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Interview

Ammar A. Aker
Chief Executive Officer
Palestine Telecom (Paltel) Group

THIS MONTH

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AND AUTONOMOUS VEHICLES**

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Edge Computing as a Key Enabler in Smart Cities and Autonomous Vehicles

The subject of sustainability within the context of smart-city development demands critical attention of private-sector and government-sector planners, strategizing in developing smart cities. Thus SAMENA Council draws the attention of the decision-makers and digital communications industry stakeholders to think longer term than they currently are in terms of enabling digital infrastructure investment. Ubiquitous connectivity for the ever-growing urban population in a hyper-connected environment, apart from meeting other essential municipal requirements, will be a major challenge for the administrations.

Smart cities, in which artificial-intelligence based driverless cars will have a contributing role to play, are a challenge to implement in the first place, and must be maintained for the long term. In order to make the concept of truly smart cities a physical reality, both public and the private-sector stakeholders will have to collaborate and invest heavily in digital infrastructure which is independent and does not require back-hauling to the main or "central" infrastructure. The case in point for such a scenario is IoT devices, including those part of smart vehicles, operating at the far edge of given communication network, where data generated by them requires to be processed right there and then instead of a centralized data-processing center. This practice of data computing brings both memory and computing power closer to the location where it is most needed, without having to transmit data farther into the main network for processing. Therefore, overcoming latency, achieving robustness through dynamic edge network architecture, and optimizing resource allocation where it is most needed for ready data processing, are some of the fundamental requirements that edge computing fulfills.

IoT or IIoT (industrial IoT), which is expected manifest itself through the presence of more

than 75 billion devices over the next five or so years, cannot be effectively implemented without edge computing (or "fog" computing), since conventional centralized cloud-based data processing capabilities are insufficient for addressing reduced-latency, spectral efficiency, and adaptive machine communication requirements, where supreme digital experience and quick, intelligence-based decision-making are necessary. However, edge computing has its own set of challenges to account for:

Many applications processed at the edge need to share sensitive, customer, and other contextual information; IoT applications require that data does not encounter bottlenecks, for which programs and data need to reside near to each other or be "centralized", but edge computing requires decentralized data processing; computers at the edge are not high-powered; edge devices running insecure software platforms can be exploited and ensuring end-to-end security may require going all the way back into the core of the network; unlike the multiple layers of physical security in a data centre, many edge devices in public spaces or other locations are difficult to secure; devices and supporting infrastructure need to be robust enough to minimize hands-on maintenance; ensuring a level of compatibility and interoperability between different deployments is tricky; among many other challenges.

That's the technology side of edge computing. On the implementation side, what demands most attention is the realization that in any smart-city scenario, much smaller data processing centers rather than large data centers will be essential to supporting large data workloads generated by a myriad of devices and machine-to-machine interactions. And it will require heavy investments. It thus is natural and critical for governments to



Bocar A. BA
Chief Executive Officer & Board
Member
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Council

think right now that they need to partner with future-minded private-sector players to meet the smart expectations set forth by the administrations, and that for effective partnership to happen effective incentives need to be put in place. On so many administrative and sustainability fronts, it can be easily envisioned how not partnering up effectively could create a new layer of financial burdens on the newborn smart cities, when either the government sectors fail to partner up with the right private-sector stakeholders, or where the sustainability of the partnerships is not sufficiently protected for the long run.

In the age of 5G and IoT, edge computing will prove to be a game-changer on multiple fronts, including especially on regulatory and policy fronts. 📍



Ammar A. Aker
Chief Executive Officer
Palestine Telecom (Paltel) Group



مجموعة الاتصالات الفلسطينية
PALTEL GROUP

Q. What can you tell us about the telecommunications landscape in Palestine?

A. The Palestinian telecommunications sector has had a significant impact on the development of Palestine's infrastructure, quality of education, recognition of its rich, innovative culture and a foundation for the Palestinian startup ecosystem, and ultimately influencing the overall quality of life. The sector's ultimate goal is to connect every Palestinian to the rest of the world.

The ICT sector is a foundation for Palestinian startups and contributes 5.5 percent to the total Palestinian GDP. It consists of a 100 percent digital telecommunication infrastructure that has been entirely developed by the Palestinian private sector and hosts more than 250 companies specialized in the field of information and communication technology.

Whereas Palestine is a country with a relatively small population, living under Israeli occupation, its many young and well-educated people constitute rich human capital that – if given the opportunity to freely develop – could significantly contribute towards making Palestine a country with a booming and sustainable economy. The ICT sector's net contribution to the Palestinian market amounts to US\$ 600 million.

The ICT sector is a foundation for Palestinian startups and contributes 5.5 percent to the total Palestinian GDP. It consists of a 100 percent digital telecommunication infrastructure that has been entirely developed by the Palestinian private sector and hosts more than 250 companies specialized in the field of information and communication technology. The market has over 4.3 million mobile phone subscribers and over 470,000 fixed-line subscribers, in addition to 100 radio stations and local television stations as well as 17 companies that operate in the field of telecommunications, and the internet.

Q. Tell us about Paltel's pioneering undertakings and what the Group encompasses.

A. Palestine Telecommunications (Paltel) Group is the largest employer in Palestine (after the government), employing around 3,000 people. It is the engine of the telecom industry and leads in the provision of the latest services and technologies, in accordance with international standards and specifications. Paltel Group represents 25 percent of the Palestinian stock market as a public shareholding company. It has achieved this by embedding sustainability as an integral part of the Company's identity, an essential function of its operations and strategy.

Paltel Group has served as the largest incubator of youth talent and youth initiatives and for entrepreneurship in the Palestinian society as a whole.

Paltel Group consists of four companies: Palestine Telecommunications (Paltel), Palestine Cellular Communications Ltd. (Jawwal), Hadara Company (internet provider), and Reach (contact center). The Group started its operations in Palestine in 1997 by providing state-of-the-art services to the Palestinian end user. Paltel Group has shown great determination in its efforts to deliver high-quality telecommunications services, as each subsidiary company provides a high quality of telecommunications services within Palestine through the adaptation of international technologies in order to improve the Palestinian quality of life and increase community livelihood.

A sustainable company such as Paltel Group has proven to be the pioneer of the telecommunications sector in Palestine and has been able to achieve the highest standard in telecommunications services by wisely investing in modern technologies, telecom infrastructure, and human resource development. Paltel Group has evolved into the most critical

force of the Palestinian ICT sector with a market capitalization of US\$ 800 million in shares in 2018.

Throughout the Group's business strategy and policies, a strong emphasis has been placed on the humanitarian rights and creating stable and sustainable communities to create a better future for the Palestinian citizens. Paltel Group has served as the largest incubator of youth talent and youth initiatives and for entrepreneurship in the Palestinian society as a whole. The Group has given priority to social responsibility and has been a role model for other companies in Palestine. For that reason, Paltel Group established its own independent corporate social-responsibility foundation, known as Paltel Group Foundation for Community Development, which focuses on various forms of youth empowerment by providing equal opportunities to all segments of society. It engages in education and promotes a knowledge-based society by encouraging entrepreneurship and by identifying role models that may inspire future generations of Palestinians.

Paltel Group is passionate about empowering the Palestinian youth and society by implementing a variety of initiatives, such as our Right for a Decent Life program that aims at empowering Palestinian families by implementing income-generating projects. 291 families, along with 41 fishermen, have benefited from the program with a sustainability and continuity ratio of 64% of the projects over the past six years. The Group has provided endless scholarships to thousands of college students of different majors in Palestinian universities, with the ultimate goal of providing educational opportunities for students of special financial circumstances. Furthermore, one of the many educational impacts we have implemented is the ongoing "Abjad Net" program that has connected thousands of schools to the internet, which have benefited over 765,000 students and 22,000 teachers.

These examples highlights how the Group is creating a better future for all and is implementing responsible business

leadership in alignment with the United Nations Sustainable Development Goals. Such endeavors will ultimately advance the telecom sector in Palestine and drive long-term national economic growth.

Q. What are Paltel's latest digital service offerings, including those relating to financial services?

A. Over the past few years, Paltel has been focusing on digitizing both its front office and back office functions to both enhance the customer experience and achieve operational efficiency. We can proudly claim that our subscribers can get almost all services needed from Paltel without the need to visit or call any of our traditional touch points.

In terms of customer care functionalities, we have successfully launched a comprehensive self-care application (AnaPaltel), which allows the subscriber to perform diverse set of transactions related to service ordering and trouble handling, which originally required access to traditional touch points (showroom visit or call center access). The application achieved record download and usage rate.

In addition, we were one amongst the first companies in the region to launch an application granting full and easy control of the home network to the subscriber. The application known as Paltel NetGuard supports advanced cyber security functionalities, allowing the subscriber to protect their network from unauthorized

The application known as Paltel NetGuard supports advanced cyber security functionalities, allowing the subscriber to protect their network from unauthorized access, cyber-attacks as well as to managed and monitor access to the internet for the different family members.

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In terms of service delivery and assurance, we have developed multiple digital tools, integrating advanced statistical models that enhance the ability of Paltel's technical teams to plan, manage and maintain the network expansion, allowing for automatic and instant identification of the most efficient routes in the network to deliver the service to new subscribers, thus contributing to significant savings in time and cost needed to deploy the service. Furthermore, our systems today are able to identify points in our network that need expansion/ maintenance in an automatic and systematic way, which prevent against service interruption or the inability to serve any of the increasing customer needs.

We were the first service provider in Palestine to fully digitize Paltel's bill creation and delivery, which resulted in huge cost savings and better reach to subscribers.

Q. Can you tell us about Paltel's journey to launching 3G services?

A. Due to the Israeli occupation, it took more than a decade for Jawwal, Paltel Group's mobile operator, to launch 3G services in Palestine. The 3G service officially took off back in January 2018. However, to this date, 3G services are only available in the West Bank as, in great part owing to the Israeli restrictions, spectrum access for Gaza was not granted to Paltel. Moreover, the range of the 3G frequencies is very much limited - only a 5 MHz bandwidth is dedicated and other 5 MHz shared. This indicates that not only bandwidth allocated to Paltel is insufficient, we are allowed to use that specific frequency within the West Bank only, while Israeli telecom companies, to Paltel's and to our local market's disadvantage, are able to use their spectrum at any given time. Additionally, Israeli operators have an illegal market share of 17% in Palestine, by providing 4G service to Palestinian consumers, which Israeli operators have more than 500 thousand Palestinian subscribers without licenses, paying neither fees nor taxes, nor contributing any value-added services to the Palestinian economy. This also adds to

Paltel administrative tasks to continuously co-ordinate on border areas.

Regardless of the limitations and setbacks that Palestine and its people and companies endure on a day-to-day basis, our ICT sector, community, and businesses continue to grow and prosper. As the front-runner of the telecom sector, Paltel Group's current priority is to obtain the needed frequencies to launch 4G services in both the West Bank and Gaza.

Q. What are the main challenges ahead in introducing 4G in Palestine?

A. Despite being long overdue, the launch of 3G in Palestine was a strategic step that has had a positive impact on the national communications infrastructure and the Palestinian economy as a whole. Due to Israeli restrictions, we have so far not succeeded in launching 4G in Palestine. Paltel Group has already requested the frequencies for 4G in the past three years. However, Paltel, with the support of the regional and international digital communications industry and likeminded organizations, hopes that the case of Palestinian people's right to advanced mobility and data services, such as provided by 4G and 5G technologies, will be supported by the international community. We are full intent on keeping pressure on the concerned parties to release 4G spectrum for Palestine and, in the very near term, to release 3G spectrum for Gaza.

As the telecommunications leader in Palestine, Paltel Group has the obligation and the right to continue to demand 4G capabilities in Palestine, as most of the world already has 4G technology, and 5G will be available in the coming months.

Q. Is Paltel introducing any artificial intelligence-based systems for improving customer experience?

A. As a telecom leader in Palestine, Paltel is investing in artificial intelligence by introducing AI tools and techniques to boost the Company's business.

Paltel has expanded its business intelligence unit function to focus on enhancing our decision making process by

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implementing complex machine learning algorithms in our customer data engines, which have helped us to develop new insights about our subscribers. Today we can predict with reasonable confidence the future behavior of our subscribers and we can customize our offering to suit their needs and to guarantee their loyalty, thus significantly minimizing churn.

On the customer support side, Paltel has launched its automatic chat service over Facebook "chat bot", which supports complex machine learning functionality able to adapt to subscribers behavior and issues.

Q. In what significant ways do you see Paltel playing a central role in developing the digital economy across your market of operation?

A. With digitization at the heart of our operations, Paltel is determined to carry the digital revolution to the rest of the Palestinian economy. Accordingly, Paltel launched a new state-of-the-art data center located at one of its headquarters, designed to offer the most advanced digital services including but not limited to traditional colocation services and cloud based disaster recovery services, backup services, as well as other managed services. Due to the Group's determination to embrace digital revolution, Paltel will be establishing another highly advanced



data center in the city of Ramallah with a capacity that will meet the Palestinian market's demand for years to come.

In addition, Paltel is leveraging its knowledge in AI and digital transformation for the benefit of the Palestinian economy by providing support to its customers to define and implement digital transformation initiatives, including support in developing the tools needed by the different industries through a its

specialized professional services unit.

Moreover, Paltel views staff training and development activities as an important aspect of its business. Therefore, we are providing employees with the opportunity to pursue learning and training programs to enhance their careers and help them understand new technologies that will shape the future of the business, including blockchain and VR/AR technologies. 

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EDCH Brings New SIM Card and Messaging Solutions for Mobile Network Operators and Enterprises

Established in 1994, Emirates Data Clearing House (EDCH) has come a long way as the only data-clearing house in the Middle East with customers from across the globe. They have enabled mobile operators and enterprises to enhance their revenues while reducing operating cost offering comprehensive solutions including data and financial clearing, revenue assurance, messaging, value added services, SIM and eSIM among others. EDCH participated in Mobile World Congress this year to engage in discussions on potential opportunities and at the same time explore new areas for future growth of the company

eSIM profile provisioning services and SIM card solutions was a major focus for EDCH at MWC this year. We were able to highlight this year how we are reshaping the SIM business by showcasing the latest trends in terms of eSIM provisioning as well as our customised SIM card solutions.

Nasser Salim, General Manager, EDCH shares his insights with the media on the current trends, new initiatives and services planned this year

Q. What was the focus for EDCH at MWC this year in terms of new services and solutions for all your customers and visitors?

A. SIM cards are a critical element in the value chain of mobile network operators (MNOs), and their security is non-negotiable. The eSIM is an important evolution in network access technology, allowing for increased mobility and simplified access to mobile networks.

eSIM profile provisioning services and SIM card solutions was a major focus for EDCH at MWC this year. We were able to highlight this year how we are reshaping the SIM business by showcasing the latest trends in terms of eSIM provisioning as well as our customised SIM card solutions. It cannot be stressed enough that reliable, high quality SIM cards help to minimise both the revenue loss and subscriber dissatisfaction caused by difficulties in connecting to the mobile network.



Nasser Salem
General Manager
EDCH



And for machine-to-machine (M2M) applications, the eSIM is already bringing substantial benefits to operators and business customers.

Designed as per GSMA standards, EDCH's innovative suite of products enables mobile operators and enterprises to offer seamless customer experience to their end users. By investing in SIM cards with appropriate memory capacities, operators can benefit from installing applications on SIM cards using Over-the-Air (OTA) technology. Some of the most popular apps include the SIM application toolkit and interactive messaging, while OTA steering of roaming, or preferred roaming, is also possible.

From its SAS-certified factory in the UAE, we offer SIM cards to suit any operators' requirements, with short delivery times within the Middle East and Africa region. EDCH is offering memory capacities from 32KB to 1MB; support for both Java and native applications; SIM, USIM, and ISIM cards for access to networks from 2G to 5G, standard, micro, and nano SIM card plug sizes and M2M SIMs.

Q. EDCH is also active in messaging solutions, what is new for mobile network operators on this front?

A. Application-to-Person (A2P) offerings is a key focus area for EDCH, two messaging products – Smart-Protect and E-Message - offer network security and revenue assurance to mobile network operators and diverse business messaging solutions to the enterprises spanning across various scales and verticals.

Our continuous efforts and commitment to innovation have enabled us to provide our Mobile Network Operator (MNO) partners with a complete and fully managed A2P messaging end-to-end solution to serve their needs. By incorporating our Smart

Protect solution, MNOs are assured of full visibility and control over the A2P SMS traffic being terminated into their networks due to near real-time updates and security rules.

EDCH's business messaging solution E-Message will help MNOs capitalise on the enormous market potential by reaching out to targeted market segments with focused marketing campaigns. With our bespoke messaging solutions, corporates can monetise latent market opportunities and convert them into enduring sources of revenue.

Smart-Protect filters and monitors A2P traffic for network security and checks revenue leakage and enhances revenue. EDCH's state-of-the-art end-to-end managed messaging service supported by the constant monitoring and vigilance of a team of experts give it a competitive edge over others. Other benefits include bespoke solutions, zero risk, zero CAPEX and zero OPEX, flexible commercial models to suit clients' needs, and an easy end-to-end integration with zero network disruption.

Our Business Messaging Solution E-Message helps enterprises capitalise on the enormous market potential by reaching out to a targeted market segment with focused marketing campaigns. It also empowers all types of enterprises to automate their workflow with our unique messaging capabilities. With EDCH's bespoke messaging solutions, corporates can monetise latent market opportunities and convert them into enduring sources of revenue without spending on CAPEX, OPEX or management/maintenance of the solution.

Q. What are the future plans for EDCH?

A. As most operators are focused on achieving efficiency and adopting advanced technologies in their network,

EDCH will continue to evolve and enrich its portfolio of products and services. In 2019, we will look at including advanced analytics and tools that will enable them to be upcoming requirements as well as manage their roaming needs in a hassle free environment.

EDCH focuses on serving more than 62 operators across four continents over 30 countries, we are looking at expanding our portfolio and footprint where we see the need for our services and solutions.

Q. Can you give us an insight into your global operations, and how do you plan to expand EDCH business this year?

A. EDCH focuses on serving more than 62 operators across four continents over 30 countries, we are looking at expanding our portfolio and footprint where we see the need for our services and solutions. At MWC we have met a lot of new potential customers and foresee immense opportunities for 2019.

Q. What is EDCH's vision and strategy for this year?

A. EDCH has served as a mobility solutions partner for MNOs for two decades due to our long-term vision to lead in driving innovation and technological advancement. This has helped our customers access the best in technology enabling them to focus on their core business objectives to provide superior customer service and enhance shareholder value. We will continue to invest in launching reliable and robust solutions for MNOs across our markets. This will enable our clients to provide their customers quality services and solutions. 🌍

SAMENA COUNCIL ACTIVITY

AT&T Joins SAMENA Council to Advance Digital Development Efforts and Build Co-operation among Operators



SAMENA Telecommunications Council has announced that AT&T, one of the world's foremost telecom companies and providers of Pay TV content, has joined members in stakeholder dialogue to address needs and issues surrounding digital communications, as business sustainability challenges intensify and as Operators' role continually evolves in the wake of fifth-generation technology.

Expressing his warm welcome to AT&T on having joined SAMENA Council's community of telecom operators from and operating in the SA-ME-NA (South Asia - Middle East - North Africa) region, Mr. Bocar BA, CEO & Board Member stated, "AT&T is well known as a world-leading customer-centric communi-

tions service provider. AT&T is a modern media company that brings together premium content, direct to consumer relationships, advertising technology and high-speed networks to deliver a unique customer experience. SAMENA Council sees, as does AT&T, that telecom operators around the world fully recognize the importance of the SA-ME-NA region as regards their push for business growth, experience-sharing, and being counted on to contribute their expertise and knowledge for materializing a new, hyper-connected digital world. The enterprising nature of SAMENA Council and AT&T and the common goal of fostering collaboration and co-operation within the digital ecosystem are good enough causes for both organizations to join their synergies together. I congratulate Mr. Mike Corkerry and the AT&T international external affairs team on their decision to join SAMENA Council, and, with pleasure, I look forward to having AT&T among our most active members."

"We look forward to working with SAMENA on policy issues impacting the industry across the region," said Mr. Mike Corkerry, AT&T's Vice President for International External and Regulatory Affairs in Europe, Middle East and Africa.

AT&T is the first North American telecoms operator to join the SAMENA Council, which is comprised of regional operators from the SA-MA-NA region, as well as some from Europe and Asia Pacific. As an important part of SAMENA Council's membership, AT&T is well placed to help SAMENA create new synergies among local, regional, and international operators on tackling multiple challenge areas, including 5G development and deployment scenarios, cross-border data flows, development of digital economy, and digital content, while also fostering AI and IoT-driven approaches in the region.

SAMENA Council believes policies and co-operative approaches can help develop new methods and models of engagement, help frame future-friendly regulations and policies, and cross-stakeholder involvement should be fostered to incentivize and influence more investment in digital development. The digital ecosystem's sustainability challenges and the need for making better use of digital technologies, therefore, demand that all operators collectively communicate on common issues and needs, while providing SAMENA Council the opportunity to provide advocacy support and build communication bridges with regional governments. 🌍

About AT&T Communications

We help family, friends and neighbors connect in meaningful ways every day. From the first phone call 140+ years ago to mobile video streaming, we innovate to improve lives. We have the best network according to America's biggest test.** We're building FirstNet just for first responders and creating next-generation mobile 5G. With DIRECTV and DIRECTV NOW, we deliver entertainment people love to talk about. Our smart, highly secure solutions serve over 3 million global businesses – nearly all of the Fortune 1000. And worldwide, our spirit of service drives employees to give back to their communities.

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**Based on GWS OneScore Sept. 2018. Excludes crowd sourced studies.

MEMBERS NEWS



STC Announces the Largest 5G Network in the Middle East

Following the launch of its first live 5G network in May 2018, STC has announced that it provided 450 locations with 5G network across the Kingdom as an initial phase, achieving the highest reach level in the MENA Region and one of the highest reach levels worldwide. STC has also announced that it is working on completing the following phases of spreading the 5G services on a wider scale to ensure keeping up with the newest global technologies, improving digital services, and enriching the customer experience across the Kingdom. Commenting on its early preparedness to introduce the network's new generation although 5G devices are currently not available in the markets for customers, STC said in a statement that this reflects its continuous initiatives as a digital leader, meeting customers' expectations of advanced services in ICT accelerating market. In addition, it stated that a larger number of advanced technical services and solutions operated in high Internet speed would be available to customers by the second half of 2019. It also praised



the Ministry of Communications and Information and the Communications and Information Technology Commission for the support has been providing in this regards. It is worth noting that STC launched its first 5G live network in last May for the first time in the MENA Region after the success of its 5G experiments and trials. On this occasion, STC stated that its

pioneering position in launching modern information technology services reflects the advancement of the communications and information technology sector in the Kingdom, stressing that this advancement is part of the Kingdom's digitization plans and NTP 2020 objectives.

STC Inks 5G Deals with Nokia, Ericsson

Saudi Telecom Company (STC) and Nokia have signed a deal to deploy a 5G network in the kingdom with Nokia's end-to-end 5G solutions. Nokia's equipment, software and services will be used to set up a 5G network in the western and southern parts of Saudi Arabia, including Makkah and Madinah. The rollout phase is already ongoing and is expected to be completed by the end of 2020. The network will feature 5G Massive MIMO technology and five component TD-FDD LTE carrier aggregation (CA). STC's CEO Nasser Al-Nasser said: 'We are excited to work with Nokia on the Aspiration project which will

help us realize our dream to be the first one to launch 5G services in the region. Once completed our subscribers will be able to enjoy innovative high bandwidth consuming use cases. The project underscores our support and commitment to the National Transformation Plan 2020 and the Government's Vision 2030 to drive Saudi Arabia's digital transformation into a knowledge economy. The leadership of our longstanding partner, Nokia, in the development of 5G is crucial for our launch of 5G services.' In a related development, meanwhile, STC has also signed a 5G deal with Swedish vendor Ericsson under which

the Saudi cellco will deploy a 5G network on the 3.5GHz band using Ericsson's hardware and solutions. According to the vendor, 5G at mid and high bands is well-suited for deployment at existing site grids, especially when combined with low-band LTE. Commenting on the deal, STC's CEO added: 'We are excited to launch one of the fastest mid-band 5G field networks in the world. We have been working in close partnership with Ericsson on 5G for tests in the lab, field trials, and now initial deployment.'

Saudi Telecom Company (STC) Signs 5G MoU Agreement with Huawei and Enters Into a New Chapter of Collaboration



STC has signed a Memorandum of Understanding (MoU) with its long-standing strategic ICT partner (Huawei) to collaborate on the innovation of 5G network technologies and services. This MoU will outline the road towards leading in 5G era for STC through joint innovation, 5G infrastructure deployment and business advancement. STC launched its first 5G network in 2018. As the pioneering operator in MENA region, STC will continue

to enhance its 5G network and provide "Ultra High Speed" user experience to its customers in the coming years. Based on the network capabilities, STC and Huawei will cooperate in building IoT and 5G ecosystem in KSA. Therefore, this agreement aims to introduce latest 5G technologies and cultivate 5G services to continually fulfil ever-growing market expectations and take the solid step towards a full national digitalization

transformation. Eng. Haithem Al Faraj, SVP Tech & Ops, STC, said: "STC is committed to pioneering the 5G Network development and deployment in order to deliver the pledged "fully digitized society" in KSA. We have already put ourselves on the road to pioneer and shape the future of 5G services in KSA and beyond. Our collaborations with our international partners will only enhance and push forward the boundaries for our 5G ambitions. Our customer deserves all the capabilities and distinguishing services that the 5G network will offer in the near future. We are very excited by the endless opportunities and the bright future that the 5G network promises to deliver to all our worthy customers." Mr. Zhao Liang, President of STC Global Key Account Dept. Huawei, said: "STC and Huawei share common understanding of industry trends and National Vision. Nowadays ICT industry is undergoing digital transformation, and operator will be more and more important role in this transformation period. Meanwhile 5G, A.I., Cloud and IoT technology are the key techs of ICT infrastructure. As the strategic partner of STC, Huawei is confident to support STC to enable KSA digital services and redefine the ICT boundaries through partnership."

STC Wins 2300 MHz Spectrum License to Provide Mobile Services

Saudi Telecom Company STC announced that it has received a notification from the Communications and Information Technology Commission, on Tuesday evening 16 Jumada I 1440H corresponding to January 22, 2019, that it has won the auction on frequencies organized and managed by CITC in the frequency band (2300), which is considered one of the most effective frequencies band due to its distinctive characteristics in coverage and capacity compared to the higher bands, for a period of 15 years starting from January

1, 2020 to December 31, 2034, with a total value of (360) million Saudi riyals to be paid in an equal installments during 15 years starting from January 1, 2020. This investment will be internally-financed from the company, and is not expected to have a material impact on the company's financial results. The acquisition of these frequencies by the company is considered an additional investment that is intended to increase the capacity of the mobile network significantly in order to meet the increase demand of services

and to increase the speed and quality of the Internet, in addition, to provide the best telecommunications services in line with the latest technologies in the field of telecommunications and information technology to meet the current and future customers' expectations. Such investment supports the company's strategy to develop its networks within the Kingdom, which contributes to the achievement of the objectives of the Kingdom's vision of 2030.



Batelco Chairman Reviews the Readiness of Batelco's 5G Network

Batelco Chairman Shaikh Abdulla bin Khalifa Al Khalifa visited the company's Training Centre to review the company's readiness for the fifth generation technology and future plans developed by Batelco to enable it to deliver products and services, based on 5G technology which will be introduced gradually over the next three years internationally. The fifth-generation technology is a breakthrough in wireless communications, enabling more data transmission, faster and shorter response time, which creates an exceptional customer experience when using the Internet, Internet products, and mobile applications. On the commercial level, 5G technology will contribute to the upgrading of services for the enterprise sector through the application of virtual reality technologies and augmented reality as well as artificial intelligence, which in turn will open up new horizons in the world of digital technology. The Chairman was accompanied by a number of Board members and executive management, who were briefed by Ericsson, Batelco's technology partner in the development of the 5G network. Ericsson presented a detailed presentation on the advantages of the 5G technology and how it can be applied in everyday life, and how it will enhance the experience of individuals and business owners alike. The company's representatives explained the stages of introducing 5G technology worldwide over the next three years, in addition to



explaining the techniques used, and how they work on the ground. As part of the development plans, Ericsson has set up a modern technical center at Batelco headquarters in Hamala to test the 5G network with Batelco's dedicated team, working alongside them in the network development project. Furthermore, Batelco's Business unit presented its strategic plans for the coming years with regard to the development of products and services supported by 5G technology. They outlined the progress so far and the challenges faced in addition to the plans to overcome those challenges. The project will be rolled out in three phases to provide the local telecom market with the latest technology. The Chairman of the Board watched a short film on a mobile device connected to the Batelco 5G experimental

network supported by Ericsson to give a live experience of the service, which is Batelco's first real experience of the 5G technology. On this occasion, Sheikh Abdulla Bin Khalifa Al Khalifa expressed the Board's satisfaction with the efforts made by Batelco's management in relation to 5G technology, and their ability to develop a technical and practical plan in line with its development stages, to meet the needs of the telecommunications sector in general and the customers' interests in particular. "Providing the latest telecommunications technology in the Kingdom of Bahrain is our top priority and one of the key pillars in enhancing the telecom sector in line with the Kingdom's plans in improving the National telecom infrastructure and supporting the growth of the digital economy and the required ecosystem.

Batelco Launches the Global Zone, a Carrier Neutral Digital Platform

Batelco, the leading digital solutions provider in the Kingdom of Bahrain, has announced the launch of Global Zone, a carrier neutral digital business platform based on a highly secured Tier III Data Centre, which helps customers to operate their digital business in a secured environment. Global Zone has been designed to support the development of the digital economy in the near future and attract leading players in the ICT industry, by providing them with opportunities to meet and exchange data. The platform

will facilitate traffic growth by serving both regional and international partners with the aim of creating a global data exchange that will act as a regional gateway to other parts of the world. This new concept will offer connectivity by serving as the regional carrier-neutral data transit-and-hub for the ever-growing data movement demands and allow service providers to meet in a robust ecosystem. Global Zone is also the ideal ecosystem to attract carriers as well as cloud and content providers, due to its efficient access to

state-of-the-art infrastructure, offering customers rapid access to interconnected partners, both regionally and globally, to meet and exchange data. Batelco Chief Global Business Officer, Adel Al Daylami commented, "Global Zone provides data center facilities and colocation services that serve as growth accelerators for digital businesses in the region and across the globe, enabling access to Batelco's robust global network with widely distributed Points-of-Presence." "Global Zone will create a robust ecosystem in

which it uses a secure and diverse network connection that will ultimately improve IP network resiliency and reliability and establish a dynamic “meet and exchange” data service platform,” added Mr. Al

Daylami. The platform offers resilient digital services for business applications and meets the requirements of businesses with mission-critical data. Furthermore, Batelco’s competitive pricing structure

and capability to deliver a one-stop-shop service, provides relevant and in demand benefits for its customers and partners.

Batelco Gulf Network Transforms to Batelco Global Network

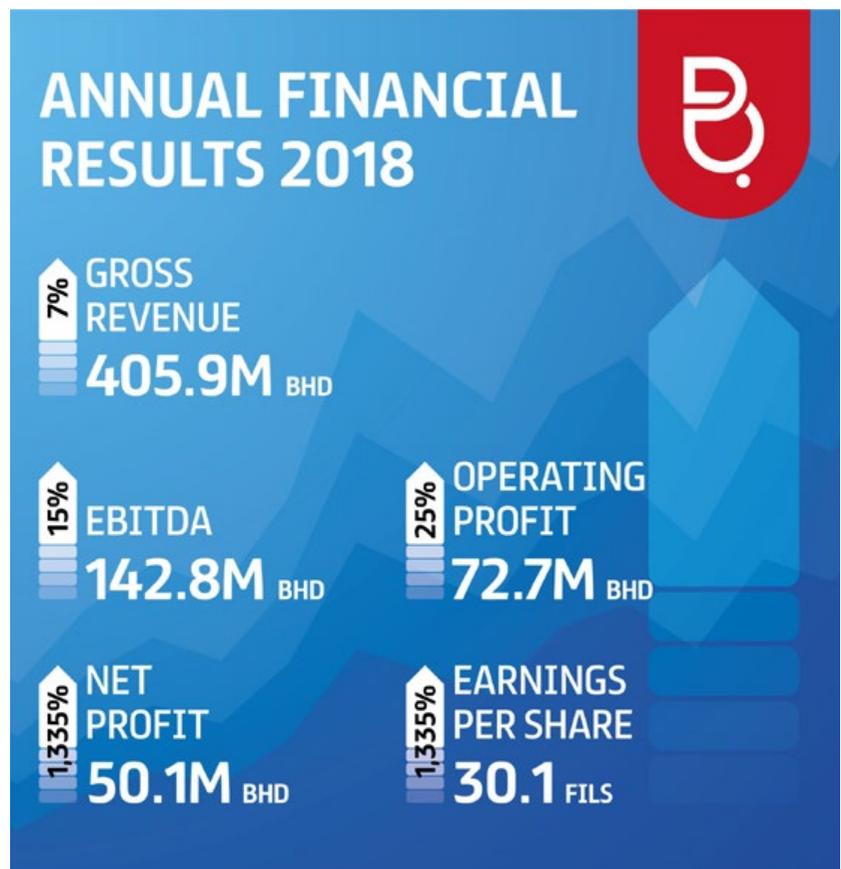
Batelco, the leading provider of digital solutions in the Kingdom of Bahrain announced that Batelco Gulf Network, an international cable system which was launched last year to provide the GCC region with an additional option for regional and international connectivity solutions, has expanded into Europe and been transformed to Batelco Global Network (BGN). The network, which runs over a protected state-of-the-art optical transport network (OTN), meets the demand for reliable high bandwidth connectivity and capacity serving the different needs of global services and customers while supporting very high capacity. Batelco has chosen Marseille

to host its network where it has deployed multi service nodes using high capacity optimized routes to provide the shortest latency, as it has garnered a reputation as the fastest growing interconnection hub in Europe over the past three years. Marseille is an interconnection hub for the world’s leading businesses, and hosts a number of data centers and gateways to emerging markets and landing stations for major continental subsea cables. Batelco Chief Global Business Officer Adel Al-Daylami commented, “This step will facilitate the provision of new and innovative services for the growing digital economy, which will support the efforts of the Kingdom of Bahrain and the GCC

in the field of communications. Batelco’s comprehensive plans are designed to support the establishment of a robust national and international infrastructure. We are committed to strengthening our delivery to contribute towards Bahrain’s presence as a major ICT hub, and we hope to build on this platform to ensure future success.” With consumers and businesses across the GCC consuming more bandwidth from both local and international providers, BGN addresses the demand. The expansion also enables Batelco to enter into new markets and extend its portfolio of services into Europe and beyond.

Batelco Posts Revenue Increase of 7% in 2018

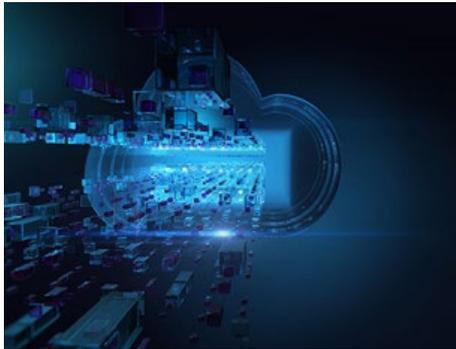
Bahrain-based Batelco Group has recorded full-year 2018 gross revenue of BHD405.9 million (USD1.1 billion), up 7% from the year-ago figure of BHD379.4 million. The group also stated that net profit rose from BHD3.5 million in 2017 to BHD50.1 million in the twelve months ended 31 December 2018, noting that its 2017 net profit was adversely affected by impairment losses in relation to its investments in Yemen and Jordan. Operating profit grew at a healthy rate of 25% to BHD72.7 million in 2018, compared to BHD58.4 million the previous year, while group EBITDA also grew 15% year-on-year to BHD142.8 million. Batelco’s total subscriber base did fall, however, from 9.4 million in 2017 to 8.6 million one year later, representing a drop of 9%.





du Moves to Programmable Cloud Platform with Hewlett Packard Enterprise

'du', from Emirates Integrated Telecommunications Company announced that it is modernizing and automating its cloud platform working with Hewlett Packard Enterprise to implement a best of breed IT cloud orchestration and automation solution as part of du's major cloudification initiative. This was announced at Mobile World Congress



in Barcelona. By moving away from a traditional infrastructure environment to a highly programmable cloud platform, du will gain more efficiency, benefit from enhanced service and operational excellence, and improve time to market of new services. The end-user would see direct benefit through tailored offerings. "The adoption of a future-proof IT cloud management solution based on open standards has enabled us to achieve our desired level of flexibility in scaling resources efficiently in line with our business needs", said Saleem AlBlooshi – Chief Infrastructure Officer, Emirates Integrated Telecommunications Company (EITC). "This underscores our ability to swiftly reposition our strategy and investments towards being an agile digital service provider". The IT cloud management solution enables streamlined

management of hybrid and multi-cloud environments, orchestrates complete end-to-end operations processes, accelerates application delivery, and offers a simplified self-service catalog. HPE is the lead system integrator to design, integrate and manage the rollout of the solution at du. "The solution has been designed to help du master any cloud, any environment, and any new technology while accelerating time to market for application innovation and avoiding vendor lock-in" said Fabio Fontana, Vice President and Managing Director Middle East, Hewlett Packard Enterprise. "This project confirms our strategic partnership with du and commitment to help du better serve their customers, and we look forward to delivering the next phases of the project."

du Accelerates 5G-Based Smart City Ambitions with the Launch of Next Generation Narrow-Band IoT Services

du, the Emirates Integrated Telecommunications Company (EITC), has announced the launch of next generation Narrow Band-Internet of Things (NB-IoT) network in the country based on the latest 3GPP Release 14 standard. The next-gen NB-IoT was developed along with Nokia, Affirmed Networks and MediaTek. The NB-IoT will leverage the purpose-built IoT platform built by du, to enable devices to deliver a wealth of smart city applications ranging from smart metering, smart parking, trackers, smart health, industrial and agriculture use cases. According to du, the announcement shows the commitment of the consortium to accelerate adoption of NB-IoT to serve customized IoT applications and lay the foundation for the 5G-era of massive IoT connectivity. NB-IoT technology is supported by a wide range of modules powered by MediaTek devices and state-of-the-art NB-IoT 3GPP Rel 14 Network provided by Nokia and Affirmed Networks. As part of this collaboration, du, Nokia, Affirmed Networks and MediaTek recently successfully demonstrated an electricity and water smart metering use

case and its associated benefits, wherein NB-IoT 3GPP Rel 14 provided deep coverage extensions of 10dB – better than LTE in band 20 (800MHz), device power saving for longer battery life and maintaining significantly better data rate and low latencies compared to the previous Release 13. NB-IoT. Saleem AlBlooshi, Chief Infrastructure Officer, EITC, said, "The development of IoT is critical to the rollout of 5G and today marks an exciting milestone as we launch a state of the art NB-IoT ecosystem in the UAE. Unlike the previous generation Release 13 NB-IoT, the launch of the first 3GPP Release 14 NB-IoT network opens up possibilities of newer implementations due to the higher throughput, lower latency and Mobility enhancements. We are excited to be a step closer to realise the vision of the UAE leadership to build the smartest city in the world and achieve digital transformation." For the project, MediaTek used an NB-IoT Release 14 enabled System-on-a-Chip (SoC) for ultra-low power and cost effective IoT devices. It enabled extended coverage for applications, such as smart trackers,

wearables, IoT security, smart metering and other industrial applications. The MediaTek chip's highly integrated design incorporated an NB-IoT modem, antenna RF and base-band analogue front-end among many other components, in order to simplify the product design process for partners. Its miniscule package size and low pin-count yields cost and size effective designs for many applications. Network Functions Virtualization (NFV) represents the foundation to achieve efficient carrier-grade solutions, and the development follows the statement made in 2018 in which du announced that it had opted for Affirmed's Network Functions Virtualization (NFV) Narrow Band IoT (NB-IoT) mobile core to provide the 3GPP core network to support a wide range of IoT use cases. Affirmed Networks' NB-IoT solution is currently deployed on du's fully virtualized native cloud open-stack environment. The state of the art deployment is 5G-ready with network slicing capability to support du's vision of a fully virtualized and software defined native cloud core network.

5G Services For du, Virgin Mobile Customers in UAE to Go Live This Year

Emirates Integrated Telecommunications Company (EITC), du's parent company, announced on Sunday that it is undertaking advanced level of preparations to deploy 5G services across the UAE this year. In a statement released, the telecom firm said that some crew members have already been commissioned to install high-technology 5G equipment in a number of popular landmarks spread across the country. The aim is to set up more than 700 5G-enabled base stations by the end of the year, thereby ensuring that EITC will be among the first providers in

the world to deploy 5G in 2019 and offer faster internet speeds. The infrastructure will benefit both du and Virgin Mobile customers. The announcement came just over a week after Etisalat made a promise to roll out the next-generation wireless technology in 2019. "We are excited to update our customers that ... we are fully on schedule to make 5G commercially available this year," said Saleem AlBlooshi, Chief Infrastructure Officer, EITC. Telecom customers are assured that they will be getting most of their internet experience through smartphone or other smart devices

once the 5G service goes live. Browsing the web, downloading files or viewing and streaming of videos will be faster. "Our customers will feel a real difference with 5G network in terms of higher speeds and lower latency – commonly known as buffering," AlBlooshi said. "Consumption of video and digital content is growing by leaps and bounds and 5G's ultra-high speed will enable smoother streaming of [high-definition] videos, 4K videos, and VR/AR experience which have multiple potential applications for individuals and businesses."

du Plans 700 5G Base Stations This Year

du says it plans to launch commercial 5G services by the end of this year, deploying

more than 700 5G-enabled base stations in the process. Rival operator Etisalat

recently said that it planned to have 600 5G base stations in service by end-2019.

du Expects 40% Jump in CAPEX This Year

United Arab Emirates (UAE) fixed and mobile operator du says it expects capital expenditures to rise by 40% this year as it increases investment in 5G mobile technology. The firm, which is hoping to

launch a live 5G network towards the end of the year, is aiming to spend between AED1.3 billion and AED1.4 billion (USD354 million-USD381 million) during the course of 2019, up from AED1 billion last year.

Du reported revenues of AED13.4 billion for full-year 2018, up 3.2% year-on-year, while net profit for the year was up 2.4% to AED1.8 billion.



Etisalat Pushing Ahead with UAE 5G Rollout

Etisalat of the United Arab Emirates (UAE) says it plans to equip 600 mobile network towers with 5G technology by the end of this year. A report from Gulf Business says the telco is planning to upgrade 300 towers in the first half of the year. Etisalat

aims to have its 5G network in place well before the launch of the first commercial 5G-capable handsets, which is expected in 2020. Rival UAE operator Du has said that it is targeting a Q4 2019 launch for its own 5G system.



Etisalat UAE Taps Huawei and Ericsson for 5G Rollout

Etisalat has awarded contracts to both Huawei and Ericsson for the rollout of its 5G mobile network in the United Arab Emirates (UAE). The telco plans to deploy

300 5G-enabled base station sites in the first half of 2019, with 600 to be active by the end of the year. Rival operator Du recently announced plans to roll out 700 5G

base stations by end-2019 with both telcos looking to launch commercial services this year ahead of the mass-market introduction of 5G-capable handsets.

Etisalat Named 'Most Valuable Telecoms Brand' in MENA Region at Mobile World Congress

Etisalat received 'The Most Valuable Telecoms Brand' in Middle East and North Africa (MENA) region by Brand Finance at Mobile World Congress as a recognition for the company's increase in brand value to \$8.3bn-higher than any other telecom brand in the MENA region and the only telecom brand portfolio to break the \$10bn brand value mark in the region. Etisalat is now among the world's top 20 telecom brands and boasts of an impressive AAA brand rating. With a portfolio of brands such as Etisalat UAE, Etisalat Misr, Mobily, Ufone, Maroc Telecom, PTCL and Etisalat Afghanistan. Eng. Saleh Abdullah Al Abdooli, CEO, Etisalat Group received the awards from David Haigh, CEO, Brand Finance, leading London-based branded business valuation firm at the ongoing Mobile World Congress, world's largest telecom gathering being held in, Barcelona, Spain from 25-28 February, 2019. David Haigh, CEO Brand Finance on the launch of this year's Telecom 300 league table report said: "Brand Finance welcomes Etisalat to the Top 20 Most Valuable Telecom Brands in the world this year. Etisalat is leading from the front as a strategic enabler of the digital transformation success story. This year's feat is a nod to efforts in the 5G space, its brand building initiatives and a clear revenue momentum from wider international operations" "We are proud to be recognized as the most valuable telecom brand and with a brand portfolio to cross \$10 billion in value in the MENA region, this is attributed to the efforts in digital transformation by investing in futuristic solutions and next generation technologies to deliver the best-in-class



services making a significant impact on the overall customer experience. Etisalat's success as a brand is credited to its global brand building initiatives and reinforced by the synergy of our family across Etisalat group footprint, creating brand loyalty and enhanced engagement with our customers," said Eng. Saleh Abdullah Al Abdooli, CEO, Etisalat Group.

Several factors have attributed to the success and growth of Etisalat's brand value mainly driven by an innovative customer service driven strategy, adapting well to a digital savvy marketplace, leading the 5G revolution and the successful launch of global brand building initiatives. Etisalat has also led digital innovation in the country with its overall strategy focused on 'Driving the Digital Future to empower societies' by working on several digital initiatives in digital infrastructure, entertainment and smart cities. Etisalat has reached out and engaged with its

consumers across markets with global branding initiatives by sponsoring global football teams and clubs aligning with the brand's priorities of being at the forefront of major sporting events. Etisalat also launched the new positioning campaign 'Together Matters' to highlight togetherness among its subscribers in today's world of connectivity. As part of its digitization efforts for consumers, Etisalat provided an efficient personalized retail experience by amplifying the roll out of smart stores in UAE and transforming a brick and mortar retail environment to a digital experience for customers. Brand Finance, is the world's leading independent branded business valuation and strategy consultancy, and is the organization behind the Global 500 Brands and Telecom 300 league table of the world's biggest brands ranked by their brand value, assesses the dollar value of the reputation, image and intellectual property of the brand.

2018 Sales and Profits Up at Etisalat

The telecoms group Etisalat has reported its preliminary financial results for full-year 2018, with revenues up 1.4% to AED52.4 billion (USD14.3 billion). Net profit attributable to equity shareholders

rose 2.4% year-on-year to AED8.6 billion, with the increases attributed both to its international operations and its domestic business. The firm's full audited financial results will be published following a board

meeting on 19 February. Etisalat has operations across the Middle East, Africa and Asia.

Etisalat Group Reports Consolidated Net Profit of AED 8.6 Billion

Etisalat Chairman, Eissa Mohamed Al-Suwaidi, said: "Our journey in 2018, marks another successful year for Etisalat in realizing its vision towards leading the digital future to empower socialites. Etisalat's solid financial performance is a reflection of our focus on sustaining our core business while enhancing and accelerating our digital portfolio. There was an increased effort on diversifying into new growth opportunities transforming Etisalat into an agile, digital and more efficient company. Today, we look at the future with optimism as we are determined to progress on solid grounds and continue innovation while focusing on driving the digital transformation to take advantage of future opportunities enabling us to add greater value to our customers and shareholders. Our continued efforts will provide consumers a wide portfolio of innovative products and services, integrated solutions, and digital platforms. "I want to thank the wise leadership of the United Arab Emirates, President HH Sheikh Khalifa bin Zayed Al Nahyan, HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister and Ruler of Dubai, HH Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces for supporting the telecom sector and for their vision for the UAE that helped fuel our success. Thanks to the steady support of our shareholders, loyalty of millions of our customers across our footprint, and to the commitment and hard work of the management team."

GCEO's Statement:

Engineer Saleh Abdullah Al Abdooli, Group Chief Executive Officer, Etisalat, said: "Etisalat had a landmark year in 2018 as we embarked on a successful journey into the digital future seizing opportunities and overcoming challenges in a fast evolving industry. Etisalat is moving forward with confidence setting new goals to drive digital transformation across the company, its customers and stakeholders. "Etisalat's performance in 2018 is a testimonial of the Group resilience and ability to mitigate the pressures arising from the dynamic

challenges facing the industry. Etisalat's strategy 'Driving the digital future to empower societies' helped deliver a digital experience and enable innovation across our customers and businesses. "With continuous efforts towards delivering the 5G promise, Etisalat's pioneering efforts will allow our customers to enjoy and unleash highly connective technologies blending physical and digital realms from AR and VR to IoT, AI, autonomous vehicles, advanced robotics, 3D printing, wearable tech and more. Innovation remains at the core of our strategy with a focus on empowering digital transformation by enhancing and building one of the most advanced networks in the region. "In 2018 we pursued an ambitious agenda in the digital space to maintain our leadership position across our operations. Our focus remains on providing governments, businesses and individuals with innovative, simple, and relevant solutions that harness the power of technology and maximizes their potential. "I am confident that Etisalat Group will deliver the ambitions and aspirations of our customers, by capitalizing on its knowledge, vast capabilities, talent, assets, and its strong financial performance. We will continue to support the communities we serve and add

value to the markets where we operate. Customer experience remains a key area of focus in which we will strive to provide our customers with a superior service level on top of our high quality products." "We are thankful to the wise leadership of the UAE and our shareholders for their steady support in this journey, our customers for their continued confidence and trust. I am confident that 2019 will continue the outline of long-term, sustainable success that is the hallmark of Etisalat Group.

Subscribers:

In the UAE, the subscriber base reached to 12.6 million subscribers, while Etisalat Group aggregate subscribers reached 141 million subscribers representing a year on year increase of 1%.

Revenues and Net Profit

Etisalat Group's consolidated revenue for Q4 of 2018 amounted to AED 13.0 billion. While consolidated net profit after Federal Royalty in Q4 amounted to AED 2.0 billion representing an increase of 2.4% in comparison to the same period last year resulting in a net profit margin of 16% .

EPS:

Earnings per share (EPS) amounted to AED 0.23 in the fourth quarter and AED 0.99 for the full year of 2018, an increase of 2.4% in comparison to the same period last year.

Etisalat Group continues to be amongst the region's top telecom groups supported by its wide reach, solid profitability, & strong cash flow generation

Key Highlights

- 16 countries, over 142 million subscribers
- Revenue: AED 51.7 billion
- EBITDA: AED 26.0 billion (at 50% margin)
- OFCF: AED 18.0 billion (at 35% margin)
- Net Profit: AED 8.4 billion (at 16% margin)
- Dividends per Share: 80 fils (at 82% payout ratio)
- A robust credit rating with AA-/Aa3 by S&P Global and Moody's.



Etisalat Group Operating Companies



Etisalat UAE Doubles Download Speeds

Etisalat, the larger of the two fixed and mobile operators active in the United Arab Emirates (UAE), says it has doubled peak download speeds on its residential and business internet services. 'eLife Unlimited' plans for home users have seen the entry-level package raised from 50Mbps to 100Mbps, at no additional cost, while the top-tier service has seen download speeds raised from 250Mbps to 500Mbps. The 'Business Quick Start' and 'Business in a Box' plans have also seen download rates doubled, to a maximum of 600Mbps. Etisalat UAE claimed 1.16 million broadband internet subscribers at the end of September 2018, according to TeleGeography's GlobalComms Database.



Etisalat Information Services Launches UAE's First 'Aggregator of Aggregators' App

Etisalat Information Services, a subsidiary of Etisalat Services Holding, announced the next generation application of the aggregator's model through its enhanced Connect.ae mobile app, taking its hyper-local search engine to the next level by bringing together businesses and consumers in the UAE through exclusive deals and special discounts. The launch of the UAE's first aggregator app is part of Etisalat's key activities to mark the

UAE Innovation Month, in line with UAE's Innovation Strategy that sets out the country's ambition to become the most innovative nation in the world. Rashid Al Naqbi, General Manager, Etisalat Information Services, said: "Etisalat Information Services is continuously investing across its multi-channel to enable digital transformation. The launch of the connect.ae app supported by innovative technology will give customers

and businesses a unique and seamless experience of the wide array of services, discounts, and deals. "Connect.ae has collaborated with the world's leading aggregators such as Booking.com for hotels bookings; ride-hailing app Careem; food delivery app Zomato; and Shopinc.com for grocery shopping, among others. Customers can easily book a cab, make hotel or restaurant reservations, and get exclusive discounts with the enhanced app. With its innovative features and services, this digital platform is seen to further boost customer loyalty as well as promote brand exposure." Connect.ae, which first launched in March 2015, is a hyper-local search engine to find companies, products, services within one's city in the UAE. The tool collects, filters, classifies, and presents local business information to the market, offers routing guidance, booking services and posts enquiries with companies. The app, available for free from Apple's App Store and the Google Play store, offers users with discount vouchers and deals at 1,000 partners, ranging from restaurants to clinics, spas, cinemas, car rentals, travel and tours, and other services. Customers can also redeem the vouchers and avail of discounts on the Connect.ae website.



Etisalat and Huawei Jointly Complete Testing of the Industry's First Single-Wavelength 600G Trial Site

UAE telecom operator Etisalat recently announced that it collaborated with Huawei to complete the industry's first testing of a single-wavelength 600G trial site. This trial cements Etisalat's leading position in transport network technological innovation, and promotes commercialization of single-wavelength 600G technology, with great commercial application value. As the largest comprehensive telecom operator in the UAE, Etisalat has not only established high-quality telecom networks in the U.A.E, but also provided extensive and reliable telecom services in 15 countries across the Middle East and Africa. Its development attracts global attention and it has become one of the most influential multinational operators in the Middle

East. With emergence of new technologies and services to cooperate with partners on product and technology innovations in terms of new services and high performance & capacity transmission. To address Etisalat's requirements for large capacity and efficient operation, Huawei provides a single-wavelength 600G ultra-high-speed optical transmission solution. This solution uses Huawei's latest generation of OptiXtreme series oDSP chips. This solution enables programmable and flexible adjustment of multiple code patterns from 100G to 600G. This allows adaptation to complex link environments and various transmission distances in physical networks. In addition, a new AI neuron module is embedded into the chips, quickly marking all wavelengths

in optical transmission networks and automatically optimizing performance. This innovative trial has verified specified items and confirmed that key indicators related to single-wavelength 600G such as transmission. Etisalat SVP Network Development Mr. Esmaeel Al Hammadi said, "Etisalat has been committed to providing optimal network services for each customer. To match the pace of network requirements, optical networks need to be adaptive and ultra-high capacity. Huawei's development for 600G, single channel will greatly improve the spectrum efficiency of optical networks." Richard Jin, President of Huawei Transmission & Access Product Line, said, "We enjoyed working with Etisalat to complete the testing of the industry's first single-wavelength 600G trial site. This is an innovative and important milestone in the global commercialization of Huawei's single-wavelength 600G solution. Huawei will continue to carry out technological innovation and research to provide Etisalat with high-quality, reliable, sustainable, and evolvable solutions, helping them achieve business success." Huawei remains committed to open collaboration and actively promotes ICT development. With the maturity of 600G technology, Huawei will further expand network bandwidth, create greater value for customers, and build a better connected world to stimulate unlimited opportunities.



Omantel Taps Optiva for Next Digital Transformation Phase

Omantel is launching a new phase of its multi-play billing and charging transformation on Optiva's Charging Engine. The Omani market leader is experiencing growth in its subscriber base as a result of massive acquisitions. Coupled with an increased demand for mobile connectivity and specifically data, this has made digital transformation critical for Omantel. The successful launch of this new phase allows Omantel to upgrade its

fixed-line and multi-play services. Omantel gains increased flexibility to create and tailor new products specific to its customers, launch new offerings to market faster and engage with a larger variety of customers and businesses to generate greater business value. "We count on Optiva Charging Engine and the payments solution - as well as their reliable support, maintenance and managed services - to allow us to monetize a variety of multi-

play services, including mobile prepaid and postpaid, hybrid, fixed, cable and internet," said Samy Al Ghassany, COO of Omantel. "Omantel's investment in their digital transformation and commitment to act on their multi-play strategy will allow them to provide a world-class experience to their customers and ultimately increase revenue while retaining their base," said Danielle Royston, CEO of Optiva.



Sudatel Receives Prestigious Award for Its CSR Campaigns



Sudatel announced that it has won an award from The Corporate Social Responsibility Regional Network, in collaboration with the International Academy for Corporate Social Responsibility. This honor recognizes Sudatel's ongoing and proactive program of CSR activities across a variety of fields including:

- Initiatives to connect the unconnected
 - A program to help Sudanese start-up companies
- The Award was received by Eng. Tarig Hamza CEO of Sudatel Telecom Group at a glittering ceremony held in Bahrain. The judges considered the CSR projects of many Arab companies with Sudatel being singled out. Mr. Zainelabdin said "Successful companies like Sudatel have a duty to give back to our communities. We work hard on our CSR program and commit significant resources to it. We see for ourselves how we can improve people's lives, however, outside recognition is always welcome. We thank The CSR Regional Network for CSR for this award."



Telecom Egypt Announces a Change in Its BoD

The government of Egypt, being Telecom Egypt's major shareholder with an ownership of 80%, has announced changing some of its representatives in Telecom Egypt's Board of Directors by a decree from the Egyptian Prime Minister with immediate effect and for the remaining period of Board of Directors. The Board of Directors held a meeting today and appointed Eng. Adel Hamed as the new Managing Director and Chief Executive Officer. The decision comes in line with the Egyptian government's plan to speed up the national digital transformation initiative, where Telecom Egypt has a strategic role in facilitating and accelerating such transformation for the country. In addition, the new revenue streams from the project are expected to boost the company's organic growth potential. Magued Osman, Chairman of Telecom Egypt, said: "The Board of Directors has chosen Adel Hamed as Chief Executive Officer due to his long-established experience and proven track record to steer the company towards digital transformation. Hamed's background and key role in Telecom Egypt's domestic wholesale and international cable systems as the Chief International & Wholesale Officer position him as the ideal candidate to capitalize on Telecom Egypt's assets to implement the digital transformation strategy. I would like to thank Telecom Egypt's former directors of the board for their efforts in adding value to the company and Mr. Ahmed El Beheiry for leading the company successfully in its transformation to a total telecom operator." Adel Hamed, Managing Director & Chief Executive Officer, added: "I would like to thank the Chairman and the Board of Directors for the faith they have placed in me and

I look forward to dedicating all my energy to drive this already successful company to its potential. This is an important time in the evolution of the telecom sector and I shall be relying on a great team at Telecom Egypt to make sure that we seize the opportunities and build on our strength. I would also like to thank the Executive Management of Telecom Egypt and all former CEOs, in particular Mr. Ahmed El Beheiry, who has made great efforts to develop the company across its business units. This puts a great responsibility on my shoulders to continue on the efforts of others in light of Telecom Egypt's long-standing strategy."



Telecom Egypt and Ericsson Go Live with 5G Cloud Core Network

Telecom Egypt and Ericsson announce the upgrade of Telecom Egypt's Cloud Core Network to be 5G ready. Telecom Egypt had gone live in September 2017 with Ericsson virtual Evolved Packet Core deployed on Ericsson's proven Network Functions Virtualization infrastructure (NFVI). The solution is prepared for 5G and enables Telecom Egypt to improve speed, efficiency, and agility both for operations of current business and when addressing new opportunities. The introduction of 5G is expected to result in many new services for consumers and enterprises, typically related to the Internet of Things. Using Ericsson's solution Telecom Egypt will be able to scale more easily the network differently for various services, as well as bring innovative services to market faster in response to changing consumer and enterprise demands. Adel Hamed, Telecom Egypt's Managing Director and Chief Executive Officer said: "The implementation of 5G ready core solution comes in line with Telecom Egypt's strategy to be ready for the future and demonstrates

our strong and strategic partnership with Ericsson. We have chosen this solution from Ericsson to be ready when the time comes for 5G commercial launch in Egypt as we believe that the efficient deployment of the latest technologies enables faster rollout of new revenue-earning services to our customers." Ericsson has delivered a wide range of its market leading telecom applications including IP Multimedia Subsystem (IMS), Unified Data Consolidation (UDC), Signaling Routing (DSC/IPSTP), a complete virtual Evolved Packet Core (vEPC) and virtual Service-Aware Policy Controller. The applications will be managed by the Ericsson Network Manager (ENM) while Ericsson Orchestrator and OpenStack based Ericsson Cloud Execution Environment are key components of the NFVI solution. Rafiah Ibrahim, Head of Ericsson Middle East and Africa says: "Operators throughout the region are transforming their networks in preparation for 5G and IoT, and network functions virtualization (NFV) is a key component of a 5G Cloud

Core network. Our NFV solution will enable Telecom Egypt core network to be 5G ready. This will rapidly address their subscribers' ever-increasing demands and enable swift deployment of future innovative new use cases presented by 5G and IoT." Ericsson's system-verified NFVI solution follows ETSI architectural principles and consists of software and hardware products as well support and system integration services forming a pre-integrated solution for telecom operators. Live deployment of Ericsson NFVI signifies an important step for Telecom Egypt to transform its network in light of the digital transformation that is taking place in the Middle East. Together with the complete Ericsson virtual EPC and Policy control applications, including continuous delivery and deployment of software, it is serving millions of users with high-capacity mobile broadband, IoT and VoLTE as well as Wi-Fi calling services ready for launch today. Efficient rollout of new revenue-earning services is critical in an increasingly network-connected world.

Telecom Egypt Apply Artificial Intelligence to Operate Telco Cloud

Telecom Egypt and Ericsson completed the successful deployment of Artificial Intelligence (AI) to its full-stack telco cloud infrastructure. The objective is to operate telco cloud environment intelligently and efficiently to enable cloud Automation and orchestration. The telecom industry is moving into cloud automation especially with introduction of Cloud Native in 5G. Artificial Intelligence assets provide an efficient method for cloud visualization with ability to monitor internal traffic between NFVI layers, in addition to providing a fast way to identify faults and generate suggestions for resolution. Adel Hamed, Telecom Egypt's Managing Director and Chief Executive Officer said: "We are keen to lead the way in the region when it comes to Artificial Intelligence, as it paves the road for implementation of new technologies across all our markets. Partnering with Ericsson enables us to achieve our strategic goals when it comes to enhanced operational effectiveness and customer experience." A key benefit in the case of cloud is that the software is divided



into smaller components. This means Telecom Egypt can be selective about what it chooses to upgrade in terms of software and manage these upgrades more easily on a live network with minimal disruption. Rafiah Ibrahim, Head of Ericsson Middle East and Africa said: "This successful pilot showcases the possibility for operators to deploy Artificial Intelligence on a broader scale. By using Ericsson's technology,

operators such as Telecom Egypt are able to build global standard agile networks and speed up the introduction of new services." The two companies will now begin to onboard other services to address further market segments and opportunities, while ensuring business continuity management and automation process evolution of live solutions.

Telecom Egypt and Vodafone Egypt Reach Agreements on Transmission, Infrastructure Services and Dividend Distribution

Telecom Egypt (TE) and Vodafone Egypt announce the signing of two ten-year transmission and infrastructure agreements with a total value of EGP 10.85bn. The transmission agreement covers Vodafone Egypt's current and future requirements for domestic transmission services for both fixed and mobile, and the infrastructure agreement represents a new cooperation between the two companies, where Telecom Egypt will avail fiber backhauling capacity to Vodafone Egypt's network. Additionally, Vodafone Egypt has proposed a dividend of EGP12.2bn,

of which Telecom Egypt's share is the equivalent of EGP 5.5bn. The dividends will be paid on two tranches, the first of which amounts to EGP 4.8bn and will be paid in March 2019 with the remainder in June 2020. Adel Hamed, Managing Director and Chief Executive Officer of Telecom Egypt, commented: "We are pleased to have reached a deal that is mutually beneficial to both parties. Vodafone Egypt is not only a strategic partner in the Egyptian market, but also a successful investment for Telecom Egypt. The agreements secure the growth of TE's domestic wholesale

revenue stream for the long-term and prove that we are the partner of choice for domestic mobile operators. Additionally, we are delighted that we have finally reached an agreement with Vodafone Group on our share of retained earnings in Vodafone Egypt. Telecom Egypt plans to utilize the cash inflow to deleverage closing all the facilities in EGP to reduce the financing expenses enhancing its profitability, in addition to support its cost cutting initiatives, and continue its strategic investment plans to benefit the telecom industry in Egypt." Alexandre Froment-Curtill, Chief Executive Officer of Vodafone Egypt, said: We at Vodafone value the partnership with Telecom Egypt; we believe that the confidence of Telecom Egypt board and the Government to invest in Vodafone business shows how strong and successful is Vodafone. With the agreements we are signing today, we have confidence in the future of our business in Egypt, as well as in our partnership with Telecom Egypt. The good news for our 44mn customers is that by this agreement, they can soon enjoy higher speed and quality fixed-line internet, as well as highest 4G and 4G+ speed and quality. "The future looks exciting for both of us, signaling more opportunities for growth, with stability and visibility of the economy. We believe that the distribution of dividend to our shareholder Telecom Egypt will help in building fantastic infrastructure for the country."



Zain CEO Talks-Up Investment Impact

Zain Group CEO Bader Al-Kharafi hailed heavy infrastructure investments and organizational changes for preparing the company to commercialize 5G, though currency issues continued to take a bite out of its bottom-line in Q4 2018. In its financial results statement, Al-Kharafi said Zain had created a foundation to

deliver 5G and the interconnectivity to power the fourth industrial revolution in its markets. During 2018, he noted, the company made significant progress in "optimizing synergies" within the group and made a number of large investments. Last year it continued to build out its fiber footprint and made other network

upgrades, spending a total of \$750 million including spectrum fees. Al-Kharafi said organizational changes were: "Geared towards making us a more agile operator that can reap the lucrative opportunities in the digital space and move quickly in the face of the sweeping changes in the ICT sector." Zain's chairman Ahmed Al Tahous

added the company had also been supported by favorable decisions by authorities in its key markets. Across its operations, Zain booked a Q4 jump in net income of 59 per cent year-on-year to KWD59 million (\$194 million), on consolidated revenue of KWD411 million. Comparisons with 2017 were impacted by the inclusion of Zain Saudi Arabia into group results from Q3 2018. The company pointed to strong profit growth in its divisions in Iraq and Kuwait, while noting its

Sudan operation had “performed exceptionally well” in local currency terms. Sudan is in the midst of an economic crisis with the currency 60 per cent lower against the US dollar in Q4 2018 than in Q4 2017, which has taken its toll on Zain’s bottom-line in recent quarters. Zain said the impact of foreign exchange fluctuations across its footprint cost it \$78 million in revenue and \$10 million in net income in Q4 2018.



Zain Group Publishes Its Latest Thought Leadership Report Entitled “Social Innovation: The Fusion of the Fourth Industrial Revolution and a New Generational Mindset”

Zain Group, the leading mobile telecom innovator in eight markets across the Middle East and Africa, announces the publication of its annual thought leadership report, this year entitled, Social Innovation: The Fusion of the Fourth Industrial Revolution and A New Generational Mindset. The report provides a clear understanding of how the various forces of the Fourth Industrial Revolution and the new generational mindset foster Social Innovation. The report identifies the endless benefits and opportunities social innovation brings to humanity, businesses, civil society and governments. Additionally, it examines how Information and Communication Technologies (ICT) can and do play a critical role in enabling a more inclusive approach to social, economic and environmental impacts,

fostering positive change. Lastly, the report provides a clear understanding of the relationship between social innovation and the United Nations’ Sustainable Development Goals (SDGs) in the context of planetary boundaries and social thresholds. The new report highlights how the Fourth Industrial Revolution has created vast opportunities to influence the trajectory of society and revolutionize the way businesses operate. The world is in the midst of a technological revolution in which societies are being forced to embrace advancements to maximize benefits and drive sustainable and inclusive growth. At its core, the Fourth Industrial Revolution serves as the interconnectedness of all emerging new technologies providing increasingly enhanced and meticulously customized products and services that

improve people’s lives. Moreover, the new generational mindset that is primarily comprised of youth, plays a fundamental role when it comes to understanding the importance of addressing society’s most pressing issues as they are the ones who will fully experience the threats of our complex world. They acknowledge that automated processes will directly impact them and are well aware that some of the lower income, less educated, and basic skilled workers are the ones who will most likely get affected. Accordingly, the youth are highly critical when it comes to corporations’ commitment to ethics and values, thus it is crucial for businesses to capture this in order to attract and ensure that youth are interjected willingly into the company. Commenting on the publication of the company’s latest report, Zain Group Vice-Chairman and CEO, Bader Al-Kharafi said, “As a business that is grounded in technology, it is fascinating to witness the rapid rate of development over the last 20 years. The latest developments in technology are not only changing the landscape in an accelerated manner, but more importantly, are finding solutions to existing and future global challenges.” Al-Kharafi continued, “As a regional leader dedicated to catalyzing positive and inclusive change, Zain will continue to push the envelope around social innovation with the aim of addressing the Sustainable Development Goals (SDGs).



ICT is an efficient and transformational tool that can be harnessed to drive the achievement of all 17 SDGs, and as such, technological advancements in this area should be viewed as a means of choice in addressing the goals and relieving the global community's most distressing problems." Furthermore, the Report highlights pressing issues such as:

- Social Innovation is using rapid technological advancements to solve some of the world's most pressing issues.
- The Fourth Industrial Revolution is impacting factors such as employment, inequality, and data privacy which are reshaping every single aspect of our lives.
- Through Social Innovation companies will be able to serve and tap into new markets and consumers that will be contributing to the sustainability and relevance of the business.
- Some of the grave global challenges such as climate change and political instability can be considered opportunities to create and innovate solutions that mitigate the negative impacts of these challenges.

Even though Social Innovation addresses all the 17 SDGs, below are some examples of how it directly contributes to some of the goals:

1. SDG 9.4 (Upgrade all Industries and Infrastructures for Sustainability): ICT

can help achieve this specific target by providing clean and environmentally friendly solutions related to industrial processes.

2. SDG 11 (Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable): Advancements in technological tools can help build and explore the potential of smart cities. Also, digitizing public places provides opportunities for such areas to become better equipped for the population's ICT needs that facilitate access to information.
3. SDG 16.2 (End abuse, exploitation, trafficking and all forms of violence and torture against children): The ICT industry can strongly spear actionable change when it comes to protecting children, even from a regulatory and policy perspective and deliver beneficial solutions to address the issue.

Social Innovation at Zain

Social innovation at Zain is an area of great importance as it not only addresses societies' most pressing challenges, it provides a legitimate avenue for youth across the company's footprint to engage in a meaningful manner and become active participants in socio-economic development. While modern businesses tend to shy away from contributing financially to social innovation and usually position it on the sidelines, Zain has been focused on this area for years.

Programs established by Zain over the years have altered the status quo and noticeably led to meaningful change on an inclusive basis. Through the effective use of new technologies, the company's reach, and mobile connectivity, Zain is devising innovative solutions to initiate an innovation ecosystem across the region that impacts segments of society that are typically marginalized. Although Zain's Social Innovation agenda is still in its early stages, it is shaped and guided by the notion of value creation for both the company and its communities. Examples of Zain's pioneering activity in the area of social innovation include the company's partnership with MIT Enterprise Forum (MITEF) Pan Arab Startup competition that has been held in Kuwait and Saudi Arabia and across the region, as well as its 'Innovate for Refugees' initiative which exemplifies how transformational such programs can be for displaced societies across the region. In Jordan, Zain partnered with a local startup, Mind Rockets, to build innovative technology to fully engage the hearing impaired. Through this partnership, Zain added a new feature to its website where hearing-impaired individuals can access the site using sign language via an avatar. The Social Fellowship Program in Sudan aims to support individuals who have innovative entrepreneurial solutions to society's most pressing deficits through the development of young aspiring entrepreneurs.



Accenture Blends AI, Data and Human Input into Its SynOps Platform

Accenture launched a new business platform that blends data, AI and digital technologies to help businesses improve their efficiencies. Accenture's SynOps is a "human-machine operating engine," but unlike some other artificial intelligence solutions it includes a human element. SynOps pulls from Accenture's more than 100,000 operations professionals, including data scientists and AI experts, to work with the company's machine workforce of more than 3,600 automation offerings, 65 analytics applications and 40 AI advisers. "SynOps represents the re-

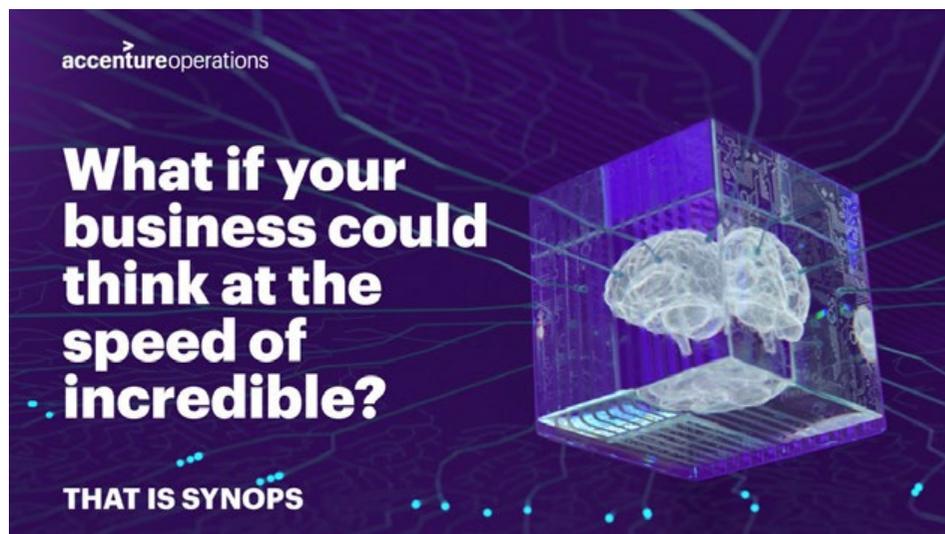
imagining of the enterprise as operations leaders grapple with integrating their automation, analytics and AI strategies," said Phil Fersht, CEO and chief analyst at HFS Research, in a prepared statement. "Moreover, Accenture focuses SynOps on augmenting the human experts, which is so critical as companies design the processes they need to drive an effective operations strategy and business outcomes." SynOps orchestrates the allocation of workloads by assigning tasks to software bots using AI and analytics in order to identify automation opportunities.

By using data-based insights, Accenture says that SynOps can ensure that the correct resources are being utilized for the right tasks. SynOps taps into the analytics and AI capabilities of the Accenture Insights Platform as well as partner technologies, which include more than 100 preconfigured analytics and AI solutions, to help businesses reach their desired outcomes. SynOps enables the collection, monitoring, storage, analysis and reporting of structured and unstructured data from various sources and creates the environment for advanced data

exploration and AI model development to help with real-time decision-making. The initial use cases for the branded SynOps offerings are for finance and accounting, procurement, and marketing. A telco service provider could use SynOps for finance and accounting to streamline its payment and charging structure. Accenture

said that one customer that has used SynOps increased the productivity of its finance operations by more than 50% and saved more than \$140 million. By mixing a human element with big data analytics and AI, Accenture is seeking to eliminate any prospective biases that could make its way into the AI algorithms while also

improving its efficiencies. Combining AI with human interaction has been a growing trend in telecommunications. Last year, IBM announced cloud software that was designed to identify any bias in AI deployments while also recommending fixes. Earlier this month, Verizon rolled out a new addition to its managed services portfolio that uses AI to improve the customer experience for its business customers. Verizon's "Digital Customer Experience" (Digital CX) managed service offering also combines AI with a human element. Digital CX integrates automation into organizations' existing customer experience tools in order to help customer service representatives offer better support based on past interactions. After years of incubation, AI appears to be poised for a breakout year in 2019, although it's somewhat hampered by a lack of skilled employees. A survey last week by Gartner said that the number of enterprises using artificial intelligence grew 270% over the past four years and tripled in the last year.



Accenture Integrates RGA's Underwriting Rules Engine into the Accenture Life Insurance and Annuity Platform

Accenture has integrated RGA's AURA® underwriting rules engine into the Accenture Life Insurance and Annuity Platform (ALIP), making ALIP the first such platform to provide an out-of-the-box option. As a result, carriers can implement ALIP faster and leverage its advanced underwriting capabilities more quickly. The integration of AURA with ALIP can also help insurers boost business and underwriting profitability by enabling them to process new business faster while meeting the industry's increasingly ambitious service-level agreements and cost targets. "Until now, underwriting time and capacity constraints have impeded the progress of fully underwritten and simplified-issue life insurance products," said Patti Treis, Senior Vice President and General Manager, AURA Technologies. "ALIP and AURA together provide a tremendous opportunity for insurers to significantly reduce the time to issuance

and cost per policy." With the integration of AURA, ALIP now provides more options for insurers to accelerate underwriting automation, reduce manual intervention and increase underwriting speed. This powerful combination provides greater synergy between industry-standard rules (AURA) and the orchestration to process those rules (ALIP). Both systems apply intelligent automation to free underwriters from routine tasks to apply their expertise on more-complex issues. "Seamless third-party integration is necessary for carriers to maintain a competitive advantage," said Shay Alon, a Managing Director at Accenture who leads its Life and Annuity Software practice. "This latest integration is part of our strategy to deliver broad out-of-the box ecosystem connectivity. Our approach targets critical third-party solutions, like AURA, to help our clients accelerate time to market." Used by leading insurers worldwide, ALIP is a

robust, configurable and scalable solution that provides life insurance carriers and annuity providers with advanced capabilities for product development, new business development, underwriting, policy administration, claims and payout. It is available as an on-premise or a cloud-based solution which includes an integrated suite of software with modules designed to be implemented individually or as part of a broader migration strategy. Accenture's life and annuity software is part of Accenture Life Insurance Services, within Accenture Financial Services. By applying extensive industry knowledge to continuously enhance its software, Accenture helps insurers reduce operating costs, manage risk and drive growth through improved product development and distribution, enhanced policy administration and distribution, and technology platform consolidation and modernization.



Apple and Dream Corps Build Career Opportunities for Oakland Coders

As part of its Community Education Initiative, Apple will partner with Oakland-based non-profit organization Dream Corps to bring educational and workforce development opportunities to young adults with a goal of career placement in the tech sector. The partnership will build on the success of Dream Corps' #YesWeCode Initiative, which aims "to help 100,000 young women and men from underrepresented backgrounds find success in the tech sector." #YesWeCode

has graduated four coding cohorts and has over a 60 percent job placement rate. "We are thrilled about launching this new initiative in Oakland," said Lisa Jackson, Apple's vice president of Environment, Policy and Social Initiatives. "Our hope is that by bringing expertise, stakeholders and resources together, we'll be able to magnify the already impressive impact that Dream Corps is having in the Bay Area and across the nation and help a new generation of young people realize their

potential." Apple will provide technology as well as professional support, curriculum guidance and advocacy to individuals in middle and high school, college and beyond. Participants will be exposed to a number of skills and tools to enhance career prospects, with an emphasis on coding with Swift. Vien Truong is the CEO of Dream Corps. She's the youngest of 11 children, born to an immigrant couple who migrated from Vietnam in the 1970s. She and her family have called Oakland home for decades. She joined Dream Corps in 2015 with the goal of expanding opportunities to young people in Oakland and beyond. "I see Dream Corps as a peace corps for the American Dream," said Truong. "It's about making sure that we can help support people who lived or grew up in communities like mine. And this partnership with Apple will help unlock the untapped genius and talent within those communities, which will allow a new generation to achieve their dreams." Apple and Dream Corps' coding programming is set to launch later this year in the Bay Area. Dream Corps is working with the Mayor's Office and the City of Oakland to identify and assess potential locations for a dedicated space to support this program and other related workforce development and social entrepreneurship efforts.



AT&T Tests 5G and Edge Computing with Microsoft Azure

AT&T has announced at Mobile World Congress (MWC) 2019 that it is working with Microsoft on a proof of concept to integrate network edge compute capabilities with its 5G network and Azure cloud services. "We're testing our ability to substantially reduce latency and improve user experience by deploying advanced cloud services in specific geographic locations closer to business sites," AT&T explained in Barcelona. The solution would be important for the industries and

Internet of Things (IoT) use cases of retail, healthcare, public safety, entertainment, and manufacturing, AT&T said, as it would provide businesses with lower latency, access to high compute power, and network routing without needing on-premises hardware. "Our collaboration will pave the way to enable Microsoft Azure cloud services to connect to more customers and devices across the US through AT&T's nationwide wireless network," Microsoft corporate VP of Azure

Networking Yousef Khalidi said. "Our two companies are working together to achieve the low-latency connectivity needed for the explosion of devices and immense amount of data being created by computing at the edge." AT&T is using drones to test the network edge compute capabilities with Azure, working with Israel-based startup Vorpai in its foundry in Plano, Texas. Vorpai's VigilAir product detects and geolocates drones in real-time, which could be used by law enforcement agencies

and airports. "By running their VigilAir application using Azure cloud services delivered through the Plano AT&T test environment, and connecting their drone-tracking sensors using AT&T LTE and 5G networks, Vorpel could achieve the low latency and compute scalability required,"

the carrier said. Also at MWC 2019, AT&T announced work with Vodafone Business on IoT applications for the automotive space, including safety, security, and entertainment. The two said they would develop connected car solutions across 5G and autonomous vehicle technology;

vehicle-to-everything (V2X) capabilities; in-vehicle entertainment; connected car applications and services; global service quality models; and the intersection of connected cars and smart cities.

AT&T, Vodafone Business Team Up to Drive IoT for Auto Industry

AT&T and Vodafone Business aim to jumpstart IoT connectivity in the automotive industry by bringing their respective areas of expertise together. The companies said they will combine their expertise to develop superior and consistent connected car solutions and experiences for customers across their combined footprints in North America, Europe and Africa. In doing so, they're addressing a common challenge for automotive companies that want to sell solutions across countries. Each market has unique requirements and regulations, and working across multiple network operators and vendors gets complicated pretty fast. The stated goal of AT&T and Vodafone Business is to simplify the deployment process, improve operations, deliver innovative solutions and make the network certification process easier. The companies said they will prioritize projects to enhance safety, security and entertainment capabilities, with these key areas of focus:

- 5G and autonomous vehicle technology
- V2X capabilities (vehicle-to-everything)
- In-vehicle entertainment
- Connected car applications and services

- Global service quality models
- Connected car/ smart cities intersection

AT&T and Vodafone currently support bi-lateral roaming on their respective networks for both automotive and general IoT solutions, according to an AT&T spokesperson. AT&T and Vodafone have also launched LTE-M roaming across a few markets and will continue to expand roaming capabilities in the future. Collectively, the companies work with nearly 50 global automotive brands and connect more than 43 million cars and trucks on the road today. AT&T and

Vodafone are both board members of the 5GAA, where automotive, technology and telecom companies are working to develop end-to-end solutions for future vehicular mobility and transportation services. Vodafone also has been testing Cellular-Vehicle-to-Everything (C-V2X) in Germany for the past two years, integrating C-V2X with adaptive cruise control, a driver assistance system that warns the driver about something happening on the road and automatically accelerating or braking in response.



AT&T Gets OK For Tests Using Various Frequencies in Texas Lab

AT&T has received the OK for tests at its lab in Austin, Texas, using a range of spectrum bands, including 3700-4200 MHz (C-Band), 3400-3600 MHz and others. The FCC just this week granted AT&T's application for the experiments. AT&T is staying mum on the suppliers of the equipment it's using, listing "confidential" under the manufacturer section of the application, although it does reveal using 12 prototype units and six other units from "various" suppliers. The grant indicates the tests will commence May 1 and the authorization will remain in effect until

May 1, 2021. The authorization stipulates that AT&T must coordinate with all earth stations operating in the 3650-4200 MHz band and coordinate with fixed microwave service licensees prior to operation in the 3700-4200 MHz and 27500-28500 MHz bands. The 14 GHz, 28 GHz and 37/39 GHz bands also are covered in the authorization for tests. Still pending at the FCC is AT&T's application to conduct tests in Austin and elsewhere using frequencies as diverse as 824-894 MHz to 5.725-5.825 GHz. That application lists Blinq and Taqua among the suppliers of experimental prototype

equipment. The tests involving midband spectrum are notable given the intense demand in the U.S. for such spectrum for 5G. The U.S. is studying the 3.45-3.55 GHz band, but there's no specific timing on the availability of spectrum. The 3.7-4.2 GHz band, however, is in the crosshairs, so to speak, at the FCC, where it corresponds to satellite operators' use of the C-band. The FCC is still accepting comments and meetings regarding the use of the C-band, with the C-Band Alliance (CBA) meeting with FCC Chairman Ajit Pai as recently as Feb. 11. According to an ex parte

(PDF) filing, that meeting involved several executives connected to the CBA, including SES, Intelsat and Intel executives. Intel is not a member of the CBA, but it has been focused on facilitating the repurposing of the C-band spectrum in an expeditious manner. Peter Pitsch, consultant for Intel, explained during the meeting that repurposing spectrum involves many complicated technical and economical decisions and that with the right incentives, the C-band satellite operators are best suited to make those decisions subject to FCC oversight. But the docket makes clear that the midband spectrum conundrum is not going to be an easy puzzle to solve. Numerous parties are affected by whatever action the commission takes, and some are suggesting that if the FCC goes with the CBA proposal, that would end up leading to more litigation and further delay



the allocation of midband spectrum for 5G. CBA proponents insist the CBA proposal will be the most expeditious way to allocate the spectrum voluntarily, but numerous

stakeholders are getting increasingly frustrated (PDF) with the lack of answers they're getting from the CBA about how things will be handled in the band.

AT&T Expands Wi-Fi Roaming Deal with Boingo



AT&T has expanded its roaming agreement with Boingo Wireless to include more than 80 venues, including major airports, military bases and other places that have Boingo's Passpoint-certified networks. The announcement provides a boost to Boingo, which routinely has been asked about the status of U.S. wireless operators using its networks, with executives usually reluctant to name names. But AT&T acknowledged all part of its network management strategy. "Boingo's Passpoint footprint allows us to connect millions in more locations than ever, making it easier for travelers and troops to talk, text and stream over Wi-Fi," said JR Wilson, vice president of tower strategy and roaming, AT&T, in a press release. "The move is part of AT&T's strategic network management initiatives

that help accommodate rising mobile data traffic." AT&T said data traffic on its mobile network has grown more than 470,000% since 2007, with video making up half of its mobile data traffic. By 2022, the company estimates video could make up more than 75% of AT&T's mobile traffic driven by growth in 4K video, autonomous cars, drones, VR/AR and mobile gaming. Wi-Fi roaming on Boingo's Passpoint-certified networks is available to AT&T subscribers at no additional charge. Passpoint is a standardized hotspot technology that automates secure roaming between AT&T cellular and Boingo Wi-Fi networks for better customer experiences, offering fast speeds as well as public Wi-Fi encryption with two-way authentication. Boingo has been doing Wi-Fi roaming for a number of years with AT&T, so it's a continuation of that relationship. But as AT&T noted in the press release, the operator is clearly making Wi-Fi roaming a part of its core strategy to deal with mobile data growth, and that's what's appealing to Boingo Chairman and CEO David Hagan. "It's a pretty significant expansion from the number of venues that they were on before," he told FierceWirelessTech. It basically means AT&T has moved beyond the "handful of venues" and onto the entire Boingo network where it has Passpoint enabled, which is pretty

much all of its venues except a couple of smaller remote locations with older gear that will eventually be upgraded. Sprint was the first to do Passpoint roaming on the Boingo network, and it's also on the majority of its network. But for many quarters running, Hagan was asked during earnings calls about the "unnamed Carrier No. 2," which a lot of analysts had guessed was AT&T, but he couldn't reveal that. Passpoint is the brand for the certification program operated by Wi-Fi Alliance, and Passpoint certification is based on the Wi-Fi Alliance Hotspot 2.0 specification. It was developed with support from the Wireless Broadband Alliance (WBA) to make the Wi-Fi experience more like cellular. AT&T's Wilson is currently chairman of the WBA board and Boingo CTO Derek Peterson is the co-chairman. The WBA helps lead ongoing research, trials and deployments for Passpoint and other wireless technologies to drive coexistence between licensed and unlicensed networks. AT&T, which found itself in an unfortunate predicament when the first iPhone took off and its network was overburdened with traffic, has been at the forefront of offloading mobile data traffic onto Wi-Fi. It purchased Wi-Fi hotspot provider Wayport in 2008 to expand its Wi-Fi footprint by adding thousands of hotspots.



BT Group Claims It Contributes £22.8bn to the UK Economy

BT Group is responsible for generating £1 in every £75 produced in the UK, according to an independent report published today, making it one of the single largest corporate contributors to the UK economy. The Economic Impact of BT Group plc in the UK report, by Hatch Regeneris, shows that the communications company generated a £22.8 billion contribution to the UK's economy expressed as "Gross Value Added" (GVA), including a combined aggregate spend of £9.2 billion with UK suppliers during the 2017/18 financial year. The report estimates that the equivalent of 290,000 full-time UK jobs are supported through BT's direct employment, its spending with contractors and suppliers and the discretionary spending of its employees. BT supported the direct employment of 82,500 people and a further 12,300 contractors, reinforcing its position as one of the UK's leading employers. The impact across the nations and English regions is also detailed in the report. For example, in East England, BT's research and development campus Adastral Park accounts for a large part of the 12,400 BT people working in the region. In Scotland, software developers, engineers and customer service centers contribute to the 7,700 people working in the country. Tim Fanning, Director at Hatch Regeneris, said: "Our analysis underlines how vast BT Group's contribution is to the UK economy, particularly across the nations and regions. "BT Group is almost unique in contributing to the economies of virtually every community across the UK, supporting significant levels of GVA spend and employment opportunities per region." The report from Hatch Regeneris comes in addition to a recent report by PWC which highlighted that BT Group is the 5th highest tax contributor in the UK among FTSE 100 companies, and the highest contributor among non-financial companies. The PWC report also identified BT as the largest capex investor in the UK. Jane Wood, BT Group UK nations and regions director, said: "Few companies play as important a role in national, regional and local communities as BT Group. Not only

does BT connect friends, families and businesses across the UK, but we also put premium fuel in the tank of the nation's economy. The report shows that BT generates £1 in every £75 of wealth in the UK. "We're proud to be one of the UK's largest private sector employers and investors. Our investments, including the latest 5G mobile technology through our mobile network EE, will ensure the UK continues to be one of the world's best-connected economies. "With more than 82,500 directly employed people spending their salaries in local businesses, from Shetland to the Scilly Isles, as well as regularly volunteering on activities such as our Barefoot tech literacy program in schools, our people are at the heart of nearly every community." The report includes the contribution of all parts of BT Group, including Openreach, mobile network provider EE and BT's Consumer and Enterprise divisions. The economic impact report also highlights the positive contributions made by BT Group through the salaries and wages of employees and contractors, and the beneficial impact of its procurement and overall expenditure around the UK.



Cisco Predicts 5G Domination by 2022

Cisco tipped 5G to become a significant source of traffic on operator networks by 2022, generating nearly three-times more than a typical 4G connection. In its latest Mobile Visual Networking Index (VNI), Cisco predicted the average 5G connection will produce 22GB of data traffic per month by 2022, compared with 8GB per month for 4G. The next-generation connections

will contribute to significant growth in monthly global mobile data traffic, which is expected to jump from 11.5 exabytes in 2017 to 77 exabytes by 2022 (an exabyte is equivalent to 1 billion gigabytes). While 5G will account for just 3.4 per cent (422 million) of mobile connections in 2022, Cisco forecast it will carry 12 per cent of global traffic. North America is expected

to have the highest proportion of 5G connections with 9 per cent, followed by Western Europe (6 per cent) and Asia-Pacific (4 per cent). The countries with the largest share of devices on 5G connections by 2022 will be Japan (12 per cent), Sweden (11 per cent) and the US (10 per cent), Cisco said.

Cisco CEO: 5G Hype Is Rooted In Reality

While 5G has been on the lips and minds of carriers, network vendors and service providers for years now, Cisco CEO Chuck Robbins today said forces are finally coalescing in the industry to bring it to fruition. "This is one technology that feels like the hype is going to be reflected in the reality," he said on stage at MWC Barcelona. "You're going to see incredible applications" for industrial use, transportation, factories, mining, manufacturing, robotics and automated precision, he said. "It also opens up a world of opportunity for the applications and capabilities we can actually deliver to help people around the world." He also expects 5G to change the dynamic of rural coverage because, as he put it: "This technology will allow us to take high-speed connectivity to places we've never been able to take it." The mobile industry is entering a phase that's unlike anything it's embarked on before now, said Robbins. "The technology you put in the network is going to be different than anything we've ever built." After multiple network upgrades that required additional components, carriers are now

planning to take them apart and replace old equipment with simpler solutions that have the ability to move with greater speed, he added. "We have to build new, massively scalable, simple" and "secure networks that are reliable, programmable, automatable, software defined," Robbins said. All the buzzwords need apply, he said, adding that 5G must also be high performance, cloud delivered, trusted and secure—one more time for good measure. With billions of connections at the edge of

the network amid multiple transitions in technology including 5G, Wi-Fi 6, artificial intelligence and automation, these seemingly unrelated technologies are "going to be incredibly important to each other," Robbins said. "We believe this will extend the opportunities that you have," he said. "As we go to build out this capability, partnerships are going to be incredibly important ... Once this starts it's going to move very rapidly."



Cisco Joins US Tech Companies Calling for GDPR-Like Privacy Rules

Cisco is calling for the US to adopt privacy regulation similar to the European General Data Protection, which was introduced in May 2018. Apple has been vocal in its support for such a move, and IBM's CEO, Ginni Rometty, has also called for stiffer penalties for data breaches. Cisco stressed it would want an amended version for the US, for example, excluding the right to be forgotten. In January, Cisco published its 2019 Data Privacy Benchmark Study, which found that GDPR-compliant companies' sales were delayed half as long as non-compliant ones by customers' privacy concerns. Many other US companies right across the spectrum are less enthusiastic about GDPR-like regulation, fearing the harshness of the penalties for data breaches, among other things. It is likely to be a hot topic at MWC2019 later this month in Barcelona. GDPR's first level fine is up to €10 million or 2% of the company's global annual turnover of the previous

financial year, whichever is higher. The second is up to €20 million or 4% of the company's global annual turnover of the previous financial year, whichever is higher. Cisco claims, "The Study validates the link between good privacy practice and business benefits as respondents report shorter sales delays as well as fewer and less costly data breaches".

Major findings

More than 3,200 global security and privacy professionals in 18 countries across industries responded to the survey about their organizations' privacy practices to reveal:

- 87% of companies are experiencing delays in their sales cycle due to customers' or prospects' privacy concerns, up from 66% last year – probably due to the greater awareness due to GDPR and data breaches in the news.
- Sales delays varied from 2.2 to 5.5

weeks, in Europe with Italy and Russia at the lower end of the range, and Spain at the higher. Delays can result in sales being lost.

- Top reasons cited for sales delays included investigating customers' questions about privacy, translating privacy information into other languages, educating customers about a firm's privacy practices and redesigning products to meet privacy needs.
- Awareness of GDPR-readiness varied from 42% to 75% with Spain, Italy, the UK and France at the top of the range, and China, Japan and Australia at the other end.
- Only 37% of GDPR-ready companies experienced a data breach costing more than \$500,000, compared with 64% of the least GDPR-ready companies.

Cisco Calls for Privacy To Be Considered a Fundamental Human Right

Cisco issued a call to governments and citizens around the world to establish privacy as a fundamental human right in the digital economy. Today, connectivity and technology have become the foundation for peoples' economic, social, and cultural opportunities. With IoT, 5G, and AI promising to soon reshape how we interact with technology, Cisco is urging governments to adopt comprehensive and interoperable data protection laws to secure that right. To start, Cisco is calling on the U.S. government to develop a US federal privacy law that assures customers their data is protected. The American system should not just look to solve for today's privacy discussions around monetization of customer data; it should aim to solve for the complex privacy needs of a world where tens of billions of devices are connected to the internet. Cisco urges three basic principles for U.S. legislation:

- Ensure interoperability between different privacy protection regimes;
- Avoid fracturing of legal obligations for data privacy through a uniform federal law that aligns with the emerging global consensus;
- Reassure customers that enforcement of privacy rights will be robust without costly and unnecessary litigation.

- Globally, Cisco will advocate for several common elements in privacy legislation, some of which include:
- Security: Assign responsibility to protect the confidentiality, integrity, availability, and resiliency of data;
- Transparency: Explain how data is collected, used, transferred, and disclosed;
- Accountability: Ensure governance for data under the entity's stewardship, including a data protection team, applying a risk-based approach;
- Innovation: Recognize multi-stakeholder-driven initiatives that enhance transparency and provide paths for implementation.

"Cisco calls for comprehensive and interoperable privacy legislation around

the world that allows ethical movement of data between countries. Laws should be anchored to the core principles of security, transparency, fairness, and accountability, because privacy is a fundamental human right," said Chuck Robbins, Chairman & CEO, Cisco. "As we enter an era powered by IoT, 5G, and AI, it is critical for our customers, partners, governments, and the public to know Cisco's commitment to privacy is stronger than ever," said Mark Chandler, EVP and Chief Legal Officer, Cisco. "Our belief that privacy is a fundamental human right has helped make Cisco the most trusted supplier of technology products and solutions, embedding privacy at the core of each Cisco technology that powers the internet."



Cisco Calls for Privacy To Be Considered a Fundamental Human Right



Cisco announced that its Application Centric Infrastructure (ACI) technology has extended its reach into Amazon Web Services

(AWS) and Microsoft Azure's public clouds. The announcement is part of Cisco's "data center anywhere" strategy. "ACI Anywhere enables automation, security, and intent-based networking to optimize data center operations, protect digital businesses, and accelerate our customers' expansion into the multicloud," said Ronak Desai, Cisco's vice president of ACI engineering, in a blog post. "Once implemented, ACI Anywhere helps with network connectivity, application segmentation and compliance." ACI Anywhere puts ACI on any workload and cloud across any location. Cisco's software-only Virtual ACI supports bare metal clouds and remote locations. With Cloud ACI, those capabilities, which include automation, manage and security, are integrated with AWS' and Microsoft Azure's infrastructure-as-a-service environments. Companies like Cisco, VMware, HPE and IBM are forging partnerships with the hyperscale cloud providers to automate data center workloads in the cloud. The battle between Cisco's ACI and VMware's NSX has moved to the cloud. VMware announced last summer that it had signed a two-year partnership with AWS that extended their previous relationship.



Eutelsat to Provide Capacity for Afghanistan Broadcasting System DTH Platform



Eutelsat Communications and Afghanistan Broadcasting

System (ABS) signed a multi-year, multi-transponder contract for video capacity on the Eutelsat 53A satellite. ABS will use Eutelsat 53A's Ku-band resources over central Asia to provide nationwide coverage for the launch of its new Direct-to-Home (DTH) platform, Oqaab HD+. This platform will be developed in the coming months to carry a mix of national and premium international channels. The capacity will also help enable ABS to extend its Digital Terrestrial Television (DTT) network from Kabul to all other Afghan provinces by feeding DTT network head-ends. "With our new teleport in Kabul, we provide better signal quality for the local broadcasters across Afghanistan at compelling terms," said ABS Chief Operating Officer (COO) Andi Wilmers. "Eutelsat's resources over Afghanistan provide the needed signal strength so that people can receive all channels, even with a 45-cm satellite dish antenna. In 2019 we will offer enhanced services like Video on Demand (VOD) and other products to customers across the country."

Eutelsat Partners with Ethiopian Broadcasting Corporation and the Association of Ethiopian Broadcasters

Eutelsat Communications has signed simultaneous multi-year contracts with the Ethiopian Broadcasting Corporation and the Association of Ethiopian Broadcasters for video capacity on its EUTELSAT 8 West B satellite. The aggregate of these contracts represents multi-transponder capacity, including incremental resources. Leveraging EUTELSAT 8 West B satellite's dedicated coverage of Ethiopia, both media groups will enjoy nationwide coverage for their free-to-air DTH platforms, representing a total of 30 channels. Introduced to the local market back in 2012, Eutelsat's 7/8° West orbital position will now broadcast the vast majority of Ethiopia's channels thanks to these new agreements. A longstanding client of Eutelsat on the HOTBIRD position, the Ethiopian Broadcasting Corporation (EBC) is the country's oldest and largest free-to-air broadcaster. Programming features news, sport, music and other entertainment, broadcast predominantly in Amharic, the official working language of the federal government. The Association of Ethiopian Broadcasters (AEB), established in September 2018, is a group of privately owned, licensed broadcasters operating in Ethiopia. Members include Ethiopian Broadcasting Service (EBS), Fana TV, Walta, Kana TV, Arts, Nahoo TV, Afrihealth, OBS, LTV, Ahadu, DWTv, Asham TV and Balageru. Michel Azibert, Eutelsat's Chief Commercial and Development Director, said: "We are proud to be working with leading broadcasters Ethiopian Broadcasting Corporation and the Association of Ethiopian Broadcasters in enriching the FTA experience for viewers across Ethiopia. These agreements also highlight the strength of Eutelsat's 7/8° West orbital position." Messay Hurissa, EBC's Chief Technology Officer, noted: "We are

delighted to be working with an industry leader such as Eutelsat as part of our expansion into the untapped broadcasting public sphere within our territory and beyond. This partnership will allow EBC's customers to benefit from a much better performance with high quality broadcasting and customer support." Anman Fissehazion, CEO of AEB, added: "Satellite technology plays a key role in reaching TV households across Ethiopia. One of AEB's goals is to increase and strengthen the number of TV households in our country. This goal can be reached if all broadcasters operate from a common orbital position to reach their audiences, such as 7/8° West. The signing is a major step in this venture and I am sure that our contract with Eutelsat will lead us to many more successes to better serve our viewers."





Facebook Buys Virtual Search Startup to Boost AI Capabilities

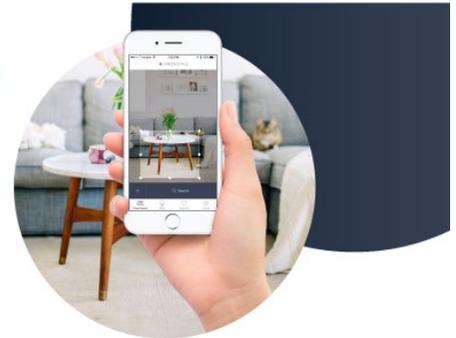
In an attempt to enable users shop better using artificial intelligence capabilities, Facebook acquired US-based virtual search startup GrokStyle for an undisclosed amount. "We are excited to welcome GrokStyle to Facebook. Their team and technology will contribute to our AI capabilities," CNET quoted Facebook spokeswoman Vanessa Chan as saying. The basic idea is to allow users to match a piece of furniture or a light fixture in an image to visually find similar ones in stock at stores, TechCrunch reported. "We are excited to share that we are moving on as a team and we will continue using our AI

to build great visual search experiences for retail," GrokStyle wrote in a blog post. GrokStyle also noted on its LinkedIn page

that it has been acquired by Facebook. Based in San Francisco, the startup was founded in 2015.



— Vision-based AI solutions for retail



Facebook Partners with NGOs in 15 Countries for Safer Internet

Facebook announced its collaboration with non-profit organizations representing over 15 African countries to mark Safer Internet Day 2019, and drive an awareness campaign together for a better internet. Several countries are involved in the campaign to promote safer internet and draw attention to concerns such as cyber bullying and cybercrime. They include Benin, Cameroon, the Central African Republic, Côte d'Ivoire, the Democratic

Republic of Congo, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. Eugene Kaspersky, CEO of Kaspersky Lab, said of the campaign: "The early concept of the internet as a tool for bringing the world closer together is being eroded, with pressure on companies and governments to shore up their defenses in the face of increasingly sophisticated threats from multiple actors. With increased attacks

against government organizations and infrastructure, as well as against supply chains and individuals, nations are going to want to protect their citizens and industries, and the easiest way to do that is by shutting the door. As a result, our industry – Cybersecurity – faces being broken up and separated along geopolitical and regulatory lines, making it much harder for us to protect anyone and everyone."

Facebook Hits Back at German User Data Verdict

Facebook vowed to fight restrictions imposed by Germany's competition regulator covering the company's practice of linking data collected by WhatsApp and Instagram with its core platform without express user consent. Bundeskartellamt issued the instruction on 7 February following a nearly three-year investigation. It said Facebook services including WhatsApp and Instagram can continue to collect user data, but "assigning the data to Facebook user accounts will only be possible subject to the users' voluntary consent". If consent is not given "Facebook will have to substantially restrict its collection and

combining of data. Facebook is to develop proposals for solutions to this effect". The regulator said the ruling also applies to data collected from third party sources. Bundeskartellamt President Andreas Mundt explained its decision was made because "the combination of data sources substantially contributed to the fact that Facebook was able to build a unique database for each individual user and thus to gain market power". The practices also "impedes competitors that are not able to amass such a treasure trove of data." Facebook must lodge its appeal at the Dusseldorf Higher Regional Court within a month. In a statement, the company

blasted Bundeskartellamt, which it said "underestimates the fierce competition we face in Germany, misinterprets our compliance with GDPR and undermines the mechanisms European law provides for ensuring consistent data protection standards across the EU." "Popularity is not dominance. The Bundeskartellamt found in its own survey that over 40 per cent of social media users in Germany don't even use Facebook. We face fierce competition in Germany, yet the Bundeskartellamt finds it irrelevant that our apps compete directly with YouTube, Snapchat, Twitter and others."

Google Plans to Invest \$13B in the U.S. in 2019

Google CEO Sundar Pichai said that the company will invest more than \$13 billion throughout 2019 in data centers and offices across the United States with major expansions in 14 states. With this new investment, Google will have a home in 24 states, including data centers in 13 communities. In the Midwest, Google will continue to expand its presence in Chicago, and it's developing new data centers in Ohio and Nebraska. The Wisconsin office is set to move into a larger space in the next few months. And the company previously announced that it was opening a Detroit office in Little Caesars Arena. In the South, Google will open a new office and data center in Virginia, where it will also double its workforce. "And with a new office in Georgia, our workforce will double there as well," Pichai said. "Data centers in Oklahoma and South Carolina will expand, and we're developing a new office and data center in Texas." Massachusetts has one of Google's largest sales and engineering communities outside of the Bay Area, and the company is building new office space there. And in New York the company is building the Google Hudson Square

2019 Google Offices & Data Centers United States

Offices
 ● Existing
 ● New Development

Data Centers
 ● Existing
 ● New Development



campus as an engineering and business hub. In the West, Google will open its first data center in Nevada, and it will expand its Washington office, a key product and engineering hub. In California, the company will continue with the redevelopment of the Westside Pavilion and the Spruce Goose Hangar in the Los Angeles area. Pichai said that in the last year, Google hired more than 10,000 people in the U.S. and made over \$9 billion in investments. But it's upping the ante in 2019 with \$13

billion in investments. He added that 2019 marks the second consecutive year when Google will be growing faster outside of the Bay Area than in it. Google Cloud's new CEO, Thomas Kurian, laid out his 2019 vision, saying Google Cloud was going to significantly expand its sales force. And the business would expand beyond its hyperscale internet clients to go after large customers in six different verticals. "You'll see us competing much more aggressively as we go forward," Kurian said.

Google Goes Big On Accessibility

Google launched two apps, Live Transcribe and Sound Amplifier, to help those who are deaf or hard-of-hearing. "The World Health



Organization estimates that by the year 2055 there will be 900 million people with hearing loss. We believe in the power of technology to help break down barriers and make life a little easier for everyone," Google said in a blog announcing the apps. Live Transcribe uses cloud-based automatic speech recognition to display spoken words on a screen. It "has the potential to give people who are deaf or hard of hearing greater independence in their everyday interactions," Google said. The app will be available in more than 70 languages and dialects. It will gradually rollout in a limited beta to users worldwide via the Play Store. The only drawback to the app is it uses the Google Cloud speech API, which means it probably won't work if a user is offline. Sound Amplifier, on the other hand, doesn't need to use the internet. First announced at Google's I/O developer conference, it is used on an Android device with wired headphones to filter, augment and amplify sounds in loud environments such as a cafe or airport lounge. The app is available on the Play Store and is compatible with Android 9 Pie or later phones. Previous examples of Google's accessible apps include Voice Access, which allows users to navigate their device via voice command, and Lookout, designed give the visually impaired notifications about their environment.

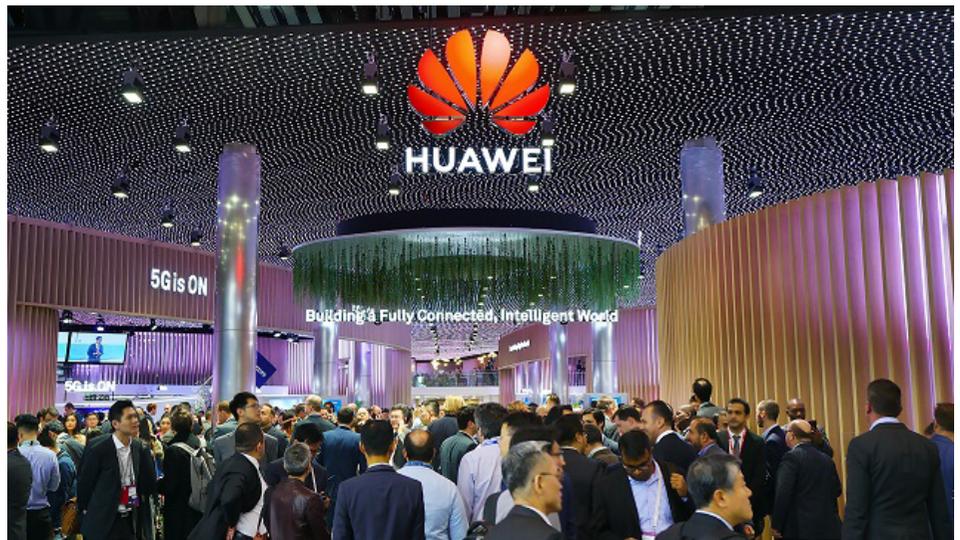


Huawei Presents Its Simplified 5G and SoftCOM AI Solutions at the MWC Barcelona 2019

Huawei is presenting its end-to-end 5G products and solutions at the event, such as simplified 5G sites, architecture, protocols, and operations & maintenance (O&M). These new offerings will help Operators quickly deploy 5G networks on a large scale. Huawei has also launched the SoftCOM AI solution, which will help build autonomous driving networks of the future and maximize the value of telecom networks. 5G has arrived, and AI has become a new general-purpose technology. Innovation will never end and humanity will continue to develop, driven by advancements in science and technology. The intelligent world of the future will be a "Digital Village" where everyone is included and closely connected. At this year's event, Huawei is expanding on the theme of "Building a Fully Connected, Intelligent World". Huawei's main exhibition hall was designed around the theme of "The Digital Village", representing the combination of technology and culture. The "Digital Village" provides a platform that brings together global industry elites and KOLs, allowing them to exchange ideas and discuss what challenges and opportunities the fully connected, intelligent world will bring to humanity. Huawei has maintained absolute leadership in 5G solutions through ongoing investment in R&D. The high 5G network performance and strong delivery capabilities make Huawei a partner of

choice. So far, Huawei has signed over 30 commercial 5G contracts with operators around the world, and shipped over 40,000 5G base stations. Its aim is to help operators jump start 5G and deliver a high-quality 5G user experience. Huawei was the first company in the industry to launch commercial 5G chips and devices, and has worked with the industry to drive 5G maturity and commercialization. Huawei demonstrated 8K high-definition (HD) livestreaming on Vodafone Spain's 5G network, and showcased new applications such as Cloud VR, cloud gaming, and cloud PCs. These applications showed that 5G will bring a better life for everyone. Under the support of Huawei, multiple

European operators, including Vodafone, announced that 5G networks are now ready for commercial use. Huawei also signed 5G contracts with many operators from around the world. In addition, Huawei presented its idea for autonomous driving networks, as well as its full-stack, all-scenario SoftCOM AI solution, with the aim to significantly improve operating efficiency, network performance, O&M efficiency, and user experiences. The SoftCOM AI solution enables "0 bits, 0 watts" and adaptive beam adjustment, thereby maximizing the value of telecom networks.



Telecom Operator in Turkey Joins Hands with Huawei to Build a 5G-Oriented All Cloud Core Network

Recently, Turkey's largest carrier Turkcell announced that it will join hands with Huawei to build a 5G-oriented all-cloud core network. This Project will launch the largest Cloud EPC Network globally, and this will be the first Core Network with key technologies for 5G evolution globally: commercial cloud-based software architecture, control and user plane separation (CUPS), and A/B test. This means global top carriers have made substantial progress in software architecture transformation,

network architecture transformation, and the O&M transformation for 5G evolution. Huawei will provide a mature, reliable cloud solution to Turkcell, which enables Turkcell to achieve the network transformation strategy and a smooth evolution to 5G. Cloud Native multi-point disaster recovery technology helps build a more elastic network, and ensure a highly reliable running environment for live network services, a network that can withstand multiple points of failure and still run smoothly. Huawei solution uses

CUPS architecture to shorten transmission distances, simplify O&M, and deliver the best service experience to subscribers. Huawei solution provides an industry-leading A/B test solution to automate O&M and help carriers perform hitless upgrades with minimal resources required. Huawei has signed more than 490 contracts for all-cloud core networks worldwide, helping carriers build an elastic, robust, agile, and all-cloud core network and smoothly evolve to the 5G network.

Huawei Unveils the Smart Logistics Solution to Power Agile Innovation in The Logistics Industry

[Barcelona, Spain, February 28, 2019] Huawei released the Smart Logistics Solution during MWC 2019, aiming to help enterprises improve efficiency in fields such as transportation, distribution, and warehousing, facilitate agile innovation in the logistics industry, and achieve digital, information-based, and intelligent management. Digital transformation is accelerating, and e-commerce is growing fast around the world. These changes are driving rapid growth throughout the logistics industry. It is expected that the annual revenue of the logistics industry will exceed trillions of dollars by 2025. The development of big data, AI, IoT, and other technologies is ushering the logistics industry into a new round of industrial revolution. They are critical for the logistics industry to reduce costs and

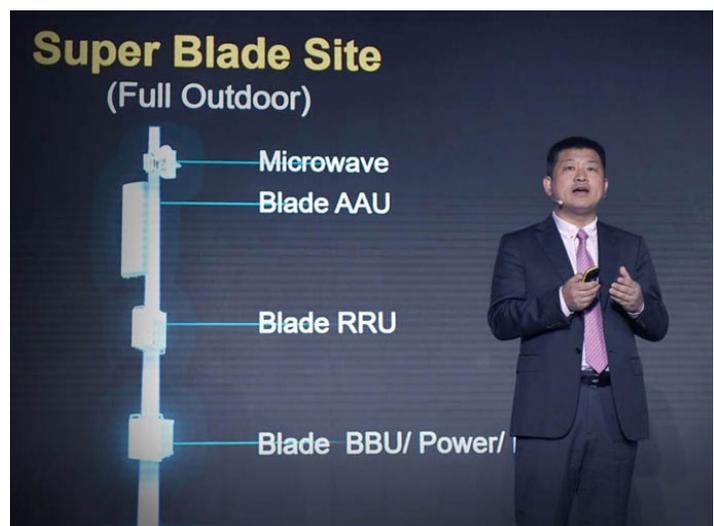
improve efficiency. The Huawei Smart Logistics Solution is built on the Huawei OceanConnect IoT Platform, NB-IoT, and RFID technologies. The whole process of goods transportation is managed in a visualized manner, and cold chain transportation monitoring improves safety and quality. In the last-mile delivery, intelligent scheduling of docks in the yard and sharing of transportation containers improve utilization of logistics resources. Digital management of warehouses makes warehouse management more intuitive and efficient. Huawei's Smart Logistics Solution has been deployed in multiple factories and yards. The solution enables enterprises to digitally manage the arrival time, waiting time, and loading/unloading time of suppliers' vehicles, and intelligently schedule docks. The unloading efficiency

in the yard and the on-time delivery rate of suppliers are greatly improved. Intelligent scheduling and management lower costs and improve logistics efficiency. Huawei will continue to explore and apply new technologies, to meet the increase in more logistics application scenarios, and help logistics industry achieve digital transformation. Huawei Enterprise is committed to bringing digital to every organization for a fully connected, intelligent world, including government and public sectors, financial services, energy, transportation, manufacturing, and other sectors. Currently, 211 of Fortune Global 500, including 48 of the top 100, and a total of more than 700 cities all over the world, have chosen Huawei as their partner in digital transformation.

Huawei Says It Will Fast Track 5G Deployment for Operators

Ahead of MWC2019 next week, Huawei released its Simplified 5G deployment strategy at a briefing in London. The strategy is based around network and business simplification, and automation designed to help operators deploy 5G much faster. At the event, Huawei released a number of products to support this vision. The Super Blade Site outdoor solution is modular and can be added to existing infrastructure. The vendor says the footprint of the Super Blade Site is "zero", cutting costs related to rental, energy and operations and maintenance (O&M). The company also launched new network automation solutions, following on from the architecture it released in November for building autonomous mobile networks. Huawei says the architecture and the new products will significantly reduce manual operations. The company also launched the MBB Automation Engine (MAE) and base stations with "powerful" computing capability. As the "brain of mobile networks", the MAE enables a shift from network element-orientated O&M to scenario-orientated O&M, and from simple network management to converged network management and control. The base stations continuously improve network performance and facilitate autonomous mobile networks. Huawei says that enhanced mobile broadband (eMBB) services will be key in the initial phase of 5G and represent the continuation and development of mature 4G business models. Peter Zhou, Chief Marketing Officer of Huawei Wireless Solutions, said. "5G will witness unprecedented rapid development. Huawei is dedicated to taking complexity and creating simplicity. We are eager to make 5G deployment efficient and convenient through systematic innovation, helping 5G enter the fast track." All eyes will be on

Huawei at MWC 19 – the company has rarely been out of the headlines due to the ongoing allegations about complicity with the Chinese intelligence services, among other things. The company strongly denies the assertions, has some loyal customers that are not fazed by the accusations, and has come out fighting: earlier this week, Ren Zhengfei, Huawei's founder, argued that the accusations were politically motivated. He reportedly said: "There's no way the US can crush us. The world cannot leave us because we are more advanced. Even if they persuade more countries not to use us temporarily, we can always scale things down a bit."



China Mobile Shanghai and Huawei Launch First 5G Digital Indoor System in Shanghai's Hongqiao Railway Station

China Mobile Shanghai has launched a 5G network in Shanghai's Hongqiao Railway Station, making it the first railway station to have a 5G digital indoor system (DIS). The deployment aims to achieve deep indoor 5G coverage within the whole station by the end of 2019 providing easy access to fast 5G network services for all passengers. The railway station's 5G network is seen as a key milestone in Shanghai's commercial 5G deployment laying a solid foundation for Shanghai as a Dual-Gigaband city, with Gigabit network speeds on both mobile and fixed networks. "Hongqiao Railway Station is leading the 5G commercial deployment in Shanghai," said Zhang Jianming, Vice Chairman of Shanghai's Municipal Commission of Economy and Information Technology. "The 5G digital indoor system will deliver a new travel experience. Passengers will feel they are getting more out of their journey. The railway station will show how 5G applications can improve the user experience and offer real benefits to the public. It will help speed up digital transformation for all sectors across the digital economy." Shanghai Hongqiao Railway Station is one of Asia's biggest traffic hubs in terms of passenger throughput, and a showcase for China's railway system. It handles over 60 million passengers every year, with over 330,000 people passing through each day during peak seasons. As the 5G era approaches, one of the key concerns for telecom operators will be how they can use 5G networks to meet the needs of high-density areas with thousands of people simultaneously using the network to make phone calls, access the Internet, and make mobile payments. 5G offers



high bandwidth, low latency, and massive connections. However, it uses high frequencies, which means network signals will lose a lot when penetrating buildings. This makes it difficult to provide full 5G coverage in any indoor environment. A huge building like Hongqiao Railway Station, with a large number of passengers generating vast data flows, increases the challenge. China Mobile Shanghai selected Huawei's 5G DIS, which is currently the industry's only commercially-available solution for 5G indoor coverage. The product was developed in Shanghai and is now ready for mass delivery. Most 5G base stations are currently being deployed outdoors. The 5G DIS will ensure that 5G network coverage extends into every scenario in every corner of the city. At the launch event, China Mobile Shanghai and Huawei demonstrated the 1.2Gbps peak rate enabled by the 5G DIS. This will mean that after logging on to a network supported

by the system, passengers will be able to download a 2GB high-definition film in less than 20 seconds. They will be able to enjoy a seamless entertainment experience as they wait, board, and ride their train. And 5G will reshape people's lives by creating interactive services such as robot navigation and takeaway delivery. With the application of the 5G digital indoor system in more diverse scenarios, the 5G railway stations of the future will meet passenger demand for high-speed connectivity and mobile payments anytime, anywhere. They will also support services including 4K HD video calling and multi-way ultra-HD video uploading. These new services will create a better travel experience for passengers. According to Peter Zhou, CMO of Huawei's Wireless Solution, "5G will also provide a big boost to cloud services. The railway stations of the future may be more intelligent than we can possibly imagine."

Huawei Unveils Foldable Mate X, to Launch Mid-2019 with 5G

Huawei has matched rival Samsung with its own foldable smartphone, the Mate X, presented at MWC in Barcelona. Running the company's first 5G modem chip, the Mate X will be available in mid-2019 for a recommended price of EUR 2,299.



Huawei Marine WACS Upgrade II Successfully Completed

Huawei Marine announced completion of the West Africa Cable System (WACS) Upgrade II. The project was signed in February 2018 and successfully put into commercial use in October of the same year. The upgrade realized 32*100G wavelengths configured on the longest optically amplified single fiber span stretching 11500km from South Africa to Portugal. As the longest 100G submarine cable system in Africa, WACS has two network operation centers and 15 landing points in 14 countries spanning West Africa and Europe. At the contract signing ceremony, the WACS consortium recognized Huawei's achievements in delivering WACS Upgrade I and looked forward to the successful delivery of WACS Upgrade II. New technologies and high integration design concepts were adopted in WACS Upgrade II through the use of Flex Grid and Optical pass-through technologies to meet the high-capacity demands. Optical pass-through transmission optimizes the performance limit and minimizes the system cost. Demonstrating multi-country end-to-end delivery capabilities, Huawei

Marine has set an industry benchmark for the world's longest 100G system by successfully completing this upgrade. Ma Yanfeng, Vice President of Huawei Marine said, "The WACS Consortium selected Huawei Marine to expand the system's capacity, and looking once again to Huawei Marine verified our product

solution capabilities, quality, and process improvement capabilities. Thanks to the WACS Consortium for its trust in Huawei Marine. We will continue to accumulate experience from the project and strive to improve connections between Africa and the world."



Huawei Awarded the Aegis Graham Bell Award 2019 in 'Innovative Telecom Solution' Category

Aegis Graham Bell Award 2019 announced Huawei as winner for the "Innovative Telecom Solution" category for the "5G Microwave Solution" - a breakthrough in resolving bottleneck of large bandwidth, precise synchronization and lowest latency. This marks the third consecutive win of the eminent Aegis Graham Bell Award for Huawei for revolutionizing the Information and Communication Technology (ICT) landscape in India with its innovative and pioneering technology solutions. Innovative features introduced by Huawei 5G Microwave, an industry first solution, will allow a more efficient use of the spectrum per link basis with Carrier Aggregation (CA), higher modulations, Multiple-input multiple-output (MIMO), Super Dual Band (SDB) & ultra-low latency. The 5G Microwave solution effectively

meets bandwidth, synchronization and latency requirements of 5G networks, increases delivery efficiency, reduces total cost of ownership (TCO) of network construction up to 30% and supports future evolution with capabilities to facilitate smooth and gradual evolution to 5G networks. It also boasts 5G-oriented features such as the innovative CA ODU (outdoor unit), modular antenna, SDB, ultra-low latency and high-power ODU. This helps customers quickly recover their investments and is a very good alternative to fiber requirements, especially for 5G till 5G penetration increase in the country. By improving mobile broadband coverage, more users can enjoy 5G services in the future. Commenting on the win, Mr. Jay Chen, CEO, Huawei India, said, "This award is a testament to our commitment towards

developing innovative technologies that effectively support operators' new service development and expand the business blueprint in the upcoming 5G scenarios. As we steer forward in the 5G era, we will continue to collaborate with operators and empower them with future-oriented and top-value technologies that bring global network development to everyone and help build a fully connected, intelligent world." Aegis Graham Bell Awards (AGBA) has been promoting innovations and entrepreneurship in ICT domain. AGBA has been rewarding those who made outstanding contribution in these fields since 8 years with a vision to foster and stimulate innovators, for India to become a nucleus of innovations.

Huawei CloudLink Board Wins Two iF Design Awards 2019

Huawei CloudLink Board of Enterprise Communications recently won this year's iF Design Award, which is known as the "Design Oscar". The winning product, all-in-one Collaborative Telepresence—CloudLink Board, won two awards in recognition of its light, elegant, all-in-one design; minimalist appearance, various product highlights, and a unique emphasis on "the 3E's": efficient, empower, and emotional. CloudLink Board is an intelligent collaborative videoconferencing endpoint. It integrates videoconferencing, interactive collaboration, wireless projection and other functions. Through voice control, intelligent broadcasting, facial recognition and other artificial intelligence technologies, CloudLink Board provides staff with a brand new meeting experience, one that is intelligent and collaborative. CloudLink Board will lead videoconferencing into an intelligent era. CloudLink Board adheres to a minimalist, user-friendly design that emphasizes an experience that is effortless, and

interactions that are natural and efficient. With its user-friendly appearance, it blends in easily with modern office environments. CloudLink Board inherits the concept of 3E, efficient, empower, and emotional, in software interaction design. Based on a foundation for interactions that are effortless and efficient, CloudLink Board adds multiple content sources and a design that moves you, a design that empowers participants to communicate

in a way that is highly-efficient and enjoyable. Huawei has engaged in the enterprise communications field for nearly 30 years, exploring innovation of future digitization and intelligentization. In the light of great practice, Huawei has developed the new generation of CloudLink Enterprise Communications solutions to help enterprises achieve digital office space, intelligent working mode, and industrialization production enabling.



Huawei Actively Promotes IEEE Smart City Reference Architecture Standard Process

Huawei successfully hosted IEEE P2413 Working Group meeting in Shenzhen. At the meeting, Huawei submitted two types of proposals, describing capabilities that were architected to support video and converged communication, as well as the scenarios and requirements of smart city

IoT, smart campus, and smart airport. Liu Min, Director of Huawei Enterprise BG Industry Solution, said at the opening of the meeting, "Huawei's vision is to bring the digital world to everyone, every family, every organization, and to build a smart world where everything is connected.

Smart cities are becoming more and more popular and this is clearly the way of the future. Leveraging innovative technologies such as the Internet of Things and Cloud Computing, the speed of development and adoption will continue to accelerate, and the Smart City industrial value chain will continue to expand exponentially. In the future, Smart Cities will make information more accessible and useful, improve service levels, and create a vibrant standards-based industrial ecosystem. "Huawei believes that video capabilities will be widely used in all areas of Smart Cities. Video will become an indispensable data source. There will be more and more new video services in the future, and video standards are in urgent need of promotion. In response to the underlying support capabilities, video capabilities and converged communication capabilities of smart cities, Huawei has derived the corresponding system architecture by describing the requirements of video and converged communication related



scenarios. Participants discussed the video analysis capability proposal in depth, and IEEE P2413 working group made a decision to send a Liaison Statement to Open Network Video Interface Forum (ONVIF) to join forces in development of a standardized northbound interface based on an open protocol. Another type of proposals elaborates on the three scenarios of smart city Intelligent Operation Center (IoC), smart park and smart airport, and then derives the corresponding Platform as a Service (PaaS) data platform requirements. The proposal submitted by

Huawei was a base for fruitful discussions at the meeting and the content of the proposal was approved by the participants for the inclusion into the draft. Chairman Logvinov proposed that the next working group meeting should include a one-day Smart City Forum, with the goal of inviting city governments and companies working in this area to discuss the Smart City requirements and architectural needs. To accelerate the fusion of technology and commerce we urgently need to grow the ecosystem and engage partners to demonstrate the value of Smart City

applications, and the importance of a bio diverse ecosystem in building the unified platform. The first step is to build a basic platform to aggregate data and open up capabilities so that upper-layer applications can use these capabilities to provide industry applications quickly, agilely, and richly. So as to build a cloud-based service platform with an ecological form, truly help corporate customers, partners, and win-win in the process of digital transformation of the industry.



Mobily Succeeded in Reaching a Positive Net Profit of SAR 80 Million in Q4 2018

Etihad Etisalat (Mobily) achieved net profit for the fourth 2018 reached SAR 80 million compared with losses at SAR 182 million in Q4 2017. Mobily succeeded in reducing its net losses by 82.7% for the year ended in 31st December 2018, where the net losses for the year 2018 amounted to SAR 123 million versus net losses of SAR 709 million for the year 2017. This improvement is due to Mobily continued to improve its revenues for the six consecutive quarter Q4 2018 revenues witnessed a YoY growth of 11.9%, and amounted to SAR 3,162 Million versus SAR 2,827 Million in Q4 2017, and annual revenues grow by 4.5% to reach SAR 11,865 million for the year 2018 versus SAR 11,351 million for the year 2017. This is mainly attributed to continued growth of; subscribers base and improvement of subscribers mix, data revenues, business unit revenues, and FTTH revenues. This was achieved despite the market, regulatory and economic challenges including the reduction of mobile termination rates. Taking out the impact of the decrease of the mobile

termination rates, quarterly revenues would have grown by 14% and annually revenues would have grown by 6.5%. For the fifth consecutive quarter, Mobily succeeded to improve its quarterly EBITDA reaching SAR 1,341 million in Q4 2018 versus SAR 911 million in Q4 2017, or an increase of 47%. Moreover Mobily succeeded in increasing EBITDA of 2018 reaching the highest EBITDA achieved in five years SAR 4,531 million versus SAR 3,646 million in 2017 representing an increase of 24.3%. The improvement in EBITDA is attributed to the increase in revenues, the improvement in operational performance supported by increasing in the efficiency in managing the operational expenses, the decrease in G&A expenses, the implementation of IFRS 15 and 9 and the reversal of provisions related to government fees, which covered all the negative impact resulted from the change in the mechanism of calculating government fees. EBITDA margin reached 42% for Q4 2018 and 38% for the year 2018. Mobily succeeded in reducing its net debt to the lowest level since 2012, since

the beginning of 2017, Mobily succeeded in repaying SAR 2.7 billion. Mobily net debt amounted to SAR 11.3 billion at the end of 2018 versus SAR 12.7 billion at the end of 2017 and versus SAR 14 billion at the end of 2016. Furthermore the company made an early repayment of SAR 1 billion, which reflects the continued concentration from the company on deleveraging. Capex in 2018 increased to SAR 2,819 million versus SAR 2,268 million in 2017. This is due to continuous deployment of network modernization project that started in Q4 2017 and the capitalization of the spectrum in 2018. Mobily succeeded in increasing its operational cash flow to the highest since 2011, which supported the company in deleveraging, despite the increase in CAPEX by SAR 551 million, 2018 Operational Cash Flow (EBITDA-CAPEX) reached SAR 1,712 million versus SAR 1,378 million in 2017, representing an improvement of 24% compared to the same period last year.

Mobily and Ericsson Showcase Network Operations Using Artificial Intelligence Techniques

Mobily conducted network operations experiments, supported by AI technologies, automation and the power of data, in collaboration with Ericsson. These experiments demonstrated the capacity

of Mobily's infrastructure to adopt latest technologies and its ability to manage network operations with the introduction of 5G and IoT technologies. This also enables Mobily to have a proactive detection of

network operation performance and to address network challenges beforehand. Eng. Ahmed Aboudoma, Mobily CEO, commented by saying that "By bringing in advanced technologies that support

digital transformation, Mobily's vision is aligned with vision 2030 of the Kingdom of Saudi Arabia. Given our continuous investment in advanced networks that support artificial intelligence applications through existing collaboration with Ericsson, Mobily is working on advanced

technologies that highlight the Kingdom's role as a center for innovative excellence." Rafiah Ibrahim, Head of Ericsson Middle East & East Africa, said: "As digitization is accelerating in the region, we are dedicated to support our partners with the latest advanced technologies and

empower intelligent networks. This stems from our passion to drive efficiency within the Managed Services sphere, and we are committed to support Mobily in their network evolution journey to implement artificial intelligence."



Nokia, German Provider M-Net Conduct 500G Field Trial

Nokia and German service provider M-net are laying claim to the industry's first transmission of a probabilistically shaped wavelength. M-net is the first carrier to trial Nokia's Photonic Service Engine 3 (PSE-3) coherent digital signal processing technology. Nokia said the PSE-3 is the first DSP to use probabilistic constellation

shaping (PCS). PCS is a signal processing technique pioneered by Bell Labs that adjusts the optical signal to maximize the data-carrying capacity of an optical fiber over any distance, according to Nokia. The field trial was conducted over a regional DWDM network spanning Bavaria as M-net prepares for the commercial

roll out its new WDM network. M-net and Nokia hit 500 gigabits per second over a single probabilistically shaped 64-QAM wavelength in a real-world environment for the first time. M-net used PCS to shape the signal from its maximum capacity of 600G to a rate optimized for the specific fiber route used in the test. The high level of performance and flexibility enabled M-net to maximize the capacity of every network fiber, ensuring its backbone will meet the future demands of increased video traffic and 5G mobile broadband. "We're excited to partner with M-net on the implementation of its new fiber optic backbone network," said Nokia's Sam Bucci, head of optical networking, in a statement. "The Technical University of Munich played a key role in the development of PCS, and the PSE-3 was largely developed at Nokia's R&D facility in Nuremberg, so it's only appropriate that the first field trial of PSE-3 technology would take place in Bavaria."



"Our new WaveSuite applications provide the tools optical network operators need to accelerate their business transformation."

Sam Bucci
Head of Optical Networks



Rakuten Selects Nokia End-to-End Cloud-Native Mobile Network: Investing in Altiostar for Virtual RAN

E-commerce services provider Rakuten has selected Nokia to build a new mobile network in Japan. With the group's Rakuten Mobile Network venture looking to become the country's fourth MNO when it kicks off services in October 2019, Nokia will provide full turnkey services to plan, manage, deploy and integrate cloud RAN, AirGile cloud-native core network technology and several Nokia software functions. The new distributed cloud network, along with Nokia and Rakuten's work to automate the network build and deployment process, should help reduce network operation costs and enhance

operational efficiencies, Nokia confirmed in a press release. The new network will be deployed across Japan – including Tokyo, Osaka and Nagoya – and use Nokia Cloud RAN, AirScale radios (remote radio heads) and the Nokia AirGile cloud-native core, incorporating technologies such as Nokia IP Multimedia Subsystem, Session Border Controller and Telco Application Server for the fast rollout of services such as VoLTE. In a separate development, Converge Network Digest writes that as part of its drive to establish Japan's fourth MNO, Rakuten plans to make a strategic investment in Altiostar Networks,

a US-based start-up that provides 5G-ready virtualized RAN software solutions that 'support open interfaces and disaggregates the hardware from the software to build an open multi-vendor web-scale network'. It also supports macro and small cells, indoor and outdoor, enabling interference management, carrier aggregation and dual reception, the press release reads. The investment is subject to approval by the Committee on Foreign Investment in the United States. Rakuten, meanwhile, has confirmed it is on track with the deployment of a fully virtualised mobile network in Japan by October 2019.

Bharti Airtel to Trial Nokia's 5G-Ready Fronthaul Solution

Nokia announced that Bharti Airtel will trial its homogenous fronthaul solution which can support 4G, 5G and enterprise services through a common platform. This trial is part of Bharti Airtel's strategy to make its network future ready to meet the growing demand for high speed data driven by the digital revolution in India. Nokia's solution under this trial has the potential to improve the performance of service providers' existing network even as it prepares the network for 5G and to meet the future demand. It allows service providers to meet the growing demand for bandwidth and enables to deliver 5G services. Fronthaul is the link between baseband

unit and radio, and modernization of this part of the transport network is essential to deliver high-speed and low latency of 5G services. Nokia's converged fronthaul transport solution helps bring down fiber requirement through multi-channel bi-directional transmission on a single fiber. The solution supports multiple interfaces, including Common Public Radio Interfaces (CPRI) and enhanced Common Public Radio Interfaces (eCPRI). Randeep Sekhon, CTO at Bharti Airtel, said: "Airtel has always set the benchmark when it comes to roll-out of latest network technologies. The upgrade of the transport network is also essential to cater to the booming

consumption of mobile broadband services and enable world-class digital services. Nokia is our longstanding partner and we look forward to their support in our journey towards 5G." Sanjay Malik Head of India Market at Nokia, said: "The modernization of the transport infrastructure is crucial for ensuring the ultra-high speed and extremely low latency, promised by 5G. We look forward to this trial with Bharti Airtel, which is a crucial step towards preparing the networks for 5G. The ring architecture will help in adding resiliency to the network and ensure that the network is able to meet the ever-growing bandwidth demand of their customers."

MIRIS Selects Nokia AirFrame Open Edge Technology to Deploy Sustainable Edge Data Center Networks across Nordic Region

Nokia announced that MIRIS, a leading Norwegian real estate and technology firm, will deploy AirFrame Open Edge data center technology to support delivery of Smart City services in business parks and residential areas. MIRIS plans to build data centers in about 20 urban locations in Norway during 2019, followed by a wider roll out across the Nordic region. City municipalities and the local real estate industry will host the infrastructure to support the first edge data centers. Many of these data centers will recycle excess heat and use it in local homes and businesses. Nokia will develop and deliver edge compute services to support

a range of innovative Smart City and Internet of Things applications, including connected vehicles, gaming, massive video compute and other demanding local applications. Nokia Open Edge is the industry's first single-socket x86 server platform in a secured compact package suitable for harsh environments and all business segments, including enterprise. Jan Gunnar Mathisen, CEO, MIRIS said: "In Nokia, MIRIS has an industrial partner with a Nordic brand and global reach that can provide a complete data center solution, including operations, leaving us free to focus on concept development, sales and deployment." Jerome Julien, Head

of Enterprise Partners, Nokia said: "Data centers consume as much as 5% of the world's power. In this fast-growing edge data center market, we are pleased to work with MIRIS on such an innovative approach that delivers desirable Smart City and IoT applications while also helping to reduce the environmental impact of these centers globally." Nokia is providing a complete AirFrame solution including Open Edge hardware, AirFrame Data Center Manager and Cloud infrastructure for IoT and real-time applications, as well as professional services for the design stage.

Nokia Release Financial Report for Q4 and Full Year 2018

Nokia ended the year with a strong fourth quarter. We saw the second consecutive quarter of year-on-year sales growth across all five of our Networks business groups, as well as improved profitability in both Networks and Nokia Technologies. The execution of our strategy also proceeded well, with the work we have put into building a solid foundation for Nokia Software showing clear results and our enterprise business rapidly becoming a

pillar of growth. Looking forward, I expect Nokia's performance to strengthen for the full year 2019 versus 2018 and our view of a fast and meaningful shift to 5G remains unchanged. Given that 5G rollouts will be staggered over the course of the year, we expect 2019 to have a soft first half followed by a much more robust second half. Over the longer-term, we expect a virtuous cycle of investment, where operators update their networks across

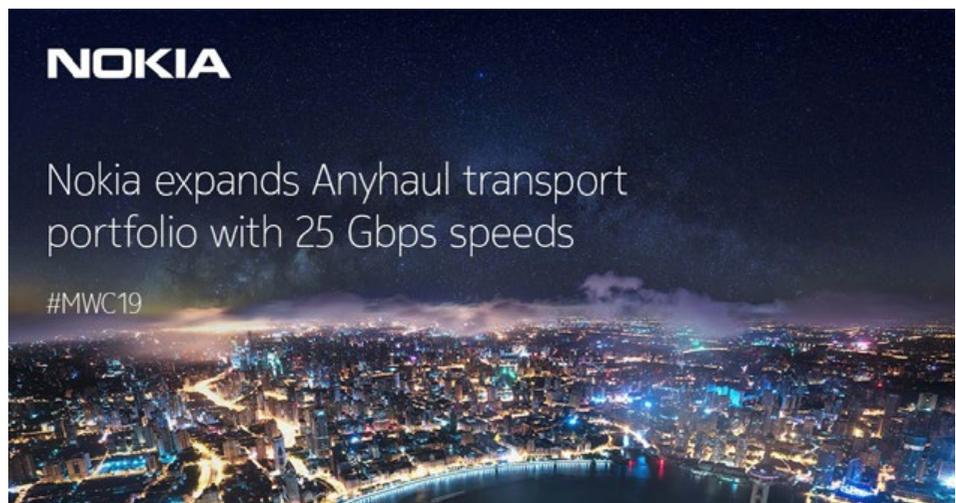
multiple domains - from optical to macro radio, fixed wireless access to cloud core, small cells to IP routing, network agnostic software and more. Following this, we expect a second wave where industrial customers will invest in private wireless technology including LTE and 5G-ready networks. With our end-to-end portfolio, Nokia is well-positioned to tap this extended cycle.

Nokia Expands Anyhaul Transport Portfolio with 25 Gbps Speeds to Support Operator Network Investment for 5G Rollouts

In advance of Mobile World Congress, Nokia announces a raft of enhancements to its Anyhaul transport portfolio that help operators prepare their networks for 5G by delivering throughput speeds of up to 25 Gbps to base stations. The launches span microwave, optical, IP and broadband technologies within a carrier Software Defined Networking (SDN) transport architecture. This simplifies the integration of transport with cloud-based radio access and core networks, thereby enabling an automated end-to-end 5G network slicing and service provisioning system. Nokia Anyhaul is the industry's most extensive range of transport solutions. These solutions can be rapidly and dynamically provisioned to support the massive connectivity, extreme low latency and very high throughput demands of 5G services. Programmability and automation dynamically create transport network slices to quickly and cost-effectively match diverse application and user needs with end-to-end service delivery guarantees. The Nokia Anyhaul portfolio enables operators to deploy the optimal mix of transport technologies to create a flexible fabric that matches their unique network and business needs. A new release of the Nokia Wavence microwave portfolio supports carrier aggregation to combine frequency bands in the traditional uWave or mmWave frequencies or even with existing third-party microwaves to achieve 5G-ready microwave throughput beyond 10 Gbps. The 2+0 E-Band systems ensure 20 Gbps throughput, as a single radio can provide 10 Gbps with the new 2 GHz channel bandwidth. These E-Band ultra-broadband radios are ready to be deployed in small form factor hardware variants to provide fiber-like backhauling for small cells. The Wavence family includes a new compact 5G-ready transceiver called UBT-C for optimal last mile connections. The new Nokia 1830

Versatile WDM Module (VWM) Translation Line Unit (TLU)-200 provides high density wavelength translation at 10 Gbps and 25 Gbps speeds. Purpose-built for Cloud RAN and Edge Cloud requirements, it simplifies operations and improves reliability of fronthaul connectivity for 4G Common Public Radio Interface (CPRI)/Open Base Station Architecture Initiative (OBSAI) and 5G eCPRI data. A new, compact interconnect router, the Nokia 7250 IXR-e, is purpose-built to support 5G and edge cloud requirements at or near base stations with 1/10/25/100 GE interfaces. The 7250 IXR-e features a compact architecture with efficient cooling and optimized space efficiency for minimal installation costs. It complements the previously released 7250 IXR-R6, which also supports 5G requirements and 1/10/25/100 GE interfaces. A proof of concept of Nokia Broadband Anyhaul 25G Passive Optical Network (PON) demonstrates the viability of building on existing fiber infrastructure to offer 25 Gbps speeds. Co-existing with 2.5G and 10G PON technologies, 25G PON enables more radio access sites to be connected on the same fiber to reduce costs. Nokia successfully trialed 25G PON proof of concept with T-1 operators in North America and Japan in January 2019. Jimmy

Yu, Vice President at Dell'Oro Group, said: "Mobile backhaul has always been done with a variety of transport technologies to balance the needs of performance, time, and economics. This will continue with 5G, and for this reason, operators will need an assortment of transport technologies-microwave, optical, IP and PON-that suit their unique requirements in 5G fronthaul and backhaul. The rollout of 5G has just started this year and if our predictions are correct, demand for 5G backhaul transport systems (not including fiber) will begin ramping in a year's time and surpass \$1 billion of annual sales in the following two years." Phil Twist, VP of Networks Marketing and Communications, at Nokia said: "Our Anyhaul portfolio is a key element of the Nokia 5G Future X architecture, which equips our customers to take advantage of the promise of this next generation of network technology. Nokia Anyhaul has been deployed globally and is now being selected in countries such as the US, Japan, China, and South Korea where we are helping the fast-movers transform to 5G. The expertise and invaluable best practices we gain will further simplify and reduce risk for other operators as they move to 5G."



Chorus To Stage 10Gbps Trial

New Zealand's open-access fixed line telecoms provider Chorus has announced that it plans to stage a 10Gbps fiber broadband trial next month, using Nokia's XGS-PON solution. Four broadband retailers – 2degrees, Kordia, Stuff Fibre and Trustpower – have signed up for the trial service, which will be available in

selected areas of Auckland and Wellington, initially for 30 residential customers. Ed Hyde, the chief customer officer at Chorus, commented: 'In the last eight years New Zealand has seen a meteoric progression in broadband capability. In 2011 the average broadband speed was just 10Mbps or so. When Chorus' fiber plans first launched

in 2012 the top speed then available was 100Mbps. We were then the first to make gigabit fiber broadband available in 2014 and today this is the fastest growing plan on our network with more than 44,000 customers.'

Nokia Launches Cognitive Collaboration Hubs to Help Operators Design 5G Networks and Create AI-Enabled Use Cases

Nokia, in advance of Mobile World Congress 2019, announced that it is opening a network of Cognitive Collaboration Hubs. These data science centers will further the cooperation between Nokia, operators, and enterprises under one roof in order to develop innovative, AI-powered use cases. One such use case is Driver Behavior Analytics that aims to improve road safety by providing real-time analysis of driver performance and road conditions. By hosting development on the Nokia AVA cognitive services platform, the hubs will reduce operators' time to market and increase their return on investments in data analytics. The Cognitive Collaboration Hubs build on the success of Nokia Cloud Collaboration Hubs established in 2018, which have attracted substantial interest from operators to help them build new cloud-based capabilities. The hubs provide a catalyst for operator strategy development and help them solve key challenges by applying analytics and Artificial Intelligence (AI) techniques. Agile development processes are used to jointly create use cases, test and put them into operation within weeks. Typical application areas focus on network operations, network performance, customer experience and data monetization. 5G is another key focus, and Nokia is currently working with several US operators on the use of machine learning to improve 5G network planning - for example to help identify the best site locations or Massive MIMO beamforming configurations. John Byrne, Service Director for Telecom Technology & Software, Global Data, said: "Network operators are eager to deploy AI to improve

network operations and strengthen customer relationships. Nokia's Cognitive Collaboration Hubs can help accelerate those plans by providing a space for operators, partners and enterprises to co-create new AI solutions utilizing a mix of data science and telco domain expertise." Operators around the world have already benefitted from the cognitive services created using these methodologies. For example, in Turkey, Nokia and Türk Telekom are testing machine learning based artificial intelligence technologies on new generation mobile and fixed networks by using Nokia's artificial intelligence assistant MIKA and AVA cognitive services platform. Dennis Lorenzin, Head of the Network Cognitive Service Unit at Nokia said: "Nokia Cognitive Collaboration Hubs are yet another step in the expansion of our data analytics and AI services capabilities, which are widely recognized as industry-leading. Building on our data science and telco expertise,

we are helping our customers apply AI technologies to improve their operational efficiency, prepare their networks for 5G, and generate new revenues." Nokia is also announcing a new innovation to improve road safety and passenger experience. Driver Behavior Analytics provides real-time analysis of data from commodity sensors delivering useful data insights for government authorities, the automotive industry and commercial enterprises. Advanced insights derived using a proprietary smartphone application to deliver information on aggressive driving, inadequate road conditions or dangerous junctions. Nokia is a global leader in 5G with the industry's only end-to-end portfolio that is available globally. With more than 70 engagements underway, our 5G solutions, software and services allow our customers to take advantage of the promise of this next generation of network technology. Learn more about Nokia 5G.



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"Nokia's Cognitive Collaboration Hubs provide a space for operators, partners and enterprises to co-create new AI solutions utilizing a mix of data science and telco domain expertise."

John Byrne
Service Director for Telecom Technology and Software, GlobalData

KDDI Deploys Nokia Gigabit G.fast Solution to Bring New Services to Its High-Speed Internet 'au Hikari' Customers in Japan

KDDI, a leading telecommunications operator in Japan, is deploying Nokia's G.fast solution to apartments and multi-dwelling units (MDU) buildings to deliver ultra-broadband services to customers. Reducing the need to install new fiber, Nokia's technology will enable KDDI to use existing copper lines in MDU buildings to deliver 830Mbps combined uplink and downlink speeds to customers. To support customers' ultra-broadband needs, Japanese operators are using fiber where possible along with new technologies like G.fast for a large number of MDU locations where copper is already installed. Developed by Nokia Bell Labs, G.fast uses vectoring technology to effectively reduce cross-talk interference that typically impacts data speeds over copper networks. Providing support for Japan's VDSL2 specifications, Nokia's G.fast solution will minimize the impact to existing VDSL systems and enable operators to quickly upgrade their high-speed internet service to gigabit class through a simple CPE (customer premises equipment) replacement. KDDI has been deploying Nokia's G.fast solution and has started its rollout of 'au Hikari MDU Type G'. Teresa Mastrangelo, principal analyst at Broadband Trends said: "G.fast continues to be a preferred choice for operators seeking to deliver gigabit broadband services to MDUs as it eliminates many of the issues found with FTTH deployments such as building types and access. However, in Japan, deploying G.fast can be just as challenging as fiber due to the

unique VDSL ecosystem and standards in place. As one of the few vendors capable of supporting both the global and local Japanese VDSL standard, Nokia has been able to help KDDI capitalize on the benefits of G.fast and seamlessly scale and migrate their network with minimal disruption. This win is another great example for how G.fast technology is being used to quickly address customers need for greater broadband speeds." Shigenari Saito, Administrative Officer, General Manager, Network Technology Development Division, Technology Sector, at KDDI said: "KDDI already provides 10Gbps service for our 'au Hikari' FTTH customers, but the speed we can provide has been limited to 100Mbps service for MDUs where fiber is difficult to deploy. Nokia's G.fast solution enables us to connect existing 100Mbps users and new G.fast users under the same DPU (distribution point unit). This

gives us the flexibility and economical path to meet the customer's demands for higher speed. Our decision to deploy Nokia G.fast is based on our long-term relationship, Nokia continues to be our long-term partner for delivering technology innovations." Sandra Motley, president of Nokia's Fixed Networks Business Group, said: "Operators looking to quickly roll out new ultra-broadband services are increasingly adopting multi-technology strategies that allow them to maximize the use of both fiber and copper technologies. This is particularly true in some cases like inside an apartment building, where more traditional Fiber-to-the-Home solutions can be very challenging to deploy. We are excited to be working with KDDI to deploy our G.fast solution to deliver fiber-like speeds that will enhance the way customers experience their broadband services."



Rain, Nokia Announce Launch of Commercial-Ready 5G Network in Cape Town

South African operator Rain and Nokia have announced the launch of what they claim is 'the country's first commercial-ready 5G network in Cape Town', following the deployment of the first 5G site in November 2018. In addition, Nokia and Rain have agreed to collaborate on deploying

the 5G network with Nokia's end-to-end 5G solutions including optical fronthaul transport products and its Fixed Wireless Access FastMile 5G Gateway, which uses 3GPP compliant 5G New Radio. The rollout of the infrastructure – which utilizes 3600MHz spectrum and Massive MIMO

technology – will continue through 2020 and extend coverage to more areas. Later this year the network will also support a variety of 5G use cases, once commercial 5G end-user devices become available.

Nokia and Open Fiber Bridge the Digital Divide in Italy

Open Fiber, the sole wholesale-only player in the Italian broadband market, selected Nokia for a fiber-to-the-home (FTTH) rollout that will bring ultra-broadband services to the small towns and rural areas of Italy. The Open Fiber network will bring optical fiber from a point of presence to the customer's home and deliver speeds of up to 1 Gigabit per second (Gbps). In line with the founding principles of the Gigabit Society, the new fiber deployment provides Open Fiber with a future-proof network that can support next generation fiber technologies. While drawing up its ultra-broadband strategy in 2015, the Italian government identified four types of clusters (A, B, C and D) in the country: where each municipality was assigned to one cluster based on factors including lower or higher housing density, presence of broadband coverage and market size. Nokia has been selected as the sole supplier for clusters

C and D (white areas) and will deliver products, services and software needed to plan, design, deploy and support the end-to-end active network infrastructure based on GPON technologies. Stefano Paggi, Network & Operations Director at Open Fiber, said: "We have selected Nokia as our supplier in clusters C and D to deliver giga-services and pave the way for future ultrabroadband technology evolutions. We are sure that Nokia's extensive experience in fixed networks will enable us to build an efficient network that uses best-of-breed components and technologies. With Nokia's solutions we will be able to offer services at 10 Gigabit per second (Gbps) and in the future at 40 Gbps on the access network. We will also have the opportunity to adopt the SDAN (Software Defined Networking) paradigm and therefore to maximize the potential of a new generation access network, with high automation,

programmable and integrated with cloud environments. Alessandro Manno, Director Global Enterprise Italy, said: "As a worldwide leader in telecommunication solutions, and a long-time front-runner in fiber technologies, Nokia has the products and delivery capability to support Open Fiber in this deployment journey. Our end-to-end solutions, professional services, consulting, maintenance and support services reduce risk and accelerate deployments, giving Open Fiber the confidence to adopt new technologies, enter new markets and extend the performance of existing networks". Nokia will also offer its professional services and customer engineering experience to fulfil solution validation and integration, installation and commissioning, on-site support, solution training and project management.



PCCW Global's Console Connect Announces On-Demand, Direct and Automated Connections to Alibaba Cloud Express Connect

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, has established on-demand, direct and automated connections to Alibaba Cloud Express Connect. PCCW Global's Console Connect provides on-demand, private connectivity to Alibaba Cloud enterprise customers via PCCW Global's global network, which spans more than 150 countries around the world. PCCW Global's collaboration with Alibaba Cloud, the cloud computing arm of Alibaba Group, allows enterprises to scale their cloud connectivity and facilitates rapid provisioning of capacity on-demand via the Console Connect platform with direct access to their business-critical applications, connecting any and all endpoints across the customers' networks. The platform is easy-to-use yet driven through sophisticated automation software that eliminates the complexities of network configuration. PCCW Global's Console

Connect platform enables enhanced performance, visibility, monitoring, and security, while providing additional reach for Alibaba Cloud customers. Mr. Paul Gampe, Chief Technology Officer of PCCW Global, said, "By connecting the Alibaba Cloud platform to Console Connect at multiple points around the world, we have enabled businesses to rapidly establish secure high-performance direct connections to business-critical applications hosted in the cloud. The agility and performance benefits of Alibaba Cloud Express Connect integrate perfectly with the superior cloud networking experience offered by Console Connect." Key Highlights:

- From a single global account, customers can reduce latency and deploy globally within Alibaba Cloud's network by leveraging PCCW Global's Console Connect.
- Connecting locally via Console Connect provides Alibaba Cloud customers with fast and consistent network

performance.

- Alibaba Cloud customers can access PCCW Global's global network, which spans more than 150 countries worldwide.
- Console Connect provides clients with on-demand, scalable bandwidth to ensure that their connectivity remains as flexible as the clouds they are connecting to.

Mr. Leo Liu, General Manager for Alibaba Cloud Hong Kong, Macau and Korea, said, "Alibaba Cloud Express Connect gives customers even more connectivity choices for hybrid environments. Together with PCCW Global, we are making it easier for customers to accelerate their digital transformation process and with the Alibaba Cloud Express Connect, we can enable rapid provisioning of capacity to Alibaba Cloud as a result of our integration with Console Connect."

Viu Collaborates with Workpoint to Launch HOH Family

Viu, a leading pan-regional OTT video service from PCCW Media Group, and Workpoint Entertainment, a leading Thai entertainment content provider, have co-produced the first Viu Original production in Thailand – HOH Family, which will be available in 16 markets in the region and the Middle East from February 12. Today's news signals a strengthening of collaboration between the two companies since a recent development provided Viu users with more than 1,500 new drama and variety show episodes from Workpoint's 2019 portfolio of content. HOH Family is derived from "Hoh", a popular curry dish in northern Thailand comprising a variety of ingredients, symbolizing people of varying characters and personalities co-existing in the same environment. The HOH Family story revolves around four paternal half siblings from different parts of the world living under the same roof. Each has a dream and yearns to make it come true, but chaotic tension between family members gradually changes as love grows in their hearts. HOH Family is scheduled for Viu streaming in February throughout 16 markets – Hong Kong, Malaysia, Myanmar, India, Indonesia, the Philippines, Singapore, Thailand and the Middle East. A

total of 15 episodes will be streamed one episode per week. The series stars up-and-coming teen celebrities Gao Jirayu and Pan Pan, who are extremely popular among Thailand's Gen Z and millennial sections of society. Ms. Helen Sou, Senior Vice President of Digital Media, PCCW Media Group, said, "The average daily video viewing time per Viu-er in Asia is 108 minutes, while Thai people spend an average of 243 minutes per day watching online videos. Thailand holds huge potential as one of Viu's fastest-growing markets and requires premium content to suit viewer tastes." Ms. Sou added, "This is the first Viu Original drama in Thailand. We and Workpoint have a common vision of presenting premium content that appeals to our discerning audiences. Viu now serves 16 markets and is proud to provide our highly-engaged Viu-ers worldwide with compelling Thai content. We are also committed to investing in the local creative industry and promoting Thailand's vibrant entertainment community by taking Thailand-based productions to other regions as part of the diversity of content we offer throughout Asia." Mr. Chalakorn Panyashom, Chief Operating Officer of Workpoint Group, said, "We are very proud

to be working with Viu to produce the first Viu Original show. We are committed to delivering high-quality work and firmly believe HOH Family will generate positive feedback from Viu and Workpoint viewers alike, as well as from internationally-dispersed fans who follow up-and-coming teen celebrities such as Gao Jirayu and Pan Pan, who star in this series. This collaboration marks Workpoint's first collaboration with a regional OTT platform. We are excited to be making a strategic move with Viu, which enables us to reach out to more than 20 million highly-engaged active users, and to be expanding our viewership at an accelerated rate as we take our productions to screens throughout the region." Workpoint ranks among Thailand's top-five digital TV channels and its collaboration with Viu enables both sides to continue widening variety to meet constantly-changing tastes and preferences among viewers. In 2018 alone, Viu released 70 titles and more than 900 episodes of Viu Original programming aimed at audiences in Hong Kong, India, Indonesia, Malaysia and The Philippines. Some of Viu's most highly-rated productions include The Bridge, Hello K-Ido and The Publicist.

PCCW Reports 5% Rise in Sales for 2018

Hong Kong's PCCW Group, which includes telecoms unit HKT, has reported consolidated revenues of HKD38.85 billion (USD4.95 billion) for full-year 2018, up 5% year-on-year. The group's consolidated

profit attributable to equity shareholders was steady at HKD897 million. Fixed and mobile operator HKT brought in revenues of HKD35.19 billion, up 6% y-o-y, following growth in both service revenues and

handset sales. HKT's EBITDA increased by 2% to HKD12.56 billion for the year ended 31 December.



SES Teams Up with Kartina TV

SES and the OTT service Kartina TV have entered into a partnership to deliver Russian channels to Europe on the Astra 19.2 degrees East satellite. Quoting Kartina TV's CEO Andrei Reich, Cableman reports that the project has the working title Kartina Satellite. Although the brand will use the word Kartina, the commercial name will be Kartina Sat. He added that

the service will distribute around 32 international versions of Russian channels, six of which will be in HD, with the start date being April 1. Significantly, the main Russian national channels and online movie service Start have already agreed to participate, with ivi, Russia's most popular OTT platform, expected to follow. The service will be available on a subscription

basis throughout Europe, with the monthly fee starting at €4.99. The target audience will be the 850,000 households in Europe that already watch Russian channels via cable or satellite, with the aim being to secure at least 200,000 in the first year of operation.

SES-12 Goes Operational to Serve Asia-Pacific and the Middle East

SES announced that its newest satellite, SES-12, is now ready to serve its video, fixed data, mobility and government customers across Asia-Pacific and the Middle East. The powerful satellite, which is designed with state-of-the-art wide beams and high throughput beams, will join SES-8 at 95 degrees East. SES-12 is the latest satellite that SES has launched to that orbital position where it will operate under the authority of the Kingdom of the Netherlands. The all-electric satellite will replace and augment the services currently being provided on SES's NSS-6 satellite. SES-12 is SES's third hybrid satellite with both wide beams and high throughput payload. Like SES-14 and SES-15 which serve the Americas, the SES-12 high throughput payload is SES's



solution for enhancing cost-effective connectivity solutions for aeronautical and maritime customers across Asia-Pacific and the Middle East. SES-12 will also be pivotal in enabling governments to provide connectivity programmes to bridge the digital divide, and in allowing telcos, mobile network operators and internet service providers to deliver reliable and enhanced cellular backhaul and faster broadband services. Together with SES-8, SES-12 will reach key direct-to-home neighborhoods. The satellites will provide pay-TV operators the reliability and scalability to improve viewing experiences by enhancing their content offerings, including delivering higher-quality picture quality to address the audience's burgeoning demand for High Definition (HD) and Ultra HD content. Ruy Pinto, Chief Technology Officer at SES said, "We are excited that SES-12 is now ready to serve our customers in Asia-Pacific and the Middle East, and would like to thank the Airbus and SpaceX teams for their hard work on making this possible. SES-12, with its high performance capacity, will be able to offer much more reliability and flexibility to our customers and enable them to deliver premium services." SES-12 has six wide beams and 72 high throughput user spot beams, and also has a Digital Transparent Processor (DTP) to increase payload flexibility to provide much more customizable bandwidth solutions to SES customers. The all-electric SES-12 spacecraft was built by Airbus Defence and Space, and launched by SpaceX. It will join SES's network of seven geostationary satellites and 16 MEO satellites across Asia-Pacific and the Middle East.

EU Maritime Safety Agency Awards Managed Connectivity Services Contract to SES

SES Networks' managed services will boost connectivity for Remotely Piloted Aircraft Systems (RPAS) services of the European Maritime Safety Agency (EMSA) provided to EU Member States and Agencies. These maritime surveillance activities supported by SES Networks are aimed at improving maritime security and safety operations, as well as response to pollution caused by ships, oil and gas installations. The RPAS-driven missions will be carried out in the seas surrounding the European Union or the European Free Trade Association (EFTA) countries. To enable multiple Long Range Long Endurance RPAS operations for maritime surveillance operations of the member states' authorities, SES Networks will design and provide deployment and maintenance of SATCOM connectivity during the missions. The managed services will include secure end-to-end satellite and terrestrial links, satellite capacity and teleport infrastructure. Under the agreement, SES Networks will support EMSA's Beyond Radio Line-of-Sight (BRLOS) RPAS operations, as well as satellite internet services to distribute the RPAS data and enable end-users to remotely follow the mission. "Good satellite coverage is essential to our long range RPAS operations. It will help our users to gain a more complete maritime picture," said EMSA's Executive Director, Maja Markovčić Kostelac. "The latest SATCOM contracts will enable the transmission of data from multiple sensors in real

time, allowing users to focus more closely on the actual operation." "It is an honor for us to support EMSA with SES Networks' satellite communication services in its critically important maritime missions," said Nicole Robinson, Senior Vice President Global Government at SES Networks. "To enable real-time long range RPAS data applications, we will be leveraging our highly-reliable global fleet which boasts virtually 100% availability. Coupled with the managed service, this will give multiple advantages to those fulfilling mission-critical tasks at sea."



SES Strengthens Leadership Team and Enhances Customer Experience through Establishment of Global Services Organization

SES is streamlining customer support and services by forming a global services delivery team under the leadership of a Chief Services Officer (CSO). This underscores SES's commitment to place customers at the heart of its business and deliver exceptional customer experience following the successful implementation of two market-facing business units in 2017, SES Video and SES Networks. The newly created CSO position consolidates all customer support and operational delivery, logistics and services related resources across the video and data businesses. It unifies functions across the organization into a single team charged with delivering exceptional services to its customers. John Baughn, formerly Executive Vice President Global Services at SES Networks, is appointed to this

newly created position. Furthermore, the company is pleased to announce Ruy Pinto as the successor to Martin Halliwell as Chief Technology Officer (CTO). Ruy Pinto, formerly Deputy Chief Technology Officer and Chief Information Officer of SES will lead SES's global technology organization including all technology functions currently within the business units and will also retain the leadership of SES's IT and Digital Transformation activities. Martin Halliwell will remain part of the Senior Leadership Team and serve as a Strategic Advisor to the CEO until his planned retirement in May 2019. "I am delighted to bring together our engineering talent and responsibility for our customer services under such strong and experienced leaders. As the demands of our markets evolve, these two teams, configured to serve our customers across

both business units, will ensure that we stay ahead", says Steve Collar, President and CEO of SES. "Unifying the technical team and creating a consistent customer facing organization will allow us to offer world class customer experiences around the world, strengthen our focus on successful end-to-end delivery and place business success for our customers at the center of our focus." "I would also like to thank Martin for his enormous contribution to the success of SES for over 30 years. Martin is a true pioneer who was responsible for so many 'firsts' for SES, for so much that we have achieved in space and I cannot thank him enough for his leadership, dedication, innovation and achievement as our CTO. Martin's new mission is retirement and we wish him every success in that endeavor!"



Tech Mahindra Announces DynaCommerce Acquisition

Tech Mahindra, a leading provider of digital transformation, IT, Networks, consulting & Engineering services has today signed an agreement to purchase 100% of shares in Dynacommerce Holding B.V. As a result, DynaCommerce will play a key role in further enhancing TechMahindra's Customer Experience Strategy. The partnership between the two companies has been in play for a number of years and together both companies have partnered on offering omnichannel, multi-play sales and delivery orchestration solutions to a range of customers worldwide. This acquisition will allow DynaCommerce to improve its service for existing customers whilst Tech Mahindra's status as an internationally renowned corporation will enable Dynacommerce to scale faster and pursue more opportunities on a global scale. This is a step to bolster Tech Mahindra's 3-4-3 strategy which targets to capture 3 mega trends of connected devices, 5G and video explosion through its four core big bets on future technology investments to help achieving customer's 3 primary objectives of Running Better, Changing Faster and Growing Greater. One of the four big bets of Tech Mahindra is Delivering Connected Customer Experiences with the interplay of digital, design and convergence. Along with its previous acquisition of the BIO Agency (UK) and Pinfarina (Italy), this acquisition of DynaCommerce is a step forward to delivering on that promise. Tech Mahindra will also bring additional

Telco knowledge and capabilities including AI, Automation and Processes Management which will help to scale and improve DynaCommerce's business offerings and market reach. Dynacommerce provides end-to-end omni-channel solutions for mobile and fixed telco, cable, media and utility companies, with a goal of simplifying digital transformation to ensure agile digital service delivery. Their practical solutions are rapidly transforming the current way of service delivery, supporting all customer journeys and business models of today and the future, regardless of complexity. DynaCommerce sees working even closer with Tech Mahindra as the next step in its evolution enabling it to rapidly expand its horizon in multiple markets and across CSPs. Rick Centeno, CEO of DynaCommerce, "We are very excited about becoming part of the Tech Mahindra solution ecosystem. We share the same vision on how to bring great customer experience to the digital world and this will give us the required resources and footprint to successfully scale to a global level." CP Gurnani, MD & CEO, Tech Mahindra, "Tech Mahindra's focus has been on helping our customers to run digitally, change digitally and grow digitally. Our strategic investment in DynaCommerce will provide concrete support to our digital transformation strategy and enable a future proof and future ready digital experience to our customers."

Tech Mahindra Debuts Platform for 5G Automation

In an effort to speed up the rollout of 5G, Tech Mahindra announced a new automation and managed services platform at Mobile World Congress. Tech Mahindra's netOps.ai framework is based on continuous integration and continuous deployment (CI/CD) principles. It was designed to accelerate 5G adoption by automating key network lifecycle stages such as telco cloud, VNF (virtual network functions) lifecycle automation, and implementation of DevOps continuous integration and service orchestration. All four areas are key elements, or pain points, in communications service providers' 5G journeys. Service providers, such as AT&T, have been frustrated with the lack of standardization across vendors' VNFs. Tech Mahindra is looking to speed up the onboarding process and end-to-end integration of VNFs with its VNF-Xchange. For service orchestration, Tech Mahindra's netOps.ai framework offers automation of network services orchestration, including closed-loop automation for self-healing and auto-scaling. For telco cloud automation, netOps.ai speeds up the rollout of different cloud profiles with one-click deployment capabilities. Tech Mahindra's NetDevOps includes the implementation of a complete DevOps CI/CD pipeline for 5G networks in a multi-

vendor environment. "Tech Mahindra's netOps.ai Framework will significantly boost the speed of 5G network rollouts," said Manish Vyas, president of CME and CEO of network services for Tech Mahindra. "Communication service providers across the globe will be able to accelerate their 5G time-to-market and simultaneously reduce their cost of ownership by automating every aspect of their network lifecycle. We are preparing to witness the real-world impact of 5G and are collaborating with multiple partners from different industry verticals to develop compelling, practical use cases. Service agility, which we aim to provide with our netOps.ai Framework, is essential to rapidly deploy and scale these

use cases." At Mobile World Congress in Barcelona, Tech Mahindra demonstrated the netOps.ai framework in a fully virtualized, multivendor 5G network and show the benefits of deploying netOps.ai including automated validation of the entire NFV stack—from hypervisors to VNFs—automated software updates, acceleration of end-to-end validation cycles and rapid deployment to production networks. While Tech Mahindra works with various service providers. It helped AT&T develop the Acumos AI project before it was put into open source at the Linux Foundation. It also resells the telco's FlexWare network product.



Tech Mahindra Commits to 22% Reduction in Greenhouse Gas Emissions by 2030 and 50% by 2050

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business re-engineering services and solutions has committed to reduce its absolute scopes 1 and 2 GHG (Greenhouse Gas) emissions 22% by 2030 and 50% by 2050, from a 2016 base-year. The same has been approved by the Science Based Targets initiative (SBTi). The SBTi approval confirms that Tech Mahindra's long-term targets are in line with the level of de-carbonization required to keep global temperature increase below 2°C, as compared to pre-industrial temperatures,

as set out in the Paris Agreement on climate change. Sandeep Chandna, Chief Sustainability Officer, Tech Mahindra, said, "Tech Mahindra is committed to the Paris agreement targets and is consciously adopting a strategy which will deliver innovative solutions without adversely affecting the environment. SBTi gives us a clear roadmap to optimize our carbon footprint and is enabling us to move towards a low carbon economy that will reduce future climate change risks." Tech Mahindra is focusing on improving energy efficiency through process optimization,

energy conservation initiatives, increased use of renewable energy and by investing in low emission and green technologies. Cynthia Cummis, Director of Private Sector Climate Mitigation at World Resources Institute, one of the Science Based Targets initiative partners, said: "We congratulate Tech Mahindra on setting a science-based target. By aligning their strategy with the goals of the Paris Agreement, they are taking a leading role in the low-carbon transition and positioning their business

Tech Mahindra Q3'19 PAT Up 28% YoY

Tech Mahindra Ltd., a leading provider of digital transformation, consulting and business re-engineering services and solutions, announced the audited consolidated financial results for its third quarter ended Dec 31, 2018. C P Gurnani, Managing Director & Chief Executive Officer, Tech Mahindra said, "This is a milestone quarter for Tech Mahindra with 5 billion dollars annual revenue run rate in sight. The current quarter has been impressive on all fronts, delivering steady growth in Enterprise and Communications business along with margin expansion. Our Run, Change and Grow strategy has helped us deliver a strong 10% sequential growth in digital revenues. We are confident of continuing the growth momentum." Manoj Bhat, Chief Financial Officer, Tech Mahindra said, "We continue to improve on our operating metrics across most of our business lines. We have clocked yet another strong quarter, in terms of revenue growth, continued EBITDA margin improvement, cash flow and robust deal wins. This continued thrust on optimization and yield management has helped us achieve margin improvement of 300 bps on a YoY basis." Engaged by a leading Telco in UK, as a partner in their transformation journey. Tech Mahindra will be responsible for driving improved customer experience through Next-Gen transformation, Automation and System rationalization. Bagged a contract from one of the largest banks in the ANZ region for digital channel integration across core banking processes and asset finance. Selected by a leading provider of jet engines and components for commercial and military aircraft as its partner for digital transformation solutions and cloud migration services, leveraging Tech Mahindra's delivery excellence. Awarded a multi-year, multi-million dollar, customer experience transformation deal, by one of the largest Railroad companies in North America for technical infrastructure management and enterprise security, using best-in-class artificial intelligence and automation-based solution. Selected by a leading healthcare solution and

device manager as long-term, strategic partner for engineering services leveraging Tech Mahindra's expertise in Next-Gen technologies. Engaged by a leading global car manufacturer for complete development, localization and testing of vehicles. Chosen by a Tier 1 telecom operator in Western Europe for multi pillar-services, including Robotics, Automation, Security, Cloud, and Release management services. Chosen as a technology partner by one of the largest Global Communication Services Provider in the US for Turnkey services across the life cycle of Site Design, Engineering and Construction. Engaged by a Tier 1 CSP in North America as a strategic partner for program management, architecture, design and implementation, leveraging latest digital and data analytics technologies. Tech Mahindra has launched GAiA - the first enterprise edition of open source Artificial Intelligence (AI) platform Acumos, which will enable enterprises across industry verticals to build, share and rapidly deploy AI-driven services and applications to solve business critical problems. Tech Mahindra has partnered with H2O.ai, the open source leader in Artificial Intelligence for establishing Center of Excellence to focus on critical industries such as Communications, Media & Entertainment, Healthcare & Life Sciences, and Banking, Financial Services & Insurance. Tech Mahindra has set up a 'Video Integration and Engineering' (VIE)

business unit to leverage cutting-edge technology and solutions to cater to the heavy demand of video services in the 5G ecosystem. Tech Mahindra and Rakuten Mobile Network Inc. have collaborated for building world-class, next generation (4G & 5G) Software Defined Network laboratories. This lab will be one of its kind in the industry, which will help create next generation of mobile broadband, enabled by 5G, and transformation of industries across the globe. Tech Mahindra recognized as a leader in group PEAK Matrix™ Report for Automotive & Software Product Engineering Services for their ability to offer large-scale product engineering engagements leveraging their strong project management capabilities and widespread delivery footprint. Tech Mahindra received IDC Insights Award 2018 for the Chatbot UVO. Tech Mahindra wins the Best Business Transformation Solution in Energy from the GEC Media Group. Tech Mahindra's CEO recognized for his significant contribution to the company's strategy and philosophy, by the jury of the 14th Indo-American Corporate Excellence (I-ACE) Awards. Tech Mahindra has emerged as one of the Top 10 Best Companies for Women in India in the 2018 Working Mother & AVTAR 100 Best Companies List. Tech Mahindra gets the "Best International Organization in Skill Development" in the ASSOCHAM Skilling India Awards -2018.





VIVA Bahrain Signs a Nationwide 5G Services Agreement with Huawei

VIVA Bahrain, the leading telecommunication provider in the Kingdom, signed a nationwide 5G service launch MoU with Huawei, a leading global provider of ICT infrastructure and smart devices. Signed at the World Mobile Congress in Barcelona, Spain, this agreement compliments the successful completion of the 5G readiness project located in key areas across Bahrain that was announced recently. VIVA Bahrain will upgrade their existing infrastructure based on non-standalone 5G core and 4/5G dual mode radio unit and high capacity backhauling technologies that will enable VIVA customers to access 5G services across Bahrain by June 2019. Moreover, transmission network's high capacity ready hardware will allow them to rapidly scale up their networks to meet capacity requirements in the near future. Commenting on the occasion, Mr. Mohammad Al Khushail Acting CEO at VIVA Bahrain, said: "We at VIVA Bahrain understand the rapid demand for 5G coverage and devices to breakout in Bahrain, therefore we made the decision to be a pioneer in launching this technology that will position Bahrain among the first to adopt the 5G network globally. Signing the MoU with Huawei who is a long-standing partner of VIVA Bahrain, is considered to be another milestone for us given our aim to innovate to better serve our customers and improve the quality of life for all in Bahrain. We continue our commitment to accelerate digitization in Bahrain and ultimately support our leadership's vision to become a diversified, knowledge-based economy." Mr. An Jian, President of Middle East Carrier Network Business

Group of Huawei, said: "We are proud to be part of VIVA's growth and expansion plans adopting our 5G products and solutions. Additionally, for consumers, we will be launching our recent 5G-compliant CPE and cellphone with VIVA to complete the offering for consumers in Bahrain, and we look forward to working together to bring 5G to Bahrain and support the country in becoming a diversified, knowledge-based economy through digital transformation." VIVA's 5G mobile and wireless fixed services will ultimately enable VIVA customers to enjoy not only gaming VR services and 3D 8K video but will also provide a platform for smart businesses and homes, ultimate VR and AR applications, AI and smart cars.



Viva Announces 5G Readiness across Bahrain

Viva Bahrain, the country's third largest mobile network operator (MNO) by subscribers, has announced the completion of 5G readiness in selected locations nationwide. Viva claims to be the first cellco in Bahrain to enable the

adoption of 5G services and the new network will allow customers to benefit from the Internet of Things (IoT), including virtual reality, ultimate real-time gaming, 3D 8K video, artificial intelligence (AI) and connected cars. Despite the currently limited availability of 5G-compatible devices, Viva says its early adoption of the latest technology is in line with its vision to become the leading mobile operator in Bahrain. As previously reported by TeleGeography's CommsUpdate, in June 2018 Viva Bahrain piloted a 5G trial, in which connection speeds of 1.5Gbps were achieved. Viva has not disclosed the locations where 5G will initially be available for customers.





Yahsat and Thuraya Specialize in Security, Services and Solutions for Military and Government at IDEX 2019

These two associated companies are combining their forces to showcase their latest government and military satellite communication technologies at this year's International Defence Exhibition and Conference (IDEX). Yahsat, the UAE's global satellite operator, together with Thuraya, the mobile satellite services subsidiary of Yahsat will unveil nine new solutions that provide robust, secure and integrated satellite connectivity. The technologies are a part of Yahsat's wider offering of integrated satellite solutions that meet the most complex security requirements of governments and defense clients. These new Yahsat Government Solutions' offerings build upon Yahsat's and Thuraya's experience in operating satellite communication services for over 30 years. Yahsat acquired a majority and controlling stake in Thuraya last year, enabling expansion of its portfolio to include Fixed Satellite Solutions

and Mobile Satellite Solutions for both government and commercial clients. Currently Yahsat Government Solutions provides the UAE armed forces with secure, reliable and robust connectivity in land, sea and air platforms. Held this year at the Abu Dhabi National Exhibition Center from February 17-21, 2019, IDEX is the only international expo in the MENA region to showcase the latest defense technology. Ali Al Hashemi, General Manager of Yahsat Government Solutions and CEO of Thuraya said that they are proud to serve the UAE government by providing them with secure satellite communications; they are continually observing the market and in dialogue with technology providers to find the best technologies and products that enable them to better serve their clients in government and defense segments. Al Hashemi further added that they are now able to provide the UAE Armed Forces with an enhanced offering including Beyond

Line of Sight Communications, Blue Force Tracking, Secure Communications on the Move and Military Grade Handheld Communications, through combining both Yahsat and Thuraya capabilities in fixed and mobile satellite communication solutions, bringing over 30 years of experience in operating global satellite communication services. Following the acquisition, Thuraya's two satellites that serve over 160 countries, joined Yahsat's existing network, Al Yah 1-3 satellites, to expand the group's total fleet to five satellites. As a result of the larger fleet, Yahsat Government Solutions' service portfolio now has the potential to reach a wider breadth of markets through a combination of geostationary satellites operating in the C-, Ka-, Ku- and L-bands. Together, they cover Europe, Africa, the Middle East, South America, Australia and Asia.





Zain Partners With Huawei for New Video Streaming Service

Zain KSA announced a partnership with Huawei in relation towards implementing a 'to Home' video streaming service platform and infrastructure. The announcement comes on the back of a Memorandum of Understanding (MoU) signed between Zain and Huawei on the sidelines of Mobile World Congress in Barcelona. By signing this MoU, the parties agree to cooperate towards the project's successful launch, and boost the 'to Home' business success, especially the Fiber to the Home (FTTH) service. This project will position Zain Saudi Arabia as the first telecom operator in the Middle East to use a cloud solution to build their own video services. The use of cloud technology to launch a streaming service will bring huge benefits both to Zain and its customers in the Kingdom. The video service will give viewers access

to pre-integrated OSN entertainment channels as well access to OSN's on-demand TV service and online catch-up platform, OSN Play which allows views to watch anytime, anywhere and on any device. The service will offer big data-based analysis function which gives users individualized recommendations and targeted advertisements. Migrating to video cloud also enables faster and more cost-effective implementation. Zain is among the first operators in the world to make use of Huawei's video cloud solutions, which Huawei launched in 2018 to catalyze the video channel distribution shift from satellite to IP. The solution tackles the challenges slowing progress in the broadcast industry, particularly high costs, sub-par user experience, and the inability of satellites to meet the growing

demand for immediate high-definition content. Eng. Sultan Bin AbdulAziz AlDeghather, CEO of Zain KSA, said: "We are committed to meeting and exceeding our customers' needs and expectations, and through our latest agreements with Huawei, we'll continue to help lead communities and businesses forward through new connected experiences." Mr. Dennis Zhang, CEO of Huawei Tech Investment Saudi Arabia, said: "We are delighted to partner with Zain to launch this innovative new service. Huawei holds a leading position in 5G and video development, and we are happy to support the Saudi ICT sector and bring the latest innovative technologies that will help transform and develop the Kingdom. Zain is one of the leading companies in Saudi Arabia and we are honored to be working together."

Zain Saudi, Nokia Conduct 4.9G Pilot to Boost Capacity and Customer Experience With 5G-Ready Massive MIMO Active Antenna on 2.6 GHz

Nokia and Zain KSA have started a massive Multiple Input Multiple Output (MIMO) pilot in the city of Jeddah in Saudi Arabia on the TD-LTE network using 2.6 GHz spectrum. The pilot uses Nokia's 5G-ready AirScale massive MIMO antenna for 4.9G calls to improve network capacity to provide speeds of above 700 Mbps per user, enabling customers to enjoy extreme broadband applications without experiencing any buffering. Once the pilot is completed, the actual deployment will allow Zain to meet the growing demand for ultra-broadband services while deploying 5G-ready equipment. Zain will be able to add revenue streams by launching innovative services and products for its subscribers. Massive MIMO is especially useful in helping service providers add capacity in densely populated urban environments. Massive MIMO uses 64-Transmit-64-Receive (64T64R), which allows unprecedented Gigabit-level throughput enabling users to enjoy new use cases including Augmented Reality and Virtual Reality. Nokia's 5G-ready AirScale massive MIMO antenna paves the way for the transition to 5G and coexistence with



LTE on the 2.6 GHz band, delivering better network capacity, improving coverage and significantly enhancing uplink and downlink speed. Eng. Sultan Abdulaziz AlDeghather, CEO of Zain Saudi Arabia, said: "This pilot is a significant milestone in our journey towards 5G. The deployment of massive MIMO helps us meet our customers' evolving needs for the best experience even while using multiple bandwidth-hungry applications. As our longstanding partner, we are confident that Nokia's proven expertise will allow

us to provide innovative use cases to Zain KSA's individual and enterprise customers." Ali Jitawi, head of the Zain Saudi Arabia customer team at Nokia, said: "We are thrilled and proud to be carrying out this prestigious project for Zain. This successful pilot and later deployment will allow Zain to delight its customers with extreme broadband. It will also add to their revenue streams as they will be able to provide newer services to their subscribers." 📺

ARTICLE

Digital Transformation and the Telecoms Sector: *The Time to Embrace the Future is Now*

Over the past decade, the modern digital revolution has redefined many of the conventions that governed the way we do business, ushering in an era of unbridled progress that is impacting all critical business sectors, including education, health, government and everything in between. But it is perhaps the telecoms sector that is presenting the most remarkable case study for this transformation, as not only is it the backbone of our economies, but also the sector in which the simplest changes can seem considerably disruptive.

For Umniah, digital transformation has and continues to be the key driver of its future vision, driven by the ever-changing usage trends among its key target demographics.

It would be an understatement to say that the global telecoms sector is experiencing a fundamental paradigm shift. Today, whether you are a start-up operating from a dorm room or a multi-billion dollar corporation, it stands truer than ever that you either go digital, or go home. And yet, despite the virtually limitless potential offered by this open future, many businesses remain slow to embrace the modern digital revolution. While any change bears its inherent risks, the past decade has demonstrated that for operators to stand still is perhaps the riskiest approach in this day and age.

For Umniah, digital transformation has and continues to be the key driver of its future vision, driven by the ever-changing usage trends among its key target demographics. As customers embrace core technologies and experiences such as media streaming, cloud storage, and online collaboration, all the while expecting more streamlined mobile payment experiences, it became clear that a shift in the way these services are made available was necessary to continue providing a well-rounded and streamlined experience. As a result, Umniah set out to reinvent many of its core services, paving the way for the Jordanian telecoms sector to evolve beyond its conventional business model.



Zaid Ibrahim
Marketing Director
Umniah



The customer service process at Umniah was revamped to embrace a digital-focused approach, with complaint filing and tracking being entirely moved into a digital database accessed through the web and the mobile app. The app itself became Umniah's flagship product for customer affairs, effectively serving as a one-stop-shop for subscription management.

The strategy developed by Umniah focused on adopting digital transformation commercially across all levels and functions of the company. This necessitated reinventing many of the core databases and data management tools used by various departments, including key departments such as customer service and product development. The strategy included a number of key transformative goals: revamping the company's primary digital platforms; moving the customer service process to entirely digital platforms; launching a mobile payment solution that not only targeted the average consumer but also reached unbanked customers in rural areas; and making digital transformation a core component of company structure, setups, functions and culture.

The implementation of the strategy took place over several stages. Firstly, the customer service process at Umniah was revamped to embrace a digital-focused approach, with complaint filing and tracking being entirely moved into a digital database accessed through the web and the mobile app. The app itself became Umniah's flagship product for customer affairs, effectively serving as a one-stop-shop for subscription management. This necessitated offering a slew of features that are integral to the customer experience. In

addition to basic account management services, such as the addition or removal of services, prepaid credit top-ups, and bill payments, the app has a set of exclusive features that are unrivaled in the industry. For example, Umniah has completely digitized the customer support process, allowing customers to create and follow-up on support tickets directly through the app. This includes live customer service chat, calling customer support, or even scheduling appointments for in-store support.

Umniah followed this by launching Mahfazti, a mobile payment solution that allows customers to make internal and external transfer of funds, perform cash withdrawals, settle bills, make purchases from various third-party vendors, make NFC transactions, in addition to a slew of other benefits that redefined the way customers make daily transactions. This was followed by the introduction of umnicoin, which serves as a fully digitized loyalty program with no physical membership cards or vouchers in sight. With umnicoin, customers benefitted from on-the-spot redemption and request of the desired service from the customer side or even donate to charitable associations, all completed through a smooth customer experience and one redemption step at the merchants' shops or via the merchant's mobile application. Umniah also offered customers the ability to transfer prepaid balance to each other directly through the app – a service that for other operators still relies on non-intuitive code-based processes.

This digital focus also permeated the core culture of the company. In addition to investing in frequent awareness and capacity building sessions on the importance of digital transformation, Umniah's social responsibility efforts also took on a digital-centric approach. For instance, following Umniah's implementation of the largest national connectivity project which was a tender for the Ministry of Education, in cooperation with the Special Communication Commission of the Armed Forces - Arab Army to deploy a nationwide network that would connect the ministry's various

constituencies in an effort to establish a more future-proof foundation for public education, Umniah took the initiative to providing free safe internet connectivity to 2769 schools benefiting more than 1.3 million students, 100,000 teachers and administrators in the Ministry of Education. Meanwhile, Umniah's business incubator – The Tank – has since become a major reference point for startups and entrepreneurs to learn the foundational technologies driving digital transformation, such as IoT, cloud computing, and others.

Umniah's business incubator – The Tank – has since become a major reference point for startups and entrepreneurs to learn the foundational technologies driving digital transformation, such as IoT, cloud computing, and others.

The result – based on extensive surveys and analyses of trends – is that the entire customer experience, as well as the brand image of the company, have been redefined. With users becoming accustomed to the operator-as-a-service business model, it became increasingly more feasible to form a direct connection to the customer, thereby overcoming one of the most notable difficulties faced by operators around the globe. More importantly, these digital services became viable marketing tools through which the essence of the Umniah brand can be communicated and shared.

Umniah's experience quite simply reveals the inherent beauty of the digital market, which is rooted in its reliance on progressive growth. In an industry driven by transformation, new ideas can quickly evolve to become long-term successes. More importantly, it shows that change, while difficult and inherently risky, is simply inevitable in today's climate, and perhaps the soundest investment an operator can make in its own future. 📌

REGIONAL NEWS

Saudi Technology Ventures Funding Rounds Account for 30% of MENA Capital

Riyadh-based MENA venture capital fund Saudi Technology Ventures (STV) led approximately \$250m worth of funding rounds in 2018, accounting for almost 30% of the estimated \$893m deployed in the region's venture capital last year. In its first year of operation, it deployed around \$100m of its \$500m fund, and assessed over 500 opportunities, building a portfolio of regional technology start-ups covering digital media, ride-hailing, e-healthcare and cloud communications. Alongside other global investors, it also led a \$200m Series F funding round in Dubai-based tech and ride-hailing company Careem, with STV CEO Abdulrahman Tarabzouni also a member of its board. STV led Saudi Arabia's largest venture deal of 2018 with

its investment in cloud-communications platform Unifonic, which allows companies to connect with customers through SMS, Voice, and other channels. Additionally, STV invested in Saudi digital video content producer Telfaz11, Egypt-based healthcare appointment app Vezeeta and US-based start-up Proof, which helps online businesses improve user conversions using social proof signals. "In a very short space of time, we have dramatically increased the quantum of venture capital available to regional start-ups, creating a completely new playing field for MENA VC. Highly attractive fundamentals coupled with unique investment opportunities in the region have seen the number of funds investing in technology grow almost 4-fold

over the last six years and we are excited to be a major part of this growth," said STV chief Tarabzouni. He added that the fund is now looking to deploy capital at an increased pace as it looks to find, grow and scale the region's best tech start-ups. According to McKinsey, start-up and SME funding in MENA constitutes only 10% of the funding in the US, relative to GDP. The region saw \$893m invested in 366 start-ups in 2018, while venture capital funding reportedly rose 31% from 2017, according to market researcher Magnitt. STV is one of the largest venture capital funds in the Middle East, with over \$500m in deployable capital. It began operations in early 2018 and has offices in Riyadh and Dubai.

Dubai Plans e-Commerce Zone with Investment of US\$545 Million

State-developer Dubai South said on Monday it aimed to spend two billion dirhams (\$545 million) to build an e-commerce free trade zone offering foreign firms 100 percent ownership. Foreigners operating outside of free trade zones in Dubai and the wider United Arab Emirates can usually only hold a maximum 49 percent stake, with UAE nationals holding the rest. The new 920,000 square metre trade zone, known as EZDubai, aimed to attract e-commerce, logistics and other related industries, the developer said, adding that construction was expected to start in 2019. Dubai is already the headquarters of the region's largest e-commerce company, Souq.com, which was bought by Amazon in 2017. It is also home to noon.com, an online shopping site set up by Dubai billionaire Mohammed Alabbar. Dubai South aimed to invest two billion dirhams over four years in the zone, although the timeline for spending the cash would depend on demand, the logistics district head for Dubai South,

Mohsen Ahmad, told Reuters. Ahmad said the funds, which Dubai South planned to raise from banks and other institutions, would be spent on infrastructure, offices

and warehouses. EZDubai will be located in the south of the emirate near industrial and residential developments and Dubai's second airport, Al Maktoum International.



19 Million Moroccans Go Online Daily

Eighty-six percent of Moroccan internet users (22.56 million) go online daily, 11 percent weekly, and 2 percent monthly, according to Hootsuite and We Are Social's 2018 digital report released last week. Seventeen million, or 47 percent of the population, are active on social media. Most of those, 16 million, use social media from their mobile phones. The report's statistics for Morocco apparently did not include Western Sahara. In Western Sahara, the number of internet users increased by 364 percent or 102,000 users, the Next Web quoted the report. There are 43.76 million mobile subscriptions in Morocco, which had an estimated population of 36.41 million people in 2018. The report shows an annual digital growth of 1.2 percent between January 2018 and January 2019. Mobile phone usage rose by 5.7 percent over the same period while the number of active users on social networks grew by 1 million, or 6.3 percent. Ninety-six percent of the total adult population have a phone. Fifty-seven percent have a smartphone. In contrast, only 25 percent of adults use a computer, 14 percent use a tablet, 87 percent have a television, and 7 percent have a streaming device. The average internet speed for mobile is 20.77 megabits per second, compared to 13.87 megabits per



second for cable. Both speeds increased by more than 26 percent in 2018 compared to a year earlier, according to the report.

Turkcell 2018 Annual Sales Jump 20.8% on Digital Services Strategy

Turkcell's consolidated group revenue grew by 20.6% year-on-year in Q4 2018 to TRY5.626 billion (USD1.060 billion) and by 20.8% in FY 2018 to TRY21.293 billion. EBITDA grew 28.8% and 41.1% in 4Q18 and FY18 respectively to TRY2.239 billion and TRY8.788 billion. Net profit for the quarter reached TRY863.9 million (a 300.1% year-on-year improvement) and TRY2.021 billion for the full year (a 2.1% increase on 2017's result). The Turkey division was

the main driver of growth, with strong ARPU performance helped by the group's digital services-focused strategy, its press release stated. Turkcell's Turkish revenues rose by 18.4% to TRY4.785 billion in 4Q18 (comprising 85% of group turnover) and by 18.2% to TRY18.266 billion in the twelve months ending 31 December 2018 (including 'data and digital services' annual revenue which grew by 16.4% to TRY11.997 billion). 'Turkcell International' divisional

revenues increased 46.3% to TRY422 million in 4Q18 (7% of group revenues) – on improvements in both Lifecell (Ukraine) and BeST (Belarus) mobile revenues – and by 36.5% to TRY1.457 billion in FY18. 'Other subsidiaries' revenues – including 'information and entertainment services, call centers and financial services' – rose by 24.3% to TRY419 million (7% of the group total) for the fourth quarter and by 40.8% to TRY1.570 billion for the year.

Faster Internet as du Confirms New Subsea Cables to Link UAE, Pakistan

Emirates Integrated Telecommunications Company (EITC), the parent company of du, is driving the progress of the nation by facilitating the launch of a new submarine cable between the UAE and Pakistan. The cables are expected to provide faster internet connectivity speeds and increase the amount of data flowing in and out of the UAE and significantly enhance

redundancy in operations. Bandwidth capacity is expected to increase with the launch of fifth generation of mobile cellular network (5G). Almost all of the internet data is transmitted through the submarine cables rather than satellite communication systems. These fiber optic cables are specially made to withstand shark bites, harsh environment and

pressure and are laid underneath the sea but are susceptible to natural disasters and sabotage. A number of projects are underway to increase the bandwidth capacity. According to statistics, there are over 420 submarine cables in service currently, stretching over 700,000 miles (1.1 million km) around the world.

Microsoft to Support Jordan's ICT Sector and Cybersecurity

The Crown Prince Hussein attended a signing ceremony for a memorandum of understanding (MoU) between the ICT Ministry and the Crown Prince Foundation (CPF) on one side and Microsoft on the other, a Royal Court statement said. The MoU, signed on the sidelines of the World Economic Forum in Davos, Switzerland, stipulates support from Microsoft in the Kingdom's digital transformation process through adopting artificial intelligence technologies and the formulation of policies related to the sector, including in the areas the Internet of Things and Blockchain. The memo aims to enhance cooperation in the fields of upgrading and developing the communication and IT sectors and cybersecurity. It is also aimed at strengthening the legislative and regulatory environment of the sector, digital transformation, artificial intelligence, stimulating innovation, entrepreneurship and technical and vocational education in Jordan. Under the agreement, the three institutions will cooperate to achieve capacity building needed in the fields of artificial intelligence, the Internet of Things, data classification and cloud programming along with training of human resources. The MoU signed by Microsoft Jordan Executive Director Hussein Malhas and Minister of State for Investment Affairs Muhannad Shehadeh, in the presence

of Microsoft's Executive Vice President and President of Global Sales, Marketing and Operations Jean-Philippe Courtois, includes "working collectively to identify a roadmap to accredit and implement digital services in the Kingdom's sectors that have been given priority", according to the statement. As per its mission to empower the Jordanian youth, the CPF's role under the agreement would be implementing the accord's articles according to a plan that involves three phases; the first of which is building the capacities of some 1,000 young local software developers. In the second phase, five to 10 emerging companies in

the field of software development will be identified and connected with business accelerators and investors in the field of artificial intelligence. The CPF will also bolster these companies' participation in international platforms such as Emerge 100 and Startups Conference along with establishing the "21st Century AI Skills Lab AppFactory". As part of the third phase, an e-platform will be launched to widen the scope of work to reach 500 companies, 16,000 programmers and developers in addition to 50 startup emerging companies.



Edotco Intends to Endow in Pakistan's Telecom Network



Suresh Sidhu, chief executive officer for Edotco Group said that Pakistan could become hub of connectivity on telecommunication services with Gulf region. The company was willing to invest hundreds of millions of dollars more to make the infrastructure cost-effective. Edotco is dedicated to laying the groundwork of a 5G-ready Pakistan, but it required some pre-requisites, including fabrication, Smartphone penetration and spectrum availability. Currently, around six percent towers in the country were fiber connected, with around 31 percent Smartphone penetration. By 2022, Pakistan's telecommunication industry would need over 30,000 new towers as compared to the amount it has now. The towers in Pakistan are operating at approximately 4,300 subscribers per tower. Service provider company, in September called off a \$940 million deal to buy 13,000 telecoms towers in Pakistan for the transaction. Edotco Company has grown rapidly and attracted new shareholders.

PTCL's Revenue Grows 8 Percent in 2018

The Board of Directors of Pakistan Telecommunication Company Limited (PTCL), the country's leading telecom and ICT services provider has announced its financial results for the year ended December 31, 2018. PTCL Group's revenue for the year 2018 grew by 8pc to Rs126.2 billion as a result of positive contribution by all group companies. The group's revenue growth in the fourth quarter accelerated to 13pc YoY. Ufone revenue increased by 13pc YoY. UBank, a microfinance banking subsidiary of PTCL, showed significant growth of 64pc in its revenue over the last year. PTCL Group's operating profit and net profit for the year improved by 198pc and 32pc respectively. Likewise, net profit of PTCL Group went higher by 22pc compared to last year. PTCL revenue of Rs70.1 billion for the year is 0.7pc higher than last year, with quarter 4 showing an accelerated growth of 3.4pc YoY. In 2018, PTCL's revenue registered YoY growth for the first time since 2014. In 2018, three-quarters of PTCL's revenue base showed growth over the last year. PTCL's flagship fixed broadband services posted revenue growth of 6.5pc over 2017. Investment in the transformation of network exchanges resulted in enhancing the customer experience by reducing network faults by 36pc and repeat faults by 50pc, along with providing higher bandwidths beyond 100Mbps, bundled with Triple Play services. To further enrich the product and services portfolio, PTCL partnered with the global OTT players like Netflix, STARZ Play, icflix, etc. PTCL has also been recognized by Brand Finance as the 'Fastest Growing Brand in Pakistan'. Corporate business continued to perform strongly and showed significant growth of 13pc over last year by signing new customers in managed services and cloud infrastructure services resulting in 154pc and 188pc growth respectively in these two segments. Conversion of EVO customers to Charji/LTE yielded positive results with YoY revenue growth

in double digits, however, it also resulted in higher subscriber acquisition cost as compared to last year. There is a continued decline in domestic and international voice revenues due to an increase in illegal/grey traffic termination, continued conversion of subscribers to OTT and cellular services, resulting in declining voice traffic volumes. PTCL's operating profit for the year is lower by 9pc, compared to 2017, mainly due to an increase in operating cost on account of currency devaluation and higher subscriber acquisition cost. Further, non-operating income also declined due to reduced funds as compared to last year. Net Profit for the year is Rs7.4 billion which is 11pc lower compared to last year, driven by lower operating profit and lower non-operating income. In 2018, the financial strength of PTCL was acknowledged through an independent rating exercise as a result of which JCR-VIS has assigned PTCL a long-term rating of AAA which will enhance all stakeholders' confidence in the long-term sustainability of the company.



inwi Offers Morocco Its Largest Datacenter Infrastructure

inwi inaugurated its new Datacenter in Rabat Technopolis. A cutting-edge infrastructure, built in accordance with the most advanced international standards, confirming inwi's leadership in Cloud and digital transformation. As a global telecommunications operator, inwi has contributed, since its creation, to the democratization of technology access through innovative services and solutions, tailored to every individual needs, throughout the Moroccan territory. This Datacenter materializes inwi's commitment to the digital transformation of our economy. It reinforces inwi Datacenter infrastructure to offer Moroccan companies hosting and development services in accordance with the international standards in

terms of connectivity, efficiency and security, explained Mrs. Nadia Fassi-Fehri, Chief Executive Officer of inwi. This new Datacenter offers an area of 1000 m² extensible to an additional 1000 m², bringing the total area of inwi's Datacenters to 4000 m² across the country. This is the largest dedicated area to Datacenters in Morocco. Designed and certified in accordance with the TIER III standard, the worldwide reference in terms of availability, this site offers a redundancy of all the strategic operating installations (electrical chains, air conditioning systems, network connectivity, etc.). The connectivity of this strategic facility is provided by redundant fiber-optic networks, allowing all customers to safely access, 24/7, the various data hosted on-site. Therefore,

this new Datacenter enables inwi to offer on demand public Cloud and physical hosting services, assisting companies in their digitalization process on a daily basis. It is also the perfect illustration of the continuous investment efforts made by «inwi» to provide Morocco with cutting-edge technological infrastructures, and help building a Sovereign Cloud where 100% of data is hosted in the country, on an identified and fully secure site. This is a crucial point. Moroccan companies, small or large, need to rely on infrastructures and solutions that ensure the best data security. Building a Sovereign Cloud allows our country to improve the competitiveness and attractiveness of its economy» concluded Mrs. Nadia Fassi-Fehri.

USF Pakistan Awards Contract to Jazz for Providing Mobile Broadband Coverage in North Waziristan

Universal Service Fund (USF) Pakistan has awarded a contract worth Rs 192 million to Pakistan's leading digital communications company, Jazz. This contract has been awarded by USF under its Broadband for Sustainable Development Program. As part of the deal, Jazz will work towards providing mobile broadband access to people of North Waziristan Agency, Frontier Region Bannu and Frontier Region Lakki Marwat. The Chief Executive Officer (CEO) USF Rizwan Mustafa Mir signed the contract with the Chief Corporate and Enterprise Officer Jazz Ali Naseer. The Chief Guest of the ceremony, Federal Minister for Information Technology and Telecommunication Dr. Khalid Maqbool Siddiqui, while addressing the audience, stated that with constant dedication and devotion, the Ministry of IT and Telecom had achieved yet another significant connectivity milestone. Khalid Maqbool Siddiqui also added that with such projects, Ministry for IT through USF would continue to work towards achieving the mission of broadband penetration across the country to facilitate the people in rural regions. He said that in addition to Broadband Infrastructure, he expected USF to launch new e-services and m-services to facilitate digital lifestyle adoption for the people of Pakistan. Also speaking at the ceremony, the CEO USF Rizwan Mir said that with the signing of North Waziristan contract, Universal Service Fund's aim is to provide voice and data services to remote and underserved areas of Pakistan, where it is most critical for development. He added

that this network would be completed in 24 months for providing 3G/4G and Voice Services to a population of 0.57 million in 401 unserved Mauzas. He further said that with the improvement of law and order situation in FATA areas, provision of advanced ICT infrastructure would be a key to the development efforts in the region. He said that we enjoy great support from Ministry of IT and Telecom as well as the ICT industry in our common mission to continuously work towards expanding broadband to all Pakistanis. He mentioned that USF was planning to launch several new broadband projects in the next few months, including one in South Waziristan. While addressing the audience, the Chief Corporate & Enterprise Officer at Jazz Ali Naseer, said, "Through this collaboration, Jazz and USF have successfully bridged

the digital divide in the country's remotest region. This is why the project has special significance for us and in due time residents of 401 administrative muzas will have access to the country's fastest mobile broadband connectivity. We are looking forward to assisting these people in unlocking their potential in an increasingly interconnected world." The USF-Jazz partnership would also open up new progressive opportunities for local communities such as e-commerce. Digital and e-services are a rapidly evolving field and can provide better health, education, agriculture and business opportunities to the people in these areas. In order to execute this project, 28 towers will be installed by Jazz in about a year.



VEON Aims to Buy out Egypt's Global Telecom

Telecoms operator VEON Ltd said it intends to offer 5.30 Egyptian pounds (\$0.3005) per share for the 42.3 percent of Cairo-listed Global Telecom Holding it does not already own. The offer for the stake in Global, formerly known as Orascom, represents a 20 percent premium to its closing price

on Monday and is worth \$600 million. VEON, based in Amsterdam, operates telecommunications companies in Russia and in developing countries in Asia and North Africa. It holds a 55.6 percent stake in Global, which operates the Djezzy network in Algeria, Mobilink in Pakistan

and Sheba Telecom in Bangladesh. Veon said in a statement it has not yet submitted the offer to Egyptian financial authorities and it would not comment further. It called off a previous attempt to buy out Global's assets in October.

Bangladesh Pushes for Third Submarine Cable

With existing internet bandwidth likely to be exhausted next year, the government is in talks with a consortium for a third undersea cable connection. The demand for internet bandwidth almost doubled in the last one year, to 1,000 gigabits per second (Gbps) from 550 Gbps of late 2017. And experts fear the country could run out of bandwidth even sooner. They say Bangladesh needs to act fast or else it would have to depend heavily on import from India. But the third connection is going to cost the country a pretty penny and will not happen until 2022. Bangladesh paid Tk 500 crore for its first undersea connection (SEA-ME-WE 4) in 2006. Myanmar shared the cost of a branch line for Bangladesh's second undersea cable connection (SEA-ME-WE 5) in 2017 but it still cost the country Tk 650 crore. The third cable Bangladesh wants to connect to is going to be further out into the Bay of Bengal than the first two, which will jack up the branch line cost. Furthermore, Myanmar this time is showing little interest in getting connected with the cable (SEA-ME-WE 6). Bangladesh is trying to get the cable closer to its shores so that the cost of the branch line is less, said an official of state-run Bangladesh Submarine Cable Company Ltd (BSCCL) which meets lion's share of the country's internet demand. The top brass of BSCCL said on January 18 the consortium members of SEA-ME-WE 6 met in Singapore, where representatives of China Telecom Global, China Telecom, True Thailand, Ni2i of Mauritius, and companies from Singapore, India, Sri Lanka, and Saudi Arabia were present. BSCCL did not attend the meeting but they have been in touch with the consortium via phone and email. Things were in the preliminary stage and if everything went well, Bangladesh would be connected by 2022, said a BSCCL source. Telecom and ICT Minister Mustafa Jabbar said definitely cost would be considered but at the same time the country needs to consider the growing demand. "More and more new technologies are hitting the market, fuelling growth in data consumption," he said. The minister said the growth rate was flying and Bangladesh would exhaust its bandwidth capacity

within the next year. It would not be possible for the BSCCL to meet demand unless an alternative source of internet was in place, Jabbar said. "For the next one, we will get huge bandwidth. I am not sure but it might have 10 Tbps [terabit per second] of ultimate capacity, and we can then look into exporting bandwidth to neighboring landlocked countries as well." The cable's capacity is usually determined by the ability of the equipment used for transmitting and receiving data through it. The equipment can be upgraded to obtain more bandwidth until the cable's ultimate capacity is reached. Another reason for considering the third submarine cable is that the first cable is nearing the end of its 20-year life, said a BSCCL official. "It is not possible to expand the capacity of the first undersea cable much and its maintenance cost is also increasing every year," the official said. With the two existing cables, the BSCCL can deliver 1,800 Gbps but is actually using about 650 Gbps. Bandwidth imported from India is used for meeting the rest of the demand. BSCCL also exports about 10 Gbps to eastern parts of India. Bangladesh has around 9.13 crore internet accounts as of December 2018, according to Bangladesh Telecommunication Regulatory Commission (BTRC).



Karandaaz Vows to Promote Fintech Innovation in Pakistan



Karandaaz Pakistan signed grant agreements with the winners of its third 'FinTech Disrupt Challenge' at a ceremony in the metropolis. The annual challenge, run with the support from the Bill & Melinda Gates Foundation, funds start up ideas that use technology to bring financial services to the underserved segments of the economy and create a social impact. In this round, Karandaaz had invited FinTechs to design and present solutions in nine thematic areas, including payments, interoperability, consumer/retail banking, regtech, insurtech, mobile wallets, loyalty programmes, lending, and savings. After a close competition between 16 FinTech startups, the three that were selected included Matilda Solutions, Love for Data, and AgriMart. Matilda Solutions is working on developing a biometric verification authentication suite, which will include fingerprint verification, liveness detection, and facial recognition. Love for Data is developing a credit scoring algorithm based on data analytics, which will predict fraud detection and credit profile of a consumer.

Active Social Media Users in Pakistan Grow by 5.7 Percent

A Global Digital Report released by We are Social and Hootsuite has revealed active social media users in Pakistan grew by 5.7% till January 2019. Pakistan's mobile internet users as a percentage of the population were recorded at 21% at end of January 2019, as per the report prepared by We Are Social and Hootsuite. The percentage remained unchanged from the previous report published in January last year, which documented Pakistan's mobile internet users as a percentage of the population at 21%. Pakistan's mobile subscriptions stood at 154.3 million, internet users with a penetration of 22%, active social media users at 37 million with a penetration of 18% and mobile social media users at 36 million with a penetration of 18%, said the report. Annual digital growth (Jan 2018-Jan 2019) according to the report for mobile subscriptions witnessed a 5.6% increase or addition of 8 million, active social media users rose 5.7% or by 2 million and mobile social media, users grew 13% or by 4 million. Device usage (survey-based) as a percentage of the adult population for mobile phones (any type) was recorded at 82%, smartphone 32%, laptop or desktop computer 10%, tablets 1%, television (any kind) 76% and wearable tech device 1%, observed the report. Pakistan's total number of active internet users based on active user data and active use of internet-powered mobile services was recorded at 44.61 million till January 2019. Moreover, internet users as a percentage of the total population stood at 22% and the total number of active mobile internet users at 43.40 million as of January 2019. The number of internet users for Pakistan sourced from different places stood at 44.61 million according to Internet World Stats, 31.45 million as per International Telecommunication Union (ITU), 31.45 million as per World Bank and 31.34 million CIA World Factbook, the report stated. The frequency of internet usage on an everyday basis for personal reasons was recorded at 58% every day, 31% at least once per week, 8% at least once a month and 3% less than once per month, the report stated. According to data shared by We are Social, the average

speed of mobile internet connections was recorded at 12.83 MBPS, recording a year-on-year decline of 9.8%. The average speed of fixed internet connections stood at 8.04 MBPS, registering a rise of 31% YoY, said the report. Data compiled by SimilarWeb highlighted websites ranking by average monthly traffic and showed YouTube generated the highest amount of traffic monthly of 92,300,000 and time per visit was recorded at 31 minutes and pages per visit were 14.5. Search engine behemoth Google generated a monthly traffic of 75,500,00 with time per visit of 12 minutes 36 seconds, Facebook generating monthly traffic of 46,000,000 with time per visit of 17 minutes 45 seconds, Whatsapp with 8,000,000 monthly traffic and time per visit of 2 minutes 39 seconds. The surprising entrant in this list was Daraz, the e-commerce website which generated monthly traffic of 5,700,000 with a time per visit of 6 minutes 46 seconds and Twitter attaining monthly traffic of 5,300,000 with time per visit of 11 minutes 19 seconds. As of January 2019, the total number of active social media users was recorded at 37 million, active social media users as a percentage of the population were 18%. And the overall number of active social media users accessing via mobile devices was recorded at 36 million and active social media users as a percentage of the population were 18%, said the report. Statistics shared for social media advertising audiences revealed some interesting facts. Total advertising audience on Facebook (monthly active users) was recorded at 36 million, with the demographics being dominated by males at 79% and females at 21%. The overall advertising on the audience in terms of active monthly users stood at 6.30 million, with females representing an audience of 33% and males at 67%. And Snapchat's total advertising audience on monthly active user basis was recorded at 2.15 million, with females representing 56% of the audience and males 42%. LinkedIn's total advertising audience in terms of registered members stood at 5.10 million with males taking a major share of 83% and females a meagre 17%. Interestingly, Twitter's total

advertising in terms of active monthly users was the lowest out of all social media platforms, touching 1.26 million with males again being the dominant force with 82% share and females 18%. The quarterly growth for these respective social media platforms based on active monthly users and total addressable advertising audiences was as follows, Facebook with zero percent change, Instagram recording a 5% growth, Twitter registered a decline of 8.4% alongside Snapchat of 4.4% and LinkedIn grew by 6.3%. Pakistan's total number of mobile connections (based on the number of cellular connections) as of January 2019 touched 154.3 million. And mobile connections as a percentage of the entire population stood at an impressive 76%, with the percentage of prepaid mobile connections standing at 96%, the percentage of postpaid mobile connections at 4%. The percentage of mobile connections that are broadband categorized as 3G/4G was recorded at 41%, as per the report. Pakistan's mobile connectivity index metrics as per GSMA's Intelligence evaluation attributed it an overall country index score of 37.08 out of a possible score of 100. GSMA Intelligence gave Pakistan's mobile network infrastructure a score of 34.45 out of 100, affordability of devices and services scored 56.37 out of an overall score of 100. Moreover, it ranked Pakistan's consumer readiness at a poor 27.77 from a possible maximum score of 100 and the availability of relevant content and services score was 35.05 out of a 100. The report's financial inclusion factors section recorded the data based on the percentage of the population aged 15 and over, that reports owning or using each financial product or service. Those having an account with a financial institution was recorded at 21%, credit card a meagre 1% has any mobile account 6.9%. And people making online purchases or paying bills online was recorded at 8%. And women with a credit card was recorded at a measly 0.7% and for men, it was 1.2%. According to the report, the percentage of men making online transactions was recorded at 12% and for women, it stood at 3.3% as of January 2019. 📍

SATELLITE NEWS

D-Orbit Will Launch Planet Satellites

D-Orbit signed a contract with Planet for the launch and deployment of six Dove-series satellites. Under the contract, D-Orbit will launch and deploy the satellites during the first commercial mission of ION CubeSat Carrier, the core technology of the InOrbit NOW launch service offered by D-Orbit. The mission will launch in August 2019, on the Vega launch vehicle as part of the Small Spacecraft Mission Service (SSMS) Proof of Concept (POC) flight. With more than 300 satellites launched as of today, the Flock constellation of Dove-series satellites constitutes the Earth's largest constellation of Earth-imaging satellites ever put into orbit, according to the release. The Flock constellation provides a snapshot of the Earth's landmass every twenty four hours at 3 to 5 meters optical resolution. The ION CubeSat Carrier, a satellite platform developed and operated by D-Orbit, is a free-flyer dispenser able to host a combination of CubeSats ranging in size from 1U to 12U+ (and soon 16U as well) for a combined volume of 48U. Once in orbit, the CubeSat carrier deploys each individual spacecraft in an individual orbital slot, with orientation and impulse specified by the client. This feature enables a faster dispersion of a batch of satellite within an orbital plane, and Planet will test the ION's accelerated phasing capabilities on this

upcoming mission. "We are honored to partner with Planet, the leading smallsat operator in the industry," said Renato Panesi, D-Orbit Chief Commercial Officer. "We are proud Planet has chosen our ION CubeSat Carrier for their next mission. Our launch services are ideal for the small satellite market because they provide high performance by accelerating the phasing of released satellites at an affordable cost. We believe this contract is the start of a long-term cooperation."



ISRO is Preparing Emisat and 28 Satellites for Launch

The Bengaluru, India-based space agency Indian Space Research Agency (ISRO) is ready to launch an electronic intelligence satellite Emisat for the Indian Defence Research and Development Organization in March, this information according to the agency's Chairman, K. Sivan. Additionally,

ISRO will be launching 28 third-party satellites, demonstrating the agency's new technologies, such as three different orbits with a new variant of the Polar Satellite Launch Vehicle (PSLV) rocket in March, said Sivan. ISRO is also preparing to launch two more defence satellites in July/

August for which the agency will use their new Small Satellite Launch Vehicle (SSLV). Sivan said after launching Emisat at an altitude of 763 km., the rocket will decrease in altitude to place the 28 satellites at an altitude of 504 km.

Teleste Continues Optic Deliveries for Türksat Broadband Network

Teleste will continue the deliveries of optical headend products to Türksat, a satellite and cable operator in Turkey. Extending the headend optics deployments last year, the new deliveries will again be carried out in cooperation with Teleste's local partner, Telco İletişim Teknolojileri, and they will take place during the course of 2019. "We appreciate that our long-term

customer Türksat decided to continue with us and Telco İletişim Teknolojileri in carrying out their network upgrades. We are pleased to see that excellent support and firm commitment to the customer's success have helped us achieve business continuity and strengthen our brand in Turkey and nearby areas", said Teleste Vice President (VP) of Hybrid Fiber

Coaxial (HFC) Networks Rami Kimari. The deliveries to Türksat continue with high-density products in Teleste's HDO family of headend optics for optical data transmission. The compact equipment aims to save space in headends and hubs, and also fully meets the requirements for DOCSIS 3.1 networks.

Cobham SATCOM to Supply Ground Infrastructure for the World's Most Advanced L-Band Satellite Constellation

Cobham SATCOM will provide L-band ground infrastructure for Inmarsat's I-6 constellation, currently set for first launch in 2020 – the company's next generation radio access network (RAN) leverages scalable technologies to deliver a more flexible, digital system, enabling Inmarsat customers to keep pace with market requirements. According to the company, I-6 will be the world's most advanced L-band satellite constellation. The network will extend Inmarsat's L-band BGAN offering, delivering additional capacity while enabling future capabilities from advanced global safety services and low cost mobile solutions, to Internet of Things (IoT) applications. This initiative continues a 30-year plus partnership between

Cobham SATCOM and Inmarsat extending across land, maritime, space, and aviation. In addition to producing market-leading user terminals in all categories, Cobham

SATCOM has developed and maintained the L-band radio access network and constructed Inmarsat Land Earth Stations in 17 countries since 1990.



Successful Launch of the First Six OneWeb Satellites by Arianespace

The cluster of spacecraft – produced by the OneWeb Satellites joint venture of OneWeb and Airbus was successfully deployed into a circular LEO on Arianespace's first Soyuz

mission of 2019 (and the launch services company's second mission overall for this year). Lifting off from the Spaceport in French Guiana, the workhorse medium-

lift vehicle delivered its payload during a flight lasting 1 hour and 22 minutes. Total payload lift performance was estimated at 1,945.2 kg. After an initial powered phase of Soyuz' three lower stages, the flight – designated VS21 in Arianespace's numbering system included two burns of the Fregat upper stage to place its passengers at their targeted deployment point. OneWeb is building the world's largest and highest throughput satellite system to connect everyone, everywhere – by land, air, sea with a vision to bridge the digital divide once and for all. The first six spacecraft will operate at an altitude of 1,200 km. in a constellation that will deliver extremely low latency for customers and provide communications access to the entire world with fiber-quality internet connectivity. The initial constellation will be comprised of approximately 650 satellites and will scale to more than 900 spacecraft as it grows to meet demand around the world.



Indonesia Launches Internet-Only Satellite, Nusantara Satu

The Jakarta Post writes that Indonesian telecoms company Pasifik Satelit Nusantara (PSN) has launched the country's 'highest capacity' satellite to date – dubbed Nusantara Satu – which promises to help bridge the digital divide and boost economic activity in regions outside Java. Launched aboard the SpaceX Falcon 9 space rocket at Cape Canaveral in the United States, the Nusantara Satu project cost USD230 million to get off the ground and was 30% financed by PSN's internal funds, with state-owned export credit agency Export Development

stumping up the other 70%. Once it reaches its geostationary orbit Nusantara Satu, which has a capacity of 15,000Mbps, is expected to provide internet connectivity of up to 3Mbps for 10,000 Indonesian villages this year. With some 25 million Indonesians, mostly in eastern Indonesia, unable to access conventional internet access platforms, PSN president director Adi Rahman Adiwoso told reporters that his company can plug a gap in the market. 'We cannot enter Java because it has enough internet connectivity, either through 4G or fiber-optic. So our service, which is more

expensive, cannot compete there,' he said. Instead, PSN aims to promote its satellite internet to remote villages at rates of IDR100,000 (USD7.13) per gigabyte (GB) – which compares to other providers that sell 30GB for IDR30,000 in Java. PSN expects to generate annual revenue of over USD55 million from Nusantara Satu's operations and its confidence is highlighted by the fact that it has begun working on two more satellites named Nusantara Dua and Nusantara Tiga, which are slated for launch in 2020 and 2022 respectively.

ITC Global Enters Partnership Agreement with Thuraya

ITC Global has signed a multi-year partnership agreement with Thuraya to provide access to next-generation, high-throughput connectivity via the Panasonic network. ITC Global is a subsidiary of Panasonic Avionics Corporation, delivering high-speed, high-capacity connectivity to customers across the oil and gas, mining, merchant maritime and passenger vessel markets. The multi-year partnership agreement includes access to ITC Global's VSAT solution, expanding Thuraya's portfolio and enhancing service delivery for its customers via Panasonic's global mobility network. As part of the agreement, ITC Global and Thuraya have collaborated on the development of a custom network offering, providing connectivity via a highly redundant satellite solution, with options

for bundling the capability with Thuraya's L-band service. Region-specific and global offerings are now available for Thuraya's customer base, enabling delivery of increased bandwidth and extended satellite coverage throughout transits and at operational sites. The network consists of HTS beams to overlap and complement Thuraya's L-band coverage areas, allowing customers to benefit from the Panasonic global network to augment the L-band footprint. "This partnership represents the mutual goals of both organizations in reaching an expansive and diverse customer market across many industries which require mobility support," said Kevin Franciotti, Vice President, Global Channel Partnership at ITC Global. "Additionally, ITC Global's access to large amounts

of bandwidth through Panasonic and the technology roadmaps for the future present an opportunity for long-term growth. Given these synergies, it is exciting to establish this partnership with Thuraya, and we look forward to working together to serve its more than 40 distributors operating across the globe," concluded Franciotti. "ITC Global's HTS coverage with multiple beams in key regions was a significant factor for us in its selection as a service provider. Most importantly, their flexibility and willingness to collaborate on a custom solution to serve Thuraya's customer base was the critical component in making our decision to move forward with this agreement, which is key to our future growth," said Shawkat Ahmed, Chief Commercial Officer at Thuraya.

Comtech EF Data Receives \$1.8 Million Delivery Order For Satellite Earth Station Equipment

Comtech EF Data Corp., which is part of Comtech's Commercial Solutions segment, received a delivery order in support of the recently awarded contract from the US Naval Warfare Systems Command. This latest delivery order, against the \$59.0 million indefinite delivery/indefinite quantity ("IDIQ") contract, is for \$1.8 million. The delivery order specified Comtech EF Data's SLM-5650B Satellite Modems and firmware upgrades. The

SLM-5650B Satellite Modem is Comtech EF Data's latest generation modem product targeted for critical government and military applications. The SLM-5650B leverages the heritage and feature set of the SLM-5650A modem. The SLM-5650B supports backwards compatibility/inter-operability for existing SLM-5650A networks while providing enhanced performance and an expanded feature set. The commercially available modems

will support satellite communications and interoperability across the Navy's platforms and shore sites. "It is a privilege to have the opportunity to support the US Navy's satellite communications requirements with our latest generation solutions," said Fred Kornberg, President and Chief Executive Officer of Comtech Telecommunications Corp.

Intelsat Launches New End-to-End Managed Service

Intelsat introduced Mobile Reach Manage, a new end-to-end managed service that enables Mobile Network Operators (MNOs) to quickly and cost effectively deploy their 2G/3G/4G network infrastructure into areas once considered unreachable. In the past, many MNOs faced business and geographic challenges when looking to expand coverage across hundreds of sites located in regions outside of the main cities and adjacent suburban areas. Mobile Reach Manage removes the cost, geographic hurdles and complexity faced by traditional backhaul solutions. It provides a high-performing, space-based cellular backhaul solution that offers MNOs an end-to-end connectivity service from any Radio Access Network (RAN) site to the MNO Core with a guaranteed Service Level Agreement (SLA). In addition, Mobile Reach Manage does not require MNOs to invest in any space or ground infrastructure. This enables MNOs to close their business case and make reliable, quality coverage available to more communities throughout the world. "With Mobile Reach Manage, Intelsat is eliminating the difficulty and expense often associated with expanding network infrastructure in the more remote and rural areas of the world," said Jean Philippe Gillet, Intelsat's Vice President and General Manager, Networks. "By including Mobile Reach Manage in their network planning strategy, MNOs will get an end-to-end, cellular backhaul managed service solution that meets quality of service requirements and delivers increased

flexibility and speed when it comes to network deployments. As a result, they will be able to increase customer satisfaction, profitably grow their business and reduce churn. Space-based platforms are essential to closing the digital divide, and with Mobile Reach Manage, MNOs will be able to demonstrate to governments and regulators that they can close the coverage gaps and attain their Universal Service obligations." Mobile Reach Manage is available today in countries across Asia-Pacific, North America and Latin America and will be rolled out globally.



NIST Taps AI for Better Radar Detection in 3.5 GHz Band

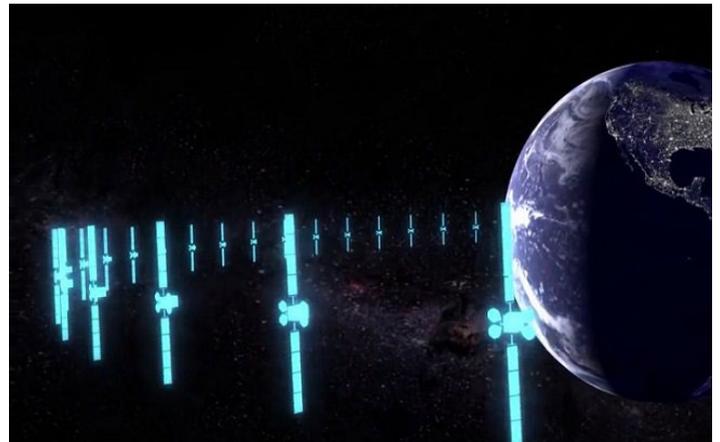
Researchers at the National Institute of Standards and Technology (NIST) say they've come up with a better way to detect offshore radars that could help commercial users know when they need to yield the 3.5 GHz band to federal users—and it involves a form of artificial intelligence (AI). In a new paper, NIST researchers demonstrate that these deep learning algorithms are significantly better than a commonly used, less sophisticated method for detecting when offshore radars are operating. NIST has been involved in the development of standard specifications to enable commercial users to operate in the 3.5 GHz band, aka the Citizens Broadband Radio Service (CBRS) band, while assuring the U.S. Navy that the band can be successfully shared without RF interference. The Wireless Innovation Forum Spectrum Sharing Committee, the public-private standards body for CBRS, approved the specifications in February 2018. Currently, there are no official standards for determining when the military is actually using the band. Radar signals from ships at sea are detected using automated detectors that look for energy rises in the electromagnetic spectrum, but these detectors are not discriminating enough to consistently get it right, sometimes confusing other RF signals as radar or missing the radar signatures altogether, according to NIST researcher Michael Souryal, who is one of the authors of the new paper. So Souryal and his colleagues turned to AI for a potential solution. Eight deep learning algorithms—software

systems that learn from pre-existing data—were trained to recognize offshore radar signals from a collection of nearly 15,000 60-second-long spectrograms. These spectrograms were recorded in 2016 near naval bases in San Diego, California, and Virginia Beach, Virginia, for NIST's National Advanced Spectrum and Communications Test Network, according to NIST. After training, the deep learning algorithms were pitted against energy detectors to see which performed best at identifying and classifying a set of spectrograms different from the ones used to educate the AI detectors. The researchers found that three of the deep learning algorithms appreciably outperformed the energy detectors. While the research sounds promising, it's not expected to have an immediate impact on how radar is detected in the CBRS band. It's not related to any proposed rule changes at the FCC but simply informs future activities. "More specifically, results of this work could inform the community of current usage of the band (its occupancy and background interference levels, at least at the locations and for the time periods observed), and related ongoing research on AI detection of 3.5 GHz signals can inform commercial development of sensors," Souryal said in a statement provided to FierceWirelessTech. The NIST researchers said they plan to continue refining the AI detectors by training them with higher-resolution, more-detailed radar data, which could lead to even better performance.

Intelsat: 5G Needs Satellites

While Intelsat has been in the news a lot for its role in the C-Band Alliance (CBA) and its controversial proposal to make more midband spectrum available for 5G, the satellite operator has other intentions in mind while making the rounds at Mobile World Congress 2019. The company will be here to meet with its numerous mobile network operator customers from around the world and press upon the industry the role of space-based communications in 5G. Intelsat is a member of ATIS and earlier this year announced it had joined GSMA. Both organizations play a role in defining 5G standards. "We want to be at the same table as the mobile network operators, just to be able to explain to them how they could leverage what we are bringing to the table," said Jean-Philippe Gillet, Intelsat's Vice President and General Manager for broadband, in an interview. Gillet said mobile operators will need to rely on a variety of technologies to deliver on the promise of 5G, and space-based communications is one of them. His message echoes that of a white paper the company published earlier this month that says mobile operators will need to rely on a variety of wireless infrastructure in radio access and transport networks to make 5G use cases a reality. "Since 5G embraces multiple 3GPP and non-3GPP technologies, including 4G LTE, 5G NR, Wi-Fi and space-based systems, the next mobile generation will be a network of networks," the white paper states. "Space-based platforms were recently added to the mix of 5G access technologies by the 3GPP, and the standards body is working on specifying requirements for satellite access that will be included with the full 5G specs in Release 16. The 3GPP recognizes that satellite networks can deliver ubiquitous coverage and availability for 5G industrial and mission critical applications." But all of this raises the question: What about latency? "Latency is latency and on satellites, you just can't avoid it, there's no way around this," he said, referring to the additional time it takes to travel to the sky and back. But he advocates making technology decisions based on use cases. For example, controlling an automated vehicle will require the least amount of latency, and satellites aren't going to

be ideal in that situation. However, there are other applications where the latency doesn't need to be so low. The way Intelsat sees it, there are different requirements for latency standards. The company, for example, has been supplying the satellite service that powers the Kymeta hot spot service, which can essentially turn an emergency vehicle into a hot spot during events with especially heavy traffic. Intelsat also has alternatives to its own fleet of GEO satellites. It was an early investor in OneWeb, and it continues to work with the company on hybrid GEO/LEO solutions, so each company can offer their customers the benefits of both of those solutions. As for the status of that other issue on Intelsat's plate involving C-band spectrum, that's sure to be a topic of some conversations during MWC19. The timing on that is unclear in terms of when the FCC might make a decision, but an Intelsat spokesperson said the company hopes that the FCC could complete its work in the second quarter—although the timing of a report and order is entirely in the FCC's court. "Regardless of when the report and order happens, the goal of the CBA is to be the only proposal that could be immediately implemented, delivering the much-needed spectrum within 18 to 36 months of the order," the spokesperson told FierceWirelessTech.



Spaceflight to Launch Beyond LEO, Includes Lunar Lander

Spaceflight revealed that it will launch two payloads on its first rideshare mission to Geosynchronous Transfer Orbit (GTO). The mission is scheduled for no earlier than mid-February 2019 aboard a SpaceX Falcon 9 launching from Launch Complex 40 at Cape Canaveral Air Force Station, Florida. The primary payload on the mission is a telecommunications satellite for the South East Asia region. It was built

by SSL, a Maxar Technologies company, which also procured the launch vehicle. Spaceflight will manage the launch of the two secondary payloads, Israeli non-profit SpacEL's lunar lander, and the U.S. Air Force Research Lab's (AFRL) experimental small satellite, S5. This will be Spaceflight's first mission beyond Lower Earth Orbit (LEO) and its first combined launch with SSL. In addition to securing capacity

aboard the launch vehicle, Spaceflight is handling all the mission management and integration services for the lunar lander, called Beresheet, and AFRL's spacecraft. This includes a multitude of services, from the unique aspects of pre-launch design, assembly, and integration to the final analysis and testing of the architecture before the spacecraft are encapsulated into the rocket.

Avanti Superfast Satellite Broadband Helps Cornish Space Observatory Reach for the Stars

A popular Cornish Astronomy Observatory can now expand its research and educational work thanks to help from Avanti Communications and its superfast satellite broadband service. The Tolcarn Observatory, just outside St Austell, is an established center for education, observation and research. Its mission is to make astronomy accessible to all, through links with schools and the Tolcarn Astronomy Group, as well as research looking for new exoplanets. The future of the Observatory was under threat until the offer of support from Avanti. Centre Director Dr Grant Mackintosh had been unable to connect the facility to high speed broadband because of its remote location and was relying on a mobile data connection. "It was becoming so restrictive that I had considered relocating the whole facility to Scotland," explained Grant, an experienced astronomer, specializing in spectroscopy, whose photographs have featured on the BBC's 'The Sky at Night' and 'Stargazing Live'. Avanti offered to connect the Observatory to its superfast satellite broadband service and the

center's communication problems have been solved. "I have tested the service to its limits and it is absolutely phenomenal," said Grant. "It allows me to connect 12 independent video sources with views of space and broadcast them live, in very high quality, anywhere in the world." Grant can also use the superfast satellite broadband connection to remotely control the facility's telescopes housed in two domes and in the "rolloff" roof observatory. Schools can now have access to the facility and its experts via Skype and Dr Grant can now easily share data from his research work searching for Exoplanets with colleagues in North America. "Just two weeks after my initial conversation with Avanti, their professional install team was here and had the satellite system up and running in no time. I have heard people complain about the latency on satellite broadband systems but I tested it by sending live images of the moon to a colleague in the US and as I annotated the image on screen, he could see my notes pretty much immediately - it was outstanding." Avanti Communications is a UK based satellite operator setting a

new standard in satellite communications with a fleet of satellites that covers the UK, Europe, the Middle East and Africa. Under a scheme funded by the European Regional Development Fund (ERDF), Avanti provides subsidized superfast connectivity to rural businesses across Cornwall and Isles of Scilly. The scheme helps eligible rural businesses without access to superfast broadband, get a connection of up to 40Mbps download, the fastest satellite broadband speeds available in Europe. The aim of the project is to support the growth of Small to Medium Enterprises (SMEs) by increasing competitiveness and productivity, as well as promoting the use of online and digital marketing tools. The scheme targets areas where there is no broadband connectivity or, where broadband access has speeds lower than 2Mbps. The project has funding to provide high speed broadband connectivity of up to 40Mbps to up to 1,000 businesses across the region. Avanti is running the project from its satellite operations base at the world famous Goonhilly site on the Cornwall Lizard peninsula.

Hellas Sat 4 Successfully Launched

Hellas Sat a premium satellite operator, and a subsidiary of Arabsat, has announced that the Hellas Sat 4 satellite was successfully launched by an Ariane 5 launch vehicle from the Guiana Space Center in Kourou, French Guiana. Hellas Sat 4 is a Ku-band satellite, it will be positioned at 39 degrees East providing exceptional coverage over Europe, the Middle East and the Southern Africa. The satellite is expected to commence service in the third quarter of 2019. The new satellite will extend Hellas Sat's capacity and geographical reach to meet the growing demand for applications that include video, maritime connectivity, cellular backhaul, corporate networks and government services. Hellas Sat 4 will also serve as a back-up to Hellas Sat 3 satellite which is located at the same orbital slot and was launched in 2017. Christodoulos Protopapas, CEO of Hellas Sat, said: "Hellas Sat 4 is a powerful addition to our network and a major milestone to our business plan. It brings new capacity that will enable our existing and new customers to unlock new growth opportunities in applications including broadcasting, mobility and private data networks. Moreover, it will enable us to deliver high quality



services at competitive prices as well as unmatched performance, resiliency and redundancy to our customers."

SpaceX Seeks FCC OK for 1 Million Satellite Broadband Earth Stations

SpaceX is seeking US approval to deploy up to 1 million Earth stations to receive transmissions from its planned satellite broadband constellation. The Federal Communications Commission last year gave SpaceX permission to deploy 11,943 low-Earth orbit satellites for the planned Starlink system. A new application from SpaceX Services, a sister company, asks the FCC for "a blanket license authorizing operation of up to 1,000,000 Earth stations that end-user customers will utilize to communicate with SpaceX's NGSO [non-geostationary orbit] constellation." If each end-user Earth station provides Internet service to one building, SpaceX could eventually need authorization for more than 1 million stations in the US. SpaceX job listings describe the user terminal as "a high-volume manufactured product customers will have in their homes." "These user terminals employ advanced phased-array beam-forming and digital processing technologies to make highly efficient use of Ku-band spectrum resources by supporting highly directive, steered antenna beams that track the system's low-Earth orbit satellites," SpaceX's new application says. "Consistent with SpaceX's space station authorization, these Earth stations will transmit in the 14.0-14.5 GHz band and receive in the 10.7-12.7 GHz band... SpaceX Services seeks authority to deploy and operate these Earth stations throughout the contiguous United States, Alaska, Hawaii, Puerto Rico, and the US Virgin Islands." Each user terminal "will communicate

only with those SpaceX satellites that are visible on the horizon above a minimum elevation angle," the application says. "The proposed user terminal is a flat phased array capable of steering its beams to track SpaceX's NGSO satellites passing within its field of view," the application also says. "As the terminal steers the transmitting beam, it also adjusts the power to maintain a constant level at the receiving antenna of its target satellite, compensating for variations in antenna gain and path loss associated with the steering angle." SpaceX asked the FCC for quick approval to support the company's "ambitious timetable for launching satellites and deploying broadband services." "Granting this application would serve the public interest by helping to speed broadband deployment throughout the United States by authorizing the ground-based component of SpaceX's satellite system," SpaceX wrote. In addition to user terminals, SpaceX plans a smaller number of gateway Earth stations to "provide the necessary communications links back from the SpaceX satellites to the global Internet," according to a previous SpaceX filing. SpaceX has estimated that it will deploy "several hundred" of these gateway stations across the US to be "co-located with or sited near major Internet peering points to provide the required Internet connectivity to the satellite constellation." SpaceX also plans two tracking telemetry and control (TT&C) stations in the US, one on the East Coast and another on the West Coast. While the latest application focuses on the US, SpaceX plans to provide broadband service globally. SpaceX hasn't provided a specific availability date, but a Reuters report in October 2018 said SpaceX's "goal of having Internet service available in 2020 is 'pretty much on target' with an initial satellite launch by mid-2019." FCC rules require the launch of 50 percent of satellites within six years of authorization and all of them within nine years unless a waiver is granted. SpaceX CEO Elon Musk fired some senior managers from the Starlink project in mid-2018, reportedly to maintain his aggressive deployment schedule. In December, SpaceX reportedly raised \$500 million to help pay for the project. SpaceX has said its broadband satellites will provide gigabit speeds and latencies as low as 25ms, similar to cable or fiber systems.



Leo Aerospace Plans to Make SmallSat Launches Far More Accessible

A startup that plans to use high-altitude balloons to deploy rockets has successfully fired a test launch, moving closer to their goal of helping end the backlog of smallsats that wait months or longer to "hitch" a ride on larger rockets. Leo Aerospace LLC, a Purdue University-affiliated startup based in Los Angeles, launched its first "rockoon," a high-power rocket from a reusable balloon platform, from the Mojave Desert in southern California in December. A video is available

at this direct link... The company aims to revolutionize access to space for those looking to launch smallsats that weigh up to 25 kilograms, or about 110 pounds. The company plans to be a "dedicated" launch for microsats, serving one customer at a time. SpaceWorks Enterprises Inc. issued a report last year estimating that as many as 2,600 smallsats will be launched over the next five years. To accomplish this, more companies that can send the satellites into space are needed. Large



aerospace launch companies generally cater more to large satellite companies, leaving microsatellite companies to wait to see if there is any leftover space available and the smallsat operator must try to find rockets that will deploy the equipment somewhere in the vicinity of where they would like to be located. Even then, this process can require months to maneuver into place after already waiting for months

for smallsat deployment. With the test launch completed, the startup founders are now planning to move on to their next phase, which involves raising \$8 million to fund the company for the next two years. They also are looking to add personnel, including a VP for business development and VP of engineering. They are looking for people experienced in the aerospace industry who can bring valuable aerospace

know-how to the firm. The team spent two months in Australia last summer taking part in Startmate, an accelerator program, and plans to conduct at least some of their launches Down Under. Leo Aerospace's long-term business plan includes engaging in a number of launches from Australia as regulations and air traffic can allow companies to fly more frequently.

Inmarsat Announces New Initiatives to Support Maritime, Ports and Logistics Start-Ups with Rainmaking and Bluetech

Inmarsat has joined forces with two leading start-up programmes, Rainmaking's Trade and Transport Impact (T&TI) and Bluetech Accelerator, to create initiatives that directly support start-ups focused on IoT and big data innovation in the maritime, ports and logistics supply chain. The programmes will fund, support and mentor start-ups developing applications that aim to harness the power of IoT and big data to enhance safety, efficiency and sustainability. Inmarsat will collaborate with those start-ups to find a route to market via its global, high-speed satellite communications infrastructure that connects over 160,000 ships and yachts, as well as ports, road and rail networks across the world. The Trade & Transport Impact (T&TI) program initiated by Hamburg-based Rainmaking will help connect established leading players, such as Inmarsat, Cargotec and Wärtsilä, with innovative start-ups and work collaboratively to address the biggest commercial and operational challenges facing the global supply chain today. The Bluetech Accelerator, sponsored by the Portuguese Government and based in Lisbon, was launched at the end of January and will take on six business partners including Inmarsat to help select and finance the first batch of winning start-ups, which will be chosen in the last quarter of 2019. From enhancing safety to improving operational efficiency, emerging digital technologies such as machine-learning and IoT are set to become increasingly important in the day-to-day running of shipping and logistics companies and vital to improving throughput at the world's



largest ports. Ali Grey, Senior Director of Digital Incubation at Inmarsat said: "Companies operating across the global supply chain clearly acknowledge the potential of digitalization, and recognize that we've only scratched the surface of what's possible. Unlocking the full benefits will require fresh perspectives on both long-standing and looming challenges. Start-ups are good at spotting opportunities that more established players miss, so it is important for the industry's future that we offer a helping hand to nurture innovation. "For Inmarsat, supporting companies in the global supply chain is not simply about deploying the most advanced communications infrastructure. It is also about supporting the creation of applications that directly address an organization's challenges and helps transform these into significant opportunities." Inmarsat already has significant experience in developing innovative application-based solutions

in both the maritime and logistics industries. Inmarsat's Fleet Data solution is a bandwidth-inclusive IoT platform that allows ship operators to instantly collect data from onboard sensors, upload the data to a secure cloud-based platform and interface with applications from third-party application developers. Inmarsat's Industrial IoT solutions are also helping drive better decision-making and efficiencies on land with fleet management and rail projects across the mining and transport sectors. Ms. Grey concluded: "Inmarsat is the only satellite provider able to offer transport businesses managed connectivity services across the entire global multi-modal journey. Working with leaders such as Rainmaking and Bluetech and the innovative start-ups that will be part of the programmes, we can help create new applications driven by data that will benefit the entire global supply chain."

Arianespace to Launch Satellite Deployment Solution from Open Cosmos

Arianespace and Open Cosmos, a company providing turnkey space missions, have signed a contract for the launch of an innovative CubeSat deployment solution. Launched from the Guiana Space Center in French Guiana using a Soyuz rocket, the CubeSat deployment platform is a key to the commercial offering from Open Cosmos. The first mission comprises an array of CubeSats with a total capacity of 12 units (12U). It will weigh about 30 kg. at liftoff, and the CubeSats will be injected into Sun-synchronous orbit at an altitude over 500 km. Open Cosmos delivers effective satellite-based solutions with the goal of enabling companies to use space technologies for tackling global challenge. It specializes in the development and

implementation of missions for small, low-cost satellites (up to 50 kg.), with short lead times (typically less than a year). One of the primary advantages of Open Cosmos is that it gives customers access to a wide range of launchers and orbits. The first Open Cosmos payload will be an auxiliary passenger on the COSMO-SkyMed Second Generation (CSG 1) satellite mission, along with the CHEOPS satellite for the European Space Agency ESA as well as the ANGELS and EyeSat's French CNES space agency missions. Launch is scheduled for the last quarter of 2019. Following the contract signature, Rafael Jordá Siquier, Chief Executive Officer of Open Cosmos, said, "Customers always ask us how they can get their payloads into orbit quickly and

surely. Our partnership with Arianespace to launch a 12U (units) deployment platform will get them into their targeted orbit less than ten months after signing the contract. This mission will use one of the world's most reliable and highest performance launchers, with a proven track record – and that's exactly the kind of agility that the space industry needs right now." Stéphane Israël, Chief Executive Officer of Arianespace, added, "This contract clearly reflects Arianespace's unwavering commitment to new players like Open Cosmos, which drive the dynamic small satellite market. It also reflects our ability to offer available, flexible and competitive solutions for all market segments, thanks to our family of launch vehicles."

O3b Satellites Arrive at Kourou for Launch



Four new O3b Medium Earth Orbit (MEO) satellites have arrived safely at the Guiana Space Centre in Kourou, French Guiana, in preparation for launch by a Soyuz rocket from Arianespace in late March 2019, SES announced. The new Ka-band satellites will join SES's existing constellation of 16 MEO satellites manufactured by Thales Alenia Space, orbiting at approximately 8,000 km from Earth and serving customers based in more than 40 countries. By increasing the size of the constellation from 16 to 20 satellites, SES Networks will offer enhanced coverage while providing greater service availability and reliability to cater

to the increasing demand for bandwidth in the government, telecom, cloud, maritime and energy markets. The O3b fleet of MEO satellites is the only proven non-geostationary (NGSO) constellation to provide carrier-grade commercial broadband services today. O3b is the only satellite-based system capable of delivering MEF Carrier Ethernet 2.0 (CE2.0) certified services, which meet the same stringent functional and performance requirements of CE2.0-certified terrestrial fibre services. The combination of O3b's fibre-equivalent performance and massive geographic reach means the system can

deliver high-performance data solutions – including cloud services and applications – across the globe. Enabled by the O3b system, SES Networks is the only satellite-based provider to be certified as an IBM Cloud Direct Link Service Provider. With these four new satellites, SES completes the first generation of a unique high-power, high-throughput fleet of 20 satellites operating in MEO. Each satellite has a mass of approximately 700 kilograms at lift-off and provides capacity of more than 10 Gigabits per second. Additionally, the MEO system's next generation, O3b mPOWER, is the only fully-funded NGSO broadband system in development, and will be fully-integrated and backward compatible with the existing O3b system starting in 2021. "Since becoming operational in 2014, the unique offering of the O3b MEO system has transformed communities and disrupted industries by empowering people with new opportunities," said Ruy Pinto, Chief Technology Officer at SES. "Expanding the O3b constellation enables us to continue elevating the connectivity experience, driving digital transformation and increasing cloud-scale adoption, by seamlessly integrating satellite-based services into the broader global terrestrial network."

Rwanda Set to Launch Its First Telecoms Satellite This Year

Rwanda is on course to launch its first satellite this year with help from Japan. The telecoms satellite is expected to be launched from the International Space Station (ISS) into orbit before May 2019's Transform Africa Summit – an annual event hosted in Kigali that explores developments in technology. The initiative is in collaboration with the Japan International Cooperation Agency (JICA) and the Japan Aerospace Exploration Agency (JAXA). This is in line with the implementation of the agreement signed in 2018 between the Rwandan and the Japanese government on Space Inclusion in Africa. A model of the Rwandan satellite prototype was first displayed in May by the Japan-Rwanda team of experts during the 2018 Transform Africa Summit in Kigali, where 100 Japanese companies displayed cutting edge Satellite technologies. "We are trying to shorten the timeline. Satellite technology will not only build capabilities for our people, but it will also give us the capacity, for instance, to inspect certain activities within the agriculture sector, monitor wetlands as part of environmental conservation efforts, and in smart urban planning,"



Rwanda Utility and Regulatory Authority's Director General, Patrick Nyirishema said. Some Rwandan engineers are currently being trained at the University of Tokyo, working with their Japanese counterparts on the project ahead of the launch. The areas mostly emphasized, are in the fabrication of local satellites specialized on the acquisition of data on weather and which could further be extended as earth observations for purposes of agriculture, itnewsafrika reported. RURA disclosed that another team of 15 engineers will be trained locally in satellite technology, starting next month. The plan to launch its own telecommunications satellite and initiation of the long-term space program was first announced back in 2017 and was set for 2020. However, the country will have the satellite earlier than its scheduled year of launch, as disclosed by the ambassador of Japan to Rwanda, Takayuki Mayishita. For Rwanda, having a satellite in the orbit in today's world is considered a leap in technological development. The East African country joins the list of few countries in Africa that have placed the devices into orbit as less than 10 African countries have managed to launch satellites. There is an untapped potential for satellite technologies within the African continent. Application of satellite data will assist in areas such as precision agriculture, predicting weather patterns, including drought among other sectors. In line with this, the African Union (AU) has taken a major step in establishing an African Space Agency to leverage space technologies for the future of the continent. Currently, the AU is in the process of identifying the country that will host the Agency. "When you look at Africa as a continent, it is massive and there are large expanses of land where the most viable means to deliver any kind of services, will depend on satellite," Nyirishema added. Nyirishema highlighted that Rwanda as a responsible and active member of the AU has found it necessary to join countries that are developing capabilities in space technologies. But for this to be realized there is a need for engagement of different partners, confirming the strong basis of Rwanda-Japan partnership to promote satellite programmes.

IBM Uses Satellite Tech for Energy and Utility Industry

IBM unveiled new technology to reduce power outages by helping energy companies predict where trees and other vegetation may threaten power lines. IBM worked with Oncor, the largest utility company in Texas and the fifth largest in the U.S., to develop a solution tailored for the energy and utility industry, to help improve operations and provide reliable electric service for millions of customers

across the state. The Weather Company Vegetation Management – Predict is built on IBM PAIRS Geoscope, a technology developed by IBM Research. The system processes massive, complex geospatial and time-based datasets collected by satellites, drones, aerial flights, millions of Internet of Things (IOT) sensors, and weather models. The resulting insights can help companies like Oncor to

monitor vegetation growth across their entire service territory, allowing them to better identify and predict potential infringement with power lines. Businesses can more proactively and accurately plan for preventive maintenance and rapid response, focusing crews in the highest-priority locations and validating that necessary trimming was completed as expected.

Gilat Demonstrates Exceptional Maritime Connectivity over Telesat's Phase 1 LEO Satellite

Gilat Satellite Networks has completed a successful test with a tier-1 maritime service provider for maritime communication over Telesat's low earth orbit Phase 1 LEO satellite. This industry-first milestone exemplified exceptionally low latency and high bit-rate essential for multiple maritime applications. The remarkable performance with latency as low as 16 msec was achieved in the tier-1 maritime service provider's teleport in Northern Europe. The test was performed with Gilat's LEO modem and a one-meter small maritime Ka-band antenna, demonstrating direct real-time

communication. Outstanding performance was achieved in testing video conferencing, over-the-top (OTT) video such as YouTube and massive data communication on a symmetric link. "Telesat is pleased to be collaborating with innovative companies such as Gilat that recognize the potential of Telesat's LEO system to transform the maritime broadband communication experience, delivering very high bit-rate services for large leisure vessels and supporting applications with critical latency requirements," said Michel Forest, Director of Engineering, Telesat. "This demonstration confirms

that Telesat's state-of-the-art LEO architecture delivers on tier-1 maritime service provider's requirements and opens the door for latency sensitive and high bit rate applications." "Gilat is proud to demonstrate outstanding results for next generation maritime communication over Telesat's phase 1 LEO Satellite," said Amir Yafe, Head of Global Accounts at Gilat. "This maritime test further strengthens Gilat's strategic partnership with Telesat and follows the recent collaboration on the industry's first inflight communication over LEO satellite."

Iridium Officially Completes Iridium Next Constellation Upgrade

Iridium Communications revealed that it completed the \$3 billion satellite constellation upgrade campaign known as Iridium Next, during a press conference held at the National Press Club in Washington, D.C. During the press conference, the company also introduced a new small-form-factor transceiver known as the Iridium CertusSM 9770, which will enable creation of new consumer and industrial applications that are highly portable and Internet of Things (IOT)-friendly, optimized for small size and low cost, yet with higher speeds than in the past thanks to the upgraded Iridium satellite network. The completion of the

Iridium Next campaign comes as the final two satellites required to complete the network refresh were activated on Feb. 5 at approximately 2:15 p.m. EST. With a fully operational constellation, featuring 66 new Iridium satellites and no further launches planned, Iridium has concluded its nearly decade-long capital-intensive program that created an upgraded network both in space and on the ground. After spending several hundred million dollars per year to build and deploy the new network, Iridium expects capital costs to decrease to approximately \$35 million per year, with revenues continuing to grow as the company expands into newer revenue

streams like broadband, IOT, and hosted payloads. "The completion of the Iridium Next program signifies a new chapter in the Iridium story, one that sees us transforming from a big cash spender to a big cash generator," said Iridium Chief Executive Officer (CEO) Matt Desch. "This is the realization of a long, successful climb, and reaching the peak, it's gratifying to know the future of the company is secure, and we have now financially matured as a satellite operator. Huge thanks are in order to our entire team, particularly our friends at SpaceX and our prime satellite manufacturer Thales Alenia Space and their teams."

Arianespace Orbits Two Telecommunications Satellites on first Ariane 5 Launch Of 2019

Arianespace has successfully orbited two telecommunications satellites: the Saudi Geostationary Satellite 1/Hellas Sat 4 condosat for operators KACST and Hellas Sat; and GSAT-31 for the Indian Space Research Organization (ISRO). Arianespace's first launch of the year took place from the Guiana Space Center (CSG), Europe's Spaceport in French Guiana (South America). The launch

was the 103rd Ariane 5 mission, bringing the number of geostationary satellites launched by Arianespace to 374. Following the announcement of this first successful launch of the year, Stéphane Israël, Chief Executive Officer of Arianespace, said: "This year we kick off the 40th anniversary celebration of the first launch of Europe's Ariane rocket with a successful launch of Ariane 5. Through this emblematic flight,

Arianespace underscores the reliability of our heavy launcher, the benchmark in the launch segment for geostationary telecommunications satellites. By carrying out a mission for long-lasting customers from three continents – Arabsat, KACST, Hellas Sat and ISRO – we continue to prove the attractiveness of Arianespace's launch services for customers from around the world, both institutional and commercial."

Gilat Awarded Multi-Year Contract for Broadband Solution Over ISRO's GSAT-11 Satellite Covering India

Gilat Satellite Networks has been awarded a multi-year contract to provide equipment and services for broadband connectivity over ISRO's GSAT-11 across India. Larsen & Toubro (L&T), an Indian multinational company engaged in technology, engineering, construction, manufacturing and financial services, chose Gilat to supply the ground segment and operate four gateways. The Indian Space Research Organization (ISRO) launched the multi-spot beam satellite GSAT-11 last month, to provide broadband coverage over

India's mainland and islands, boosting connectivity to rural India and chose L&T to supply, install, commission and maintain GSAT-11 ground system network. GSAT 11 will enhance public welfare systems like e-banking, e-health, e-governance as well as provide a platform to demonstrate new generation applications. L&T chose Gilat's multi-application SkyEdge II-c platform to deliver broadband services across the country. Gilat's hubs will be placed and operated in the following main and diversity gateway sites in India: Ranchi,

Delhi, Ahmedabad and Bangalore. "We are gratified by the trust L&T put in Gilat to deliver the baseband equipment and services for the GSAT-11 satellite," said Abhay Kumar, Regional Vice President Asia and North America at Gilat. "This is another testimony to Gilat's superior solution being chosen by satellite operators worldwide to deliver plentiful, quality and affordable satellite-based broadband communication."

Connectivity in Tonga Restored by SES Networks and Digicel Following Fiber Outage

Mobile networks and broadband access services for business and consumer customers operated by Digicel Tonga were rapidly restored across the Polynesian archipelago by SES Networks' managed services following a severe fiber outage last week, announced SES. Under the agreement Digicel, a mobile network provider operating in the Caribbean, Central America and Asia Pacific, uses SES's reliable and comprehensive C-band beams to deliver satellite-enabled and scalable IP transit trunk circuits between Tonga and Fiji. SES Networks' Signature Telecom Solution enabled Digicel Tonga to ensure business critical services were available to customer across the island nation. Connectivity in the Polynesian country was disrupted when the Tonga Cable System, an 827-kilometre-long fiber optic submarine cable that links Sopo in Tonga and Suva in Fiji, was cut in two places on 20 January. The cable cuts occurred in relatively shallow offshore water, and it has been suggested that the damage may have been caused by a ship's anchor, negatively impacting education, commerce and tourism. "We are extremely proud to deliver reliable, high-speed broadband connectivity to nations that experience unexpected outages, so that their citizens

can continue with daily communications and business activities uninterrupted," said Imran Malik Khan, VP, Global Fixed Data Sales at SES Networks. "We have worked closely together with Digicel in the past in the Asia Pacific region, and now we're able to implement together our Signature Telecom Solution in a record time in Tonga. We are especially pleased to help Tongan people get back online while efforts to repair the Tonga Cable System cable are taking place." "Our job always is to ensure that our customers are as connected as possible. We have been

hugely helped in that by SES Networks who provided a reliable and flexible solution that could help us overcome the challenges faced when trying to get our mobile networks and broadband access up and running where and when we needed it in the shortest possible time.," said Francis Thomsen, CEO at Digicel Tonga. "Our customers have an alternative path to access data services at all times through SES' satellite fleet and the peace of mind that Digicel is always working to keep them connected." 🇹🇴



WHOLESALE NEWS

Bahrain TRA Removes Wholesale Ex-Ante Regulation from Terminating Messaging Services

The Telecommunications Regulatory Authority (TRA) has published its final determination in relation to its review of competition in the wholesale Mobile Termination Markets in Bahrain. In its final decision, TRA concludes that messaging termination services on individual Mobile Networks Operators (MNOs) should no longer be susceptible to ex-ante regulation, while the wholesale market for call termination services still remains susceptible to ex-ante regulation by TRA. These determinations have been taken based on the recent developments and changes in the market. The number of messages sent by residential customers has significantly declined due to the

existence of other alternatives such as Internet applications with a high penetration rate of mobile Internet services that enable residential customers to use such applications. Moreover, the prices of messaging termination services on individual mobile networks in Bahrain are much lower than those in the developed countries. "TRA continuously reviews the telecommunications markets, studies their developments and determines the need for ex-ante regulation and procedures to maintain competition and the interests of subscribers. With regard to the deregulation of messaging termination services, this determination will allow licensees in Bahrain to flexibly compete

with foreign companies in providing SMS services specifically to business customers, thereby thriving their revenues for the benefit of the national economy. This determination could also reduce the volume of random and anonymous text messages." Said TRA Director of Market and Competition Mohamed Yusuf AlBinali. "TRA will closely monitor market developments resulted from deregulating wholesale messaging termination rates on the relevant wholesale and retail markets and it will take necessary actions to ensure that competition and the interests of end users are protected." Mohamed AlBinali added.

Western Balkan States to Sign Regional Roaming Deal



The governments of several western Balkan states are expected to sign a pact to reduce roaming charges across the region in April as part of preparations for greater European integration, Serbian Minister for Trade, Tourism and Telecommunications Tatjana Matic was quoted as saying. The official noted that the text of a draft agreement that will harmonies the rules for roaming – including regulating retail and wholesale pricing for such – across the region was green-lit at a meeting hosted by North Macedonia and attended by representatives from Bosnia and Herzegovina, Montenegro, Albania and Greece. The pact is scheduled to be signed in Belgrade in April, during the Digital Summit of the Western Balkans. In addition to roaming costs, the officials also reportedly discussed matters including regional development of the cloud and electronic signatures as well as potential cooperation in the field of cyber security.

Algeria, Tunisia Ending Roaming Surcharges, Looking at Satellite/Fiber Partnerships

The ICT ministries of Algeria and Tunisia have announced an agreement to end mobile roaming surcharges for users travelling between the two countries, MenaFN reports. The Algerian and Tunisian ICT ministers are also understood to have

held discussions on potential partnerships for Tunisia to utilize capacity on Algeria's Alcomsat-1 satellite alongside proposed future cooperation on access to the countries' respective fiber network infrastructure.

UK Mulls Rural Roaming in Regulatory Review

The UK government launched a public consultation on priorities for regulator Ofcom, which includes a proposal to investigate the case for mobile roaming in rural areas to improve access. Other issues being assessed include coverage obligations for rural areas and the UK's road network as part of a forthcoming 700MHz spectrum auction; and tackling a so-called "loyalty penalty" where consumers who do not switch providers end up paying more. A rule to prevent such perceived penalties would fit with legislation being discussed for a number of other industries including

utilities and insurance. One of the ultimate aims outlined in the proposal is to "support investment in reliable, gigabit-capable broadband networks across the country". This includes examining the cost and benefits of enabling mobile roaming in areas not covered by all four operators, described as "partial not spots". The government's four central targets for Ofcom are: build world-class infrastructure; further the interests of telecoms consumers; ensure secure and resilient telecoms infrastructure; and measures around protecting the

universal postal service. Its Statement of Strategic Priorities consultation covers telecommunications, the management of radio spectrum and post: it ends on 27 March. Jeremy Wright, UK Secretary of State for Digital, Culture, Media and Sport said: "As well as ensuring the necessary improvements to broadband and mobile services, consumers must also be protected. I urge Ofcom to tackle harmful business practices and remove barriers to switching."

ComCom to Lower Swisscom's Charges for LLU, Interconnection and Leased Lines

Switzerland's Federal Communications Commission (ComCom) has completed a review of the prices charged by state-owned fixed line incumbent Swisscom for certain regulated services and has announced plans to lower the prices for interconnection, local loop unbundling (LLU) and carrier line services with retroactive effect for the 2013-2016 period. ComCom noted that the prices Swisscom charges for services provided to its competitors must be cost-based, adding that the review used fiber-optic cabling

as the basis for its cost model for the first time, rather than copper infrastructure as it had done previously. The study was prompted by requests from rivals Sunrise and Salt, which asked ComCom to review pricing from 2013 onwards. ComCom plans to lower charges for unbundled copper subscriber lines by 10%-25%, whilst interconnection prices would be cut by an average of around 10%. Leased lines, meanwhile, will see a reduction in price of between 65% and 80%, with the regulator attributing the size of the adjustment to a correction of 'Swisscom's inappropriate price-setting process'. Pricing for access to Swisscom's cable ducts were unaffected by the ruling, however, as the watchdog said there could be no objection to the charges set by the incumbent. Other areas reviewed by the regulator, such as co-location and subscriber line billing will see 'little, if any, change'. Swisscom has a 30-day window to appeal the decision and the operator confirmed in a press release that it was analyzing ComCom's findings and would consider filing an appeal. The operator explained that it was only the change to leased line pricing that it found 'difficult to comprehend'.



Nkom Sends Draft Decision on FTRs to ESA

Norwegian telecoms regulator the National Communications Authority (Nasjonal kommunikasjonsmyndighet, Nkom) has sent a draft decision regarding fixed termination rates (FTRs) to the EFTA Surveillance Authority (ESA) for its consideration. In a press release regarding the development, the Nkom confirmed that it is looking to reduce FTRs from a current maximum of NOK0.006

(USD0.0007) per minute to NOK0.005 from 1 July 2019. As per the proposals, a further reduction to NOK0.004 per minute would then be implemented from 1 January 2021. These charge caps will apply to a total of ten operators, namely: Altibox, Broadnet, eRate, Ice, NextGenTel, Orange, Puzzel, Telenor, Telia and Verizon.

ACCC Publishes Latest NBN Wholesale Indicators

According to the Australian Competition and Consumer Commission (ACCC), there are now 4.79 million premises connecting to the internet via the National Broadband Network (NBN). In releasing its most recent 'NBN Wholesale Market Indicators Report', the regulator highlighted that more than half of users are now signed up to a service offering downlink speeds of up to 50Mbps. In total, 2.29 million connections were on such a plan, up significantly from the 159,000 reported at end-December 2018. By comparison, just under 400,000 users were reported to be connecting at speeds of up to 100Mbps, broadly unchanged year-on-year, with the number of those connected at 25Mbps falling from 1.88 million at end-2017 to around 945,000 as customers have increasingly opted for the 50Mbps service tier. Retail service provider (RSP) market share remained stable, meanwhile, with what the ACCC referred to as 'smaller retailers' collectively accounting for 6.6% of NBN accesses, up from 6.3% at the end of the previous quarter. Telstra remains the operator with the largest number of customers served over the NBN, with around 2.38 million such accesses at end-2018, while TPG notably surpassed the one million barrier to end the year with 1.04 million NBN-based services in operation.

Key quarterly indicators

Total services

4.79 million

↑ 6.8 %

Total CVC capacity acquired

7,934 Gbps

↑ 3.3 %

Average CVC per user

1.65 Mbps

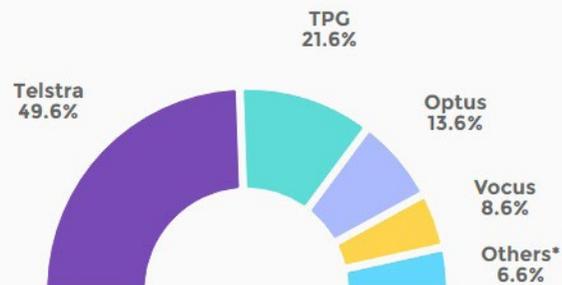
↓ 3.3 %

Number of >50Mbps services

2.68 million

↑ 20.2 %

Wholesale access seeker market share



UK Users Face Potential Return of EU Roaming Fees

The UK government confirmed citizens could face high roaming charges when using their mobile phones across Europe if the country fails to reach a formal agreement to leave the European Union (EU). Culture secretary Jeremy Wright told ministers operators could not be prevented from imposing roaming charges on UK citizens if there was no deal between the UK and the EU, although he added the government was working on voluntary agreements. The UK and EU are currently negotiating the wider terms of the country's exit from Europe, which is scheduled to take place on 29 March. However, failure to reach an agreement would complicate matters, as no regulations would be in place on the

amount European operators could charge UK operators when their customers travel across the continent? Roaming charges across the EU were scrapped in June 2017. Wright's comments follow the emergence of a leaked piece of legislation this week, which revealed consumer groups had urged the government to ensure there would be no roaming charges in the event of a no deal. However, "after careful consideration, the government decided not to adopt this proposal", notes alongside the legislation showed. The Guardian reported that Wright was responding to a question in parliament from the country's shadow culture secretary Tom Watson, when he made the admission. Wright

said "the availability and pricing of mobile roaming in the EU would be a commercial question for the mobile operators". "Many mobile operators, including those who cover over 85 per cent of mobile, have already said they have no current plans to change their approach to mobile roaming after the UK leaves the EU," he added. Watson argued such operator assurances were not enough: "The reason the EU introduced free roaming in the first place is because the telecoms companies could not be trusted to give consumers a fair deal." If roaming charges are restored, the UK government plans to introduce new rules ensuring users are alerted once they reach a £45 limit.

KPN Completes Sale of Wholesale Arm to Tofane Global

US-based iBasis has been acquired by the Paris-based company led by Alexandre Pébereau, former CEO of Orange International Carriers. The acquisition of iBasis will expand Tofane's business substantially: in 2017, iBasis had revenues of €705 million, and 280 employees in 16 countries. Tofane acquired Altice Europe's international voice carrier business in France, Portugal and the Dominican Republic in September last year. In 2017, the three entities involved in that deal – SFR International Carrier Services, MEO International Carrier Services and Altice Dominicana International Carrier Services – collectively handled 14 billion minutes of international voice traffic. When the KPN was announced in March 2018,

Pébereau was reported saying, "iBasis... is the ideal first acquisition to serve our strategy of consolidating the international carrier services market as an independent player. The partnership with KPN brings us strong and long-lasting dynamics to our consolidation project". The value of the transaction has not been made public. KPN acquired iBasis in 2007. In a statement today the company said, "The transaction is in line with KPN's focus on the execution of its successful strategy in The Netherlands. iBasis will continue to deliver international voice termination and data services to KPN." However, that might all be about to change. In January, there were reports that Canada's biggest alternative asset manager, Brookfield Asset Management,

was in preliminary discussions with Dutch pension funds PGGM and APG Groep about jointly acquiring KPN itself. This was seen as a positive development for the entire telecoms sector: between 2012 and 2018, the value of European operators almost halved, according to Bloomberg. Before news of the talks became public, pushing KPN's share price to the highest level since 2013, the business was worth about €10.6 billion. GSMA Intelligence says it has 43% of the Dutch telecoms market. Brookfield is clearly intent on the telecoms sector, having previously been interested in acquiring the tower assets of Idea Cellular and Vodafone India for around \$1 billion.

NT Launches Pre-Paid Roaming Service

Nepal Telecom (NT) has introduced the roaming service for pre-paid mobile also. Prior to this, the service was available only in post-paid mobile phones. In case of outside the country, the pre-paid mobile roaming service will be available in India and China. The NC has begun the 'out-bound roaming' service. The prepaid mobile phone users are entitled to the new service without deposits. Prior to this, the post-paid mobile phone users had to deposit Rs 10,000 to have an access to

this service. According to NT Managing Director Dilliram Adhikari said the company plans to further diversify its services and the new decision was of part of such plan. Similarly, the company is to provide two GB data per month in a 900 package for GSM postpaid customers. The scheme shall come into effect from today. Similarly, new customers of GSM postpaid mobile phones to be registered from February 6 to February 20 will be given free one GB 'all time' data and 100-minute phone calls per

month till three months. Under the touristic package, five GB data, 50 minutes' phone calls within the NT network, 50 SMS and a 100-minute international call services are available at Rs 500. The ceiling of these services is double in the package of Rs 1,000. The schemes were announced on the occasion of the 15th anniversary of the NT. The company in the fiscal year 2074/75 BS (2017-18), earned a profit of Rs 45.27 billion and the figure was Rs 44.59 billion in the previous fiscal year. Last fiscal year, company's net profit increased by 13.73 percent compared to the previous year and touched Rs 17.48 billion. Company's income in per unit share was increased and reached 116.56 percent in that period. The company has a significant contribution to the government revenue as it paid over Rs 26.20 billion in total (as tax and non-tax category) to the government in the fiscal year 2017-18. The number of its customers till last mid-December has reached 21,098,000. The figure was 17,600,000 in the previous fiscal year. The increase was 13.51 percent. Its present tele-density is 72.5 percent. The company has connected all the 77 districts in seven provinces with this wire and wireless and data services. 📶



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TECHNOLOGY NEWS

Verizon to Launch Mobile 5G in 30 Cities in 1H19

Verizon has confirmed plans to deploy a standards-based 5G

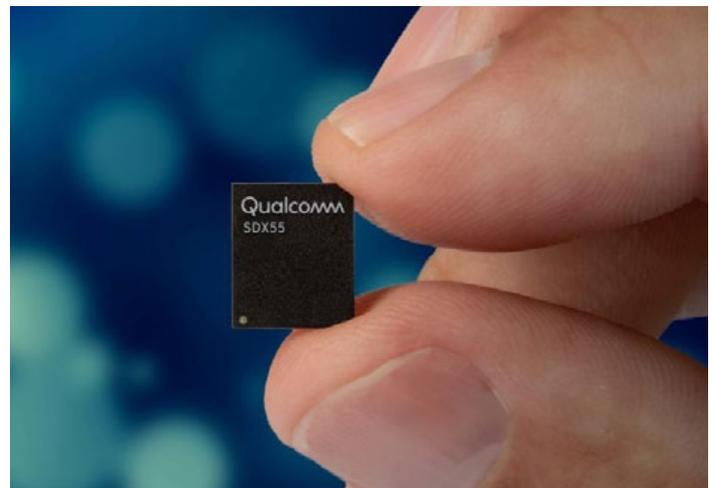


mobile service in more than 30 US cities during the first half of this year. The target was revealed by company CEO Hans Vestberg at an investor conference in New York City. Mr. Vestberg stopped short of confirming the exact locations but indicated that the new network will be powered by millimeter wave (mmWave) spectrum. The service will be branded '5G Ultra Wideband', he added. As previously reported by TeleGeography's CommsUpdate, Verizon's '5G Home' fixed-wireless service went live on 1 October 2018 in selected parts of Houston, Indianapolis, Los Angeles and Sacramento. While industry standards body 3GPP has yet to certify 5G technology for use in hardware, software, chipsets and devices – that milestone is expected to occur in Release 16 – Verizon argued that the new network adheres to its own 5G TF (Technical Forum) proprietary standard.

Qualcomm Debuts Second-Generation 5G Modem

Qualcomm unveiled its second-generation 5G modem, which is intended to offer more flexibility by supporting a wider range of deployment types and applications globally. Called Snapdragon X55, the chip supports "all major frequency bands, whether mmWave or sub-6GHz, supports TDD and FDD modes of operation and is capable of both standalone (SA) and non-standalone (NSA) deployments". The 7nm chip is also described as a "5G to 2G multimode modem", being compatible with previous mobile generations and including high-speed LTE (Category 22) support. It also enables dynamic spectrum sharing between 4G and 5G, allowing operators to speed deployments by using existing frequencies to support both technologies. Qualcomm's existing 5G modem is set to power the first generation of compatible smartphones from vendors including OnePlus, Xiaomi and LG, among others. Qualcomm has previously touted more than 30 commercial design wins for X50 in partnership with the Snapdragon 855 processor. But this combination has also limited adoption to smartphones, which is the natural home for high-end silicon. The chip giant said X55 is "designed to bring 5G to a broad range of devices including premium smartphones, mobile hotspots, always-connected PCs, laptops, tablets, fixed wireless access points, extended reality devices, and automotive applications". Cristiano Amon, president of Qualcomm, said: "We expect our platform to accelerate 5G commercial momentum and power virtually all 5G launches in 2019 while significantly expanding the global 5G rollout footprint." Supporting the launch,

Qualcomm also announced a new 5G mmWave antenna module (QTM525), a new single-chip 14nm RF transceiver for 5G sub-6GHz and LTE, and sub-6GHz RF front-end modules. It said the package together offers a "next generation modem-to-antenna solution for all major spectrum bands, helping customers to build 5G devices quickly, and at global scale". Snapdragon X55 is currently sampling to customers and expected to be in commercial devices by late 2019. The new antenna products are expected to sample in the first half, with commercial device launches also late in 2019.



Li-Fi Handsets Could Be Coming Soon

The new optical Li-Fi components will debut in a commercial device at MWC later this month. They will allow mobile device manufacturers to design Li-Fi into mobile handsets for the first time. Short for 'light fidelity', Li-Fi technology uses visible light from LED bulbs to transmit data, rather than radio waves. Proponents say gigabit Li-Fi is not only fast but also more reliable and virtually interference free, as well as being inherently more secure than radio technology such as Wi-Fi or cellular. However, Li-Fi can't travel through walls, although it can bounce off them and move around corners. pureLiFi CEO, Alistair

Banham, said, "Now is the time for Li-Fi to move into the hands of the consumer. The ecosystem is crying out for new spectrum and new wireless technology that will service the global appetite for more bandwidth and digital innovation. Device manufacturers need new technology to be sure they're ready for 5G and differentiate between their competitions." He added: "We're already in discussions with mobile phone manufacturers, demonstrating how our optical Li-Fi components will enable innovation in their products and transform the user experience." Li-Fi has also generated interested from telecoms

providers as well as device manufacturers. In August, O2 began a Li-Fi trial at its Slough headquarters, saying that Li-Fi has the potential to serve as a "serious contender to Wi-Fi", as well as to reduce infrastructure complexity and energy consumption. In July, Orange reinforced its 4G network with Li-Fi to meet the "unique infrastructure needs" of the Tour de France. Companies such as Intel, TI, Quantenna, Cisco, HPE are collaborating the deliver standard for Light Communications based on the Wi-Fi standard IEEE 802.11. The Li-Fi standard is set for release in 2021.

China Mobile Launches First Batch of 5G Chipsets and Devices

China Mobile's '5G Device Forerunner Initiative', established at Mobile World Congress 2018, has this year launched its first batch of results, including four 5G chipsets and nine 5G devices. The 5G chipsets will be provided by Qualcomm, Huawei, MediaTek and Unisoc. The nine 5G devices will be released by China Mobile, Huawei, Vivo, Oppo, ZTE, Xiaomi and Samsung. Among the 5G devices, some will support both NSA and SA, while some will have peak throughputs that reach 4.67 Gbps in sub-6 GHz spectrum, the operator said. The first commercial devices are expected to reach the market by June.



Ericsson Joins Next-Generation RAN Initiative

Ericsson added its weight to the operator-led O-RAN alliance, an organization which aims to accelerate the development of smart radio access network architecture. The initiative was launched at Mobile World Congress 2018 by founder members AT&T, China Mobile, Deutsche Telekom, NTT Docomo and Orange. It combined two former groups, the C-RAN Alliance and xRAN Forum. In a statement, Ericsson said it would focus on helping create "open

inter-working between RAN and network orchestration and automation, with emphasis on artificial intelligence (AI)-enabled closed-loop automation and end-to-end optimization", with the ultimate aim of decreasing operator RAN costs and improving performance. Ericsson CTO Erik Ekudden (pictured) added the group was: "An important coalition that creates an arena for these discussions, complementing other standardization and

open-source initiatives in the industry which we are already active in." The organization's website shows it expanded to 19 operator members from markets across the world since its foundation. From the end of 2018 it began allowing vendors to join the alliance and has already attracted backing from some of the largest in the sector including Qualcomm; Intel; Broadcom; Samsung; Nokia; and ZTE.

Singtel, Optus Complete AR 5G Video Call Between Singapore and Australia

Claiming a 'world first', Singapore's Singtel, Aussie subsidiary Optus and Ericsson of Sweden have completed an Augmented Reality (AR) 5G video call between Singapore and Australia. Using Chinese smartphone maker OPPO's 5G test devices equipped with Qualcomm Snapdragon X50 5G modems, engineers for both telcos tested AR on a real-time 5G video call using Ericsson's networks, the firms have confirmed. The new 5G technology is expected to bring forward a 'more inclusive form of communication whilst also opening up new possibilities for enterprises, ranging from mobile collaboration between experts in different locations, on-the-job training to remote assistance'. The new network is expected to allow users to surf at speeds that are up to 100 times faster than on 4G networks, while the increased capacity and speeds offered by 5G networks will support industrial applications such as driverless cars and smart appliances that require a constant connection.



Renewable Energy a New Reality for MENA Region's Telecom Towers

Bladon Micro Turbine ("Bladon", "the Company"), the pioneer in the design, development, engineering and manufacture of micro turbine gensets ("MTGs"), announced that it has signed a production supply agreement with GRIDSERVE®, the international provider and operator of critical power infrastructure solutions. They launched their partnership in Dubai at the influential TowerXchange Meetup MENA 2019, the event for leaders in the telecom towers industry. The multi-million pound, five-year contract will see the pioneering Bladon MTG12 integrated into GRIDSERVE's 12kW solar hybrid power solution, SolarEnergyCentre®(SEC12). This partnership see further progress in Bladon's efforts to provide long life, ultra-efficient distributed power to telecom towers around the world. The new product, the SEC12-MT will see Bladon's game-changing technology paired with bifacial solar panels and cutting-edge lithium-ion batteries to produce a hybrid unit that delivers reliable, low operating cost, low impact, clean power generation to telecom towers. This early contract win follows the launch of Bladon's MTG12 at TowerXchange Africa in October 2018 and

demonstrates increasing demand for the MTG12 for the telecom towers market. The integration is now underway, and the product will be deployed later this year into selected regions that GRIDSERVE operate in. Bladon believes that its MTG12, which incorporates advanced jet engine technology, is poised to take over from conventional diesel gensets in this market. The Bladon MTG offers superior performance, cleaner emissions and compelling commercial advantages compared with the existing equivalent product, typically a conventional diesel generator. Paul Barrett, CEO of Bladon Micro Turbine, said: "We are really pleased to be working with GRIDSERVE as we step up our production in 2019. Not only do they have a wealth of experience in the industry and international reach, but they share our vision of replacing the conventional diesel generator with ultra-efficient, low emission, distributed power solutions in the telecom towers market. We look forward to seeing the rollout of their new product, with the MTG12 integrated, later this year." Heston Harper, co-CEO of GRIDSERVE, said: "Bladon's micro turbine technology delivers a combination of advantages that

we have been unable to find in traditional combustion engine diesel gensets. Its long service interval fits perfectly with plans to deliver the lowest opex in the tower power arena while dramatically lowering carbon emissions. In Bladon we have found a partner totally aligned with our pioneering stance and our commitment to pushing boundaries and doing things differently to attain a truly sustainable future for the benefit of all stakeholders." According to Kieron Osmotherly, CEO of TowerXchange, since 2010 independent tower companies have expanded into Sub Saharan Africa, acquiring 40 per cent of Mobile Network Operators' cell sites, driving at least two tenants per tower, unlocking substantial operational efficiencies, and delivering against challenging Service Level Agreements. "With the announcements of landmark tower deals between Zain and IHS in Kuwait and Saudi Arabia, driven by the search for operational efficiency, the towerco revolution is extending into MENA. We forecast that out of 180,000 towers, towercos will own and operate 30,000 MENA towers by this time next year."

Deutsche Telekom Leads on Development of eSIM for IoT

Deutsche Telekom is working with partners to develop nuSIM. The initiative aims to move SIM functionality from the physical SIM card directly to the chipset. nuSIM is specifically designed for low-cost devices used in mobile IoT applications with a long life-span, such as asset trackers or smart motion or temperature sensors. The operator has partnered with a range of companies



specializing in IoT chipsets, modules and digital security with the aim of making the product commercially available in the second half of 2019. The elimination of the physical SIM card simplifies the form factor of an IoT device as there are no additional contacts, circuit paths or SIM card holders to consider. Deutsche Telekom says nuSIM will provide a “minimum hardware and software footprint for cost-efficient implementations with minimal power consumption”. Device vendors benefit from better design options due to smaller package size and extended battery life. SIM logistics, such as stock keeping or handling, are no longer necessary. IoT service providers can save costs through a simple digital process which puts the operator’s credentials onto the device during manufacture. Customers also benefit from the lower device cost and greater simplicity Ingo Hofacker, Senior Vice President, responsible for the IoT business at Deutsche Telekom, said, “Deutsche Telekom has built a solid track record in IoT technology innovation over the past years. The most important success driver for us is to anticipate customer needs to make sure we enable their business success. “nuSIM, our rigorously optimized SIM solution for the cost-sensitive mobile IoT market is our latest endeavor and an important building block for our offering moving forward.”

ETSI Unveils New Standard for NFV Deployment Templates

While there are several anchors on the adoption of NFV architectures, standardizing VNFs has been one of the weightier issues. The European Telecommunications Standards Institute announced it had published the first version of a specification that it said will standardize the structure and formats of virtual network functions (VNFs). “The ETSI Industry Specification Group (ISG) on Network Functions Virtualization (NFV) ended 2018 on a bright note, with the publication of the first version of ETSI GS NFV-SOL 001, the specification of NFV descriptors based on the Topology and Orchestration Specification for Cloud Applications (TOSCA),” according to the press release. “This was a highly-anticipated document in the industry,

considering the prominent role VNF deployment templates play in an NFV system. Together with ETSI GS NFV-SOL 004, the specification of the structure and format of a VNF package, this new specification provides the foundations of an open ecosystem.” Operators have complained for years that the VNF vendors, including large vendors that were previously mainstays of the legacy telco architectures, have made their own flavors of VNFs, which meant operators had to configure, scale, and rebuild the VNFs prior to deploying them. ETSI is laying claim to solving the VNF issue with the NFV deployment templates, which it said creates an open ecosystem where VNFs can be onboarded and managed “by independently developed management

and orchestration systems.” “It provides a standard way to describe VNFs, so they can be deployed and managed by NFV orchestrators,” said Bruno Chatras, Vice Chairman of ETSI NFV ISG (Network Virtualization Industry Specification Group), in an email to FierceTelecom. “This is an obvious advantage for VNF consumers and developers. “It has been developed by the ETSI NSP (new standards and policy) and vendors, and it is being used. This has already been exercised in some early (ETSI) Plugtests. ONAP, the open source community, uses it as one of the VNF descriptor formats accepted for its platform.” ETSI pioneered the NFV movement with an initial white paper seven years ago, but not everyone is on ETSI’s NFV bandwagon.

IDC Says Consumers Will Champion IoT in Europe This Year

The latest Worldwide Semi-annual Internet of Things Spending Guide from International Data Corporation (IDC) suggests that total spending on IoT solutions in Europe will maintain a double-digit annual growth rate throughout between 2017 and 2022, and surpass \$241 billion (€210 billion) in 2022. Western Europe will account for the lion's share of the market, according to the report, and Germany will be the "European IoT champion in 2019", with spending exceeding \$35 billion (€30.5 billion). Adoption of IoT technology in other European countries is also predicted to "soar", with France and the UK each set to spend over \$25 billion (€21.8 billion), followed by Italy with \$19 billion (€16.5 billion). Central and Eastern Europe (CEE) will account for 7% of the total European IoT revenues in 2019. The industries forecast to spend the most on IoT solutions in 2019 are manufacturing (\$20 billion/€17.4 billion), utilities (\$19 billion/€16.5 billion),

retail (\$16 billion/€13.9 billion) and transportation (\$15 billion/€13.09 billion). The industries expected to see the fastest annual growth rates throughout the 2017-2022 period are retail (18.5%), healthcare (17.9%) and state/local government (17.1%). However, the analysts say "the true leader" for IoT spending in 2019 will be the consumer segment, with revenues exceeding \$32 billion (€27.9 billion). The largest consumer use cases will be related to the smart home, personal wellness and connected vehicles. Hardware is predicted to be the most significant technology category in 2019, with revenue of \$66 billion (€57.6 billion) led by module and sensor purchases. IoT services will be close behind at \$60 billion (€52.3 billion), including traditional IT and installation services as well as non-traditional device and operational services. IoT software spending will total \$35 billion (€30.5 billion) in 2019 and will see the fastest

growth over the five-year forecast period with a CAGR (compound annual growth rate) of 18.9%, IDC says. The company predicts that IoT connectivity spending will total \$10 billion (€8.7 billion) in 2019. "We're still just scratching the surface of how powerful IoT solutions can be when combined with the massive scale of IoT endpoints, world-class connectivity and advanced technology," said Milan Kalal, Program Manager at IDC. "That said, organizations across industries are gradually experiencing that driving business outcomes with IoT requires not only new technologies and expertise in areas like edge infrastructure, wired and wireless networking, security, and edge-to-cloud architectures, but also viable use cases that deliver short-term results and help drive a strategic IoT innovation road map."

Cloud and Digital Service Providers Fuel ICT Spending

Despite blowback from a trade war with China and a slowing global economy, business spending on information and communications technologies (ICT) will continue to flourish, according to a report. The forecast by International Data Corporation (IDC) predicts that worldwide spending on ICT will reach \$4.6 trillion by 2022 with an average growth rate of 4% per year. That spending estimate takes place across hardware, software, services and telecommunications verticals, according to IDC. Commercial customers will account for around 63.5% of the total spending by 2022 (\$2.9 trillion), while consumers make up 36.5% (\$1.7 trillion), according to IDC. The fastest growth segment over the forecast period will come from the professional services vertical (7%), including cloud and digital services providers, which will account for a bigger piece of overall tech spending. IDC said the increase in tech spending was largely due to the explosive growth of the cloud infrastructure providers, which include Google Cloud, Microsoft Azure, IBM, and Amazon Web Services. The

other fastest-growing segments include media (6%), banking (5%), retail (5%), and manufacturing (5%), while the slowest growth in commercial technology budgets will come from the federal government, followed by wholesale and construction firms. The slowing economy and the trade war between China and the U.S. is putting pressure on companies to increase their technology budgets while also implementing their digital transformations through the use of artificial intelligence and data analytics. "In the short term, the trade war between the U.S. and China continues to add volatility to the outlook," said Stephen Minton, vice president in IDC's customer insights and analysis group, in a prepared statement. "Some firms are also facing the double whammy of weaker sales in China, an increasingly important export market for the manufacturing industry. "Meanwhile, the impact in China itself could persist over a longer period of time, with manufacturing and financial services firms being the most exposed." Despite market maturity, business investments in digital transformation, cloud, and AI will

help drive overall U.S. growth of 4.5% over the forecast period, equaling Latin America as the second fastest growing region for total ICT spending behind China. "In the U.S., the professional services industry is expected to continue with strong technology growth and investments. The appetite for cloud-based delivery, new apps, and tech-fueled services show no signs of slowing, and thus we are optimistic about the growth opportunity for this industry," said Jessica Goepfert, vice president in IDC's customer insights and analysis group, in the statement. "Consumer-driven industries such as retail and hospitality are benefitting from higher wages and disposable incomes." In response, firms in this space are working to develop and deliver unforgettable customer interactions. This takes shape as customizable experiences and infusing technology into their operations. For instance, hotels are implementing technology in guest rooms that can be controlled by mobile apps."

Verizon Slashes Latency in 5G Edge Compute Test

Verizon applied edge compute technology to cut latency in half in a trial conducted on a live 5G network in Houston, Texas. Using multi-access edge compute (MEC) equipment placed near the edge of the network at its 5G test bed, the operator said a facial recognition application was able to identify individuals twice as fast as when it ran on a network which processed information at a centralized data center. Verizon did not provide a latency measurement from the test. The trial follows Verizon's move in 2018 to lay the foundation for MEC. In April 2018, it began the process of decoupling software and hardware on routers at the edge of its

network. Part of its so-called Intelligent Edge Network initiative, Verizon executives at the time told Mobile World Live the change would allow it to scale its edge hardware and software separately, and deliver the ability to launch new services more quickly. Verizon has long talked up ultra-low latency as a key benefit of 5G: CEO Hans Vestberg (pictured) recently highlighted the capability as one of eight pillars of 5G which will enable new use cases in areas such as virtual reality, industrial automation, autonomous cars, healthcare and gaming. But Verizon is looking to reap other gains beyond latency as it builds out its MEC network. It noted

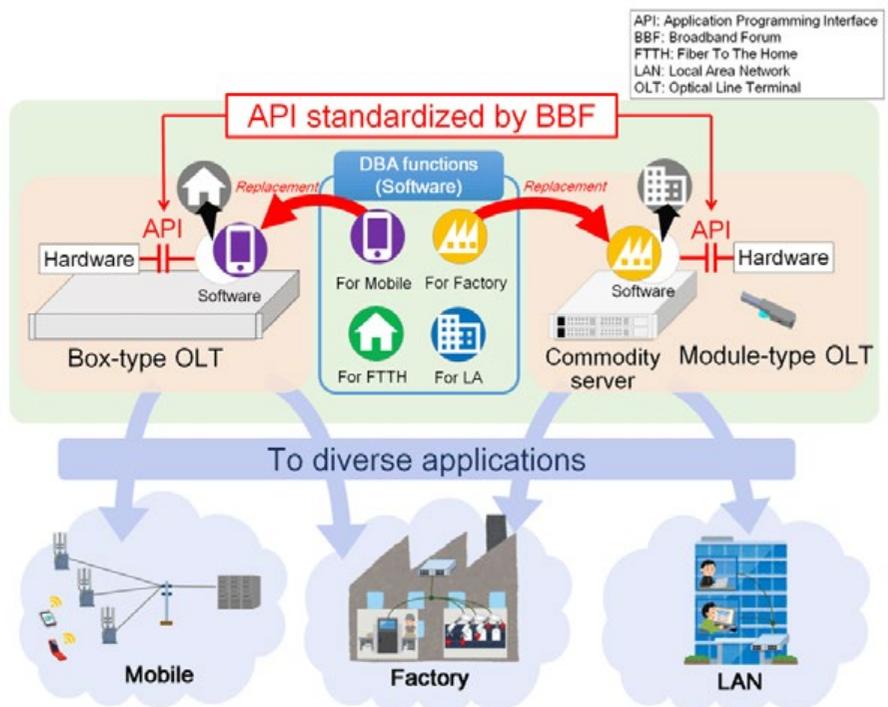
in a press release "an increase in reliability, energy efficiency, peak data rates and the ability to process more data through more connected devices are also benefits of introducing MEC technology." Rival AT&T has similarly been moving toward an MEC architecture, rolling out open source whitebox hardware at its cell sites in 2018 as part of its transition. It also opened an edge computing test bed in Silicon Valley to explore potential use cases, and partnered with The Linux Foundation on an open source project to create the software stack necessary to support edge computing.

Broadband Forum Publishes Standards to Boost Global Use of Optical Access

Using the API to replace the DBA software module allows optical access systems to provide a wide range of services quickly and cheaply, including support for 5G fronthaul interfaces and enterprise services. NTT and Chunghwa Telecom jointly proposed use cases for the DBA software module and developed the API specifications as international standards within the Broadband Forum. "These technical advances will enable carriers to use a common access system for a diverse range of services including the accommodation of base stations for 5G mobile systems, which place strict requirements on acceptable latency thresholds," said Jun Terada, General Manager at NTT Access Network Service System Laboratories. "We believe that the widespread use of the API as an international standard will lead to the drastic expansion of the application area of optical access systems." The new standards are part of the Broadband Forum's work on an abstraction interface for time-critical applications on passive optical networks. The project began back in 2017, launched by NTT. It comprises two technical reports, TR-402 and TR-403. The first gives an overview how to capture the DBA function in a module, including a use case for 5G base stations over an optical access network, and specifies the functional requirements of the API. TR-403

provides the details of the API, including format and performance requirements. Next NTT plans to encapsulate the remaining access functions in modules in cooperation with carriers, system vendors, standards organizations and open source software communities in a bid to avoid the cost of redeveloping hardware to meet various requirements. Robin Mersh, CEO, Broadband Forum, commented, "The work

fits perfectly with our other initiatives around next-generation access and will enable operators to cost-effectively upgrade their optical access networks as they prepare for the 5G era. "We applaud NTT for its innovation and its commitment to feeding this work into new industry-wide standards which will create an open broadband infrastructure and simulate mass deployment."

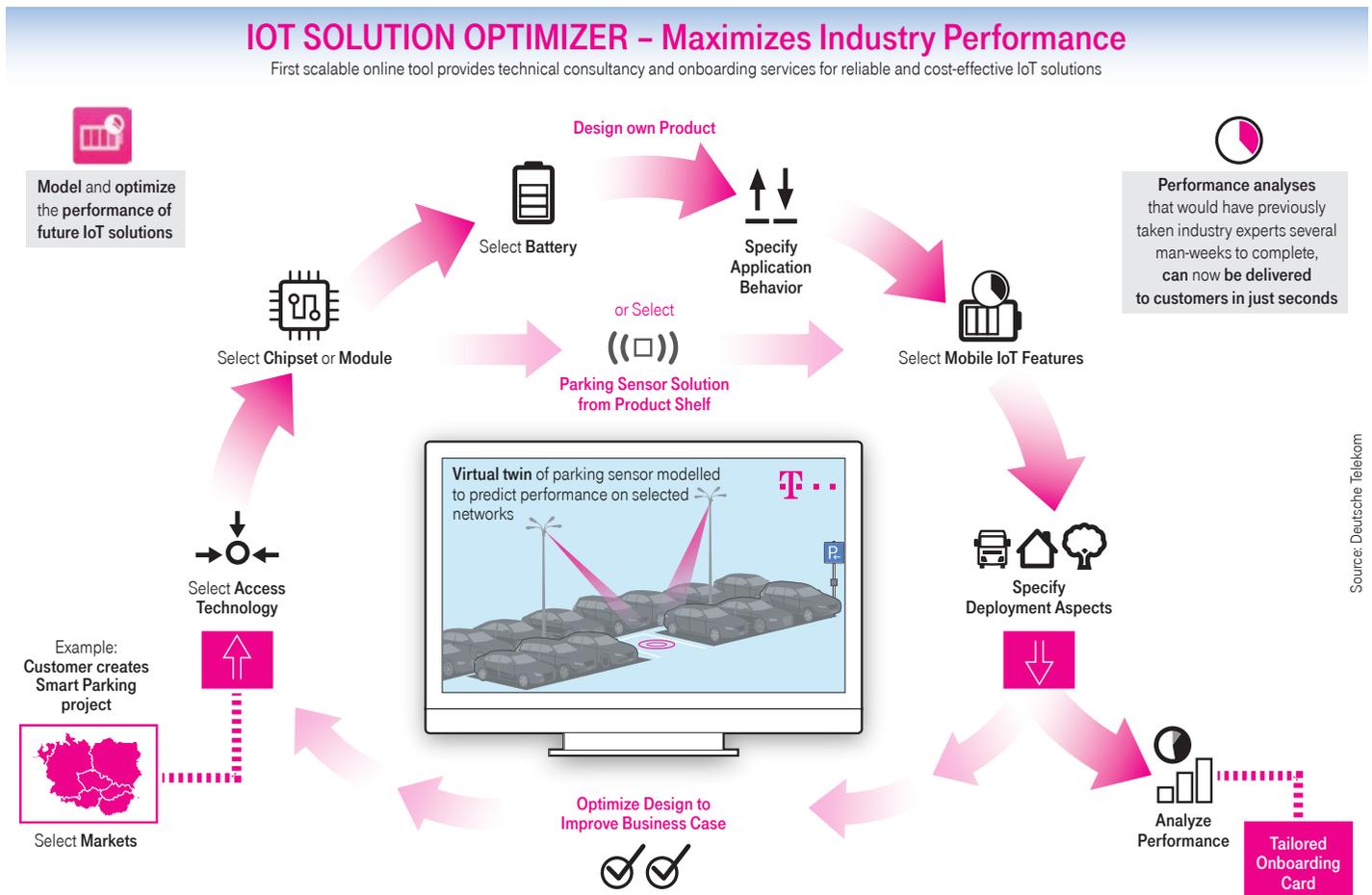


Deutsche Telekom Launches the IoT Solution Optimizer

Deutsche Telekom launches the IoT Solution Optimizer, a scalable online tool that provides technical consultancy and customer onboarding services for reliable and cost-effective IoT solutions. It enables businesses around the world to model and optimize the performance of IoT applications in numerous vertical industries such as smart city services, security or asset tracking. The service brings together the hardware, application

and network feature elements necessary to assess IoT solution designs. Users can either model their own custom design, or try a standard IoT offering off the shelf. All in an easy to follow, step-by-step experience that takes only minutes. "Businesses investing in IoT solutions increasingly look for leadership in a fast-developing, yet still very fragmented industry," says Ingo Hofacker, Senior Vice President, responsible for the IoT

business at Deutsche Telekom. "Deutsche Telekom's IoT Solution Optimizer is the first service which pairs technical IoT consultancy with a comprehensive solutions shelf. It is extremely easy to use, offering reliable guidance and exceptional choice throughout the process. Our clients can now make fact-based decisions before rolling out their intended IoT solutions, significantly improving time-to-market, while minimizing cost and risk."



Telefónica Deutschland Claims First Dynamic 5G Dual-Band Radio

The operator's 5G TechCity project in the north of Munich saw two locations, 5km apart, linked by dual-band 5G radio in mid-January. The link connects an eNodeB site to the core network, via systems on high roofs, at a height of about 40 meters. To achieve the transmission rate of 16Gbps, Telefónica Deutschland aggregates two parallel microwave frequencies, 18GHz and 80GHz. The transmission in the lower band, at 18GHz, primarily switches

prioritized user data and voice, while the 80GHz band mostly transmits all the other data services. However, the bandwidth is used dynamically so that when traffic on the 18GHz connection exceeds a certain limit, the system automatically uses the free capacity at 80GHz. This provides high capacity, but also high availability and reliability. The hardware used at the two sites is already deployed commercially, but the dynamic interconnection of the two

frequency bands is new. "Our 5G-ready radio equipment installed in Munich enables the high-capacity connection of future mobile radio sites both in remote areas as well as in cases where a fiber optic installation is not economically feasible or simply impossible. So, this radio-based technology is a very good alternative, especially with regard to 5G," explains Dr. Anja Höhn, Director of the 5G TechCity project at Telefónica Deutschland.

5 Internet of Things Trends Everyone Should Know About

2019 will see the Internet of Things (IoT) becoming more deeply embedded in our day-to-day lives at home and at work. We may begin to hear the term itself used less frequently – but that’s because it’s moving out of the hype phase and quickly becoming a part of everyday life. Soon, it will be taken for granted that pretty much any device we own – cars, TVs, watches, kitchen appliances can go online and communicate with each other. In industry too, tools and machinery are increasingly intelligent and connected, generating data that drives efficiency and enables new paradigms such as predictive maintenance to become a reality, rather than a pipe-dream. In fact, it is predicted that by the end of 2019 there will be 26 billion connected devices around the world. Here are five predictions about how this is likely to play out over the next 12 months as we become increasingly used to the fact that the internet isn’t just something we connect to using computers and smartphones, but virtually anything we can think of:

Businesses will get serious about IoT

According to research by Forrester, businesses will lead the surge in IoT adoption in 2019, with 85% of companies implementing or planning IoT deployments this year. IoT clearly offers huge benefits to businesses. Some examples we have seen in recent years include mannequins that can communicate with customers’ smartphones in retail environments, beaming information about products on display. Manufacturing, however, is the clear leader when it comes to IoT deployment. Here, throughout 2019, businesses will increasingly see the value in connected machinery that is capable of reporting every detail of its operating parameters and efficiency to other smart, connected devices. Predictive maintenance is something that has been promised for a while by tech evangelists but is currently only achieved by the biggest players who have invested heavily in IoT for several years now. With a growing understanding of when these solutions are (or aren’t) useful, these solutions will start to trickle down to smaller organizations, that can be confident that their investments will pay

off.

Devices will become more vocal

Just as the standard internet gave all of us a voice – the IoT will give everything we own a voice, too. We’re getting used to using our voices to control smart home devices such as Amazon’s Alexa hub, or Apple’s Siri. But 2019 will be the year that the rest of our possessions find their own voice. Virtually every car manufacturer is working on virtual assistants to help drivers more safely and conveniently operate vehicles while behind the wheel. And voice control (with natural-language driven feedback) will increasingly become an option for industrial and enterprise technology. Voice control makes sense in many ways as it keeps our hands free to operate controls that still need manual input, and our eyes free to watch for hazards. It also represents a further removal of the barriers of communication between humans and machines. To start with we were entirely reliant on programming them with computer code, before user interfaces and graphical environments and dashboards began to be used, lowering the barriers to entry. Voice recognition and generation (known as natural language processing) is the logical next step towards making technology that anyone can use to work more effectively or improve their lives.

More computing moving to the edge

Edge computing refers to algorithms that are run at the “edges” of a network – usually at the point where the network touches the real world, such as within sensors and cameras themselves. The fact is that a huge amount of data collected by these devices will be useless. A good example is a security camera – it may have to pass terabytes of video data to a central server, or cloud, but the only data of any importance will be the few megabytes showing suspicious or illegal activity. When these devices are capable of carrying out their own computation, rather than dumbly passing information on to be processed in the cloud, networks become less clogged with traffic and more computing power is available for the important tasks. In the above example, image recognition algorithms running on

hardware and software installed in the camera itself would analyze the footage for suspicious activity, and only useful video data would be passed on to the cloud for further processing and storage.

Artificial Intelligence will increasingly drive IoT development and deployment

Artificial intelligence (AI) and IoT are closely related areas of technology. The IoT is useful and powerful because of the enormous amount of data that it generates. When you have hundreds or thousands of machines all talking to each other in an industrial network, analyzing the mountains of data that are created is beyond the ability of humans. Training machine learning algorithms to spot outliers in the data that could indicate opportunities for efficiency, or provide early warning of an upcoming problem, is the primary task of AI within an IoT environment. As IoT networks increase in size and complexity, they will become increasingly reliant on new developments in AI and machine learning. AI also has a huge part to play in keeping IoT systems secure, through automated threat detection systems.

5G networks will broaden the scope and availability of IoT

This year should see the switching-on of the first consumer-ready 5G networks that could operate up to 20 times faster than existing mobile data networks. IoT is reliant on speed and availability of data services, and today there are still many locations that are effectively “dark” when it comes to smart, connected tech, due to a lack of availability of these services. With mobile networks that are even faster and more stable than the cable networks we’re used to connecting to in our homes and offices today, the scope of IoT projects can broaden dramatically. Ideas such as the “smart city” – where civic amenities are networked and the data analyzed to create cleaner, more efficient urban living environments – become more viable. The technology used by self-driving, autonomous cars, and public transport vehicles will also greatly benefit from the increased bandwidth available. 📍

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REGULATORY NEWS

Broadband Forum Wi-Fi Test Standard Defines Carrier-Class Home Wi-Fi Performance

The Broadband Forum and its member partners have released the TR-398 Indoor Wi-Fi Performance Test Standard, which the group says is the first to measure residential Wi-Fi performance. The announcement was made at Mobile World Congress in Barcelona. The standard, according to the BBF, systematically and quantitatively evaluates home Wi-Fi for throughput, coverage, multi-user support, anti-interference and stability. It defines key performance indicators (KPIs) including Wi-Fi equivalent bandwidth (a measure of throughput), rate at different distances and throughput for multiple users. "Wi-Fi performance of single gateways must meet service requirements

and comply with standards to support industry development," BBF CEO Robin Mersh said in a press release. "The goal of TR-398 is to define carrier-class home Wi-Fi performance." The rapid proliferation of services such as 4K TV, online gaming and smart homes have created a world in which more than 1 billion users have access to fixed broadband. Wi-Fi, of course, is front and center in this, especially in residential settings. At the same time, the BBF says, Wi-Fi service is "far from perfect." The group cites a key Ovum statistic: Thirty percent to 60 percent of operators' complaints about broadband stem from Wi-Fi. The firm says that poor Wi-Fi quality slows growth of new service and increases

operations and maintenance costs. TR-398 aims to gradually reduce that percentage. It describes the purpose, test scope, conditions, test cases and standard thresholds for indoor home gateway Wi-Fi performance testing, the BBF says. The ubiquity of Wi-Fi also means that it must be easy to set up and operate. In December, Comcast Xfinity announced a feature that automatically imports the names given to devices as they are connected to a customer's home Wi-Fi network. This type of functionality is seen as vital as the density of services and connected devices in smart homes grows.

Parliament Passes Digital Inclusion 'ONE Philippines Act' on Final Reading

The House of Representatives in the Philippines has unanimously approved House Bill 3437 (aka ONE Philippines Act), which seeks to provide for an online network establishment (ONE) policy for the country to reduce the digital divide and accelerate the rollout of more wireless communications technology across the country. House Bill 3437 passed on its third and final reading with 174 votes and sets

out the state's policy to recognize the vital role of information and communications technology in nation-building. Further, it should allow the government 'to encourage investment in the countryside by providing the infrastructure necessary for the growth of information and communications technology'. In short, the ONE Philippines Act 'seeks the widest participation of private groups, local government, and community-

based organizations in the generation and utilization of available technology'. Under the Bill, the government will look to develop a 'comprehensive policy for the creation and establishment of Information and Communications Technology Centre (ICTC), or an Information Communications Technology Hub (ICT Hub), whichever is applicable, in every legislative district in the country with the end view of enhancing the access of every Filipino to information'. The Philippines has 81 provinces and once the ONE Philippines Act becomes law, at least 81 nodes can be established to promote development in each one. Furthermore, House Bill 3437 also empowers the Department of Information and Communications Technology (DICT) and the National Telecommunications Commission (NTC) 'to formulate and approve a national ICT Plan for the development of an information superhighway that will accelerate the establishment of ICTC or ICT Hub in every legislative district and barangay [small administrative division]'.



Germany Consults Industry about Blockchain Potential

Germany has opened a consultation process on how to tap into the potential of blockchain technology ahead of presenting a strategy by the summer, government sources said on Monday. Berlin is a hub for startup companies of which around 170 in one way or another look at blockchain, the distributed ledger technology that underpins the bitcoin currency. There is great interest from would-be participants and investors across a raft of industries including cars, pharmaceuticals, energy and public sector administration that hope to transform mass market processes via blockchain. According to the sources, companies and industry groups that could become stakeholders in a blockchain deployment process in Europe's biggest economy were invited to supply recommendations from this week onwards. While concrete results were being sought, it was as yet unclear whether those would immediately materialize in any legislative moves, they said. Blockchain startups have said that without a legal framework, there are high entrance hurdles. Governments urge caution toward cryptocurrencies that run on the technology. Few major economies worldwide have crafted comprehensive strategies on



how to nurture blockchain startups. Some, including Britain and Singapore, have allowed such firms limited freedom to experiment with innovative applications of blockchain in the financial sector. Other smaller jurisdictions, notably Malta and Gibraltar, have tried to lure young companies by creating laws designed to encourage the growth of such firms.

NCC, CBN, Police Move to Fight e-Fraud

The Federal Government is to develop a roadmap that would be used to curb the



menace of financial fraud using telecoms/electronic platforms. Also, the Nigerian Communications Commission (NCC), is working with the Central Bank of Nigeria (CBN), the Nigeria Police, and other relevant agencies to fight electronic e-banking fraud. Speaking at a stakeholders' forum on financial fraud using the telecoms platform in Abuja, Minister of Communications, Adebayo Shittu, said the incidence of financial fraud using telecom platforms has become pervasive. He added that apart from leading to the loss of reputation and income, it is also tied to direct financial loss of billions of Naira in the financial services sector, e-commerce, and telecommunications.

TTSL Offers to Return 800MHz Spectrum

Tata Teleservices Limited (TTSL) has offered to return spectrum in the 800MHz band that cannot be transferred to Bharti Airtel when the latter takes over the company, the Economic Times reports, citing an unnamed official. TTSL and Airtel suggested relinquishing 2.5MHz of spectrum in the 800MHz band across

most circles that was allocated to TTSL without auction and which, under the current spectrum trading rules, cannot be transferred to another party without being liberalized by a payment of its current market value to the Department of Telecommunications (DoT). Due to the debt levels of both parties, neither

company is willing to pay the market rate for the airwaves, however, and have instead sought to return the frequencies. The acquisition of TTSL by Airtel was agreed in October 2017 and is currently awaiting approval from the DoT.

Vodafone Germany Makes New 5G Auction Move

Vodafone Germany filed an emergency application with a German court regarding the country's planned 5G auction, stating a "recent rush procedure" by a competitor had changed the legal situation. While action by Germany's big operators is not new (filings were made at the turn of the year) a new action has prompted the latest move by Vodafone to "be legally heard here and also to represent its own legal interests". Although Vodafone did not name the

rival which prompted the move, earlier this month Telefonica filed what it described as an "urgent request for legal clarification of the auction rules", which it warned could delay the process. In a statement issued on 15 February, Vodafone said it "has always been and is still interested" in a quick 5G process, as it wants to deploy 5G "fast and wide" in the country. But it noted the original auction conditions submitted by Bundesnetzagentur have been "greatly altered" by external pressure, with new conditions created which make 5G investment more difficult, rather than easier. Telefonica's argument was that rollout obligations could not be met with the spectrum being made available, meaning existing frequencies would have to be used, which is already covered by other coverage targets. Regulations with regard to cooperation between operators and domestic roaming were also branded unclear. Noting that the current draft regulations lack the clarity needed ahead of billions of euros of investment in 5G, Vodafone said the three main operators had already brought actions before one broke ranks. It was not just the big players which put forward arguments: Telefonica stated a total of nine companies made representations, more than ever before in a similar scenario. Vodafone Germany made its latest filing with Verwaltungsgericht Köln, the administrative court of Cologne.



European Telcos Launch Data Portability Specification

At MWC19 in Barcelona, a group of European operators has launched the first specification for data portability among operators. The Group, established a year ago, is collaborating to define a common data portability standard to improve users' ability to port their personal data as required under General Data Protection Regulation (GDPR), which came into

effect in May 2018. The Group's members are trying to balance ensuring that the portability process safeguards the privacy and security of personal data and gives users control over it, while making sure that companies can capture the opportunities offered by the upcoming data economy. Visitors at MWC will be able to see a demo of the first transference of personal

data implemented between Orange and Telefónica, based on this first version of the specification, at the Telefónica booth. The Group also presented a whitepaper analyzing the impact of the GDPR on data management for operators and exploring ways the industry can collaborate to develop new data-based proposals that benefit the consumer.

Etisalat and Vodafone Bag 'Closed Compound' Concessions; TE and Vodafone Ink Pair of Deals

Egypt's National Telecommunications Regulatory Authority (NTRA) has awarded licenses allowing for the establishment and operation of access networks in closed compounds to both Etisalat Misr and Vodafone Egypt. In a press release regarding the matter the regulator confirmed that the concessions will allow the pair to offer triple-play services in

closed compounds, which it defines as 'a community in which the number of units does not exceed 100,000 units'. In separate but related news, fixed line incumbent Telecom Egypt (TE) and Vodafone Egypt have signed two ten-year transmission and infrastructure agreements which are reported to be worth a total of EGP10.85 billion (USD617 million). According to the

companies the transmission agreement covers Vodafone Egypt's current and future requirements for domestic transmission services for both fixed and mobile, while the infrastructure agreement 'represents a new cooperation between the two companies, where TE will avail fiber backhauling capacity to Vodafone Egypt's network'.

Wi-Fi Alliance Presses for Modifications in 6 GHz Rules

For the most part, the Wi-Fi Alliance is stoked about the Notice of Proposed Rulemaking (NPRM) in which the FCC is examining ways to make up to 1200 megahertz of spectrum available for use by unlicensed devices in the 6 GHz band (5.925-7.125 GHz). But it's offering some ideas for modifications, saying its



suggestions will ensure protection of incumbent operations while providing critically needed spectrum for unlicensed uses like Wi-Fi. The FCC released the NPRM last fall and posed a series of questions to industry stakeholders on a range of proposals to make it all work. The Wi-Fi Alliance said it supports the FCC's proposal to divide the 6 GHz band into four sub-bands: the U-NII-5 (5.925-6.425 GHz), U-NII-6 (6.425-6.525 GHz), U-NII-7 (6.525-6.875 GHz) and U-NII-8 (6.875-7.125 GHz), based on the characteristics of incumbent services. The alliance also supports the commission's proposal to regulate unlicensed use in the 6 GHz band based on a two-class approach, which differentiates between low-power, indoor-only (LPI) AP and standard-power AP devices. Specifically, the alliance wants the FCC to consider allowing LPI AP operations

across the entire 6 GHz band, including the U-NII-5 and U-NII-7 bands, without an automatic frequency coordination requirement for those bands. It would also like to see the commission allow client devices that operate under the control of an AP to operate at the same power level as the AP (whether standard-power or LPI), among other things. According to the Wi-Fi Alliance, the 6 GHz band is not only valuable for Wi-Fi, but it's also critically needed. "As with any wireless technology, Wi-Fi's functionality depends on adequate access to spectrum," said Alex Roytblat, senior director of regulatory affairs at the Wi-Fi Alliance, in a statement provided to FierceWirelessTech. "Currently, Wi-Fi's performance, capabilities, and its role in the Nation's telecommunications infrastructure and economy are threatened by the lack of sufficient spectrum access."

GSMA Urges Balance in Network Security Reviews

Mobile industry body GSMA urged European policy makers and operators to work together to safeguard the security of network infrastructure without jeopardizing 5G supply chains, as concern grows over the future of vendors in major global markets. In a statement, the association declared it is time for regulators to take "a fact-based and risk-based approach" to network security, or risk jeopardizing the success of 5G rollout in Europe. The statement comes as European authorities weigh action to block Chinese vendor Huawei from their telecommunications infrastructure amid security concerns. Huawei has strenuously denied it poses a threat. By 2025, mobile operators are expected to invest between €300 billion and €500 billion on the roll out of 5G across Europe. GSMA warned actions which disrupt the network equipment supply "will increase costs to European operators, businesses and citizens; delay 5G deployment by years across Europe; and potentially also jeopardise the functioning of existing 4G networks upon which 5G is intended to be built." Last month it was reported that Deutsche Telekom believes Europe's 5G rollout could be delayed by at least two years if governments on the continent implement a ban on Huawei. Along with Germany, France and Norway have also said they are considering a ban on Huawei. In the UK, Vodafone Group said in January it was pausing installation of new Huawei core network equipment across its European operations. BT previously said it would remove kit made by the vendor in mobile operator EE's core network within two years. While the GSMA noted extensive government and operator testing has "not discovered any evidence of wrongdoing" to date,

it stated operators "stand ready to work with policy makers now to agree on further proportionate and risk-based methods, not least a common, consistent and agreed security assurance, testing and certification regime for Europe." The GSMA said it will build on its existing security work and is assembling a task force of European operators to identify ways to enhance and extend current schemes. It also recommends that governments and mobile operators work together to agree what this assurance testing and certification regime for Europe will be, "so that it ensures confidence in network security while maintaining competition in the supply of network equipment."



Egypt Authority Reviewing VEON's Latest GTH Offer

NASDAQ and Euronext Amsterdam-listed telecoms group VEON issued a statement on 11 February confirming that it has deposited a public mandatory cash tender offer ('MTO') with the Egyptian Financial Regulatory Authority (EFRA) for the remaining 42.31% of shares it does not own in its Egypt-based sub-division Global Telecom Holding (GTH) at a price of EGP5.30 (USD0.30) per share (up to a total value of USD600 million). The

offer represents a 50.5% premium over GTH's average six-month share price on Egypt's stock exchange. The EFRA is currently reviewing the MTO, which can only commence when EFRA approval is granted. VEON intends to take GTH private following the MTO. The Netherlands-headquartered group currently owns 57.69% of GTH and already consolidates the results of GTH subsidiary cellcos Jazz (Pakistan), Banglalink (Bangladesh) and

Djezzy (Algeria). As previously reported by CommsUpdate, in April 2018 VEON withdrew an offer for the remaining GTH shares after the EFRA failed to grant approval. Subsequently, in October 2018 VEON cancelled an offer to take full direct ownership of GTH's Pakistan and Bangladesh units due to currency devaluation in Pakistan and an apparent initial negative reaction to the offer by GTH minority shareholders.

Court Vacates FCC's Tribal Subsidy Revamp; Remands Back to Commission for New Comment Cycle

The FCC will have to go back to the drawing board, or at least the comment cycle, to impose two limitations on Tribal lands voice and broadband subsidies after the U.S. Court of Appeals for the D.C. Circuit said the commission's decision was arbitrary and capricious for a host of reasons, including that it did not provide a "reasoned" explanation or enough time for the public to comment on the proposed changes. The court did not rule against the changes, per se, just that the commission did not sufficiently justify or explain how and why it made the changes, or give others sufficient chance to figure that out before it voted, along party lines, to make them. The court vacated (nullified) and remanded the decision back to the FCC with instructions to open a new comment period, after which the FCC will need to better explain itself if it wants to make the changes. In November 2017, a bitterly divided FCC adopted two changes to the Universal Service Fund Lifeline subsidy on tribal lands, confining it to carriers who used their own facilities, which excluded resellers that had been part of the program, and limiting the subsidy to rural areas of Tribal lands. That was part of a larger revamp of the Lifeline program aimed at curtailing waste, fraud and abuse in the wake of a GAO report that found big problems with the subsidy program. Democrats on the commission and the Hill called it an assault on the subsidy. Democrat Jessica Rosenworcel called it cruel, then commissioner Mignon Clyburn called the revamp, billed as better bridging the digital divide, a "bridge to nowhere, and



Hill Dems called it 'lawyerly' maneuvering to kill the program." Tribal groups sued the FCC over the decision. "The Commission's decision evinces no consideration of the exodus of facilities-based providers from the Tribal Lifeline program. Neither does it point to evidence that banning resellers from the Tribal Lifeline program would promote network buildout," wrote Judge Judith Rogers. Also hearing the case were Judges Thomas Griffith and A. Raymond Randolph. "Nor does it analyze the impact of the facilities requirement on Tribal residents who currently rely on wireless resellers," Rogers continued. "Further, the Commission ignored that its decision is a fundamental change that adversely affects the access and affordability of service for residents of Tribal lands. Similarly, in adopting the Tribal Rural Limitation, the Commission's decision evinces no consideration of the impact on service access and affordability. Its decision

does not examine wireless deployment data related to services to which most Tribal Lifeline recipients subscribe." On the procedural, but "nonharmless" side, the court said, "two weeks notice in the form of an unpublished draft order was inadequate." Rogers is one of the judges that had been scheduled to hear last week's challenge in the same court to another FCC decision, the Restoring Internet Freedom order, but was replaced before oral argument. "We are still reviewing the Court's decision but remain committed to combatting waste, fraud, and abuse in the Lifeline program," said an FCC spokesperson. "In particular, we are disappointed that today's decision leaves in place an indefensible status quo where residents of Tulsa, Oklahoma, whether or not they are Native American, receive \$25 more a month in Lifeline subsidies than residents of cities like St. Louis, Kansas City, and Omaha."

OECD Members Agree Plan for Digital Tax Rules by 2020

The OECD announced that its member countries have reached a new agreement on taxing internet companies operating across borders and paying little to no corporate income tax due to a lack of physical presence in a country. They aim to present a first proposal to G20 finance ministers at their meeting in June and agree the new international tax rules in 2020. The agreement is part of the larger Base Erosion and Profit Shifting (BEPS) project of the OECD and G20, which have been working for several years on updating international standards in order to reduce tax evasion and avoidance. A recent meeting of the participating countries approved a policy note on how they envisage tackling the problem of taxing internet companies. The main issue is how to update the so-called

'nexus' rules, namely how to determine the connection a business has with a given tax jurisdiction. Companies operating only online often lack a significant physical presence in a country, which is one of the main determinants in subjecting them to corporate income tax. The OECD members will look at defining new concepts such as a 'significant economic presence' or 'significant digital presence', to give countries a new base for levying corporate income tax on online businesses. In addition to new rules on determining tax jurisdictions for online businesses, the proposal will explore rules designed to give countries a remedy in cases where income is subject to no or only very low taxation. This addresses a common practice of online businesses of shifting revenues or

profits to related companies in low-tax jurisdictions through royalty or associate agreements, rather than paying taxes in the country where their customers are based and revenue is generated. In the coming weeks, the OECD will issue a consultation document outlining the proposals, and a public consultation will be held in Paris in March as part of the meeting of the Task Force on the Digital Economy. The OECD agreement comes as several European countries are already proposing their own digital taxes, such as Spain and France. The European Commission proposed in 2018 a sales tax on certain large digital businesses as an interim measure until an international agreement can be reached, but the EU member states have yet to agree on implementing the plan.

German Giants Look to Deploy Private 5G as Spectrum Auction Starts

Germany's industrial giants are looking to acquire regional 5G licenses to build their own networks in next-generation factories and other facilities, according to a Reuters report. Today is the deadline to apply for the spectrum licenses from the federal network regulator, Bundesnetzagentur (BNetzA). The frequency bands are suited to building dedicated networks for industrial complexes and research campuses to further the EU Industrie 4.0 initiative, which originated in Germany and relies heavily on more sophisticated automation in manufacturing. The regional licensing process will run in parallel with the national licenses for network operators, which makes provision for the entry of a fourth competitor, 1&1 Drillisch, which is a subsidiary of United Internet. Preparation for the spectrum auction has been a painful and protracted affair, and the regulator the subject of severe criticism for the onerous terms and conditions it was applying to network operators. The GSMA at one point questioned the regulator's grasp of physics regarding 5G radio waves and claimed BNetzA was making

it impossible for the operators to recoup their huge investment in 5G and Germany's future economic prosperity. Despite some concession by the regulator, in particular the GSMA cited the regulator's decision to reserve 25% of the total spectrum (100 MHz) for local use. The organization claimed, "This undercuts Germany's efforts at 5G leadership, by driving up spectrum costs and limiting the amount of spectrum available for nationwide usage." GSMA also claims the terms give new operator entrants unfair advantages. Reuters quoted a spokesperson for Siemens, which is headquartered in Munich, saying, "We can't wait for the network operators to be ready – we are in the midst of Industrie 4.0". The conglomerate is particularly keen to use 5G for its Siemensstadt factory in Berlin and its plant in Erlangen to enable machinery to communicate directly, and exploit the Mindsphere platform developed by the company to manage and analyze processes, and find ways to operate more efficiently. Volkswagen, the largest car manufacturer, wants to run 5G "inside the factory fence". And its Audi



division has begun work with Ericsson on a 5G lab to develop connected production approaches. The German chemicals company BASF runs 600,000 networked sensors and other devices at its main production facility in Ludwigshafen on the Rhine, which is likely to rise by a factor of ten or more, hence the attraction of 5G. Also, maintenance employees will rely on tablets and virtual-reality goggles to guide them on jobs, which also needs very high capacity bandwidth.

Investigation Finds EU's Net Neutrality Policy is Failing Operators and Consumers

A new piece of research published after a year-long investigation into the EU's net neutrality policy found it is damaging operators' business and ignoring what users want. The policy is due for review this year, but the Body of European Regulators for Electronic Communications' (BEREC) entrenched views are a cause for concern, according to John Strand. Over the past year Strand Consult fought to create transparency in BEREC's work but faced opposition to legal requests made under Europe's freedom of information laws. Eventually, Strand Consult succeeded in gathering the minutes of more than 40 meetings on net neutrality behind closed doors, many of which were heavily redacted. Here is a brief summary of the main findings:

- BEREC's goal is to create a de facto regulatory regime designed around measuring the speed of connections which gives preference to certain kinds of technologies and methods – a clear violation of the EU law's provision for technological neutrality.
- Those speed measurements are gratuitous and egregious, garnered from



bogus crowd sourced measuring tools to create user-generated complaints on missed speed targets.

- These are automatically forwarded to regulators so that operators can be penalized.
- EU policymakers wrongly assume connection speeds will increase linearly indefinitely, regardless of whether users want to pay for higher speeds or applications need them. This fixation with speed has limited consumers' choice of preferred features like flexible pricing, service quality, safety, durability, and so on and amounts to a regulatory taking of consumers' and producers' welfare without compensation.
- BEREC's preferred group of stakeholders are advocacy organizations AccessNow, EDRI, ISOC, and BEUC, all of which apart from BEUC have received funding from Google and only deal with consumers in the capacity of ISP customers. Yet information from these organizations is how BEREC claims to know what all consumers want.
- The invasive nature of monitoring networks and BEREC's desire to implement always-on surveillance amounts to an invasion of users' privacy and violation of provisions 8, 9, and 10 of the European Convention on Human Rights.
- Penalties for net neutrality violations differ wildly across countries, from thousands to millions of euros for an infraction, which seems to violate EU competition standards.

- Operators' efforts to protect users and secure their networks is being increasingly hindered by net neutrality rules.
- EU law allows zero rating, but some countries and regulatory authorities want to criminalize it, prosecuting operators for traffic management practices rather than commercial ones to avoid time-consuming economic assessments which often favor the operators.

In early December 2018, BEREC said it was satisfied with its implementation of the net neutrality law and did not mention the many problems it created for operators, including six or more regulatory investigations of 'net neutrality violations' to justify its heavy-handed approach. At the beginning of this month, UK regulator Ofcom warned O2 (Telefonica UK) that there are "reasonable grounds" for believing that they failed to provide "accurate and complete answers" as part of last year's investigation into the mobile operator's Traffic Management practices on its 3g and 4G infrastructure. The operators had long insisted that without those restrictions, they could charge a premium for delivering certain traffic faster which they would invest in better networks. Instead, as the Financial Times reports [subscription needed] from the companies' filings for last year, the US' four largest broadband providers –AT&T, Charter Communications, Comcast and Verizon – spent less on infrastructure in 2018 than in 2017: the first drop in three years.

Government Rejects Spectrum Relief Proposals

The Indian government has rejected requests for financial relief with regards to spectrum payments, but will consider other measures. The Economic Times quotes Telecom Secretary Aruna Sundararajan as saying that, although the Department of Telecommunications (DoT) could not support certain measures proposed by industry stakeholders to ease the financial burden on telecom operators, 'two of their demands have been positively

recommended to the finance ministry that include bringing down import duties and Goods and Services Tax (GST) relief.' The official explained that as operators were not agreed on the subject of spectrum payments, the government could not intervene, saying that disagreements between providers indicated that it was not an industry-wide issue, and as such 'has to be left to the market.' Perhaps unsurprisingly, disruptive newcomer

Reliance Jio Infocomm (Jio) has been the dissenting voice, arguing against suggestions put forward by Vodafone Idea and industry body the Cellular Operators Association of India (COAI) such as the deferment of spectrum payments. Elsewhere, however, operators were more unified in their support of proposals to reduce the custom duties on telecom equipment.

C-Band Alliance Responds to Backlash

The C-Band Alliance (CBA) recently responded to a number of critics of its proposal to make 200 megahertz of 3.7-4.2 GHz spectrum available for 5G, saying many commenters wrongly contend that the “market-based approach” that it’s advocating for violates the Communications Act and flies in the face of precedent. It’s noteworthy on several fronts, including the timing. The CBA’s response was filed Feb. 6, the same day that several critics were calling for more transparency from the group and noting the great likelihood that the CBA’s plan would lead to litigation. Representatives from Google and Charter Communications also suggested the CBA plan would delay getting the spectrum into the hands of 5G players longer than if it were to go through a public FCC auction. The C-band, or 3.7-4.2 GHz, is considered midband spectrum, which offers a “Goldilocks” mix of capacity and coverage that mobile operators and other 5G stakeholders want in 5G. It’s probably one of the best shots carriers have at getting midband spectrum at the moment, since the 3.5 GHz band will offer only 70 MHz for licensed usage when a portion of that band is made ready for auction. In its filing, the CBA—a group comprised of Intelsat, SES, Eutelsat Communications and Telesat—cited specific sections of the Communications Act that back the idea that its proposal is permissible under the current law. The CBA called its plan a “market-based approach.” Others are calling it a private sale or auction that would lead to a windfall for satellite companies. The Open Technology Institute (OTI) at New America held a forum on February 6 titled “The Great Airwaves Robbery II,” explaining that it wouldn’t be the first attempt by someone trying to get wrongly reimbursed for government-controlled spectrum. Congress enacted legislation in 2002 that averted those earlier efforts. The CBA wasn’t on that panel, although its proposal dominated the discussion and CBA Head of Advocacy and Government Relations Preston Padden addressed some issues during a heated Q&A session. The American Cable Association (ACA) and T-Mobile assert that the CBA’s approach would violate Section 309(j)(6)(E) because it contemplates negotiations among “private parties,” which they suggest is beyond the scope of that statute. “These entities offer no support for their contention that the statutorily authorized ‘negotiations’ cannot take place among private parties,” CBA told the FCC. “Nothing in the language of the statute limits this term, and their position flies in the face of D.C. Circuit precedent which confirms that ‘settlement negotiations’ ‘sure[ly]’ are a permissible ‘means of avoiding mutual exclusivity’ under Section 309(j)(6)(E).” Much of the filing refutes arguments

T-Mobile has put forth and at one point refers to one of T-Mobile’s comments as a “banal observation” given the unique challenges raised in the proceeding, including shared access by satellite operators to C-band spectrum. Padden said the unique feature about the CBA’s approach is the satellite operators are all on board. When comparisons are made to the 600 MHz incentive auction involving TV broadcasters, he said those TV stations were voluntarily participating. With the C-band, each satellite operator has equal access to all 500 megahertz at their disposal, so every carrier must agree to participate in an auction and be happy with the price they’re getting—something he puts the odds of happening at zero. The C-Band Alliance is also offering to take care of existing users, making sure the proper filters are installed on thousands of satellite dishes across the county so that service is not disrupted. Padden questioned who in the government would take care of that if it rejects the CBA’s proposal. The C-Band currently carries live TV and radio programming from content producers to local stations and cable systems nationwide. Panelists at the OTI event reiterated that one of their big concerns was the lack of information they were getting from the CBA—something they think would be rectified if the FCC were to conduct a more traditional public auction of the airwaves. The ACA has some real concerns especially for rural companies that are highly dependent on C-band spectrum because alternative ways, namely fiber, are not available or affordable, and they’re concerned about remediation being driven by the satellite industry. The CBA also filed satellite transponder migration plans (PDF) developed by SES and Intelsat. The plans describe in detail how SES and Intelsat currently plan to accommodate all existing C-band customers in 300 MHz of spectrum and demonstrate that 200 MHz is the maximum amount of spectrum that can be cleared without denying C-band service to some current customers. 📄



A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION



A public tender could soon be launched in Algeria to roll out the 3G in rural and tourist zones. This was announced by the Minister of Posts, Telecommunications, Technology and Digital Imane Houda Feraoun, during a visit in Tissemsilt where she inaugurated the Algérie Telecom's commercial agency in Theniet El Had. According to the Minister, the public tender, which will be launched next week, will be steered by the Post and Telecommunications

Regulator ARPCE. It is aimed at allowing the whole country, even residents of remote areas, access to the advantages offered by telecom services and take advantage of the positive impacts of the digital economy. The official further indicated that the rollout would be supported by the national investment fund (FNI), which has a window dedicated to the financial management of public equipment. (February 16, 2019) ecofinagency.com

Algeria



The Telecommunications Regulatory Authority (TRA) announces that it has been awarded ISO 27001 Certificate for its Information Security Management System (ISMS) by the Quality Certification Bureau Italia, the authorized body to grant the ISO 27001 certificate. This achievement reflects TRA's commitment to implementing highest standards of information security and risk management. TRA conforms to the ISO / IEC 27001:2013 standard

by adopting an ISMS with the aim of maintaining high information security, confidentiality and integrity and controlling information management risks. TRA exerts all its endeavors to preserve data security through keeping up with the latest technology advancements. ISO 27001 is an international standard that defines the requirements for an Information Security Management System. (February 3, 2019) tra.org.bh

Bahrain



The Bangladesh Telecommunication Regulatory Commission (BTRC) has imposed four additional restrictions on GrameenPhone (GP) after declaring the cellco as holding Significant Market Power (SMP) earlier this month. The operator was asked to immediately implement the new restrictions, which include a ban on signing any exclusive deals with goods and service providers and a ban on nationwide ad campaigns marketing its dominance. GP is also required to reduce its call drop rate to less than 2% (currently 3.4%, higher than its competitors according to a BTRC study conducted in November 2018), while subscribers wishing to switch their mobile provider will be required to stay with GP for only 30 days (90 days for other operators). In another letter, the telecoms regulator said it would evaluate the situation related to the four restrictions within six months and add new restrictions if required, including the possible imposition of a different termination rate for GP. (February 20, 2019) [The Daily Star](http://TheDailyStar.com)

The Bangladesh Telecommunication Regulatory Commission (BTRC) has declared Grameenphone (GP) as holding Significant Market Power (SMP), four months after the adoption of The Bangladesh Telecommunication Regulatory Commission (Significant Market Power) Regulations 2018 in November 2018. The regulator has declared GP as holding SMP in two categories: subscribers and revenue, with the operator accounting for 46.33% of the country's active customer base in 2018, while its revenue share has been more than 50% for several years. The BTRC informed the market leader in a letter that it may be subject to additional restrictions, while unnamed sources revealed that the commission is working on eight points that may see GP charged additionally for customer acquisition. The regulator is also planning to increase the SMP operator's tariffs for both voice calls and data and impose different quality control parameters on the cellco. (February 11, 2019) [The Daily Star](http://TheDailyStar.com)

Bangladesh

The Bangladesh Telecommunication Regulatory Commission (BTRC) has shown interest in spending a part of the social obligation fund (SOF) from telecom operators for e-waste management, said BTRC Chairman Md Jahurul Haque. "According to the Telecom Act, the SOF can be used only to extend telecom facilities in remote areas. But there will be no problem if we add e-waste management to this," he said. However, the Act will have to be amended for this. The BTRC can take steps in this direction if the demand is made by the sector, said Jahurul Haque. "We have to create an opportunity for e-waste management to protect the interest of the people. We need to add a provision to the Telecom Act. We need proper planning to implement this measure," the BTRC Chairman told The Independent after a recent seminar in the capital on e-waste management. Post, Telecommunications and ICT Minister Mustafa Jubber said: "I think it is important to look into the legal aspect of the matter." The SOF, built with contributions from telecom operators, reached Tk. 1,411.90 crore in December 2018. The BTRC introduced the fund in November 2011 when four mobile operators renewed their licenses. The BTRC began the collection in 2011, while the rule was finalized in 2015. According to the Bangladesh Mobile Phone Importers' Association (BMPIA), around 35 million phones end up as e-waste every year in the country. Nearly 45 million mobile phone batteries are annually added to the existing e-waste. There are three points where e-waste is generated—the factory level (as Bangladesh moves into manufacturing, wastage will occur), the service center level (about 6 per cent of the phones are repaired or parts replaced every year) and the consumer level. The Director General of the Department of Environment (DoE), Sultan Ahmed, said in addition to the mobile phones, the country also use about seven lakh computers, 29 lakh television sets, 2.55 crore CFL bulbs, 40 lakh fans, 1.55 lakh refrigerators, and about 95,000 air conditioners and 30,000 deep freezers annually. These contribute to the volume of e-waste in the country. The department concerned has already developed a draft regulation for e-waste management in line

with the existing Environment Conservation Act of the country, he added. (February 5, 2019) theindependentbd.com

The telecom regulator plans to concentrate on market equilibrium in the telecommunication sector to break the uneven market share of mobile network operators (MNOs). Officials said Bangladesh Telecommunication Regulatory Commission (BTRC) was going to implement the legal framework dubbed 'significant market power (SMP)' as early as possible for the purpose. BTRC Chairman Md. Zahurul Haque said they would finalize the mode of SMP implementation in the next commission meeting. 'No more monopoly would exist in the telecommunication market after the implementation of the SMP,' he added. Meanwhile, BTRC prepared a set of policy guidelines for MNOs to promote fair competition in telecommunications industry by creating a level playing field. In November 2018, BTRC issued a gazette notification regarding the SMP. The guidelines said an operator should be considered an SMP if its market share is above 40 per cent. As per the new guidelines, BTRC officials said, leading mobile phone operator Grameenphone would be considered as an SMP for having 45.8 per cent market share. Besides, the second largest operator Robi has 30 per cent stake in the market followed by Banglalink 22 per cent and Teletalk has only 2.5 per cent. If any operator violates the guidelines, the commission will take action as per Section 64 of the Bangladesh Telecommunication Act, 2001 (amended 2010). It also allows the regulator to impose a fine of up to Tk 300 crore and a five-year jail term in case of non-payment of the fine within the timeframe set by the commission, they added. After spending a long time, the guidelines have been finalized with everyone's opinion. Although some market players will be affected commercially all have agreed on it for the sake of fair market competition. Earlier in 2011, BTRC had planned to launch the SMP and prepared the guidelines. Later, on August 21, 2011, the guidelines were sent to the posts and telecommunications division for approval. (January 26, 2019) newagebd.net



Egypt

The National Telecommunications Regulatory Authority (NTRA) has granted the mobile network operator, Etisalat Misr, a triple-play telecom license that allows the firm to provide mobile and landline services, high-speed broadband, and fiber-optic TV services. NTRA's Acting Executive President, Mostafa Abdel Wahed, and CEO of Etisalat Misr, Hazem Metwally, has signed the license agreement. 'We are pleased to receive the license to establish and operate triple-play services in compounds. We will also announce more products for customers in compounds in the near future, as Etisalat Misr's plan is to provide Value-Added Services (VAS) to enhance content and improve services quality,' Metwally said. Egypt has started to offer triple-play telecom licenses for the private sector since 2010. Teletech, a Vodafone-led consortium, and Link, an Orascom Telecom and Mobinil-led consortium, were the first to receive this license in the country. The service is expected to attract \$1bn of investments within the

next five years. According to the license's terms, Telecom Egypt, which later became a mobile service provider, was responsible of establishing necessary infrastructure for the triple-play services in compounds. Etisalat Misr will be the first telecom company to provide this service independently. (February 18, 2019) menafn.com

The communications and information technology sector witnessed a growth rate of 16.4 percent during the second quarter of the fiscal year 2018/2019, the highest among the entire Egyptian economy sector. The sector's contribution to GDP reached eight percent. These findings came in the economic performance indicators for the second quarter of the current fiscal year 2018-2019 announced by the Ministry of Planning, Follow-up and Administrative Reform. Minister of Communications and Information Technology Amr Talat said that the sector's success in achieving positive growth comes through implementing projects

and initiatives aimed at developing the information technology industry, creating an environment attractive to investment and technological innovation, increasing the competitiveness of small and entrepreneur companies and providing different funding resources. He added that the ministry's initiatives aim to increase exports of IT services by expanding to global markets, alongside efforts to localize the electronics industry and cooperate with Egypt's different sectors to implement Egypt's strategy in

transforming digital society and developing a strong, secure communications infrastructure. The Minister pointed out that the ICT sector has a great human resource. Youth development is the main pillar of the Ministry's strategy, Talaat said, adding that these positive indicators are an incentive for the sector's employees to exert more efforts to achieve desired goals and contribute to social and economic development.

(February 3, 2019) [egyptindependent.com](#)



The Ministry of ICT (MICT) says that broadband internet access will be available to almost all rural areas of the country by the end of the next Iranian calendar year (March 2020). According to a report, 63% of rural areas currently have access to fixed or mobile telephony and broadband services, up from 32% in September 2017. Mehrdad Torabian, director of ICT at the Rural Development office of the MICT, is quoted as saying: 'In 2017 close to 9% of villages were totally deprived of any sort of communication services. The figure is now down to 3%.' The Iranian government controls the country's main fixed and cellular operators, Telecommunication Company of Iran (TCI) and Mobile Communication Company of Iran (MCI).

(February 28, 2019) [The Financial Tribune](#)

The ICT Minister Mohammad Javad Azari Jahromi says the country is aiming to deploy 5G and IoT networks in Iranian calendar year 1398, which begins on 21 March 2019. A report

cites the Minister as tweeting: 'Heading towards 5G! It is an aim we pursue besides development of IoT in 1398. Now, all the Iranian cities and over 66% of villages have 3G/4G coverage ... The new generation of telecommunications is waiting for us.' Iran is home to three nationwide mobile network operators (MNOs) plus one regional provider. (February 21, 2019) [The Tehran Times](#)

Iran's Telecommunication Infrastructure Company (TIC) says it plans to install a further 14,000km of fiber-optic network over the next two months to take the total length of its infrastructure to 84,000km. The state-operated organization is carrying out the project to improve the reach of its networks, which are utilized by third-party service providers. The company's Managing Director, Sadeq Abbasi Shahkouh, is quoted as saying that the capacity of IP networks in Iran has increased threefold over the past ten months.

(February 18, 2019) [The Tehran Times](#)



Challenges changes related to information security have become a driving force in the fight against cyberpiracy, Chairman and CEO Public Authority of Communication and Information Technology Regulatory Authority (CITRA) Salem Al-Athaina said. Al-Athaina said in a speech at Kuwait's First Cyber Security Conference, organized by Kuwait Hackers Company, that his authority faces great challenges in addressing such danger, calling for more efforts by public and private sectors in Kuwait. Al-Athaina added that CITRA is keen to benefit from national expertise in the implementation of information security strategic projects within the framework of security-integrated policies, procedures, standards and technical controls. This aims at developing a national defense system, and to respond to emergencies on vital systems and confront electronic attacks, he said. The Chairman pointed out that CITRA supports national strategy for cybersecurity in an integrated manner by establishing the National Cyber Security Center, adding that his authority also supports national cadres seeking to spread national awareness regarding cyber-attacks and how to address them. Al-Athaina

also pointed out that the issues of information security, methods of treatment, and national awareness dissemination of their dangers is the duty specialists, adding that the presence of such expertise in the Kuwaiti youth contribute to fight Internet piracy. For her part, Director General of the Central Agency for Information Technology (CAIT), Haya Al-Wadani said CAIT has prepared a comprehensive vision for an emergency project on a Kuwait-based information security center to control and protect infrastructure of information technology. Al-Wadani added that CAIT faces challenges in cybersecurity such as campaigns of defamation and blackmail to the point of impersonation and identity replacement. The agency also have dealt with crimes related to electronic penetrations, theft of smart phone data, and spying, in addition to the random breaches of websites and the disruption of services in government and private agencies. She stressed the need for "concerted efforts to raise awareness over the dangers of electronic misconducts and training of Kuwaiti youth to address such destructive ways in our society."

(February 18, 2019) [kuna.net.kw](#)

Iran

Kuwait

The government will soon announce the privatization of various government entities, including the state's fixed telecoms operating division, the Ministry of State for Service Affairs ('Ministry of Services', in the process of being renamed to Ministry of Communications). The ministry is the incumbent fixed line operator, whilst its legacy regulatory duties have largely been

taken over by the Communication and Information Technology Regulatory Authority (CITRA); it also provides postal and transportation services. The privatization drive is aimed at cutting expenditure, trimming down the state's organizational structure and meeting budget deficit targets.

(February 12, 2019) telegeography.com



Morocco

The Moroccan government has enacted Law No. 121-12, amending and supplementing the Post and Telecommunications Act No. 24-96. The new regulation is designed to give more power to telecoms watchdog the National Agency of Telecommunications Regulation (Agence Nationale de Reglementation de Telecom, ANRT) and will allow the ANRT to impose penalties on operators of up to 2% of their turnover before tax in cases of infringement. The

bill also addresses consumer protection, infrastructure sharing and the integration of optical fiber infrastructure in buildings, and provides for the creation of a national roaming system, which will allow subscribers to use the network of any operator available in the area in which they are located.

(February 27, 2019) telegeography.com



Nepal

Nepal Telecom has been allocated spectrum in the 800MHz frequency band for the expansion of its 4G network in rural areas. The country's Radio Frequency Allocation Committee has agreed to award 10MHz of spectrum to the mobile market leader. At present, Nepal Telecom's LTE network, which operates in the 1800MHz band, is restricted to Kathmandu and Pokhara.

(February 15, 2019) NepaliTelecom

The stop-start auction of frequencies in the 900MHz, 1800MHz and 2100MHz bands by the Nepal Telecommunications Authority (NTA) has ground to a halt once more, with the regulator

postponing the process at the behest of the Supreme Court. The spectrum sale – which was launched by the NTA on 19 December 2018 – seeks to sell off blocks of 'residual' spectrum not currently in use. Frequencies up for grabs include: 2x3MHz in the 900MHz band; 2x16MHz in the 1800MHz band; and 2x10MHz/2x15MHz in the 2100MHz band (depending on current spectrum holdings). As per the original terms of the auction, would-be bidders must be in possession of a 'Basic Telephone Service License' or a 'Mobile Service License' from the NTA and must not have defaulted on a previous payment to the regulator. Once assigned, all licenses will be valid for a period of 25 years. (February 8, 2019) telegeography.com



Oman

A high-profile delegation from Oman, led by Dr. Hamed bin Salim Al Rawahi, Executive President of the Telecommunications Regulatory Authority, travelled to the United Kingdom with the aim of leading the way towards the implementation of 5G in the Sultanate. The team of officials included Ooredoo CEO, Ian Dench, Omantel VP of Operations Eng. Said Abdullah Al Ajmi, senior representatives from the Ministry of Transport and Communications, Oman Broadband Company, Ministry of Environment and Climate Affairs, Ministry of Regional Municipalities and Water Resources, Suhar Municipality, Muscat Municipality and Dhofar Municipality. Put together in conjunction with the British Embassy, this unique opportunity has laid the foundation for the development of Oman's 5G roadmap by allowing the delegation to gain on-the-ground expertise as

well as forge key contacts with UK policymakers, regulators and investors. Commenting on the trip, Ian Dench, Ooredoo CEO said, "It was an honor to accompany Dr. Hamed and the Oman Delegation on this important UK tour. We are very excited about bringing our 5G Supernet to Oman. Having just obtained our 5G spectrum, we are already exploring the implementation of operational trials, including urban testing. And in just the last few days, Ooredoo Group successfully trialed the first International 5G call in the Arab World. This collaborative trip allowed us to gain expertise on 5G trials experiences, from industry leaders who have already been through the process." Dr. Saoud Al Shoaili, Director General of Communications and Postal Services at the Ministry of Transport and Communications commented, "This tour paved the

way for the implementation of 5G in Oman. By working together with key entities from Oman, as well as other global organizations we will make sure that we are able to develop the environment for innovative and state-of-the-art technology, which will support the communications needs of the future." Eng. Yousef Al Balushi, Vice President for Spectrum Affairs at the Telecommunications Regulatory Authority added "Our vision has always been to make sure that everyone in the Sultanate has access to world-class telecommunications services. As an organization, we understand the value of developing the industry through a market-driven environment and with 5G expected to hit the market in the near future, we are working together with industry leaders both in Oman and abroad to ensure we are ready. This tour was a fantastic opportunity for us to gain some insight, share knowledge and ultimately create a better way to keep everyone connected." Eng Said Abdullah Al Ajmi, Vice President of Operations Unit at Omantel said "Adoption of 5G technology forms the cornerstone in the Omantel technology roadmap. We conducted several successful trials and live 5G tests throughout the past two years while preparing Omantel transmission and access networks for the anticipated commercial launch of 5G later this year. This visit provided us with a valuable opportunity to learn more about global 5G experiences and network with relevant stakeholders in the

UK". Her Majesty's Ambassador to Oman, H. E. Hamish Cowell at the British Embassy added "I am delighted that the trade team at the British Embassy was able to help set up this important visit to share lessons on 5G policies, regulation and technologies. This next generation of telecoms has the potential to revolutionize so many areas of our lives. I hope to see close ongoing collaboration between Oman and the UK to develop the opportunities for economic development and enhanced public services that 5G can bring." The program was carefully planned to cover four key function areas: regulatory, government, implementation and investment. The delegation met with Ofcom, the UK's regulator for the communications services, to gain an insight into how it is managing the introduction of 5G from a regulatory perspective. The party also visited several key government representatives in charge of issuing licenses for the installation of telecoms towers and antennas to hear about their experience in getting ready for the introduction of the new technology. The group also went to a number of 5G trial sites to see how they are being coordinated and conducted at a grassroots level. This included a trip to the 5G Innovation Centre in Surrey to explore whether a similar initiative could be launched in Oman. Representatives from the party also met with various UK vendors involved with 5G related activities to explore future collaboration and partnership opportunities.

(January 28, 2019) albwaba.com



Pakistan

Pakistan Telecommunication Authority (PTA) has said that it along with the Ministry of Information Technology and other stakeholders have been working since April 2017 on a license renewal framework as licenses of three telecom service providers are going to expire this year. "The renewal of license and associated spectrum at the end of a license period will be as per policy of the government. In case of renewal of licenses, PTA will make recommendations to the federal government within the timelines stipulated in the respective licenses," PTA said in a statement. The statement came after a news story appeared in The Express Tribune which said the telecom operators were worried over delay in the renewal of their licenses. PTA emphasized all procedures relating to license renewal were being handled in a timely manner, keeping in view the established benchmarks, spectrum and technological roadmap and market dynamics, so that the government, consumers and telecom operators continue to benefit. (February 27, 2019) tribune.com.pk

The number of 3G and 4G users in Pakistan reached 62.99 million by end January 2019, said Pakistan Telecommunication Authority (PTA). The number of mobile phone users in Pakistan reached 153.302 million by end January 2019 compared to 153.986 million by end December, which registered an increase of 0.684 million during the period under review. Jazz's total count for 3G users stood at 13.72 million by end January compared to 13.79 million by end December, registering a decrease of 0.07 million. Jazz 4G user numbers jumped from 7.053 million by end December

2018 to 7.606 million by end of January. Zong 3G subscribers decreased from 8.692 million by end December to 8.660 million by end January 2019 while the number of 4G users jumped from 9.860 million by end December 2018 to 10.443 million by end January. The number of 3G users of Telenor network decreased from 9.136 million by end December to 8.917 million by end of January. The number of 4G users jumped from 4.732 million by end December to 5.227 million by end of January. Ufone added 0.079 million 3G users on its network during the month of January as the total reached to 8.418 million by end January compared to 8.339 million by end December 2018. Teledensity for cellular mobile increased to 75.78 percent by end January compared to 75.15 by end December and broadband subscribers reached 65139237 by end January compared to 63773916 million by end December 2018. PTA received 3196 complaints from telecom consumers against different telecom operators including (cellular operators, PTCL, LDIs, WLL operators and ISPs) as of November 2018. According to PTA data Jazz (Mobilink + Warid) leads the chart with 827 complaints and PTCL stands at second position as the most complained telecom operator with 780 complaints. PTA said that it was able to get 3182 complaints resolved i.e. 99.56 percent. Cellular mobile subscribers constitute a major part of the overall telecom subscriber base, therefore, a maximum number of complaints belong to this segment. The total number of complaints against CMOs by November 2018 stood at 2358. In terms of the segregation of complaints on operator basis, a total of 827 complaints were received against Jazz which is 35.07% of

the total CMO related complaints. Zong stood second with 531 complaints i.e. 21.51 percent of total complaints. Telenor, which has the second largest number of consumers, was third with 528 i.e. 22.39 percent complaints were received against it. Ufone had 472 complaints against its various services which make up 20.01 percent of the total CMO related complaints.

(February 23, 2019) phoneworld.com.pk

Pakistan Telecommunication Authority (PTA) in collaboration with Internet Corporation for Assigned Names and Numbers (ICANN) organized a workshop on "Domain Name System (DNS) Abuse and Misuse" at PTA Headquarters Islamabad, to build capacity and skills of senior technical officials from PTA, telecom sector and other stakeholders. The participants were introduced to strategies, techniques and tool that information security professionals use to identify abuses of DNS and malicious registrations of domain names or hosting, a press release said. The workshop was conducted by Fahd Batayneh, Manager ICANN for the Middle East region, who has vast technical experience of the subject at international level. The workshop focused on capacity building among technical professionals to enhance their familiarity with Internet protocols and equip them with essential skills and knowledge to intercept and block DNS attacks. This workshop is just one of the many collaborative steps taken by PTA for enhancing cyber security of telecom sector and capacity building of Pakistani technical community, including but not limited to IPv6 routing, IXP workshops, DNSSEC and Network security. (February 10, 2019) brecorder.com

The Prime Minister has constituted a technical committee to evaluate benchmarks for the license renewal of three mobile operators and award of additional spectrum. The government is expected to generate \$2 billion in revenue from the process. Official sources revealed that license renewal of two mobile operators are due in early May, 2019 and one in October. The government has yet to come up with any policy guidelines in this regard so far which is resulting uncertainty in the industry. The technical committee is headed by Secretary Ministry of Information Technology and Telecommunication (MoITT) while officials from Pakistan Telecommunication Authority (PTA), Ministry of Finance, Law and Justice and Frequency Allocation Board (FAB) are the members of the body. The technical committee has been tasked to evaluate benchmarks, different models, legal and financial aspects and submit recommendations to the committee of ministers—comprising on Finance and IT ministers. After the approval from a committee of ministers, a final draft would be submitted to the federal cabinet for approval of the policy and later IT Ministry would announce it. Sources said that due to delay in announcing license renewal policy, telecom operators would have little time for decisions about future investment and business plan, which is creating uncertainty in the industry. According to experts renewal decisions should ideally be finalized 18-24 months prior to license expiry to ensure service and business continuity. The license of Telenor Pakistan and Jazz (Warid) are due to expire early in May 2019, and according to telecom experts, the operators may face the operational issue, if fail to renew its licenses within due time. The license of Zong is due to expire in October 2019. All the three

operators have submitted requests for renewal but a decision on renewal terms is still pending. The licenses of the three cellular mobile operators were awarded by PTA under the cellular mobile policy for a period of 15 years in 2004. Two operators –Mobilink (Jazz) and Ufone- have renewed their license at \$291 million in the past after the expiry of 15 year period. The remaining two mobile operators, Jazz (Mobilink) and Ufone are not due for renewal until 2022 and 2029 respectively. Sources said that efficient completion of the renewal process will help maintain certainty in the industry. However, it depends on the new framework of the licenses regime by the telecom authority especially after the award of licenses and spectrum of 3G/ 4G technologies to various operators. Clause 8.11 of Telecommunications Policy 2015 states that: "Renewal of license and associated spectrum at the end of a license period will be as per the policy of the government. PTA will in a timely manner initiate the process in accordance with terms and conditions of the license" In case the renewal of licenses PTA will make recommendations to the federal government (MoIT), within the timelines stipulated in the respective licenses. Another spectrum not subject to license renewal terms will be priced in accordance with the applicable spectrum pricing methods specified. Where spectrum payments for microwave and mobile spectrum have been introduced subsequent to the initial assignment of the mobile spectrum, the spectrum fees associated with the mobile spectrum will be determined under the terms of the applicable license. (February 8, 2019) phoneworld.com.pk

In order to facilitate International Travelers, PTA in collaboration with FBR has launched a new web-based user interface application in DIRBS for the regularization and registration of unregistered mobile phones. It means now, one can pay duties and taxes online rather than standing in long queue on Airport. For now, International travelers will be able to bring phones in their luggage and don't need to declare it on Airport. The FBR has issued separate procedures for or the registration of the mobile devices brought in by international travelers, registration of mobile devices by the local applicant, registration of mobile devices imported by individuals through postal service or courier and registration of mobile devices imported illegally through informal channels by local traders. PTA Online Device Registration System is specially launched to facilitate overseas Pakistanis. As per orders, Overseas Pakistanis can bring only one phone free of duty and a maximum of five can be brought in as per personal baggage rules. However, if they bring five phones then they have to pay duty on the four extra handsets. The PTA provides online application service whereby web-based user interface <https://dirbs.pta.gov.pk/drs> can be accessed by international travelers for hassle-free registration and payment of duty/taxes against mobile devices imported in their baggage. The system will need the applicant to submit the details of passport number, computerized National Identity Card (CNIC) number, International Mobile Equipment Identity (IMEI) number etc. The overseas Pakistanis can register their mobile devices brought-in baggage within 60 days of their arrival in Pakistan. People living in Pakistan can also register their devices through this online portal however they will have to pay some amount accordingly whereas, for overseas Pakistani, registration of one mobile is totally free. All Pakistani mobile

device users wishing to know the status of a device can send each 15 digit IMEI number via SMS to 8484. The status of the mobile device can also be checked via PTA website link www.dirbs.pta.gov.pk or by downloading DIRBS android mobile application. (January 30, 2019) phoneworld.com.pk

gov.pk or by downloading DIRBS android mobile application. (January 30, 2019) phoneworld.com.pk



In tandem with the launch of a Vision 2030's flagship program, National Industrial Development and Logistics Program (NIDLP), the Ministry of Communications and Information Technology (MCIT) signed a cooperation agreement with Dawiyat and other telecom companies for the implementation of the initiative to deploy the ICT infrastructure for the industrial cities in the Kingdom of Saudi Arabia. This agreement will contribute to transforming the Kingdom into a leading industrial powerhouse and a global logistics platform, seeking to integrate four strategic sectors (industry, mining, energy and logistics) and deliver an enabling competitive ecosystem for the private sector in order to invest in these sectors. Eng. Abdullah Al-Swaha, Minister of Communications and Information Technology, attended the signing ceremony, where the agreement was signed by the Deputy Minister for Communications and Digital Infrastructure Eng. Abdullah Al-Kanhil and the Chief Executive Officer of Dawiyat Dr. Ahmed Sindi. On this occasion, Eng. Abdullah Al-Swaha pointed out that the initiative to deploy the ICT infrastructure for the industrial cities is targeting 39 industrial cities and will contribute to the public and private sector in achieving the investment goals estimated at 2 billion riyals. He stressed the importance of the

initiative in developing the digital infrastructure through the deployment of fiber optic and wireless networks in the industrial cities to enable modern technologies (5G & IoT) to boost digital transformation in factories, support the Fourth Industrial Revolution, and create many job openings for the Saudi citizens in the ICT and industrial sectors. Eng. Al-Swaha emphasized the significance of digitalizing factories targeted by the initiative, with a total area of over 1.6 billion square meters, adding that the digital infrastructure of 200 million square meters for the developed plots will be implemented through the deployment of fiber optic and wireless networks for 6000 factories. He also stated that the digital transformation of factories is expected to contribute effectively to raising efficiency by 30-50% and reducing cost by 20-30%, leading to a paradigm shift and quantum leap in improving the performance of Saudi Arabia's factories, as well as a great growth of various investments. It is worth mentioning that the five Industrial City, with a total area of 500 million square meters. The deployment of digital infrastructure and communications services will begin for the developed areas with more than 80 million square meters by the delivery of fiber optic networks to more than 1500 factories. (January 28, 2019) mcit.gov.sa

Saudi Arabia



The Tunisian telecom authority INT (Instance Nationale des Telecommunications) has published a consultation opening a new cycle of market analysis. This initial stage of the process aims to gather stakeholders' feedback on the definition of the relevant markets for ex-ante regulation. Tunisia set in motion

the adoption of the current model of analysis in 2014, similar in principle to the process implemented across the EU. The INT defined a methodology in 2015 and launched the first cycle of analysis under the new rules in August 2016. (February 16, 2019) telecompaper.com

Tunisia



The Information and Communication Technologies Authority (BTK) has approved applications by the country's three mobile network operators Turkcell, Vodafone and Turk Telekom (Avea) to conduct 5G trials in different frequency bands in the largest three cities Istanbul, Izmir and Ankara this year. Minister of Transport & Infrastructure Cahit Turhan was quoted as saying that Turkey will be a 'frontrunner' in 5G rollout, stating: 'We aim to achieve the

goal of shifting to 5G technologies in 2020 through research and product development.' (February 12, 2019) YeniSafak.com

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Turkey

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The Information and communication technology spending by institutions in Turkey is expected to reach US\$17.1 billion in size this year, according to an International Data Corporation (IDC) report. According to the 2019 IDC Turkey Predictions report prepared by IDC analysts, digitalization in all institutions continues with significant investments despite certain fluctuations in the economy. The report highlights that telecommunication, finance, public, production and retail sectors come to the fore with the highest IT spending, while especially telecom operators are making significant investments toward becoming a digital service provider. Hosted by Microsoft Turkey, the 2019 IDC Turkey Predictions event was held on Feb. 7. Organized for the fourth time, the event was attended by chief information officers (CIOs) of prominent corporations, IDC Turkey analysts, and leading ICT (Information and Communication Technologies) suppliers. IDC is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. With more than 1,100 analysts worldwide, IDC offers global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries. "Global spending and employment measures, increased competition and profitability measures; rapid depreciation and volatility of the Turkish lira against the U.S. dollar led the institutions operating in the public and private sectors to reconsider their IT investments," IDC Turkey Country

Director Nevin Çizmecioğulları said in her address at the event. Despite all the negativity, Çizmecioğulları said, they have observed that businesses that want to obtain a permanent place in the Turkish market and that have a long-term perspective continue to invest in technology. "The importance of digital transformation for companies is becoming clearer in such environments. In the coming period, with the contribution of the growing startup ecosystem, we anticipate that many new partnerships, new investments and projects will be realized in new technologies such as blockchain, cybersecurity, 5G and robotic process automation," she added. Besides Turkish telecom services, the rest of the IT market will reach \$8.3 billion this year. In the hardware-weighted market, IT services and sub-sectors of the software industry are the fastest growing areas with an estimated annual growth rate of 3.8 percent predicted by the IDC. The financial sector is, on the one hand, shaping its investments within the framework of ensuring regulatory compliance, according to the report, while on the other hand, it focuses on improving customer experience and operational efficiency with new technologies such as blockchain and Open API. By becoming the most critical priority of CIOs in Turkey, innovation and the value provided to the company will have an effect on the future IT investments. Moreover, companies are said will interact much more with technology initiatives to become more innovative and agile. The robotic process automation will turn into one of the most important solutions for reducing the labor cost of companies and increasing their operational efficiency. Increasing investments in the big data and analytics area will reveal the importance of data architecture. Also, cloud services will become one of the most important components of digital transformation projects with the flexibility they provide. (February 12, 2019) dailysabah.com



The Telecommunications Regulatory Authority (TRA) received the European Innovation Management Standard Certification. Hamad Obaid Al Mansoori, TRA Director General, received the certificate from Colin Rushmere, BSI MEA General Manager Compliance and Risk. TRA's certification in the European Innovation Management Standard CEN/TS 16555-1:2013 came as a result of its work on developing an integrated system for innovation management at the corporate level, leading the implementation of innovative proposals and providing services in accordance with global standards. Commenting on this milestone, Hamad Obaid Al Mansoori, TRA Director General, said: "Innovation is part of the pillar 'United in Knowledge' of UAE Vision 2021 which seeks to achieve a knowledge-based, diversified and flexible economy led by skilled Emirati competencies and backed by best practices to ensure the long-term prosperity of the UAE and its people. Furthermore, innovation is a basis upon which the TRA acts and, as such, the TRA has a strategy to support, promote and disseminate a culture of innovation in the field of ICT in line with the directives of our wise leadership in creating an innovation-stimulating environment that enables the UAE to be a world leader in this area. Al Mansoori stressed that TRA's receipt of

United Arab Emirates

the European Innovation Management Standard Certification is proof of the effectiveness of the plans adopted by the TRA in this regard, adding: "To be the first place in the world, you must make innovation an approach. Nowadays, innovation is one of the most important fundamentals of survival. A country that does not know innovation will not live long. Therefore, and based on the directives of our wise leadership, the TRA has sought to activate the innovation strategy and provide all resources necessary to achieve the UAE's vision. In doing so, the TRA considered innovation management tools, evaluation of innovation and ideas results, planning, improving and enabling factors to support the innovation system." TRA Director General stressed that all doors are open to all innovators, where he said: "The TRA provides all means of supporting national cadres to demonstrate their innovation and development skills, and takes their creative ideas seriously if proven practical and feasible." It is noted that the TRA has already received several ISO certifications in Business Continuity, Quality Management System, Environmental Management System, Information Management and Security System, Health and Safety. 📍

(January 28, 2019) tra.gov.ae

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION



Albania

Telecoms watchdog the Electronic and Postal Communications Authority (Autoritetit Te Komunikimeve Elektronike Dhe Postare, AKEP) has announced the results of the first round of its 800MHz auction, confirming that Vodafone Albania was the only provider to submit a bid for the frequencies. The celco

offered just over EUR7.44 million (USD8.4 million) for a 2x10MHz block of spectrum in the 800MHz band. AKEP noted that its bid evaluation committee will now review the legal, economic and technical documentation accompanying Vodafone's bid.

(February 12, 2019) telegeography.com



Australia

The Department of Communications and the Arts (DCA) has called for feedback on plans to revamp the 'Carrier License Conditions (Telstra Corporation Limited) Declaration 1997', which allow the authorities to declare that a particular carrier is subject to specified license conditions. With the regulations 'due to sunset' on 1 April 2019, the DCA noted that they currently include obligations on fixed line incumbent Telstra which relate to, among other things: the establishment and maintenance of the Integrated Public Number Database; the disclosure of specified premises location information to NBN Co; and the provision of directory and operator services. The DCA has proposed that the regulations be remade 'in broadly the same

form as they exist currently', albeit redrafted to 'remove redundant provisions, provide clarity, and update terminology and the drafting style to reflect current conventions'. However, specific provisions that are to be removed include: the local presence obligation, which has been made redundant by the 'Telstra Universal Obligation Performance Agreement', which requires Telstra to maintain its copper network in areas outside the National Broadband Network (NBN) fixed line footprint until 2032; and the provision of mobile coverage in selected population centers and highways, which applied for the first ten years after the services were activated and are now redundant.

(February 8, 2019) telegeography.com



Austria

The Regulatory Authority for Broadcasting & Telecoms (RTR) has confirmed that Austria's 5G spectrum auction is underway. A total of 390MHz in the 3.4GHz-3.8GHz band is available; spectrum licenses are valid for 20 years until 31 December 2039 and will be divided into twelve regions to give local broadband providers the opportunity to enter the high-speed mobile internet market. The frequencies are assigned technology neutral, but the product design offers flexibility to adapt the terms of use to future 5G standards. The auction consists of two phases: the award phase, during which parties will bid in several clock rounds for the desired amount of MHz in the twelve regions; and the assignment phase, during which the winners

of the award phase then bid for the actual blocks that they need within the 3410MHz-3600MHz and 3600MHz-3800MHz bands. In terms of coverage obligations, depending on the spectrum range and the region, a successful bidder must provide services to up to 1,000 locations, around a third of them by the end of 2020. In the clock rounds the spectrum cap for A1 Telekom Austria and T-Mobile Austria is 150MHz and for all others 170MHz. If spectrum remains after the clock rounds and there is another bidding round, the restrictions can be loosened; if there are no competition concerns, the absolute maximum is 160MHz for A1 and 190MHz for all others (in each region). The total of the minimum bids is EUR30 million (USD34 million).

(February 27, 2019) [Der Standard](http://DerStandard)



Brazil

The National Telecommunications Agency (Agencia Nacional de Telecomunicacoes, Anatel) has voted to renew a 1980MHz-1990MHz license used by Claro to support its legacy WiLL services – but only for five years, rather than another 20-year period. In justifying the decision to reissue the concession for a reduced time-frame, the regulator cited the declining interest

in fixed telephony as a platform. According to Anatel, Claro Brasil accounted for a total of 10.430 million fixed voice subscribers at end-December 2018, of which 1.430 million utilized WiLL technology, down from around 3.510 million at the end of 2014.

(February 12, 2019) telegeography.com



Czech Republic

The regulator the Czech Telecommunication Office (CTU) want to kick off its auction of 5G-suitable frequencies in early November 2019 and is seeking to attract bids from a new fourth mobile network operator (MNO) to tackle the long-standing problem of high mobile rates in the country. A report from Reuters claims that the CTU is in the 'later stages of planning' and having submitted the main terms and conditions of the tender process to the government, hopes that discussions will now take place ahead of a public consultation – likely to start in April. The regulator plans to auction off blocks of spectrum in the 700MHz and 3.4GHz bands and in an attempt to smooth the way for a new entrant it is reserving one block in the 700MHz band for newcomers, preventing existing MNOs from driving up prices. It will also put in place stipulations to protect the newcomer in the set-up phase, including the requirement that MNOs allow it access to their networks while building its own, provided the entrant initially covers 10% of the population itself. CTU Chairman Jaromir Novak is quoted as saying that the

5G frequency auction would be considered a success if it attracted a fourth operator to take on the might of the three incumbents O2 Czech Republic, T-Mobile CR and Vodafone CR. 'The main goal is promoting competition on the Czech market,' he confirmed in an interview at a time when an EC study into mobile broadband prices across the continent concluded that the Czech Republic and Cyprus had the most expensive data prices in Europe – a perennial complaint of customers in the Republic. Responding to questions on whether the bid to attract a newcomer would be successful, Novak conceded that while previous attempts had failed, this time was different. 'The time is changing and I am not sure Czech operators realise it,' he is quoted as saying. 'When you compare prices across Europe, you really see people are starving for data in the Czech Republic.' Going forward, the CTU official confirmed that the agency is confident about its proposals, adding: 'We would like to call the tender in the summer and start the bidding procedures in the beginning of November. It is an optimistic scenario.' (February 28, 2019) telegeography.com



Chile

Telecoms watchdog the Department of Telecommunications (Subtel) has unveiled plans for a 5G spectrum auction, with a total of 60MHz in the 700MHz and 3.5GHz bands available to potential bidders. The regulator made the announcement at the Mobile World Congress in Barcelona in an effort to attract new operators to the market. In a statement from the watchdog, it explained that the tender: 'aims to increase number of participants nationwide in the future 5G network, and specifically in the 3.5GHz band, since today there are five operators with allocated spectrum, from which only two could provide these services.' Subtel went on to claim that several foreign operators had already shown an interest in participating in the contest with a view to entering the market. Initial public consultation documents for the auction will be made available by the end of March. In June last year Subtel suspended use of the 3.5GHz spectrum after finding that the frequencies were either underutilized or not being used at all. Following a legal backlash from the five operators affected by the freeze, the regulator relented in October and allowed the providers to continue using around half of their previously-allocated airwaves. Potentially complicating matters further, there is an ongoing legal dispute over the allocation of 700MHz frequencies in 2014 relating to spectrum holding caps. Subtel submitted proposals for new upper limits on spectrum holdings in October

2018, but the new measures have not yet come into effect.

(February 26, 2019) telegeography.com

Chilean cellcos Entel, Movistar and Claro have won a brief reprieve in their ongoing legal battle over the allocation of the 700MHz spectrum in 2014. La Tercera writes that the Constitutional Court has agreed to stay a June 2018 Supreme Court decision ordering the trio to return frequencies equaling the amount they had been awarded in the 2014 tender. The trio had been instructed to return airwaves after the apex court ruled that they had broken rules limiting spectrum holdings to a combined total of 60MHz. The subsequent six months saw the operators protest against the instruction, arguing that they could not comply as there was no mechanism in place for the return of spectrum and that a review of the spectrum holding cap would eliminate the need for them to hand back the airwaves. Following the ruling, sector regulator the Department of Telecommunications (Subsecretaria de Telecomunicaciones, Subtel) had launched a review of the spectrum cap rules and submitted its proposals to the Antitrust Tribunal (Tribunal de Defensa de la Libre Competencia, TDLC) in October 2018. Nevertheless, the following month the TDLC ordered the trio of operators to comply with the Supreme Court's order.

(February 1, 2019) telegeography.com



China

China will fast-track the issuance of commercial licenses for 5G as part of a national plan to boost consumer spending, said a notice published this week by the National Development and Reform Commission. The move appears to be multifaceted, for 5G plays a key role in China's bid to lead the global technology race, and one of its biggest 5G champions, Huawei, has been facing troubles on a global scale. In its statement, the economic regulator calls on local governments to support the promotion and showcase of services utilizing the super-fast network technology. Ultra-high definition TVs, virtual/augmented reality handsets and other futuristic products will be eligible for government subsidies, though the regulator didn't outline the detailed criteria. The acceleration of 5G licenses comes

as Beijing copes with a weakening national economy, a move that will "drum up demand with upgraded technology experiences across devices, automotive and manufacturing leveraging 5G technology," said Neil Shah, research director at Counterpoint Research, to TechCrunch. 5G is on course to generate 6.3 trillion yuan (\$947 billion) worth of economic output and 8 million jobs for China by 2030, according to estimates from the China Academy of Information and Communications Technology. Beijing has been gearing up to be the world leader in the next-generation network tech, pouring resources into 5G research and infrastructure. But it has been hit with a speed bump overseas as western countries grow increasingly wary of spy threat posed by Chinese 5G equipment.

(February 4, 2019) [dailynews.lk](#)



Colombia

The Ministry of Information Technology and Communications (Ministerio de Tecnologías de la Información y las Comunicaciones, MinTIC) has issued a request for expressions of interest (Eoi) in a proposed sale of E-band spectrum (60GHz-90GHz). The

watchdog claims that of the frequencies in question are suitable for 'last mile connections and the deployment of cells in urban areas' as well as supporting 4G optimization. Interested parties are invited to submit applications between 14 and 18 February.

(February 13, 2019) [telegeography.com](#)



Croatia

The Regulatory Authority for Network Industries (HAKOM) has revealed that the country's three incumbent cellcos have applied for spectrum in the 2.6GHz (2500MHz-2690MHz band). Hrvatski Telekom (HT), A1 Croatia and Tele2 Croatia all submitted applications by the deadline on 24 February. The watchdog is looking to allocate 190MHz of frequencies, incorporating 2x70MHz blocks of paired spectrum and a 50MHz unpaired lot. A limit of 2x20MHz per bidder has been placed on the paired frequencies, while there is no cap on the unpaired spectrum. Winning bidders are scheduled to be announced in March. 2.6GHz spectrum is suitable for 4G services, with operators currently employing frequencies in the 800MHz and 1800MHz bands for their 4G LTE networks.

(February 28, 2019) [telegeography.com](#)

The Regulatory Authority for Network Industries (Hrvatska Regulatorna Agencija za Mrežne Djelatnosti, HAKOM) has issued a call for applications for wireless spectrum in the 2.5GHz (2500MHz-2690MHz) band. The watchdog is looking to allocate 190MHz of frequencies, incorporating 2x70MHz blocks of paired spectrum and a 50MHz unpaired lot. A limit of 2x20MHz per bidder has been placed on the paired frequencies, while there is no cap on the unpaired spectrum. Applications are being accepted for 30 days. Earlier this month HAKOM announced that two bidders had submitted offers for a tender to allocate 30MHz of technology-neutral 2100MHz spectrum, which is suitable for 3G or 4G services. A1 Croatia (formerly VIPnet) was the highest bidder for the three lots of 2x5MHz spectrum, with Tele2 Croatia entering lower offers. The watchdog is currently evaluating the bids and expects to announce the winners in mid-February.

(January 29, 2019) [telegeography.com](#)



Denmark

Lars Christian Lilleholt, the Danish Minister for Energy, Utility Supply and the Environment, has published the '5G Action Plan for Denmark' at Odense University Hospital. The plan intends to put the country at the

forefront of installing and using 5G. It said the main four pillars for the strategy are frequencies, deployment, regulation and application. (February 18, 2019) [telecompaper.com](#)



Ecuador

The government is considering the appointment of a private administrator for state-owned telco Corporacion Nacional de Telecomunicaciones (CNT) Counsellor of the president, Santiago Cuesta, has proposed granting a concession to administer CNT and two other electricity companies for at least 20 years. Cuesta added that the idea is for a tender to take place in the second half of this year. The state will still

maintain 100% ownership of CNT, however the day-to-day running of the telco would be handled by the winning bidder. Cuesta said that he has met with the National Anti-Corruption Commission to discuss the matter and has also spoken with CNT employees and other state companies in order to discuss bidding rules for the potential auction.

(January 28, 2019) TeleSemana



El Salvador

The Electricity and Telecommunications Superintendency (Superintendencia General de Electricidad y Telecom, SIGET) has announced plans to hold the long-delayed auction of 140MHz of mobile spectrum in the 1900MHz and 1700MHz/2100MHz (AWS and Extended AWS) bands. Divided into 14 lots of 2x5MHz, the frequencies on offer include 20MHz

in the 1850MHz-1860MHz/1930MHz-1940MHz range, 90MHz in the 1710MHz-1755MHz/2110MHz-2155MHz (AWS) range and a further 30MHz in the 1755MHz-1770MHz/2155MHz-2170MHz (Extended AWS) band. Each block of 2x5MHz has a reserve price of USD6.25 million. The regulator has set a tentative auction date of 4 April. (February 8, 2019) telegeography.com



Estonia

All three of Estonia's mobile network operators (MNOs) have signaled that they intend to take part in the government's forthcoming sale of 5G wireless spectrum. The Consumer Protection and Technical Regulatory Authority (TTJA) has unveiled plans to offer licenses in the 3410MHz-3800MHz (3.6GHz) band, which is seen as a key frequency range for

future 5G networks. Three concessions are available at a reserve price of EUR1.597 million (USD1.8 million) each. The Baltic Course reports that the country's three incumbent cellcos, Telia, Elisa and Tele2, will all be entering the 3.6GHz auction. Sales of spectrum in other 5G-suitable bands are expected in the future.

(February 27, 2019) telegeography.com



Ethiopia

The Council of Ministers has issued a new proclamation calling for the establishment of an independent federal government body to oversee the communications sector. Having agreed the move, the proclamation now passes to the House of People's Representatives for approval, while a draft copy of the document posted by the local news sources shows that it proposes to create the 'Ethiopian Communications Regulatory Authority' ('ECRA') as 'an independent federal government authority for regulation of communications having its

own legal personality'. Among the powers and duties that are to be assigned to the new body are: the issuing, modification and renewal of licenses; the regulation of interconnection between providers; the supervision of radio spectrum and the authorization of frequencies for commercial use; the regulation of tariffs; and the regulation of the types of telecoms equipment that can be used. In addition, it will be tasked with advising the government on communications policy and legislative measures. (February 6, 2019) Addis Standard



France

Arcep has shared the initial results of some excellent navel-gazing it has undertaken, as the French telco watchdog tries to redefine its purpose as networks migrate to the cloud, and evolve to support a richer variety of services. The first two bodies of work, available only in French for now, concern connected vehicles and virtualization. Arcep is not proposing any solutions at this point; it is not really even posing any questions. Instead it is identifying various issues it needs to discuss with interested parties to make sure that regulation keeps up with technological progress. "In this era of continual innovation, telecoms networks are expected to undergo major upheavals in the

coming years, as much in terms of their architecture as how they operate. This is why Arcep opened up a period of reflection to anticipate how networks are likely to evolve over the next five to ten years," Arcep said, in a statement. To help with the reflecting, Arcep assembled a 10-person committee of academics, entrepreneurs and industry veterans "with varying areas of expertise". Try to imagine this without picturing Sartre having a thoughtful puff on his pipe. It's impossible. Arcep seems a little troubled by the flourishing ecosystem around connected vehicles. The problem with all this unhindered innovation is that it is too scattergun, resulting in competing air interfaces

and ambiguous business models. It sees the need to establish “a unifying ecosystem between vehicles, telecommunication networks and road networks, which will pave the way for various uses in the field of road safety, traffic efficiency, environmental protection or driver comfort.” As far as Arcep is concerned, when it comes to enabling cars to communicate with each other and the world around them, it is a two-horse race between the IEEE-backed ITS-G5, and 3GPP’s C-V2X, which both make use of 5.9-GHz spectrum. Some car makers favor the former, while others prefer the latter. “These two technologies are not interoperable today,” Arcep said while acknowledging that work is underway to change that. “The technological debate is considered regrettable as it generates many uncertainties that slow down the deployment of technologies and infrastructure along the roads.” Arcep wants stakeholders to chime in with their thoughts, and while it poses explicit questions, implicitly, the questions are there for all to see: To what extent can and should Arcep intervene in order to facilitate a unified ecosystem? Should it back one technology over another? Does it have any sway over technology decisions taken by car makers? Should it? The second document grapples with new network architectures facilitated by NFV and SDN, and the new business models they might support, such as hosting virtual network functions – or even an entire network – on behalf of other operators or corporate customers. Arcep wants to know how NFV and SDN can best be exploited to the benefit of innovation and competition, and what regulatory headaches all this might cause regarding interoperability, net neutrality, security, and national sovereignty. Those last two considerations

are particularly interesting, because they sound like they have the potential to become a bureaucratic nightmare. “The relocation of certain functions abroad, facilitated by virtualization, can also have an impact on the capacity of the state to implement its capabilities in the detection of cyberattacks or reaction in a crisis,” Arcep explained “The fact that functions historically internalized by operators can be outsourced to external suppliers may also have an impact related to sovereignty when, for example, these actors are subject to foreign regulations.” In addition, when it comes to lawful interception of communications, France’s current legal framework is clear that devices that enable such interception must receive authorization from the prime minister. “However, when network functions, subject to the authorization regime mentioned above, are virtualized, there is the question of precisely which elements must obtain this authorization,” said Arcep. “Is it just the virtualized feature itself, or do you need authorization for the cloud infrastructure, physical machines and operating systems that can perform the virtualized functions for which authorization is required?” (February 23, 2019) telecomtv.com

France’s 5G telecoms frequencies auction will commence this autumn, with licenses expected to be awarded at the beginning of 2020, junior minister Agnes Pannier-Runacher told Le Figaro. The official was cited as saying: ‘The government will fix the political framework in spring. Arcep will then establish the specific requirements, which will be certified in autumn ... The auction will then be launched with attributions at the start of 2020.’ (January 31, 2019) telegeography.com



Germany

Germany’s Federal Network Agency (FNA, or BNetzA) has announced that it has admitted four companies to participate in the upcoming 5G spectrum auction. The country’s three incumbent mobile network operators (MNOs) – Telekom Deutschland, Telefonica Deutschland and Vodafone Germany – will compete with Drillisch Netz, a wholly-owned subsidiary of telecoms company 1&1 Drillisch. The auction is scheduled to begin on 19 March, although the start date may need to be postponed due to legal proceedings filed by MNOs, which have objected to the conditions imposed on spectrum license winners, including coverage obligations. Overall, a total of 420MHz in the 2100MHz and 3.6GHz bands will be auctioned off. ‘Frequencies for mobile spectrum are limited and therefore should be used efficiently in the interests of consumers,’ commented FNA President Jochen Homann, adding: ‘The Bundesnetzagentur has carried out a qualification procedure to check whether the applicants have the necessary competencies and means to roll out the network across the country. The admission of Drillisch Netz to the auction gives a further company the opportunity to acquire frequencies and

strengthens competition.’ (February 26, 2019) telegeography.com

Telefonica Deutschland has filed an emergency motion seeking a temporary suspension to the country’s upcoming 5G mobile spectrum auction, Reuters cites a regional court as saying. The move comes after the nation’s mobile network operators (MNOs), including Telekom Deutschland and Vodafone, filed lawsuits against the conditions for participating in the auction, which is scheduled to take place in the second half of March. The Federal Network Agency (FNA, Bundesnetzagentur or BNetzA) had tightened up the auction rules by imposing more extensive coverage obligations and including measures to promote competition, such as national roaming requirements. It was unclear how quickly the court would rule on the injunction because the FNA must first have a chance to respond. As well as the three MNOs, 1&1 Drillisch submitted an application to take part in the spectrum sale, as it seeks to establish and operate a 5G mobile network to rival the incumbent trio.

(February 7, 2019) telegeography.com

Telekom Deutschland (TD), the domestic operating unit of Deutsche Telekom (DT), has applied to the Federal Network Agency (FNA, Bundesnetzagentur or BNetzA) for permission to use 700MHz frequencies. The firm says it hopes to use the new spectrum from the first half of this year to expand high-speed mobile broadband services to rural and unserved areas. The frequencies are suitable for the rapid development of an LTE network in rural areas and will also lay the foundation for the future 5G network there. Telekom says it paid for the 700MHz spectrum back in 2015, but it has not been able to use it due to the ongoing migration of digital broadcasting services and a lack of border coordination with neighboring countries.

(February 6, 2019) telegeography.com

The communications regulator confirmed it was processing applications from four companies to take part in its 5G auction, a process scheduled for late March despite ongoing legal action by operators.

Although regulator Bundesnetzagentur did not reveal the identity of the contenders, given comments last week from potential newcomer United Internet, it looks likely that company will take part alongside the market's three existing operators: Telefonica, Deutsche Telekom and Vodafone. Another potential bidder floated by German media was MVNO Freenet, however in an interview with Handelsblatt last week its CEO Christoph Vilanek ruled his company out due to the expected cost of acquiring spectrum and uncertainty around 5G license rules. The regulator said it would "quickly assess" the suitability of the applications as it aims for an auction starting date in the second half of March. But this date could be under threat as the country's three operators reportedly filed legal action against the terms of the auction. Formal challenges followed a number of grievances including the extent of coverage obligations and some of the concessions being made to encourage a new entrant.

(January 28, 2019) mobileworldlive.com



Ghana

The Electronic Communications Tribunal has granted a stay of execution requested by two telcos AirtelTigo and Vodafone Ghana, regarding fines imposed on them by the National Communications Authority (NCA) in late-2018. MTN Ghana and Glo Mobile have also filed the same requests but their applications are still pending. As previously reported by CommsUpdate, in

November 2018 all four mobile operators were fined a combined total of GHS34.1 million (USD7.0 million) for breaches of quality of service (QoS) requirements. The stay of execution granted to AirtelTigo and Vodafone Ghana means that both companies have more time to prepare for the hearing of the substantive case, for which no date has yet been fixed.

(February 5, 2019) Business Ghana



Hong Kong

China Mobile Hong Kong, HKT and SmarTone have all applied to be assigned 5G spectrum in the 26-GHz and 28-GHz bands. The three operators have submitted applications for regulator Ofca's planned administrative assignment of spectrum in the two bands. Ofca plans to assign a total of 3,700MHz of spectrum in the frequency range for the provision of large scale public mobile services across the territory. Notably absent from the list of applicants is 3 Hong Kong, which announced in a statement that it plans to abstain from the allocation following an in-depth study. The main reasons for the decision include the fact that the 26-GHz and 28-GHz bands are known to be unsuitable for penetrating buildings and are not commonly used 5G bands, as well as the availability of multiple other options for the provision of 5G services including the 3.3-GHz, 3.5-GHz and 4.9-GHz spectrum due to be allocated later this year. Another major factor behind the decision is Ofca's requirement that operators establish thousands of radio units compatible with the spectrum within five years of the assignment. The operator decided it would be a challenge to meet these obligations. If a suitable number of 26-GHz and 28-GHz compatible 5G devices are released to market by

the time Ofca initiates the second round of allocation of spectrum in the bands in two years time, 3 Hong Kong will reconsider its approach, the company said.

(February 25, 2019) telecomasia.net

The Office of the Communications Authority (OFCA) released a spectrum roadmap for 2019 to 2021, with plans to allocate additional 5G airwaves in two lower bands in 2021. In addition to previously announced plans to assign nearly 4,500MHz of 5G spectrum across five frequency ranges this year, OFCA said it will allocate 160MHz of spectrum in the 600MHz and 700MHz bands from July 2021. The agency stated it aims hold a consultation this year, but noted the target date and timing of the earliest release and assignment are subject to progress in switching off analogue television broadcasting services. The outcome of frequency coordination with China on the use of the two bands to avoid radio interference across the border is another factor. OFCA announced in December 2018 it will assign 4,100MHz of 5G spectrum in the 26GHz and 28GHz bands for use across the territory by Q2 2019, with plans to auction 380MHz of spectrum in the 3.3GHz, 3.5GHz and 4.9GHz bands in mid-2019. Public

consultations on all of these bands were completed in 2018. The regulator faced strong criticism over the past two years for its 5G spectrum policy, particularly from market leader HKT, which often complained about the slow release of the airwaves. Chan Chi Keung, head of group communications at HKT, told Mobile World Live: "We welcome the release of more spectrum for mobile use which is consistent with what the industry has been asking for. We await further details on how this spectrum will be assigned in the consultation process." SmarTone CTO Stephen Chau also welcomed the government's plan to release 160MHz of spectrum, noting: "To meet the capacity requirement of future mobile broadband and various 5G use cases and applications, sufficient spectrum in low, mid and high bands is critical." He said it would be useful if the government could maintain a planning horizon of at least three years on the release of new spectrum so mobile operators can have sufficient time to make investment decisions for network deployments. OFCA noted the release plan is subject to annual review and may be amended "as and when it is considered necessary in the light of latest developments". In December 2018, the Hong Kong government raised HKD6 billion (\$764 million) from the sale of 120MHz of spectrum in the 900MHz and 1800MHz bands, with all four mobile operators (HKT, 3 Hong Kong, China Mobile and SmarTone) participating.

(February 12, 2019) mobileworldlive.com

The Communications Authority (CA) has adjusted the rollout obligations for upcoming 26GHz and 28GHz band 5G mobile licensing in response to requests from industry players, the regulator announced on its website. Licensees have five years to install a set minimum number of base stations – calculated in proportion to the amount of spectrum they receive – and must install at least 20% of the total in the first three years, rising to 50% in the fourth year. The timescale was loosened after industry comments concerning lead times for network installations including indoor cell sites. The application deadline has been extended slightly, and is now 22 February 2019. The performance bond for guaranteeing compliance with the network and service rollout obligations, at HKD1 million (USD127,000) per MHz of spectrum assigned, remains unchanged. As announced in December 2018, beginning in April the Hong Kong regulator will offer a total of almost 4,500MHz of frequencies, including 100MHz in the 3.3GHz band, 200MHz at 3.5GHz and 80MHz at 4.9GHz, plus 4,100MHz across the 26GHz and 28GHz bands. Due to higher demand, the 380MHz of spectrum in the lower ranges will be offered via auction, while the ample supply in the higher bands means those frequencies can be allocated directly.

(February 4, 2019) telegeography.com



Indonesia

The Ministry of Communications and Information Technology (MCIT), known locally as Kementerian Komunikasi dan Informatika (KemKominfo), has commenced spectrum refarming of the 800MHz and 900MHz bands. The process – which arises from the passing of Decree No. 998 of December 2018 (Concerning the Re-Arrangement of 800MHz and 900MHz Radio Frequency Bands for the Need for Organising Cellular Mobile Networks), and SDPPI Decree No. 29 / DIRJEN / January 2019 (Concerning Technical Guidelines for the Rearrangement of 800MHz and 900MHz Radio Frequency Bands for the Need for Organising Cellular Mobile Networks) – began on 23 January 2019, it said, and affects mobile network operators (MNOs) Telekomunikasi Selular (Telkomsel) and Indosat Ooredoo. Unlike KemKominfo's rearrangement of the 2.1GHz band which was concluded in April 2018 involving three MNOs, this time the re-tuning of the use of the lower bands only involves two cellular operators, it confirmed. In announcing the plan, KemKominfo head of public

relations Ferdinandus Setu explained that the refarming exercise would begin in some Riau Islands clusters and will continue to completion for all Telkomsel and Indosat networks throughout Indonesia. In accordance with the data from the Directorate of Resources Planning, a department within the Directorate General of Resources and Equipment of Post and Information Technology, the entire exercise will involve no fewer than 42,000 network elements (i.e. base stations) operating at 800MHz and 900MHz, and is expected to be completed no later than 21 March 2019. As it stands, the radio frequency bands used by MNOs lack consistency and are still not contiguous – in particular the spectrum held by Telkomsel. The refarming and reallocation is intended to improve efficiency and better optimize the use of radio frequency bands, with the ultimate aim of achieving contiguous radio frequency bands for all Indonesian cellular operators to enable them to implement advanced mobile broadband services more easily.

(January 27, 2019) telegeography.com



Japan

The country's three major mobile carriers – NTT DOCOMO, KDDI (au) and Softbank Corp – and e-commerce firm Rakuten have all applied to the Ministry of Internal Affairs and Communications (MIC) for a share of mobile phone frequencies to introduce next-generation 5G wireless services, which are considered essential for new technologies such as IoT. In a communique dated 26 February, the communications ministry said it will review plans submitted by the three incumbent MNOs and that of Rakuten Mobile Network, before seeking final approval

by an advisory panel to the minister on 10 April. The MIC notes that some operators are looking to launch 5G services on a trial basis during the course of this year, ahead of full-blown rollout sometime in 2020. It has also urged operators to 'effectively exclude products made by Huawei Technologies and ZTE Corp in their network facilities due to concerns about security breaches that have already prompted the US and some other countries to ban the two Chinese companies from supplying infrastructure products'.

(January 27, 2019) Japan Times



Liberia

The Liberia Telecommunications Authority (LTA) has issued an individual/universal licence to start-up venture JamCell allowing it to own and operate a public telecommunications network providing triple-play (voice, video and high speed internet data) services throughout the country. According to the LTA press release, JamCell is partnering with Ericsson of Sweden to deploy a form of Narrow Band Technology (NB-LTE), as an alternative to LTE, to meet the growing demand of device connectivity and serve as a pre-5G platform for cellular services and anticipated smart city applications. NB-LTE (sometimes called NB-IoT)

has been described as one of the more promising low power wide area (LPWA) technology options. It brings to the table long range, low power and reliable communications, occupies less bandwidth (when compared to broadband) and produces a higher transmission power than wideband broadband. JamCell's representatives and LTA officials signed off on the license on 8 February 2019, with the start-up saying it aims to effectively start operations in 2021. The company will invest close to USD100 million over the license term, including licensing fees, spectrum acquisition and infrastructure development.

(February 19, 2019) telegeography.com



Mauritania

The Regulatory Authority (Autorite de Regulation, ARE) has re-launched its tender for 4G spectrum after receiving no bids in its original auction. Like the previous sale, which was launched in October 2018, three 4G licenses are being offered to the incumbent operators, while a fourth concession, which covers 2G, 3G and 4G technologies, is aimed at a new market entrant. The deadline for applications has been set

at 13 March. Mauritania is currently home to three active cellcos: Mauritel, Chinguitel and Mattel. The incumbents have in the past been subject to fines from the ARE due to problems with their quality of service (QoS) levels. It has been speculated that the failure of the first tender was due to operators protesting at the fines that have been handed down.

(February 13, 2019) telegeography.com



The Netherlands

Telecoms regulator, the Authority for Consumers & Markets (ACM), has issued its draft rules and guidance for the upcoming 700MHz/1400MHz/2100MHz mobile spectrum auction to the Ministry of Economic Affairs & Climate Policy, inviting comments from industry players until 27 February. The auction will take place at the end of 2019 or the beginning of 2020, whilst a 3.5GHz band auction is expected in 2021. ACM does not propose any reservation of spectrum for new players to compete

with incumbents KPN, VodafoneZiggo or the newly merged T-Mobile/Tele2 Netherlands as it asserts that there will be sufficient competition in the mobile market over the next five years. ACM proposes an individual maximum cap of 50% of the total frequencies on offer. ACM will incorporate comments received into its final advice on the auction, which will be presented to the Ministry in March.

(February 8, 2019) telegeography.com



New Zealand

The government has announced that it plans to stage its first auction of 5G-suitable spectrum in early 2020, when it distributes frequencies in the 3.5GHz band. National spectrum rights in the 3.5GHz band will be available to use from November 2022 when the existing rights in this band expire. However, if an

agreement is secured with the existing rights holder, an operator may be able to use the spectrum earlier than 2022. A consultation regarding the 3.5GHz band will be published in the second half of 2019, while allocation details of regional spectrum rights are expected to be announced later this year. Minister of

Broadcasting, Communications and Digital Media Hon Kris Faafoi commented: 'we are on track and keeping pace with other countries: with the spectrum being progressively allocated, companies can start rolling out 5G from 2020. While spectrum allocations occur, we will concurrently be working with Maori to address the radio spectrum-related Treaty of Waitangi issues [i.e. the protection of Maori interests]. Until this work has been completed, we will not be able to provide details of the 3.5GHz spectrum that will be available for auction ... The government's next priority

is allocation of other segments of the spectrum for 5G in the millimeter wave (mmWave) bands, and details on that will be shared later this year.' The lower part of the 3.5GHz band (3410MHz-3487MHz and 3510MHz-3587MHz) is currently used for wireless broadband and management rights are held by the Crown and by private operators (Kordia, Vodafone, Spark, Connecta). The upper part of the 3.5GHz band (3589MHz-3700MHz) is currently allocated for fixed satellite services and is largely unused.

(February 28, 2019) telegeography.com



Norway

Norwegian telecoms regulator the National Communications Authority (Nkom) has published the final rules for its upcoming auction of frequencies in the 700MHz and 900MHz bands for use offshore. As such, the regulator has confirmed that the sale process will get underway on 9 April 2019 and has advised would-be participants of a 4 April deadline for submitting

an application to take part. In addition, the Nkom has confirmed that 2x30MHz in the 700MHz band will be made available for mobile services, with winning bidders able to use their spectrum from 1 November 2019. Meanwhile, a total of 2x20MHz in the 900MHz band is to be offered, which will be useable as soon as possible after the sale process is complete.

(February 25, 2019) telegeography.com



Peru

The Ministry of Transport and Communications (Ministerio de Transportes y Comunicaciones, MTC) has established new limits on spectrum holdings in order to safeguard competition and prevent hoarding of frequencies. Through resolution No. 085-2019 MTC/01.03, the ministry established an upper limit of 60MHz of spectrum in 'Low Bands,' specifically the sub-1GHz bands: 450MHz, 700MHz, 800MHz, 850MHz and 900MHz. Across the 'Medium Bands' between 1GHz and 6GHz, meanwhile – the 1700MHz, 1900MHz, 2300MHz, 2500MHz, 3500MHz and 3700MHz ranges – operators could hold a combined total of up to 250MHz. The MTC's order added that it would prepare proposals for the allocation of the frequencies in the 3400MHz-3800MHz range within the next six months. Separately, the MTC also said it would look to make additional spectrum in the 2300MHz band available, with plans to release 30MHz covering the Lima and Callao region and a further 30MHz covering the rest of the country.

(February 19, 2019) telegeography.com

The Ministry of Transport and Communications (Ministerio de Transportes y Comunicaciones, MTC) has concluded that the allocation of 2.5GHz spectrum

covering 183 provinces to Vietnamese-backed celloco Bitel in December 2017 was legal and valid. The MTC launched an investigation into the matter in September 2018, after doubts were raised regarding the legitimacy of the allocation, which was completed at the request of Bitel rather than via public tender. MTC's probe found that the authorization was issued 'in accordance with the legal system in force at the date of the assignment ... and meets the requirements of validity.' The Ministry confirmed that the General Telecommunications Law allows for spectrum rights to be issued through a direct request from a party – as was the case with Bitel's frequencies – or via public bidding, and that there were no relevant restrictions in force at the time. Regulations introduced after the allocation have since established that all spectrum licenses must be awarded through public tender, however. The MTC added that Bitel will be required to participate in the planned harmonization of the 2.5GHz band, which looks to restructure the range and will carry additional coverage obligations for remote areas. For the sake of transparency, MTC noted that details of the case would be submitted to the Comptroller General for review.

(February 4, 2019) telegeography.com



Philippines

Philippine de facto duopoly PLDT (incl. Smart Communications) and Globe Telecom, and New Major Player (NMP) Mislattel are reportedly backing the government's market-led common and shared passive infrastructure policy, according to the Department of Information and Communications Technology

(DICT). Officials from the three groups have expressed their willingness to collaborate on the initiative that involves a dozen or so tower companies – which have already signed agreements with the DICT – to deliver a network of common tower assets that should improve telecommunication services while lowering

costs. 'Shared [passive] facilities through this policy would cut back unnecessary expenses from the telco operators and subscribers will benefit from this,' said Acting DICT Secretary Eliseo Rio Jr. The DICT has requested that telcos each submit a list of areas and number of cell sites that their respective operations will need as a working guide for the policy. Since December it has signed agreements with the following towercos: ISOC Infrastructures, Singapore's ISON ECP Tower, IHS Towers, Edotco Group, RT Telecom of Malaysia, China Energy Engineering Corp, Aboitiz InfraCapital, MGS Construction, American Towers, Frontier Tower Associates Management, Phil Tower Consortium (incl. Global Networks and JTower), and JS Cruz Construction and Development. With the government set to finalize the common tower policy by the second quarter of 2019, all interested towercos must first secure a business contract from the telcos for the government to provide assistance through facilitation of permits, right-of-way, and other government requirements for infrastructure. The country needs a minimum 50,000 cell towers to provide full coverage to the population – the existing total stands at 16,000 covering just 8,000 locations. (February 24, 2019) telegeography.com

The President of Philippines Rodrigo Duterte has signed a new act mandating the provision of mobile number portability in the market. The new act requires Philippines mobile operators to provide free mobile number porting to all customers nationwide. Under the new law, telecoms regulator NTC will be required to work with the Department of ICT, the National Privacy Commission and the Philippine Competition Commission to draw up the rules and regulations for the new act within the next three months. These regulations will include a mechanism for allowing consumers to submit complaints about refusals or delays in providing mobile number portability. After evaluating the complaint, the NTC may mediate discussions between the subscriber and the mobile operator to facilitate porting, and may resolve to either compel or deny the porting request. Operators will then have six months to implement the new requirements and ensure they are compliant with the provisions of the act. The wording of the act notes that its basic goal is to provide consumers with the freedom to

choose mobile operators without having to change their numbers, and to encourage competition between mobile operators by encouraging them to provide the most enticing services to consumers.

(February 20, 2019) The Philippine Star

The Department of ICT has announced that it plans to continue with its common tower project regardless of whether the franchise of new major player Mislattel is deemed valid or invalid. The department is recruiting tower operators for a common tower provider program aimed at improving the infrastructure available to the market's mobile operators. One major objective for this initiative is improving the infrastructure available to Mislattel, which was the sole qualified bidder in the new major player selection process, and has an ambitious plan to achieve 70% population coverage in its first three years of operation. Mislattel is a joint venture between China Telecom and businesses owned by local tycoon Dennis Uy, including Mindanao Islamic Telephone Company – also known as Mislattel – which was granted a congressional telecommunications franchise in 1998. But the validity of this franchise has been called into question both in parliament and through legal challenges, and the company now potentially faces having its franchise revoked. But in light of the debate over the validity of the Mislattel franchise, the DICT insisted last week that it will proceed with its common tower project regardless of the outcome. "We will go ahead with the common tower initiative even if we have only two telcos because the fact remains that we still need an additional 50,000 towers to improve our connectivity," acting ICT secretary Eliseo M. Rio said during a signing ceremony with a sixth tower provider. "Common towers can bring down the cost of our telecommunication services so there is definitely a need for this initiative, whether we have to two or three or even four telcos." Rio said the common tower project is expected to bring in around \$4.4 billion in investment and create thousands of new jobs, without using any public funds. The newest tower provider to join the initiative, which will grant participants with easier access to permits and other approvals, is Malaysia-based RT Telecom. The operator is the second Malaysian tower provider to sign on to the initiative after Edotco Group. (February 4, 2019) telecomasia.net



Poland

The Ministry of Digitization has invited comments on plans to amend the frequency usage plan for the 700MHz band, which is currently used for digital terrestrial TV services but is set to be freed up for mobile broadband. Late last year (28 December) the country applied to the EC to delay its scheduled reallocation of the 700MHz band from June 2020 to

June 2022, due to potential problems with coordinating the switchover with neighboring Russia. As such, an update to the National Action Plan for the reallocation of the 700MHz band is necessary, with the Ministry of Digitization issuing the consultation on 1 February and setting a deadline of 8 February for the submission of comments. (February 5, 2019) telegeography.com



Singapore

The Infocomm Media Development Authority (IMDA) has launched a multi-year roadmap to identify new cyber threats and to develop solutions for protecting Singapore's connectivity infrastructure. The initiative will identify areas for improvement in the country's telecommunications cybersecurity capabilities and recommend policies and strategies. It will be run by the newly formed Telecom Cybersecurity Strategic Committee, with the first set of recommendations expected later this year. Senior Minister of State for Communications and Information Janil Puthuchery announced the plans at the Infocomm Media Cybersecurity Conference on Friday. "IMDA has a role in this space as both a regulator, as well as with roles around industry development and capability development. And we have to make sure we have the right balance to

both drive innovation and have the correct, appropriate regulations to protect both our interests as well as our citizens," he said. IMDA further announced new initiatives to strengthen cybersecurity in the infocomm sector. The agency launched an electric Know Your Customer (e-KYC) guide to enable consumers to register for mobile services safely without the need for face-to-face transactions. IMDA also launched a public consultation on its cybersecurity guide for Internet of Things (IoT) systems. The guide aims to help companies take cybersecurity into consideration when purchasing IoT systems. Government agencies and telecom companies can look forward to additional workshops and training programmes that IMDA will run in collaboration with the National University of Singapore Centre for Quantum Technologies.

(January 26, 2019) businesstimes.com.sg



South Africa

New Communications Minister Stella Ndabeni-Abrahams has announced to a parliamentary portfolio committee that she has withdrawn the Electronic Communications Amendment Bill. The draft legislation, which creates the framework for a wholesale open-access network (WOAN) operator, has drawn severe criticism over its proposal to force network operators to provide wholesale access to their infrastructure on a cost-orientated and open-access basis, and the plan to transfer certain powers from telecoms watchdog ICASA to the telecoms minister. In a letter to Jabu

Mahlangu, the chairman of the portfolio committee on telecommunications and postal services, the minister said: "... I hereby withdraw the bill for further consultations. As part of this process, we will also assess the policy and regulatory requirements needed to support the fourth Industrial Revolution and the digital economy. The Electronic Communications Amendment Bill will also have to evolve to support our drive to create a digital society and should contribute to strengthening and enabling the regulatory environment. (February 13, 2019), TechCentral



Sweden

The National Post and Telecom Agency (PTS) has issued a public consultation on proposed rules for a 5G frequency license auction in the 3.5GHz and 2.3GHz bands, which is scheduled for December 2019. Industry stakeholders can submit comments on the proposals until 5 March 2019. The PTS proposes, among other things:

- Allocation of eight 10MHz blocks in the 2.3GHz band and 15 20MHz blocks in the 3.5GHz band
- License validity up to 31 December 2044
- A spectrum ceiling in the 3.5GHz band limiting the

amount of spectrum that an operator can acquire in the auction at 120MHz (designed to ensure that at least three independent licensees can provide network capacity based on the 3.5GHz band).

Following this consultation, the PTS will compile detailed rules regarding the auction, and intends to issue a public invitation in April. Furthermore, with regard to the 3.7GHz–3.8GHz band, the PTS says it 'continues to investigate the issue of local permits'.

(February 7, 2019) telegeography.com



Switzerland

Swiss telecoms watchdog the Federal Communications Commission (ComCom) has completed its auction of 5G-compatible spectrum, awarding airwaves in the 700MHz, 1400MHz and 3500MHz bands to the trio of active mobile network operators – Swisscom, Sunrise and Salt – and generating CHF379 million (USD378 million) for the treasury. UK-based wholesale provider Dense Air also participated in the auction but failed to secure any frequencies. Mobile market leader Swisscom paid CHF195.6 million for 2×15MHz (three

2×5MHz blocks) in the 700MHz band and 120MHz of unpaired spectrum in the 3500MHz range, as well as 50MHz of supplementary downlink (SDL) frequencies in the 1400MHz band. Salt paid the next-highest amount at CHF94.5 million for 2×10MHz in the 700MHz band, 80MHz in the 3500MHz band and 10MHz of SDL 1400MHz frequencies. Finally, Sunrise was awarded 2×5MHz of paired spectrum and 1×10MHz of SDL airwaves in the 700MHz range, as well as 100MHz of 3500MHz frequencies and 15MHz of SDL spectrum

in the 1400MHz band. Sunrise paid CHF89.2 million for its allocation. Three 5MHz blocks in the 1400MHz (SDL) band and 5MHz of 700MHz (SDL) frequencies, as well as a 2x5MHz block in the 2600MHz range leftover from a previous tender were left unsold. Commenting on the results, Sunrise CEO Olaf Swantee was quoted as saying: 'We prepared meticulously for the auction, resulting in prudent use of our resources to secure valuable spectrum. This clever bidding strategy has secured the implementation of our 5G strategy as planned ... We were able to acquire the strategically most important bands at a very favorable price per MHz, even better than the competition ... We are therefore very satisfied with the outcome of the auction. Now it's up to the Federal Council to amend mobile network radiation limits so the economy and entire population can really benefit from this positive starting point.' A press release from Salt, meanwhile, announced that the company would be using the frequencies to introduce 5G services later this year, setting its sights on a Q3 launch. The cellco noted that the 700MHz frequencies were vital to its portfolio for providing deeper indoor 5G coverage. The 3500MHz and 1400MHz frequencies would be used 'to deliver extreme mobile broadband with super-fast speeds and ultra-robust low-latency connectivity for consumers as well as for IoT.'

(February 8, 2019) telegeography.com

The Federal Communications Commission (ComCom)

awarded 5G radio frequencies to all three mobile operators – Swisscom, Sunrise and Salt – raising CHF380 million (\$379 million). The frequencies will be assigned for 15 years, which the regulator said provides the "operators long-term planning security to develop their networks." ComCom said it set caps to ensure all operators were able to acquire a wide range of 5G frequencies at reasonable prices and the process is "of key importance for the digitalization of Switzerland". It also said its aim was not to maximize auction revenue, but rather to allocate frequencies efficiently to ensure high quality mobile communications services. The money raised in the auction is a far cry from other European countries: Italy raised around \$7 billion, for which it has faced criticism; while Germany could reportedly raise around \$5.6 billion. Dense Air, a small cell player which launched in 2018, pulled out of the Swiss auction. Reuters noted this "removes a potential rival for the three companies in the already crowded Swiss mobile market". Swisscom, which paid CHF196 million, said by the end of 2019 it expects to roll-out 5G to 60 towns and communities. Sunrise and Salt did not have such concrete plans. The former said the frequencies gained will help it to "deliver a world-class 5G network in the future" and the latter that it will "improve its high-quality mobile network" with "next-generation speed, latency and capacity".

(February 8, 2019) mobileworldlive.com



Taiwan

The government in Taiwan will complete the first-stage release of 5G spectrum licenses by 2020 at the latest to embrace global explosions of 5G applications and smartphone shipments, Premier Su Chen-Chang has announced. Su said that the government will materialize the "digital country, innovative economy" project to step up the development of next-generation industries and spur diverse 5G applications in Taiwan. Many Asian countries such as Japan, South Korea and China have set timetables for releasing 5G spectrum licenses in 2020 in line with the massive shipments of 5G smartphones and proliferation of 5G applications. Leading smartphone vendors, network equipment suppliers, and chipmakers are expected to showcase

their latest 5G offerings at the upcoming 2019 MWC as part of their warm-up efforts to tap 5G business opportunities. To welcome the advent of the 5G era, a 5G industry development alliance has been established in Taiwan by major telecom operators, and more than 40 enterprises have joined as members, shaping up 5G vertical application ecosystems. Taiwan-based FarEastone Telecommunications has also invited 26 businesses to jointly set up 5G Internet of Vehicles (IoV) supply chain innovation base. In addition, Taiwan makers of 5G chips, antenna modules and small-cell equipment are also planning to join the Clear5G project initiated by the EU to pave the way for entering the IIoT (industrial IoT) market. (February 19, 2019) digitimes.com



Timor-Leste

The government has confirmed that local consortium Ceslink is submitting an application to become the country's fourth telecoms operator. The company comprises Ceslink, a computer technology company, and the Oka-D'tel consortium. According to a statement from the Council of Ministers, Ceslink intends to offer high-quality, high-speed, affordable

and secure telecoms services in all areas of the country. If successful in its application, Ceslink will compete with three other players in the telecoms market, namely former monopoly operator Timor Telecom, Vietnamese-owned Viettel Timor-Leste (Telemor) and Telin Timor-Leste (Telkomcel), part of Telekomunikasi Indonesia International (Telin).

(February 22, 2019) telegeography.com



Thailand

The National Broadcasting and Telecommunications Commission (NBTC) is planning to use the Broadcasting and Telecommunications Research and Development Fund (BTRDF) to provide low-interest loans to mobile operators as an alternative source of funding to expedite 5G-related investment. The regulator is also considering more flexible draft conditions for the planned auctions of several spectrum ranges, including 2600MHz, 26GHz and 28GHz. Takorn Tantasith, Secretary General of the NBTC, said: 'The adoption of 5G infrastructure requires huge investment and the business use cases are still immature. As the regulator, we want to ease the burdens for operators and promote infrastructure investment for the benefit of the country.' He said the BTRDF currently comprised THB40 billion (USD1.28B) (February 6, 2019) telegeography.com.

The National Broadcasting and Telecommunication Commission (NBTC) is moving ahead with plans to auction 5G spectrum in the 2600MHz, 26GHz and 28GHz bands later this year, after the three main

operators expressed no interest in bidding for 700MHz frequencies. Takorn Tantasith, Secretary General of the NBTC, said that if the regulator were to auction only the 700MHz range this year, it could affect the adoption of 5G. The 2600MHz band is currently occupied by state-owned broadcaster MCOT, which has a total of 180MHz of spectrum bandwidth. MCOT has agreed to return the unused bandwidth of roughly 150MHz to the NBTC in exchange for compensation. Meanwhile, the 26GHz and 28GHz bands are partly occupied by satellite business provider Thaicom, though Mr Takorn added that the NBTC can reallocate 4GHz in the two bands for 5G use. A working team is currently working on the draft auction conditions for the planned 5G auction, with a deadline for the initial details set for February. The NBTC is still planning to hold the 700MHz auction in May, as initially planned, with CAT Telecom the sole domestic operator to have disclosed plans to participate in the tender. The company is currently on the lookout for a strategic foreign partner.

(January 30, 2019) telegeography.com



Togo

The government of the western African nation of Togo has announced that it will renew the operating license of TogoCom Group – the state-owned holding company formed in July 2017 from the merger of fixed telephony operator Togo Telecom and mobile operator Togo Cellulaire (Togocel) – as part of plans to increase its attractiveness to investors ahead of its planned capital opening in March 2019. On 31 January 2019, the Council of Ministers approved the decree to authorize the Ministry of Posts & Digital Economy to sign the order for the renewal of the license, which is expected to be extended until 31 December 2036. The government hopes the move will 'reinforce the confidence of the strategic investor who will be retained at the end of the tender procedure,' according to the Council's press release, and encourage 'the realization of the investments necessary to achieve the objectives set in the sectoral policy declaration established for the period 2018-2022.' In December 2018 Togo launched the international tender for shares

in TogoCom Group, saying it hopes to be in the position to reveal the name of the new strategic partner by 31 March 2019. The relevant authorities are seeking to select an investor with the capabilities to rapidly develop TogoCom's broadband internet systems, fixed and mobile, through the deployment of 4G and optical fiber networks 'by 2020'. The government maintains that this will allow the group 'to consolidate its investment capacity and benefit from latest ICT, to develop new growth segments'. With the state-owned telco looking to take on the might of Maroc Telecom, which operates in Togo via local unit Moov, a spokesperson was quoted at the time as saying: 'For the government, this move will accelerate development and boost investments in telecommunications, hence providing a service of better quality and competitive prices, for the benefit of the people and businesses, while supporting the country's development strategy.'

(February 4, 2019) telegeography.com



Uganda

The government has been forced to go back to the drawing board in its search for a majority investor for state-owned fixed and mobile operator Uganda Telecom Limited (UTL). In October last year Nigeria-based private equity firm Teleology Holdings was named as the winner of a tender to acquire an interest in the telco. The privatization attracted seven bidders and Teleology emerged ahead of its rivals with an offer of USD71 million for a 67% stake. A report however, cites government officials as saying that Teleology failed to pay the required 10% deposit by the deadline of 26 January. State Investment minister Evelyn Anite

is now taking the matter back to Cabinet for approval to seek a new investor, the report adds. Ms. Anite had been against naming Teleology as the winner, saying that Mauritius Telecom had a better track record in investing in African telcos, despite offering a much lower bid than its Nigerian rival. Teleology has also faced problems in Nigeria, where it was hoping to take over struggling cellco 9mobile. Disagreements between the private equity group and local investment partners have reportedly led to Teleology Holdings pulling out of the deal. (February 20, 2019) The Independent.



Ukraine

The National Commission for State Regulation of Communications & Informatization (NCCIR or NKRZI) adopted a decision to cancel the nationwide 3.4GHz-3.6GHz WiMAX wireless broadband operating license of Ukrainian High Technologies (FreshTel) for failure to utilize the frequencies, it announced on its website. The FreshTel was established in 2005 as Ukraine's first commercial WiMAX provider, and its current 15-year license was due to run until November 2021, but it suspended operations during 2018. The NCCIR stated that the 3.5GHz license revocation was aimed at increasing effective use of spectrum 'in order to further introduce the latest technologies in Ukraine', implying that the band will be made available for 5G mobile/fixed

operating concessions. The decision enters into force ten days after its adoption and is implementable after three months. The NCCIR's announcement confirmed multiple reasons for FreshTel's license revocation. The company failed to meet license stipulations to fully develop its 3.5GHz network in all Ukrainian regions by June 2013, and in twelve regions the operator had no valid permits for equipment operation. Furthermore, the February 2019 decision claims that the firm had discontinued use of the licensed frequencies 'for more than one year'. It had also failed to report subscriber information to the regulator and had not paid spectrum fees for a period of more than six months.

(February 20, 2019) telegeography.com



United Kingdom

Ofcom has reported on plans by Openreach to withdraw the WLR and SMPF products by 2025 and deliver voice over a broadband connection previously and in an Ofcom policy positioning paper we learn that Virgin Media is working to a similar time scale for shifting from a PSTN to VoIP type structure. We prefer the Voice over Broadband naming for this shift, since saying VoIP has lots of historical baggage from the days when using VoIP meant learning all about SIP and NAT settings in your router. Voice over broadband as planned by both Openreach and Virgin Media should be plug and play for majority, the vulnerable and at risk may require someone to visit to ensure everything is plugged and battery backup fitted where needed, plus install broadband for the first time. In broadband USO areas this might involve a 4G router with a traditional socket for a telephone. The change will offer potential benefits to consumers, such as clearer phone calls, and it will help ensure the UK's landline telephone services are fit for the future. The transition will be straightforward for most customers but some may require additional support to help them update their services. Ofcom's rules mean that phone users must receive equivalent protections, however their landline is delivered. In this document, we explain what changes are taking place, the roles and responsibilities of different organizations, and our expectations of telecoms providers as they make these changes. The voice over broadband shift is NOT about wholesale ripping out of the copper network by 2025 which we have seen a good number assume, one simple reason being that with only half the UK expected to have access to full fiber by 2025 and for individual operators such as Openreach it may be only one in three premises, so existing copper will still be very important. Another factor is that MPF (full LLU) services are still planning to be operating in

2025, though given the MSAN at the many exchanges they have unbundled will be getting older we may see changes from them in the next few years. If the 2025 deadline had been back in the days of 2010 the switchover would have been a lot more complex, but with the number of landline calls diminishing year on year as more people rely on their mobile phone for calls, or are abandoning the notion of a phone call totally and just use apps to communicate with friends and family the need for a switch off campaign like we had for the transition to Digital TV is diminished but some form of safety net will need to be in place, even if just to ensure that vulnerable people are not exploited by con artists charging well over the odds just to prepare people for the switchover. (February 23, 2019) thinkbroadband.com

The telecom regulator Ofcom has begun consulting on proposed changes to both the 'General Conditions' and the 'National Telephone Numbering Plan', with a view to 'preparing for all eventualities relating to the UK's planned withdrawal from the EU'. In a press release regarding the matter, the watchdog said that it is seeking feedback on changes that would need to be made to two regulatory instruments in the event that the UK were to leave the EU on 29 March 2019 without a withdrawal agreement being in place. Specifically, it has said that in such a scenario it would seek to amend both the General Conditions and National Telephone Numbering Plan so as to change references to the 'European Union' in those documents to either the 'United Kingdom and European Union' or 'United Kingdom or European Union', in order that 'the scope of the regulations remains the same' after the country's exit from the European bloc. A deadline of 15 March 2019 has been set for submissions to the consultation.

(February 13, 2019) telegeography.com



United States

The FCC plans to adopt an order opening up spectrum above 95 GHz for unlicensed operations and experimentation. In addition, it plans a consultation on redrawing the 900 MHz band to open up room for broadband applications. The meeting will be held 15 March. The order for the 95 GHz band would open up in total 21.2 GHz, creating a new class of experimental licenses for the 95 GHz to 3 THz spectrum range. FCC chairman Ajit Pai noted that while the physical properties of this range have made it considered less suitable for wireless communications, it fits with the FCC's 'Spectrum Horizons' policy to stimulate innovation and research in new frequency ranges. In addition, the US regulator has new plans for the 900 MHz band, traditionally used for narrowband services like two-way dispatch radios. It will consult on reconfiguring the 900 MHz band to create a broadband segment to facilitate technologies and services for a wide variety of businesses, including critical infrastructure. The consultation will cover various transition mechanisms to achieve this goal, including a voluntary spectrum exchange, overlay auction or an incentive auction. Another consultation is planned on potential changes to partitioning, disaggregation and leasing rules that might help reduce the digital divide and increase spectrum access by small and rural carriers. This could allow smaller carriers to own or lease smaller portions of spectrum compared to current license blocks, in a specific geographic area in need of increased coverage, and facilitate secondary spectrum market transactions.

(February 24, 2019) telecompaper.com

The US Federal Communications Commission (FCC) has confirmed that it will initiate 'Auction 102' – its sale of Upper Microwave Flexible Use Service (UMFUS) licenses in the 24.25GHz-24.45GHz/24.75GHz-25.25GHz (24 GHz) band – on 14 March. Upfront payments from registered participants are due by 19 February 2019. Auction 102 represents the FCC's second sale of millimeter wave (mmWave) spectrum in recent months. As previously reported by TeleGeography's CommsUpdate, Auction 101, which comprised spectrum in the 27.5GHz–28.35GHz (28GHz) band, concluded on 24 January, after 176 rounds of bidding. Auction 101 generated total bids of USD702.57 million, with offers for 2,965 of the 3,072 available licenses. (February 4, 2019) telegeography.com

A federal appeals court asked pointed questions of the Federal Communication Commission on Friday in hearing a challenge to whether the Trump administration acted legally when it repealed landmark net neutrality rules governing internet providers in December 2017. The panel heard more than four hours of arguments in the first court hearing on the FCC's controversial decision to reverse the Obama administration's 2015 rules, which barred internet service providers from blocking or throttling traffic, or offering paid fast lanes,

also known as paid prioritization. The arguments focused on how internet providers should be classified under law – either as information service providers as the Trump administration decided or as a public utility, which subjects companies to more rigorous regulations – and whether the FCC adhered to procedural rules in dismantling the Obama-era rules. "We are creating rules that are built to last," FCC general counsel Tom Johnson told the U.S. Court of Appeals for the District of Columbia. Judge Patricia Millett repeatedly pressed Johnson over the FCC's legal basis for treating telephone calls differently than internet traffic and asked if the FCC had properly considered the public safety impacts. Millett raised the example of police needing to send urgent photos or video of a suspect that could be delayed if some internet traffic was prioritized. "We can't anticipate all harms," Johnson said. As he sought to play down the concern Millett interjected: "There's no evidence because they haven't done it yet." In its 2017 decision the Republican-led FCC voted 3-2 along party lines to reverse the net neutrality rules. The agency gave providers sweeping power to recast how users access the internet but said they must disclose any changes in users' internet access. The appeals panel is made up of Judges Millett and Robert Wilkins, two appointees of Democratic former President Barack Obama, and Stephen Williams, an appointee of Republican Ronald Reagan. A group of 22 state attorneys general and the District of Columbia asked the appeals court to reinstate the Obama-era internet rules and to block the FCC's effort to pre-empt states from imposing their own rules guaranteeing an open internet. Several internet companies are also part of the legal challenge, including Mozilla Corp, Vimeo Inc and Etsy Inc, as well as numerous media and technology advocacy groups and major cities, including New York and San Francisco. The challengers also got difficult questions about their legal rationale for seeking reinstatement of the rules. Kevin Russell, a lawyer for the challengers, said hypothetically an internet provider could now block the Daily Caller website or graphic animal abuse videos as long as they disclosed it. "We never get a straight answer from the commission whether it thinks blocking and throttling must always be prohibited" or only if it applies to punishing a competitor, Russell said, arguing that the FCC failed to engage in a reasoned analysis and did not properly assess consumer complaints. The FCC repeal was a win for providers like Comcast Corp, AT&T Inc and Verizon Communications Inc, but was opposed by internet companies like Facebook Inc, Amazon.com Inc and Alphabet Inc. Major providers have not made any changes in how Americans access the internet since the repeal. In October, California agreed not to enforce its own state net neutrality law until the appeals court's decision on the 2017 repeal, and any potential review by the U.S. Supreme Court. A decision is expected by this summer.

(February 1, 2019) reuters.com



Vietnam

The Ministry of Communications has awarded the nation's first 5G trial license to military-run operator Viettel. The ministry has awarded a license that will allow Viettel to operate trial 5G services in both Hanoi and Ho Chi Minh City, Vietnam News Agency reported. Viettel plans to conduct technical trials and evaluate the ability to deploy 5G infrastructure in the nation. Viettel will not be allowed to collect fees from 5G users during the trial period, which will last until January

21 next year, the report states. According to Reuters, Viettel has earmarked \$40 million for the development of its own 5G chipset, but is also evaluating using technology from Ericsson and Nokia. Viettel has around 60 million subscribers in Vietnam, and has been aggressively pursuing overseas expansion, with Viettel Global now having operations in 10 countries. [\[Source\]](#)
(January 27, 2019) telecomasia.net

"Information contained in Member News updates, Regional News updates, Policy & Regulatory updates, Satellite News updates, Technology News updates, Snapshot of Regulatory News SAMENA Countries, Regulatory News beyond SAMENA region and Wholesale News updates have been obtained from sources, which we deem reliable. SAMENA Telecommunications Council is not liable for any misinformed decisions that the reader may reach by being solely reliant on information contained herein. Expert advice should be sought."

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