advantage in the market. With the special technical configuration of the two satellites, either of the satellites can undertake the services of the other within a very short time from the same orbital slot, should there be a partial or complete failure."

At present, Hellas Sat transmits more than 100 Arabic channels from its facilities in Cyprus, including MBC and Rotana DTH platforms. The Hellas Sat fleet reportedly caters to an audience of almost three million DTH subscribers in Central and Eastern Europe, who watch premium satellite TV services from three DTH platforms, namely Dolce in Romania, Bulsatcom and others, comments Alaidda.

"We also have clients in the government sector in the Middle East, Europe and southern Africa," he reveals.

With Hellas Sat's core business being the provision of reliable satellite TV to markets in Central and Eastern Europe, CEO Protopapas adds that the company is gearing up to "help existing and future customers to introduce more advanced DTH services, establishing our orbital slot of 39 degrees East as a TV hotspot".

He clarifies: "Both satellites have been tested and qualified for the launch environments with acoustic and vibration testing, simulating the harsh space environment with vacuum and extreme temperature testing, and radio frequency compatibility and performance testing to validate that the payload meets critical performance expectations."

Technical Director Kalamaris adds that Hellas Sat's strategy and satellite design have kept in mind future demand for video applications, "which is partly linked to the expected development of DTH (direct-to-home) broadcasting in emerging countries".

"We believe that with HDTV and UHDTV consuming more satellite capacity, the demand for payload will increase. The adoption of new technical broadcasting standards has resulted in and could continue to result in a higher signal compression rate, which reduces the overall capacity demand. However, factors like larger television screens and demand for better image quality will offset that reduction. Moreover, we believe that linear TV will continue to be the primary means for premium content, thereby keeping our services in much demand."

It is not the broadcast and telecom industries alone that are shaping the demand curve for the satcom industry. Policy discourses on satcom in Europe are offering a conducive environment for companies like Hellas Sat to grow and help governments reach their communication agenda. Governmental satellite communications, for instance, was defined as one of the four capability development programmes by the European Council in December 2013. A case in point is the GovSatcom initiative, where the mandate is to prepare the next generation of satellite communications within the 2025 timeframe.

"We are also seeing an increased demand for connectivity in various areas from the end user. The increased demand is coming from markets where there is enough terrestrial infrastructure. Recent European policies addressing the digital divide and initiatives like GovSatcom will boost the demand for satellite connectivity, especially in underserved areas. In emerging markets, we see that satellite continues to remain a key player in supporting connectivity needs, as it is the only means to deploy a broadband network with minimum investment," adds Kalamaris.


The team at the launch of Hellas Sat 4 in French Guiana.

> "Hellas Sat launched the two new satellites as condominium satellites, with cost sharing of the launch and the satellite bus with partners. This gives our company the ability to survive in a very competitive market, because the investment per transponder is lower than our competitors"
>
> **Christodoulos Protopapas, CEO, Hellas Sat**

In the meantime, with 5G promising to drive demand in the future, Protopapas says Hellas Sat has "the satellite capacity for the provision of connectivity to IoT and 5G providers and is geared to contribute to the development of these services".

In fact, the company has already started work on Hellas Sat 5, with the aim of offering more premium satellite telecom services for IoT and 5G providers in a wide geographical area. With Hellas Sat 5 especially, the satellite operator will be ready to

support fast internet connections for 5G backhaul and IoT.

"The engineering team has begun work on the design of the new Hellas Sat 5 satellite. We are in contact with potential strategic customers and investors to work on the new satellite," reveals Alaidda.

"We are working closely with our R&D team to build a satellite that will address these future needs," clarifies Kalamaris. "The focus points we are trying to address are primarily the very high throughput to the end user and the flexibility of the payload. We are working to introduce a payload to the bus that will use higher spectrum bus like Q/V, and of course it will have the capability to reshape itself according to business needs. We strongly believe that a spacecraft with the technology of flexible payload working in multiple bands will be the next generation of Hellas Sat satellites."

Although broadcasting remains one of Hellas Sat's core verticals, the company's location immediately makes it attractive to the maritime sector.

"Greece is one of the most important maritime players in the world, especially after the Prime Minister of Greece announced during the Posidonia 2018 event that it will facilitate 'Space in Maritime' and fund a Maritime Cluster for new and emerging technologies," explains Protopapas.

"We are in close contact with the newly founded Maritime Cluster in Greece and the Eastern Mediterranean Maritime Institute in Cyprus, to develop IoT maritime applications. With the new AI techniques and the new technologies for IoT for maritime, satellites can offer a suitable communication infrastructure for fleet connectivity, telemetry, data processing and remote ship management."

Hellas Sat's future seems on track, although spectrum availability and new claims for spectrum for the wireless market pose a grave challenge to the company's growth trajectory, as both the CEO and the CTO point out.

"Retention of spectrum for satellite services is becoming an increasing challenge. There is a big tussle today between satellite and mobile operators for spectrum rights. It is very important that satellite operators have dedicated satellite spectrum, to continue their operations without any interruptions or interference," says Protopapas.

"The current trend is to allocate spectrum to IMTs. We are of the view that any discussion that involves the sharing of spectrum currently used by the satellite industry impacts our business and technology in general. Spectrum sharing will endanger the performance of end user services," adds Kalamaris.

Another challenge is the drop in prices for satellite capacity, says Protopapas, though Hellas Sat has successfully addressed this.

"Hellas Sat launched the two new satellites as condominium satellites, with cost sharing of the launch and the satellite bus with partners. This gives our company the ability to survive in a very competitive market, because the investment per transponder is lower than our competitors," he says.

With discerning investments in futuristic technologies and an expanding footprint in space and on the ground, Hellas Sat is inching closer to tasting success in its business operations. While it may find itself mired in the spectrum conundrum, it helps that global policies favour the need to enhance satellite communications. A sharp business sense and a favourable policy climate could propel Hellas Sat as it – literally – reaches for the sky. PRO

Hellas Sat is expecting an 80% fill rate on its newly launched satellites within the next two years, says Dr. Omar Alaidda. In the meantime, work has begun on Hellas Sat 5.

With Hellas Sat's core business being the provision of reliable satellite TV to markets in Central and Eastern Europe, CEO Christodoulos Protopapas, says the company is gearing up to introduce more advanced DTH services.

Hellas Sat's location makes it attractive to the maritime sector. The company is already working with maritime centres in Greece and Cyprus to develop IoT applications for the sector.

A NEW INTERCONNECTED WORLD

Chasing global pursuits within broadband satellite technology and services, Hughes is investing in today to lay down stronger foundations for a connected tomorrow. **SatellitePro ME**, in conversation with Pradman Kaul, President of Hughes Network Systems, LLC, learns how Hughes is securing its future through its portfolio of services and global partnerships

Back in 1973 in the US, seven engineers and a lawyer with start-up capital of $40,000 got together to start a company called Digital Communication Corporation from a garage in Rockville, Maryland, where they began designing circuit boards for telecom-related products. Over the years, that company has grown into Hughes Network Systems, a $2bn company with a global footprint across continents through its numerous subsidiaries and partners.

An in-depth understanding of the market and an astute business strategy have fuelled Hughes' growth trajectory in a highly competitive market under President Pradman Kaul, one of its founders.

Recalling the early days, Kaul says: "When we started in 1973, we were the only commercial company to use digital techniques in satellite applications. We were a group of individuals who were working for Comsat Laboratories and were united by our passion to serve this industry, so we started this."

In its 46-year history, the company has gone through various mergers and acquisitions, the key ones being acquisition by Hughes in 1987 and EchoStar in 2011. Hughes has seen tremendous growth in these years, due to its various partnerships globally.

Today, Hughes has subsidiaries on every continent and sells equipment all over the world. Kaul credits it to a "simple philosophy".

"We entered into partnerships to expand our international influence and presence. We first started companies in the US, as that was home base, and then slowly expanded into Europe, Brazil and India. As we continued to grow, we started looking for partners in markets that we were not serving directly. Africa and the Middle East were clearly an important part of that strategy. Since we didn't have a local presence in these markets, we looked for the best partners we could find," he explains.

In 2018, that strategy led to a joint venture between Yahsat and Hughes to provide satellite broadband services in the Middle East, Africa and southwest Asia markets.

"Yahsat already had satellites serving MENA and had a solid distribution presence. We didn't own any assets there, so we invested $100m into the company to buy 20% equity while Yahsat owns an 80% stake."

Last month at the Satellite 2019 show in Washington, DC, the two companies announced a new partnership in Brazil – this time with Hughes having an 80% stake and Yahsat 20%.

Kaul says: "Yahsat is the logical partner for Hughes in Brazil as we continue to expand our services and meet growing demand across consumer, enterprise and carrier markets. In Brazil, we have had a presence for over 10 years. We started here by offering business enterprise-related networks and then in the last few years went into the consumer business, offering direct-to-home services. Here, Yahsat didn't really have a strong local presence. It had just launched a new satellite over Brazil with a payload from Al Yah 3. It worked to its advantage to partner with somebody who already had good distribution and capability. As we are already partners in another market, it led to this new alliance."

Kaul adds that there was no financial transaction in this partnership.

"We launched two payloads – Hughes 65 West and Hughes 63 West – and Yahsat has its payload. When we looked at the footprints of all our beams, we realised that we could achieve a lot more if we combined our assets. But the assets we were contributing here are significantly greater than Yahsat's. They are contributing the payload of the satellite and some gateways. Our contribution was our payloads, our satellite gateways and the business. An asset valuation exercise showed that we would get 80% and they would get 20%."

Brazilians throughout the country will benefit from the capacity, scale and operational synergies of this combined entity as they connect the unconnected and enable businesses and communities to thrive, says Kaul.

Brazil is at the heart of another partnership between Hughes and Facebook to provide affordable internet access, through a programme that both companies are exploring extensively across the world, both individually as well as in partnership with various entities.

Launched recently in Brazil and Mexico, the Community Wi-Fi programme offers HughesNet Wi-Fi hotspots supported by the Facebook Express Wi-Fi platform. HughesNet Wi-Fi hotspots empower local merchants in villages and towns to offer affordable internet access to customers on a prepaid basis, employing a solution that combines a Hughes satellite VSAT (very small aperture terminal) and Wi-Fi equipment with Facebook's Express Wi-Fi platform.

"Community Wi-Fi works on a similar principle to the phone booths of the past, where everyone

could not afford to own their own phone. Everyone may not be able to afford a $50 internet connection every month, but may be able to afford $5. They could come to a kiosk that is potentially located in a grocery store to access that service.

"We are working with Facebook to provide such a service in other countries, where Facebook is putting together the infrastructure. It is putting together the back office and the ability to bill and do the logistics, as well as provide the access points for the hotspot. We are providing the connectivity from the hotspot to the network switching centres and data centres.

"FB is only one aspect of Community Wi-Fi. We are also pursuing this concept in other countries on our own."

Sharing more information on its Wi-Fi projects, Kaul says: "Hughes customers have deployed over 32,000 of these satellite-enabled community Wi-Fi hotspots in Russia, Mexico, Brazil and Indonesia, bringing the benefits of internet access to more than 25m people around the world. FB is only one aspect of Community Wi-Fi. We are also pursuing this concept in other countries on our own."

> "Connectivity should be ubiquitous. People may use different words to describe it... but the basic idea is to connect everything together economically and at high speeds"
>
> **Pradman Kaul, President, Hughes Network Systems**

In addition to making internet access affordable and widespread, Hughes is working towards offering higher speeds at lower costs.

The Hughes stand at Satellite 2019 in DC.

"Our 2021 launch will leverage the capacity on the Hughes JUPITER 3 'ultra-high-density satellite', designated EchoStar 24, to offer speeds of 100Mbps and higher to the subscriber. JUPITER 3 is expected to have a total throughput of more than 500Gbps. The coverage will be optimised to cover areas where we anticipate more demand rather than offering a uniform blanket coverage. All our traditional markets, including consumer, enterprise, aeronautical, cellular backhaul and community Wi-Fi, will be served," says Kaul.

Hughes has so far operated in the GEO space, but with low-Earth orbit (LEO) satellites gaining significance, Hughes has been working closely with OneWeb to develop the ground infrastructure to support OneWeb's LEO constellation.

"We have an investment in OneWeb and are the prime system architects building equipment to support multiple satellite access points in gateway locations around the world, each including a custom switching complex, outdoor modems and power amplifiers," says Kaul, adding that he believes the world needs both LEO and GEO satellites – a solution that leverages the advantages of both will succeed.

"LEOs give you coverage, as they cover every square inch of the globe. Geostationary satellites offer power, high density and frequency for a region. The coverage of a LEO combined with the power and frequencies of GEOs will offer the best solutions."

The company is especially looking at the Middle East and Africa markets very closely, owing to their scattered populations and the increasing demand to serve unserved as well as underserved markets.

"There is a huge demand in the Middle East market," confirms Kaul. "The geography of the Middle East is such that the populace is dispersed and has underserved and unserved markets, and that is an opportunity for us to justify an entry." Other factors that make this market attractive include "good investment potential, strong economic ability of the subscriber and an increasing paying capacity".

In markets where the subscriber base isn't as affluent, like parts of North Africa, Hughes is exploring Community Wi-Fi to serve the entire region.

To service Africa better, Hughes also entered into a partnership with Eutelsat last month. To enable services on Eutelsat's new satellite KONNECT, a new-generation high-throughout satellite (HTS) for Western Europe and Africa, Hughes (through its JUPITER system) will build a significant part of the ground network system, which is expected to launch in 2019.

The JUPITER System is a next-generation platform for VSAT networks, designed and optimised for broadband services over both high-throughput and conventional satellites. Incorporating the wideband DVB-S2X industry standard and designed with a powerful system on a chip, JUPITER enables very high overall efficiency and fast packet processing rates. It powers HughesNet, with 1.3m subscribers across the Americas. Kaul says JUPITER is becoming the de facto standard for most operators, as a result of which most services are available on the platform.


Technology must help to increase throughput and speed, lower costs and improve reliability, says Pradman Kaul.

INTERVIEW

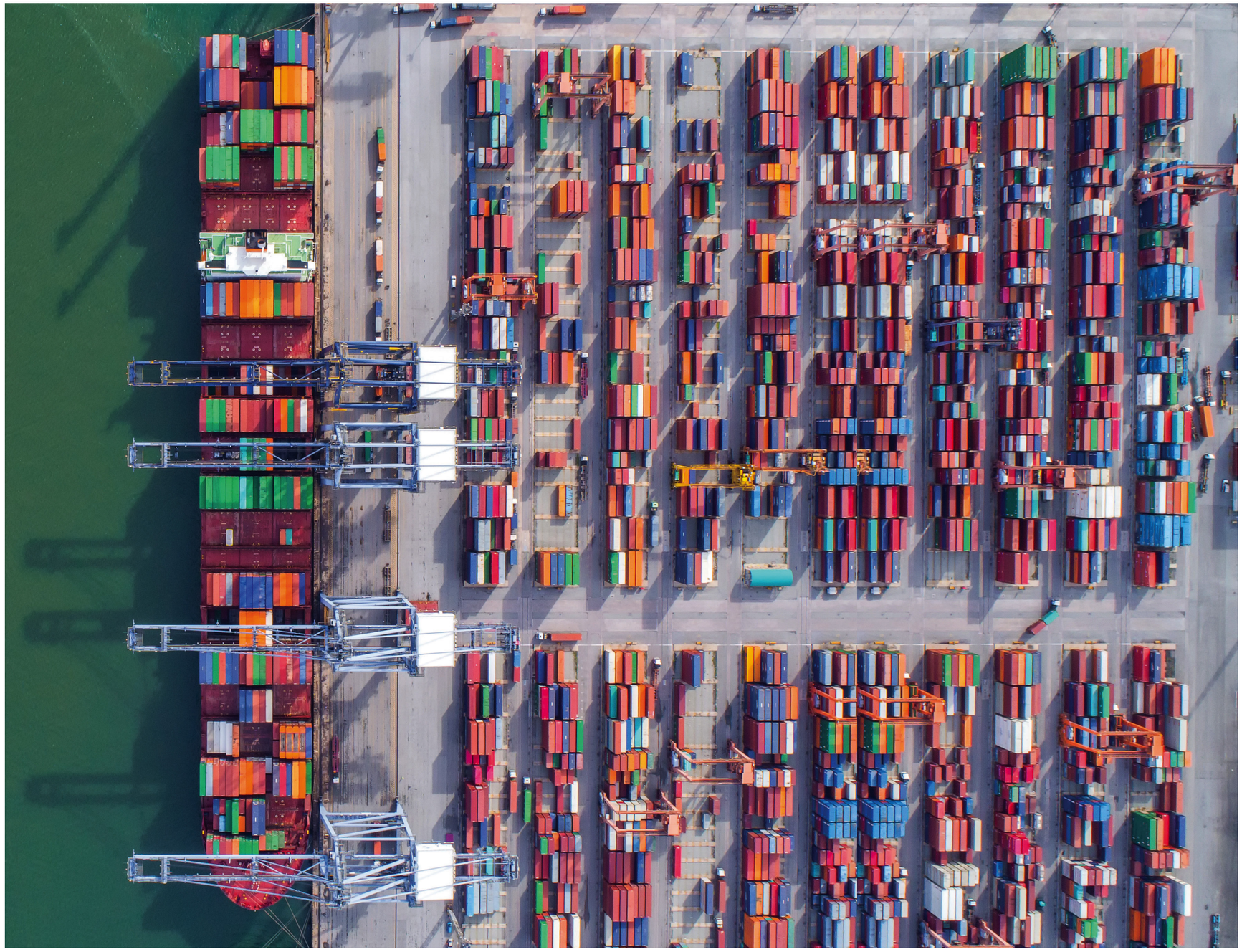
Another big emerging market for Hughes is Asia Pacific (APAC), says Kaul, as the company heads to ConnecTechAsia in Singapore.

"APAC is such a large region, which is largely dominated by India and China. Both have huge populations. India, for instance, may have only 300m sophisticated users in a country of 1.3bn people, but that small number is the size of the total US population."

He points out, however, that it is difficult to enter these markets due to commercial and licensing regulations. Still, Hughes secured a big win in India early this year when Hughes Communications India (HCIL) received a Flight and Maritime Connectivity (FMC) licence from the Indian Department of Telecommunications. This allows it to provide in-flight connectivity (IFC) and broadband services to Indian and foreign airlines as well as shipping companies operating in the country.

With its footprint across the globe supporting the satellite broadband industry, Kaul is confidently eyeing the future. "The future is connectivity, and we want to be the company that offers the customer the ability to connect. Connectivity should be ubiquitous. People may use different words to describe it, some call it IoT, but the basic idea is to connect everything together economically and at high speeds. Technology must help to increase throughput and speed, lower costs and improve reliability. Those who do that well will win, and that is our endeavour." PRO

> "Our new launch for 2021 will leverage the capacity on Hughes JUPITER 3 'ultra-high-density satellite', designated EchoStar 24, to offer speeds as high as 100 Mbps and higher... JUPITER 3 is expected to have a total throughput of more than 500Gbps"
>
> **Pradman Kaul, President, Hughes Network Systems**



SMOOTH WATERS AHEAD?

Every day, more than 50,000 merchant ships cross the oceans with millions of cargo containers in tow, signalling the need for fast and efficient communications aboard vessels, and between land and sea. **SatellitePro ME** spoke to some prominent maritime solution providers to understand key trends and challenges in the segment, and how they are being addressed

The maritime industry is going through a major transformation on multiple levels. Overcapacity and low freight rates have led to several consolidations – particularly among dry bulk, offshore and containers – leading to a bearish outlook and compelling companies, in turn, to look at operational efficiencies and reduced costs through digitisation. In parallel, connectivity demands have skyrocketed with crew welfare, seafarers and passengers using their own devices on ships, and the insatiable appetite for operational data processing and analysis moving up the priority list for ship owners. All these factors have driven the need for always-on connectivity on the seas, thereby driving some of the biggest innovations in the sector at the moment.

"The revenue for maritime service providers is estimated to exceed $2.5bn by 2025," says Nabil Soussia, Managing Director of IEC Telecom Middle East. "We see the emergence of the smart ship and the autonomous ship," he says, citing a report from Reportlinker that the autonomous ships market is expected to grow from $6.1bn in 2018 to $13.8bn by 2030, at a CAGR of 7%.

"Connectivity will be a driving factor for improved operations and efficiency, as well as to bring more attention to topics such as safety and cybersecurity," explains Soussia.

Priya Patel, Regional Director APAC of NSSLGlobal, agrees that "smart ships are not just redefining the way maritime organisations manage their communications systems and digital infrastructure,

but also revolutionising their core business models".

"Satellite connectivity is enabling ships to become an extension of on-shore operations – effectively fully-functional mobile offices at sea. In this context, the adoption of broadband always-on connectivity for maritime applications continues its exponential upwards climb, driven by a greater understanding of the high bandwidth benefits among shipping companies, the increasing mission-criticality of IT systems and remote monitoring systems in maritime applications, and the need for remote systems to integrate with central IT networks."

With over 90% of worldwide trade served by the maritime market, vessels at sea rely on broadband connectivity to stay in touch with operations on land to receive revised instructions, weather forecasts and navigation map updates in time for prompt decision-making.

"Satcom enhances productivity by allowing new technologies onboard. Such technologies as remote maintenance, digital medicine and e-training fully rely on disrupted connectivity," explains Soussia.

One technology that perhaps all solution providers agree is playing a key role in the maritime sector is VSAT technology, which has evolved over the years to cater to changing market requirements. A Verified Market Research report estimates that the global maritime VSAT market will reach $5.19bn by 2025, growing at a CAGR of 13.3%, with Asia Pacific predicted to be the fastest growing market.

NSR's 'Maritime Satcom Markets 7th Edition' report, published last month, also says that VSAT-enabled maritime vessels are estimated to grow in number from over 20,000 vessels in 2018 to over 75,000 by 2028, and to generate almost $42bn in cumulative revenues in that period. The maritime satcom connectivity market has never looked more promising, thanks to the "right combination of price, end user requirements and connectivity demand", according to Brad Grady, NSR Principal Analyst and author of the report.

More APAC companies are migrating from L-band satellite communications for their fleets to VSAT services on Ka- or Ku-band, says Tore Morten Olsen.

> "Ship owners are looking to secure their systems against hackers and ransomware, as well as ensure that their data is collected and stored with the GDPR requirements"
>
> **Tore Morten Olsen, President for Maritime at Marlink**

In fact, each market will provide unique advantages across the maritime satcom value chain, Grady says. For satellite operators, the passenger market (ocean and river cruises, ferries) will require massive amounts of connectivity, exceeding 870Gbps by 2028. For service providers, merchant vessels are adopting VSAT connectivity at unprecedented rates, adding over 40,000 vessels between 2018 and 2028. For equipment manufacturers, the fishing and leisure markets are expected to post some of the best revenue growth rates, at almost 8% with a CAGR of over 12% between 2018 and 2028.

Soussia explains why "VSAT wins over MSS in every way" for vessel owners looking to leverage investment to maximise operational efficiency and ROI.

"The biggest reason is the financial predictability of flat monthly rates offered by VSAT, as opposed to the traditional pay per use of MSS communication. Unlike MSS, VSAT services can enable modern applications onboard, bringing maritime connectivity on a par with land solutions. Satcom technologies turn vessels into fully operational remote business units," he points out.

"VSAT set up on its own is capable of receiving and distributing bandwidth. The rest comes with a package of value-added services connected to your VSAT terminal. The most common requirements fulfilled by value-added services are optimisation, filtration, email compression services and cybersecurity."

Marlink has also witnessed a 50% growth in VSAT uptake in the APAC market over the last 12 months, says Tore Morten Olsen, President for Maritime at Marlink.

"More APAC companies are migrating from L-band satellite communications for their fleets to VSAT services on Ka- or Ku-band. This comes from the realisation that more throughput can enable digital applications that support more efficient fleet management, while also keeping crew connected to friends and family ashore."

He says global demand for satellite bandwidth is always increasing and "our VSAT installations generally double in number year on year".

Patel advocates a more cautious approach, however, saying hybrid solutions may be the answer in some scenarios.

"VSAT has become a very generic term these days, to represent broadband services. Whether it is the best solution for connectivity depends on the vessel's requirements as well as the supplier's offering. The old adage 'you get what you pay for' applies to VSAT, and while the headline offering can look the same between suppliers, in reality they can be very different," she explains, adding that NSSLGlobal tries to help customers decide which solution is ideal for their requirements.

She says that with the "connected expectation" growing, "there is a real opportunity for satcom operators to create broader maritime connectivity platforms which use more hybrid connectivity, including VSAT, L-band, 4G/5G and Wi-Fi in port/coastal areas".

"NSSLGlobal is positioning itself at the forefront of hybrid/connection-agnostic systems through solutions such as FusionIP in Europe and the recently launched FusionIP-LITE for Asia, providing cost-effective connectivity and flexible packages."

> "IoT connectivity is capable of generating huge data insights regarding operations and the work environment, as well as a slew of new data-based revenue opportunities"
>
> **Nabil Soussia, Managing Director of IEC Telecom Middle East**

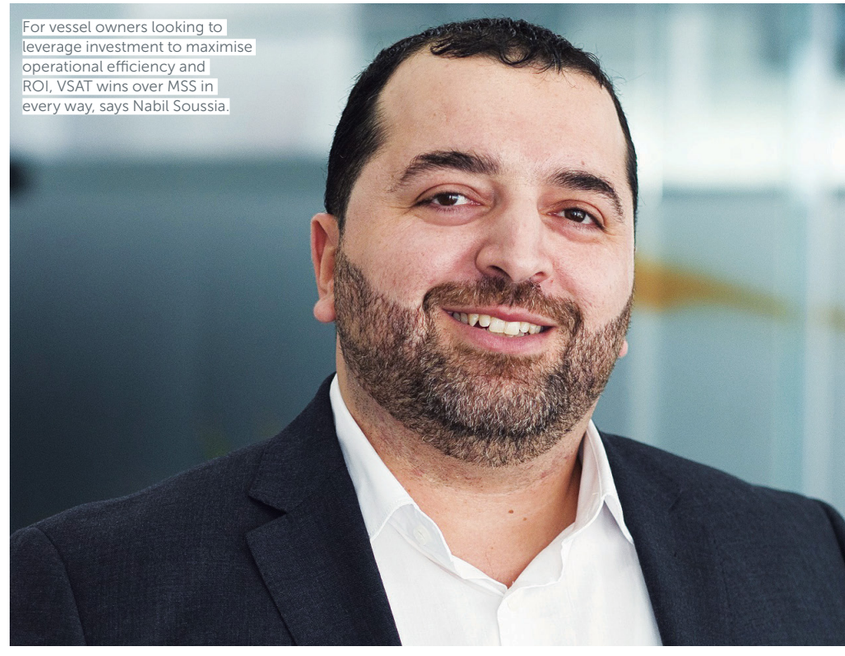
Patel is quick to add that NSSLGlobal also owns and operates its own global VSAT network and its own VSAT modem and hub technology. "This means that we are able to offer full end-to-end support responsibility and can tailor the development roadmap specifically to our key mobility markets and maritime customers."

A key area that differentiates suppliers, according to Patel, is "the average speeds of the broadband service, as opposed to the headline MIR figures".

"Many suppliers quote high maximum data rates and also only contracts to the minimum CIR values for 90-95% of uptime. They then heavily contend the network so that in reality, the customer only ever receives the minimum CIR and never the maximum data rate. NSSLGlobal only commits to the CIR 100% of uptime, but because of the diverse customer market base, as well as careful network management, the average network speed always significantly exceeds the CIR and average speeds are often nearer to the maximum data rates."

Soussia agrees that it is important to educate and advise customers on correct implementation.

"With the crisis, companies had to be creative in cutting costs



For vessel owners looking to leverage investment to maximise operational efficiency and ROI, VSAT wins over MSS in every way, says Nabil Soussia.

and deploying technology, without necessarily considering all the aspects of safe implementation. That's why we serve as a technology consultant more than a technology provider.

"IEC Telecom Group is one of the leading global providers of managed network communication solutions. We offer a comprehensive suite of system integration, system products and network services, enabling a complete end-to-end solution for our customers that includes cybersecurity. We believe that our integrated approach of in-house design and engineering expertise provides us with a competitive advantage. Our solutions are deployed in selective vertical markets, including government, humanitarian, wireless, media, energy, enterprise and maritime."

Of course, the demand for connectivity is not without its challenges, but each of these companies touts its solutions as ideal for managing the core issues around bandwidth for business, crew and vendor demands in a digitised world.

NSSLGlobal claims its proprietary CrewVision ship entertainment service, provided through Cruise Control+, its onboard communications and IT management app, is ideal because ship management can provide low-cost, high-quality, appropriately licensed content such as movies, TV dramas, documentaries and world news to crew without disrupting data speeds for operational traffic or crew internet access.

"NSSLGlobal's VSAT IP@SEA service ensures that the vessels' data speeds or voice quality are unaffected by the content downloads, and also requires no additional hardware. Content is continually refreshed using NSSLGlobal's network capacity, not the vessels', so there is no impact on the vessels' business operations. The result is an optimised onboard user experience and higher staff retention levels," says Patel.

Soussia advocates IEC Telecom's OneGate Maritime solution as a platform designed to meet the dual requirements of onboard connectivity for both crew welfare and corporate use.

"It provides 360-degree support for corporate communication, helping businesses manage bandwidth, monitor usage consumption, control budget and retrieve 24/7 satellite support. At the same time, OneGate Maritime improves the crew well-being on board by providing access to a high-quality voice and data connection including VoIP, web browsing, VOD and emails. It allows tight control over budgets while managing crew allocations. It also includes the ability to hold remote crew training, arrange special assistance via telemedicine and more," he explains.

VSAT-enabled maritime vessels are estimated to grow in number from over 20,000 vessels in 2018 to over 75,000 by 2028, and to generate almost $42bn in cumulative revenues in that period, according to Northern Sky Research.

Marlink's Olsen says: "VSAT has further developed with our development of a multi-band network offering, which enables ships to operate with several available channels onboard at once. Should the ship move outside of one service's coverage, it will be automatically switched to an alternative carrier. We believe this holistic approach to network building is the only way to deliver industry-leading quality of service (QoS) with very high service level agreements (SLA)."

One big challenge, however, is cybersecurity. With around 50,000 vessels at sea or in port at any one time and increasing connectivity, new threats continue to emerge on the horizon, costing the maritime sector hundreds of millions of dollars.

"Implementing stronger cybersecurity standards is essential to manage risk and potential loss," points out Soussia, explaining that this solution is part of IEC Telecom's offering.

"Cybersecurity can be managed effectively if maritime companies approach it strategically, addressing and mitigating risks coming from the outside and within their organisation," explains Patel, adding that the company has decades of cybersecurity experience working with governments to ensure that critical security controls are at the core of all of its products, applications and services.

"Ship owners are looking to secure their systems against hackers and ransomware, as well as ensure that their data is collected and stored with the GDPR requirements. This is required for any ship visiting European ports, so it applies to ship owners worldwide," Olsen explains, adding that as a major maritime ICT specialist, Marlink offers an extensive portfolio of solutions, from ship-based SkyFile anti-virus and secure VPNs to remote access solutions and an arsenal of network and teleport-based technology.

Pre-empting a spike in cyber threats, Marlink is introducing a new cybersecurity strategy called Cyber Guard Solutions Portfolio, which promises a holistic approach to maritime cybersecurity that meets dynamic and evolving needs.

"Cyber Guard deploys established means such as a firewall and anti-virus (PROTECT), and complements them with advanced network-based hardware and software solutions, cyber expertise (DETECT and RESOLVE), as well as training. The goal is to prevent Marlink customers from ever being in a position of having to pay hackers a ransom, a fine to national bodies or suffering from a severe loss of reputation."

But the range of transformation within the maritime sector does not end there. The industry has also witnessed the rapid adoption of IoT, the next big buzzword in the sector.

"IoT connectivity is capable of generating huge data insights regarding operations and the work environment, as well as a slew of new data-based revenue opportunities. It can also transform day-to-day operations at sea, at port and as part of a wider logistics network. Issues can be pinpointed, downtime can be reduced and processes can be streamlined, changing the face of the maritime industry as we know it," explains Soussia.

Alongside that, he sees AI playing a big role in "predicting the future course and movements of a vessel and relaying this information on-shore for ship masters to improve situational awareness and decision-making and create safer outcomes". He also says blockchain and big data analytics will play crucial roles.

5G usage, however, will be restricted to ports, according to the experts.

"Any cellular network is interesting for IoT, but the same range restriction applies; data can't be transmitted from the ship if it is circa 50 miles offshore or more. For this, only L-band MSS and VSAT will suffice, unless of course a store-and-forward approach is used, holding on to data until your ship is within cellular coverage. This, however, is counter-intuitive to the very reason for IoT, in that a continuous stream of data can provide operational benefits," Olsen points out.

With the launch of so many new technologies to ensure high connectivity at sea, the satcom industry is clearly driving both connectivity and digital transformation in the maritime industry. Those solution providers who continue to innovate will, no doubt, remain ahead of the game. PRO

With connectivity demands growing, Priya Patel says there is a real opportunity for satcom operators to create broader maritime connectivity platforms which use more hybrid connectivity, including VSAT, L-band, 4G/5G and Wi-Fi in port/coastal areas.

> "Satellite connectivity is enabling ships to become an extension of on-shore operations – effectively fully-functional mobile offices at sea"
>
> **Priya Patel, Regional Director APAC of NSSLGlobal**

5G IS THE FUTURE

As we gear up for ConnecTechAsia 2019, one of the key topics of discussion at Marina Bay Sands will be on 5G and how it will enable businesses in the coming years. We hear from some of the experts in the APAC market

When Verizon in the United States and SK Telecom in South Korea both rushed to proclaim that they were the first to commercially launch 5G services in April, the telecom operators were seen by many to be engaged in a game of one-upmanship.

While the race to be first may not make an impact on most users today, the technology they are rolling out is expected to change the way people live, work and play in profound ways.

Its impact is not in doubt among industry experts. There will be almost 400 million 5G subscribers by 2022, a short three years from now, according to research firm Ovum.

First-generation or 1G networks enabled voice, 2G brought text, 3G static images or photos, and 4G enabled video, said Ed Barton, Chief Television and Entertainment Analyst at Ovum, in an interview with the BBC in April this year.

"We're expecting the leap from 4G to 5G to be a much greater leap than ever before," he added.

Besides simply offering download speeds that are 20 to 100 times faster, 5G is expected to deliver new services that many users today are still yet to discover. As the technology matures, it promises to enable new use cases.

Many of them will make use of a unique feature in 5G – its low latency. In other words, there is very little lag between connections, say, between connected sensors or machines deployed in the field.

This means a user can remotely control equipment wirelessly with a lot more precision than before. Remote surgery, for example, may be possible now with 5G providing a reliable, low-latency link that lets a surgeon control a robotic arm with precision.

A number of other machines can be controlled wirelessly like this. For example, operators working lonely shifts high up in a container port's cranes may not have to be stationed in a small, cramped space in future.

They can use a 5G wireless link to remotely control the crane to load or unload containers safely – and in the comfort of a larger room.

The low latency can be used in a number of other future scenarios. Autonomous cars, for example, can benefit from a link that allows them to make split-second decisions on the go.

Virtual reality headsets are another possibility. On the go, a user can enjoy a much more immersive experience with the zippy, wireless connection. Of course, such devices have to be developed first.

That is one thing that manufacturers are rushing to do right now. With many operators launching commercial services in the next 12 to 18 months, handset makers are readying 5G devices to let more users hop into the fast lane.

When Verizon launched its 5G services in selected cities in the US, it relied on a snap-on module for a Motorola phone. SK Telecom, meanwhile, used a 5G version of Samsung's new Galaxy S10 phone.

The number of handsets is expected to increase in the months ahead, with many manufacturers, from Korea's LG to China's Oppo, all readying new phones that connect to the new network.

Perhaps the biggest breakthrough from 5G may not be its speed or even low latency but the way it allows telcos to run their networks more simply.

Instead of having to build out new features with big upgrades to the network equipment, a 5G network will be more modular, allowing telcos to add features more easily in future.

This will be key to their digital transformation, at a time when their network capabilities have to quickly match up to the changing demands of both businesses and consumers.

"5G is the fundamental springboard for the fourth industrial revolution. That is why it is so important to ensure that network capabilities are fully optimised for a successful 5G rollout," says Ong Geok Chwee, CEO of Bridge Alliance.

"By coming together as an industry, network telecommunication service providers can catalyse this co-creation process, realising 5G as a key digital enabler, unlocking new possibilities and business models across different industries," she adds.

Ong Geok Chwee, CEO, Bridge Alliance.

Despite the initial rush to be first, experts see 5G as a long-term project that will eventually connect up not just people but billions of things such as sensors, smartwatches and cameras more efficiently. Many of these are just coming online, though the speed of adoption is expected to pick up, comments Seizo Onoe, president of Docomo Technology and Chief Technology Architect at NTT Docomo.

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Within the next three years, it is estimated that there will be 500m 5G subscribers, according to Konesh Kochhal, Solutions Director of Huawei Southern Pacific Region. That took almost 10 years with 3G and 5 years with 4G, he points out.

Plus, 5G smartphones will be available roughly when the first 5G networks are rolled out commercially, he says, adding that the process took seven years for 3G and one year for 4G, leading to slower take-up in the past.

"By 2020, spectrum, the fundamental building block, will see completion of allocations or licensing procedures for new >3GHz bands in more than 60 countries globally, in addition to innovative solutions like Cloud Air (radio codification) that will enable usage of current spectrum in sub-3GHz band for 5G as well," he comments.

The large-scale 5G deployments are accelerated as the end-to-end ecosystem readiness is achieved even before the first commercial launch, a global first, he adds.

"The business models to monetise data through propositions around variable speeds, latency, connections and traffic are clear and already reshaping business value growth," he notes.

"Cloud X, namely Cloud PC, Cloud gaming and Cloud AR/VR, are the killer applications for 5G, offering carriers new means and methods to disrupt a $410bn market." PRO

Other activities that will be staged at CommunicAsia2019

- 5G Xperience
- Technology of Tomorrow
- Satcomm Stage
- APSCC Industry Briefing: Satellite in Asia
- SIG Workshop: The Evolution of Satellite Communication
- Smart Cities

THE MISSING LINK

Only by combining LTE MCPTT systems with L-band satellite solutions and new network agnostic push-to-talk gateways can disruptive technologies effectively serve remote and vulnerable APAC communities

From first responders to utilities and transport providers, all industries operating in remote areas of APAC rely heavily on radio communication to fulfil their daily jobs. For many of them, radio coverage issues are a regular occurrence, with white spots – where there's little to no radio reception – constraining their ability to provide vital services. This can have serious consequences, from restricting access to energy supplies to disrupting the provision of clean water and sanitation, and even putting lives in danger by limiting access to emergency healthcare and law enforcement.

In remote areas, including rural communities in Thailand, Vietnam and Indonesia, new radio communications technologies that enable clear, consistent and uninterrupted communication between all parties are keenly demanded by citizens and service providers.

The radio communications industry has recognised the need for change, and disruption in the market is rife. Right now, the main focus is on transitioning traditional LMR or DMR radios to long-term evolution (LTE) technology. First movers who have already adopted these new radio networks include the US, the UK, Australia and South Korea.

The US for example recently rolled out its FirstNet system, designed "to develop, build and operate a nationwide broadband network that equips first responders to save lives and protect US communities". The system has been established with considerable investment in LTE mission-critical push-to-talk (MCPTT).

For APAC, FirstNet provides tangible lessons in terms of driving interoperability and encouraging the use of MCPTT systems (the system brings a number of benefits, including access to 4G, increased network capacity and speed to mobile device users). However, it falls short of its mission to deliver nationwide coverage unless additional provisions can be made to address white spots in remote areas with little or no LTE coverage.

This issue is universal. If APAC countries also choose to invest in LTE MCPTT systems, then their first responders, utilities and other organisations operating in far-flung locations will experience similar issues.

Fortunately, the coverage gaps in remote areas can now be plugged by combining LTE MCPTT systems with L-band satellite solutions. This approach provides comprehensive and seamless coverage in non-urban areas where LTE and trunk radio are unavailable. L-band satellite terminals provide continuous, uninterrupted connectivity regardless of geographical location. They also provide a high degree of resilience regardless of environmental impact, including natural disasters, as they do not rely on a terrestrial network. In addition, L-band satellite solutions operate seamlessly with LTE MCPTT, LMR and DMR, consistently enabling seamless and continuous radio connectivity, as well as a continuous interface between the user's data device (computer, tablet or smartphone) and the central IT systems.

On-the-ground support can access this technology by extending VHF/UHF-based trunk radio systems with push-to-talk (PTT) solutions. A combination of radio, LTE and satellite provides users with beyond-line-of-sight voice and data communication that systematically routes communications between the most reliable terrestrial (2G/3G/LTE) and satellite (L-band) networks (multiple bearers). Such network-agnostic, user-friendly solutions provide a failsafe solution that enables users to make mission-critical and often life-saving voice calls, as well as send and receive important data in all conditions.

With great strides already being made to improve radio communication, APAC, with its vast number of white spots, is primed to make the leap into LTE MCPTT systems. Yet as the region considers upgrades to its radio communications networks, decision-makers should not lose sight of the limitations of LTE MCPTT systems. PRO

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