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Amy Saunders
Editor

It never rains but it pours...

The old idiom, 'It never rains but it pours,' is proving particularly apt these days.

COVID-19 continues to rampage throughout the world, leaving businesses, consumers and pretty much everyone racking their heads as to what to do next. In the UK, our vaccine rollouts are going strong despite criticism from conspiracy theorists and anti-vaxxers... Whether the vaccines will be the result we're all hoping for – since they reportedly reduce but don't stop transmission and severity – remains to be seen.

Meanwhile, in a break from the constant pandemic reports, our screens, social media, and newspapers have been filled with the incredible spectacle that is the latest drama from the British Royal Family. Love them or hate them, they have provided a welcome distraction for many during these trying times. Moreover, with mental health more fragile than ever right now for so many across the world, this latest news highlights the need for us all to consider our priorities.

In brighter news, NASA's made a huge step forwards on a very exciting project, with the Space Launch Systems (SLS) 'megarocket' having passed a major assembly milestone. Ultimately planning to transport astronauts and cargo to the Moon and Mars, this month, the ten segments which comprise the two booster rockets were successfully stacked over several weeks at the Kennedy Space Centre. SLS will, once complete, be the most powerful rocket ever made at a hefty price tag of US\$18.6 billion. The rocket is expected to achieve its first test flights later this year, an ambitious feat that will take it one step closer to landing the first ever woman and next man on the Moon with the Artemis III mission.

Onto the important stuff! In this issue Hughes has outlined the contemporary risks and priorities with the growth of data networks, while METIS Cyberspace Technology discusses the importance of ship system interoperability with the drive towards digitisation. Comtech EF Data opines on value leakage, the biggest challenge in ground infrastructure networks today, and how they might be resolved for less than you might think. Meanwhile, we've explored the latest developments in MEO satellite systems, and checked in on the latest trends in digitisation; underground, at sea, and in space. ■

“The rocket is expected to achieve its first test flights later this year, an ambitious feat..”

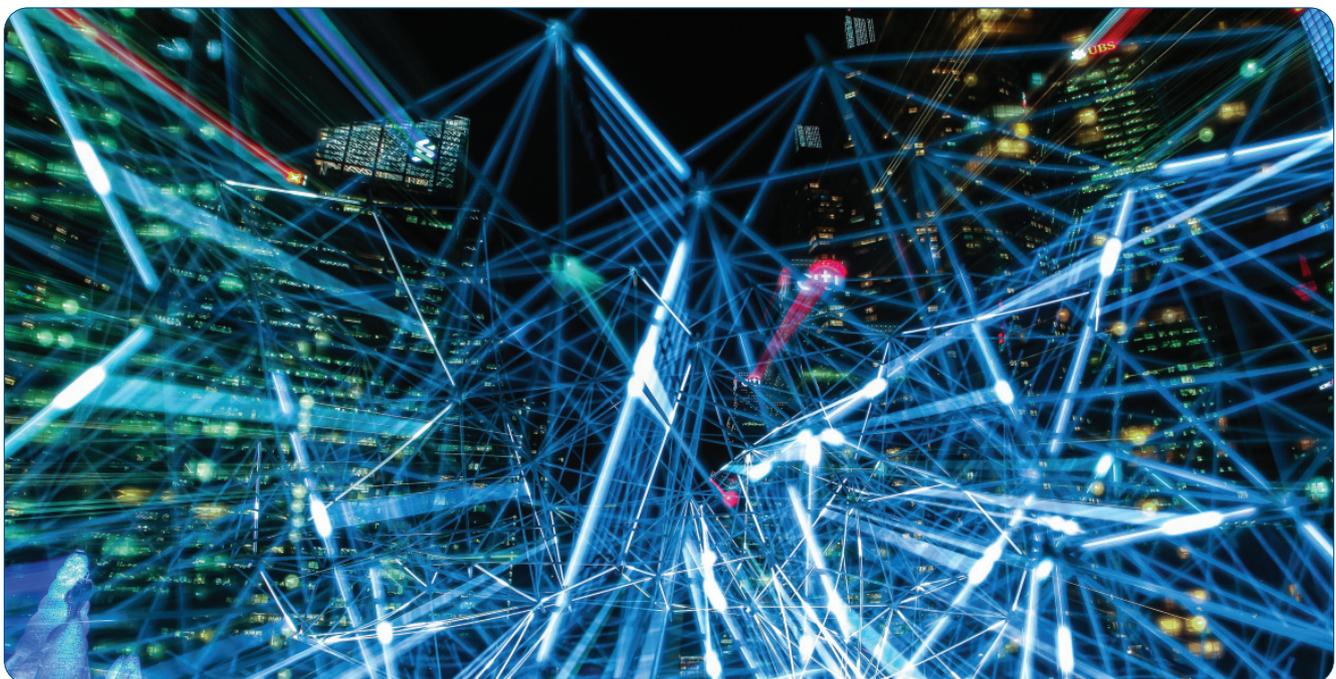


Photo courtesy of Pexels

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MEO - an underestimated orbit?

While classically under-discussed, MEO orbits are seeing healthy demand from large customers making excellent use of its best-of-both-worlds capabilities between the binaries of LEO and GEO. Whilst many players are hungry to differentiate with the best throughput or coverage, the sober middle-ground possesses plenty of advantages of its own.



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Front cover: Photo courtesy of Toria/Shutterstock



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Photo courtesy of NOVELSAT

BSNL selects NOVELSAT hub system for remote islands connectivity

NOVELSAT, a global leader in content connectivity over satellite, has been awarded a contract by System Integrator Precision Electronics Ltd (PEL) on behalf of BSNL, the Indian state-owned telecommunications company, to provide high-capacity satellite-based connectivity for broadband and backhaul services under a Universal Service Obligation (USO) project funded by the Department of Telecommunications.

BSNL is looking to increase its network capacity to address growing demand for broadband amidst sharp rise in data consumption across users and locations. PEL along with its technology partner NOVELSAT addressed the BSNL requirement, and in turn their customer BSNL selected NOVELSAT's Xnet Data hub system for the exceptional efficiency and flexibility it offers for growing BSNL network.

Designed to support the growing needs of hub network operators, NOVELSAT's Xnet optimizes and maximizes both performance and usage of satellite and network resources. Utilizing NOVELSAT's DynamiX technology for dynamic allocation of network resources in MCPC/Point-to-Multi-Point networks on top of the most bandwidth-efficient waveform, NOVELSAT NS4™, significantly improves network economics

NOVELSAT partnered with Precision Electronics Limited, a listed company in India to offer its solution to BSNL. Precision Electronics Limited brings in network elements like networking gear, antenna & indoor/outdoor electronics, and overall systems integration beyond the core satellite hub and remote solution from NOVELSAT.

"BSNL's network requires the highest levels of network quality and flexibility. NOVELSAT's proven track record, combined with its leading-edge technology, allow us to rapidly expand our network and offer better services to our customers," said Sh. Sanjay Kumar, GM (Radio) at BSNL. "NOVELSAT has been selected to meet our challenge of providing highly efficient and reliable broadband connectivity between our country's islands and the mainland. With this

solution we are supporting the goal of accelerating the economic growth and bettering the life of the islands population."

"We are honoured to play a part in the rollout of enhanced broadband connectivity to the people of Lakshadweep, Andaman, and Nicobar Islands, and we are committed to supporting BSNL during these challenging times, as it implements its network development," said Gary Drutin, CEO of NOVELSAT. "The BSNL deployment is a great example of the benefits offered by NOVELSAT's Xnet data hub system, delivering a high capacity, scalable solution with maximum performance and efficiency." ■

KVH partners with Tile Marine for KVH watch maritime IoT solution

KVH Industries has announced that Tile Marine, a leading marine services company in India and the Middle East, is now a KVH Watch® Solution Partner and will offer KVH Watch connectivity to augment its extensive maritime solutions. Tile Marine's services cover a wide range of electrical, electronic, and mechanical work for shipowners and shipyards including installation, maintenance, and repair of communications equipment, integrated bridge systems, and other critical maritime equipment.

"With KVH Watch connectivity, we will be able to extend our services and add remote monitoring, condition-based monitoring, and assistance for a repair even if there is an incident in the middle of the ocean," says Pravin Raghavan, Managing Director of Tile Marine. "Many vessels are looking for this level of service but what has been missing in our opinion was the reliable backbone of connectivity to transfer data from the ship to shore. Our ability to offer these services will be a great comfort to our customers."

"When you combine dedicated KVH Watch IoT connectivity with Tile Marine's extensive experience in supporting everything from bridge systems to below decks equipment, shipowners and managers will be able to enjoy the most comprehensive remote service experience to date,

including remote troubleshooting sessions at deep sea,” says Sven Brooks, Senior Director of IoT business Development for KVH. “Tile Marine’s entire ecosystem will benefit from this ability to do it all remotely.”

The need for dedicated connectivity to transfer real-time data from ship to shore is well known by marine services technicians and IoT analytics experts who find themselves challenged with limited bandwidth if a vessel is equipped with only one communications system. With dedicated IoT connectivity, it becomes possible to monitor performance data, quickly identify specific equipment issues, and support high-speed video troubleshooting while the vessel is at sea, saving time and money when the vessel is in port. IoT connectivity can also be a benefit in other maritime situations, including sea trials and regulatory activities.

For example, during sea trials, representatives from the major equipment manufacturers are on board for several days; the ability to do a remote troubleshooting session during the sea trial saves time and money, particularly when it eliminates the need to return to port. Regulatory activities such as a government’s need to certify whether vessels are fishing in approved zones can be greatly aided by real-time data. A dedicated IoT connectivity solution is also critically important for reducing cyber risks by keeping the flow of a vessel’s operational technology (OT) data separate from its information technology (IT) data.

KVH Watch is an IoT Connectivity as a Service solution that provides Flow, secure 24/7/365 machine-to-cloud satellite connectivity for remote monitoring of onboard equipment plus the ability to perform on-demand Remote Expert Interventions using video, voice, or text via KVH’s global HTS network. KVH Watch is designed for maritime equipment manufacturers, multicaud service providers, and shipyards seeking affordable monthly subscription-based connectivity that L-band and cellular services cannot deliver at deep sea. ■

Rajeev Suri, CEO of Inmarsat, reappointed as a Commissioner for the UN Broadband Commission

Rajeev Suri, CEO of Inmarsat, the world leader in global, mobile satellite communications, has been reappointed as a Commissioner to the UN Broadband Commission for Sustainable Development. Founded in 2010 by the International Telecommunication Union (ITU) and UNESCO, the Commission was established to bring the goal of universal broadband connectivity to the forefront of policy discussions.

The commission examines and advises on what steps need to be taken to shore-up digital networks, strengthen capacity at critical connectivity points like hospitals and transport hubs, and boost digital access and inclusivity. The work is particularly relevant

in light of the Covid-19 pandemic and the increasing frequency of natural disasters.

Suri was first appointed to the Broadband Commission in 2016. During his time in the role, he has co-chaired the Digitalisation Scorecard group and also the Digital Health group. With his reappointment, Suri will continue to focus on ways to improve connectivity globally, especially in more remote and underserved areas, as well as through the use of technologies including satellite communications, which can help deliver services to these hard-to-reach locations.

Commenting on his reappointment, Rajeev Suri, CEO of Inmarsat, said: “Covid-19 has highlighted the need for resilient connectivity and affordable access, wherever you live and work. We urgently need to extend broadband into every rural area, every underserved community, and every global trade route. Digital inequality has to be addressed and that includes



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Rajeev Suri, CEO of Inmarsat

using satellite communications to overcome it. Inmarsat has been connecting people for 40 years and I hope our work, alongside others on the Broadband Commission can help tackle this challenge.”

The UN Broadband Commission’s Annual Spring Meeting is being held today and will focus on building an inclusive post-Covid digital future. It will consider the challenges of increasing connectivity and tackling digital inequality given that 49percent of the world’s population is still unconnected. ■

OneWeb and SatixFy sign agreement for In-Flight Connectivity (IFC) compact terminal

OneWeb, the global communications network powered from Space and SatixFy UK, a leading multibeam antenna and terminal design specialist, have signed an agreement to develop a new In-Flight Connectivity (IFC) terminal that will work over the OneWeb network as well as on Geostationary (GEO) satellite networks. SatixFy UK has formed a Joint Venture with Singapore Technology Engineering Ltd (ST Engineering), called JetTalk, to exclusively commercialize the IFC terminal for Commercial Aviation markets.

The agreement reaffirms OneWeb’s ambitions in the global aerospace arena as it sets out its roadmap to support commercial, regional, business and government aviation users.

The IFC terminal will unleash the power of OneWeb’s Low Earth Orbit (LEO) constellation and deliver a ‘home-equivalent’ inflight broadband experience, while also allowing operators to complement their legacy GEO service. The product is based on SatixFy’s Electronically Steered Multibeam Antenna (ESMA) technology, developed together with JetTalk, and provides multibeam capability and operates simultaneously on multiple LEO and GEO satellites.

Well positioned to bring ESMA technology to the market earlier than originally anticipated, SatixFy, has recently completed the development of Tx tile of 576 elements and Rx tile of 1024 elements, that can be used as building blocks

for the planned terminal. The tiles, which have been co-developed together with JetTalk, have completed initial testing and are currently being implemented inside a terminal product. The OneWeb IFC terminal will integrate the OneWeb modem as well as a GEO network one, inside the terminal.

OneWeb is confident of its suitability for all aviation applications - commercial, regional, business and government aviation use-cases. Ben Griffin, VP Mobility at OneWeb, said: “OneWeb is creating IFC solutions which offer a significant increase in the whole passenger travelling experience. This agreement with SatixFy represents a major milestone for OneWeb Aviation, as we plot our path to facilitating onboard connectivity, globally, on commercial airliners and corporate jets, large and small.”

“The ability to deploy multibeam, multi-satellite, multi-orbit IFC terminals is key in SatixFy’s offering developed in partnership with ST Engineering through our Joint Venture – JetTalk.” says Yoel Gat, SatixFy’s CEO. “Aggregating capacity from multiple satellites will give customers the grade of service they expect on flights. This great leap forward is made possible thanks to the continuous support by ESA and UK Space Agency.”

Catherine Mealing-Jones, Director of Growth at the UK Space Agency, said: “The last year has shown connectivity has never been more important to our daily lives, and it is exciting to see SatixFy and OneWeb working together to provide aircraft with broadband internet for the first time. The new aviation terminal will make use of the Prime, Beat and Sx3099 ASIC chips developed with UK Space Agency backing, showing how supporting our most innovative companies leads to results that make a real difference for people all over the world.”

Elodie Viau, Director of Telecommunications and Integrated Applications at ESA, said: “Space and satellites are becoming increasingly important to the digital economy and there is a need to get data all the time and everywhere - even on board a plane. ESA is proud to have supported SatixFy in the design of the chips used for this terminal – enabling the digital transformation of society using telecommunications satellites.” ■

Express-80 satellite comes into service

Russian satellite communications company (RSCC) confirms commercial service introduction (CSI) of Express-80 communications and broadcasting satellite. The satellite belongs to the RSCC orbital constellation at 80° E. The Express-80 flight tests were carried out in full and with positive results.

The spacecraft is intended to provide fixed and mobile services; digital TV and radio broadcasting; high-speed Internet access, as well as data transmission across the Russian Federation and abroad.

Yuri Prokhorov, RSCC Acting General Director, said: “The orbital slot of the Express-80 spacecraft at 80° E east longitude. i.e., over the very centre of Russia, makes it possible to provide state-of-the-art and reliable communications and broadcasting services to users almost anywhere in our country. With the launch of the new satellite, we are offering the market fundamentally new products that are in high demand on the market today: packet digital broadcasting, Internet access on the move, distance education and telemedicine.”

The Express-80 spacecraft was launched into geostationary orbit from the Baikonur Cosmodrome on July

31, 2020. The satellite was manufactured by the leading Russian enterprise in the rocket and space industry - JSC ISS Reshetnev Company in collaboration with its European partner, Thales Alenia Space. The Express-80 spacecraft service life is 15 years. ■

SES announces total reach of 361 million TV homes worldwide

SES has announced the results of its annual Satellite Monitor market research, the industry’s premier accounting of satellite’s TV reach, which underscore SES’s established position as a leader in enabling direct and indirect content delivery via satellite. SES continues to lead the industry by delivering 8,265 channels, with almost 3,000 of them in HD, to a total of 361 million households worldwide.

This year’s Satellite Monitor survey showed continued growth across Europe (+2 million households) and Africa (+2 million households). At SES’s prime orbital neighbourhood of 19.2 degrees East, SES’s satellites now serve an unparalleled 118 million households or over 43 percent of all European TV homes.

The number of TV homes receiving HD content from 19.2 degrees East also continued to increase to 84 percent, representing an increase of almost 30 percent over the past five years.

In Africa, SES has also seen its TV reach increase in the Ethiopian TV market as a result of establishing Ethiopia’s first-ever dedicated TV platform, Ethiosat, on NSS-12 at 57 degrees East. The TV penetration in Ethiopia has tripled compared to four years ago and is at 49 percent in YE 2020.

Overall, SES’s reach to TV homes is marginally down this year largely due to a change in reporting methodology implemented by the regulatory authority in India requiring a new definition of active subscribers.

Additionally, key trends have been identified in the European market:

- HD and UHD growth – satellite remains the platform of choice for HD, representing nearly 40 percent of HD TV homes and almost the same as cable and IPTV homes combined. In addition, UHD screens increased 5 percentage points since 2019 and are now present in 20 percent of European TV homes.
- OTT content is complementary – Over-the-top TV complements and does not replace linear TV. Over the past five years OTT TV has grown by 138 percent whereas traditional linear TV – whether through satellite, cable, IPTV or terrestrial – has largely remained stable.

“An industry bellwether report, this year’s Satellite Monitor survey once again confirms SES’s established leadership position in terms of our global reach combined with our focus on delivering the most immersive viewing experience through HD and UHD content. The COVID-19 pandemic has driven content consumption higher than ever, and in large parts of the world, linear TV remains the primary choice for people to consume news and information. We will continue to innovate to enable our video customers to reach as many audiences as possible via multiple screens,” said Steve Collar, CEO at SES. ■



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Leveraging artificial intelligence and machine learning

Hughes is an international leader in high-speed satellite data networks. As data becomes increasingly relevant to the fabric of our lives and businesses, artificial intelligence and machine learning are being leveraged by innovative market leaders to fill the gaps in these systems, and Hughes is no different. We asked Senior Vice President of Enterprise Dan Rasmussen to discuss how Hughes is staying ahead, particularly with their cutting-edge AI Ops feature.



Dan Rasmussen, Senior Vice President of Enterprise, Hughes

Laurence Russell, News & Social Editor, Satellite Evolution Group

Question: What impact has the age of big data and machine learning had on the demand for sophisticated networks and administration tools?

Dan Rasmussen: If I had to sum up where we are today in how businesses are leveraging increasingly sophisticated networks, I would say that we've seen a shift from using data for status to using data for *action*. Take package tracking as an example. A consumer today can place an order online and

then watch the data as the order gets processed and travels from depot to vehicle until it reaches their house. I can literally watch the UPS truck from the time it leaves the depot, through my neighbourhood until it stops to deliver a package to my front door. That visibility into the data has set the bar for enterprise network users using data for status. They fully expect that the network administrator, the solution provider, and the network access providers are able to tell them what's going on with their network at any point in time, anywhere on the network.

What's changing is the need to use that data, not just for status, but to take action. Using our package example, I not only watch the package as it moves from point A to point B, I could reroute it along the way. If I have to be away

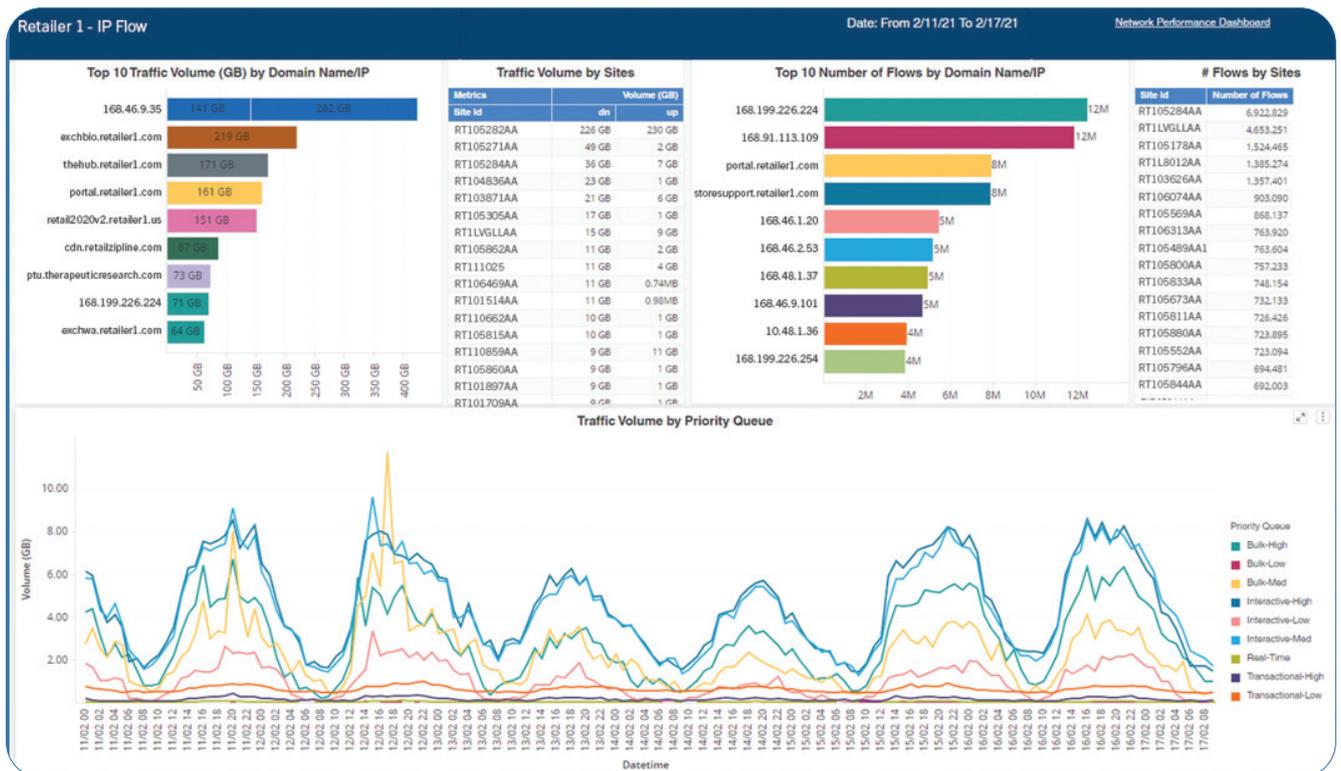


Photo courtesy of Hughes

from my house the day the package is due to arrive, for instance, I can change the delivery address to a neighbour's house.

This is the kind of demand we see in enterprise data networking. It's the unprecedented flexibility for the user to react to traffic and modify parameters in motion to ensure the best performance and precision in meeting specific network demands. And with the advent of AI and ML, it is automating that fine tuning of the network, so the customer or service provider doesn't have to continually make those adjustments directly.

Question: How are network developers keeping up with these demands and incorporating new industry trends?

Dan Rasmussen: To keep up with demand and maximize innovations, we're chiefly looking at patterns within the data. The amount of information generated by the number of devices in use across our networks is staggering. Where, historically, a business had a router bouncing data off a satellite back down to a hub, today a single enterprise site might have a router plus a firewall, and SD-WAN platform, access points, and various types of transport. There are now so many different devices and users and applications that new trends like AI and ML are the only way to make any sense out of it.

The key thing that we're working on in development is how we use data science to find the underpinning

patterns. That means processing historic data that we've stored for years to recognise these patterns across huge timescales. We held onto this data with the exact anticipation that teachable insights were within them – we just needed the tools and context of the modern world to substantiate their value.

This helps us recognise when and how things go wrong so that we can better flag those behaviours and, more importantly, predict them before they impact network performance, all to better act on them in the right ways. Predictive and proactive methods of data management are our priorities today.

Question: What's the state of artificial intelligence on network management?

Dan Rasmussen: If you look back over the years, we've been using data science for some time – whether we used the AI/ML acronym or not. For example, I can go back eight or nine years ago to when our business used algorithms to find satellite sites that were gradually getting miss pointed. If bolts weren't tightened down enough, antennas would slowly drift out of alignment in such a way that a human wouldn't notice.

Day to day, it just wasn't that big of a change. However, the algorithms could flag the change over time and alert us if a site was drifting out. We didn't use the words "machine learning" for that; it was just a way of using our

signal data to improve customer results.

Today, we use the same types of tools and systems and, rather than just flagging when a problem requires human intervention, we're advancing our artificial intelligence application to the next logical step: creating a self-healing system that corrects its own infrastructure.

As an example, we've been able to identify certain firewall states that develop two to three weeks before a piece of equipment is likely to fail. After categorizing these key indicators, we trained our algorithms to identify them and then reach out and reset the equipment or change configurations automatically. This way, our self-healing AIOps feature predicts and pre-empts equipment outages.

I think that's an application that is on the rise in artificial intelligence. The question will be, how far do you let the AI go in making proactive changes before you involve the human element?

Question: We've also seen a rise in the popularity of multi-transport networks and SD-WAN. How has Hughes responded?

Dan Rasmussen: We've been doing multiple transports since 2005 by combining satellite and wireline connectivity. Today, we work with over 400 different network access providers in the US alone, including fibre, cable, LTE, DSL, and satellite providers. As we continue to offer enterprises – and eventually consumers – the opportunity to have multiple transports, the artificial intelligence side of it becomes more and more important.

The objective with multi-transport is to optimise that traffic, not only based on network performance but in consideration of the application and costs. Let's say that an enterprise site has both DSL and LTE transport available. At a pure network characterization level, LTE may look better, with more bandwidth and potentially lower latency. But it doesn't make financial sense to only use the LTE transport since it is usage sensitive in pricing. It makes sense to send the bulk data transmissions on DSL and move only the high priority traffic over to LTE.

The algorithms are getting better and better at understanding how to mix and match multiple variables to get the best performance and cost out of the multi-transport network.



Photo courtesy of Hughes

Question: What can you tell us about Hughes' new AI Ops feature?

Dan Rasmussen: We put our self-healing WAN edge AIOps feature in place about twelve months ago to offer self-healing at the network edge for all of our enterprise customers using our HR or Fortinet platforms.

The feature watches for a set of characteristics that suggest the equipment at the customer site is headed towards a performance issue. In this instance, the algorithm runs completely on its own, observing (predicting) the edge devices on the network and correcting (self-healing) any issues.

The system effectively generates a report that tells us: "at 2 am last night, local time, I reset this equipment." The algorithm then watches to see if that box re-enters that state; if it does it two or three times, we treat it as a chronic site

and proactively investigate with a human.

Based on our 2020 results, over 97 percent of the sites that we self-heal continue for months and months without any recurrence of the issue. If you assume that each incident averted would have caused the customer a three- to four-hour outage, that's a significant amount of downtime that we've been able to avoid for our customers.

Question: How can AI Ops benefit satellite networks and transport?

Dan Rasmussen: For satellite in particular, I think it's going to become much more relevant as the new generation systems come online. In the historic satellite world, the networks were generally "hub and spoke," so you might only use AI to prioritise or train application performance between a

remote and hub. If you look at the architecture behind the LEO systems, the MEO systems and even our next-generation GEO, there are exponentially more uplinks. That means dramatically more complexity. AI and ML allow the network operator to step back and let the technology help guide the optimal performance characteristics. Our HughesNet system in the Americas is a great example of the complexity with more than 40 uplink locations and 1.5 million remote terminals.

If a hub is going into rain fade, for example, AI can shift that traffic to another gateway facility and then back again when the conditions clear. That kind of complexity creates change so fast that no human could move the switches quickly enough to ensure a seamless customer experience for all of the users on the network. AI and ML in the satellite world will become increasingly more important to the process of running the networks themselves.

Question: What are your expectations for AI Ops going forward, and what can we expect from Hughes in the frontier of artificial intelligence and machine learning?

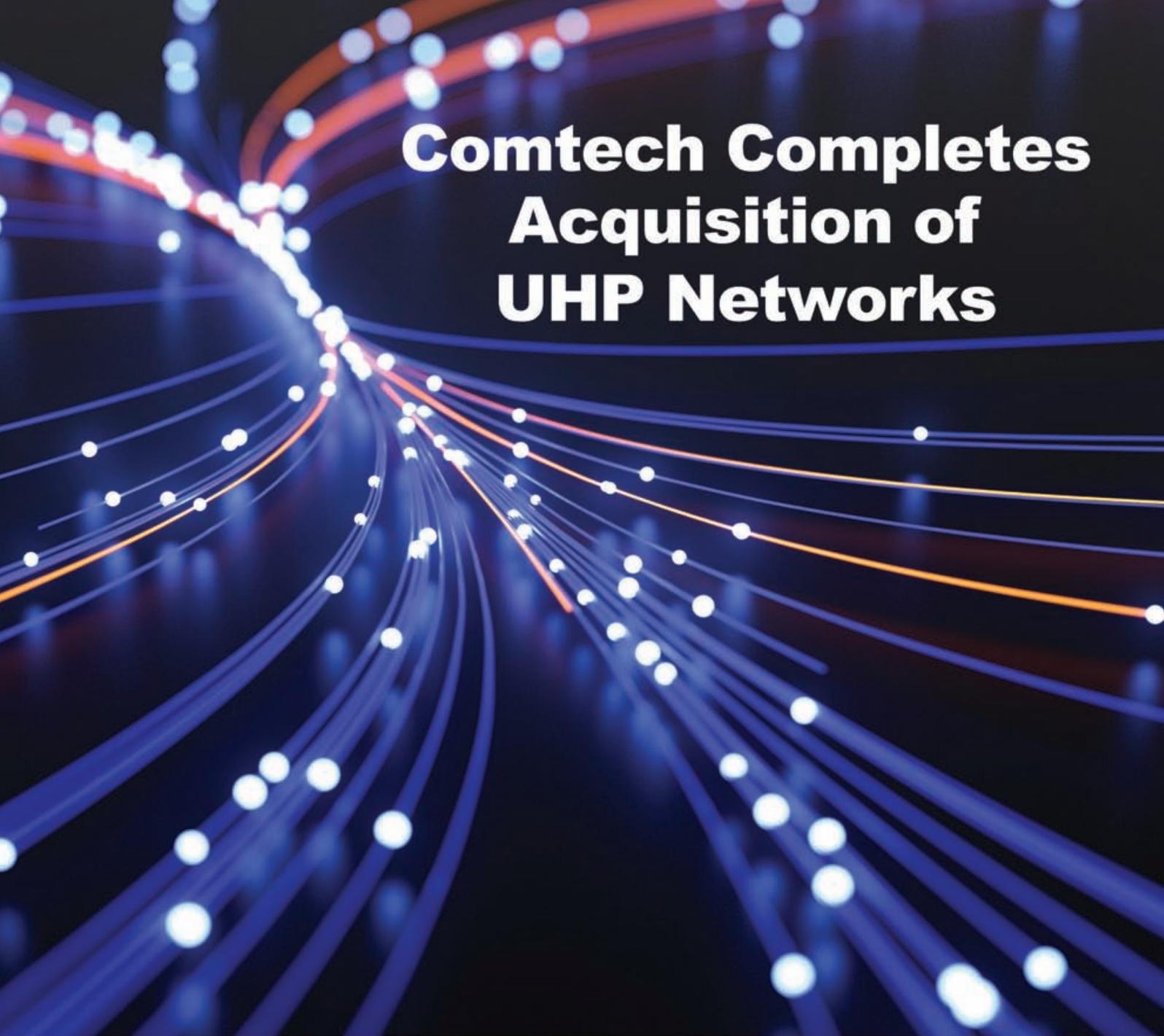
Dan Rasmussen: We will continue to evolve our AIOps capabilities and apply both AI and ML to our own as well as our customers' increasingly complex and sophisticated networks. For example, in our own consumer network, we are using AI to triage home Wi-Fi issues. Instead of needing to have the customer supply information on their Wi-Fi status, we can use an AI feature on the network to identify if the issue is with one of their connected devices, the access point or the satellite.

We believe that over the next several years, the competitive edge in network management will come from a differentiated user experience brought about by a more sophisticated network management interface and overall customer experience.

It's not enough to just move bits and bytes; we're working to understand and connect with each and every user on our networks and make their experience better for them. More and more users, consumers or enterprise – whether in their home at work or on a mobile device– expect an increasingly seamless high-performing network experience, and AI/ML is an essential ingredient to meeting – and exceeding – that expectation. ■



Photo courtesy Hughes

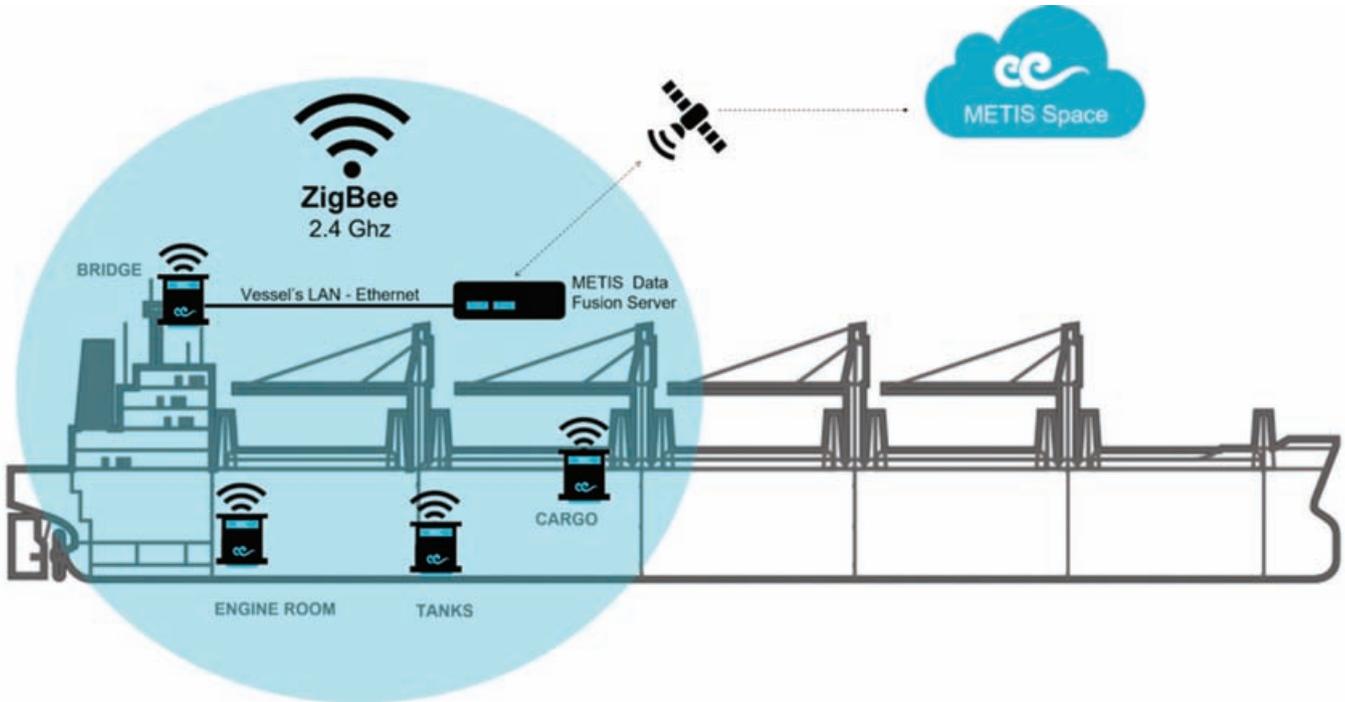


Comtech Completes Acquisition of UHP Networks

The acquisition of UHP Networks fits perfectly with Comtech's strategy to build the most robust communication solutions for our global customers. By leveraging UHP's cost-effective, innovative and disruptive ground station technologies with our strength, stability and reliability, we are uniquely positioned to deliver solutions that meet our customers' needs. Let's explore how the combined team can deliver benefits for your network. **Contact us today.**



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Cybersecurity but without the digital limits

If 'IMO 2021' brings clarity on cybersecurity, attention must now turn urgently to ship system interoperability so that the true rewards of digitalization are not allowed to slip through shipping's grasp.

Serafeim Katsikas, CTO, METIS Cyberspace Technology

International Association of Classification Societies Recommendations on Cyber Resilience unsurprisingly feature shipowners and connectivity providers among the "many stakeholders" involved in the International Safety Management (ISM) Code cyber provisions from 2021.

With ship owners/operators tasked with keeping software onboard updated and crew alert to meet cyber threats, 'service providers' are to ensure procedures, technical competence, reporting and remote maintenance are up to requirements.

However, stakeholders also include data providers, whose ability to acquire data from shipboard sensors, store it, pre-process and transform it, then evaluate it and use the results for decision-making purposes provide the platform for shipping's digital revolution. In this context, cyber security relies on preserving data 'quality,' its safe production, delivery, and integration.

Data stake holding

As one such data provider, METIS Cyberspace Technology already uses the scalability, unlimited storage, and processing power of cloud computing to empower Big Data analytics, machine learning and AI onboard 250+ ships. Today, its

solution gathers 1.5 billion sensor measurements every month, using these inputs as a game-changer in decision-making across a range of performance parameters, including fuel consumption, emissions, hull fouling and charterparty agreement fulfilment.

In doing so, and based on real installations, the METIS platform has been refined to standardize interoperability with leading navigation, cargo control and alarm monitoring systems, as well as with torque meters, flowmeters, steam production and Power Management & main switchboards.

METIS does not specialise in cybersecurity, therefore, its position as stakeholder rests in the need for its cloud-based platform data acquisition, pre-processing, uploading and transmission to be fully cyber resilient. Regardless of its source, the METIS solution allows data to be filtered and stored in a central database, while any processing, analysis, functionality, and service implementation are executed by independent microservices.

All microservices are interconnected either through an Application Programming Interface or a common Message Bus System, so that none has direct access to the main database to execute SQL inquiries. Any applications or users are prevented from accessing a vessel's information without permission, while the administrator can see, set, and revoke user and app permissions.

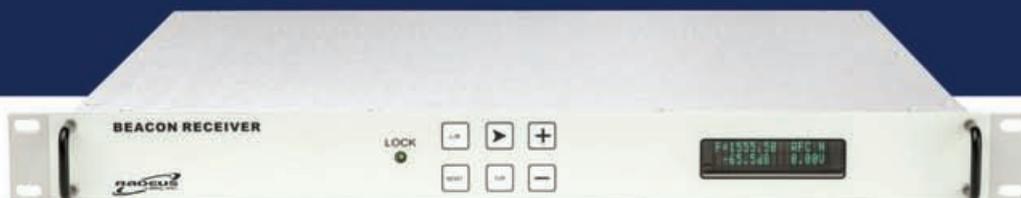


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Serafeim Katsikas, CTO, METIS Cyberspace Technology

Ships typically feature diverse digital interfaces and fragmented systems, and their IT networks can sometimes be of low quality and do not unify all systems on board. Given these conditions, vessel control and monitoring systems are accepted as the most viable route to digitalisation.

Here, stakeholders look to the International Standards Organization for recommendations covering a ship's control and monitoring systems encryption and threat detection capability, rather than to IMO itself. However, at a time when cybersecurity is uppermost in the maritime consciousness, a CIMAC 'Systems Integration' Working Group merits separate attention, given its special focus on the design and use of alarm and control systems to manage marine hybrid propulsion.

Cybersecurity requirements provide a 'golden thread' running through the work of this group. Even so, while some stakeholders may still be catching up with IMO2021 regulations, the group is also deconstructing the shipboard control and monitoring system itself in a way that aims to conserve cybersecurity while advancing interoperability.

In doing so, the Systems Integration WG defines monitoring system functionality as:

- Data acquisition (including hardware/software for measurement and conversion to signals);
- Data storage - in the acquisition module, the virtual server, the cloud, or backend system;
- Data pre-processing and transformation;
- Interpretation and evaluation (may vary); and

- Information and recommendations supporting decision-making.

Interoperability standards

Looked at from the practical situation as it exists today, the group's work suggests that opportunities exist to avoid duplication by 'synthesizing' modules from multiple systems within each category, and standardizing system or module interfaces to enable interoperability by sharing data and services.

International Electrotechnical Commission data exchange standards can already be used to access data from navigational equipment, for example. Again, while standardisation has not so far been achieved for ships' machinery, equipment, etc., ISO standards do provide unified rules for developing machine and human-readable identifiers and data structures to enable exchange and processing of sensor data from ships.

What is more, ISO standards provide guidelines for the installation of ship communication networks for equipment and systems: This means a monitoring system defined as a shipboard data server and sharing information to any other system can already be designed to ISO recommendations.

At a time when owners can feel pressurised to follow the digital lead of individual equipment makers, or to settle for the absurdity of multiple cloud-based solutions, METIS therefore believes strong focus should be placed on standardising shipboard control and monitoring systems. We will therefore continue to work closely with our partners to realise a vision for the digitalized maritime industry whose common goals of safety, security, environmental performance, and efficiency are best served by common solutions. ■

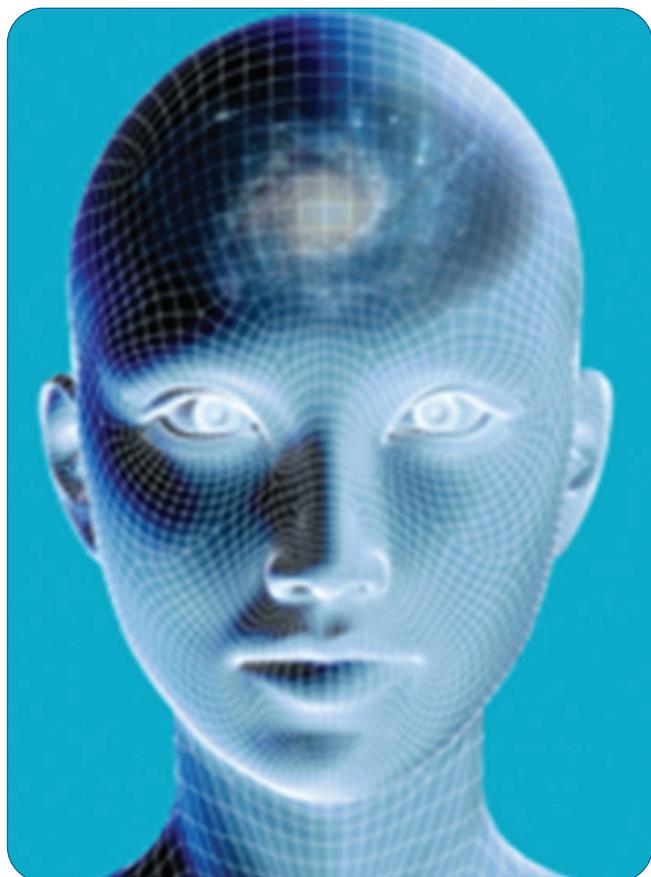


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MEO – an underestimated orbit?

While classically under-discussed, MEO orbits are seeing healthy demand from large customers making excellent use of its best-of-both-worlds capabilities between the binaries of LEO and GEO. Whilst many players are hungry to differentiate with the best throughput or coverage, the sober middle-ground possesses plenty of advantages of its own.

Laurence Russell, News & Social Editor, Satellite Evolution Group

Strictly categorised as anything above 2,000km and below 35,786km, MEO is perhaps the least discussed of our orbital frontiers, quite commonly folded into discussions around LEO under the NGSO umbrella, though often such constellations include MEO units in the extreme minority.

Higher-end MEO satellites can transmit data at up to 1.6Gbps, beating out some home fibre connections. Though LEO can offer even higher throughput, the altitude of MEO offers some unique advantages for coverage.

Starlink, OneWeb, SES, Kepler and Telesat's constellation fleets style themselves as LEO/MEO installations, though as the newer technology, with competitive pricing, LEO often takes centre stage.

While LEO and MEO are ultimately quite distinct, if we continue to see them regarded in parallel terms, it's possible the lines between them could blur, particularly if low Earth congestion becomes as much of an issue in the next ten years as contemporary experts have warned. Perhaps the profitability of LEO connectivity that the mainline mega-constellations are set to establish could excite new players, who may be forced to deal in MEO space in the wake of near-future orbital congestion regulation once the LEO range is considered "full."

It's also worth noting that, though a LEO satellite's throughput can always be upgraded, the physical limitations of its range in LEO space is not so easily addressed. There are simply advantages in MEO that cannot be emulated elsewhere, and whilst today MEO space stands as a somewhat unpopular orbit, the NewSpace economy of the future could find itself turning around on it quite rapidly.

The O3b ecosystem

While MEO is sometimes regarded cynically as an unhappy middle-ground between the supreme range of GEO and ultra-low latency of LEO, MEO's ability to balance coverage and connectivity is often considered well-suited for certain purposes. SES Government Solutions recently reported it was fielding an O3b medium Earth orbit (MEO) low-latency

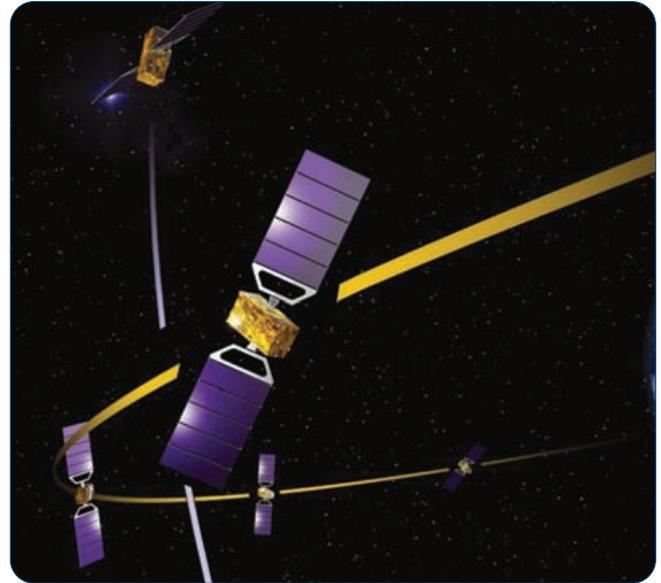


Photo courtesy of ESA

high-throughput loopback capability for mission-critical Department of Defence (DoD) communications in southwest Asia.

The configuration leverages two MEO beams in looping back across five sites, each providing 450 Mbps of capacity, connecting users across their range, providing strong service which may bridge toward SES' next-generation O3b mPOWER system.

"As the need for secure communications and timely access to critical data on the battlefield increases," explains President and CEO of SES Government Solutions, Brigadier General Pete Hoene, USAF (retired). "So does the need to have resilient and robust high-performance connectivity from any location." The provision stands as another example of



President and CEO of SES Government Solutions, Brigadier General Pete Hoene, USAF (retired)

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Tom Keane, Corporate Vice-President of Azure Global

how defence connectivity can make use of commercial gateways. The SES Government Solutions O3b system was always intended to go the extra mile to connect its customers, spanning a wide spectrum of maritime customers and underserved communities using thousands of user beams per satellite, and so is well-suited to providing for defence and mission-critical partners too.

As a unique HTS constellation using MEO, O3b beats out competitors where range is considered, while cutting costs in terms of smaller fleets and simpler telemetry, spreading out across an emptier orbital height where it's a lot less crowded compared to LEO.

SES also plans to use the expanding O3b ecosystem to bring cloud closer to the customer and enable edge computing to support 5G technologies. In September of 2020, SES joined Microsoft as it's Azure Orbital partner, cementing its commitment to providing cloud services.

Tom Keane, Corporate Vice-President of Azure Global penned a blog post last October describing Azure's vision, explaining: "The space community is growing rapidly, and innovation is lowering the barriers of access for public- and private-sector organisations. With Azure Space, we have the ambition to make space connectivity and compute increasingly attainable connections across industries including agriculture, energy, telecommunications and government."

GPS goes MEO

Another consummate MEO service is ESA's Galileo constellation, a highly accurate global positioning service (GPS) set to offer accuracy down to the metre range, supporting dual frequencies in interoperability with Glonass, its US and Russian equivalent.

Consisting of 24 satellites at 23,222km and two ground control centres, Galileo provides coverage across the breadth of Europe, even extending to the high latitude of Norway's North Cape - the highest tip of Europe. The constellation ensures reliability through three active spare satellites per orbital plane, ensuring that a potential satellite loss will not result in a dip in service for the user.

With Galileo's second-generation wave up for bid, the landmark MEO GPS system is still gaining steam. The first satellites of this new 'G2' constellation are projected for launch by the end of 2024, alongside their associated ground systems. These models will be built with the functionality to be reconfigured in orbit, in expectation of the in-orbit servicing market experts have long been prophesising.

While in-orbit servicing is a horizon technology traditionally relating to LEO, MEO satellites usually aren't much further out from LEO space, and can still benefit from much of the cost-saving concepts of satellite repair, adaptation, and upscaling.

Time in the spotlight

MEO orbits may currently feel like the black sheep of the herd, but the advance of NewSpace technologies suggests it won't remain that way. With plenty of functionality and uptake yet to be realised, and proper orbital traffic regulations yet to be defined, the wide spaces of MEO and its favourable ranging advantages suggest its time in the spotlight could be on the way. ■



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The digital revolution

Digitisation has been taking over the world in recent decades, with traditional pen and paper, hardback books and vinyl records all being replaced by intangible digital solutions. While some mourn this loss of physical goods that you can hold in your hands and keep for decades, the benefits of digitisation including efficiency and cost savings are hard to deny.

Amy Saunders, Editor, Satellite Evolution Group

Digitisation, the process of converting information into a digital format, is taking over the world. Granted, the process has been slow, thus far spanning several decades, but traction is picking up in all sorts of areas. Many of us are old enough to have happily snapped away with our own cameras containing actual film or to have whiled away afternoons listening to music on vinyl records – both now making a comeback as all things retro eventually do. But today, like many other things, our cameras, films, music, books and so much more have gone digital.

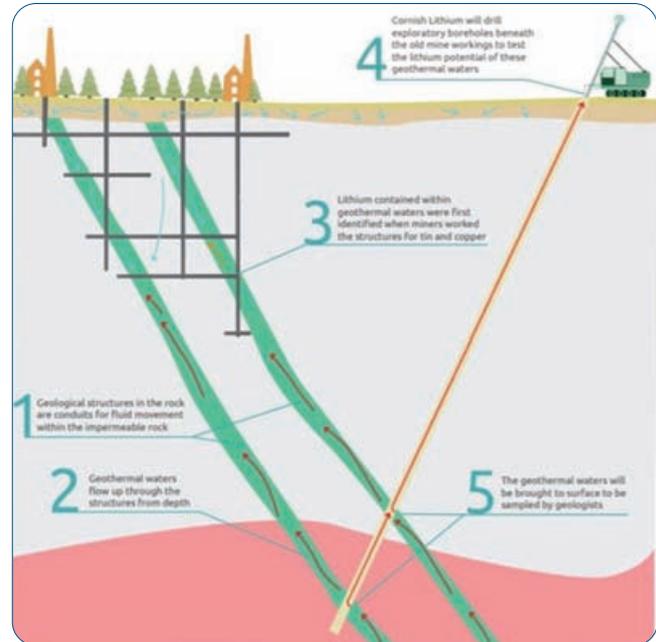
The digital revolution is well and truly upon us. Ramping up from its steady growth in recent decades as more and more areas went digital, the COVID-19 pandemic saw digitisation increase exponentially across the globe as more people than ever before were forced online, with record-breaking numbers achieving their work, studies, shopping, healthcare, social activities, and leisure in a new digital era. And that's just at the consumer front. Businesses faced with unprecedented circumstances, which had been slowly evolving to new, more efficient digitised systems, suddenly found themselves thrust into a new world in which the options were to digitise fully or fold.

Digital mining

One of the oldest industries in the world, and certainly one of the slowest to adapt to new technologies, mining companies are nevertheless jumping on board the digitisation trend, making use of IoT, satellite connectivity and remote imaging, UAS and cellular backhaul innovations to bring mining into the modern era. The benefits are similar to those achieved at sea or in-flight, including enhanced safety, employee retention, cost savings and increased efficiencies.

According to the latest research from Inmarsat's 'The Rise of IoT in Mining,' mining businesses expect to invest a considerable portion of their IT budgets into the IoT over the next three years to achieve benefits such as improved health and safety and staff productivity. This level of planned spend on IoT marks it out as a critical next generation technology as mining companies continue to navigate the COVID-19 pandemic, giving them the tools to become more resilient, more flexible, and quicker to adapt and react to change.

Inmarsat's research, which focused on Industry 4.0 technologies, found that, over the past three years, cloud



Gwennap lithium drilling. Image courtesy Cornish Lithium

computing, cybersecurity and IoT have seen the highest percentage of budgetary investment, totalling 5.7 percent, 4.2 percent, and 3.9 percent, respectively. These three technologies are set to retain the highest percentage of investment in the next three years rising to 9.8 percent, 8.4 percent, and 7.6 percent respectively. This reflects the wider increases across the other technologies surveyed, including machine learning, artificial intelligence, and robotics.

Mining companies also reported that their IoT deployments are continuing to make a positive impact on their bottom line. Currently, cost savings amounting to an average of 5.1 percent are being reported. Hopes of a future impact on cost savings are more pronounced, rising steadily from 7.7 percent in 12 months, 13.8 percent in three years' and a significant 18.9 percent in five years' time. This is a sizable increase on previous research, where in 2018 mining organisations reported average current cost savings of an average of 1.76 percent, expected to rise to 16.02 percent by 2023. This not only illustrates the immediate return on investment (ROI) that IoT has brought to the sector over the past few years, but also the continued confidence the sector has in IoT to bring long-term cost savings.

"Mining companies are starting to place more faith in IoT technologies, and with increased adoption they are starting to see an increase in cost savings amongst other tangible benefits," said Nicholas Prevost, Director of Mining, Inmarsat. "In the next five years this return on investment is set to grow further, ensuring that those companies investing in IoT are those that will lead the pack. From an investor community perspective, investment in IoT is a good indicator of a mining organisation's resilience, efficiency and commitment to safety and sustainability. These are the sorts of markers that will ensure mining companies can thrive in the present and in the future, particularly in light of the challenges that Covid-19 has thrown at the industry."

An interesting £4 million new project out of Cornwall, UK, was recently announced, which aims to create a world leading centre for digital mining exploration and map out Cornwall's true mineral wealth. The Deep Digital Cornwall project, led

by the Camborne School of Mines (CSM) with the Institute for Data Science and Artificial Intelligence at the University of Exeter, will conduct research and champion innovation.

Funded by the European Regional Development Fund, the project includes three partners: Cornish Lithium, bringing expertise in new data collection, digitising data, and identifying and developing opportunities for the application of machine learning and AI technologies; Cornwall Resources Limited (CRL) which will provide Redmoor as a field site for acquisition of new geochemistry and geophysical data, which will then be provided to the Deep Digital Cornwall data centre; and the South West Centre of Excellence in Satellite Applications (SWCoESA), which will help SMEs develop and commercialise space technologies and beneficial satellite applications.

A new physical research hub will be created on the University of Exeter's Penryn Campus, offering a state-of-the-art 3D modelling and visualisation suite with dedicated researchers, innovators, and business development specialists.

Deep Digital Cornwall will carry out research into digital technologies and develop new digital products, processes, and services to enhance SME offerings to sectors including mining, geothermal, civil engineering, surveying and water resources, heritage, planning and more.

"The DDC project is an exciting development to push the boundaries of digital data capture and interpretation to optimise assets," said Matt Eyre, senior lecturer in mining engineering/intelligent mining at Camborne School of Mines. "The outputs of the project can have wide reaching effects in an ever more technologically focused digital world."

Earth observation 2.0

Earth observation – the monitoring of everything from weather, atmospheric make-up, pollution through to coastal erosion, crop monitoring, wildlife migration and much more in between – has always been of vital importance to government bodies and the scientific community. This information affects all of us every single day of our lives,

impacting the food we have available, the way we travel, where we build our homes, and so on.

Like many other areas of life, the last few decades have seen Earth observation become increasingly digitised. Where the movement of wild animals and herds used to be tracked manually, now they're increasingly monitored via satellite from space, or via the Internet of Things (IoT) with remote GPD trackers. Similarly, cliff erosion – which has huge impacts on housing, beach safety and sea levels – once only monitored with physical inspections and measurements, can now easily be tracked remotely, digitally, over the space of days, weeks, months and even years via satellite. These are just two key areas where increasing levels of digitisation across the globe makes it easier, faster, cheaper, and more effective to monitor the natural world, often from a convenient distant location, digitally.

A fantastic new project out of Spain has recently made the headlines, wherein more than 20 Spanish companies have joined forces to design, manufacture and launch a constellation of 30 Earth observation satellites which will enable the digitisation of multiple strategic sectors as well as obtaining key data for environmental monitoring and ecological transition.

The Euro147 million project is being led by Open Cosmos and fits neatly into the framework of the Programme for the Promotion of Industrial Competitiveness and Sustainability projects that will be financed with European recovery funds. The space initiative will promote a new industrial fabric exporting 100 percent Spanish technology, which is expected to generate 10 percent more quality jobs in the space sector and a turnover of more than Euro500 million by 2026. The first phase of the project is expected to commence in less than two years and will ultimately help build digital models to address the main challenges facing Spain in terms of sustainability, digitisation, and optimisation of multiple economic sectors with frequent data of high scientific value.

The satellites will include novel propulsion systems, a generation of observation cameras with integrated Artificial Intelligence (AI), a high bandwidth communications system



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or the integration of applications with terrestrial and satellite Internet of Things (IoT) services, among other elements. A data platform will be deployed in the cloud where, through advanced processing techniques supported by AI, it will be possible to analyse the environment for effective decision-making, allowing direct applications in agriculture, civil and environmental protection, alternative energies, infrastructure management, prevention, and detection of natural disasters, etc. In this way, they will monitor the environment or the impact of the human footprint from space, contributing to the fulfilment of the European digitalization and environmental objectives detailed in the European Green Deal.

“This project aligns almost an entire industrial sector, the so-called NewSpace or Space 4.0,” said Carlos Fernández de la Pena, Vice President of data and satellite services at Open Cosmos. “This is an environment that is very rich in knowledge but faces the difficulty of having it very fragmented in SMEs and research centres; without a doubt, an ambitious objective and a clear boost would place the consortium at the forefront of technology and the market. This is a project that brings together top-level talent and technology, and which will attract international investment, create highly qualified jobs and increase the sector’s export capacity.”

The digital ship

The shipping sector is notoriously slow-moving when it comes to technology upgrades. New hardware installations require ships to dock for extended periods for physical installations, testing and calibration activities, bringing the ships out of use and resulting in loss of income for shipowners. Nevertheless, recent years have seen an increasing push towards digitising ships to increase profitability and crew retention, while cutting costs and downtime due to maintenance.

This new drive for digitisation went into overdrive in 2020 when, like many other industries, the COVID-19 pandemic prompted a much-needed overhaul of systems across the globe.

Ship data consumption doubled in during the year according to Inmarsat, which has since launched a new ‘Fleet Data Academy’ to understand the full benefits of digitalisation provided by a fast-growing ecosystem of applications.

Inmarsat, which has completed its 10,000th Fleet Xpress ship installation, has reported that daily download data rates per vessel grew from less than 4GB from mid-2020 to 8GB by the end of the year, as more ships than ever before look to go digital to achieve safer, greener, and more efficient operations.

“Covid-19 has brought a major spike in data demand for crew connectivity and our Fleet Hotspot wi-fi solution has gained exceptional traction, but the arrival of Fleet Data as maritime’s first secure and scalable Internet of Things platform has also been pivotal,” said Ronald Spithout, President, Inmarsat Maritime. “Using cloud-based data storage and interfacing easily with decision-making software, this has moved Fleet Xpress to a ‘2.0’ solution. This also delivers fully on the promise of smart shipping, fully-scalable for vessel operators, making maritime accessible for start-up application providers just as it is for established corporates.”

A ‘Digitalisation Uncovered’ survey of 370 ship owners commissioned by Inmarsat at the end of 2020 saw 71 percent of respondents citing cost reduction and operational efficiencies as a top three driver for digitalisation, while compliance featured as a top three concern for 60 percent. The move from Class Societies to support remote surveys, wider adoption of telemedicine and shipyards building in smart capability to new buildings are also transformative.

“Maritime digitalisation is now unstoppable,” said Spithout. “The market is becoming mature enough to support its own digital ecosystem with separate bandwidth channels for crew, applications and operations.”

TMI

As we move into a truly digitised era, it’s absolutely vital that we do not become overloaded with Too Much Information (TMI). With so much data being produced, moved, shared, and stored, processing that data becomes an immense challenge. The solution, according to many, is Machine Learning (ML) and AI, which are set to change the world with intelligent automation of so many processes, including the handling, analysis, and actioning of all this data we’re suddenly producing. Time will tell whether these systems prove as useful as we’ve been promised, or whether they’ve been oversold! ■



Inmarsat GX1-4 satellite. Photo courtesy Inmarsat



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Value leakage is your biggest problem

Value leakage is a growing problem in the satellite sector as technologies come on in leaps and bounds, but smaller sites continue on with legacy equipment. Upgrading equipment is often seen as a hefty expense to be put off for as long as possible while the status quo works the same as it always has, however, upgrades needn't always be as pricey and complex as imagined.

David Burr, Vice President, Business Development for Comtech EF Data

What exactly is value leakage, you're probably asking. It's the latest buzzword for leaving money on the table. The value is there but you're not able to fully capture it for some reason.

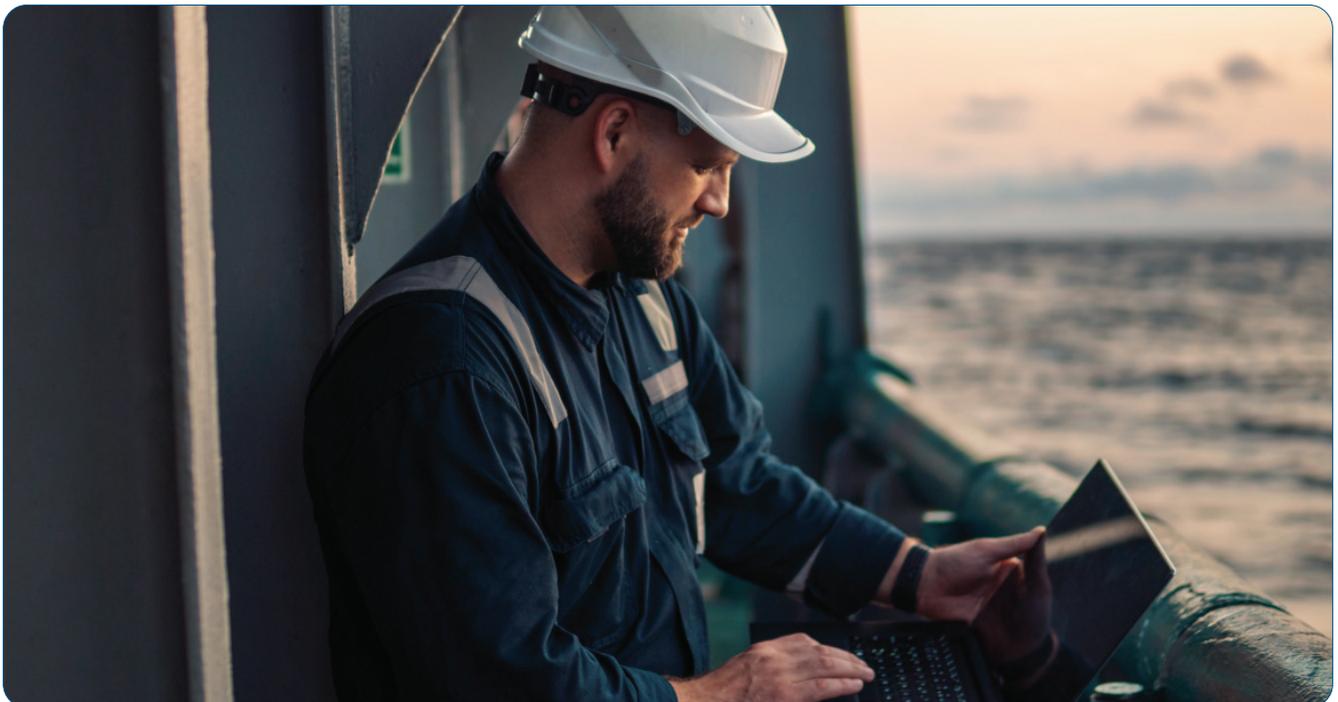
Budgets are tight these days, and a step that many businesses are taking is to reduce CapEx spend on things like network refresh projects. While this may seem logical, many older networks are leaking value and as a result, companies are leaving money on the table because modern technology has come a long way in the last few years. Today's satellite modems are much more efficient than previous generations featuring:

- More efficient coding such as DVB-S2X, which squeezes more bits into the same bandwidth;
- Higher order modulation as high as 256 APSK that can take full advantage of higher power, more sensitive HTS and Ka-band satellites; and
- Higher processing power, which supports better WAN optimization of networking protocols to avoid transmitting unnecessary bits.

Here is the typical scenario that we see: The network is a few years old and uses an aging strictly TDMA VSAT system that is still working but has limited MODCOD support and maybe an outdated coding scheme like Turbo. In the time since the network was originally deployed the satellite operator has replaced the satellite with a more powerful one, possibly an HTS satellite. The new satellite is providing a much better C/N than the previous satellite, but the legacy TDMA VSAT can't take advantage of the better C/N because of the limited MODCOD support. The customer doesn't really notice because everything is still working as it always did. There are fewer rain outages, which seems like a good thing until the user realizes that's because so much margin is being wasted under clear skies. Value is leaking and you are not realizing the profits that you should.

Getting value leakage under control

Even though there is value to be recovered, cash flow is still tight, so it's not easy to fund a technology refresh. So, how do you realize the longer-term value of efficiency while balancing short term cash flow constraints? Start with the highest capacity sites. While it may not be strictly an 80/20 situation, most networks have a few high-capacity sites that



Crew connectivity is on the rise. Photo courtesy Istockphoto

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02:00pm - 02:30pm: Corporate strategic Conference

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04:30pm - 05:00pm: Closing Conference

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David Burr, Vice President, Business Development for Comtech EF Data

use much more bandwidth than the rest. High-capacity sites are also usually less bursty and benefit less from TDMA oversubscription. You can move these larger sites off the TDMA platform and onto dedicated SCPC links with better efficiency. This allows you to either reduce the MHz – and the associated costs – or add more (billable) Mbps, both of which improve profitability and cash flow. You can then use the additional cash flow to fund the next level of sites.

Brazilian use case

One of Comtech EF Data’s customers is a key service provider to the energy sector in Brazil and had to develop a plan for upgrading their network to support the increased crew Internet requirements based on the updated Brazilian regulation NR 37. They considered the two choices; adding more bandwidth to their existing TDMA platform; or transitioning to Comtech EF Data’s more efficient SCPC technology.

The service provider conducted side-by-side tests over the air to compare the spectral efficiency – a measure of

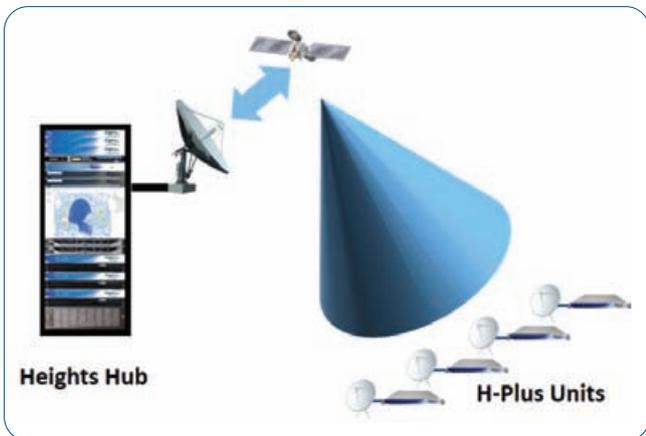
how much data is carried in a fixed amount of satellite bandwidth – of their existing TDMA platform and Comtech EF Data’s high-performance SCPC modems. Their testing demonstrated that they were able to more than quadruple the link efficiency from 1.75 bits/Hz to 7.7 bits/Hz without having to change out any of the stabilized antennas or amplifiers offshore while at the same time significantly improving the link availability. Over a 1.5m stabilized antenna, an impressive throughput of 25Mbps duplex was achieved over Ku-band with a link availability of 99.7 percent a year even considering the regions notoriously challenging tropical storms.

In the Brazilian case, Comtech’s SCPC approach was able to provide 4.4 times the throughput per MHz compared to TDMA. SCPC will provide the more efficient solution for sites and/or networks where the traffic oversubscription is less than 4.4x. The network operator can easily examine the performance of the existing network and identify sites with lower oversubscription rates, which are the best candidates for moving to SCPC. In the case of the Brazil network, all of the sites met this criterion, and the entire network was migrated to SCPC.

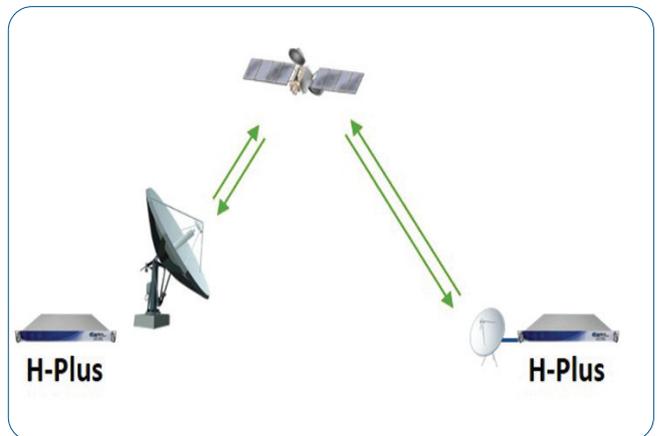
The H-Plus Heights Remote Gateway – The best of both worlds

The Brazil case showed the benefits of upgrading TDMA VSATs to Comtech EF Data’s high-performance SCPC technologies. Comtech’s dual mode H-Plus Remote Gateway offers service providers tremendous flexibility. In point-to-point mode, the H-Plus offers the same functionality as the CDM-625A modem including high performance coding and Doubletalk® Carrier-in-Carrier® technologies and is even interoperable with the CDM-625A. In addition, in Heights mode, the H-Plus can function as a remote modem as part of a point-to-multipoint Heights VSAT network, bringing the advantages of a shared bandwidth on demand networking using Comtech’s industry-leading Heights Dynamic Network Access (H-DNA) waveform.

Using the H-Plus Remote Gateway, service providers are able to fully optimize the network by configuring sites to either high-efficiency point-to-point links using DoubleTalk Carrier-in-Carrier for high traffic sites or configuring the site as part of a managed Heights network allowing capacity to be efficiency shared by multiple sites with bursty traffic. As the network evolves, sites can be reconfigured from Heights to point-to-point mode and vice-versa, ensuring that expensive



Network mode



Point-to-Point SCPC mode

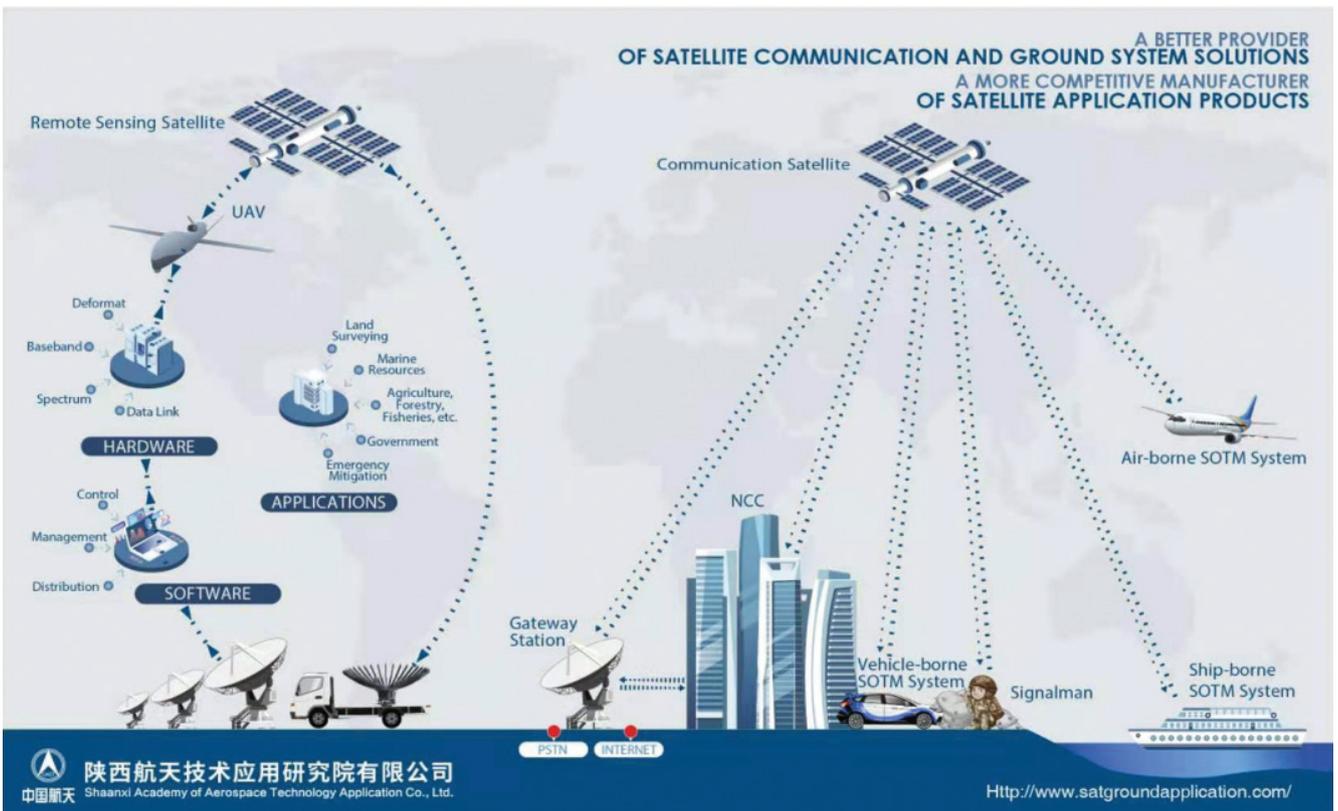


Value leakage. Photo courtesy istockphoto

satellite resources are fully optimized. The H-Plus provides service providers with the best of both worlds, providing the most efficient use of satellite resources while minimizing the number of modem types that need to be supported.

Many service providers look at SCPC as being 'old school,' but the superior efficiency still has a role to play, especially with today's COVID reality. Budgets may be tight, but cutting CapEx isn't necessarily the best strategy to optimize cash flow. The strategic deployment of more efficient technologies such as Comtech EF Data's advanced satellite modems with high performance, low latency VersaFEC®-2 encoding and

Doubletalk Carrier-in-Carrier technology can reduce bandwidth costs and improve network profitability. A phased approach which prioritizes the largest sites can form the core of a strategy which minimizes value leakage and provides substantial financial benefits for service providers who are often forced to choose between the efficiency of SCPC and flexibility of a managed network. In this environment the H-Plus dual mode support enables service providers to offer the best of both worlds, reducing OpEx in the near term while building the foundation to transition to a fully managed network. ■



Welcome to **SATELLITE SHOWCASE**, bringing you the latest products and services for the international Satellite and NewSpace sectors.

In this, and future issues, we will publish a selection of products, services and solutions from leading suppliers around the world. These companies invest millions of dollars to create and improve their offerings, to enable you to design, build and operate equipment and provide services that will improve the telecoms, radar, observation, communication, financial, tracking and environmental businesses that we all depend on.

Check out the entries on the following pages. If an item is of interest, click on the links to request more information or to visit the company's website.



Advantech Wireless Technologies releases Ultra-High Power SSPA System for TT&C and Deep Space Communications

Advantech Wireless Technologies announced the release of its DeepBlu-Series 8.5kW Wideband C-band Modular SSPA System for LEO, MEO and GEO applications that include Satellite Telemetry, Tracking, and Control (TT&C) and Deep Space Communications. The newly designed DeepBlu-Systems consist of multiple high-power SSPAs packaged in ruggedized, outdoor enclosures and integrated into a single frame structure that includes combiners, loads, power distribution and M&C – perfectly suited for fixed and full motion antenna installations. Modular architecture with 1:N built-in redundancy and field replaceable amplifiers minimizes downtime, resulting in the highest service availability in the industry.

For further information visit: <https://advantechwireless.com>



Integrasys Beam Budget is the Link Budget calculation tool ideal for Satellite Operators and Service Providers

Beam Budget provides the most accurate Link Budget which includes graphical beam representation. Its friendly interface makes it easier for Sales Representatives providing Automatic & Graphical reports and the possibility to export Excel & PDF reports with an executive summary and a complete report for forward and return link.

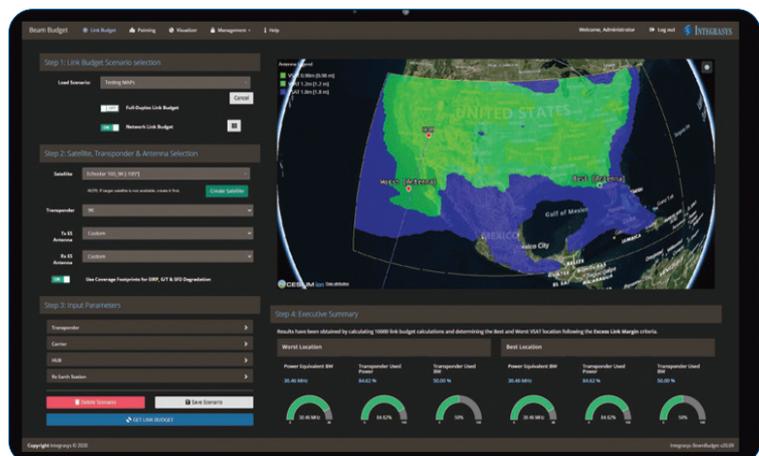
There are two licenses:

- Basic License Features
- Beam Budget Base License.
- USB Dongle Key.
- License Certification.
- User Manual.
- Support Videos.
- Private Cloud Support.
- Support for First Year.
- Installation and Configuration (in *VMWare remotely).

*VMWare not included

Network License (Upgrade)

- Perform several link budgets inside a selected region in one calculation.
- Select the region drawing a rectangular area on the 3D globe.
- Select the region depending on the satellite EIRP or G/T value of the uploaded footprint.
- Full-Duplex option to perform FW and RT link budgets in a single calculation in the selected region.
- ACM calculation to check the most efficient MODCOD in the selected region.
- Optimize Transmit Power, VSAT Antenna Diameter, MODCOD or Excess Link Margin in each location of the selected region.



For further information visit: <https://www.integrasys-space.com/>

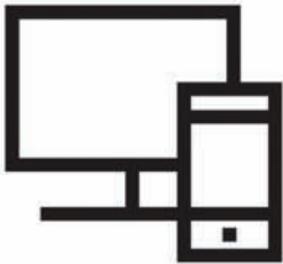


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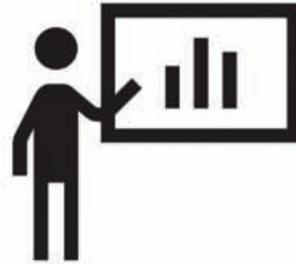
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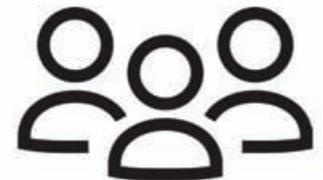
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MDI has introduced two products specifically designed for NewSpace SmallSats

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- Magnetically coupled feedback;
- Seam Weld Hermetic Package; and
- Single and Dual output models.

For further information visit: <http://www.mdipower.com>



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For further information visit: <http://www.satgroundapplication.com>



Innovator in the RF space

Terrasat Communications designs and manufactures innovative RF solutions for satellite communications systems. The ground-breaking IBUC - the Intelligent Block Up Converter - brings advanced features and performance to C-band, X-band, Ku-band, & Ka-band satellite earth terminals and VSATs. Terrasat Communications offers the IBUC (Intelligent Block Upconverter) brand RF solution for MILSATCOM terminals. Building on the company's reputation as an innovator in the RF space, Terrasat has launched several IBUC models that play a key part in ruggedized tactical satellite terminals. All IBUCs are engineered and manufactured in the company's modern Silicon Valley facility and are backed by a 3-year warranty.



For further information visit: <https://terrasatinc.com>



Discover how to protect your Earth Station Antenna signals from the elements with WALTON DE-ICE

WALTON's unique plenum HOT-AIR DE-ICE system delivers superior performance and efficiency for antennas 3.7 to 32m. Uniform surface heating minimizes reflector distortion, delivering the most powerful and cost-efficient de-icing on the market:

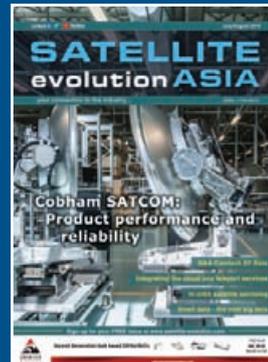
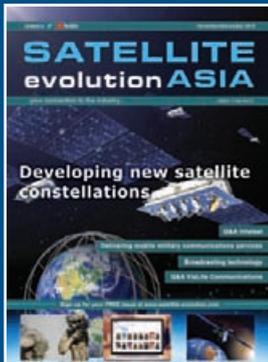
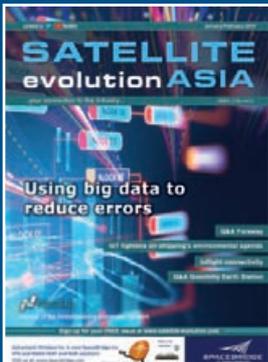
- Liquid Propane, Gas or Electric Heating to best suit your unique installation.
- Unmatched performance for the most demanding Ka-band antenna requirements.
- For 0.6 to 6.3m, SNOW SHIELD antenna covers offer heated/un-heated solutions.
- Adding ICE QUAKE to SNOW SHIELD sheds off snow before ice forms. Up to 100x energy savings.



The Walton PORTABLE RADOME protects GEO/LEO/MEO antennas from winds (to 85Mph), snow, ice, rain, sand storms, debris and more. Single-person-setup in under an hour. The Radome is also airline shippable.

For further information visit: <http://www.de-ice.com>

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- Comms on the move
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