- **5G: the towers and the technology**
- **Country focus: an in-depth look at Vietnam**
- **Subsea cables: the Asian connection**

Powering future mission critical communications: Sepura launches its LTE solution

sepura

Sepura is a global leader in the design, development and supply of digital radio solutions, providing comprehensive support for critical communications users in public safety, transport, manufacturing, utilities, airports and other sectors.

Based in the UK in the Cambridge technology hub, Sepura is a trusted partner for Professional Mobile Radio public safety and commercial users across the globe. Since it was founded in 2002 Sepura has brought together radio infrastructure, terminals and data applications to create compelling solutions that enable its customers in over 100 countries address the demanding operational challenges that they face every day.

The company has a long history of being first to market with product innovation and has recently launched its first LTE product to complement its proven range of TETRA devices, which are trusted by organisations around the world to support their communication needs.

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KADIUM

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RAJANT

Inmarsat gets first install by Malaysia's ADE

Global mobile satellite communications firm Inmarsat announced the first installation of its GX Aviation inflight broadband solution by Asia Digital Engineering (ADE), a wholly-owned AirAsia Group subsidiary and provider of engineering services in southeast Asia.

The installation, completed onboard an AirAsia Airbus A320 aircraft supports ADE's ambitions to become a GX Aviation installation partner for other airlines in the region.

The company will also establish a one-stop shop for airlines that want to operate a fully connected fleet, combining its vast expertise in end-to-end engineering and maintenance, repair and overhaul (MRO) with Inmarsat's connectivity solutions.

Chris Rogerson, Inmarsat Aviation's vice president of global sales, said ADE parent company AirAsia Group is the largest customer for our GX Aviation inflight broadband solution in the Asia Pacific region and one of the largest in the world. "Our partnership has been a hugely successful one, based on a common passion about the exciting opportunities that digitalisation and connectivity provide to passengers and the aviation industry, especially as airlines recover from the pandemic," he added. "We are delighted, therefore, to now collaborate on GX Aviation installations for AirAsia and other airlines in the region, bringing together the combined experience and expertise of Inmarsat, ADE and the rest of the AirAsia Group."

ADE was established in September 2020, after AirAsia
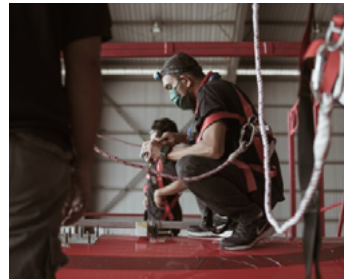
Group consolidated its engineering and MRO assets to provide a centralised support service, not only for its own aircraft fleet, but also for other commercial airlines in the region.

On December 21, 2021 Inmarsat will add to its satellite fleet for the region, launching I-6 F1 from Japan. The satellite is Inmarsat's first dual payload satellite, with both Ka-band (Global Xpress) and L-band (ELERA) onboard.

Singapore telcos win more spectrum

Singapore's Singtel and an M1-StarHub consortium boosted their 5G spectrum holdings in a 2.1GHz auction in which TPG Telecom won 10MHz, after Infocomm Media Development Authority (IMDA) announced the results of its auction.

TPG Telecom has two years to reach 50% coverage with a standalone (SA) 5G network and five years for nationwide. It holds spectrum in the 900MHz and 2.3GHz bands won as part of its market entry in 2016.

Singtel and the M1-StarHub consortium were each allocated 25MHz in the 2.1GHz band, which they will use to increase coverage and capacity of their existing SA 5G networks deployed on 3.5GHz spectrum.

Both must achieve 50% coverage by end-2022 and fully by end-2025.

The 2.1GHz spectrum will be allocated at the beginning of 2022.

Singapore's Infocomm Media Authority stated the latest auction is a "milestone in Singapore's 5G journey to have a world-class, secure

and resilient infrastructure".

Anna Yip, Singtel Consumer CEO, cited benefits to the operator's ability to "support the nation's smart city ambitions" in a brief statement.

StarHub-M1 paid S$52.5m (US$38.3M) to secure five 5MHZ lots.

China Mobile-owned tower in Pakistan destroyed by explosives

A China Mobile tower was destroyed in a northwestern tribal district of Pakistan, soon after it started providing Internet service.

Police said November 5 that the tower in the restive North Waziristan district was destroyed with explosives by unidentified persons.

The tower belonged to China Mobile Pakistan, a 100% owned subsidiary of China Mobile Communications. The Pakistan-based mobile data network operator does business under the name Zong.

Tehrik-e-Taliban Pakistan (TTP), known as the Pakistani Taliban and other militant groups are known to operate in the area.

A local police officer said the tower had been providing mobile phone signals since 2019.

According to reports, the blast occurred two days after the tower started providing internet service to the area.

Local residents have staged protests in the past demanding high-speed Internet connections.

Pakistani security forces carried out a massive military operation in North Waziristan in June 2014 claiming that the TTP had been eradicated.

However, continued attacks by the militants suggest the group has returned and poses a threat to peace and security in the area once again.

As yet, no group has claimed responsibility for the explosion.

Vietnam yet to receive signal from NanoDragon satellite

A Vietnamese satellite designed and launched to help monitor navigation in the disputed South China Sea has not transmitted for over one month since it was launched into orbit.

According to the satellite developer, the Vietnam Space Center under the Vietnam Academy of Science and Technology, a total of nine satellites, including Vietnam's NanoDragon, were mounted on Japan's Epsilon 5 rocket sent into space November 9.

So far, seven of them have successfully sent signals to the ground station. The two remaining satellites are the ARICA satellite of Aoyama Gakuin University, Japan, and NanoDragon, which were in the eighth and ninth positions when they separated from the rocket.

NanoDragon is the product of a project to research, design, manufacture, launch and test nano-sized microsatellites under the "National science and technology program on space technology in the 2016-2020 period".

Before the launch, NanoDragon underwent four rounds of safety inspection by the Japan Aerospace Exploration Agency (JAXA) with the strictest standards and environment, shock and functional tests. It also passed rounds of examination in Vietnam and was sent to Japan for launch under JAXA's plan August 6.

All tests in Japan were closely monitored by its developer VNSC, the Kyushu Institute of Technology, JAXA, High-Reliability Engineering and Components Corporation (HIREC) and MEISEI – partner of VNSC in Japan and supplier of test equipment for NanoDragon.

The launch was cancelled three times on October 1, October 7, and November 7 due to unsuitable weather conditions.

According to the Vietnam Space Center, NanoDragon has three communication lines.

Semtech, Everynet and Telkom Indonesia to provide LoRaWAN-based insulated vaccine carrier
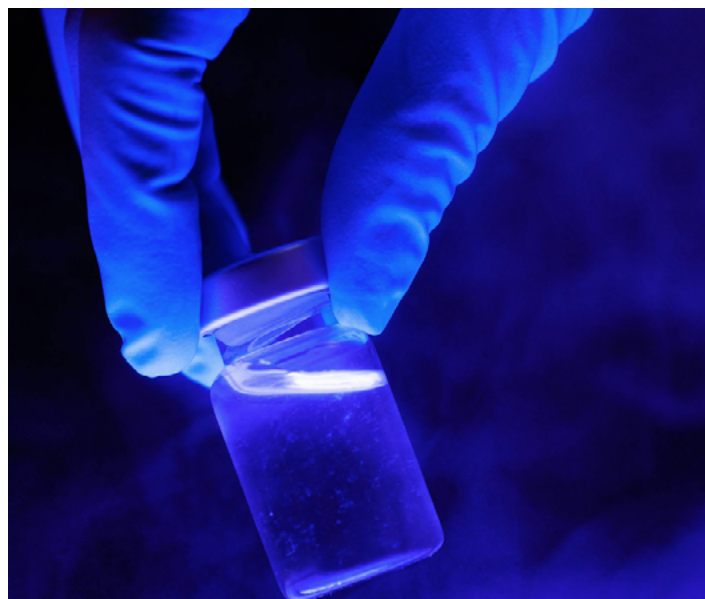
US-based Semtech and internet of things (IoT) network provider Everynet have teamed up with Telkom Indonesia to track and monitor Covid-19 vaccine temperature.

The insulated vaccine carrier is designed to decrease waste, improve customer confidence and increase inoculation rates via a LoRaWan. As vaccines must be stored at specific temperatures to maintain their efficacy, the insulated vaccine carrier offers an end-to-end system that gathers a continuous and consistent data stream in real time.

"Over the last two years, Everynet has been laying the groundwork along with our partner Telkom Indonesia to deploy a public LoRaWan in Indonesia," said Ali Fahmi, Indonesia country manager for Everynet. "The end result now features over 200 Indonesian cities with LoRaWan coverage, with plans to further expand the coverage to more cities. The LoRaWan is ready to deliver simple, highly efficient, flexible and secure IoT throughout Indonesia."

The insulated vaccine carrier leverages a national LoRaWan in Indonesia to avoid expensive front-end investments related to infrastructure build-up and maintenance. In addition, LoRaWan connectivity maintains high security and quality of connection for this use case. Overall, it can continuously maintain temperature stability for safer vaccines, decreasing the waste of this life-saving resource.

"The insulated vaccine carrier is leveraging IoT and LoRaWan to send accurate data and log the temperature systematically during distribution," added Edi Witjara, director of enterprise and business service at Telkom Indonesia. "This relay of data will assist to guarantee the quality of the vaccine to comply with the regulation from Ministry of Health in Indonesia."

Ibnu Alinursafa, senior manager for IoT platforms at Telkom Indonesia, added: "The LoRa-based insulated vaccine carrier accelerates the vaccination programme across Indonesia and is providing a quality service for the end customer."

Covid-19 vaccines require deep freeze conditions to be maintained in the supply chain to ensure their efficacy. To maintain a proper environment for the vaccine, the vaccine temperature must be constantly monitored, recorded and reported throughout all steps of the supply chain. Due to the flexibility of the LoRaWan standard, the insulated vaccine carrier is a completely wireless, automated monitoring system. Whenever an anomaly in the data stream is detected, such as a drop or rise in temperature, a notification is sent to the end user who can immediately take corrective action.

PT Telkom Indonesia (Persero) is a state-owned information and communications technology enterprise and telecommunications network in Indonesia. The government of Indonesia is the majority shareholder with 52.09% shares while the remaining 47.91% shares belong to public shareholders.

Hundreds of towers destroyed in Myanmar coup resistance

More than 400 telecommunication towers in military-ruled Myanmar have been destroyed by opponents of a February 1 coup, attacks which operators said had severed connectivity for many customers.

A report by newswire Reuters said the Global New Light of Myanmar newspaper, the junta's mouthpiece, claims the destruction of the towers was intended to undermine the government.

The military has previously shut down the internet in many areas to try to disrupt its opponents during protests and strikes.

"Terrorists are attempting to hamper the implementation of the future activities of the nation and to overthrow the government's administrative machinery," the newspaper reported, adding that 88% of the 409 towers destroyed are owned by Mytel, a partly army-controlled firm.

Militias allied with a shadow Myanmar government have claimed responsibility for damaging some towers but have said the military also contributed to the damage by planting mines near some facilities.

Since the coup, Myanmar's security forces have reportedly killed more than 1,300 people and arrested thousands in a bid to crush resistance, according to the Assistance Association for Political Prisoners, a local non-governmental organisation.

Viettel joins mobile money ranks

The State Bank of Vietnam has allowed Viettel to pilot mobile money service, just a week after licensing MobiFone and Vietnam Posts and Telecommunications Group (VNPT) to do likewise.

Viettel customers will be able to use their mobile subscription as a bank account, buying and selling low-value goods and services, as well as directly withdrawing, depositing, and transferring funds.

With over 65 million subscribers and market share greater than 50%, the availability of Viettel's mobile network far exceeds that of the nation's banks, with some predicting that widespread and rapid uptake of Vietnam's burgeoning mobile money services could put pressure on banks.

However, Pham Trung Kien, chief executive officer at Viettel Digital, said mobile money does not necessarily pose a threat to the nation's banks and may, in fact, boost citizens' engagement with financial institutions once they realise how convenient cashless payment is.

"Some studies estimate that in Vietnam, only about 30% of the adult population have a bank account, and when we create a habit of using electronic payments, the remaining 70% will be customers of banks," Kien added. "Thus, Mobile Money not only competes but also promotes use of bank accounts when they are familiar with electronic payment methods."

Recent data from Omdia suggests that this trend towards a cashless society is already accelerating in Vietnam, with payment card market penetration set to increase to almost 50% by 2025.

Meanwhile, Viettel is working with the city of Da Nang to turn it into a smart city by 2025. The first steps of the plan include the deployment of a 5G network at Da Nang Software Park.

Axiata on its direct carrier billing platform

Bangladeshi mobile operator Robi Axiata has been added to mobile technology company Fortumo's payments platform.

Merchants using the latter platform can now collect payments from more than 52 million Robi and Airtel subscribers through direct carrier billing.

Merchants connected to Fortumo's platform can collect payments from Robi and Airtel subscribers through Fortumo's Unified SDK. Unified SDK connects merchants to Robi and a network of hundreds of telcos and 30+ digital wallets through one integration. Fortumo hosts and localises Unified SDK checkout flows on its platform, making it simple and scalable for merchants to launch local payment methods across the world.

Martin Lips, chief commercial officer at Fortumo said that adding local payment methods is the main way merchants can achieve rapid revenue growth in emerging markets. "Our aim at Fortumo is to make launching those otherwise complex payment methods as simple as possible for merchants," he said. "We are excited to partner with Robi/Airtel and help merchants grow in Bangladesh."

In Bangladesh, credit card penetration is only 0.2% while 41% of people own a smartphone. This creates a problem for merchants in that there are many users able to access services but without a payment method to pay for premium content. Carrier billing solves the problem by allowing any mobile device owner to charge payments to their phone bill instead.

Intelsat expands FlexMaritime service across Indian waters

Integrated satellite and terrestrial network operator Intelsat is expanding its FlexMaritime service to reach vessels traveling in Indian territorial waters.

The expansion, which gives Indian-registered vessels access to Intelsat's high throughput maritime network, will take place after Intelsat commences operations at a new gateway in Noida, India with its regional partner, Cloudcast.

It expects service in India's waters to become available at the beginning of 2022 through various regional solutions partners.

According to India's Ministry of Shipping, approximately 95% of India's trading by volume and 70% by value is done through maritime transport. Intelsat, which already claims to serve more than 8,000 vessels with its FlexMaritime service, expects investment in India to pay off with new subscriber returns.

"The completion of this regulatory milestone means customers of our FlexMaritime solutions partners will immediately benefit from the well-known power, performance and resilience of the FlexMaritime service in Indian waters," Intelsat senior vice president of mobility Mark Rasmussen said in a statement.

Airtel picks Juniper to expand broadband network coverage

Bharti Airtel has selected AI-driven networking firm Juniper Networks to deliver network upgrades for expansion of Airtel's nationwide broadband coverage across India.

Juniper will supply, install and provide support for upgrades to the MX Series routers and line cards as part of its broadband network gateway to manage subscribers and services, as well as carrier-grade NAT (CGNAT) solutions to ensure secure encryption across the network respectively.

Airtel has expanded its fibre-to-the-home broadband coverage to over 430 towns with plans of covering 30 million households in over 2,000 cities in the next three years.

"In support of this increased nationwide penetration into many previously underserved cities and markets, the latest network upgrades build on the strong long-term relationship between Airtel and Juniper Networks," a Juniper statement said.

Sajan Paul, managing director and country manager, India & SAARC, Juniper Networks added: "We are privileged to have been Airtel's partner for the last 15 years, growing alongside them as they have expanded their broadband and ISP network, in service of India's home, SMB and large enterprise customers. At Juniper, we strive to deliver network experiences that transform how people connect, work and live. As Airtel gears up their network for 5G, we are excited to continually contribute towards their network transformation, not just in support of their fiber-to-the-home broadband services expansion, but also for other use cases and applications across various business segments."

Starlink targets India in 2022

SpaceX-owned Starlink said it will apply for a commercial licence in India next year, in a move that would see the company provide broadband and other services to the country.

During a presentation by country director Sanjay Bhargava, the company confirmed it plans to have 200,000 Starlink devices in India by December 2022, with 80% of these in remote, rural areas.

"We hope to have applied for a commercial licence on or before 31st January 2022 (unless we hit some major roadblock)," Bhargava also posted on LinkedIn.

He added that "for a lot of users, Starlink makes sense... A 100% Broadband India will require collaboration across stakeholders, service providers, and technologies, and we encourage everyone to think about their use cases and develop connectivity plans for districts as well as private use".

Starlink said it has received more than 5,000 pre-orders for devices in India, in spite of the government's advice against doing so. The Indian government has warned consumers that Starlink does not have a licence to operate in the country.

India has emerged as a major arena for telecommunications operators across both broadcasting and connectivity services. Starlink, launches small satellites into a LEO network to provide broadband services in areas that terrestrial internet infrastructure can struggle to reach.

Sri Lanka launches national QR code MoMo solution

The Central Bank of Sri Lanka (CBSL) has begun a nationwide rollout of the LankaQR digital payments solution, enabling consumers to make payments to merchants and service providers directly from their bank account by scanning a QR code with their mobile device.

This new solution supports the CBSL's LankaQR standard for QR code payments and allows consumers to pay from a payments app provided by any LankaQR-certified financial institution.

"LankaQR is a low-cost digital payment solution which targets small and medium enterprises especially," the CBSL said. "Customers will not be charged for using LankaQR-based payments. Merchants are provided with the LankaQR printed sticker free of charge by the member institutions of LankaQR to be displayed at their places of business."

A total of 24 payments apps provided by 21 financial institutions in Sri Lanka have been certified for use with the LankaQR system to date.

The CBSL originally introduced LankaQR as a national QR standard for local currency payments in July 2019.

Indonesia explores low Earth orbit satellite

Indonesia is exploring the latest telecommunication technology, the low earth orbit (LEO) satellite, in a bid to spur digital transformation.

The country's coordinating minister for economic affairs Airlangga Hartaro underlined the digital transformation requires adequate telecommunication infrastructure, such as satellites and fibre optics.

"There is new technology named the low Earth technology named the low earth orbit satellite for an archipelagic country like Indonesia," he added. "This is being explored and is needed globally because this infrastructure is easier to launch given the available providers."

However, Airlangga underlined the requirement for calculating economic factors to apply the earth observation satellites. He also said he hoped that it would boost equal opportunities to access technology throughout the country.

Furthermore, the technology was also tipped to be the next disruption.

"This (satellite) will be the next megatrend or disruption where people need reskilling or retraining to meet digitisation needs," Airlangga added.

Indonesia has already designed the roadmap and pushed for digital infrastructure and plans to exploit the LEO satellite communication services to remote areas.

5G to the fore in five-year Ooredoo-Nokia deal

Ooredoo Group, the Qatar-based telco, has engaged Finland's Nokia to provide multiple technologies and services, including 5G, as part of a multi-country, five-year deal.

The network technology upgrade project is already under way and is expected to be completed by 2026 southeast Asia.

Under the terms of the deal, Nokia will deploy equipment from its AirScale radio access network (RAN) portfolio on sites across southeast Asia. The AirScale radio platform will provide the flexibility and capability required to deliver 5G services to consumers and enterprises across different spectrum bands. The deal also includes digital deployment services supporting a faster time to market as well as technical support services.

Nokia's microwave transport supports 5G microwave growth and new spectrum such as E-band, which is likely to be employed for state-of-the-art applications and new services such as a telemedicine and real-time virtual reality, where communities and businesses can rely on privacy, security and near-instant response times.

"This renewed contract is testimony to our growing partnership with Nokia to modernise and expand our network by rolling out world-class 4G and 5G services across North Africa and Southeast Asia," said Aziz Aluthman Fakhroo, managing director of the Ooredoo Group. "Thanks to Nokia's advanced technology, our customers will be able to experience faster speeds and enhanced response times, as well as more bandwidth."

Ooredoo serves consumers and businesses in Indonesia, Myanmar and the Maldives. The company, which spent much of 2020 developing 5G systems, is initially applying 5G in existing frequency bands, beginning with Qatar, where the firm is rushing to develop a next-gen infrastructure ahead of major events such as the 2022 football World Cup.

Singapore delays satellite toll system again

Singapore has again postponed the deployment of its next-generation Global Navigation Satellite System (GNSS)enterprise resource planning (ERP) systems due to a global chip shortage.

It was initially scheduled to be implemented from last year, but completion is now set for mid-2023. The government then pointed out the impact of Covid-19 on the global supply chain as the reason for the revised timeline.

The new date means there will be a delay of about two years before the 18-month implementation work is completed. This includes the installation of new in-vehicle units to replace the current in-vehicle units required for all vehicles registered in Singapore. The exceptions are vehicles that do not use or are covered by public roads on the mainland.

The in-vehicle unit, called the "centre" of the new ERP system, provides drivers with a variety of services, including charging location alerts and real-time traffic data.

However, the supply of critical microchips needed for these units was affected by the "deterioration." The Land Transport Authority (LTA) said in a statement that it had affected other industries as well.

Industry regulators pointed out that the shutdown of major semiconductor foundries across multiple countries affected production as global demand accelerated during the pandemic.

Talking satellite

Martin Jarrold, chief of international programme development, GVF

Satellite Orbits to 2022… Looks back at 2021

Since the Covid-19 pandemic came to necessitate international travel restrictions and the postponement of satellite industry conference events, GVF has been setting a much-lauded high standard for virtual discussion fora.

On 18th November our programme brought together a panel comprising Dr Vagan Shakhgildian, president, Comtech Satellite Network Technologies Commercial Group; Dr Onur Karabey, founder & CEO, Alcan Systems; Tony Taylor, chairman & CEO, Global Invacom Group; and Dr Leslie Klein, President & CEO, C-COM Satellite Systems, and moderated by Jose Del Rosario, consultant with Northern Sky Research to discuss 'Ground Segment: All Change for a New Satcoms Era'. The dialogue was a continuation of GVF's long-standing webinar series examination of the satellite communications ground segment. The premise upon which the event was founded is that the ground segment has for too long been considered the less interesting, non-identical twin, to the satellites we place into orbit. Launches and the orbiting of spacecraft are major, attention grabbing, spectacles; outdoor and indoor units of equipment down here on Earth do not offer the same visual excitement. The question is, isn't this all this is changing, as reflected in the industry having already coined the name "New Ground" to parallel and complement the now familiar term "New Space"?

As the video recording of this webinar (which you can see on-demand and free-of-charge on the GVF website at https://gvf.org/webinar/ground-segment-change-for-a-new-satcoms-era/) illustrates, anyone with this view of the ground segment will be quickly disabused of any such perception by the bold expressions of bullish enthusiasm from the panellists over a full 75-minutes of analytical insights. The size of the live audience, almost 400, and the wealth of audience generated questions, was clearly indicative of significant industry stakeholder interest in what is happening under the umbrella term of "New Ground". At the end of the 75-minutes the body of audience questions was far from exhausted. As is GVF's regular practice remaining questions and panellists' answers have been posted on the GVF website along with the video recording.

The posted written questions and answers cover such topics as a prognosis on the future market for communications over geostationary satellites in the context of explosive development of low Earth orbit (LEO) communications, specifically if geostationary-based communications will transfer to LEO. From a different angle, other questions asked if the market has the stomach for absorbing the failure of part or all of the great LEO megaconstellation project and, if there should be even only one failure and bankruptcy, what happens to the orbital highway if the bankrupted system's satellites are left in orbit unmanaged.

Additionally, the dialogue brought clarity to any understanding of the nature of the profound changes which the ground segment is undergoing across such topics as satellite's role in 5G, Artificial Intelligence, virtualisation and software-defined networks, standardisation, and the increasing commercial use of higher frequencies than the long-used C, Ku, and Ka bands.

When embracing the imminent prospect of another new year we habitually tend to turn to appraising the previous 12-months. This tendency is understandably strengthened by a year of pandemic circumstances which have exacerbated our reliance on connectivity. Against this general backdrop – and as we move towards the 5G era, acknowledging (as does the 3GPP Release 17 document due for publication in the first quarter of 2022) that the near-future "network of networks" is the highly significant opportunity that the world has to completely leverage the advantages to be derived from additional use cases for satellite communications – the GVF webinar of 1st December investigates the nature of industry stakeholder dialogues on the current state of the satellite communications industry and its user markets in respect of a swath of interconnected trends engendering transformational changes in the industry, changes that are additionally serving to catapult satellite into a more central position in our everyday lives.

'Satellite Industry Trends: A Year to Remember, A Year Ahead' (https://gvf.org/webinar/satellite-industry-trends-a-year-to-remember-a-year-ahead/), moderated by Stéphane Chenard of Euroconsult, assembles a panel of industry experts from across antenna technologies; communications and IT service provision; modem/network management systems/ infrastructure technologies; and NGSO constellation operations. Providing penetrating analysis and insight along with the complementary perspectives of orbital and ground assets are, from Kymeta, David Fotheringham, Director Product Management; from Speedcast, Will Mudge, Vice President, Engineering Operations; from ST Engineering iDirect, Jo De Loor, Vice President, Market Development & Strategy; and from OneWeb, Chris McLaughlin, chief of government, regulatory & engagement.

From a 'big picture' perspective the webinar examines the justification, across both space and ground segments, for describing 2021 as "transformational", defining which trends set it apart from previous years and which are primarily responsible for propelling the satellite industry into a more central position in our everyday lives. The discussion also looks at the impact the industry's transformational changes are having on the business of space, both strategically for the entire sector and at the scale of the individual company, both corporates and start-ups. A big question for the panel asked if the co-habitation of geostationary and non-geostationary satellites will be a happy orbital marriage in all respects, such as successfully providing complimentary services, and avoiding radio frequency interference.

Returning to dialogue on the business aspects of space, it is clear that recent years have witnessed some significant trends in vertical integration in the satellite industry. More recently we have seen innovative investment relationships within and across industry segments such as investments in OneWeb by Hughes and Eutelsat. Very recently, a major acquisition was announced with the Viasat-Inmarsat deal. The panellists reflected on how these industry patterns and the industry's current future investment environment will evolve. In another big picture reflection, the panel considered the ongoing impact of the technology and cloud mega-giants on the space industry as we move into a new year with every prospect of more profound transformation.

Until 2022, stay safe!

Powering the future of mission critical communications

Today, mission critical communications rely on dedicated Land Mobile Radio (LMR) networks to provide a high grade of service for availability, reliability and security. Worldwide, many of these networks are based upon the TETRA standard, providing narrowband voice and data services to its users

Mission critical users have traditionally relied on voice services but are evolving their operations to encompass many more data services and applications, many of which can be carried over TETRA. There is, however, an increasing need for the use of data services such as video and high-speed data, which have higher bandwidth requirement than narrowband systems can deliver, and require broadband data services, such as LTE, to satisfy this demand and complement their narrowband communications.

Mission Critical LTE (MC-LTE) has been defined by 3GPP as an international standard to provide an equivalent service to current TETRA systems using LTE services. The specification provides for mission Critical Voice (MCPTT), Mission Critical Video (MCVideo) and Mission Critical Data (MCData) allowing both voice and

Mission critical users, such as airports or oil refineries are increasingly looking to incorporate data solutions into their critical communications solutions.

Public Safety users such as police and ambulance users will benefit from additional access to data from broadband solutions in the future.

broadband data capabilities to be combined into a single technology. The service provides Quality of Service performance guarantees, prioritisation and end-to-end security. A set of key performance indicators are defined for communications, and these values are intended to ensure that Mission Critical LTE service provides performance that is as good as existing LMR standards and solutions.

To answer this growing need in the market, Sepura has launched its first mission critical LTE solution; the powerful SCU3 Broadband Vehicle Device is ready for today's mission critical users whilst also offering flexible opportunities for the future.

With Sepura's experience delivering trusted critical communications solutions, the SCU3 has been designed for use in vehicles and/or fixed office locations, and supports Mission Critical Voice (MCPTT), video (MCVideo) and data (MCData) features.

Built on the market leading Android operating system, the device provides compatibility with a wide range of applications which have been designed to run on existing Android smartphones and tablets.

The device features an optional TETRA modem, enabling narrowband voice and data services, whilst also supporting Bluetooth®, Wi-Fi and Ethernet, providing connections to a range of accessories and ancillary systems. Paired with Sepura's Mobile Device Management (SDM) solution, the SCU3 Broadband Vehicle Device is the complete communications solution for today's critical communications users.

Sepura has a proven history of providing mission critical devices to users around the world, in a variety of harsh environments. The SCU3 is the latest evolution of this; a fit for purpose mission critical device, designed for exactly the type of public safety use that Sepura has decades of experience in and now with the advantage of adding broadband data to our solutions.

Sepura has a proven history of providing mission critical devices to users around the world,
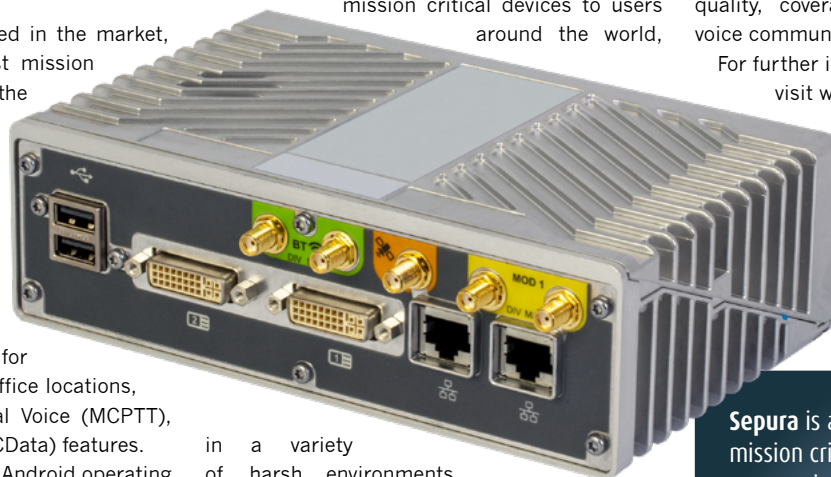

in a variety of harsh environments. The SCU3 is the latest evolution of this; a fit for purpose mission critical device, designed for exactly the type of public safety use that Sepura has decades of experience in and now with the advantage of adding broadband data to our solutions.

In combination with the Sepura Accessory Hub (SAH3), the SCU3 can be connected to a wide range of Sepura and third party accessories, providing flexibility for vehicle and fixed installations, including a Vehicle Control Unit (VCU) which gives the user complete control, with ergonomic buttons designed to enable safe, error free use in vehicles that may be moving at speed. The option to reuse existing Sepura accessories means the cost of ownership is minimised and training requirements are significantly lowered.

Mission critical users are always looking for ways to extend their capability, and the Sepura LTE solution enables them to do exactly this; adding broadband data to support their operations, while benefitting from the proven quality, coverage and robustness of TETRA voice communications.

For further information on Sepura's solutions, visit www.sepura.com. ■

Access to broadband features increases the flexibility of an organisation's communications solution.

Sepura is a leading provider of mission critical solutions to critical communications users and the SCU3 is the next step forward in supporting our customers around the world. With increasing demand from the market to integrate data into their operations, the SCU3 complements the TETRA solutions used and trusted by Sepura's customers.

Steve Barber, CEO, Sepura

Nepal Telecom opens 270 vacancies

Nepal Telecom (NTC) the government-owned telecom company, is set to hire 270 new employees as part of a major push in 2022.

The company has opened job vacancies for 20 different positions, which was published in Gorkhapatra daily on November 19, 2021. NTC said anyone with the required qualifications can apply for the vacant posts ranging from deputy manager to junior technician and including several engineers. Information on how to to apply for the recent vacant jobs can be found on the operator's website.

Meanwhile, NTC is set to distribute 97 number ranges for GSM SIM cards after its 98 ranges reach the combined 30 million subscriber limit.

The new range is designated for the telco's CDMA service/RUIM card. However, the company is shutting down the CDMA service in favour of GSM leaving its number range available for use. This is also one of the reasons why NTC is converting CDMA's 97 range into GSM numbers.

"The company's allocated 98 range has reached its end, and therefore, it's converting CDMA's available 97 range into GSM," said NTC managing director Dilliram Adhikari."

As per the National Numbering Plan, NTC has acquired 984, 985 and 986 number ranges for its GSM services. It operates 984, and 986 ranges for its prepaid services while it uses 985 for postpaid. Each number range is entitled to one crore (10 million) subscribers. This means NTC has three crores (30 million) subscribers available in which NTC can issue two crore SIM cards for prepaid and one crore for the post-paid GSM services. However, NTC's prepaid number range has been exhausted.

Teletalk and Huawei roll out 5G in Bangladesh

Bangladesh state-run operator Teletalk has partnered with Huawei to roll out 5G in the country.

Under the terms of the deal, the 5G network will initially be made available in six locations around the Bangladesh Secretariat, the National Parliament area, the prime minister's Office, the Bangabandhu Memorial Museum, the National Monument in Savar, and the mausoleum of the Father of the Nation in Tungipara, Gopalganj. Coverage will gradually expand to more regions of the country.

"The key to realizing Digital Bangladesh is connectivity. In the era of connectivity, now everything is going digital," said Sajeeb Wazed Joy, the prime minister's ICT Affairs Adviser, said. "I would like to thank the Ministry of Posts, Telecommunications and Information Technology, and BTRC. They worked hard to implement 5G. I would also like to thank Huawei for their contribution in implementing the 5G service."

India's Reliance denies bid for UK's BT

Reliance Industries denied a report that it is considering making an offer for the UK's biggest phone company, BT Group.

A report in the Economic Times said the Indian firm could make an unsolicited offer to buy into the company or move for a controlling stake with some strategic shareholders open to cashing out at the right price.

However, billionaire Mukesh Ambani, the chairman, managing director and largest shareholder of Reilance rejected the report, claiming it had no foundation whatsoever.

"We categorically deny any intent to bid for the UK telecoms group BT. The article is completely speculative and baseless," Reliance said in a stock exchange filing.

A BT spokesman declined to comment on the report.

Afghanistan services 'back to normal', claims ATRA

Telecom services in Afghanistan have returned to pre-government collapse levels, according to the country's watchdog

Taliban forces took over the country in August, with some conquering forces burning cell towers and critical infrastructure as part of the coup. Now, the Afghanistan Telecom Regulatory Authority (ATRA) claims that the damage has all been undone - but the group is itself now controlled by the Taliban, which means the claims have not been independently verified.

ATRA was regarded by many to be a controversial agency even prior to the collapse of the US-backed regime that preceded the Taliban.

Along with the state-owned Afghan Telecom company, MTN Group, Etisalat, and Roshan operate networks in the country. In August, MTN said that it was re-evaluating its business in Afghanistan.

SLT posts positive growth

SLT-Mobitel achieved a 49.2% year-on-year growth in Q3 2021, posting Rs.3.2bn profit after tax (PAT).

The company said commitment to cost consolidation across verticals combined with the group-wide undertaking to minimise waste, convert waste to cash and manage OPEX costs, resulted in savings over the year and is reflected in the year-on-year bottom-line and continued dividend payments.

Group revenue for Q32021 grew by 15.6% compared to the corresponding quarter of the previous year to Rs. 26.7 bn. The EBITDA (Earnings Before Interest, Tax, Depreciation and Amortisation) of the Group stood at Rs. 10.8 bn. reflecting a 25.7% year-on-year growth and the EBITDA margin improved to 40.4% compared to 37.1% in Q3 2020.

Top line for the first nine months of 2021 was Rs.76.6 bn, a 14% increase compared to the same period in 2020. This achievement was made possible due to a customer centric marketing strategy, with demand coming in for fibre connectivity for residential and corporate customers together with the demand for PEO TV and mobile services.

"SLT-Mobitel is on the cusp of transformation from telephony to technology, backed by research and development, moving Sri Lanka to the digital platform," said SLT Group chairman, Rohan Fernando. "To reiterate our commitment to service and technology the construction of a technologically advanced Mobitel headquarters commenced this year. On completion in 2022, all our Mobile services will be brought under one roof in a new tech park in Welikada."

The company also partnered with CISCO to offer new managed SD-WAN services for enterprise customers to carry out online services, while SME customers got a boost with the 'SLT-Mobitel BizChat, FB Chatbot' supporting business transformation as they turned more and more towards online options.

Smart invests US$1.88bn in Cambodia

Smart Axiata has invested circa US$1.88bn in telecoms infrastructure to connect Cambodia and contributed more than US$562 million in taxes, levies and regulatory fees to the kingdom since it began operations in 2008.

According to its 2020 Sustainability Report seen by The Phnom Penh Post, the company paid US$95 million in taxes, levies and regulatory fees last year while "continuing to be the Kingdom's employer of choice", supporting some 56,000 jobs directly or through its investments.

"High on Smart Axiata's nation-building agenda is the commitment to the country's digital future with ongoing investments in crucial infrastructure as well as support to Cambodia's digital start-ups and 'technopreneurs'," the company said. "Having successfully trialled 5G at about 20 sites in Phnom Penh, Smart will work closely with the relevant authorities to enable the widespread availability of this exciting technological development and lead the way in the rollout of 5G in Cambodia."

Smart acting chief executive officer Feiruz Ikhwan said the company's mission is to continue connecting people and investing in areas that benefit the Cambodian economy – especially in "turbo-charging" the Kingdom's digital future.

"We continue to work tirelessly to help pave the way for Cambodia's digital age... Smart has made a point of using our strengths and resources and collaborating with the relevant ministries of the royal government to help Cambodia during these trying times," he said.

However a lack of telecoms infrastructure development has been causing disruptions in service delivery and minister of post and telecommunications Chea Vandeth in June called for telecom operators and internet service providers (ISP) to scale up investment to meet the sharp increase in consumer demand.
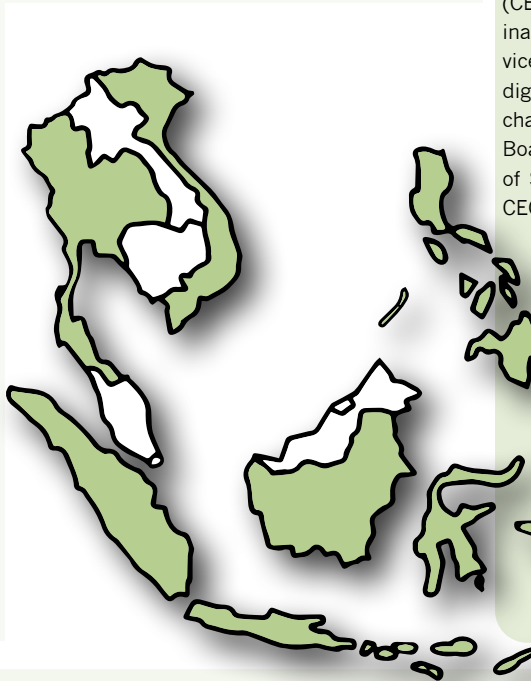
Indonesian city gets commercial 5G

Indosat Ooredoo, Indonesia's leading digital telco, has launched 5G commercial services in the port city of Makassar.

This launch is a continuation to power Indonesia's 5G revolution, following the previous launch of 5G commercial services in Solo, Jakarta, and Surabaya.

The first Indosat Ooredoo commercial 5G services in the east of Indonesia is part of a partnership with Huawei to revive key local economic sectors, specifically the agriculture, trade, and tourism sectors.

President director and chief executive officer (CEO) of Indosat Ooredoo, Ahmad Al-Neama, inaugurated the launch of 5G commercial services in Makassar. The event was attended by dignitaries, including minister of investment/chairman of Indonesia Investment Coordinating Board (BKPM), Bahlil Lahadalia; acting governor of South Sulawesi, Andi Sudirman Sulaiman; and CEO of Huawei Indonesia, Jacky Chen.

"I am deeply humbled and proud to launch Indosat Ooredoo's 5G commercial services in Makassar to continue the 5G revolution across the country, reaching eastern Indonesia. This technology will open up huge opportunities for the locals to revive the economy across industries at the epicenter of trade in Eastern Indonesia, ranging from agriculture, trade, and tourism sectors.

"This is the second time we have supported the commercialization of Indosat Ooredoo's 5G services in Indonesia after previously in Solo, central Java," said Chen.

Dtac adds 3.7m digital service subscribers thanks to anti-fraud strategy

Thailand-based mobile operator Dtac has reported an increase of 3.7 million new digital services subscriptions in 12 months after deploying anti-fraud solutions.

In line with its strategy to capture growth in data services, the kingdom's third-largest operator, engaged mobile automation firm Upstream both to extend its digital services portfolio and to actively market the new offerings. Dtac was looking to increase digital revenues and improve its competitive position in the Thai market, prioritizing secure, fraud-free transactions.

Over 12 months, dtac experienced an increase of 174% in digital service acquisitions. The ambitious campaign to transform the operator's revenues saw Upstream onboarding 33 new providers, while managing over 80 digital services in total. The expanded digital portfolio covers popular revenue-generating consumer services including gaming, lifestyle, social, dating and horoscopes.

Upstream was able to deliver new subscribers by operating as the exclusive digital media buying partner for the mobile operator, tapping into 45 different traffic sources, including Facebook, TikTok, Google and Twitter. This was achieved securely due to the deployment of Secure-D feature, which ensures that only genuine, consumer-initiated transactions are completed.

"Our challenge was to dramatically scale-up our digital services business, but in a sustainable way that didn't expose us and our users to fraud," said Partomchai Tangnoi, head of platform solution and operation at Dtac. "By working in close partnership with Upstream we were able to drive fraud-free cross-vertical customer acquisitions by constantly improving and optimising our campaigns."

The customer acquisition campaign was managed and executed using Upstream's Grow platform, a multi-channel marketing automation system which allows for continuous optimisation to be built into each campaign. Consistent A/B testing was conducted across multiple creative concepts, landing pages, and user flows to maximise conversion rates. By the first quarter of 2021, the campaign was delivering 250,000 new customer acquisitions per month.

"A highly-targeted, mobile-first approach can deliver real results in just a matter of months even during a time of turbulence in the sector," said George Kalyvas, chief commercial officer of Upstream. "Dtac is a great example to other operators of how you can tap into immediate and impressive revenue growth from relevant, no-frills and fraud-free digital services. We are proud of our marketing automation platform, able to deliver such results on behalf of our partners."

Singtel net profit more than doubles

Singapore Telecommunications (Singtel) said net profit in the first half ended September more than doubled, supported by a turnaround in the business of its Indian associate.

The operator said it also benefitted from the resumption of economic and business activities following easing of Covid-19 restrictions.

Net profit came in at S$954m (US$705.20m) versus S$466m in same period last year.

Meanwhile, revenue rose 3% on year to S$7.65bn, mainly lifted by higher mobile service revenue in Australia and strong digital services and data centre revenue.

"We are making headway in our other strategic priorities, including the roll out of commercial 5G services and unlocking the value of our infrastructure assets with the partial divestment of Australia Tower Network which operates Optus' passive telecommunications tower infrastructure," Singtel chief executive Yuen Kuan Moon said.

The firm said that its cash position remains healthy and that free cash in the first half rose 4% on year to S$1.77bn. This was mainly due to higher dividends from its associates, Singtel added.

In addition, the company reaffirmed its earlier guidance that it expects dividends payout by its associate to be at least S$1.3bn for this year. Capital expenditures including that for 5G networks is expected to be around S$2.4bn.

Telenor and CP Group in US$8.6bn merger of Thai telecom units

Norwegian operator Telenor and Thai conglomerate Charoen Pokphand Group (CP Group) will merge their telecom units in Thailand in an US$8.6bn deal to create a firm with just over half the mobile subscribers in the country.

Subject to regulatory approvals, the deal will see Telenor and CP Group each owning a third of the combined company, with stock market investors holding the rest.

The partnership will arm the two companies better against current market leader Advanced Info Service Pcl (AIS) and give them deeper pockets to face mounting investment costs for 5G.

Telenor said it will merge its majority-owned Total Access Communication (Dtac) with CP Group's True Corporation at an exchange ratio of 10.221 True shares per Dtac share.

Telenor and CP Group will have equal influence over the new business, the Norwegian firm's chief executive officer Sigve Brekke told newswire Reuters.

"When we now do this, we give up a majority control over the company we have," he said. "Therefore, it is important for us to make a company where there are equal partnerships, as in, the two big owners have the same shareholder position."

Telenor and CP Group's merged company will have "revenue market share in the low 40% that is similar to AIS," Brekke told other media. "AIS is still a big brother when it comes to profitability so we will learn as we go."

The tie-up between True and Dtac is set to become the third biggest merger deal between Thai companies, according to Refinitiv data. The combined firm will be listed on the Thai stock exchange.

Viasat acquires Inmarsat for US$7.3bn

Viasat agreed to buy British rival Inmarsat in a US$7.3bn deal to broaden the US-based company's satellite and land-based communications services.

The takeover of London-based Inmarsat comes just two years after it was taken private in a US$3.4bn deal by a consortium of British-based Apax partners, US-based Warburg Pincus and two Canadian pension funds.

The deal to buy Inmarsat includes US$850m in cash, circa 46.4 million of Nasdaq-listed Viasat's shares valued at roughly US$3.1bn billion and the assumption of Inmarsat's $3.4bn net debt, the companies said in a joint statement.

Viasat said it has signed up for US$2.3bn of new debt facilities to partially fund the deal as it also reported its second-quarter results.

"Joining with Viasat is the right combination for Inmarsat at the right time," said Rajeev Suri, a former Nokia executive who became Inmarsat chief executive in February.

The combination of Viasat and Inmarsat will have a fleet of 19 satellites, with 10 more under construction for launch in the next three years.
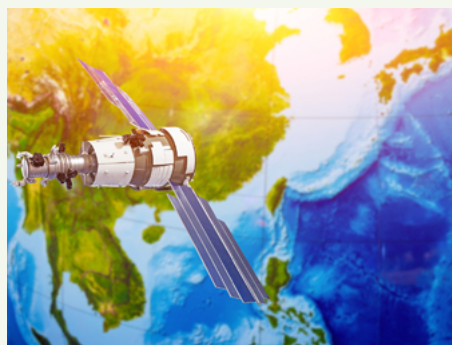
Yahsat and Ericsson provide private networks across Asia

Satellite communications firm Yahsat has partnered with Swedish tech giant Ericsson to offer private network, data, and internet connectivity services for the oil and gas, mining and ports industries across Asia.

Under the terms of the deal, the former's advanced telecommunication services and solutions will integrate with the latter's private networks solutions and devices across these industries.

The two companies will extend their services and applications, including remote sensing, video surveillance, UAVs and drones, geo-positioning, and backhaul solutions for offshore oil rig sites, across Asia as well as the Middle East and Africa.

These solutions will deploy the technology and connectivity ecosystem necessary for automation and IoT adoption in these industries.

"Leveraging our combined areas of expertise, we are confident that we will play a key role in overcoming the access and connectivity challenges facing these critical industries and further build upon our strong value proposition to prime customer segments, regionally and internationally," said Yahsat Group chief executive officer, Ali Al Hashemi."

Senior vice president and head of business area technologies and new businesses at Ericsson, Åsa Tamsons added: "Ericsson's private network solution, combined with Yahsat's satellite connectivity and services, will empower advanced IoT use cases. Predictive maintenance, connected worker, augmented reality, sensor-based monitoring, and automated guided vehicles are some exciting examples."

PLDT 'leads digital integration' in Asia

PLDT, the Philippines' largest fully integrated telecommunications company leads digital inclusion among Asian telcos, according to the latest Digital Inclusion Benchmark conducted by the World Benchmarking Alliance (WBA).

The company ranked 12th out of 150, joining global blue-chip businesses like Apple, Cisco, Samsung and Alphabet in the Top 15.

While being the sixth telco following Telefonica, Orange, Telstra, Deutsche Telekom and Telia, PLDT is the top ranked telco from Asia (excluding China) and the highest-ranking company headquartered in a developing nation.

"We are proud to be ranked globally with the world's biggest tech companies in promoting a more inclusive digital economy and society. We are encouraged to see that our efforts have been recognized and this recognition motivates us even more to pursue efforts to connect and empower Filipinos digitally," said Melissa Vergel de Dios, Chief Sustainability Officer of PLDT.

The WBA noted PLDT 's initiatives on skills development where it ranked second among companies surveyed. The Infoteach Program, in partnership with the UP Open University (UPOU), provides nationwide digital literacy training for students. The Digital Farmers Program trains small-scale Filipino farmers on using technology to improve harvest and market crops. The Smart Wireless Engineering Education Program (SWEEP) is the country's longest-running industry-academe linkage helping to produce industry-ready graduates or technopreneurs. The School-in-a-Bag is a portable digital classroom that brings education to children in far-flung communities. The said programs address narrowing of the digital divide and the inclusion of marginalised sectors.

PLDT also showed strong performance on the "use" category, placing 10th among companies evaluated. The WBA also recognised the company's investments in its cybersecurity defences. The alliance further noted PLDT's commitment to keeping a safer online space for its customers, particularly, children where the company has partnered with like-minded organisations to spread awareness on and curtail online abuse and exploitation of minors.

Talking critical

Jason Johur, TCCA board member and chair, TCCA's Broadband Industry Group

What role will 5G play in delivering critical communications?

5G networks promise greater capabilities to critical users but further specification work is needed to ensure their unique requirements are met. A new white paper from TCCA, the global organisation for the advancement of standardised critical communications technologies, says that ultimately, 5G will enable cooperation between critical users to become more efficient and effective. As a result, the safety of first responders and the communities they protect will be enhanced.

The white paper addresses a number of key questions raised by the critical communications community on the role of 5G, including how it compares to 4G LTE, the initial use cases, the expected impacts on user operations and the likely market availability of such solutions.

5G opens up the potential for a range of new services, most notably driven by 5G's ultra-reliable low latency communications and support for massive machine-type device deployments. Use cases that will benefit users include enhanced situational awareness through the use of advanced video recognition capability and artificial intelligence-powered analysis of data. For first responders, this means control rooms will have a far more accurate view of a situation and can better allocate people and resources. Information can be shared between agencies seamlessly, via cloud-based application platforms.

In terms of standardisation, several of the 5G network enablers have been specified in 3GPP Releases 15 and 16. However, some enablers critical for use cases such as broadcast and device-to-device communications are still in development and not expected before 2023. The white paper outlines the expected timescales for this work and warns that although there are some early 5G devices available now, those suitable for critical communications will not be available for at least another year. Similarly, while applications that could benefit critical communications users have been designed for 5G networks, these are not yet mature or proven enough for mission-critical operational use.

While 4G LTE delivered a paradigm shift in critical communications versus previous technology generations, 5G brings evolutionary change in terms of speed, latency, security, breadth of use cases and quality of service. There is a growing global ecosystem committed to driving further standardisation and development of 5G features and services to ensure the networks, applications and devices will fully support the crucial work of critical communications operators and users.

"There is no doubt that 5G has earned the attention of mission critical communications customers with its promises to address their demands for flexibility and higher speeds to help the evolution of their traditional voice-centric communications and adopt disruptive multimedia features like prioritised video sharing, real-time data analysis and location-based services - all under an augmented focus on reliability, capacity, security, and cost efficiency," says Ildefonso de la Cruz, principal analyst - industrial and government critical communications at Omdia. "We have started to see examples of 5G deployments taking business automation to the next level in other industries. However, the ongoing 3GPP standardisation efforts are necessary to overcome gaps such as direct-mode communication and support for MCX services to enable 5G to make significant inroads into the critical communications market. Read the white paper here."
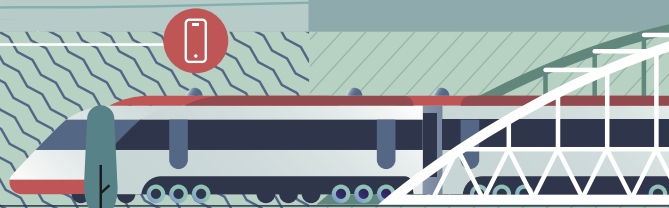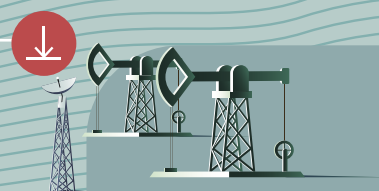
Jason Johur is head of strategy and market development for Ericsson's mission critical networks business.
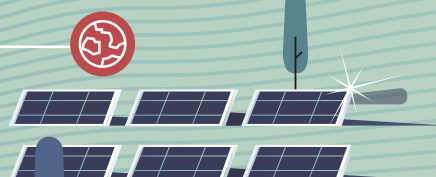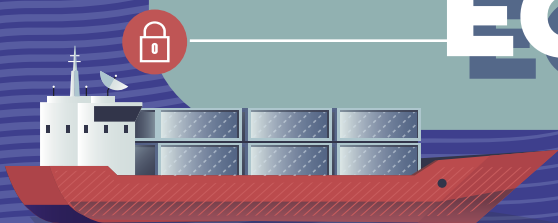
RSCC Russian Satellite Communications Company

SATELLITES FOR DIGITAL ECONOMY

rscc.ru

The rebalancing of the global internet

Geoff Bennett, director, solutions and technology, Infinera explains how submarine cable systems point the way to economic growth

It's estimated that submarine communication cables facilitate over $10 trillion USD in global trade per day. For rapidly growing regions of the world like Asia and Africa to have full access to this flow of digital commerce, they need to have reliable, high-capacity subsea cable connections. This is even more important as the epicentre of internet traffic shifts away from the U.S. and toward a far more equitable balance of traffic around the globe.

In response to this need, in recent years we have seen new, high-performance cables providing higher capacity and lower latency for connections between Europe, the Middle East, and Asia, as well as new direct cables between Europe and South America.

The longest submarine cable in the world today

The Asia-Africa-Europe-1 (AAE-1) cable is a great example. A 25,000-km cable system that connects Southeast Asia to Europe via Egypt, it is the largest submarine cable to be constructed in almost 15 years. AAE-1 is a modern cable design, optimized for the latest generation of high-performance coherent subsea transponders. These are the active transmitter/receiver devices that are plugged into either end of the cable, and which inject high-data-rate optical signals at over 100 Gb/s per wavelength, with an initial design capacity of 40 Tb/s for the cable.

Note that, while a submarine cable has an engineering design life of about 25 years, transponder evolution occurs in roughly four-year cycles, so new transponders can be deployed on existing cables to give them a mid-life boost in capacity. For example, over the past 20 years, the capacity of trans-Pacific subsea cables has increased by a factor of 357 times. But over that period, only 12 cables were laid. Most of that capacity growth has been achieved by submarine transponder evolution.
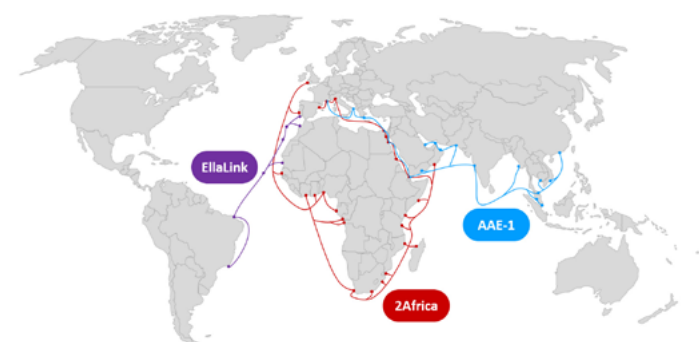
The Asia connection

According to the same source, growth in demand for capacity in the Asia region is only marginally lower. Intra-Asia routes alone are forecast to receive US$1.6bn in investment in new cables over the next three years.

The Asia region demonstrates that geopolitics shapes markets as much as technology change and demand. Plans by several providers to land trans-Pacific cables in Hong Kong were severely disrupted when the U.S. government denied a licence to Pacific Light Cable Network, a Chinese-owned operator, to land part of its cable in Hong Kong. Fearful of similar restrictions, other operators with plans to land cables in the territory began to withdraw their landing licence applications.

The impact of this affair on Hong Kong's economy would be difficult to exaggerate. While the territory has long enjoyed a powerful position as an intra-Asia hub, it is only currently connected to a single trans-Pacific cable and a key aspect for submarine connectivity must be resilience – especially where cables need to be laid within the geologically active "Ring of Fire" regions.

Not only was this a blow to Hong Kong's prospects of expanding its role in international connectivity, the move to thwart PLCN prompted rapid redrawing of plans by other operators. Hong Kong's loss, meanwhile, may be a gain for Singapore and other Asian countries.

Architecting submarine networks for data security

Given that data security represents one of the 21st century's most important strategic assets, it should come as no surprise that governments are taking seriously inherent risks associated with submarine networks and pushing for stronger security measures. For example, the U.S. recently launched The Clean Network initiative, which includes a Clean Cable working group tasked with assessing what a "secure" submarine cable looks like and ensuring that undersea cables around the world are not subject to compromise, including by foreign governments looking to exploit weaknesses for intelligence-gathering purposes. Earlier this year, over 20 European Union (EU) Member States committed to strengthening internet connectivity between Europe and its partners in other global regions by signing the Declaration on "European Data Gateways as a key element of the EU's Digital Decade," an initiative that includes increasing focus on submarine cable security and dependency risks. In addition to architecting for higher capacity and increased performance, data security is playing an increasingly critical role in how submarine networks will be designed and built moving forward.

Putting content on the map

Telecommunications market research firm TeleGeography earlier this year published a map of the world's submarine cables showing 464 cables and 1245 landing stations. The map helps to visualize the extent and pace of the market as well as its changing dynamics. The 19 new cables added to the 2021 edition of the map alone add a further 103,348km to the global supply – enough to circle the earth two and a half times – boosting the total to 1.3 million km. The link between this new capacity, the boom in data centres, the growth of public cloud services and increasing consumption of online content is clear. By 2020, content providers – the likes of Google, Amazon and Microsoft – accounted for 66% of total capacity. These same companies are becoming significant investors in subsea cable as well as data centre infrastructure.

In conclusion

Submarine cable systems are vital to the digital economy worldwide. In the past, so much of this activity was centered on the US but now Asian, African, and South American routes are increasing in capacity, with an explosion of local data centres and an increasing diversity of landing points.

The future is bright for these growing economies to grasp the opportunity to recover in the post-Covid world. ■

5G: the towers and the technology

5G is finally starting to gain traction after a stop-start 18 months. Robert Shepherd asks the experts about the towers and technology that facilitate its delivery against the backdrop of an unrelenting pandemic

Thanks to the Covid-19 global pandemic, supply chain disruptions, cost concerns and infrastructure sharing understandably slowed tower and small cell growth in 2020 around the world. As a result, projections and plans for 5G infrastructure and integration had to be adapted and re-evaluated across Asia-Pacific.

Nowhere was it felt more keenly than in southern Asia. Take India, the world's fifth largest economy at the time of writing and closing in on China as the world's most populous. The March 2020 lockdown imposed by prime minister Narendra Modi's administration forced almost all people within and across different states to stop building new towers and cell sites. That meant the country's operators, tower companies and other relevant players and to shift their focus to other things like maintenance work.

Mukesh Ambani, who is Asia's richest man as well as the chairman and managing director of India's largest private firm, Reliance Industries, recently upped the ante by declaring that 5G needs to be "India's top priority".

Head east and to a new entrant by the name of Dito Telecommunity in the Philippines, which began commercial operations in March this year also had to press the pause button on its tower building. The company said it only completed 300 of a planned 1,600 towers due to problems with the equipment it imports via part-owner China Telecom because of China's lockdown in January 2020.

Research conducted by S&P Global called Asia-Pacific tower and small cell projections through 2031 and published in March 2021 says that operators and tower companies, however, remain bullish on tower growth for these two markets. "American Tower Corp. remains optimistic on its tower business in India, citing the consolidation of the tower industry and strong government support for digitalisation as significant growth drivers," it says. "There is significant room

for growth in rural areas where 4G penetration remains lower than the national average."

Terence McCabe, chief technology officer, Asia Pacific & Japan at Nokia, says that while he would "rather not talk about specific customer engagements, it is worth pointing out that we do see an increase in the interest by tower companies in the role of 'neutral host' arrangements which extend beyond sharing of the tower real-estate" and include sharing of radio or baseband facilities using a range of technologies such as MOCN (Multi-Operator Core Networks) or MORAN (Multi-Operator Radio Access Networks). McCabe continues: "The increasing complexity of site design and the challenge of rolling out densified 5G networks increase the interest in network sharing to accelerate coverage footprints and contain OpEx growth. 5G does not specifically enable these developments, but the increased rollout activity creates an environment where these innovations become worthwhile considerations."

McCabe adds that for the tower company, the question at hand is whether it has the means and interest in growing their value by taking a larger part in the rollout and operational management of the radio network. "For the mobile carrier, the issue is one of control versus cost, as a shared network requires compromises in deployment and reduces the scope for differentiation with their competitors," he says. "There is certainly an opportunity for tower companies to play a greater role in the management of the complexity of site design and in environments where the difficulty

of site acquisition is a critical factor, the tower company can play an important role in ensuring that 5G rollout is not delayed."

Meanwhile, the same S&P Global research explains that the government of the Philippines remains committed to its earlier target of building 50,000 additional towers with no specified timeline to improve connectivity. Indeed, it awarded at least 23 tower company licenses and expedited approval of tower building permits to support this goal. Incumbent operators Globe Telecom and PLDT vowed to ramp up infrastructure spending in 2021 to prepare for the entry of Dito.

"Pakistan and Vietnam are also seeing aggressive tower rollouts, whereas spectrum issues could curb growth in Indonesia, Malaysia and Thailand," the report adds. "These developments could push total towers in southeast Asia and south Asia to grow by 6.72% and 4.76% CAGR, respectively, from 2021 to 2031."

McCabe concedes that Covid had an impact on the rollout.

"One impact of the pandemic has been the realisation that 'all networks have become critical networks' as our residential broadband networks have become the basis not just of entertainment delivery, but have become the means to continue working, learning, and shopping while at home," he says. "Some people will return to the office environment but the proportion of the workforce who 'work from home' has changed permanently in many countries. The potential to work as effectively from rural or urban environments

has increased the awareness of the need for coverage and connectivity solutions that extend beyond urban cores. 5G as a compliment to fibre deployment is now becoming a reality in many markets and increasing the flexibility offered to consumers."

When it comes to the impact of Covid on the roll-out of networks themselves, McCabe says "of course the challenge of maintaining safety in the workplace" for Nokia's employees and contractors has been critical throughout the crisis, and there have been cases where the reduction in international mobility has created stresses. However, he argues that it has also proved a trigger for the increased adoption of digitisation tooling in network buildout. "We have been able to extend the reach of our experts through video connections with on-site engineers and innovations such as drone-based site survey has become more valuable in these new working circumstances," adds McCabe.

Indonesia while perhaps not considered one of the powerhouses of southern Asia when it comes to 5G infrastructure and rollout, has been making quiet yet steady progress. In fact, Vikram Sinha, chief operating officer at Indosat Ooredoo, argues that his company is "at the forefront of Indonesia's 5G revolution" and that it continues to support the government on Indonesia's digital agenda.

"We have already launched commercial 5G services in Jakarta, Solo, Surabaya, Makassar and we intend to continue to rollout 5G in other cities across Indonesia," says Sinha. "Aligned with the government agenda to cover population in Indonesia with 4G, for the last three years we put our focus to sunset 3G services and continue to expand our 4G coverage across Indonesia."

In terms of progress, Sinha says he is "happy to share" that over 90% of Indonesia's population are already covered with Indosat Ooredoo's 4G services and most of its 4G BTS are 5G ready."

5G was hyped and arguably arrived with more fanfare than any of its predecessors, with faster speeds and lower latency usually the main selling points. Yet while the next generation technology is no doubt a significant improvement on all that's come before it, the true test is how it's going to benefit society.

Sinha says his company believes 5G technology and its many use cases has the power to revolutionise Indonesia's manufacturing industry, public services, healthcare sector and meet growing consumer demand for digital content and entertainment services over mobile networks.

What's more, Sinha has some examples to share as Indosat Ooredoo is exploring a wide range of advanced 5G use cases.

"They include connected cars and in-car entertainment services, smart surveillance technologies such as drones and smart CCTV, smart electricity that automatically detects faults in household circuits, healthcare applications that involve remote monitoring and entertainment applications such as mobile HD video, 360 video and virtual reality," he says.

"Aligned with the government agenda to cover population in Indonesia with 4G, for the last three years we put our focus to sunset 3G services and continue to expand our 4G coverage across Indonesia"

Vikram Sinha, Indosat Ooredoo

FEATURE: 5G: TOWERS AND TECH

> "Typically, this will require fibre connectivity to extend to more sites with only the rural edge supported by microwave"

Terence McCabe, Nokia

"As part of Indosat Ooredoo's growth strategy we refocused the business on digital products and services and transition to an asset-light model. In-line with this strategy, in March 2021 we announced a deal to sell and leaseback more than 4,200 of our telecommunications towers in one of the largest transactions of its kind in Asia, valued at around US$750m."

While the drive and wherewithal are there to make 5G a success, a lot of money has been spent on existing infrastructure. Can these towers and the kit that facilitate cellular connectivity be used, or do they have to be uprooted and replaced in their entirety?

McCabe says the degree of change to existing tower facilities "has much to do with the existing site infrastructure and the priorities of the mobile operator". He explains how much of Nokia's deployed radio infrastructure is '5G ready,' meaning that software upgrades are

available to allow 5G NR (New Radio) to be rolled out on existing equipment and existing spectrum with disruption.

"However, the rollout of 5G is often associated with new spectrum allocations and may require additional radio and antenna deployment," he warns. "Where the new spectrum is in the mmWave bands, the need to facilitate line-of-sight connections and short propagation paths typically requires a small-cell rollout plan in which existing towers play a reduced role."

McCabe also explains that "a key factor" in any 5G rollout is planning for backhaul facilities capable of supporting the bandwidth demands of intense broadband usage. "Typically, this will require fibre connectivity to extend to more sites with only the rural edge supported by microwave," he continues. "Likewise, the aggregation of these sites will require a backbone optical network capable of significant growth, so if that does not exist today, the development of a robust and extensible optical network is critical to success of the 5G rollout."

Singapore is presently leading 5G development in southeast Asia, but telcos in other parts of the region have announced merger deals worth a combined US$30bn this year. While this has been done to enlarge their market clout and improve profitability, it's good news for 5G infrastructure investment.

Recently announced deals include Thailand's True, the second-biggest mobile operator that is owned by the country's largest conglomerate Charoen Pokphand, joining forces with Dtac, owned by Norway's Telenor. In Indonesia, south-east Asia's biggest economy, Qatar-based Ooredoo and Hong Kong's CK Hutchison, the two largest operators, are set to combine in a US$6bn deal the regulators are expected to approve by the turn of the year. In Malaysia, regulators are poised to assess a US$15bn megamerger between local firm Axiata and Telenor, which would create an industry leader with a 46%-50% market share, according to estimates by Fitch Ratings. In 2019, Cambodia's regulator signed a deal with Chinese giant Huawei to deploy infrastructure in the country by 2020.

It's clear that sector consolidation has been gathering pace globally, as companies pursue scale to defray the costs of investing in 5G and full-fibre broadband networks.

Good to hear that 5G, all things considered, is powering on and that companies are, in a way, sharing the costs. Does that mean 6G could be here sooner than we think?

While you may scoff at the thought and say that we haven't even cracked 5G yet, South Korea and the US are just two countries already making major inroads. When it does arrive, will the 5G tech work for 6G or is it all 5G specific?

"Firstly, we are still a decade out from 6G, with the intended commercial deployment to begin in 2030, but the expectations are already being set for what the technologies of 6G involve," says McCabe. "Before that comes, we still have significant development to come in 5G and 5G Advanced which will bridge current networks to the 6G future. While today's 5G deployments have focused on enhanced mobile broadband coverage, further enhancements to both latency and reliability as well as the addition of non-terrestrial networks."

McCabe concludes by suggesting that the rollout of 5G is an opportunity to survey the legacy tower equipment with a view to power efficiency and future extensibility. "Likewise, the re-farming of existing spectrum for 5G NR deployment creates opportunities for consolidation of tower footprint," he says. ∎

Estimated tower and small cell share per market in Asia-Pacific, 2020 (%)
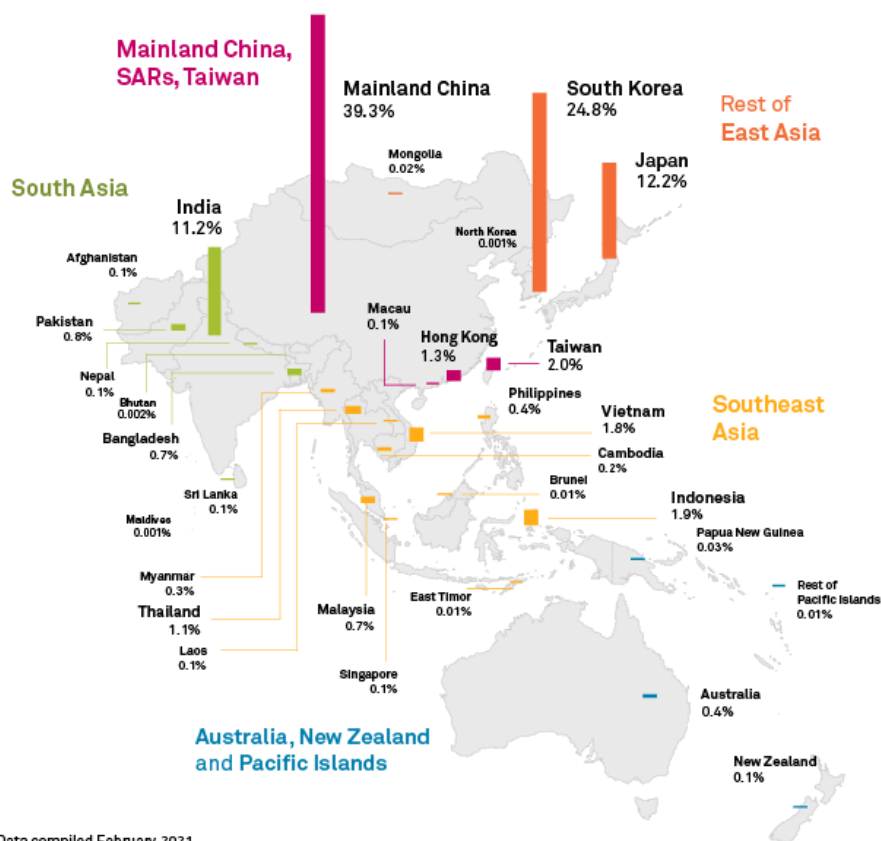
Data compiled February 2021.
SAR = special administrative region
Sources: Industry data; Kagan estimates
Kagan, a media research group within the TMT offering of S&P Global Market Intelligence
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RF over fibre in southeast Asia

John Meyers – ViaLite Communications sales manager, APAC

For those unfamiliar with the applications of RF-over-Fibre in satellite communications, it may seem a contradiction that satcom would depend on fibre, the very terrestrial technology that satellite communications is often purported to replace.

However, in the past few years, something has happened in the world of satcom. With the advent of High Throughput Satellites (HTS), satellite bandwidth capacity has grown exponentially. Satellite frequencies have moved from C-band to higher frequencies such as Ku and KA-band. These higher frequencies usually require the implementation of diversity gateway sites to address rain fade. In some countries, regulatory authorities require commercial satcom operators to build backup gateway sites to improve network resiliency in case of natural disasters.

All of these satcom trends have arrived in the SE Asian region, and have put a strain on the ground interconnectivity infrastructure of satellite gateways. Traditionally, coaxial cable has been the mainstay for connection of baseband satcom equipment to the RF components. However, as RF capacity, RF frequency, and distances between RF and baseband equipment increases, the signal loss inherent in coax cable becomes problematic.

Enter RF over Fibre. The Transmission of RF signals over Fibre (RoF) is an established technology, and the continued fall in the price of electro-optical converters over the last ten years has led to RoF becoming a competitive transmission platform.

As a market leader in RoF solutions for satcom, broadcast and other areas, ViaLite Communications has seen continued growth in the Southeast Asian region for the reasons mentioned above. However, the design and implementation of these solutions has also evolved, and this has benefited our – ViaLite's - customers in the region.

A decade ago, RF over Fibre was used to connect gateway baseband equipment (operating at L-band or 70/140 MHF IF frequencies) to the BUC/LNB on large gateway "hub"

antennas that were located more than 100 meters from the equipment room. Coax cable is typically limited to a 100 meter distance in this application.

Today, there is also a need for Long Distance links that connect the baseband equipment to both a local gateway Radio Frequency Transmitter (RFT) and a diversity or backup RFT site. These remote gateway RFTs are typically 30-100 km away, but depending on how the fibre is physically run, the actual distance may be more. During rain fade or hardware failure at the main gateway, the RF signal may need to be seamlessly switched between the local RFT and the remote RFT with no disruption to user traffic.

ViaLite uses DWDM (Dense Wavelength Division Multiplexing) and CWDM (Coarse Wavelength Division Multiplexing) methods to transport L-band RF signals between baseband equipment and remote gateways at distances up to 600 km. DWDM and CWDM allows many RF frequencies (satellite carriers) to be multiplexed and transported over a single fibre or fibre pair.

Proper link design is critical when implementing a long distance link, as amplifiers and boosters are typically employed. If a design is incorrect, the link may not close. ViaLite has created a tool to address this concern.

When satcom engineers design a satellite link, they utilise link budget tools to take into account link losses, gain, power, noise, availability and other factors to properly design a reliable satellite link.

In the same way, ViaLite has made available to its customers a link budget tool for designing Long Distance RoF links. Called the *System Designer tool*, it is a cloud-based link budget tool used by ViaLite engineers to confirm the performance of Long Distance Link designs. It is also available for our customers to use and "tweak" the inputs, as performance details of the actual fibre become available or change over time.

This is a great time saver for our customers, as they can confirm changes to the design as well as the link reliability by themselves. A proper

link budget is especially critical when DWDM or CWDM technology is utilised for Long Distance links.

We have noted varying degrees of the quality of dark fibre in some markets in the region. A poorly performing 30 km fibre run may have the same end-to-end losses (dB/km) as a well performing 100 km fibre run. This makes the need for a link budget tool to confirm a long distance DWDM/CWDM link design even more critical. If a Long Distance link is designed improperly, the link may not close, resulting in additional labour and equipment costs to replace the supplied optical amplifiers and other equipment with higher power equipment.

Remote access and support

Over the past two years, the Covid-19 pandemic has impacted the installation and support capabilities of many communications systems in the SE Asian region. Not only have ViaLite engineers been unable to travel to other countries to install equipment, but similarly, the in-country engineers of our customers often had difficulty accessing the satcom gateway site to install and commission the ViaLite equipment. ViaLite addressed this shortcoming with our remote access capability. Using PC-based remote access tools such as Teamviewer and the M&C capability of the ViaLite equipment, ViaLite engineers in the UK have been able to *remotely* configure, test and finalize customer acceptance of RoF equipment in countries such as Indonesia and Hong Kong.

When troubleshooting was required, our engineers were able to quickly access the M&C system of the RoF equipment to assist our customers. Of course, following training on these remote access tools, many of our customers use this report access capability by themselves as well.

Several LEO (Low Earth Orbit) satellite networks are planned to be on-station and covering portions of SE Asia within the

next two years. From the RF-over-Fibre perspective, this represents increased activity for companies like ViaLite. Unlike a typical GEO earth station, which may have one or two RFTs, a LEO gateway may have a dozen or more antennas that need to be connected together to allow the tracking and handoff between the multiple LEO spacecraft as they move across the sky.

In addition, a country may need several gateways (Starlink says it will need thousands of gateway antennas for its LEO constellation). ViaLite has already provided this type of gateway connectivity in North America and we foresee similar requirements across the APAC region.

The Southeast Asian region will always be an active region for satcom and satellite broadcast, due to the prevalence of islands and dispersed rural areas across a large geographic area. Even landlocked countries such as Thailand and Vietnam, which have a significant installed base of terrestrial fibre will always have some requirements for satellite communications.

Broadcasters continue to have requirements for connecting multiple Television Receive Only (TVRO) antennas to broadcast studios – along with satcom, this has always been a sweet spot for ViaLite.

ViaLite is addressing the RF-over-Fibre aspect of these requirements, as well as other areas including broadcast, GPS/GNSS extension and military RoF solutions. We see an exciting future in the SE Asian region. ■

Vietnam awaits 2022 to surge ahead with mobile broadband

Sébastien de Rosbo,
research manager, BuddeComm

Even with Covid-19 pandemic-related mobility restrictions in place, Vietnam's economy has continued to outperform the rest of the region in 2020 and 2021. Nevertheless, the telecom sector essentially spent most of this period in a holding pattern, focusing on maintaining service throughout the crisis while preparing for some major changes to come in the mobile market in 2022.

Both fixed-line telephony and mobile have experienced small drops in subscriber numbers since the start of the pandemic, but the similarities between the two markets end there. Fixed-line teledensity continued its downwards trajectory towards virtual oblivion, with just 3% penetration (around 3 million subscribers) at the start of 2021. The mobile market has lost about the same number of subscribers since the end of 2019, but has been sitting on much higher penetration levels around 130% for many years. Growth is expected to kick in again in 2022 following the anticipated launch of commercial 5G mobile services along with a range of government-led schemes to move consumers completely off 2G and 3G.

One example is the planned redistribution of GSM/3G bandwidth to LTE. In addition to propelling Vietnam into having one of the most advanced mobile markets in the world, this should also spur on the mobile broadband segment. With a penetration level of just over 70%, mobile broadband has considerable room to grow. Increasing economic prosperity coupled with the latest smartphone technology and networks should see mobile broadband underwriting the country's telecommunications sector for at least the next few years.
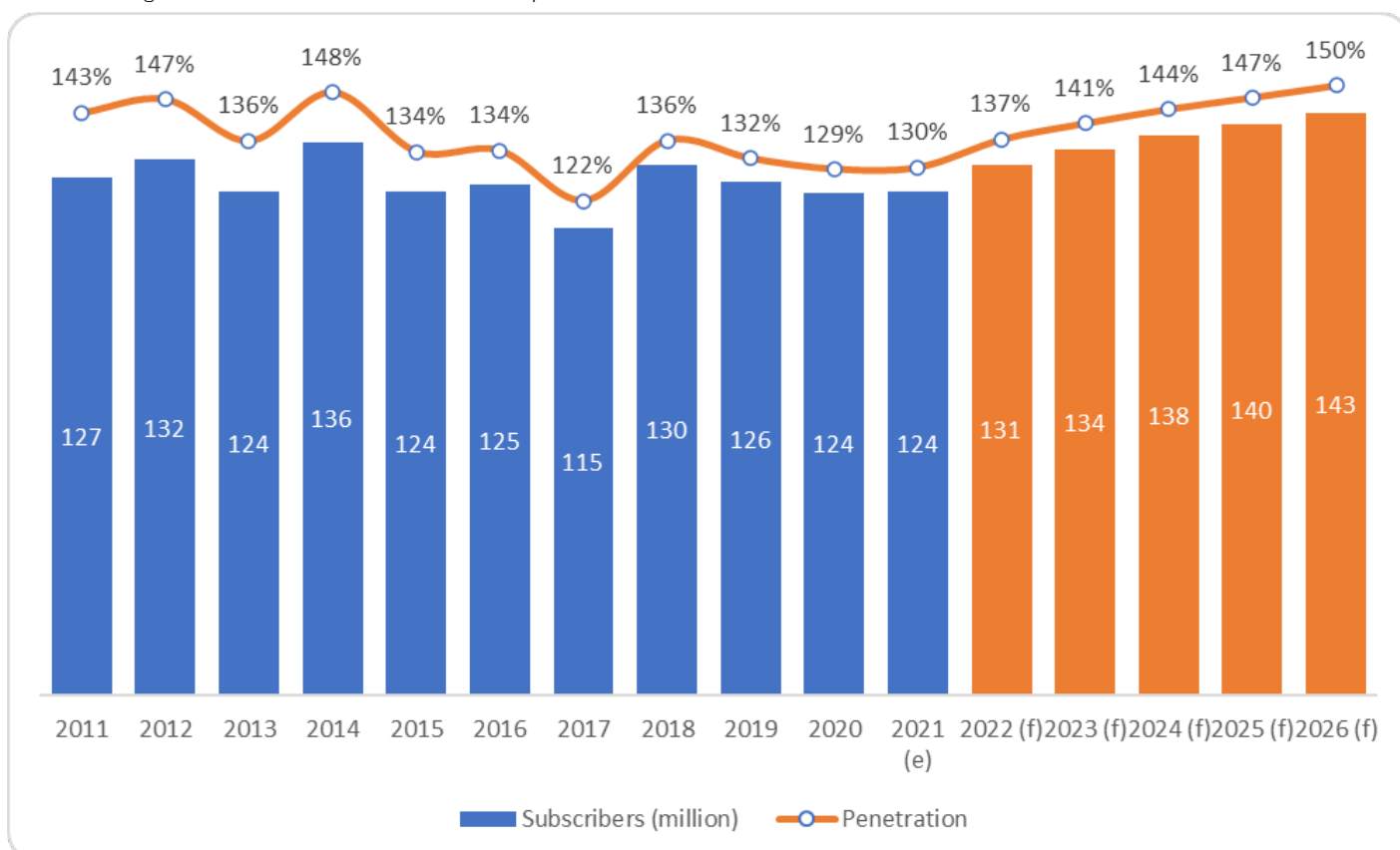
Table 1 – Change in the number of mobile subscribers and penetration – 2011 – 2026

Year	Subscribers (million)	Penetration
2011	127	143%
2012	132	147%
2013	124	136%
2014	136	148%
2015	124	134%
2016	125	134%
2017	115	122%
2018	130	136%
2019	126	132%
2020	124	129%
2021 (e)	124	130%
2022 (f)	131	137%
2023 (f)	134	141%
2024 (f)	138	144%
2025 (f)	140	147%
2026 (f)	143	150%

Source: BuddeComm based on regulator data

This report includes the regulator's market data to July 2021, telcos' financial and operating data updates to June 2021, Telecom Maturity Index charts and analyses, assessment of the global impact of Covid-19 on the telecoms sector, and other recent market developments.

Key developments in 2021

- Government plans to shutter GSM and 3G networks, and redistribute spectrum to 4G LTE and 5G services.

- Viettel achieves a record data transmission speed of 4.7Gb/s in 5G trials.

- Viettel, VNPT, and Mobifone agree to trial 5G network sharing and data roaming.

- Viettel develops a national immunisation management platform, while the Vietnam National Administration of Tourism (VNAT) launches a digital vaccine certification system for international visitors and workers.

- Reddi becomes Vietnam's second MVNO, using VNPT's network.

Chart 1 – Change in the number of mobile subscribers and penetration – 2011 – 2026

Source: BuddeComm based on regulator data

Five reasons why 5G makes the difference

The fifth-generation of wireless technology is paving the way for the connectivity that digital technologies increasingly require. Peter Linder, head of 5G marketing at Ericsson, shares his views on why 5G makes a difference

5G has rapidly gained mindshare in society as a vital technology. But what makes 5G different from its predecessors? We describe a set of strategic choices made for previous mobile generations of which we made a single choice. 5G makes it possible to embrace both options, unlocking larger opportunities earlier in the deployment cycle.

The mobile industry made five strategic choices for 4G and focused on:

- The type of users driving development, i.e., consumers
- The type of service offerings, i.e., mobile broadband
- The nature of connectivity services, i.e., universal internet access
- Infrastructure build-out, i.e., public networks
- Initial network coverage, i.e., urban and sub-urban areas

5G extends the scope and opportunities in each of these five factors, beyond the original choices made for 4G.

INDUSTRY VIEW: 5G

Consumer and business users

The introduction of 4G was consumer-led, with infrastructure and device technology development centered around smartphones for consumers. Businesses adopted consumer technology through a more visible, bring-your-own-device (BYOD) movement. Internet of Things realisations using 4G focused on re-using technology designed for smartphones at a later stage of the 4G journey. Where devices such as smart watches came after smartphones.

5G always has been a consumer AND business-led phenomenon. The existing consumer-led market is growing at 0.53 percent CAGR this decade, and the business-led market is growing at 12 percent CAGR. In simple terms, the consumer segment will remain the business foundation, and the business segment represents the growth potential for communications service providers (CSPs).

5G gives enterprises access to a richer value proposition for wireless connectivity. The 5G standards have prioritised whole business use categories, such as massive IoT and critical IoT. Service providers are transforming their marketing and sales teams to engage beyond selling SIM cards and buckets of data traffic, to supporting the digital transformation of enterprises.

Mobile broadband and fixed wireless access

Mobile broadband led with its coverage and capacity capabilities during the rollout of 4G infrastructure. Cellular technology, which provided internet access to mobile devices, was dominated by smartphones, and fixed wireless 4G applications came to market once mobile broadband applications were successful in niche volumes.

5G is enhanced mobile broadband AND fixed wireless access (FWA) led from the start. Mobile broadband to smartphones defines initial coverage plans and device introduction strategies. Half of the 800+ 5G devices launched to date are smartphones. FWA using 5G comes earlier in the deployment cycle and will play a larger role in the market. We expect FWA to grow from 60 million in 2020 to 180 million in 2026. A mix of 4G and 5G will connect the next 100 million households, with 5G serving 70 million connections by 2026.

> "5G allows fixed wireless to become a powerful alternative to wired broadband where fibre doesn't exist and where existing copper/coax infrastructure delivers subpar performance"

5G allows fixed wireless to become a powerful alternative to wired broadband where fibre doesn't exist and where existing copper/coax infrastructure delivers subpar performance. 5G can be rolled out faster, at a lower cost, and with a high synergy between fixed and mobile broadband upgrades.

Universal use and Business and mission critical use

4G started as a homogenous business proposition, defined around a universal internet connectivity service. All applications and all users would get equal access to the available network capacity.

Today, support for unique requirements by business and mission-critical applications vary across 4G networks.

Network architecture and design for 5G support all three connectivity types. These connectivity types leverage traffic separation, reliability, availability, and security as the main improvement areas, from standards to implementation, and allow us to raise the bar for what 5G can support. One network supporting all three connectivity types is vital for applications where dedicated spectrum and infrastructure is not an option. The FirstNet deployed by AT&T in the United States is an excellent example of how powerful these combinations are already.

Business-critical connectivity supports business processes where performance, security, availability, and reliability are higher and require service level agreements. Mission-critical applications support users, like first responders, who have even higher requirements and where nationwide coverage is vital.

Network slicing is a mechanism introduced with 5G, where network resources in a public or private network can be dynamically allocated for different connectivity types. This opens the door for mobile infrastructure to play a bigger role as a platform for digital transformation supporting tailored connectivity services. We are at the point where one network slice does not fit all use cases any longer.

Public networks and private networks

Today, public networks use 4G technology, and private networks use WiFi technology for wireless connectivity. 4G uses licensed spectrum, and WiFi uses unlicensed spectrum. These distinct silos with a service provider that are linked to a specific spectrum and technology are changing.

4G and 5G are moving beyond public networks and into the private or hybrid network domain, using licensed, shared or spectrum acquired on commercial terms. Ownership preference for private networks varies by industry. Private networks use a dedicated or shared spectrum.

The private network movement comes from the demand for superior cellular technologies for business-critical applications. 5G offers the performance of inflexible wired infrastructure with the flexibility of insecure and unreliable wireless alternatives.

New business models are emerging for private/hybrid networks with different combinations of spectrum ownership, network asset ownership, service provider, and degree of support for public services – mobile broadband, for example.

Urban and suburban coverage and rural coverage

The roll-out of 4G started with a focus on urban and suburban areas. Ten years into the deployment cycle, there are still areas in developed economies without 4G coverage. Citizens in rural areas are often left one mobile generation behind, accepting less capable infrastructure options. Before the pandemic, this was a bad situation, but still acceptable; from now on, access to adequate infrastructure is a survival strategy for rural communities and their economy.

Access and early access to 5G is necessary for both urban, suburban AND rural communities. Luckily, market forces are currently driving 5G implementation in urban and suburban areas. Early 5G builds in rural communities come from a combination of visionary business and society leaders who see the potential of 5G, and government subsidies. Leaders who don't push early run the risk of always being left a generation behind.

The real value of 5G in rural communities is threefold. First, rural consumers will get digital access for their work and leisure that's on par with their urban and suburban peers. Second, rural businesses will get the opportunity to be an equal partner in the digital economy. For example, many industries such as agriculture, outdoor recreation and green energy production will remain in rural areas and go through a digital transformation. And finally, rural communities will gain anchor institutions like education and healthcare that are on par with cities.

5G has the potential to close two digital divides in mobile and fixed broadband, with one infrastructure. Not in areas where fiber already exists or will reach this decade, but for the large areas beyond the fiber footprint.

Consumers, mobile broadband, universal use, public networks, urban and suburban coverage and Business users, fixed wireless access, business and mission critical use, private networks and rural coverage.

When facing the doubt if 5G is just another G, similar to 4G but faster, I hope you remember the power of AND on the five aspects outlined above. 5G is not defined to be another G but a different G on multiple fronts. ■

New from Doodle Labs

The Helix Smart Radio from Doodle Labs features six software selectable frequency bands, M1-M6 (1625 MHz to 2500 MHz) to support global deployments with a single SKU, simplifying a major logistics hurdle. It weighs as little as 25 grams depending on the configuration.

The Helix is a core radio in DIU's Blue sUAS Ecosystem and it's integrated and compatible with a number of UAS components like QGroundControl, Auterion's Skynode and UXV's GCS systems.

"We are very excited about the release of the Helix Smart Radio from Doodle Labs," says David Sharpin, CEO of Auterion Government Solutions. "We are currently integrating the Doodle Labs Embedded Smart Radio into Auterion OS and our Skynav Controller series. Helix is the next step in this journey, offering embedded mesh network radio technology with the six selectable frequency bands used by our US Government and Allied Nation customers."
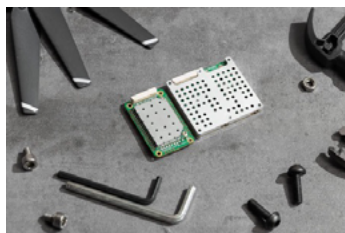
The Helix has been field proven for video streaming for up to 25 km, which can be extended with high gain antenna systems.

Helix is powered by Doodle Labs' patented Mesh Rider technology. *doodlelabs.com*
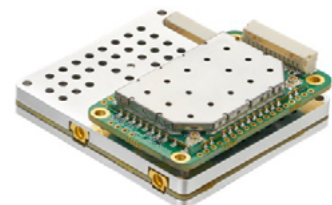
Ultra-rugged phablet

Handheld Group, a manufacturer of rugged mobile computers, brings to market a new version of its NAUTIZ X6 ultra-rugged phablet – a handheld computer that combines the big-screen functionality of a tablet with the go-anywhere performance of a rugged phone.

With this platform upgrade, the new version of the Nautiz X6 ultra-rugged phablet runs Android 11 and is Android Enterprise Recommended (AER). Apparently one of Handheld's most successful products since its launch in 2019, the Nautiz X6 is supposedly ideal for industrial and field applications with the reliability to perform in the most challenging outdoor and industrial environments. Amongst other things, you get an Android 11 operating system with GMS, Android Enterprise Recommended (AER) and a sunlight-readable, 6-inch capacitive multi-touch display with super-hardened Gorilla Glass.

"Since its introduction, the Nautiz X6 has been one of our fastest-selling devices," says Johan Hed,
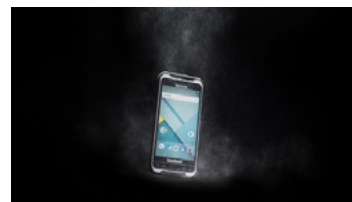
Handheld Group director of product management. "With its combination of military-level ruggedness, slim design, and reliable performance, the Nautiz X6 has been exactly the rugged handheld our customers needed." *handheldgroup.com*

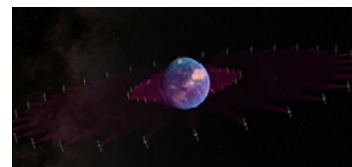# Isotropic, SES complete multi-orbit antenna field tests

SES and partner Isotropic Systems, a developer of transformational multi-link satellite technology, successfully completed "the first-ever" simultaneous multi-orbit antenna field tests.

Described as a "game changer" as far as multi-satellite and multi-orbit connectivity is concerned, the new versatile antenna successfully connected with SES's satellites in their geostationary orbit as well as simultaneously connecting with a 03b satellite in medium earth orbit (MEO).

Currently, users are reliant on legacy ground antennas which only connect to a single network at a time. This industry breakthrough enables satellite end-users to combine the best attributes of all available networks achieving superior network uptime and application performance. Isotropic's deep tech solution multiplies the performance of single antenna solutions to transform the global appeal of satellite connectivity, ensuring critical defence communications infrastructure and delivering multiple broadband that are highly reliable.

SES and Isotropic listed a number of ways in which the technological breakthrough include the fact "NATO and other international forces will finally be able to converge the most advanced military and secure commercial satellites, ensuring total mission assurance around the world". Another example is that aircraft pilots will be able to connect to the optimal satellites for navigation and ground communications, "while passengers in the cabin can connect to entirely separate satellites in different orbits to access live television, super-fast broadband, and enhanced entertainment options with streaming and gaming". It will also help the land transport and shipping industries, the partners said.

"We have removed the major bottleneck holding back the expansion of the satellite sector for both commercial and defence communications. Users can finally connect to as many satellites as they want, when they want, wherever they want and that's a game-changer for enterprise, aero, maritime, government and defence," said John Finney, founder and chief executive officer of Isotropic Systems."

First-of-its-kind location hyper-precise tracking software

Geo-location startup, Naurt, welcomes full public access to what it claims is "game-changing" software set to unlock the future of hyper-precise location tracking. Following a year of beta testing with a pilot group of high-profile local and international businesses and governments, Naurt has now made its first-of-its-kind software accessible to any and all businesses around the globe. The startup's plug-and-play toolkit apparently has no direct competitors and promises to deliver 45 times more accurate location data when used indoors or outdoors and across borders.

Naurt says its software does not replace the satellite location services businesses currently use - "instead, it simply integrates seamlessly with it and fixes the problems that cause the location data to be inaccurate". Where businesses might currently be able to pinpoint a location to within around 20 metres, integrating Naurt could improve accuracy to within centimetres, it claims.

"Standard satellite location services are no longer fit for purpose and are costing businesses and people time, money and safety," says
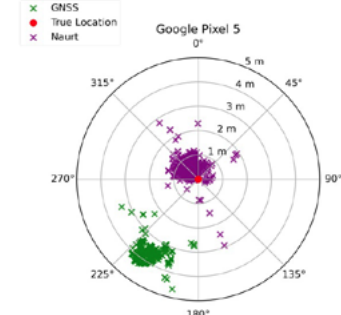
Jack Maddalena, co-founder and CEO of Naurt. "Naurt is making geo-location ultra precise." *nuart.com*

Intellian and Inmarsat launch FleetBroadband terminals

Intellian says it's pleased to announce that it has received type approval from Inmarsat for its new FB250 and Fleet One L-band terminals, "making it one of the first to market" with user terminals for operation on Inmarsat's innovation catalyst L-band network, ELERA. The FB250, the company claims, is a multi-functional terminal, either acting as a stand-alone primary communications terminal or combining with Intellian's GX60NX and GX100NX to create the Fleet Xpress (FX) solution. The Fleet One terminal, Intellian says, provides

an easy-to-install, reliable voice and data solution, ideal for smaller fishing and leisure vessels.

Meanwhile, Intellian's Fleet One terminal represents a lightweight, dependable and affordable solution for simultaneous voice and data connectivity of up to 150kbps on smaller vessels. The firm claims it's "an ideal product for those operating beyond terrestrial coverage", whether as seasonal users or simply not in need of the capabilities of higher-end satellite communications, the terminal guarantees peace of mind with

secure, unbroken access at any time for safety alerts, navigational warnings, emails, internet-based messaging and voice calls. *intelliantech.com*

Sepura's new SCU3 Broadband Vehicle Device

Sepura says its "powerful" SCU3 Broadband Vehicle Device" is ready for today's mission critical users and offers flexible opportunities for the future".

The new piece of kit has been designed for use in vehicles and/or fixed office locations and supports Mission Critical Voice (MCPTT), video (MCVideo) and data (MCData) features.

Built on the Android operating system, the device provides compatibility with a wide range of applications which have been designed to run on existing Android

smartphones and tablets.

It also features an optional TETRA modem, enabling narrowband voice and data services, whilst also supporting Bluetooth, Wi-Fi and ethernet, providing connections to a range of accessories and ancillary systems. Paired with Sepura's Mobile Device Management (SDM) solution, the SCU3 Broadband Vehicle Device is the complete communications solution for today's critical communications users.

"The SCU3 is the next step forward in supporting our customers

around the world," says Steve Barber, Sepura's CEO. "With increasing demand from the market to integrate data into their operations, the SCU3 complements the TETRA solutions used and trusted by Sepura's customers."

New directional coupler

Krytar, known for its design and production of ultra-broadband microwave components and test equipment, has continued the expansion of its line of directional couplers with the addition of a new model offering 30 dB of Coupling over the broadband frequency range of 18 to 40 GHz (K- through Ku-Bands), in a single, compact and lightweight package. The firm reckons its new directional coupler, Model 184030, enhances the selection of multi-purpose, stripline designs that exhibit excellent coupling in a single, compact and lightweight package. Krytar claims

it's "uniquely designed for systems applications where external levelling, precise monitoring, signal mixing or swept transmission and reflection measurements are required". The new directional coupler also lends itself to wireless designs and many test and measurement applications within K- through Ku-Bands including electronic warfare (EW), commercial wireless, 5G communications, Satcom, radar, signal monitoring and measurement, antenna beam forming, and EMC testing environments. The new directional coupler comes with industry-standard 2.4mm SMA

Female Connectors. The compact package measures just 1.12 inches (L) x 0.40 inches (W) x 0.62 inches (H), and weighs only 1.0 ounces. Operating temperature is -54° to 85° C. The directional coupler can also be manufactured to meet ridged military specifications. *krytar.com*

European scientists bounce first ever LoRa message off the Moon

A European team of scientists have bounced, for the first time ever, a LoRa (long range) message off the Moon.

The feat set a new record of 730,360 km for the furthest distance a LoRa message has ever travelled. It was also the first time a data message was bounced using an off-the-shelf small RF (radio-frequency) chip. For a brief moment in time the entire message "PI9CAM" (the call sign of the telescope) was in space on its way from Earth to the Moon and back.

It also proved that LoRa technology, used for many IoT (Internet of things) applications, can cover such great distances and that it is possible to send and receive low-powered messages from the Moon. This could become relevant for future lunar communications.

The team, some of them licensed radio amateurs, consisted of Jan van Muijlwijk (CAMRAS), Tammo Jan Dijkema (CAMRAS), Thomas Telkamp (Lacuna Space) and Frank Zeppenfeldt (ESA). To achieve the transmission, the team used the Dwingeloo radio telescope, operated by the CAMRAS foundation in the Netherlands. The radio telescope has a history of being used in amateur radio experiments and is now often used for moon bounces.

"I had never dreamed that one day a LoRa message would travel all the way to the moon and back," said Nicolas Sornin, co-inventor of LoRa. "This dataset is going to become a classic for radio communications and signal processing students. A big thumbs up to the team and CAMRAS foundation for making this possible."

Nokia and Orange complete network trial

Nokia and Orange have announced the completion of a network trial using the Nokia PSE-Vs, its fifth-generation super coherent optics.

With this field trial, Orange validated a planned upgrade of its long-haul backbone networks to support new high-bandwidth 400 Gbps services, and the ability to scale fibre capacity up to 600Gbps. This represents an increase in spectral efficiency by 50% compared to prior technologies on its long-distance network.

The trial was performed in real-world conditions using Nokia PSE-Vs optics in production-ready optical transport hardware, just 16 months after the lab prototype trial done on Orange's live network.

Orange and Nokia demonstrated error-free performance at a data rate of 600Gbps over a 914km network between Paris and Biarritz, under what the company describes as "challenging live network conditions". The fibre network consisted of 13 spans of Orange's existing network, through multiple cascaded reconfigurable optical add/drop multiplers (ROADM), using 100GHz WDM spectrumchannels.

"With the booming market bandwidth requirement and need for scalability and flexibility, it is important that Orange continues to support an ever-greater network scale and new high-bandwidth services across our terrestrial and subsea global footprint," said Jean-Luc Vuillemin, vice president of international networks and services at Orange.

"Validating super coherent optics with Nokia represents an important enabler for future-proof networks which will bring spectral efficiency and operational deployment flexibility to our customer solutions. Furthermore, this technology will allow for power savings by nearly 50%, which is key to our objective of developing greener networks for our customers. "

James Watt, head of optical networks division, Nokia, added: "We are delighted to work with Orange in continued support of their network upgrade plans. With the introduction of the PSE-Vs super coherent capabilities across our entire 1830 portfolio, Nokia enables spectrally-efficient transport at 600Gbps over real-world long haul networks, and 400Gbps services over ultra-long haul networks spanning multiple 1000's of kilometres."

4iG acquires Telenor Montenegro

Hungary's 4iG has penned an agreement with PPF Telecom Group to acquire 100% of Telenor Montenegro for an undisclosed sum.

The former made its first bid for the unit in July and the deal is expected to close by the end of the year providing it meets the relevant regulatory requirements.

"Our business strategy focuses on markets offering significant growth potential and solid weighting within our portfolio," said Marek Slacik, executive director TMT CEE at PPF Telecom Group. "Therefore, we have decided to sell Telenor Montenegro to a party that has a long-term interest to develop the mobile operator further."

Gellert Jaszai, president and CEO of 4iG added: "Telenor Montenegro is a mobile operator with a stable growth background, the acquisition of which is an important step through the implementation of our strategy in the western Balkans. The acquisition may open up additional opportunities for us in the region in the telecommunications and ICT markets."

PPF bought Telenor Montenegro from Norwegian parent company (Telenor) along with its businesses in Bulgaria, Hungary and Serbia in a US$3.3bn deal.

Australia's Telstra acquires Pacific firm 'to block China'

The Australian government and telecoms firm Telstra are buying a Pacific telecoms company in a joint venture viewed as a political block to China's influence in the region.

Telstra called the A$2.1bn deal to acquire Digicel Pacific a "unique and very attractive commercial opportunity to boost our presence in the region".

The latter employs 1,700 people spanning Fiji, Papua New Guinea, Samoa, Tahiti and Vanuatu.

In 2020, the firm was forced to deny a report that it was negotiating the sale of its Pacific unit to state-owned China Mobile.

Telstra said the Australian government approached it "to provide technical advice in relation to Digicel Pacific, which is "critical to telecommunications in the region". The government then agreed to finance the bulk of the bid.

"Partnering on infrastructure development is a key part of our Pacific step-up," a spokesman for Australia's Department of Foreign Affairs and Trade told newswire Reuters.

A fear of Chinese investments and control of telecoms has led many countries to ban Huawei, ZTE and other players from China supplying them technology.

Vodafone reaches over 35 million people in Germany with 5G network

Vodafone Germany's 5G network is now available to more than 35 million people across the country, the company said.

The operator had previously said it aimed to service over 30 million people with 5G in Germany by the end of this year. It also claimed that its 5G network is expected to be available to 60 million people by 2023.

"We are activating the most modern 5G network in Europe," said Vodafone Germany chief executive officer Hannes Ametsreiter. "In the coming year, every 5G antenna will also become a 5G standalone antenna. With 5G, we not only bring high bandwidths, but also extremely short response times and network slicing to people and factories. Our 5G network then reacts as quickly as the human nervous system and needs less and less power to transmit data."

Ametsreiter added that the entire 5G network will rely on standalone architecture by 2023.

Vodafone recently put 5,000 more 5G antennas into operation in urban and rural areas across Germany. The telco said a total of 15,000 5G antennas at 5,000 locations are now live.

Earlier this year, Vodafone Germany launched its 5G standalone (SA) network in partnership with Ericsson, Nokia, Qualcomm and OPPO.

Vodafone has already upgraded 3,000 sites to SA 5G. The new network was initially launched in some major cities including Frankfurt, Berlin, Hamburg, Munich and Düsseldorf.

Vodafone is also is also installing new 5G antennas from Swedish technology partner Ericsson in its 5G network, which transmit data in a significantly more energy-efficient manner.

Latvia introduces 'first' 5G cross-border test site in Europe

Latvian operator Latvijas Mobilais Telefons (LMT) has created a 5G mobility innovation testbed, which is understood to be the first ever cross-border mobility simulation space in Europe.

Located at the Bikernieki racetrack in the capital, Riga, the plan is to use LMT and Estonia's Telia 5G networks to imitate fully functioning international connectivity.

The new testbed has already demonstrated its first use – a teleoperated vehicle simulation was carried out remotely over LMT's 5G network from the town of Cesis, some 80km away, the firm said.

Moreover, the testbed is part of the 5G-Routes project, an international effort to ensure cross-border automated mobility and to develop and demonstrate several 5G-Routes project use cases.

With a consortium made up of 21 partners, the 5G-Routes project began work in September. It is designed to validate 5G field trials on the "Via Baltic North" 5G cross-border corridor spanning the borders of Finland, Estonia and Latvia.

Greek tourism boosts OTE profits

The Greek government's decision to lift Covid-19 travel restrictions over the summer boosted third-quarter core profit for OTE, according to Greece's biggest telco.

Growing demand for higher data speeds and volume in mobile also helped the group, which is 46% owned by Deutsche Telecom.

Earnings before interest, tax, depreciation and amortisation (EBITDA) reached €341.6m in the same period last year.

OTE has been investing heavily in fast broadband services in recent years and it launched 5G in 2020. The next-generation technology is expected to be made available to more than 60% of the country's population by the end of 2021.

'Iranian hackers targeting telcos and ISPs using upgraded malware', says report

Iranian-backed criminals have been hacking into ISPs and telecoms companies since July this year, according to a new Accenture report.

The group known as Lyceum, which also goes by Hexane or Spirlin, has been in existence since 2017 and been linked to malicious campaigns targeting Middle Eastern oil and gas companies.

From July-October this year, it carried out attacks on Internet providers and telcos organisations in Israel, Morocco, Tunisia, and Saudi Arabia, according to researchers from Accenture's Cyber Threat Intelligence (ACTI) group and Prevailion's Adversarial Counterintelligence Team (PACT). In addition, the APT is responsible for a malicious campaign against an unnamed African country's foreign affairs department.

"Telecommunications companies and ISPs are high-level targets for cyber espionage threat actors because once compromised, they provide access to various organisations and subscribers in addition to internal systems that can be used to leverage malicious behaviour even further," said security researchers.

Lyceum appears to be using two families of malware, Shark and Milan, according to the most recent operation analysed in a joint report by researchers at Accenture and Prevailion.

Shark backdoor is a 32-bit executable file written in C# and .NET, and it executes commands and exports data from infected systems. Milan is a 32-bit remote access trojan (RAT) that can retrieve data from the compromised system and send it to servers derived from domain-building algorithms (DGAs).

Both backdoors communicate via DNS and HTTPS with the command and control (C2) servers. Shark also uses a DNS tunnel.

Researchers said they also identified beaconing from a reconfigured or a new Lyceum backdoor in late October 2021.

Unitel inks satellite deal with Lynk for coverage across Mongolia

Mongolia's biggest player Unitel has entered into an agreement with Lynk Global, enabling its subscribers to remain connected anywhere around the world with "ordinary cell phones".

The deal will hand Unitel first-to-market rights to implement Lynk's service in Mongolia, with the latter's global commercial service providing direct satellite to cell phone service is on schedule to be deployed in 2022.

Lynk characterises itself as a cell-tower-in space connectivity provider and recently agreed similar deals with Aliv in the Bahamas and Telecel Centrafrique in the Central African Republic.

"The landscape of Mongolia represents a significant challenge to the country's telecommunications sector as we have a sparse population that's spread throughout the Gobi Desert, temperate forests, vast steppes and extensive mountain ranges," said Enkhbat Dorjpalam, CEO, Unitel Group. "Under these circumstances, Unitel Group has been successfully providing many modern B2C and B2B tech services and solutions including mobile plans, high-speed internet, IPTV, OTT and cloud services to Mongolians for the past 15 years."

Dorjpalam added that the company is "excited" to make its services "more inclusive and extensive for thousands of people."

Orange CFO predicts 'inevitable' merger within French telecoms

France will "inevitably" see the number of telecom operators drop from four to three, Orange's (chief finance officer) CFO said, adding that recent take-private deals by two of them, Iliad and Altice, could improve conditions for a merger.

The French telecoms has yet to fully recover from a protracted price war started by Iliad's Free Mobile services in 2012, with aggressive offers successively impacting the performance of all four operators, including Bouygues Telecom.

This has prompted industry leaders to pursue consolidation, but all attempts have so far failed.

The de-listing of Iliad and Altice Europe from the stock market may facilitate deals, Orange CFO Ramon Fernandez told the Morgan Stanley TMT conference.

"For companies which are private now, it's probably easier to consider… strategic options, maybe consolidation in the French market," Fernandez said. "I'm not saying that we are now on the verge of seeing something happening in France. But when the time will come, and inevitably it will come, it will be easier for these players to engage into discussions."

IDB Invest improves efficiency of wireless broadband in LatAm

IDB Invest has granted a senior credit line of US$45m to the subsidiaries of QMC Telecom International Holdings in Mexico, Colombia and Peru – a 10-year transaction to improve the quality and efficiency of wireless broadband services in the countries.

Lockdown and social distancing measures have made broadband connectivity essential for most social and economic activities, including work, education, and healthcare.

Mobile data traffic was already expected to increase considerably by 2025, but the pandemic has significantly accelerated data traffic with increased adoption of digital services.

QMC Telecom said it expects to significantly increase its portfolio of towers, distributed antenna systems and street-level solutions in Mexico, Colombia and Peru as all of these countries prepare for 5G spectrum deployments and the required network densification that

will follow. In Colombia, the new financing will allow QMC Telecom to support national deployments by operators of the recently auctioned 700MHz spectrum, including those in communities that currently do not have cellular coverage.

"Our partnership with IDB Invest underscores QMC Telecom's commitment to corporate citizenship, sustainability and diversity in the communities it serves," said Ricardo Zubieta, CFO of QMC.

Lebanon's telecoms sector 'days from collapse' due to deepening fuel crisis

Lebanon's worsening financial crisis is so close to the brink for the country's telecoms sector, with the national Parliamentary Media and Communications Committee warning that the nation's networks are on the brink of collapse.

According to local reports, state-run telcos only have enough diesel in storage to keep networks operating

for a few days.

"The quantity of diesel at Lebanon's state-owned Touch and Alfa mobile companies and the state-run telecommunications company Ogero, which operates fixed lines and fixed internet, is enough to run for only a few days, otherwise telecom services will crumble," the committee said.

In September, Lebanese telcos started to show signs of struggle, with fixed-line operator

Ogero being forced to shut down services in parts of the country temporarily due to lack of fuel.

"Our services have stopped temporarily with the range of the Barouk, Halba and Qoubayat centres until we are resupplied with diesel fuel," the company said in a statement.

Lebanon's financial crisis dates back to 2019 and was then exacerbated by the coronavirus pandemic of 2020.

Rakuten Mobile enters towers business

Japan's Rakuten Mobile is acquiring a stake in towers operator JTower in a move to roll out its network more quickly and cost-effectively.

The country's newest mobile operator said it has agreed to buy an undisclosed number of JTower shares from its president and chief executive Atsushi Tanaka for an undisclosed sum.

The deal will "strengthen cooperation and accelerate network development by promoting the utilization of infrastructure sharing," Rakuten Mobile said, in a statement.

This "capital alliance" will help to promote infrastructure sharing both indoors and outdoors, using shared equipment and towers, mainly in 4G and 5G networks. Rakuten has been using JTower's Infra-Sharing solutions since the start of 2020, it said, adding Tokyo-based smart poles into the mix in April this year.

"We and Rakuten Mobile will use this capital alliance as an opportunity to deepen our collaboration, and we will promote Infra-Sharing in indoors and outdoors using sharing equipment and sharing towers in the development of 4G and 5G networks, and work to build a more comfortable communication environment at an early stage," JTower said.

Rakuten recently partnered with Oki Electric and Nagoya University to develop autonomous mobile networks incorporating AI to manage operations independently, as part of Japan's Beyond 5G R&D Promotion Project.

The operator said the trio aims to work on technologies and applications to enable networks to autonomously respond to diverse service demands while operating stably. There are also plans to create IoT services for a robot connecting to an autonomous network, Rakuten added.

Turk Telekom's revenues reach $US2.4bn in first nine months

Turk Telekom has earned revenues worth US$2.4bn in January - September 2021 and achieved 18% growth to exceed the expectations for the third quarter.

The company's net profit amounted to US$484m, while its investment expenditures increased to US$443m in the first nine months of 2021.

Turk Telekom's investment target increased to US$897m and the investments will mainly be made in a fibre network, which it sees as a powerful tool for future technologies.

Furthermore, the total number of subscribers rose to 51.4 million in the reported period, with a 12-month net subscriber gain of 1.9 million.

"We are happy to see once again the strengths of our financial and operational results underline our history, experience, investment decisions, human capital, and application competencies," said Turk Telekom CEO Umit Onal. "We are determined to complete the digital transformation for our country and to make Turkey a pioneer in the 5G journey."

Onal added that fixed broadband continued to be the driving force of growth in the third quarter with its 29% revenue growth.

"Digitalisation fuels the demand for technology and communication services, leading to a permanent transformation in consumer behavior," he said.

OneWeb signs LoI with Kazakhstan aerospace firm for satellite component production

OneWeb, the Bharti-backed low Earth orbit (LEO) satellite communications firm, has signed a letter of intent (LoI) with Kazakhstani aerospace business, Ghalam, to explore opportunities for locally-produced components for the second generation of its satellites in the country.

The two companies signed the LoI during the annual international technological forum Digital Bridge 2021 in Kazakhstan's capital Nur-Sultan in late October.

At the event, OneWeb chief executive officer (CEO) Neil Masterson also oversaw the satcom company's first-ever demonstration of LEO-powered broadband within the Commonwealth Independent States (CIS).

"OneWeb's demonstration network delivered a significant performance in both downlink and uplink peak rates, together with low latency, during demonstrations using video conference calling, content streaming and cloud-based applications," the company said in a statement. "This demonstration set the stage for the formation of a centre of expertise for the use of low-orbit satellite communication systems in CIS."

The demonstration tests were carried out by OneWeb Kazakhstan, with the support of the Republican Centre for Space Communication JSC and Jusan Mobile JSC.

Also in October this year, OneWeb launched another 36 satellites from the Vostochny Cosmodrome, bringing the total currently in-orbit constellation to 358. That figure is over half of its entire 648 LEO satellite fleet that will deliver high-speed, low-latency satellite broadband worldwide.

Remote Mobile subsidiary to acquire 49% stake in Kuwaiti firm

Routesms Solutions FZE, a subsidiary of Indian cloud firm Route Mobile, has signed a share purchase agreement to purchase 49% of the total outstanding equity share capital of Kuwait-headquartered Interteleco.

Under the terms of the deal, Routesms will also acquire an additional 41% of economic and beneficial interest, including distributions, dividends, profits and voting.

Mobile communications services provider Interteleco offers mobile app services, payment solutions, chatbot and conversational AI.

It serves sectors such as telecommunications, e-commerce, financial accounting, inventory management and project management service companies.

"Route Mobile has been a communication enabler in the GCC and this acquisition further reinforces our commitment in bringing global personalised communications solutions to businesses in the regions," said Rajdipkumar Gupta, managing director and group CEO, Route Mobile.

The acquisition is expected to be completed in the next two months, subject to certain conditions being met.

Colombia begins public consultation on spectrum caps

Colombia's ICT ministry said it will publish a draft decree for public consultation related to updating spectrum caps and enable frequency allocation to foster the development of 5G.

Telecommunications minister Carmen Ligia Valderrama said during the Andicom event that plans involve increasing the caps for the bands below 3,000MHz and add a category for bands between 3GHz and 6GHz.

She added that Colombia could license about 400MHz in the 3.5GHz band.

Valderrama also encouraged participation in the consultation to achieve broad consensus.

Colombia has a spectrum cap of 45MHz in low bands and 90MHz in high bands.

In May, the ministry proposed raising the ceiling in low bands (698MHz-960MHz) to 50MHz, establish a 95MHz cap in medium bands (1,710MHz-2,690MHz), and an 80MHz cap for upper-medium bands (3,300MHz-3,700MHz).

However, the government will not be able to launch the 5G tender but Valderrama said it will leave Colombia prepared to receive the technology.

She added that the government and spectrum agency ANE will produce a study on the best 5G test experiences.

Meanwhile, satellite internet company Viasat is entering Colombia as an internet provider targeting remote communities with limited technology. The Latin America-wide move is designed to win customers where telecoms have failed to make inroads.

"We can drive the cost of (internet) delivery dramatically," said Rick Baldridge, Viasat president and chief executive said in an interview. "That allows us to go anywhere. To do that a very , very low cost."

Viasat said it can currently serve customers up to north Colombia.

Q&A

Eugina Jordan
vice president marketing
Parallel Wireless

What was your big career break?

Let me tell you. It happened when Starent's CEO Ashraf Dahod gave me an opportunity. The story goes like this …

At the age of 37, newly single, with a new mortgage, & a 2-year old son counting on me to provide for him, I realized that as an EA, I had little opportunity to advance.

On a mid-winter afternoon in 2007, I marched into my CEO's office determined to ask for his support.

Thoughts raced through my head. I had heard about an entry-level marketing job that sounded like an opportunity for career growth. I had been considering my options carefully & going back to school was not financially viable in my present circumstances, but this job…this job felt like something to help me grow. I knew that given the chance; I would succeed. All I needed was a chance to prove myself. All I needed was a "yes" from my boss, the CEO.

But I am his EA, I support the whole executive team. Will he let me go?

Anxiety roiled in the pit of my stomach as I walked into his office. I remember the way the sunlight streamed through the window across his desk like it was yesterday. His answer had the power to be life changing.

I took a deep breath, and with no preamble, before I could change my mind, I told him, "There is an opening in the marketing department, and I want a transfer."

He studied me for what felt like an eternity, then he smiled, and said, "I would miss you, but I cannot be selfish and stop your growth."

I didn't even realize I was holding my breath until I felt it whoosh out of me at his answer.

And just like that, with one simple "yes," I got my biggest career break.

With that one simple "yes", I took the first step of my journey to becoming one of the best marketers in the tech industry & a C-level female executive.

And make no mistake, it was hard work. For a full year, I did both jobs—EA & marketing, learning all I could about the marketing profession, while as a single mom, raising my son.

I did not know back then that one day my story of "asking for more" might help others: other single moms, other immigrant women, other women struggling to make ends meet in entry-level jobs…in short, other women who want more. Other women just like me.

It's taken me 14 years since that mid-winter day, when I asked for a job, I wasn't sure I deserved, but each day, I make a conscious choice not to hide the extraordinary light of my true self and perform to my best ability.

Who was your hero when you were growing up?

My mom has been always my hero. She has been gone 10 years now. We fell out of touch during the last years of her life, but her unconditional love, and the hard work she demonstrated and taught me made me who I am today.

She got to be the person she was because she was a single mom to twin daughters in communist Russia. She worked extremely hard. Every weekday, she got up in the dark at 5 AM to get ready for work, then get on a bus for an hour-long ride to be at work by 7 AM. She was working as a secretary making just enough to cover basic food and clothing needs and we had hard times making ends meet. That meant that sometimes we had to borrow macaroni from the neighbors or walked to a place instead of riding a public bus. But she never gave up hope and she never allowed my sister and me to give up hope. When Russia was going through turmoil in the early nineties, she knew that her daughters "deserved better." She sold what she could, an apartment, her jewelry, so her daughters could immigrate to Canada, because she believed we deserved better, and we could only build a better life in a free world.

Never in my wildest dreams did I, an immigrant woman and a single mother, imagine that I would become who I am today, a C-level executive.

All because of those words that my mother said to me when I was growing up "you deserve better". Because of those words I would dream the biggest dreams.

If you had to work in a different industry, which would you choose?

A Hollywood actress! I still have some time to fulfill that dream once I retire from telecom though.

What's the best piece of advice you've been given?

"Don't act like a victim." This means that a person is always in control of their life. We cannot blame others for us not getting to our goals.

If you could live anywhere, where would you choose?

Anywhere where there is no snow. I grew up in Russia, then lived in Canada and now I have been living in New England for 20+ years. So, dealing with winter and all that cold and snow is getting old. I would love to live somewhere closer to the ocean (if I can afford it). The sounds and the smells of the ocean are very calming.

At some point in my life, I thought that I would go back to the big city life eventually, with lots of things happening. I have been living in the small-town USA now for almost half of my life and I appreciate the serenity and simplicity of that life. So, I have realized that small town is where I belong, just not with the snow.

Which law would you most like to change?

I would change any law where the government tells people what to do with their bodies. For example, the Due Process Clause of the Fourteenth Amendment to the U.S. Constitution provides a fundamental "right to privacy" that protects a pregnant woman's liberty to choose whether or not to have an abortion. And we still have many countries preventing women in 2021 (!) the right to choose what to do with their bodies.

What would you do with US$1m?

Let me tell you. First, I would give some scholarship money to my nephews and nieces. Student debt can cripple a young person when they get out of college. So, by giving them the scholarship money, my hope is to give them a leg up and start their adult life after college in a better position than many.

Secondly, I would donate to programs that help with food insecurity for school age children. My husband grew up very poor and the only meals he got were the meals that he got when he went to school, on the weekends he often went hungry. And he grew up in Massachusetts! During Covid when the schools were closed and just like my husband experienced, children did not have access to food, I drove food early in the morning to central locations where parents can pick the meals up.

Thirdly, I would establish a charity where I can help immigrant women like me to create better lives.

If you could have dinner with any famous person, past or present, who would you choose?

That would be Princess Diana. I relate to her as she was a simple girl and once, she fell in a position of power, she made sure she used it for good, to make an impact on the world.

Which place must you visit before it's too late?

I miss traveling … My job and my personal passion for travel took me to many different places across the world, from Brazil to Japan. I am always fascinated by new cultures and excited to meet new people. I would like to go back to Paris and Venice. I also would like to visit Australia and the Pacific islands. Who am I kidding? There is not a particular place, I want to see all the 7 wonders of the world, all 1000 places a person should visit. Sign me up! ■